PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO.201

Occupant Protection In Interior Impact—Passenger Cars

(Docket No. 19)

Motor Vehicle Safety Standard No. 201, issued January 31, 1967, and published in the *Federal Register*, February 3, 1967 (32 F.R. 2413), specifies requirements for instrument panels, seat backs, protrusions, sun visors, and armrests to afford impact protection for occupants of passenger cars manufactured after January 1, 1968.

Parties adversely affected by the Standard were permitted to petition for reconsideration on or before March 6, 1967, pursuant to 23 CFR 215.17. By order dated March 29, 1967, the Acting Under Secretary of Commerce for Transportation consolidated the 27 petitions related to Standard No. 201 and ordered that a hearing on reconsiderations be held.

On April 21, 1967, the Federal Highway Administration issued an order directing that a rule-making hearing be held pursuant to 5 U.S.C. 553 (formerly sec. 4 of the Administrative Procedure Act (60 Stat. 238, 5 U.S.C. 1003). The hearing was held May 22 and 23, 1967, at Detroit, Mich., and May 24 and 25, 1967, at Washington, D.C. On June 22, 1967, the presiding officer submitted his Report of Recommended Findings to the Federal Highway Administration.

On June 8 and 9, 1967, and July 6 and 7, 1967, meetings were held by the National Highway Safety Bureau with domestic and foreign auto industry engineers in which detailed engineering discussions of all problems of compliance with the Standard were held.

After review of the evidence presented at the hearings ordered by the Federal Highway Administration, the report of the presiding officer, and the Bureau's analysis of the engineering meetings with the industry, I have determined that Standard 201 issued January 31, 1967, should be superseded by a new Standard that specifies initial requirements to afford impact protection for occupants, and that certain related definitions should be amended accordingly.

Good cause is shown that an effective date earlier than 180 days after issuance is in the public interest and notice and public procedure hereon are unnecessary since these amendments relieve restrictions and impose no additional burden on any person.

In consideration of the foregoing, Part 371, Initial Federal Motor Vehicle Safety Standards, is amended by superseding § 371.21, Motor Vehicle Safety Standard No. 201 (32 F.R. 2413), with a new Motor Vehicle Safety Standard No. 201 . . . and by amending § 371.3(b). . . .

These amendments are made under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority of March 31, 1967 (32 F.R. 5606), as amended April 6, 1967 (32 F.R. 6495), and becomes effective January 1, 1968.

Issued in Washington, D.C., on August 11, 1967.

Lowell K. Bridwell,
Federal Highway Administrator

32 F.R. 11776
August 16, 1967

PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 201

Occupant Protection in Interior Impact

(Docket No. 78-116; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

EFFECTIVE DATE: The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

ADDRESS: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

SUPPLEMENTARY INFORMATION: This notice amends Standard No. 201, *Occupant Protection in Interior Impact,* and Standard No. 203, *Impact Protection for the Driver From the Steering Control System,* to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement,* to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting,* and Standard No. 219-75, *Windshield Zone Intrusion,* led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards

Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars, Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arrguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed reulmaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivvated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201,203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manfacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done bySherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly edmonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the

requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA belives that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

Loading Requirements

At present, Standard No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

Commercial Vehicles

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212–76, *Windshield Mounting,* and Standard 219–75, *Windshield Zone Intrusion.* As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.

The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

Walk-In Vans

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention,* and 219-75, *Windshields Zone Intrusion.* The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their uniques driver/steering column configuration, and thus is exempting walk-in vans for the present.

Belts in Forward Control Vehicles

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection.* They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

Upgrading of Standard

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In additional, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy, absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children invilved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

Heavy Trucks

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited commens on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck reguylatory action may be needed.

Miscellaneous Comments

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment apprars to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a headform representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For protions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufactuere, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exceptions to Standard No. 201 and, if not, sought to have its instrument panel constured to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on teh instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.

Costs and Leadtime

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been places in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said that the cost associated with complying with all three standards was $30. Ford estimated the cost for compliance with Standard No. 201 as $10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at $120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance, Bases on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of $16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a $27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between $6 and $15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design asssumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with

the standard, the DeLorean Corp. also examined the leadtime necessary to comply with the standards. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18–24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 20, 1979.

Joan Claybrook
Administrator

44 F.R. 68470
November 29, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 201

Federal Motor Vehicle Safety Standards; Standard No. 201, Occupant Protection in Interior Impact

[Docket No. 82-12; Notice 2]

ACTION: Final rule.

SUMMARY: Standard No. 201, *Occupant Protection in Interior Impact*, sets requirements for instrument panels, interior compartment doors, seat backs, sun visors, and arm rests to lessen injuries to persons thrown against them in crashes. At the request of Blue Bird Body Co., the agency proposed excluding school buses from the standard since they have to meet the requirements of Standard No. 222, *School Bus Passenger Seating and Occupant Protection*. The agency agrees that the seat back requirements of the two standards overlap and therefore has decided to exclude school buses from the seat back requirements of Standard No. 201. The other requirements of Standard No. 201 do not overlap with Standard No. 222 and therefore they will continue to apply to school buses.

DATE: The final rule is effective December 22, 1982.

SUPPLEMENTARY INFORMATION: On June 10, 1982 (47 F.R. 25169) the agency proposed an amendment to Standard No. 201, *Occupant Protection in Interior Impact*, that would exclude school buses from the seat back requirements of the standard. The agency issued the proposal in response to a request from Blue Bird Body Co., a school bus manufacturer. Blue Bird argued that since school buses have to comply with Standard No. 222, *School Bus Occupant Seating and Crash Protection*, whose requirements cover the same aspects of performance, they should not have to comply with Standard No. 201.

The only comment received by the agency supported adoption of the proposal. Because the agency has determined that compliance with the requirements of Standard No. 222 provides adequate protection, the agency has decided to adopt the proposal to exclude school buses from complying with the redundant seat back requirements of Standard No. 201.

Additional 201 Requirements

In addition to the requirements for seat backs, Standard No. 201 sets performance requirements for instrument panels, interior compartment doors, sun visors and arm rests to prevent or reduce injuries to persons thrown against them in crashes. Since Standard No. 222 does not contain any performance requirements for those specific items, it is not appropriate to exempt school buses complying with Standard No. 222 from those requirements of Standard No. 201.

Future Rulemaking

The one commenter to the docket, Mr. Edward deR. Cayia, proposed a change to the test procedures to Standard No. 201 and Standard No. 222. He pointed out that the two standards use different test devices in the head impact test of the standards. Standard No. 201 uses a 15-pound, 6.5 inch diameter headform. Standard No. 222 uses a headform that has two joined hemispheres with a total weight of 11.5 pounds; the one sphere has a diameter of 6.5 inches and the second, which is centered and protrudes from the first, has a 2-inch diameter. Mr. Cayia said that the Standard

No. 222 headform is a more accurate representation of the human facial structure.

The agency agrees that it would be desirable to have a uniform headform for the head impact tests of the two standards. The agency intends to evaluate the headforms to determine which would be the most appropriate and, based on that evaluation, will decide what rulemaking action is necessary.

Issued on November 15, 1982.

Raymond A. Peck, Jr.
Administrator
47 F.R. 52450
November 22, 1982

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 201

Occupant Protection in Interior Impact

(Docket No. 90-14; Notice 2)
RIN: 2127-AD84

ACTION: Final rule.

SUMMARY: Vehicle manufacturers must comply with Standard No. 201 which specifies occupant impact protection requirements for interior vehicle components that are likely to be struck by a lap-belted occupant during a crash. Those components include instrument panels, visors and armrests. This final rule alters the impact protection requirements concerning the instrument panel for vehicles with passenger-side air bags. Today's notice will encourage greater availability of passenger-side air bags and thus result in a net safety benefit.

DATE: The amendments made by this final rule to the *Code of Federal Regulations* are effective June 6, 1991.

SUPPLEMENTARY INFORMATION:

The Standard

Standard No. 201, Occupant Protection in Interior Impact, specifies occupant impact protection requirements for interior vehicle components likely to be struck by a lap-belted occupant in a crash. Such components include instrument panels, seat backs, sun visors, and armrests. In addition, the standard requires that interior compartment doors (e.g., glove compartment doors) remain closed during a crash.

To comply with Standard No. 201's impact requirements, vehicle manufacturers install energy absorbing materials in the portions of the instrument panel within the "head impact area," as defined in 49 CFR 571.3. The requirements specify that when those portions are impacted by a head form at 15 miles per hour (mph), the deceleration of the head form must not exceed 80g continuously for more than 3 milliseconds. Installation of appropriate energy absorbing materials in the upper and middle surfaces of the instrument panel to meet the requirement can prevent or reduce the severity of chest and head injuries resulting from contacts with the panel.

Petition for Rulemaking and Request for Comments

NHTSA received a petition for rulemaking from Chrysler Corporation (Chrysler) on August 17, 1988. The petition requested an exclusion from the impact protection requirements of Standard No. 201 for those portions of the instrument panel which are ahead of front seat passengers who are protected by air bag systems which meet the requirements of Standard No. 208, Occupant Crash Protection. NHTSA granted the petition on April 26, 1989 and requested comment on issues related to the petition in a published in the *Federal Register* on August 10, 1989 (54 FR document 32830).

NHTSA received 11 responses to its request for comments. Comments were received from the Insurance Institute for Highway Safety (IIHS), the Automotive Occupant Restraints Council, and 9 motor vehicle manufacturers or importers. No commenter opposed a modification of Standard No. 201 to facilitate the installation of top-mounted, passenger-side air bags.

Motor vehicle manufacturers commented that they have had problems complying with Standard No. 201 when dealing with top-mounted, passenger-side air bags. The primary problem apparently occurs because, in order to optimize air bag deployment with such a system, the air bag housing should not be located more than 1 inch below the instrument panel surface. Yet to meet the standard's head form impact test at 15 mph, the equivalent of about 2 inches of energy absorbing material is needed. The "head impact areas" in the instrument panels of some top-mounted rearward-deployment air bag systems have been able to meet the standard's requirements, although it has been difficult to do so. However, commenters stated that, with padding limited to 1 inch, compliance would be very difficult, if not impossible, for upward deployment systems.

Manufacturers identified a number of benefits from installation of top-mounted, upward-deployment air bags, instead of rearward-deployment ones. The major benefit is the reduced risk of injury to out-of-position occupants or standing children. Other advantages listed by commenters include the following: the top portion of the instrument panel provides more space for locating and supporting the air bag module; the air bag module is more remote from the knee impact surface and is thus less likely to adversely affect knee and femur loads; since the mass of the air bag module is closer to the body structure, shorter and stiffer supporting members can be used, resulting in a more stable platform for deployment; and instrument panel design is simplified due to reduced interference between the air bag system and the glove box.

In addition, a change in Standard No. 201 to facilitate installation of top-mounted, upward-deployment air bags may increase the installation rate of passenger-side air bags. In its comments, Ford Motor Company (Ford) stated that improved "feasibility of a top-mounted, upward-deployment supplemental passenger air bag system may substantially increase availability of passenger air bags, particularly in compact and subcompact cars, by helping to reduce overall risks to out-of-position occupants. Modification of S3.1 of Standard 201 would aid in establishing feasibility of the upward-deployment supplemental air bag."

In the request for comments, NHTSA also asked whether lap/shoulder belts should be required to be provided for all positions for which the requirements of Standard No. 201 might be relaxed. No commenter opposed requiring lap/shoulder belts to be provided for the front outboard passenger. One commenter opposed such a requirement for the middle passenger position, believing that lap/shoulder belts would be unnecessary and counterproductive for that seating position. NHTSA did not propose to require installation of lap/shoulder belts for the center front seating position, nor did it mean to imply that the lap/shoulder belt requirement should apply to this position.

Notice of Proposed Rulemaking

On July 18, 1990, after considering the public comments and further analyzing the issues, NHTSA published in the *Federal Register* a notice of proposed rulemaking (NPRM) to amend Standard No. 201 to relax the impact protection requirements for vehicles equipped with passenger-side air bags (55 FR 29238). The agency proposed to reduce the head form impact velocity specified by Standard No. 201 from 15 mph to 12 mph for vehicles equipped with passenger-side air bags. The proposal applied to all vehicles with passenger-side air bags, not just those with upward deployment air bags. The proposal also required the installation of lap/shoulder belts at the right front seating position if the manufacturer elects to meet the requirements of Standard No. 201 at the 12 mph head impact velocity. In the NPRM, NHTSA stated that it believes that this additional requirement would provide protection in crashes where the air bag is unlikely to deploy. Examples of such crashes include frontal crashes under 12 mph; crashes involving a car whose air bag has previously been deployed, but not replaced, rear crashes in which the unrestrained occupant rebounds from his or her seat back and strikes the instrument panel; side crashes; and rollover crashes.

NHTSA requested that commenters provide data or estimates of the possible greater safety benefits of upward-deploying air bags or other information on how such air bags are preferable. Because NHTSA wanted to ensure that the rulemaking resulted in net safety benefits, the agency also solicited comments on a number of issues, including the number of passenger-side air bags that manufacturers planned to install, with and without the amendment; means of limiting the test speed reduction to the areas of the instrument panel necessary to accommodate the top-mounted air bag; and data on the manufacturers' current and projected deployment speed thresholds for air bags.

NHTSA proposed to make the amendment effective upon publication of the final rule in the *Federal Register* since the amendment would not establish additional requirements, but would instead establish an alternative for manufacturers to choose at their option. In addition, an immediate effective date would allow motor vehicle manufacturers the greatest flexibility in designing vehicles with passenger-side air bags.

NHTSA received eight comments in response to the NPRM. All of these comments were considered in connection with the final rule, and the most significant are discussed below.

Comments on the Proposed Rule and Final Rule

All eight commenters expressed support for the agency's proposals. No comments in opposition to the proposed amendments were received. After reviewing the comments, NHTSA has decided to adopt the amendment in this final rule without substantive change. The agency revised the regulatory text of the proposed amendment to improve consistency with the wording of the previous text. In accordance with the proposal, NHTSA has decided to reduce the head form impact velocity specified for Standard No. 201 from 15 to 12 mph for any vehicle equipped with a passenger-side air bag, not just those with upward-deployment air bag systems. The agency has determined that the amendment will result in either the increased use of passenger-side air bags, or the earlier introduction of such systems. The agency has also determined that a requirement for different portions of an instrument panel to comply with different impact speed requirements might not be practicable and could negate or reduce the incentive for manufacturers to install passenger-side air bags. Finally, NHTSA determined that the amendment will likely result in a reduction in the number of serious injuries and fatalities and that the amendment will have a net positive safety impact. A discussion of the responses to the proposed rule and their subsequent consideration in the consideration in the formulation of the final rule follows.

Upward-Deploying versus Rearward Deploying Air Bags

Ford, citing its earlier response, restated its belief that improved "feasibility of a top-mounted, upward-deployment supplemental passenger air bag system may substantially increase availability of passenger air bags, particularly in compact and subcompact cars, by helping to reduce overall risks to out-of-position occupants." GM commented that it did not have sufficient field data to support an argument that upward-deploying air bags are preferable to rearward deploying air bags. GM's analysis, however, indicated that upward-deploying air bags may pose less risk of injury to out-of-position occupants than rearward-deploying bags.

As stated above, the agency has decided to reduce the head form impact velocity specified for Standard No. 201 from 15 to 12 mph for any vehicle equipped with a passenger-side air bag, not just those with upward-deployment systems. By not limiting the type of air bag system that must be used, this final rule is intended to result in the introduction of more effective air bag designs. In addition, the final rule is intended to provide an incentive for the increased use of passenger-side air bag systems.

Effect of Proposed Amendment on Manufacturers' Plans to Introduce Passenger-Side Air Bags

Chrysler stated in its comment that although the amendment will not increase the number of its passenger-side air bag installations, the effect of the amendment would be to reduce its passenger-side air bag system development time. Chrysler also stated that, without the amendment, air bag development might have to be delayed or cancelled. Ford commented that lowering the impact test speed would encourage Ford to "consider extensive usage of the top-mounted, upward-deploying passenger supplemental air bag." General Motors Corporation (GM) stated that it was unable to provide information on the effect of the amendment on the introduction of passenger-side air bags. GM did say, however, that tests of its air bag systems that are under development indicate that those systems will have "serious difficulty" in meeting the current test requirements. Nissan Motor Co., Ltd. (Nissan) commented that it does not intend immediately to alter its plan for installing passenger-side air bags. Nissan did, however, believe that the amendment, as proposed, would encourage manufacturers to offer passenger-side air bags "by the earliest dates."

All of the commenters who submitted responses to this request stated or implied that this final rule will result in either increased use of air bags or, at the very least, use of the same number of air bags as previously planned but at an earlier introduction date. By either measure, there will be a net safety benefit from this final rule. As discussed in the NPRM, although there are not yet enough crash data to evaluate conclusively the extent of the real-world effectiveness of various automatic restraint systems, the agency believes that the installation of air bags has greater potential for total safety benefits compared to automatic safety belts because air bags provide supplemental protection in addition to the basic protection of a safety belt system.

Means of Limiting the Test Speed Reduction to Only Those Areas on the Instrument Panel Necessary to Accommodate the Top-Mounted Air Bag.

Ford stated that the reduced impact speed criteria should be uniformly applied to all areas of the instrument panel affected by Standard No. 201. Ford asserted that having a "two-level criteria" would "impose considerable added design, testing, manufacturing, and quality control complexity on vehicle manufacturers." Finally, Ford stated that if the agency were to limit the areas covered by the test speed reduction, the area should be "the instrument panel between a vertical longitudinal plane positioned 3.25 inches inboard of the air bag module's inboard extremity and a vertical longitudinal plane located 3.25 inches outboard of the air bag module's outboard extremity." GM commented that it knew of no way to create a uniform specification to limit the 12 mph test area that would not also restrict air bag design. The area affected by an air bag installation, GM said, is vehicle-specific and is the result of several factors. Those factors include occupant compartment geometry, module design, configuration of the instrument panel, and the required module supporting structure. Chrysler commented that it could limit the area affected by the test speed reduction to the air bag cover or door itself and an area three inches from any point of the cover or door. Nissan commented in favor of application of the reduced test speed to all portions of the instrument panel that are within the head impact area. Nissan also believes that the area affected by installation of a passenger-side air bag would depend on numerous vehicle-specific factors. Even assuming that the specific area to be affected could be defined, Nissan argued that having two different requirements would complicate instrument panel design and manufacturing processes.

The agency has decided not to limit the test speed reduction to only those areas on the instrument panel necessary to accommodate the top-mounted air bag. With only one exception, all commenters who responded to this request for comments stressed the difficulties of limiting the area for use of a reduced test speed. The areas affected by an air bag installation will be different for different manufacturers and for different models produced by the same manufacturer. Those areas are not capable of being delineated by a simple definition. Finally, design of the instrument panels to comply with different impact speed requirements might not be practicable and could negate or reduce the incentive for manufacturers to install passenger-side air bags.

Current and projected deployment speed thresholds for air bags.

Ford commented that it does not perform tests to determine the exact air bag deployment speed. It does, however, perform tests to ensure that no air bags deploy at speeds below 8 mph and that all air bags deploy by 14 mph, barrier equivalent velocity (BEV). Ford believes that there is a trend by manufacturers to use higher deployment speeds in order to reduce repair costs in minor accidents. Repair costs are increased if a vehicle's air bag system has to be replaced or repaired after an accident. If new technologies lowered repair costs associated with air bag systems, Ford asserted, manufacturers would be able to lower deployment speeds. On the other hand, if a particular passenger-side air bag deployment design caused damage to the instrument panel when it deployed, the manufacturer may raise deployment speeds in order to reduce repair costs. GM stated that the BEV for air bag deployment is vehicle-specific and depends on a number of factors, including crash pulse and interior compartment design. However, GM said that a "0-degree barrier equivalent speed of approximately 12-14 mph appears to be the predominant desired deployment threshold" for passenger-side air bags currently under development. Nissan has set the deployment speed threshold for its air bag systems at 12 mph, for a head-on collision into a fixed barrier.

Based on the comments that were received, it appears that the amendments to the test speed contained in this final rule should ensure that instrument panels maintain sufficient energy-absorbing capabilities, by meeting the 80g requirements, at all speeds below that at which most air bags deploy. The agency has reexamined its previous crash testing data to determine how a vehicle's BEV is related to the velocity at which an occupant impacts the interior of the vehicle. The Standard No. 201 head impact test, run at an occupant impact speed of 15 mph, is designed to provide a measurement of such interior impact forces. Occupant impact velocity is dependent upon many factors, including: the friction between the occupant and the seat, crash speed, crash pulse and duration, occupant size, distance from the occupant to the object struck, and the effect of restraint systems. From these data, the agency has determined that an occupant typically impacts the vehicle interior at a velocity that is 90 percent of the vehicle's BEV. Thus, given that a 14 mph BEV is the highest air bag deployment speed reported by the commenters, the speed at which the head impact test would have to be run to assure that occupants are protected by the instrument panel at all speeds below which the air bag would deploy is 12.6 mph (90% of 14 mph). Given this information, the agency has determined that there is no justification for a reduction in the test speed below 12 mph.

A reduction in the test speed from 15 mph to 12 mph may produce some increase in minor-to-moderate injuries in low-speed vehicle crashes. On the other hand, greater use of passenger-side air bags will likely result in a reduction in the number of serious injuries and fatalities. The agency believes that this reduction will outweigh any potential increase in less serious injuries that could result from a reduction in the test speed, and that this final rule will have a net positive safety impact.

Requirement for Lap/Shoulder Belts at the Right Front Seating Position

No comments were received in opposition to this proposal. The agency has determined that lap/shoulder belts provide an important supplement to air bag systems, especially in accidents involving rear impacts or rollovers. Therefore, the amendment is adopted as proposed.

Miscellaneous Comment

Volkswagen of America, Inc. (Volkswagen) asked that the language of the proposed amendment to S3.1 of Standard No. 201 be revised in order to be consistent with the current wording. Volkswagen asked that the words "that area of any frontal interior surface" be revised to read "that area of the instrument panel."

The agency has revised the wording of the amendment in response to this request. NHTSA defines the scope of the test impact area to include that portion of the instrument panel that lies within the head impact area as defined by 49 CFR §571.3.

Effective Date

NHTSA proposed to make the amendment effective upon publication of the final rule in the *Federal Register* since the amendment would not establish additional requirements, but would instead establish an alternative for manufacturers to choose at their option. In addition, an immediate effective date would allow motor vehicle manufacturers the greatest flexibility in designing vehicles with passenger-side air bags. No commenter objected to the proposed effective date. NHTSA has determined that good cause exists to make the amendment effective immediately upon its publication.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

1. Section 571.201 is amended by revising S3.1 to read as follows:

S3.1 Instrument panels. Except as provided in S3.1.1. when that area of the instrument panel that is within the head impact area is impacted in accordance with S3.1.2 by a 15-pound, 6.5-inch diameter head form at—

(a) A relative velocity of 15 miles per hour for all vehicles except those specified in paragraph (b) of this section,

(b) A relative velocity of 12 miles per hour for vehicles that meet the occupant crash protection requirements of S5.1 of 49 CFR 571.208 by means of inflatable restraint systems and meet the requirements of S4.1.2.1(c)(2) of 49 CFR 571.208 by means of a Type 2 seat belt assembly at the right front designated seating position, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds.

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Issued on May 31, 1991.

56 F.R. 26036
June 6, 1991

MOTOR VEHICLE SAFETY STANDARD NO. 201

Occupant Protection in Interior Impact—Passenger Cars

S1. Purpose and scope. This standard specifies requirements to afford impact protection for occupants.

S2. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less.

S3. Requirements for passenger cars and for trucks, buses and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1981.

S3.1 Instrument panels. [Except as provided in S3.1.1, when that area of the instrument panel that is within the head impact area is impacted in accordance with S3.1.2 by a 15 pound, 6.5 inch diameter head form at—

(a) A relative velocity of 15 miles per hour for all vehicles except those specified in paragraph (b) of this section,

(b) A relative velocity of 12 miles per hour for vehicles that meet the occupant crash protection requirements of S5.1 of 49 CFR 571.208 by means of inflatable restraint systems and meet the requirements of S4.1.2.1(c)(2) of 49 CFR 571.208 by means of a Type 2 seat belt assembly at the right front designated seating position, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds. **(56 F.R. 26036—June 6, 1991. Effective: June 6, 1991]**

S3.1.1 The requirements of S3.1 do not apply to—

(a) Console assemblies;

(b) Areas less than 5 inches inboard from the juncture of the instrument panel attachment to the body side inner structure;

(c) Areas closer to the windshield juncture than those statically contactable by the head form with the windshield in place;

(d) Areas outboard of any point of tangency on the instrument panel of a 6.5 inch diameter head form tangent to and inboard of a vertical longitudinal plane tangent to the inboard edge of the steering wheel; or

(e) Areas below any point at which a vertical line is tangent to the rearmost surface of the panel.

S3.1.2 Demonstration procedures. Tests shall be performed as described in Society of Automotive Engineers Recommended Practice J921, "Instrument Panel Laboratory Impact Test Procedure," June 1965, using the specified instrumentation or instrumentation that meets the performance requirements specified in Society of Automotive Engineers Recommended Practice J977, "Instrumentation for Laboratory Impact Tests," November 1966, except that—

(a) The origin of the line tangent to the instrument panel surface shall be a point on a transverse horizontal line through a point 5 inches horizontally forward of the seating reference point of the front outboard passenger designated seating position, displaced vertically an amount equal to the rise which results from a 5 inch forward adjustment of the seat or 0.75 inches; and

(b) Direction of impact shall be either—

(1) In a vertical plane parallel to the vehicle longitudinal axis; or

(2) In a plane normal to the surface at the point of contact.

S3.2 Seat Backs. Except as provided in S3.2.1, when that area of the seat back that is within the head impact area is impacted in accordance with S3.2.2 by a 15 pound, 6.5 inch diameter head form at a relative velocity of 15 miles per hour, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds.

S3.2.1 The requirements of S3.2 do not apply to seats installed in school buses which comply with the requirements of Standard No. 222, "School Bus Passenger Seating and Occupant Protection" (49 CFR 571.222) or to rearmost, side-facing, back-to-back, folding auxiliary jump, and temporary seats.

S3.2.2 Demonstration procedures. Tests shall be performed as described in Society of Automotive Engineers Recommended Practice J921, "Instrument Panel Laboratory Impact Test Procedure," June 1965, using the specified instrumentation or instrumentation that meets the performance requirements specified in Society of Automotive Engineers Recommended Practice J977, "Instrumentation for Laboratory Impact Tests," November 1966, except that—

(a) The origin of the line tangent to the uppermost seat back frame component shall be a point on a transverse horizontal line through the seating reference point of the right rear designated seating position, with adjustable forward seats in their rearmost design driving position and reclinable forward seat backs in their nominal design driving position;

(b) The direction of impact shall be either—

(1) In a vertical plane parallel to the vehicle longitudinal axis; or

(2) In a plane normal to the surface at the point of contact;

(c) For seats without head restraints installed, tests shall be performed for each individual split or bucket seats back at points within 4.0 inches left and right of its centerline, and for each bench seat back between points 4.0 inches outboard of the centerline of each outboard designated seating position;

(d) For seats having head restraints installed, each test shall be conducted with the head restraint in place at its lowest adjusted position, at a point on the head restraint centerline; and

(e) For a seat that is installed in more than one body style, tests conducted at the fore and aft extremes identified by application of subparagraph (a) shall be deemed to have demonstrated all intermediate conditions.

S3.3 Interior compartment doors. Each interior compartment door assembly located in an instrument panel, console assembly, seat back, or side panel adjacent to a designated seating position shall remain closed when tested in accordance with either S3.31(a) and S3.3.1(b) or S3.3.1(a) and S3.3.1(c). Additionally, any interior compartment door located in an instrument panel or seat back shall remain closed when the instrument panel or seat back is tested in accordance with S3.1 and S3.2. All interior compartment door assemblies with a locking device must be tested with the locking device in an unlocked position.

S3.3.1 Demonstration procedures.

(a) Subject the interior compartment door latch system to an inertia load of 10g in a horizontal transverse direction and an inertia load of 10g in a vertical direction in accordance with the procedure described in section 5 of SAE Recommended Pactice J839b, "Passenger Car Side Door Latch Systems," May 1965, or an approved equivalent.

(b) Impact the vehicle perpendicularly into a fixed collision barrier at a forward longitudinal velocity of 30 miles per hour.

(c) Subject the interior compartment door latch system to a horizontal inertia load of 30g in a longitudinal direction in accordance with the procedure described in section 5 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965 or an approved equivalent.

S3.4 Sun visors.

S3.4.1 A sun visor that is constructed of or covered with energy-absorbing material shall be provided for each front outboard designated seating position.

S3.4.2 Each sun visor mounting shall present no rigid material edge radius of less than 0.125 inch that is statically contactable by a spherical 6.5 inch diameter head form.

S3.5 Armrests.

S3.5.1 General. Each installed armrest shall conform to at least one of the following:

(a) It shall be constructed with energyabsorbing material and shall deflect or collapse laterally at least 2 inches without permitting contact with any underlying rigid material.

(b) It shall be constructed with energy-absorbing material that deflects or collapses to within 1.25 inches of a rigid test panel surface without permitting contact with any rigid material. Any rigid material between 0.5 and 1.25 inches from the panel surface shall have a minimum vertical height of not less than 1 inch.

(c) Along not less than 2 continuous inches of its length, the armrest shall, when measured vertically in side elevation, provide at least 2 inches of coverage within the pelvic impact area.

S3.5.2 Folding armrests. Each armrest that folds into the seat back or between two seat backs shall either—

(a) Meet the requirement of S3.5.1; or

(b) Be constructed of or covered with energy-absorbing material.

33 F.R. 15794
October 25, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

(Docket No. 8)

A proposal to amend § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, by adding a new standard, Head Restraints—Passenger Cars; was published in the *Federal Register* on December 28, 1967 (32 F.R. 20865).

Interested persons have been afforded an opportunity to participate in the making of the amendment.

Several comments requested that the use of a 50th percentile adult male manikin be permitted in demonstrating compliance with the Standard. The Administration feels that a 50th percentile manikin is not representative of a large enough percentage of the public, but recognizes that certain modifications to a 50th percentile manikin may result in a suitable test device. Therefore, the Standard has been modified to permit use of an approved equivalent test device.

A comment from an equipment manufacturer and an equipment manufacturers' association asserted that the Standard should not require that motor vehicle manufacturers provide head restraints at the time of vehicle manufacture, but that each customer should be free to equip his vehicle with head restraints of his own choice, maintaining that the installation of head restraints is a relatively simple matter and that there appears to be virtually no technological advantage in requiring factory installation. The Administration has determined that safety dictates that head restraints be provided on all passenger cars manufactured on or after January 1, 1969, and that a head restraint standard that merely specified performance requirements for head restraint equipment would not insure that all passenger cars would be so equipped, and would not, therefore, meet the need for safety. Furthermore, the Administration has determined that the performance of a head restraint is dependent upon the strength of the structure of the seat to which it is attached, as well as the compatibility of the head restraint with its anchorage to the seat structure.

Some of the comments expressed concern that the proposed Standard would exclude the use of head restraints that are integral with the seat back. The Administration did not intend to imply that "add-on" head restraint devices are the only available means of providing appropriate levels of protection. Such protection may be achieved by the use of a restraint system that is integral with the seat back.

Some comments noted that when testing head restraints that are adjustable to a height of more than 27.5 inches above the seating reference point, the load would not be applied to the appropriate portion of the head restraint. To provide the necessary flexibility, the Standard has been modified to specify that the point of load application and the point of width measurement be determined relative to the top of the head restraint rather than the seating reference point.

Some comments stated that the 8g performance requirement would be incomplete without the inclusion of a time duration requirement. The Administration has concluded that a minimum time duration of 80 milliseconds is appropriate and the Standard has been so modified.

Some comments requested that the location of the head restraint relative to the torso line be measured without a load being applied to the head restraint. The Administration feels that this measurement would be unrealistic and, therefore, the Standard requires that the measurement be taken during the application of the 132-pound initial load.

Many comments requested a more precise description of the method to be used in locating the test device's reference line and torso reference line. Therefore, the Standard has been modified to provide the necessary clarification.

Some comments claimed that lead time would be a problem; however, the Administration believes that the need to protect the public from neck injury outweighs the possible lead time problems.

Several comments requested clarification of the term "approved representation of a human articulated neck structure." "Approved" is defined in § 371.3(b) as "approved by the Secretary." The Secretary would approve the neck structure of a test device if it could be demonstrated by technical test data that the articulation of the neck structure represented that of a human neck. Approval could only be given to a structure sufficiently described in performance parameters to ensure reliable and reproducible test data.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 202 . . . Effective January 1, 1969.

(Secs. 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966; 15 U.S.C. 1392, 1407; and the delegation of authority of Mar. 31, 1967, 32 F.R. 5606; as amended Apr. 6, 1967, 32 F.R. 6495; July 27, 1967, 32 F.R. 11276; Oct. 11, 1967, 32 F.R. 14277; Nov. 8, 1967, 32 F.R. 15710, and Feb. 8, 1968)

Issued in Washington, D.C., on February 12, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 2945
February 14, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

(Docket No. 8)

Motor Vehicle Safety Standard No. 202, issued February 12, 1968, and published in the *Federal Register* February 14, 1968 (33 F.R. 2945), specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions to occupants of passenger cars manufactured after January 1, 1969.

Pursuant to 23 CFR 216.35 (32 F.R. 15818), interested persons could petition the Federal Highway Administrator for reconsideration on or before March 15, 1968.

Several petitioners questioned the 80 millisecond duration requirement of the 8g dynamic test on the grounds that it imposes a more severe load on the seat back than is required in Motor Vehicle Safety Standard No. 207, Anchorage of Seats—Passenger Cars. The Administrator has determined that the demonstration procedure should be revised to incorporate a half-sine wave acceleration pulse shape with an amplitude of 8g and a base (duration) of 80 milliseconds. This revised loading is closer to actual crash conditions, and is more consistent with existing seat strength requirements. The demonstration procedure has been revised to include the half-sine wave pulse shape.

Several petitioners questioned the method for establishing the displaced torso line for the static test on the grounds that it did not take into account the compression of the seat back cushion by the torso under load. The Administrator has determined that the Standard should be revised to take into account seat back cushion compression in establishing the displaced torso line, and the demonstration procedure has been revised accordingly.

One petitioner questioned the procedure outlined for establishing the dummy reference line for the dynamic test. The procedure made use of the torso line of the 95th percentile dummy or test device and there is no commonly accepted definition of this torso line. The Administrator has revised the procedure for establishing dummy torso reference lines to make use of the SAE two-dimensional manikin, with its torso line established in accordance with SAE Aerospace-Automotive Drawing Standards.

One petitioner questioned the requirement that a spherical head form be used to apply the static load because tests have shown that this head form tends to slip under the foundation structure of the head restraint, thus showing an unrealistic loss of load. The Administrator has revised the demonstration procedure to include a cylindrical head form as an alternative.

One petitioner requested that the static load requirement of 200 pounds for head restraints adjusted to a height of 27.5 inches be changed to an equivalent moment about the seating reference point. This would permit the manufacturer who has a head restraint which adjusts higher than 27.5 inches to subject his head restraint to less than a 200 pound static load. This petition is denied. The Administrator has determined that the 200 pound static load should remain in the Standard to ensure that all head restraints sustain this load to meet the needs of safety.

Since this amendment provides clarification, relieves a restriction, and imposes no additional burden, notice and public procedure are unnecessary.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 202, which becomes effective January 1, 1969, is amended by revising sections 5.1 and 5.2 (relating to the demonstration procedures). . . .

(Secs. 103, 119, National Traffic and Motor Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of March 31, 1967 (32 F.R. 5606), as amended April 11, 1968 (33 F.R. 5803))

Issued in Washington, D.C., on April 11, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 5793
April 16, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

(Docket No. 8)

Motor Vehicle Safety Standard No. 202 (33 F.R. 2945), as amended (33 F.R. 5793), specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions to occupants of passenger cars manufactured after January 1, 1969.

Paragraph S4(b)(2) of the Standard provides that a head restraint qualifying under the static procedure shall have a lateral width of 10 inches for use with bench-type seats and 6.75 inches for use with individual type seats when measured 2.5 inches below the top of the head restraint.

One manufacturer has petitioned the Administrator for reconsideration of the method by which the lateral width of the head restraint is to be measured. The petitioner requests that the Standard be revised to permit the width to be measured either 2.5 inches below the top of the head restraint of 25 inches above the seating reference point.

Measurement of width 2.5 inches below the top of the head restraint may present possible difficulties for manufacturers of vehicles with head restraints which are integrated into the seat back. These manufacturers may elect to exceed the minimum required height of 27.5 inches to accommodate tall occupants and taper the top portion of the head restraint to provide minimum visibility restriction. In this case, the head restraint, when measured 2.5 inches below the top, might meet the minimum width requirement.

The Administrator has determined that the procedure for measuring head restraint lateral width should be revised since it is in the public interest to encourage the additional protection offered by seat backs higher than the minimum height requirement of this Standard. Accordingly, the Standard is being amended to permit measurement of head restraint width either 2.5 inches below the top of the head restraint or 25 inches above the seating reference point.

Paragraph S5.1(c) of the Standard provides that the magnitude of the acceleration curve for the dynamic test shall not be less than that of a half-sine wave having the amplitude of 8g and a duration of 80 milliseconds not more than 20% above the half-sine wave.

One manufacturer has requested an interpretation of the term "not more than 20% above the half-sine wave."

It is necessary that a test tolerance be allowed because of equipment variances. However, the tolerance must be properly limited to prevent very severe accelerations which might fail the seat back without properly testing the head restraint. The intent of the "20%" limitation was to establish a half-sine wave upper limit curve having an amplitude of 9.6g and a duration of 96 milliseconds.

Accordingly, the Standard is being amended to require that the magnitude of the acceleration curve be not more than that of a half-sine wave curve having an amplitude of 9.6g and a duration of 96 milliseconds. In addition, the equation for the lower limit curve is being deleted since it imposes an unnecessary restriction on the lateral location of the curve. By removing the equation, the limit curves can then be moved laterally with respect to each other to allow for normal test variances.

Since these amendments provide clarification and an alternate means of compliance, relieve restrictions, and impose no additional burden, I find that for good cause shown notice and public procedure are unnecessary, and that an effective date for these amendments of less than 180 days is in the public interest.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 202, as amended, is further amended effective January 1, 1969. . . .

These amendments are made under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority contained in Section 1.4(c) of Part 1 of the Regulations of the Office of the Secretary of Transportation (49 CFR 1.4(c)).

Issued in Washington, D.C., on October 3, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 15065
October 9, 1968

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints
(Docket No. 88-24; Notice 02)
RIN 2127-AC06

ACTION: Final rule.

SUMMARY: This final rule extends the applicability of Standard No. 202, *Head Restraints,* to trucks, multipurpose passenger vehicles (MPV's) and buses with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. National estimates of accident data for 1982-85 indicate that approximately 17,800 whiplash injuries occurred annually to front seat occupants 15 years and older in light trucks and vans involved in rear impacts. 4.6 percent of all occupants in light trucks in reported rear impacts suffered whiplash injuries and 34.4 percent of those injured in rear impacts suffered whiplash injuries. Limiting the rearward motion of an occupant's head in a rear impact crash by a head restraint should help reduce those injuries since research has demonstrated the effectiveness of Standard No. 202 in reducing whiplash injuries.

EFFECTIVE DATES: The effective date of changing the *Code of Federal Regulations* to reflect the amendments in this notice is November 9, 1989. The expanded application of the standard takes effect September 1, 1991. Each truck, bus and multipurpose passenger vehicle that is manufactured on or after that date, and has a gross vehicle weight rating of 10,000 pounds or less, must comply with the requirements of the standard.

SUPPLEMENTARY INFORMATION: On December 13, 1988 (53 FR 50047), the agency proposed extending the applicability of Standard No. 202, *Head Restraints,* to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating of 10,000 pounds or less. (This notice will occasionally use the term "light trucks and vans" to refer to trucks, MPVs and buses with a GVWR of 10,000 pounds or less.) The agency's proposal responded to a petition for rulemaking from Mr. Dale T. Fanzo requesting that NHTSA require head restraints "on vehicles other than passenger cars," and a petition from Mr. Mark Goodson requesting that NHTSA issue a safety standard that would "minimize spinal, cerebral, cranial, and vertebral injuries that occur when light trucks ... are involved in rear end collisions." Specifically, Mr. Goodson suggested that the glazing material used for the rear window in light trucks should have "safety features so as to minimize compression of the head and spine due to striking the rear glass." The agency proposed a September 1, 1991 effective date for the amendment.

The Standard.

Standard No. 202 reduces the frequency and severity of neck injuries in rear impacts and other collisions by requiring a head restraint of a specified height, width and strength, for the driver position and the right front seating position. The restraint is intended to limit rearward motion of an occupant's head in a rear impact crash, thereby preventing whiplash injury due to hyperextension of the neck.

Whiplash injuries typically occur in the soft tissues (such as the intervertebral discs, ligaments and skeletal muscle) joining together the vertebrae that support the head (i.e., the cervical spine). Whiplash commonly occurs when the head is thrown suddenly rearward with a snap during a rear impact crash. Whiplash injuries may not be immediately apparent after the crash, and some crash victims may not develop symptoms of pain or discomfort until several days after the accident. Neck pain and stiffness are the most common whiplash symptoms. If the cervical nerves and spine are injured, the head, shoulder, arms or upper back also could be affected. Whiplash can be difficult to cure because of differing physiological responses among victims. The symptoms can last several days, or can cause long term (i.e., a year or more) disability. Data indicate that whiplash victims miss an average of four days of work. (National Crash Severity Study, June, 1980.)

In general, motor vehicle manufacturers currently use two types of head restraints to meet the requirements of Standard No. 202. "Integral head restraints" use the design of the seat to meet Standard No. 202. Typically, they consist of a seat back that is extended high enough to meet the height requirement of the standard and a seat structure strong enough to withstand the required force levels. The integral head restraint is a nonadjustable or "automatic" device requiring no action on the part of the occupant, regardless of his or her height, to be effective. "Adjustable head restraints" consist of a separate cushion that is attached to the seat back, typically by sliding metal shafts. Adjustable head restraints provide sufficient vertical motion to accommodate different occupant seating heights.

In 1982, NHTSA published a report on the effectiveness and costs of Standard No. 202. ("An Evaluation of Head Restraints, Federal Motor Vehicle Safety Standard 202," NHTSA, February 1982.) The report showed that both integral and adjustable head restraints significantly reduce the overall injury risk in rear impact crashes. Integral restraints reduce the overall risk by approximately 17 percent, and adjustable restraints by 10 percent. (Integral restraints were found to be nearly twice as effective as adjustable head restraints because 75 percent of the latter are left in the lowest position by occupants. In that position, the adjustable head restraint does not adequately protect an occupant of average or greater height.)

The Proposal.

NHTSA proposed extending Standard No. 202 to light trucks and vans because national estimates of accident data indicated that approximately 17,800 whiplash injuries occurred annually to front seat occupants 15 years and older in light trucks and vans involved in rear impacts. (NHTSA limited its evaluation to persons 15 years and older because current seat backs seem to be high enough to provide sufficient head support to most children younger than 15 years old.) Those data were for 1982-1985, when approximately 25 percent of the light trucks and vans were equipped with front seat head restraints. 4.6 percent of all occupants in light trucks and vans in reported rear impacts suffered whiplash injuries and 34.4 percent of those injured in rear impacts suffered whiplash injuries. The agency tentatively concluded that these injury rates could be significantly reduced by applying Standard No. 202 to light trucks and vans. Further, accident data also indicated that there are 11,046 head injuries annually due to impacts with the rear window and/or window frame structure of pickup trucks. The agency thought that head restraints in light trucks might also prevent some minor head injuries to light truck occupants.

NHTSA also proposed extending the standard because increasing numbers of light trucks and vans are being used to transport passengers instead of or in addition to property. The Census Bureau's "Truck Inventory and Use Survey" shows that pickup truck use has changed from 1967 to 1982 from being 51 percent personal transportation to 66 percent personal transportation, and from 26 percent agricultural use to 12 percent agricultural use. NHTSA stated that the greater use of light trucks as passenger carrying vehicles is leading to increases in the number of light trucks and vans on the road, the number of persons transported in such vehicles, and consequently, the number of persons exposed to accident situations where whiplash and other injuries are likely to occur. In addition, the agency believed that as the use of light trucks and vans increases, and as the likelihood that an accident would occur involving a light truck or van increases, the overall number of rear impact collisions into these vehicles would increase.

Additional information on these and other matters discussed in this notice can be found in the agency's final regulatory evaluation, which analyzes in detail the impacts of this rulemaking action. This regulatory evaluation has been placed in Docket No. 88-24; Notice 2.

Based on an analysis of the comments received in response to the notice and other available information, NHTSA has decided to adopt the proposal and extend the applicability of the standard to light trucks and vans. The issues raised by the commenters and the reasons for the agency's decision are discussed below.

Support for the Extension.

The commenters generally supported the proposed extension of the standard, although some commenters raised concerns about particular issues, such as the leadtime, permitting the use of only integral restraints, and the effect of the standard on school buses.

Chrysler said that it supports the proposed extension and that it plans to have head restraints on all its pickups, vans and sport utility vehicles before the proposed effective date of September 1, 1991. Ford also supported the amendment, and stated that it had decided prior to issuance of the NPRM to include head restraints on all of its future light trucks and vans. Ford said it will achieve 100 percent compliance by the proposed effective date. General Motors said it does not oppose the proposal, but questioned whether head restraints would significantly reduce whiplash injuries in light trucks and vans. GM stated that it plans to provide head restraints or high back bucket seats as standard equipment on 80 percent of the projected sales volume of its light truck, van and utility model production for the 1992 model year. GM asked that NHTSA phase-in head restraint requirements for light trucks and vans to enable the manufacturer to meet the standard without having to design, test and install head restraints in vehicles slated to be discontinued after model year 1992, which comprise the remaining 20 percent of its projected sales volume.

The Insurance Institute for Highway Safety (IIHS) also supported the proposed extension, stating that the standard would significantly reduce neck and head injuries to front seat occupant in rear impact crashes. IIHS implied that the extension would be consistent with its longstanding position that passenger car standards should be applied to light trucks and vans. That commenter said that whiplash injuries are a major source of economic loss, due to the extended period of time whiplash victims suffer pain from their injury.

IIHS believed that "passenger carrying vehicles" should be required to have only integral (non-adjustable) head restraints, since these restraints are less expensive and more effective in reducing injuries than adjustable ones. This suggestion for an integral-only requirement was echoed by the American Insurance Association and Motor Voters. The American Insurance Association also asked that NHTSA consider requiring head restraints for rear seats.

NHTSA has decided to adopt the proposed extension to light trucks and vans to reduce whiplash injuries in those vehicles. NHTSA is not excluding any subclasses of light trucks from the amendment (based on weight, size, type of use, etc.). No commenter supported such an exclusion when asked to comment on the possibility of one in the NPRM. Further, the agency believes this amendment is practicable and meets the need for safety. The agency disagrees with GM that the agency does not have a reliable basis for assessing the effectiveness of head restraints in light trucks and vans. Since the injury mechanism and types of injuries are similar for passenger cars and light trucks, the effectiveness estimates should be similar. While the rear window in some light trucks may reduce whiplash injuries, a head restraint could reduce some of the head injuries resulting from head impacts with the rear window, and could reduce ejections through the rear window simply by reducing the area through which occupants are ejected.

The agency believes the amendment would not affect visibility significantly or in a way that affects safety. In its comment, Chrysler said that the loss in rearward visibility for short drivers will be minimal and will not depreciate motor vehicle safety to a measurable degree. Chrysler stated that the anatomy of the neck is such that the driver is able to look around his or her head restraint when looking to the rear, unless the head restraint is unusually wide. Further, Chrysler said the passenger-side head restraint generally is not a problem because it is usually in line with the B-pillar. No commenter raised concerns about potential loss of visibility.

NHTSA has excluded vehicles over 10,000 pounds GVWR from this amendment in light of the apparent absence of a safety need for such an extension. National accident data estimates for 1982-1985 indicate that occupants of trucks with a GVWR greater than 10,000 pounds received an annual average of 1,400 whiplash injuries (compared to an annual 17,800 whiplash injuries for occupants of light trucks in the same time period). Further, while NHTSA estimates that 14.8 percent of front seat occupants in passenger cars and 4.6 percent of front seat occupants in light trucks received whiplash injuries in rear end collisions, the whiplash injury rate for occupants of heavy trucks is only 2.5 percent. Since the whiplash injury rate for heavy trucks is relatively low, and because the agency is aware of no indications that heavy trucks are becoming more similar in appearance or use to passenger cars, the same consideration for applying Standard No. 202 to light trucks and vans do not apply to vehicles with GVWR's greater than 10,000 pounds.

NHTSA is not extending the standard to rear seats, in light of the few injuries (81 annually) found in the accident data (compared to 17,800 whiplash injuries annually for light truck and van front seat occupants). No commenter provided information showing a need for extending the standard to the rear seating positions.

This extension excludes the right outboard front seating position on small school buses. The agency concludes that this seat should be excluded because passenger seats on small school buses must already meet their own seat back height and strength requirements under Standard No. 222, *School Bus Seating and Crash Protection*. It appears that a vast majority of the occupants of that seating position are children for whom current seat backs provide the type of head support that would be offered by a head restraint.

Mid Bus Inc., a school bus manufacturer, expressed concerns about the compatibility of a requirement for a driver's head restraint with the requirements for head impact protection under Standard No. 222. Standard No. 222 limits the acceleration and force distribution of impacts on "contactable surfaces" in the "head impact zone." Mid Bus said that a driver's head restraint on its vehicles would fall within the head impact zone for the passenger seated directly behind the driver. Consequently, Mid Bus said it would have to "repad or replace the driver's seat" to comply with both FMVSS Nos. 202 and 222. Mid Bus seemed to ask NHTSA to exempt a driver's seat meeting Standard NO. 202 from the head impact protection requirements of Standard No. 222. (Mid Bus made unexplained references to its compliance with Standard No. 208 (*Occupant Crash Protection*) as reason for an exemption from the school bus head impact protection requirements. NHTSA believes the commenter meant to refer to Standard No. 202, not 208.)

NHTSA does not believe that the two standards are incompatible. There are current designs, such as high back seats, that could be used to meet both standards without having to reposition the driver's seat. NHTSA notes that head restraints on passenger cars are now included in the area of a seat back that must meet the head impact protection requirement of Standard No. 201, *Impact Protection in Interior Impact*. In order to comply with Standard No. 201's impact requirements, passenger car manufacturers install energy absorbing materials (e.g., padding) in the head restraint. (Standard

No. 201's requirement for seat backs exclude school buses since head impact requirements are specified by Standard No. 222.) Since head restraints are currently manufactured with padding or other energy absorbing material to meet head impact protection requirements, NHTSA believes it is practicable for school bus manufacturers to meet both Standard Nos. 202 and 222 without degrading school bus safety.

NHTSA is not requiring that head restraints be integral, as requested by several commenters. The desirability of such a requirement is outside the scope of this rulemaking proceeding and need not be further addressed in this final rule. However, the agency will continue to monitor injuries in rear end crashes to determine if further rulemaking is desirable.

The regulatory language specified in this amendment differs from the NPRM, in that NHTSA has separated the requirements for light trucks and vans from the passenger car requirements. This change was intended only to clarify the standard; the standard is extended to light trucks and vans as proposed.

Rear Windows.

NHTSA requested comments on a number of issues relating to Mr. Goodson's belief that the rear window in light trucks should provide protection against head and neck injuries resulting from impact with that window.

No commenter believed that the rear window would be an acceptable substitute for a head restraint. Several commenters provided information on whether the window could be made safer by means such as using laminated glass, or glass-plastic glazing. Commenters generally agreed with the agency that many parameters would influence the effectiveness of the rear windows, such as the size and shape of the glazing, the spatial relationship between the window and the occupant, the angle of installation and the window mounting. As NHTSA stated in the NPRM, the agency was not proposing to require improvements to pickup truck rear windows. However, the agency is researching glass-plastic glazing and may review issues relating to rear windows in the future, including information on potential costs and benefits associated with these windows.

Leadtime

The current availability of engineering and manufacturing resources needed to implement the proposed extension of Standard No. 202 is illustrated by the availability of head restraints as standard or optional equipment on roughly 64 percent of the 1986 light truck and van models. Commenters indicate that approximately 91 percent of the 1992 model year light truck and van fleet would have head restraints in the absence of this amendment. No manufacturer showed that installation of head restraints is impracticable by the proposed effective date of the amendment.

The agency declines to phase in the requirements of the amendment as requested by GM. Phased-in requirements are extraordinary measures that are taken only for compelling reasons, such as consumer acceptability of a requirement (e.g., automatic restraints), none of which GM provided. Phased-in requirements are also more difficult to administer and enforce. Under requirements made applicable to all vehicles in a class of vehicles manufactured on or after the effective date, it is obvious from a vehicle's date of manufacture whether the vehicle must comply with the requirement. However, it is not obvious from the date of manufacture alone whether a vehicle must comply with a phased-in requirement.

GM implied that the effective date of the amendment should be delayed because the safety benefits of the rule are not significant enough to warrant the expenditure of resources to design, test and install head restraints in vehicles that will be discontinued in one or two years. NHTSA has sought to minimize the burdens of this rule on manufacturers to the extent possible by providing adequate leadtime. However, the agency has not said that *no* burdens would be imposed on manufacturers by this rule. In view of the safety benefits of this rulemaking and of the current availability of head restraints as standard or optional equipment on light trucks and vans, NHTSA believes that the burdens imposed on GM by the 1991 date are reasonable and practicable.

For the reasons given above, the agency has decided to adopt the September 1, 1991 effective date. NHTSA recognizes that most vehicles will be able to comply before that date. However, the agency finds good cause for an effective date later than one year from the date this rule has been issued to ensure that all vehicles can be modified as necessary by the September 1, 1991 date.

Costs and Benefits.

NHTSA has examined the effect of this rulemaking action and determined that it is not major within the meaning of Executive Order 12291. It is, however, significant within the meaning of the Department of Transportation's regulatory policies and procedures because it concerns a matter in which there is great public interest. The economic effects of this rulemaking action are discussed in detail in the regulatory impact analysis.

NHTSA estimates that the average cost per affected vehicle is approximately $29.45 ($22 per vehicle plus $7.45 lifetime fuel penalty cost accounting for 7 additional pounds of weight per vehicle). Based on the estimated number of vehicles that will not have head restraints by the September 1, 1991 effective date (8.71 of the fleet), the estimated total consumer cost of the amendment is $12.4 million. The agency estimates that this rulemaking action annually will reduce an estimated 510 to 870 injuries.

NHTSA requested information from commenters on whiplash injuries and their costs (including data relating to the cost of the more minor whiplash injuries and/or the cost of the more severe whiplash injuries, with some indication as to what percent of all whiplash injuries are represented by these costs). The agency explained that whiplash injuries are not like the typical AIS 1 (minor cuts or bruises) or even AIS 2 (moderate injuries—broken bones, etc.) injuries, because whiplash injuries often involve longer term pain and stiffness. These effects, along with rehabilitation therapy, often last a year or longer.

Information from Mr. Donald Segraves of the All-Industry Research Advisory Council indicate that nearly half (49.2 percent) of all injury claims paid by automobile insurance companies involve a reported neck sprain or strain. Neck sprain and strain were the most severe injury in about 19 percent of all injury claims paid. The total payment, including pain and suffering, for an average insurance claim for neck sprain or strain was $2,943. (This information can be found in the docket to this rulemaking.)

In consideration of the foregoing, NHTSA amends 49 CFR Part 571 as set forth below.

Paragraph S2 of Standard No. 202, *Head Restraints*, is revised to read as follows:

S2. *Application*. This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less

Paragraph S4 is revised to read as follows:

S4. *Requirements*.

S4.1 Each passenger car shall comply with S4.3.

S4.2 Each truck, multipurpose passenger vehicle and bus with a GVWR of 10,000 pounds or less, manufactured on or after September 1, 1991, shall comply with S4.3.

S4.3 *Performance levels*. Except for school buses, a head restraint that conforms to either (a) or (b) shall be provided at each outboard front designated seating position. For school buses, a head restraint that conforms to either (a) or (b) shall be provided for the driver's seating position.

(a) It shall, when tested in accordance with S5.1, during a forward acceleration of at least 8g on the seat supporting structure, limit rearward angular displacement of the head reference line to 45° from the torso reference line; or

(b) It shall, when adjusted to its fully extended design position, conform to each of the following—

(1) When measured parallel to torso line, the top of the head restraint shall not be less than 27.5 inches above the seating reference point;

(2) When measured either 2.5 inches below the top of the head restraint or 25 inches above the seating reference point, the lateral width of the head restraint shall not be less than—

(i) 10 inches for use with bench-type seats; and

(ii) 6.75 inches for use with individual seats;

(3) When tested in accordance with S5.2, the rearmost portion of the head form shall not be displaced to more than 4 inches perpendicularly rearward of the displaced extended torso reference line during the application of the load specified in S5.2(c); and

(4) When tested in accordance with S5.2, the head restraint shall withstand an increasing load until one of the following occurs:

(i) Failure of the seat or seat back; or

(ii) Application of a load of 200 pounds.

4. The introductory test of S5.1 is revised to read as follows:

S5.1 Compliance with S4.3(a) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position:

* * * * *

5. The introductory test of S5.2 is revised to read as follows:

S5.2 Compliance with S4.3(b) shall be demonstrated in accordance with the following with the dead restraint in its fully extended design position:

* * * * *

Issued on: September 19, 1989

Jeffrey R. Miller
Acting Administrator

54 F.R. 39183
September 25, 1989

MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

S1. Purpose and Scope. This standard specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions.

S2. Application. [This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less. **(54 F.R. 39183—September 25, 1989.** Effective: November 9, 1989. The expanded application of the standard takes effect September 1, 1991. Each truck, bus and multipurpose passenger vehicle that is manufactured on or after that date, and has a gross vehicle weight rating of 10,000 pounds of less, must comply with the requirements of the standard.)]

S3. Definitions. "Head restraint" means a device that limits rearward angular displacement of the occupant's head relative to his torso line.

S4. Requirements.

S4.1 [Each passenger car shall comply with S4.3.

4.2. Each truck, multipurpose passenger vehicle and bus with a GVWR of 10,000 pounds or less, manufactured on or after September 1, 1991, shall comply with S4.3.

S4.3 *Performance Levels.* Except for school buses a head restraint that conforms to either (a) or (b) shall be provided at each outboard front designated seating position. For school buses, a head restraint that conforms to either (a) of (b) shall be provided for the driver's seating position.

(a) It shall, when tested in accordance with S5.1, during a forward acceleration of at least 8g on the seat supporting structure, limit rearward angular displacement of the head reference line to 45^0 from the torso reference line; or

(b) It shall, when adjusted to its fully extended design position, conform to each of the following—

(1) When measured parallel to torso line, the top of the head restraint shall not be less than 27.5 inches above the seating reference point;

(2) When measured either 2.5 inches below the top of the head restraint or 25 inches above the seating reference point, the lateral width of the head restraint shall be not less than—

(i) 10 inches for use with bench type seats; and

(ii) 6.75 inches for use with individual seats;

(3) When tested in accordance with S5.2, the rearmost portion of the head shall not be displaced to more than 4 inches perpendicularly rearward of the displaced extended torso reference line during the application of the load specified in S5.2(c); and

(4) When tested in accordance with S5.2, the head restraint shall withstand an increasing load until one of the following occurs:

(i) Failure of the seat or seat back; or,

(ii) Application of a load of 200 pounds.

(54 F.R. 39183—September 25, 1989. Effective: November 9, 1989. The expanded application of the standard takes effect September 1, 1991. Each truck, bus and multipurpose passenger vehicle that is manufactured on or after that date, and has a gross vehicle weight rating of 10,000 pounds or less, must comply with the requirements of the standard.)]

S5. Demonstration Procedures.

S5.1 [Compliance with S.4(a) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position: **(54 F.R. 39183—September 25, 1989.** Effective: November 9, 1989. The expanded application of the standard takes effect September 1, 1991. Each truck, bus and multipurpose passenger vehicle that is manufactured on or after that date, and has a gross vehicle weight rating of 10,000 pounds or less, must comply with the requirements of the standard.)]

(a) On the exterior profile of the head and torso of a dummy having the weight and seated height of a 95th percentile adult male with an approved representation of a human, articulated neck structure, or an approved equivalent test device, establish reference lines by the following method:

(1) Position the dummy's back on a horizontal flat surface with the lumbar joint in a straight line.

(2) Rotate the head of the dummy rearward until the back of the head contacts the same horizontal surface in (1).

(3) Position the SAE J-826 two-dimensional manikin's back against the flat surface in (1), alongside the dummy with the h-point of the manikin aligned with the h-point of the dummy.

(4) Establish the torso line of the manikin as defined in SAE Aerospace-Automotive Drawing Standards, Sec. 2.3.6, P. E1.01, September 1963.

(5) Establish the dummy torso reference line by superimposing the torso line of the manikin on the torso of the dummy.

(6) Establish the head reference line by extending the dummy torso reference line onto the head.

(b) At each designated seating position having a head restraint, place the dummy, snugly restrained by a Type 1 seat belt, in the manufacturer's recommended design seated position.

(c) During a forward accleration applied to the structure supporting the seat as described below, measure the maximum rearward angular displacement between the dummy torso reference line and the head reference line. When graphically depicted, the magnitude of the acceleration curve shall not be less than that of a half-sine wave having the amplitude of 8g and a duration of 80 milliseconds and not more than that of a half-sine wave curve having an amplitude of 9.6g and a duration of 96 milliseconds.

S5.2 [Compliance with § 4.3(b) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position: **(54 F.R. 39183—September 25, 1989.** Effective: November 9, 1989. The expanded application of the standard takes effect September 1, 1991. Each truck, bus and multipurpose passenger vehicle that is manufactured on or after that date, and has a gross vehicle weight rating of 10,000 pounds or less, must comply with the requirements of the standard.)]

(a) Place a test device, having the back pan dimensions and torso line, (centerline of the head room probe in full back position) of the three dimensional SAE J-826 manikin, at the manufacturer's recommended design seated position.

(b) Establish the displaced torso reference line by applying a rearward moment of 3300 in. lb. about the seating reference point to the seat back through the test device back pan located in (a).

(c) After removing the back pan, using a 6.5 inch diameter spherical head form or a cylindrical head form having a 6.5 inch diameter in plain view and a 6-inch height in profile view, apply, perpendicular to the displaced torso reference line, a rearward initial load 2.5 inches below the top of the head restraint that will produce a 3300 in. lb. moment about the seating reference point.

(d) Gradually increase this initial load to 200 lbs. or until the seat or seat back fails, whichever occurs first.

33 F.R. 15065
October 9, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 203

Impact Protection from the Steering Control System

(Docket No. 74–33; Notice 2)

This notice amends Standard No. 203, *Impact protection from the steering control system*, 49 CFR § 571.203, to exclude from its requirements some passenger cars which meet the frontal barrier crash requirements of Standard No. 208, *Occupant crash protection*, 49 CFR § 571.208.

The NHTSA proposed this exclusion of vehicles from the requirements of Standard No. 203 at the request of General Motors, to permit development of an air cushion restraint system at the driver's position as a means of meeting the frontal barrier crash protection requirements (S5.1) of Standard No. 208 (39 F.R. 34062, September 23, 1974). General Motors sought the exclusion because its modification to the steering control system to incorporate the air cushion system and accept higher loads exerted during a crash makes conformity of the column with Standard No. 203 difficult and sometimes impossible.

Comments were received from General Motors Corporation and Volvo of America Corporation, in support of the proposal. Renault, Inc., Peugeot, Inc., and Mercedes-Benz of North America, Inc., supported the proposal and suggested that the exception be extended to passive straint systems that incorporate seat belts. These comments argue that the use of passive belts will be high and that the protection offered by Standard No. 203 would in nearly all cases be redundant to that of Standard No. 208.

As a general matter, the NHTSA has maintained that the redundant occupant crash protection offered by standards (e.g., Standard No. 212, *Windshield retention*) is justified for those situations where the primary occupant crash protection system fails, or multiple collisions occur. Redundant protection is particularly justified in the case of passive seat belts because of the greater likelihood that seat belt protection will be rendered inoperative by an occupant than will crash-deployed protection.

In this case, the NHTSA has made the limited determination that the redundant protection offered by Standard No. 203 is not justified where it directly interferes with development of a more advanced, convenient, and effective restraint system. In contrast, it is obvious that passive systems which utilize belt assemblies do not require modifications of steering control systems and there is, therefore, no reason to sacrifice the redundant protection. These petitions to expand the scope of the proposed exception are accordingly denied.

American Motors Corporation has suggested that an exception not be granted in this case until future requirements of Standard No. 208 are established, and that General Motors' developmental work be undertaken on the basis of a temporary exemption under 49 CFR Part 555. This approach has not been adopted by the NHTSA. In light of the financial commitments that might be involved, this agency has concluded that General Motors is entitled to the assurance that their developments on advanced Standard No. 208 systems will not be barred by Standard No. 203 in the future.

In consideration of the foregoing, paragraph S3 (application) in Standard No. 203 (49 CFR § 571.203) is amended. . . .

Effective date: [30 days following date of publication of the amendment in the *Federal Register*]. Because this amendment relieves a restriction, it is found for good cause shown that an effective date sooner than 180 days from the date of its publication in the *Federal Register* is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on April 17, 1975.

James B. Gregory
Administrator

40 F.R. 17992
April 24, 1975

PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 203

Impact Protection for the Driver From the Steering Control System

(Docket No. 78-116; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

EFFECTIVE DATE: The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

ADDRESS: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

SUPPLEMENTARY INFORMATION: This notice amends Standard No. 201, *Occupant Protection in Interior Impact,* and Standard No. 203, *Impact Protection for the Driver From the Steering Control System,* to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement,* to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting,* and Standard No. 219-75, *Windshield Zone Intrusion,* led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards

Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars, Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arrguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed reulmaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivvated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201,203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manfacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done bySherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly edmonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the

standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA belives that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

Loading Requirements

At present, Standared No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

Commerical Vehicles

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting,* and Standard 219-75, *Windshield Zone Intrusion.* As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.

The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

Walk-In Vans

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention,* and 219-75, *Windshields Zone Intrusion.* The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their uniques driver/steering column configuration, and thus is exempting walk-in vans for the present.

Belts in Forward Control Vehicles

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection.* They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

Upgrading of Standard

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In addition, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children involved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

Heavy Trucks

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited comments on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck regulatory action may be needed.

Miscellaneous Comments

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment appears to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a headform representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For portions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufacturer, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exeptions to Standard No. 201 and, if not, sought to have its instrument panel construed to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on the instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.

Costs and Leadtime

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been places in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said that the cost associated with complying with all three standards was $30. Ford estimated the cost for compliance with Standard No. 201 as $10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at $120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance, Bases on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of $16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a $27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between $6 and $15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design asssumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with

the standard. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogyo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18–24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 12, 1979.

Joan Claybrook
Administrator

44 F.R. 68470
November 29, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 203

Federal Motor Vehicle Safety Standards; Impact Protection for the Driver from the Steering Control Systems

[Docket No. 81-10; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 203, *Impact Protection for the Driver from the Steering Control System*, to modify the current limitation on the amount of force imposed on the steering column during the compliance test which simulates a crash. The standard will now allow the force measured on the steering column to exceed 2,500 pounds for a cumulative duration of not more than 3 milliseconds. The agency has concluded that this amendment will not pose an unreasonable risk to safety.

EFFECTIVE DATE: This amendment is effective December 2, 1982.

SUPPLEMENTARY INFORMATION: In response to a petition for rulemaking from General Motors (GM), NHTSA issued a notice in October 1981 (49 F.R. 48260) that proposed an amendment to Standard No. 203, *Impact Protection for the Driver from the Steering Control System* (46 CFR 571.203). The notice proposed modifying the current 2,500 pound limitation on the amount of force imposed on the steering column. The force is measured during an impact test in which a hard rubber block simulating the human torso strikes the steering column at 15 miles per hour.

GM sought the change because a mechanical interference between several parts in its tilting and telescoping steering wheel cause the force measured in the Standard No. 203 impact test to momentarily increase above 2,500 pounds. The mechanical interference only occurs when the steering wheel is fully telescoped and tilted down 15 degrees. GM requested and the agency proposed to prohibit forces above 2,500 pounds only if they cumulatively exceeded 3 milliseconds in duration.

To support its request, GM presented data from three sled tests simulating 30 mile-per-hour frontal barrier crashes in which an unrestrained Part 572 anthropomorphic test dummy struck the steering column. The GM tests showed that the momentary increase in force levels measured on the steering column do not cause a corresponding increase in the resultant acceleration in the test dummy's chest. (Resultant acceleration is the criterion used in Standard No. 208, *Occupant Crash Protection*, as a means of determining whether forces are potentially harmful.)

This notice amends Standard No. 203 to adopt the proposed change. Significant comments submitted to the docket are addressed below.

Five commenters, American Motors, Chrysler, Ford, General Motors, and Volkswagen, supported adoption of the proposed amendment. The Insurance Institute for Highway Safety (IIHS) and the Center for Auto Safety (CFAS) filed comments opposing the amendment.

IIHS argued that the GM test data considered by the agency do not demonstrate that the short duration force levels permitted by the amendment will not pose an unreasonable risk of injury to the driver. IIHS objected that GM had not discussed the relationship between the 30 mile-per-hour impact tests the automaker conducted with instrumented Part 572 test dummies and the 15 mile-per-hour impact tests GM conducted with the body block in accordance with the requirements of Standard No. 203. IIHS said that it is difficult to make a straightforward comparison between the two tests because one involves use of a full-size test dummy representing a 50th percentile male while the other uses a simple hard rubber block representing only the upper torso and head of a human. In addition, IIHS stated that the force/deflection characteristics of the test dummy and the torso block are significantly different.

The agency believes that of the two tests, the 30 mile-per-hour sled test conducted by GM is more representative of an actual vehicle crash. In GM's sled test, the unrestrained test dummy was placed on a vehicle seat behind the steering column as in an actual vehicle. In the simplified 15 mile-per-hour test of Standard No. 203, the torso block is accelerated toward the column, usually by a pendulum, and then released to strike the column.

Equally important, the anthropomorphic test dummy specified in Part 572 of the agency's regulations is more representative of a human than the torso block used in Standard No. 203. The simplified torso block was developed before human-like test dummies were available. The area representing the chest of the torso block is significantly harder and stiffer than a human chest. As a result of that hardness and stiffness, an impact with that surface is more likely to produce the sudden, short increases in acceleration than is a more flexible surface designed to be similar to the human chest. The chest of the Part 572 anthropomorphic test dummy is based on testing done with cadavers and human volunteers and thus is more representative of the actual human chest. Thus, the agency believes that the GM testing is a better measure of the forces that would be imposed on a driver's chest in an actual crash. As explained more fully below, the agency is considering changes to Standard No. 203 that would improve its test procedures and requirements.

IIHS's second objection was that GM had not demonstrated that the Part 572 dummy and the injury criteria used in GM's testing are suitable for assessing whether the forces generated in the testing are likely to be injurious. IIHS said that the Part 572 dummy was designed specifically with the air bag in mind, which distributes forces over a large area to reduce injuries, and was not designed to be sensitive to the effects of large concentrated loads. IIHS and CFAS both emphasized that concentrated forces are known injury producers.

The Part 572 test dummy was designed to be used in the automatic restraint system testing of Standard No. 208, *Occupant Crash Protection*. During and after its development, the test dummy has been used extensively to measure loads generated by automatic and conventional belt systems as well as air bag systems. The injury criterion used in the GM testing is the same as the chest injury criterion adopted in Standard No. 208. At present, the Part 572 test dummy and the Standard No. 208 chest injury criterion are the only generally recognized and accepted measures of potential injury to the chest. The data from the GM testing, using available test dummies, show that the resultant acceleration measured in the chest were within the limits set by the agency in Standard No. 208. Thus, the agency concludes that based on available data, the short duration forces experienced in the Standard No. 203 impact test do not pose an unreasonable risk of injury.

Future Rulemaking

Several commenters requested the agency to make several technical and other amendments to the standard. GM requested the agency to amend the standard to adopt the updated version of the Society of Automotive Engineers recommended practice currently incorporated in Standard No. 203. Volkswagen recommended that the agency consider, for reasons of international harmonization, modifying the standard to adopt the alternative head impact test procedure contained in the European regulation on steering columns, Economic Commission for Europe Regulation 12.

IIHS and CFAS both criticized the agency for not upgrading the performance requirements of the standard and urged the agency to do so quickly. IIHS devoted a substantial portion of its submission to changes in the test procedures and requirements for the standard. Ford said that, before making any changes to the standard, the agency should determine whether any changes would compromise the field performance of current steering systems.

As mentioned in the notice of proposed rulemaking for this rule, the agency actively is considering possible improvements to Standard No. 203. The agency agrees, as Ford pointed out, that steering columns meeting Standard No. 203 have been proven to be injury reducers. However, the agency's technical report (Publication No. DOT HS 805-705) evaluating Standard No. 203 and Standard No. 204, *Steering Column Rearward Displacement*, also suggested areas for improving the standards. The agency will consider CFAS's, GM's, IIHS's, and Volkswagen's suggested changes during the process of evaluating possible changes to the standard.

At present, a number of research projects are being conducted for the agency on energy-absorbing steering columns. For example, Calspan is conducting a special study (contract DTNH22-80-C-07450) of data gathered during the National Crash Severity Study. The study is identifying conditions leading to both more and less successful operation of energy-absorbing steering columns, determining the relationship of energy-absorbing column compression and column intrusion to injury severity and comparing performance between specific energy-absorbing column designs. The agency is also working with Minicars, Inc., to conduct static and dynamic testing of steering columns to rate their protective capability. Based on the Calspan, Minicar and other research, the agency will make a determination of what, if any, changes to propose to the standard.

Issued on October 5, 1982.

Raymond A. Peck, Jr.
Administrator

47 F.R. 47840
October 28, 1982

MOTOR VEHICLE SAFETY STANDARD NO. 203

Impact Protection for the Driver from the Steering Control System—Passenger Cars

(Docket Nos. 2 and 3; Notice 1)

S1. Purpose and scope. This standard specifies requirements for steering control systems that will minimize chest, neck, and facial injuries to the driver as a result of impact.

S2. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less. However, it does not apply to vehicles that conform to the frontal barrier crash requirements (S5.1) of Standard No. 208 (49 CFR 571.208) by means of other than seat belt assemblies. It also does not apply to walk-in vans.

S3. Definitions. "Steering control system" means the basic steering mechanism and its associated trim hardware, including any portion of a steering column assembly that provides energy absorption upon impact.

S4. Requirements. Each passenger car and each multipurpose passenger vehicle, truck and bus with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1981, shall meet the requirements of S5.1 and S5.2.

S4.1 Except as provided in S4.2, when the steering control system is impacted by a body block in accordance with Society of Automotive Engineers Recommended Practice J944, "Steering Wheel Assembly Laboratory Test Procedure," December 1965 or an approved equivalent, at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds.

S4.2 A Type 2 seat belt assembly that conforms to Motor Vehicle Safety Standard No. 209 shall be installed for the driver of any vehicle with forward control configuration that does not meet the requirements of S4.1.

S4.3 The steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

S5. Impact protection requirements.

S5.1 [When the steering control system is impacted in accordance with Society of Automotive Engineers Recommended Practice J944, "Steering Wheel Assembly Laboratory Test Procedure," December 1965, or an approved equivalent, at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds, except for intervals whose cumulative duration is not more than 3 milliseconds. (47 F.R. 47840—October 22, 1982. Effective: December 2, 1982)]

S5.2 The steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

Interpretation

The term "Jewelry" in paragraph S4.3 refers to watches, rings, and bracelets without loosely attached or dangling members.

32 F.R. 2414
February 3, 1967

PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 204

Steering Control Rearward Displacement

(Docket No. 78-116; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

EFFECTIVE DATE: The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

ADDRESS: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

SUPPLEMENTARY INFORMATION: This notice amends Standard No. 201, *Occupant Protection in Interior Impact,* and Standard No. 203, *Impact Protection for the Driver From the Steering Control System,* to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement,* to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting,* and Standard No. 219-75, *Windshield Zone Intrusion,* led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards

Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities, per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars, Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arrguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed reulmaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivvated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201,203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manfacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done bySherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly edmonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the

standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA belives that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

Loading Requirements

At present, Standared No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

Commerical Vehicles

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting*, and Standard 219-75, *Windshield Zone Intrusion*. As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.

The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

Walk-In Vans

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention*, and 219-75, *Windshields Zone Intrusion*. The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their uniques driver/steering column configuration, and thus is exempting walk-in vans for the present.

Belts in Forward Control Vehicles

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection*. They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

Upgrading of Standard

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In addition, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children involved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

Heavy Trucks

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited comments on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck regulatory action may be needed.

Miscellaneous Comments

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment appears to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a headform representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For portions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufacturer, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exeptions to Standard No. 201 and, if not, sought to have its instrument panel construed to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on the instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.

Costs and Leadtime

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been places in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said that the cost associated with complying with all three standards was $30. Ford estimated the cost for compliance with Standard No. 201 as $10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at $120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance, Bases on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of $16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a $27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between $6 and $15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design asssumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with

the standard. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogyo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18–24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 12, 1979.

Joan Claybrook
Administrator

44 F.R. 68470
November 29, 1979

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 204

Steering Control Rearward Displacement—Passenger Cars

(Docket No. 3)

ACTION: Final rule; correction.

SUMMARY: On November 29, 1979, NHTSA published in the Federal Register a final rule extending the applicability of Standard No. 204, *Steering Control Rearward Displacement,* to light trucks, buses and multipurpose passenger vehicles with an unloaded vehicle weight of 4,000 pounds or less (44 FR 68470). In amendment number 5 on page 68475 describing the changes made to Standard No. 204, the notice said that a new section S6 was added to the standard. However, the notice did not provide the text for a new section S6. The reference to a new section S6 is an error. No such section was to be added to Standard No. 204. The purpose of this correction is to make clear that the only changes to Standard No. 204 are the amendments to sections S2 and S4 and the addition of a new section S5. All of those changes are fully described on page 68475 of the November 29, 1979, Federal Register notice.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

Issued on January 28, 1980.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

45 F.R. 7551
February 4, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 204

Steering Control Rearward Displacement (Docket No. 78-16; Notice 6)

ACTION: Final rule.

SUMMARY: This final rule amends Standard No. 204, *Steering Control Rearward Displacement*, to extend its coverage of trucks, buses, and multipurpose passenger vehicles. The standard currently applies to trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less and an unloaded vehicle weight of 4,000 pounds or less. This final rule raises the unloaded vehicle weight limitation to 5,500 pounds. Agency research has consistently shown that steering assemblies are a major source of driver-related injuries in light trucks and multipurpose passenger vehicles (e.g., van-type passenger vehicles and utility vehicles). Limiting the amount of steering column displacement should help reduce those injuries since research has demonstrated the effectiveness of Standard No. 204 in reducing steering column-related injuries.

DATES: The effective date of changing the *Code of Federal Regulations* to reflect the amendments in this notice is January 7, 1988. The expanded application of the standard takes effect September 1, 1991. Each truck, bus, and multipurpose passenger vehicle that is manufactured on or after that date, and has a gross vehicle weight rating of 10,000 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the requirements of the standard.

SUPPLEMENTARY INFORMATION: On November 9, 1978 (43 FR 53364), the agency proposed extending the applicability of Standard No. 204, as well as that of two other passenger car standards, to trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. The agency proposed these changes since research has indicated that additional safety improvements were needed to reduce steering assembly-related injuries to drivers of light trucks, utility and van-type vehicles. Based on the demonstrated effectiveness of steering assembly-related improvements in passenger cars, the agency amended Standard No. 204, *Steering Column Rearward Displacement*, on November 29, 1979 (44 FR 68470) to extend its applicability to vehicles with a GVWR of 10,000 pounds or less and an unloaded vehicle weight of 4,000 pounds or less. The agency explained that it took that action while it continued to study methods for dealing with certification problems, which were fully discussed in the November 1979 notice, experienced by final-stage manufacturers of vehicles that have an unloaded vehicle weight greater than 4,000 pounds.

On April 4, 1985 (50 FR 13403), NHTSA proposed to complete this rulemaking action by extending the benefits of Standard No. 204 to additional vehicles. Based on an analysis of the comments received in response to the notice, NHTSA has decided to adopt the proposal and extend the applicability of the standard to vehicles that have a gross vehicle weight rating (GVWR) of 10,000 pounds or less and an unloaded weight of greater than 4,000 pounds, but not greater than 5,500 pounds. The issues raised by the commenters and the reasons for the agency's decision are discussed below.

Support for the extension

The commenters generally supported the proposed extension of the standard, although several of the commenters raised concerns about the leadtime. Chrysler said that it "generally concurs with the appropriateness of extending the applicability" of the standard. Chrysler said that most of its vehicles could comply with two years of leadtime. It did, however, request one year of additional leadtime for forward control vehicles, saying that the "very short front end and limited crush space on forward control vehicles requires the development of a very efficient energy management system to maximize passenger compartment integrity and control displacement of the steering assembly." Ford said that it did not object to the proposed extension, but questioned whether the strengthening of a vehicle's front end to limit steering column intrusion could make the vehicle more aggressive in impacts with other vehicles. General Motors (GM) also questioned whether the structural changes made to comply with the standard would adversely affect the safety of occupants in vehicles struck by the light trucks, buses, and multipurpose passenger vehicles covered by the proposed rule. GM asked the agency to defer adoption of a final rule until this issue is resolved.

The Insurance Institute for Highway Safety (IIHS) also supported the proposed extension saying that "the need for protection of drivers of these vehicles from steering assembly-related injuries has increased due to the growing popularity and increased numbers of vehicles in this weight range." IIHS urged the agency to consider an earlier effective date noting that some manufacturers may have already redesigned their steering columns in response to the earlier final rule extending the standard to some light trucks, vans, and multipurpose passenger vehicles.

NHTSA has decided to adopt the proposed extension to light trucks, MPV's and buses with unloaded vehicle weight up to 5,500 pounds to reduce occupant deaths and injuries in those vehicles. NHTSA disagrees with Ford and GM that the extension will promote more aggressive vehicle designs and negatively affect the safety of occupants of passenger cars and vehicles not covered under today's rule. The vehicles affected by this final rule have already been designed to withstand the 30 mile per hour barrier impact tests required by Standards No. 212, 219, and 301. Neither GM nor Ford provided any information indicating why and to what degree further strengthening of the vehicle's frontal structure is needed to comply with Standard No. 204. NHTSA believes steering column designs are capable of limiting steering column intrusion without having to increase frontal stiffness. Therefore, the agency believes that extending the applicability of the standard need not increase the aggressivity of the vehicles covered by the standard.

Effect on final stage manufacturers

Winnebago Industries filed comments addressing the concern of small incomplete and final-stage manufacturers, such as itself. Winnebago explained that it manufactures a front wheel drive multipurpose vehicle which consists of components supplied by a variety of companies. It expressed concern that if the proposed requirements were adopted, the burden of redesigning the affected vehicle components might fall on the final-stage manufacturer, which has limited engineering and financial resources. Winnebago said that final-stage manufacturers would have to conduct the necessary testing to determine whether the redesigned vehicle complied with the standard.

The agency has considered the compliance difficulties described by Winnebago for final-stage manufacturers and has determined that the 5,500 pound unloaded weight limit of this adopted extension of Standard No. 204 provides sufficient relief from those problems. As described in the proposal to this rule, the effect of this rule on the multi-stage manufacturing process has been addressed in past rulemaking actions. A brief summary is appropriate.

In November 1978, NHTSA proposed to extend Standard No. 204 and two other companion standards to all multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less. The final rule issued in November 1979 extended Standard No. 204's applicability only to those vehicles with a GVWR of 10,000 pounds or less and an unloaded vehicle weight of 4,000 pounds or less. NHTSA explained that it took that action while it continued to study methods for dealing with certification difficulties experienced by final-stage manufacturers of vehicles having an unloaded vehicle weight greater than 4,000 pounds. NHTSA then completed its evaluation of possible solutions to those certification difficulties, and in rulemaking on Standard Nos. 212, *Windshield Mounting*, and 219, *Windshield Zone Intrusion* (45 FR 22044; April 3, 1980), the agency provided the 5,500 pound unloaded vehicle weight limit as a reasonable means of reducing compliance problems for final-stage manufacturers without compromising occupant safety.

Amending Standard No. 204 to adopt the 5,500 pound weight limit thus completes the original plan of the agency to upgrade the performance of steering columns for multipurpose passenger vehicles, light trucks and buses, and succeeds in making test requirements consistent wherever possible. NHTSA is aware of no indications that final-stage manufacturers are experiencing compliance problems with Standards Nos. 212 and 219 notwithstanding the 5,500 pound unloaded vehicle weight limit provided for their benefit, and is aware of no data showing that the 5,500 pound limit will provide insufficient relief in the case of Standard No. 204. In the absence of evidence substantiating the claims that the 5,500 pound limit will not provide the intended relief, NHTSA is proceeding with the extension of Standard No. 204 as proposed.

Use of a driver test dummy

As presently codified in the Code of Federal Regulations, the text of Standard No. 204 is followed by a note setting forth two agency interpretations concerning the test procedures of the standard. The agency adopted these interpretations soon after the original standard was issued in 1967. The first interpretation states that a driver test dummy may be used during a compliance test without measuring the impact force developed on the chest. The agency has never used a driver test dummy in its compliance test because of the possibility that the test dummy could interfere with the rearward displacement of the steering column. In addition, the use of such a dummy would preclude the use of a scratch tube device for measuring steering control dynamic displacement, which is the measurement device the agency has used in its compliance testing. (A scratch tube is a metal tube mounted to the steering column that has a sharp marking device that scratches the tube during a crash to indicate the amount of steering column displacement.) NHTSA explained that it was proposing to delete the interpretative note on the use of the test dummy since the agency believed the note was unnecessary, and because the agency understood that no manufacturer used a test dummy when conducting Standard No. 204 compliance tests.

Both Ford and GM objected to the proposed deletion of the interpretative note permitting the use of a driver test dummy. Ford explained it does combined compliance tests for Standards Nos. 204, 208, 212, 219, and 301 and noted that all of those tests, except for Standard No. 204, require the use of a test dummy in the driver's seat. GM opposed the proposed deletion because it uses a photographic technique for measuring steering column intrusion which is not affected by the presence of a test dummy.

Although Ford and GM have provided new information on manufacturers' use of a test dummy for Standard No. 204 compliance testing, NHTSA still believes that the interpretative note is unnecessary and will delete it from the standard. NHTSA is aware of no reason for keeping the note in the standard. In fact, as explained below, Ford's and GM's comments indicate that the note engenders some confusion about the nature of the compliance test procedures set forth in our motor vehicle safety standards, and this gives the agency further reason for deletion.

It appears that Ford and GM object to removing the interpretative note because they believe such an amendment to Standard No. 204 is commensurate with a prohibition against the use of the test dummy. That belief reflects a misunderstanding of the compliance test procedures established by the Federal motor vehicle safety standards. The compliance testing procedure in any of the safety standards specify the procedures NHTSA will undertake in its compliance tests. Manufacturers, in certifying their vehicles, must exercise due care in ensuring that their vehicles will comply with the applicable motor vehicle safety standards when tested by this agency under the procedures set forth in the standards. Manufacturers are free to choose the manner in which to satisfy this "due care" standard and are *not* compelled to test their vehicles only in accordance with the procedures specified by any standard. Thus, NHTSA's removal of the test dummy note in Standard No. 204 does not prohibit manufacturers from continued use of a test dummy. This amendment does not reduce in any manner their prerogative to use a test dummy or any other device to determine compliance, and does not preclude them from demonstrating, in the event a potential noncompliance arises, that they have exercised due care in ensuring that their vehicles will comply with Standard No. 204 when tested by NHTSA with the scratch tube device described in the test procedures for the standard.

Crash test speed correction factor

The second NHTSA interpretation concerning Standard No. 204 explains how to correct steering column rearward displacement measurements for impact speeds greater than 30 mph. NHTSA adopted the interpretation at a time when it was not possible to control closely a vehicle's impact speed in a barrier crash. At present, however, the test speeds for barrier impact tests can be precisely controlled to within ± 0.5 mph of the intended impact speed. Because of this advance in the state-of-the-art of impact testing, NHTSA believed that there was no longer a need for a correction factor and thus the agency proposed deleting it.

Ford objected to the proposed deletion of the interpretative note providing a formula for adjusting steering column displacement based on differences in impact speeds. Ford said that it conducts much of its barrier crash tests at 35 mph to determine how its vehicles will perform in the agency's New Car Assessment Program (NCAP) crash tests, which uses a 35 mph crash test. Ford said it is concerned that if it cannot use the formula to adjust the steering column displacement measured in 35 mph tests, it will have to conduct another test at 30 mph, to verify that its vehicles comply with Standard No. 204. Ford said that since the current formula has an upper limit of 33 mph, it should be changed to 35 mph to promote the use of crash tests at that higher speed.

In addition, Ford said that use of the formula promotes international harmonization since the regulations of the Economic Commission for

Europe (ECE) uses a barrier impact speed of 50 km/h, which is equal to 31.1 mph. Ford said that because "manufacturers typically aim for test speeds above that required by the ECE standards in order to assure that all tests are at least equal to the required speed, actual test speeds would probably range from 31 to 32 mph." Further, because Ford was concerned that it would be no longer able to base its safety certification of current production or future carryover models on tests that relied on the speed correction factor, it asked the agency to provide a suitable period for manufacturers to adjust to the removal of the interpretative formula.

NHTSA believes the interpretative note on the speed correction factor should be removed from Standard No. 204 for the same reasons the agency is removing the note on the test dummy. As explained above, NHTSA is removing the notes to improve the clarity of the standard. The agency is not limiting in any manner the ability of manufacturers to use the testing devices and mechanisms described in the notes. Because the speed correction factor note in Standard No. 204 is *not* a form of "permission" allowing manufacturers to test their vehicles at speeds other than 30 mph, its removal should not affect manufacturers' compliance testing. Manufacturers may continue to combine their Standard No. 204 testing with the tests conducted for the NCAP and the ECE standards. Of course, manufacturers should ensure that their vehicles will meet the requirements of Standard No. 204 at 30 mph.

Barrier test procedures

GM was the only commenter to specifically address the proposed amendments to incorporate several test requirements that are used in the agency's other crash test standards. GM supported the proposed changes saying that it already has followed those test procedures in its own compliance tests.

NHTSA has decided to adopt the changes as proposed. The pre-impact test procedures adopted in today's final rule require latching the vehicle's door, disengaging the parking brake, placing the transmission in neutral and inflating the vehicle's tires to the manufacturer's specified tire pressure, positioning an adjustable steering wheel at its mid-position, and filling the fuel tank to 90 to 95 percent of its capacity. These procedures have been followed in the agency's other crash test standards and adopting them in Standard No. 204 will make the agency's standards more consistent.

Leadtime

At the time that Standard No. 204 was originally extended to trucks, buses and multipurpose passenger vehicles, the agency provided approximately two years of leadtime. This leadtime was based on a cost and engineering analysis performed for the agency that estimated the required leadtime as 18 to 24 months. In the April 1985 notice, the agency proposed to provide two years of leadtime for the proposed extension of the standard.

In their comments, manufacturers requested from two to three years of leadtime to make the necessary changes. As discussed earlier, Chrysler said that most of its vehicles could comply with two years of leadtime. However, it requested one year of additional leadtime for forward control vehicles. Ford also indicated that "most of its current production of trucks, buses, and multipurpose passenger vehicles in the 4,000 to 5,500 pound weight range, including all conventional trucks in this weight range, would meet the column displacement limits." However, it also said that some of its van-type vehicles may have to be redesigned to comply with the requirements. Thus, Ford requested the agency to provide one additional year of leadtime. Winnebago Industries said it would need three years of leadtime — one year to assess the performance of its current vehicles and two years to make the necessary design changes.

GM indicated that its vehicles could comply with two years of leadtime. GM said "it is expected that the C and K model Blazer, Suburban, and pickup truck models, and the standard size van models would require design changes to meet the proposed requirements." GM estimated that it would require "up to 25 months of lead time from design to production." GM also suggested that the standard might make it necessary for GM to have to impose new weight and center of gravity restrictions on its incomplete vehicles in the short term. In the longer term, restrictions may not be needed.

After carefully considering each of the comments, the agency has decided to set a September 1, 1991 effective date for the extended requirements of Standard No. 204. This date provides a sufficient amount of time to manufacturers who will be redesigning their vehicles to achieve compliance. While NHTSA acknowledges that manufacturers' comments indicate that many of their vehicles already comply with the standard and others will be able to comply with minimal design changes, the agency recognizes that the amount of redesign necessary to comply with the requirements of the standard will vary considerably from vehicle to vehicle. The agency realizes that, as Chrysler observed in its comments, preparing an effective design for forward control vehicles can be difficult because of the lack of frontal structural in those vehicles. The effective date of this amendment to Standard No. 204 will accommodate redesigning efforts by all manufacturers without penalizing those who are faced with the more complex re-evaluation of their vehicles.

NHTSA has provided the long leadtime period also to enable manufacturers to coordinate their Standard No. 204 design changes with those necessary to achieve compliance with new requirements adopted for dynamically testing light trucks and multipurpose passenger vehicles with manual safety belts. NHTSA has adopted a September 1, 1991 effective date for the safety belt rule, and the agency recognizes that manufacturers will be re-evaluating their vehicles and making necessary design changes to ensure that they can meet the new requirements. To avoid imposing excessive costs resulting from manufacturers having to make two separate sets of design changes, NHTSA has decided to set the September 1, 1991 effective date for both Standard Nos. 204 and 208.

Cost and benefits

NHTSA has examined the effect of this rulemaking action and determined that it is not major within the meaning of Executive Order 12291 or significant within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has placed in the docket a regulatory evaluation of the economic and other effects of this rulemaking action. This regulatory evaluation has been placed in Docket No. 78-16; Notice 6. Any interested person may obtain a copy of this regulatory evaluation by writing to: NHTSA Docket Section, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590, or by calling the Docket Section at (202) 366-4949.

To briefly summarize the regulatory evaluation, the agency estimates that the modifications necessary to comply with the standard will cost approximately $4.05 for trucks and $20.04 for multipurpose passenger vehicles and buses. The cost differential is due to the differences in vehicle configuration which, of course, affect the extent of the modifications needed to comply with Standard 204. Because buses and multipurpose passenger vehicles, such as vans, have generally shorter front ends and higher steering column angles, and also a steering gear box that is mounted forward of the chassis frame, they typically require an additional intermediate steering shaft with double universal joints to meet the standard's limit on rearward displacement of the steering control. In contrast, light trucks would need only a co-axial slip joint to comply, which is less expensive than the the double "U" joint shaft described above. Since most of the vehicles in the 4,000-5,500 pound unloaded vehicle weight fleet are trucks, the average cost per affected vehicle is in the $7 to $9 range. Based on the estimated number of vehicles that are not currently in compliance, the total consumer cost of the amendment is $2.8 to $6.7 million per year. The agency estimates that this rulemaking action annually will reduce an estimated 12 to 23 fatalities and 146 to 275 serious injuries once all vehicles in the fleet meet the standard.

Regulatory Flexibility Act

NHTSA has also considered the impacts of this rulemaking action under the Regulatory Flexibility Act. I certify that it will not have a significant economic impact on a substantial number of small entities. The primary cost effect of this final rule will be on incomplete vehicle manufacturers, which are large corporations. Although many final-stage manufacturers are small businesses, NHTSA estimates that most of those businesses would not be significantly affected by the requirements adopted today. The impacts on small businesses are discussed briefly below and in more detail in the agency's final regulatory evaluation, which has been placed in the docket for this final rule.

NHTSA estimates that a substantial number of final-stage manufacturers will not be significantly affected by this final rule because of the 5,500 pound limit on unloaded vehicle weight adopted today. In many instances, businesses involved in the final-stage manufacturing of a vehicle are adding substantial items of heavy work-performing equipment to a truck chassis, or are otherwise manufacturing vehicles with an unloaded vehicle weight of greater than 5,500 pounds. Since today's rule extends Standard No. 204 only to vehicles with an unloaded vehicle weight of 5,500 pounds or less, NHTSA believes most vehicles completed by final-stage manufacturers would not be covered by the requirements adopted today.

In the case of vehicles that will be covered by the steering column displacement test requirement, converters and final-stage manufacturers have a number of different alternatives. The manufacturers of the truck or van chassis used by final stage manufacturers are required to provide information on what center of gravity, weight, and other limitations must be followed for the vehicle to remain in compliance with all the agency's safety standards. Final-stage manufacturers and converters can stay within the limitations prescribed by the original chassis manufacturer and thus the final vehicle will continue to comply. They may also choose to finish the vehicle outside of the limits imposed by the original manufacturer and do the necessary testing or engineering analysis to show that the vehicle still complies with the steering column displacement requirement. Finally, alterers or final-stage manufacturers that use a chassis intended for a completed vehicle of 10,000 pounds or less GVWR may complete the vehicle so that its unloaded vehicle weight if greater than 5,500 pounds, or use a vehicle with a GVWR greater than 10,000 pounds, and not be covered by the standard.

Small organizations and governmental units should not be significantly affected. Those entities may be purchasing new vehicles covered by today's final rule, including some multistage manufactured vehicles. There might be a relatively small price increase for some vehicles, but NHTSA anticipates no significant impacts for any small entity.

For the reasons set out in the preamble, section 571.204 of Title 49 of the Code of Federal Regulations is amended as follows:

S1. **Purpose and scope.** This standard specifies requirements limiting the rearward displacement of the steering control into the passenger compartment to reduce the likelihood of chest, neck, or head injury.

S2. **Application.** This standard applies to passenger cars and to multipurpose passenger vehicles, trucks, and buses. However, it does not apply to walk-in vans.

S3. **Definitions.**

"Steering column" means a structural housing that surrounds a steering shaft.

"Steering shaft" means a component that transmits steering torque from the steering wheel to the steering gear.

S4 **Requirements.**

S4.1 **Vehicles manufactured before September 1, 1991.**

When a passenger car or a truck, bus, or multipurpose passenger vehicle with a gross vehicle weight rating of 10,000 pounds or less and an unloaded vehicle weight of 4,000 pounds or less is tested under the conditions of S5 in a 30 mile per hour perpendicular impact into a fixed collision barrier, the upper end of the steering column and shaft in the vehicle shall not be displaced more than 5 inches in a horizontal rearward direction parallel to the longitudinal axis of the vehicle. The amount of displacement shall be measured relative to an undisturbed point on the vehicle and shall represent the maximum dynamic movement of the upper end of the steering column and shaft during the crash test.

S4.2 **Vehicles manufactured on or after September 1, 1991.**

When a passenger car or a truck, bus, or multipurpose passenger vehicle with a gross vehicle weight rating of 10,000 pounds or less and an unloaded vehicle weight of 5,500 pounds or less is tested under the conditions of S5 in a 30 mile per hour perpendicular impact into a fixed collision barrier, the upper end of the steering column and shaft in the vehicle shall not be displaced more than 5 inches in a horizontal rearward direction parallel to the longitudinal axis of the vehicle. The amount of displacement shall be measured relative to an undisturbed point on the vehicle and shall represent the maximum dynamic movement of the upper end of the steering column and shaft during the crash test.

S5 **Test conditions.** The requirements of S4 shall be met when the vehicle is tested in accordance with the following conditions.

S5.1 The vehicle, including test devices and instrumentation, is loaded to its unloaded vehicle weight.

S5.2 Adjustable steering controls are adjusted so that a tilting steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. A telescoping steering control is set at the adjustment position midway between the forwardmost and rearwardmost position.

S5.3 Convertibles and open-body type vehicles have the top, if any, in place in the closed passenger compartment configuration.

S5.4 Doors are fully closed and latched but not locked.

S5.5 The fuel tank is filled to any level from 90 to 95 percent of capacity.

S5.6 The parking brake is disengaged and the transmission is in neutral.

S5.7 Tires are inflated to the vehicle manufacturer's specifications.

Issued on November 18, 1987

Diane K. Steed
Administrator

52 F.R. 44893
November 23, 1987

MOTOR VEHICLE SAFETY STANDARD NO. 204

Steering Control Rearward Displacement—Passenger Cars Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 3)

S1. Purpose and scope. This standard specifies requirements limiting the rearward displacement of the steering control into the passenger compartment to reduce the likelihood of chest, neck, or head injury.

S2. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses.

S3. Definitions.

"Steering column" means a structural housing that surrounds a steering shaft.

"Steering shaft" means a component that transmits steering torque from the steering wheel to the steering gear.

[S4. Requirements.

S4.1 Vehicle manufactured before September 1, 1991.

When a passenger car or a truck, bus, or multipurpose passenger vehicle with a gross vehicle weight rating of 10,000 pounds or less and an unloaded vehicle weight of 4,000 pounds or less is tested under the conditions of S5 in a 30 mile per hour perpendicular impact into a fixed collision barrier, the upper end of the steering column and shaft in the vehicle shall not be displaced more than 5 inches in a horizontal rearward direction parellel to the longitudinal axis of the vehicle. The amount of displacement shall be measured relative to an undisturbed point on the vehicle and shall represent the maximum dynamic movement of the upper end of the steering column and shaft during the crash test.

S4.2 Vehicle manufactured on or after September 1, 1991.

When a passenger car or a truck, bus, or multipurpose passenger vehicle with a gross vehicle weight rating of 10,000 pounds or less and an unloaded vehicle weight of 5,500 pounds or less is tested under the conditions of S5 in a 30 mile per hour perpendicular impact into a fixed collision barrier, the upper end of the steering column and shaft in the vehicle shall not be displaced more than 5 inches in a horizontal rearward direction parallel to the longitudinal axis of the vehicle. The amount of displacement shall be measured relative to an undisturbed point on the vehicle and shall represent the maximum dynamic movement of the upper end of the steering column and shaft during the crash test.

S5 Test Conditions. The requirements of S4 shall be met when the vehicle is tested in accordance with the following conditions.

S5.1 The vehicle, including test devices and instrumentation, is loaded to its unloaded vehicle weight.

S5.2 Adjustable steering controls are adjusted so that a tilting steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. A telescoping steering control is set at the adjustment position midway between the forwardmost and reawardmost position.

S5.3 Convertibles and open-body type vehicle have the top, if any, in place in the closed passenger compartment configuration.

S5.4 Doors are fully closed and latched but not locked.

S5.5 The fuel tank is filled to any level from 90 to 95 percent of capacity.

S5.6 The parking brake is disengaged and the transmission is in neutral.

S5.7 Tires are inflated to the vehicle manufacturer's specifications. **(52 F.R. 44893—November 23, 1987. Effective: January 7, 1988)]**

Interpretations

(1) When conducting the barrier collision test, a driver dummy may be used without measuring the impact force developed on the chest.

(2) In the event that the vehicle impacts the barrier at a velocity not less than 30 miles per hour nor more than 33 miles per hour, the displacement of the steering column may be corrected to 30 miles per hour by means of the following formula:

$$\frac{D_1}{D_2} = \frac{V_1^2}{V_2^2}$$

32 F.R. 2414
February 3, 1967

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials—Passenger Cars, Multipurpose Vehicles, Motorcycles, Trucks, and Buses

(Docket No. 9)

Motor Vehicle Safety Standard No. 205 (32 F.R. 2414) as amended (32 F.R. 10072) specifies requirements for glazing materials for use in passenger cars, multipurpose passenger vehicles, motorcycles, trucks, and buses.

As a result of inquiries seeking clarification of the applicability of the Federal motor vehicle safety standards to campers, a ruling was published in the *Federal Register* on March 26, 1968 (FHWA Ruling 68–1) (33 F.R. 5020) which specified that the glazing standard is applicable to slide-in campers because they are items of motor vehicle equipment for use in motor vehicles and to chassis-mount campers.

The glazing standard requires that glazing materials "conform to the United States of America Standards Institute 'American Standard Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways,' ASA Standard Z26.1—1966." As a result, windshields and forward facing windows are required to be AS1 laminated glass.

The Federal Highway Administration has received petitions for rule making requesting that forward facing windows on campers be allowed to use AS2 or AS3 laminated glass which is able to meet the Z26.1–1966 penetration resistance test, No. 26, required of AS1 type glass. The requests point out that AS1 type glass which is presently required for forward facing windows in campers is unduly expensive and unnecessary for campers because AS1 type glass must meet stringent optical tests. The petitioners argue that forward facing windows on campers should not have to meet these stringent optical tests because the windows are not used for driver visibility.

The Administrator has determined that granting the petitions would not reduce the protection afforded the public by the standard. Accordingly the glazing standard is being amended to allow AS2 or AS3 laminated glass in forward facing windows of campers if the glass is able to meet the penetration resistance test. The amendment will require that forward facing windows in campers conform to AS1 type laminated safety glass; or AS2 type laminated safety glass that meets Test 26 of Z26.1–1966; or AS3 type laminated safety glass that meets the requirements of Test 26 of Z26.1–1966. The latter two glazing materials will be identified by the characters AS2–26 and AS3–26 respectively.

The Federal Highway Administration has received a petition for rule making requesting that Standard No. 205 be amended so that paragraph S3.2 Edges be changed to provide that exposed edges must meet the Society of Automotive Engineers Recommended Practice J673a, Automotive Glazing, August 1967, instead of the SAE Recommended Practice J673, Automotive Glazing, June 1960. The petition also requests that the words "except that the minimum edge radius dimension shall not be less than the nominal thickness of the glazing material" be deleted because this requirement is already included in the SAE Recommended Practice J673a. These requests would allow minor imperfections in edging that would not diminish the safety benefits derived from the requirements but would allow normal manufacturing tolerances. These requests are granted and Standard No. 205 is being amended accordingly.

The Administrator has received a petition concerning certification requirements for prime manufacturers of glazing materials; prime glazing material manufacturers being those who fabricate, laminate or temper glazing materials.

The Petitioner states that he has encountered practical problems in the use of certification labels because: (a) glass stored for appreciable lengths of time, covered by the label, may "weather" in a different manner from the remaining areas of the glass (b) labels on individual lights of glass can produce pressure points due to local area loading and may result in breakage during shipment and storage, and (c) certification labels can become separated from the material prior to delivery from consigned stock distributors to non-stocking distributors.

The Petitioner points out that Standard No. 205 requires marking of safety glazing materials in accordance with paragraph 6 of the United States of America Standards Institute (USASI) Standard Z26.1–1966. The Petitioner requests that the permanent marking on the glazing material required by Standard No. 205, with the addition of the symbol "DOT", be allowed as an alternative method of certification required under Section 114 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1401). This petition is granted provided that the symbol "DOT" and an approved two digit manufacturer's code number is included in the permanent marking. Any prime glazing material manufacturer may apply for an approved two digit manufacturer's code number assignment to the Director, National Highway Safety Bureau, Washington, D.C. 20591.

Since these amendments relieve restrictions, provide alternative means of compliance and create no additional burden the Administrator finds, for good cause shown, that it is in the public interest to make them effective upon date of issuance.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 205 (32 F.R. 2414) as amended (32 F.R. 10072) is amended. . . .

These amendments are made under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1392, 1407) and the delegation of authority contained in section 1.4(c) of Part I of the Regulations of the Office of the Secretary (49 CFR 1.4(c)).

Issued in Washington, D.C., on September 18, 1968.

John R. Jamieson, Deputy
Federal Highway Administrator

33 F.R. 14162
September 19, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 23; Notice 2)

Motor Vehicle Safety Standard No. 205 specifies requirements for glazing materials for use in passenger cars, multipurpose passenger vehicles, motorcycles, trucks, and buses.

As a result of inquiries seeking clarification of the applicability of the Federal motor vehicle safety standards to campers, a ruling was published in the *Federal Register* on March 26, 1968 (33 F.R. 5020), which specified that the glazing standard (No. 205) is applicable to slide-in campers because they are items of motor vehicle equipment for use in motor vehicles.

Standard No. 205 requires, among other things, that glazing materials "conform to the United States of America Standards Institute 'American Standard Safety Code of Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways,' ASA Standard Z26.1-1966" (hereafter Z26.1-1966).

By order published in the *Federal Register* on September 19, 1968 (33 F.R. 14162), section S3.2 of the Standard was amended to allow the use of AS2 or AS3 laminated glass in forward facing windows of campers provided such glass met the requirements of Test 26 of Z26.1-1966. On the assumption that Z26.1-1966, as incorporated in Standard No. 205, required the use of AS1 type laminated glass in forward facing windows of campers, the Administrator found that this amendment relieved restrictions, provided alternate means of compliance and created no additional burdens. Accordingly, the amendment was made effective immediately.

Thereafter, petitions for reconsideration were filed on the grounds, among others, that properly interpreted Z26.1-1966 permitted the use of AS1, AS2, AS3, AS4, and AS5 glazing material in forward facing camper windows and that, therefore, the September amendment did not relax an existing requirement but in fact imposed additional restrictions upon manufacturers by limiting the types of glazing materials allowable for use in such windows. Consequently, it is urged that notice of that amendment should have been given and interested parties afforded an opportunity to comment.

The Administrator recognizes that, prior to the issuance of the September amendment, Standard No. 205 as initially promulgated could have been reasonably interpreted as allowing the use of AS1, AS2, AS3, AS4, and AS5 glazing materials in the forward facing windows of campers, that many manufacturers could have reasonably acted in reliance upon such a reading, that a great deal of confusion concerning the requirements has and continues to exist and that, in fact, comments focusing directly upon the proper glazing materials required in forward facing windows of campers have not been specifically solicited by the Administration. In the light of all of these circumstances it is considered appropriate to revoke section S3.2—"Materials for use in forward facing windows of campers" of Federal Motor Vehicle Safety Standard No. 205, as amended (33 F.R. 14162), as well as any interpretation that would have required the use of AS1 glass only in forward facing camper windows. The net effect of this action is to permit, subject to further rulemaking action,[1] the use of glazing materials that petitioners represent are presently being used, i.e., AS1, AS2, AS3, AS4, and AS5 glazing materials referred to in Z26.1-1966.

Since this amendment relieves restrictions and creates no additional burden the Administrator finds good cause is shown that an effective date earlier than 180 days after issuance in the public interest and the amendment is made effective upon date of issuance.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 205 as amended (33 F.R. 14162) is amended by revoking S3.2—"Materials for use in forward facing windows of campers".

(Secs. 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority contained in § 1.4(c) of Part 1 of the regulations of the Office of the Secretary (49 CFR 1.4(c))

Issued: February 27, 1969.

John R. Jamieson, Deputy
Federal Highway Administrator

[1] See notice of proposed rule making published at 34 F.R. 3699, which proposes glazing requirements for forward facing windows of campers.

34 F.R. 3688
March 1, 1969

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 71–1; Notice 3)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 205, "Glazing Materials," to permit the use of certain plastic materials in motor vehicles in addition to those presently allowed; to modify the certification and labeling requirements; and to modify the test for the chemical resistance of plastic materials. It also clarifies the applicability of the standard to motor vehicle equipment, and the provisions of the standard dealing with readily removable windows.

Federal Motor Vehicle Safety Standard No. 205 was initially published February 3, 1967 (32 F.R. 2414), and amended July 8, 1967 (32 F.R. 10072), September 19, 1968 (33 F.R. 14162), and March 1, 1969 (34 F.R. 3688). On January 9, 1971, a notice of proposed rulemaking (Docket 71–1, Notice 1) was published based upon petitions for rulemaking received from the Eastman Chemical Products, Inc., and the California Highway Patrol. The former requested that the standard be amended to allow the use of butyrate plastic materials, and the latter requested changes in the requirements of the standard dealing with the marking of glazing materials. This amendment responds to both of these petitions and also modifies the standard as a result of independent agency action.

Standard No. 205 is applicable to "glazing materials for use in passenger cars, multipurpose passenger vehicles, trucks, buses and motorcycles." It is also applicable, under FHWA Ruling 68–1 (33 F.R. 5020, March 26, 1968), to glazing for use in slide-in and chassis-mount campers. This amendment to Standard No. 205 incorporates the substance of FHWA Ruling 68–1 into the applicability section of the standard and specifies, in accordance with the notice of March 1, 1969 (Docket 23; Notice 2, 34 F.R. 3688) the glazing materials that are permitted to be used in these equipment items.

The notice of January 9, 1971, proposed to revise the incorporation by reference of American Standards Association Test (ASA) Z26.1–1966 to include supplement Z26.1a–1969, March 7, 1969, and to reflect the change in the name of the American Standards Association to the American National Standards Institute. No objections were raised in the comments to these proposals, and they are incorporated into the standard by this amendment.

The notice proposed to modify the chemical resistance tests incorporated into the standard (Tests 19 and 20), by deleting carbon tetrachloride as a testing agent and by adding trichlorethylene. The tests are designed to test the resistance of plastic materials to chemicals that are commonly used to clean them. By this notice, carbon tetrachloride is deleted from the list of materials. As indicated in the notice of proposed rulemaking, the deletion is commensurate with the ban imposed by the Food and Drug Administration on this substance because of its high toxicity. At the same time, the NHTSA has decided not to include either trichlorethylene or freon in the list of testing agents. The comments have indicated that these substances are not commonly used as cleaning agents, and accordingly they are not used for test purposes.

The major revision proposed by the notice, based upon a petition for rulemaking from the Eastman Chemical Products Co., Inc., was to allow additional plastic materials to be used in motor vehicles. The petitioner claimed that the requested materials would meet any test to which other plastic materials are subjected, except for resistance to undiluted denatured alcohol (Formula SD 30), where a slight tackiness would occur. Rather than merely exempt these plastics from the alcohol resistance requirement, the notice suggested that they still be subjected to the same chemicals as other plastics, but that if structural integrity were maintained, a loss of transparency would be allowed. The notice for the same reason proposed not to subject these materials to the abrasion and weathering tests applied to other plastics. Instead, the proposal would have required labels to be affixed to the material specifying cleaning agents and instructions that would minimize loss of transparency, and would have restricted them to locations in motor vehicles where loss of transparency would not affect driver visibility.

Based upon information received during the rulemaking process, the NHTSA has determined that the materials in question exhibit characteristics which make them satisfactory from the standpoint of safety for use in certain motor vehicle applications. Many comments, however, opposed the approach taken by NHTSA in the proposed rule, and as a result the proposed requirements have been changed. The standard as now amended will provide that these materials not be required to show resistance to undiluted denatured alcohol if (1) they show resistance to the other chemicals presently specified as testing agents, (2) they can meet the other tests to which other plastic materials are subjected, and (3) they are used in only limited locations in the motor vehicle. In addition, they must be labeled, as proposed, with instructions regarding cleaning that will minimize a loss of transparency.

Some comments also objected to certain locations where the additional plastic materials would have been allowed to be used: specifically, auxiliary wind deflectors and folding doors. The comments suggested that transparency is an important characteristic for glazing used in these locations, and that materials not resistant to Formula SD 30 alcohol should not be used in them. The NHTSA has determined that these comments have merit, and has not permitted these materials to be used in the two locations.

The notice of proposed rulemaking would have required all interior mirrors, both rearview and vanity-type, to be constructed of glazing materials that meet the requirements of ANS Z26. As a result of comments received, the NHTSA has determined that the requirements should not be applied to interior mirrors. With regard to rearview mirrors, many are today constructed of annealed glass of a wedge shape, in the form of day/night mirrors. The comments have indicated that materials allowed to be used pursuant to ANS Z26 do not make satisfactory day/night mirrors. As these mirrors have clear safety advantages when used in night driving conditions, the NHTSA has determined that their elimination would not be in the best interests of safety. With reference to other vehicle interior mirrors, while the use of safety glazing in them is preferable, there is presently a lack of data which shows a compelling need for changing current industry practices. This is especially important where, as here, much of the equipment involved is not peculiarly adapted to motor vehicle usage. One particular type of mirror, a sun-visor mirror, falls within the purview of Motor Vehicle Safety Standard No. 201, "Occupant Protection in Interior Impact," and will be dealt with as part of that standard.

The notice of proposed rulemaking prescribed a scheme for the marking and certification of glazing materials which would have required prime glazing manufacturers to certify glazing materials by applying to the glazing material the symbol DOT and an appropriate code mark, together with the marking required by section 6 of ANS Z26. The proposal would have also required these markings to be in a specified format and in a specific location of the completed glazing. Other than primary manufacturers would have been required to certify the material by affixing the mark of the primary manufacturer.

As amended Standard No. 205 will require prime manufacturers to certify glazing material, as proposed, by adding to the markings required by section 6 of ANS Z26 the symbol DOT and a code mark obtained on application to the NHTSA. Those who as manufacturers or distributors cut glazing for use in motor vehicles from larger sheets are required to certify conformity to the standard in any way they choose, as long as the method chosen is consistent with Section 114 of the National Traffic and Motor

Vehicle Safety Act. One such method would be to affix a label to the completed piece of glazing containing a statement to the effect that the material conforms to Standard No. 205. The proposed requirement that such manufacturers label the material with the marking of the prime manufacturer has been deleted, as is the proposed requirement that would have required the markings to appear in a specified order, or in specific locations on the glazing material.

An issue arose during the period that this rulemaking was under consideration concerning the use of plastics in side windows of buses. General Motors has requested an interpretation of Standard No. 205 that would include within the definition of "readily-removable windows" emergency escape windows which can be pushed out, except for one side which is hinged to the window frame, without the use of any special tools. The NHTSA has concluded that the term "readily removable windows" includes windows of this design, and in this amendment so clarifies Standard No. 205.

Effective dates: The addition of glazing materials to those already allowed imposes no additional burdens on any person, and relieves restrictions on the types of glazing materials which can be used. That part of the amendment pertaining to the addition of these materials, paragraphs S5.1.1.2, S5.1.1.3, andS5.1.2, is effective upon publication of this notice in the *Federal Register*. Similarly, both the deletion of the test for chemical resistance of plastics to carbon tetrachloride in paragraph S5.1.1.1, and the clarification of "readily-removable windows" in S5.1.1.4 relieve restrictions, and the effective date of those amendments is the date of publication of this notice. The other amendments to the standard are effective April 1, 1973.

In light of the above, Motor Vehicle Safety Standard No. 205, appearing at 49 CFR section 571.205, is revised. . . .

This notice is issued pursuant to the authority of sections 103, 114, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1403, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on June 14 ,1972.

Douglas W. Toms
Administrator

37 F.R. 12237
June 21, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket 71–1; Notice 4)

This notice responds to petitions for reconsideration of an amendment published June 21, 1972 (37 F.R. 12237), to Motor Vehicle Safety Standard No. 205, "Glazing Materials" (49 CFR § 571.205). Petitions were received from the Recreational Vehicle Institute (RVI) and the California Highway Patrol. To the extent that this notice does not grant the requests of the petitioners, they are hereby denied.

In the amendment of June 21, the NHTSA changed the application section of the standard, based on FHWA Ruling 68–1 (33 F.R. 5020, March 26, 1968) to expressly include glazing for use in all campers, and defined campers to include both slide-in or "pickup" campers (including a related item, pickup covers) and chassis-mount campers (campers mounted directly onto truck chassis). The 1968 ruling held that Standard No. 205 applied to glazing for use in slide-in campers, and that glazing for use in chassis-mount campers came within the standard when the camper was ultimately attached to a chassis, as the standard applied expressly to the glazing of the completed vehicle, a multipurpose passenger vehicle. The petitioner objects to this amendment on the basis that the recreational vehicle industry has distinguished between the two camper types, and has considered the latter a motor home (a multipurpose passenger vehicle under Standard No. 205), and the former an item of motor vehicle equipment. It requests in its petition that this earlier distinction be retained in the standard.

The NHTSA has determined that the petition of RVI in this regard should be granted, and the applicability section of the standard is amended to refer specifically both to glazing for use in "slide-in campers", as that term is defined in Motor Vehicle Safety Standard No. 126, Truck-Camper Loading, (49 CFR 571.126), and to glazing for use in pickup covers. Chassis-mount campers are included in a newly defined category of multipurpose passenger vehicle, "motor home", and glazing for use in them is subject to the standard insofar as they are incorporated into completed vehicles.

The RVI petition also requested that the requirements of the standard for glazing for use in multipurpose passenger vehicles (including chassis-mount campers and other motor homes) be clarified, suggesting that the requirements be made identical to those for passenger car glazing, with an exception in the case of motor homes for locations other than windshields, and windows directly to the right and left of the driver. It further requested that forward-facing windows of motor homes be considered to be "openings in the roof" under ANS Z.26. The NHTSA has previously, as a matter of interpretation, taken the position that is embodied in this amendment, that for the purposes of Standard No. 205 glazing for use in multipurpose passenger vehicles is subject to the requirements for glazing for use in trucks. This is based on the definition of multipurpose passenger vehicle in section 571.3: "A motor vehicle with motive power, except a trailer, designed to carry 10 persons or less, which is constructed either on a truck chassis or with special features for occasional off-road operation". The agency has decided to adhere to this position.

An exception is hereby adopted for motor home windows other than windshields, forward-facing windows, and windows directly to the right and left of the driver. Manufacturers may use in these other locations any type of glazing allowed by the standard to be used in motor vehicles. This is the position previously adopted for slide-in campers, which have a purpose and use similar to motor homes. The effect of this provision is to allow the use in motor homes, except for windshields, forward-facing windows, and windows to the immediate right and left of the driver, of any item authorized for use in motor vehicles by Standard No. 205. Windshields and windows to the immediate right and left of the driver must conform to the requirements applicable to trucks for those locations. Forward-facing windows may be manufactured of any item authorized for use by the Standard except item 6 (AS 6), item 7 (AS 7), and item 13 (AS 13) flexible plastics.

The California Highway Patrol has petitioned for reconsideration of that part of the amendment which seemed to delete a requirement that persons who cut glazing material must place on the cut material the prime manufacturer's marking. Section 6 of ANS Z26 requires sections of glazing cut from pieces bearing the markings required by that section to be identically marked. The June 21 notice did not delete this provision. It deleted that part of the proposed requirements specifying that persons who cut glazing materials include the DOT symbol and the prime manufacturer's code number. The language of the preamble (p. 12238, col. 3) was intended to reflect only that fact. This amendment clarifies those requirements to make it clear that persons who cut glazing must include the markings required by section 6 of ANS Z26 on each cut piece. The amendment also provides that the prime manufacturer's DOT symbol and code number are to be affixed only to glazing items made by the prime manufacturer as components for specific vehicles, and not on sheets to be cut into components by other persons.

The marking provisions are further amended to specify that the new items of glazing material authorized by the amendment of June 21 be identified for purposes of marking by the marks "AS 12" and "AS 13". The use of these marks does not indicate approval by the American National Standards Institute, but is specified for the purpose of consistency with existing marking requirements.

In light of the above, Motor Vehicle Safety Standard No. 205, Glazing Materials, appearing at 49 CFR § 571.205, is amended . . . .

Effective date: The effective date of April 1, 1973, is retained.

This notice is issued under the authority of Section 103, 114, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1403, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on November 8, 1972.

Douglas W. Toms
Administrator

37 F.R. 24035
November 11, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 71–1; Notice 06)

This notice amends Safety Standard No. 205, *Glazing Materials*, to permit the use of rigid plastic glazing in all doors and windows of buses, other than in windshields or in windows to the immediate right or left of the driver.

Effective Date: December 5, 1977.

For Further Information Contact:

Hugh Oates
National Highway Traffic Administration
Washington, D.C. 20590
(202–426–9511)

Supplementary Information: This amendment of Safety Standards No. 205 (49 CFR 571.205) is based on a proposal issued December 30, 1976 (41 FR 56837), in response to a petition for rulemaking from General Motors Corporation. Standard No. 205 currently permits plastic glazing materials to be used in buses only in standee windows and in readily removable windows of buses having a GVWR of more than 10,000 pounds. This amendment expands the permissible locations for plastic glazing in buses of all sizes to include all doors and windows, other than windshields or windows to the immediate right or left of the driver.

As noted in the preamble to the proposal, use of plastics in bus side windows should reduce the safety hazards and maintenance costs resulting from the deliberate breakage of bus windows, since plastic glazing is more difficult to break than regular glass. Further, Safety Standard No. 217, *Bus Window Retention and Release*, (49 CFR 571.217) now provides for emergency occupant egress in buses. One of the reasons for the original prohibition against plastic glazing was the fact it would be difficult to break in emegency situations. Since the issuance of Standard No. 217, the prohibition is no longer necessary.

Comments to the proposal preceding this amendment were submitted by Ford Motor Company, the Flxible Company, and the Department of California Highway Patrol. All three commenters supported the proposed changes. California noted the experimental use of plastic glazing in side windows of buses by the Southern California Rapid Transit District. That experiment showed that plastic glazing is superior to glass with regard to resistance to breakage. Further, California noted that the abrasion-resistance coating on the plastic glazing used in the experiment was sufficient to reduce scratching by wash-rack brushes to an acceptable level, during normal cleaning of the buses.

The proposal specified the use of plastic glazing in all doors and windows, other than windshields and windows to the immediate right or left of the driver, of buses having a GVWR of more than 10,000 pounds. Ford Motor Company recommended that the proposed changes be made applicable to all buses, regardless of gross vehicle weight rating. The NHTSA has determined that Ford's comment has merit since small buses are also now provided with means of emergency egress (Standard No. 217) and since multipurpose passenger vehicles and trucks are currently permitted to have plastic glazing in windows to the rear of the driver. The basic distinction between a small bus under 10,000 pounds GVWR and a van multipurpose passenger vehicle or van truck is the number of designated seating positions. Thus, the safety considerations for these vehicles are generally the same. The proposal is, therefore, made final in a form that includes all buses.

The Flxible Company supported the proposed changes and also recommended that the standard be amended to permit the use of Item 4 and Item 5 plastic glazing in front of "destination and route numbering signs" on buses and in front of interior displays such as route maps or advertisements. Since these changes were not proposed, the NHTSA will consider them in future rulemaking actions.

This amendment should have only a minimal economic and environmental impact, since it relieves a restriction and since the increased use of plastics that may result will have a negligible effect upon the environment.

(Because this amendment relieves a restriction and does not create additional obligations for any person, it is found that an immediate effective date is in the public interest.)

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 205, *Glazing Materials* (49 CFR 571.205), is amended as follows . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on November 28, 1977.

Joan Claybrook
Administrator

42 F.R. 61465
December 5, 1977

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials
(Docket No. 71-1; Notice No. 8)

ACTION: Final rule (interpretive amendment).

SUMMARY: In response to a petition for rulemaking, this notice amends Safety Standard No. 205, Glazing Materials, to clarify that Item 5 rigid plastics can be used in all the vehicle locations that are specified in the standard for Item 12 rigid plastics, and that Item 7 flexible plastics can be used in all the vehicle locations that are specified in the standard for Item 13 flexible plastics. Glazing materials that comply with Item 5 and Item 7 test requirements, by definition, also comply with the less stringent Item 12 and 13 test requirements, respectively. Currently, however, the standard inadvertently prohibits the use of Items 5 and 7 glazing materials in some of the locations in which the Items 12 and 13 materials may be used. The purpose of this amendment is to modify the standard to remove that inconsistency.

DATES: Effective date (upon publication), July 14, 1980.

ADDRESSES: Any petition for reconsideration should refer to the docket number and notice number specified in this notice and be submitted to Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. Edward Jettner, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264)

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, Glazing Materials (49 CFR 571.205), specifies performance requirements for vehicle glazing as well as the locations in which particular types of glazing may be used. The standard incorporates by reference the American National Standard "Safety Code for Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z26.1—1966 (hereinafter ANS Z26). The ANS Z26 standard defines the various types of glazing in terms of performance tests with which a particular "Item" must comply. There are currently 13 Items or types of glazing specified in the standard.

Safety Standard No. 205 was amended in 1972 to allow two additional types of glazing for use in specified vehicle locations not required for driving visibility (37 FR 12237, June 21, 1972). The first new glazing type was rigid plastic described as "Item 12", and the second was flexible plastic described as "Item 13". The test requirements specified for Item 12 are identical to the test requirements for Item 5 rigid plastics, and the test requirements for Item 13 are identical to the test requirements for Item 7 flexible plastics, except that neither Item 12 nor 13 is required to meet the test for resistance to undiluted denatured alcohol (Formula SD No. 30). Therefore, the performance requirements of the standard are more stringent for Items 5 and 7 than for Items 12 and 13, respectively, because of the one additional test with which the former must comply.

When Items 12 and 13 were added to the standard, several locations in which the types could be used were specified which were not included for Items 5 and 7. Thus, the standard specifies that Item 12 plastics may be used as motorcycle windscreens, but there is no such specification for Item 5 plastics. Similarly, the standard allows Item 13 plastics to be used in standee windows in buses, interior partitions, and in openings in the roof, but does not specify these locations for Item 7 plastics.

Since Item 5 and 7 glazing materials must meet more stringent requirements, they should be allowed in all vehicle locations in which Items 12 and 13 may be used. Last year, the Rohm and Haas Company petitioned the agency to amend Safety Standard No. 205 to remove this inconsistency. This notice responds to that petition.

The agency agrees that the standard is currently inconsistent with regard to the locations in which the various types of rigid and flexible plastics may be used. When Items 12 and 13 were added to the standard, the agency inadvertently failed to expand the list of permitted locations for Items 5 and 7 so that the list would include all of the locations specified for Items 12 and 13. (The agency wishes to point out that there are several locations specified for Items 5 and 7 in which Items 12 and 13 may not be used. This is appropriate since the performance requirements for Items 5 and 7 are more stringent.)

The agency has determined that the change requested by the petitioner can be accomplished by interpretive amendment and that opportunity for public comment is not required. Items 5 and 7 glazing also qualify as Items 12 and 13, respectively, because an item of glazing is only defined in the standard in terms of the test requirements it can meet. Since Items 5 and 7 glazing comply with all the test requirements specified for Items 12 and 13, manufacturers would be permitted to mark a particular piece of glazing as Item 12 or 13 and to use the glazing in the locations specified for those Items, even though that piece of glazing could also pass the additional test requirement for the higher-grade plastics, Items 5 or 7. There is nothing in the standard which requires a specific piece of glazing to be labeled with the highest performance Item number with which it can qualify, although for practical purposes this is generally done. In other words, Items 12 and 13 glazing are lower performance forms of Items 5 and 7 glazing. Therefore, Items 5 and 7 can be used wherever Items 12 and 13 may be used in the vehicle. This notice amends Standard No. 205 to clarify this point by making the necessary additions to the list of locations currently specified for Items 5 and 7.

Since this amendment removes a current inconsistency in the standard, the agency has determined that an immediate effective date is in the public interest.

The agency has determined that this amendment does not qualify as a significant regulation under Executive Order 12044 and the Departmental directives implementing that Order. Since the amendment only clarifies existing requirements, there should be negligible cost or environmental impacts resulting from this modification. Therefore, no regulatory evaluation has been prepared.

The engineer and lawyer primarily responsible for the development of this amendment are Edward Jettner and Hugh Oates, respectively.

In consideration of the foregoing, Safety Standard No. 205, 49 CFR 571.205, is amended as set forth below.

1. Paragraph S5.1.1.2 is amended by adding a new subparagraph "(m)" to read:

"(m) for Item 5 safety glazing only: Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position."

2. Paragraph S5.1.1.3 is amended by adding the following phrase and new subparagraphs "(l), (m) and (n)" after existing subparagraph (k), to read:

"For Item 7 safety glazing only:

(l) Standee windows in buses.

(m) Interior partitions.

(n) Openings in the roof."

Issued on July 1, 1980.

Joan Claybrook
Administrator

45 FR 47150
July 14, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Federal Motor Vehicle Safety Standards, Glazing Materials and Rearview Mirrors

(Docket No. 71-1; Notice 8, Docket No. 79-19; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 205, *Glazing Materials*, to delete the abrasion resistance requirements specified for Items 3, 5, 9, and 12 glazing. The purpose of the abrasion requirements is to ensure that glazing will resist scratching that can distort the driver's view and thus reduce visibility. The glazing Items specified above, however, can be used in vehicles only in window locations that are not necessary for driving visibility. These locations include sun roofs and side windows to the rear of the driver in trucks, multipurpose passenger vehicles (MPV's), and buses. Since the standard currently does not require glazing in window locations such as these to be transparent, there is no real need for Items 3, 5, 9, and 12 to pass the abrasion tests. Thus, this notice deletes the abrasion requirements for these types of glazing.

The agency has decided, however, not to adopt another proposed amendment to Standard No. 205, or a related change in Standard No. 111, *Rearview Mirrors.* These amendments would have made the rear-most windows of trucks, MPV's, and buses having GVWR's of 10,000 pounds or less requisite for driving visibility. The proposal would have also required the manufacturers of such vehicles to install inside rearview mirrors.

DATES: The amendment is effective on August 31, 1981.

ADDRESSES: Petitions for reconsideration should refer to the docket and notice numbers and be submitted to: Docket Section, Room 5109, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (Docket hours: 7:45 a.m. to 4:15 p.m.)

SUPPLEMENTARY INFORMATION: On September 27, 1979, NHTSA published a notice of proposed rulemaking (44 F.R. 55610) regarding Standard No. 205, *Glazing Materials* (49 CFR 571.205). That notice proposed to amend the standard to delete the abrasion requirements for Items 3, 5, 9, and 12 glazing. The notice also proposed to amend the standard to clarify that the rear windows of trucks, multipurpose passenger vehicles (MPV's), and buses having gross vehicle weight ratings (GVWR's) of 10,000 pounds or less are considered requisite for driving visibility. This would have required that glazing materials used in the rear windows of these vehicles have a luminous transmittance of at least 70 percent. On December 31, 1979, in a related action, the agency published a notice of proposed rulemaking (44 F.R. 77224) regarding Standard No. 111, *Rearview Mirrors.* That proposal would have amended Standard No. 111 to require that light trucks and vans having rear windows be equipped with an inside rearview mirror. The purpose of the two proposals was to improve rearward visibility for the drivers of those vehicles.

Consumers, vehicle manufacturers, trade associations, equipment manufacturers, and others submitted comments in response to the notices. The final rule is based on a thorough evaluation of the data obtained in NHTSA research, data and views submitted in the comments and data obtained from other pertinent documents and reports. The major comments are discussed below, along with the agency's final decision on each proposal.

The Abrasion Requirements

Standard No. 205 specifies performance requirements for glazing materials to be used in motor vehicles and motor vehicle equipment, and also specifies the vehicle locations in which various types of glazing may be used. The standard incorporates by reference the American National Standard "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z26.1-1966 (ANS Z26). The abrasion resistance requirements of Standard No. 205 are set forth in ANS Z26 in terms of performance tests that the various "Items" of glazing must pass. (There are 13 "Items" or types of glazing for which requirements are specified in the standard.) Items 3 and 9 glass glazing materials are required to pass Abrasion Test No. 18, which allows no more than two (2) percent light scatter or haze when the glazing is abraded for 1,000 cycles. Items 5 and 12, which are rigid plastic glazing materials, must pass Abrasion Test No. 17 (less than 15 percent light scatter or haze when abraded for 100 cycles). The purpose of the abrasion tests is to assure that glazing resists scratching which can distort the driver's view and thus reduce visibility. Visibility through the Items of glazing in question, however, is not required, as the glazing can only be used in locations not necessary for driving visibility. Since the abrasion requirements test for a quality that is not relevant to Items 3, 5, 9, and 12 glazing, NHTSA proposed that they be deleted for these types of glazing material.

Several comments were submitted on this proposal, and virtually all were in favor of its adoption. Chrysler and Ford noted that the abrasion tests are not relevant to Items 3, 5, 9 and 12 glazing since such Items cannot be used in locations requisite for driving visibility. GM stated that deletion of these tests for the Items in question would resolve some of the inconsistencies in the standard. One such inconsistency noted by GM is the fact that the current standard allows rigid plastics, which are required to pass a less stringent abrasion test than glass glazing materials, to be used in locations in which glass in combination with treated coatings would not be allowed. Rohm and Haas Company noted in their comments, however, that this proposal may permit materials to be used which will not be as durable and functional as currently used materials and thus will present a poor appearance.

The agency has decided to adopt the proposed amendment. As emphasized by Ford and Chrysler in their comments, there is no compelling safety need for retaining the abrasion requirements for these four glazing Items since the standard prohibits their use in vehicle locations that are requisite for driving visibility. The abrasion requirements for these Items do serve as additional tests of glazing strength and durability. However, there are other more direct tests of these characteristics (such as the Impact Tests Nos. 8-14 of ANS Z26) that are applicable to these Items and that will ensure that the glazing remains in safe condition throughout its useful life. Considering that totally opaque glazing is permitted by the standard, there is no justification for imposing the abrasion requirements on these Items. Deletion of the abrasion requirements should result in cost savings for some vehicles, because less expensive types of glazing would qualify for installation. Manufacturers would be able to use plastic glazing that is more resilient and thus may reduce the possibility of occupant ejection in a crash. In light of these considerations, the agency has decided to delete the abrasion tests for Items 3, 5, 9, and 12 glazing.

Rear Window Visibility

The September 27, 1979 notice also proposed to amend Standard No. 205 to clarify that the rear-most windows (if present) in trucks, MPV's and buses having GVWR's of 10,000 pounds or less are requisite for driving visibility. This would have required that glazing materials used in the rear windows of these vehicles have a luminous transmittance of at least 70 percent, as specified in Test No. 2 of ANS Z26. At present, Standard No. 205 allows the use of certain types of glazing (Items 3, 9, and 12) that are not required to have a luminous transmittance of 70 percent if the rear window is not requisite for driving visibility. Item 5 glazing may also be used if the rear window is not requisite for driving visibility and other means of visibility to the side and rear of the vehicle are provided. The standard does not specify, however, which rear windows are necessary for driving visibility. The proposed change would have resolved the indefiniteness of the present standard in regard to which rear windows of trucks, MPV's, and buses are considered necessary for driving visibility.

All the comments filed regarding the proposed amendment disapproved of the change. Many commenters stated that the agency had presented no evidence showing that a safety problem exists because the rear windows of trucks and buses are not required to be transparent. The commenters suggested that if a vehicle is equipped with an outside mirror system as proposed in Docket No. 71-3a, Notice 4, *Rearview Mirror Systems*, and meets the proposed requirements of Docket 70-7, Notice 05, *Fields of Direct View*, the needs of drivers for visibility, both direct and indirect, will be satisfied. The proposed amendment to Standard No. 205 would then be redundant. Thus many of the commenters argued that the proposed change should not be adopted, or else should be incorporated as part of Standard No. 111, *Rearview Mirrors*, and made applicable only when the manufacturer is using inside mirrors to satisfy the other requirements of the standard. (On June 22, 1981, NHTSA published a notice in the *Federal Register* that rescinded Standard No. 128, *Fields of Direct View* (46 F.R. 32254). That decision has no effect on this rulemaking proceeding.) Almost all the commenters felt that the purpose of the amendment—to increase visibility to the rear of certain vehicles and thereby improve safety—would be easily circumvented. Either cargo or passengers would block the driver's view of the rear window, or the owner of the vehicle would hang curtains or reflective film to ensure privacy. Many of the commenters noted that there is no requirement that trucks and vans even have a rear window. Several pointed out that the proposed amendment will waste fuel, because the 70 percent luminous transmittance requirement will eliminate the use of plastic glazing (which is lighter in weight than glass) and will increase the use of air conditioners since smoked glass windows will be prohibited.

The NHTSA has decided not to adopt this proposed amendment to Standard No. 205. The agency believes that consumers would not derive a significant safety benefit from such a regulation. However, NHTSA encourages vehicle manufacturers to voluntarily use glazing which has a luminous transmittance of at least 70 percent in the rear windows of trucks, MPV's, and buses.

Inside Rearview Mirrors

Standard No. 111, *Rearview Mirrors*, currently allows the manufacturers of MPV's, trucks and buses (other than school buses) that have GVWR's of 10,000 pounds or less the option of complying with either of two rearward visibility requirements. A manufacturer may equip those vehicles with inside and outside rearview mirrors which meet the requirements for passenger car mirrors. Or, it may equip the vehicle with larger outside mirrors on each side of the vehicle and forego providing any inside mirror. Under the latter alternative, the outside mirrors must be plane mirrors and have not less than 19.5 square inches of reflective surface.

Notice 1 of Docket 79-19 proposed an amendment to Standard No. 111. That proposal would have required manufacturers of light trucks, MPV's, and buses (other than school buses) equipped with rear windows to install in those vehicles an inside rearview mirror that is similar to mirrors found in passenger cars. Manufacturers would have had the same options for compliance as before, except that if a manufacturer chose to provide only the larger outside mirrors, he would also have to install an inside mirror that provided a field of view through the full horizontal width of the rear window. (The inside rearview mirror in a passenger car must provide a field of view through a 20 degree horizontal angle and through a vertical angle sufficiently large to provide a view of a level road surface extending to the horizon beginning at a point not greater than 200 feet to the rear of the vehicle.) The proposed amendment supplemented the proposed changes in Standard No. 205 regarding rear window visibility. The proposed amendment to Standard No. 111 would have enabled drivers to take full advantage of the more transparent glazing materials that would have been required in rear windows.

The manufacturers and trade associations who submitted comments on the proposed amendment were unanimous in their opposition to it. Many emphasized that the research cited in support of Docket No. 71-3a, Notice 4, *Rearview Mirror Systems*, which proposes to upgrade Standard No. 111, does not indicate a need for inside rearview mirrors when outside mirrors are adequate. The inside rearview mirror would be totally useless if the rear window of the vehicle is blocked by cargo, passengers, or the like. Most of the commenters noted that a pick-up truck manufacturer who complies with the large outside mirrors/inside mirror option (as opposed to the passenger car mirrors requirement) would have to install an extremely wide inside mirror. This would be necessary if the mirror was to provide a field of view through the full horizontal width of the rear window because of the close proximity of the mirror to the backlite. According to the commenters, such a wide mirror would interfere with the driver's ability to see through the windshield and could not be mounted in a stable, vibration-free manner. Some commenters noted that most of the affected vehicles already have inside rearview mirrors, despite the fact that most rear windows are designed only to admit ambient light, not for visibility. One second-stage manufacturer stated that NHTSA had underestimated the cost of the amendment to the ultimate consumer.

The NHTSA has decided not to adopt the proposed amendment to Standard No. 111. Since the agency has decided not to make the rear windows of trucks and vans requisite for driving visibility, there is no need to require such vehicles to have an inside rearview mirror which would enable drivers to take advantage of the improved visibility the glazing would have provided. Also, the agency has observed that virtually all vehicle manufacturers voluntarily provide inside rearview mirrors as standard equipment on their light trucks and vans. The agency approves of this practice and encourages manufacturers to continue it. NHTSA will continue to study the question of whether inside rearview mirrors should be mandated for trucks, buses and MPV's as a part of Docket No. 71-3a, Notice 4, *Rearview Mirror Systems*.

Costs

The NHTSA has considered the economic impacts of the amendment to Standard No. 205 that will delete the abrasion requirements for Items 3, 5, 9, and 12 glazing. The agency has determined that this rule is not a major rule within the meaning of Executive Order 12291 or a significant rule under the Department of Transportation's policies and procedures for implementing that order. Based on that assessment, NHTSA has further concluded that the economic and other consequences of the amendment are so minimal that a regulatory evaluation is not necessary. Deletion of this requirement will permit the use of less expensive types of glazing in motor vehicles. Thus, NHTSA anticipates cost savings for some vehicles as a result of this amendment. However, the agency expects that the cost savings will not be significant.

NHTSA has also evaluated the environmental impact of this amendment in accordance with the National Environmental Policy Act (42 U.S.C. § 4321 *et seq.*) and has determined that the amendment will not have a significant effect on the environment. Reasons for this finding can be found in the Environmental Assessment, copies of which will be placed in the public docket.

Issued on August 24, 1981.

Raymond A. Peck, Jr.
Administrator
46 F.R. 43687
August 31, 1981

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

[Docket No. 81-04; Notice 4]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 205, *Glazing Materials*, to permit the installation of glass-plastic glazing a windshield and windows in motor vehicles and to establish appropriate performance requirements for such glazing. The existing requirements of the standard do not permit the use of glass-plastic glazing in areas necessary for driving visibility because the currently produced materials cannot meet the abrasion resistance requirements of the standard.

The agency has determined that glass-plastic glazing should be allowed because research data and limited field experience indicate that such glazing substantially reduces lacerative injuries when vehicle occupants strike windows and windshields in an accident. Although there are still certain concerns about potential problems with this type of glazing material, the agency believes these to be minor, and has concluded that the safety benefits derived from this material outweigh the possible problems. This amendment permits, but does not require, the use of glass-plastic glazing.

EFFECTIVE DATE: November 16, 1983.

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, *Glazing Materials*, (49 CFR 571.205) specifies performance requirements for the types of glazing that may be used in motor vehicles, as well as the vehicle locations in which the various types of glazing may be used. The standard incorporates by reference the American National Standard "Safety Code for Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z26.1—1966 (ANS Z26). The requirements in ANS Z26 are specified in terms of performance tests that the various types or "Items" of glazing must pass. There are 13 "Items" of glazing for which requirements are currently specified in the standard. Currently, the only types of glazing that may be used in the windshield of motor vehicles are Item 1, Safety Glazing Material for Use Anywhere in a Motor Vehicle, and Item 10, Bullet Resistant Glass.

The windshield in all current vehicles is a "High Penetration Resistant" (HPR) windshield whose interior and exterior surfaces are made of glass, held together by an intervening layer or layers of plastic. When HPR windshields are impacted in an accident, both the inner and outer glass layers tend to break, leaving edges of broken glass on the inner surface (i.e., the side of the windshield facing the interior of the vehicle).

To alleviate the problem of lacerative injuries which result from this broken glass, manufacturers have experimented with windshields composed of laminated glass to which a layer of soft plastic is bonded on the inner side. Saint Gobain Vitrage of France has developed one such windshield called Securiflex, which has a layer of polyurethane on the inner surface. The Securiflex windshield has been demonstrated to reduce the risk of lacerations to car occupants who strike the window in an accident because the plastic inner layer prevents the occupant from coming into contact with the sharp glass edges that are formed when the glass is broken.

Although Securiflex has the potential for reducing many serious lacerative injuries, it cannot pass current Test No. 18, *Abrasion Resistance*, of Standard No. 205 when tested on the inner plastic side. The existing abrasion requirements were established in ANS Z26 prior to the development of glass-plastic glazing materials, such as Securiflex, and were geared specifically to symmetrical glass glazing. Since Securiflex cannot pass the current abrasion requirements, it may not be installed in motor vehicles manufactured in or imported into the U.S. at the present time.

In light of this fact, Saint Gobain petitioned the agency June 1980 to amend Standard No. 205 to permit the use of glass-plastic glazing, such as Securiflex, by establishing performance requirements that are appropriate for the special use characteristics of this new technology (i.e., the plastic inner layer of this material is not exposed to the harsher environment outside the vehicle).

In response to this petition, the agency issued an advance notice of proposed rulemaking on January 26, 1981, concerning possible performance requirements for glass-plastic glazing (46 FR 8067). Following further study and a review of the information received in response to the advance notice, on March 10, 1983, the agency issued a notice of proposed rulemaking to amend Standard No. 205 to permit the installation of glass-plastic glazing materials (48 FR 10097). The proposal specified performance requirements designed particularly for glass-plastic glazing, recognizing the varying environmental demands placed on the outer and the inner surfaces of this material. (For a complete understanding of the technical issues involved in this rulemaking, as well as a description of the specific performance requirements proposed, interested persons should consult both the advance notice and the notice of proposed rulemaking referred to earlier.)

As noted in the notice of proposed rulemaking, one of the primary issues in this rulemaking is whether the inner plastic side of glass-plastic glazing can adequately resist abrasion. Plastic does not resist the surface damage caused by rubbing and scraping as well as glass. Abrasion is a potential concern since it produces haze which scatters the light passing through the glazing in a way that can make it more difficult for the driver to see through the windows. Other issues which were discussed in the proposal included: the possible problem of delamination of glass-plastic glazing; rearview mirror attachment to the plastic surface of glass-plastic glazing; attachment and removal of decals in relation to the plastic side of glass-plastic glazing; and the effect of glass-plastic glazing on head impact forces (HIC values).

A majority of comments received in response to the proposal supported permissible use of glass-plastic glazing in all vehicle locations. These supporting comments unanimously cited the great potential of glass-plastic glazing for reducing lacerative injuries in vehicle accidents, and stated that solutions can be found for the potential technical problems associated with this material. Several commenters, however, voiced serious concern about the level of stringency of the requirements (i.e., not high enough), outstanding technical issues, and quality control problems. These commenters urged further research and field testing prior to amending the standard to permit the use of glass-plastic glazing. Following is a discussion of the points raised in these comments, along with a discussion of the agency's analysis and conclusions.

Haze and Transmittance

From the outset of this rulemaking, one of the major concerns about glass-plastic glazing has been the ability of the inner plastic liner to resist abrasion which could lead to haze and loss of light transmittance, thereby reducing driving visibility. The proposal specified that glass-plastic glazing materials to be used in areas requisite for driving visibility must meet Abrasion Test No. 17, allowing a haze of only 4 percent after 100 cycles of controlled laboratory abrasion.

Several commenters pointed out that there is still no clear relationship between haze and driver visibility (i.e., when haze becomes a safety factor), and stated that the levels specified in the proposal were only arbitrary levels. DuPont questioned what it calls a relaxation of the standard's requirements (HPR windshields must meet a 2 percent haze maximum after 1,000 cycles of the Taber abraser).

The agency believes that different test procedures and performance requirements set for glass-plastic glazing are appropriate given the differences in actual exposure between the inner plastic liner and the glass side of the windshield. The inner plastic liner will not experience the same exposure to outdoor environmental conditions that the glass side of this glazing will encounter. Therefore, the abrasion requirements for the two sides are not equivalent and the 2 percent limitation specified for the glass cannot be compared to the specification for the plastic inner liner (i.e., the latter should not be considered a "relaxation").

The specified abrasion requirement for the plastic side of glass-plastic glazing was tailored to the requirement for this type glazing specified by the

Economic Commission for Europe (ECE) in ECE Regulation 43, which is currently recognized in some form by 20 European countries. The agency has also obtained data describing haze build up on Securiflex windshields in use in Europe (Docket No. 81-04-N01, Entry 03A) as well as data that describe haze buildup and loss of transmittance of standard HPR windshields in the United States (Docket No. 81-4-N01, Entry 048). These data indicate that Securiflex windshields tested to ECE Regulation 43 are, in actual use, no less durable than ordinary windshields. In light of the test data currently available, the agency believes that the 4 percent test limitation specified in the proposal for the plastic liner of glass-plastic glazing is sufficient to minimize the loss of transmittance and to provide adequate driving visibility. However, the agency does solicit any information or data that any party may obtain in the future concerning the relationship between haze buildup and driving visibility. The agency also intends to monitor closely this aspect of glass-plastic glazing performance as this product is introduced in the market. If future information indicates that changes in the abrasion requirements are necessary, the agency will, of course, take appropriate action.

Discoloration

The plastic side of glass-plastic glazing is susceptible to chemical alteration (becoming yellow or cloudy) when exposed to intense and prolonged ultraviolet radiation. Chrysler Corporation cited tests it conducted in the Arizona desert in which a glass-plastic windshield was exposed to direct sunlight for 2 years. Chrysler stated that the test results showed that the plastic surface became etched, hazy, and translucent after 1 year of exposure. That company argued that the proposed requirements will not insure that glass-plastic material performs satisfactorily throughout the wide range of environmental and usage conditions it will encounter in the United States. PPG Industries also stated that the test procedure included in the proposal for weathering is insufficient because the ultraviolet radiation in the test is only directed against the glass side of glass-plastic glazing.

The agency believes that the Chrysler test involved a much more severe exposure to the sun than glass-plastic windshields would experience in actual use, because the plastic side of the windshield would be inside the vehicle and receive little direct ultraviolet exposure in most cars. The amount of ultraviolet light that will actually pass through the windshield to the inside layer of plastic should be minimal, since test data provided by DuPont indicate that the plastic inner layer in HPR windshields acts as an effective filter for ultraviolet light.

The agency also believes that the proposed weathering test procedures (i.e., direct ultraviolet exposure of the exterior surface of the windshield and not the interior plastic surface) of Test No. 16 is the best simulation of the exposure the windshield will receive when it is installed in a car. Thus, the agency has decided not to adopt PPG's recommendation for changing the test procedure.

The agency is, however, concerned about the potential exposure of the plastic side of the windshield in convertibles and vehicles that have no or removable tops. While the agency believes that a prolonged test directing ultraviolet radiation against the plastic side of the glazing would be overly stringent, it does believe that it may be appropriate to set some requirement for directing ultraviolet radiation against the plastic side of glass-plastic glazing for use in convertibles or cars with no or removable tops. At this time, the agency lacks the necessary data to support such a requirement. As an interim solution, the agency has decided to prohibit the use of glass-plastic glazing in those vehicles until such data are available. This prohibition does not apply to the use of glass-plastic glazing in vehicles with sun roof or T-tops. The probability that the plastic side of the glazing in those vehicles would be directly exposed to the sun over a prolonged period is particularly small due to the installation angle of the windshield and restricted path of the sunlight through the opening in the top of the vehicle.

Commenters also raised questions about the susceptibility of glass-plastic glazing to deterioration resulting from exposure to some chemicals. Since glass-plastic glazing would be exposed to various cleaning agents, the proposal included Test No. 19, *Chemical Resistance*, to insure that inferior plastic materials are not used in glass-plastic glazing. Libby-Owens-Ford said that in its tests, glass-plastic materials were damaged when exposed to one commercial glass cleaner. Information provided by the Maryland State Police, however, indicates that they have used commercial glass cleaners on their glass-plastic windshields without problems. Because of potential problems that may be associated with some commercial glass cleaners, the agency has added an additional generic formula, typical of several chemical glass cleaners, including the one used in the Libby-Owens-Ford test, to the list specified in the chemical resistance test to simulate the use of commercial glass cleaners.

Frost Removal

There has been some concern that the plastic side of glass-plastic glazing could become overly abraded by the scraping action of vehicle owners in the removal of frost. Transport Canada recently conducted a study of this problem and determined that the plastic surface of the glass-plastic samples tested did not develop haze levels in excess of 2 percent when subjected to frost removal scrapings. (See Docket No. 81-04-NO3, Entry 13.) The tests did show that the plastic samples did receive fine scratches from the scraping and several commenters argued that this indicates that there is still a serious problem. The agency disagrees and believes that the low haze level is within acceptable limits. If owners remove frost with plastic scrapers, the agency does not expect there to be any noticeable degradation of visibility through this glazing. Since the cleaning instruction label will instruct owners on the proper method of frost removal, there should be no problem.

Decal Removal

There has also been concern that the plastic surface of the subject glazing could be cut or abraded during the process of removing decals from the windshield (e.g., removing of State inspection stickers). The proposal discussed this problem and noted that, as one possible solution, special decals could be produced which could be peeled off easily without the use of damaging tools. Several vehicle manufacturers mentioned this problem and discussed other possible solutions. General Motors suggested that a "free corner" could be provided on the lower surface of the windshield to allow a small area of exposed glass (i.e., no plastic) which would serve as a decal mounting zone. Ford said that it had experimented with a plastic mounting which would be placed over the plastic inner liner of glass-plastic windshields on which the decals could be attached.

The agency believes that all of these suggestions are possible solutions to this potential problem, and that manufacturers should be allowed to experiment with various methods. Consequently, no specific requirements regarding decal placement are included in this rule. The agency does not believe that the potential problem is insurmountable or so great that it should preclude the use of glass-plastic glazing. Since decals are ordinarily placed where they don't obstruct the driver's view of the road ahead, any damage that does result from decal removal would also not block that view.

Mirror Attachment

The notice of proposed rulemaking discussed the potential difficulty of attaching rearview mirrors to the plastic side of glass-plastic windshields, because of problems of adherence. As noted in the proposal, a review of technical material presented in SAE Paper 770246 (Docket No. 81-04-NO1, Entry 009) indicates that this is not an insurmountable technical problem. The agency also noted that Saint Gobain is recommending an acrylic adhesive material for mirror attachment.

General Motors currently has a test fleet of 2,500 vehicles equipped with Securiflex windshields which have been in the field for several months. General Motors does report that three mirrors have fallen off in this test fleet and attributes this occurrence to poor adhesion of the mounting button to the plastic (the adhesive used was that recommended by Saint Gobain). General Motors stated that if the adhesion cannot be improved, it may be necessary to provide a hole in the inner plastic liner so that the mirror button can be attached directly to the glass, using current production methods. The agency believes that this is a viable alternative. Also, the mirror could be attached directly to the windshield header rather than to the windshield, as was typically done in all production vehicles ten years ago. Since Standard No. 111, *Rearview Mirrors*, requires all mirrors to have breakaway mountings, there should not be a safety difference in placing the mirrors directly on the windshield or on the windshield header. Although either of these alternative solutions would involve some slight additional costs, the agency believes they offer a technically feasible solution should they become necessary. No commenters suggested that the rule should not go forward because of potential difficulties in this area.

Delamination

To insure that the inner plastic layer of glass-plastic glazing does not separate (delaminate) from the glass layer during use, the notice of proposed rulemaking specified that these materials must pass Test No. 28, *Resistance to Temperature Change*. This procedure involves the testing of 12-inch by 12-inch specimens by exposing them to extremely cold and hot temperatures (−40 to +161° F) to determine whether the plastic will delaminate from the glass. Several commenters stated that this test procedure is inadequate because the small test samples do not simulate the performance of entire windshields. These manufacturers argued that the stress placed on glass-plastic glazing when molded into windshields (i.e., the curvature) can cause delamination in certain glass-plastic material which is not evident when small, flat samples are tested. General Motors also noted that it would not market glass-plastic windshields without conducting the delamination tests on the entire windshields, regardless of the requirements of the standard.

The agency has given careful consideration to these comments. However, the agency believes that this concern is primarily a quality control consideration for the manufacturer of the windshield, since delamination is not directly related to safety, unless there are instantaneous delaminations while a vehicle is being driven. The agency believes that the tests specified in the proposal and included in this final rule are adequate to insure the minimum performance of glass-plastic glazing in terms of delamination resistance. In addition to Test No. 28, this rule includes two other tests that relate directly to delamination. Test No. 3, *Humidity*, investigates the behavior of the laminated construction when exposed to high levels of moisture (100 percent relative humidity). Test No. 4, *Boil Test*, evaluates laminated materials when exposed to tropical temperatures. The agency believes that this combination of tests is adequate to insure that low-quality glass-plastic material will not be produced, even though the tests involve small samples. It should be noted that Test No. 28, *Resistance to Temperature Change*, is not currently specified under the standard for Item 1 HPR windshields. This additional test is specifically added to insure the integrity of glass-plastic material in terms of delamination resistance.

Flammability and Toxicity

The notice of proposed rulemaking included a specific degree of flame resistance, Test No. 24. PPG Industries stated that this test may not be sufficient because it does not measure the possibility of toxicity or dense smoke which can result from the burning of some plastics. The agency has considered this comment but does not believe that will represent a real problem with glass-plastics that comply with Test No. 24. For example, the Maryland State Police (MSP) reported to the agency that there was a fire in one of their vehicles equipped with a Securiflex windshield. MSP said that an examination of the windshield after the fire showed that the inner plastic liner was self-extinguishing. Further, the time required to egress from a burning vehicle is sufficiently short that toxicity should not be pertinent. The agency does intend, however, to monitor glass-plastic windows that may be introduced in the market in terms of this consideration.

General Motors also questioned whether Test No. 24 (specified for thick plastic materials), which was specified in the proposal, should be included rather than Test No. 23 (specified for thin plastic materials). That company also suggested that Safety Standard No. 302, *Flammability of Interior Materials*, may be sufficient to insure adequate flame resistance in glass-plastic glazing.

The agency specified Test No. 24, rather than 23, because the overall construction of glass-plastic glazing is "thick" not "thin". Test No. 24 will evaluate the burning behavior of the plastic inner liner as it is bonded to the windshield glass, and the agency believes that this is a more appropriate test than Test No. 23.

Relying on Safety Standard No. 302 to insure the flame resistance of glass-plastic glazing is not possible since that standard only applies to vehicles and does not cover items of aftermarket equipment. Safety Standard No. 205 is an equipment standard and the inclusion of Test No. 24 will insure that the glass-plastic glazing manufacturer has analyzed the flame resistance of its product.

Head Injury Criterion (HIC)

The notice of proposed rulemaking noted that some data indicate there may be somewhat higher occupant HIC values in crashes with glass-plastic windshields (HIC values are calculated from readings from instrumented dummies involved in barrier crash tests and are a measuring tool used to assess the injury-producing effects of a crash). Data reported by Patrick and Chou (Docket No. 81-04-N01, Entry 009) show graphically that the "best fit" curve of HIC values for glass-plastic glazing is approximately 100 units higher than the comparable curve representing the standard HPR windshield. Libby-Owens-Ford and PPG stated concern about this matter and suggested the need for additional testing. No commenter suggested a specific HIC value requirement that should be included in the standard at the current time.

Ford Motor Company stated that it had analyzed the data used by Patrick and Chou and found no statistically significant differences in anthropomorphic test device HIC response due to differences in windshield type. GM also reported that the only test it had run to date with a glass-plastic windshield produced a HIC considerably lower than an equivalent test of a windshield without the inner plastic liner. In addition, Volkswagen reported that in all of its tests the HIC values with Securiflex windshields were lower than those with conventional windshields.

Currently, the cost of glazing and vehicle production (including fuel economy considerations) favors glazing of the minimum acceptable thickness and weight. This will help to insure that very thick plastic coatings are not used on glass-plastic windshields, which could possibly lead to increased HIC values. The agency is not including any dynamic testing for glass-plastic windshields at the current time, since the available data show that glass-plastic glazing apparently does not adversely affect HIC values. In fact, test data supplied by some commenters show lower HIC values with glass-plastic glazing. The agency will continue to evaluate this aspect of glazing performance, however, as glass-plastic glazing is introduced into the market.

On a related issue, DuPont noted that the proposed definition of glass-plastic glazing would allow glass-plastic laminates containing only one sheet of glass, and states that this radical departure from existing windshield construction could lead to unforeseen safety problems. Existing windshields are laminates of glass-plastic-glass. Securiflex is constructed of a typical windshield laminate with an extra layer of bonded plastic.

The agency does intend to allow glass-plastic constructions of only two layers if manufacturers choose to develop such designs. Such constructions could potentially be very beneficial in terms of reducing lacerations and ejections, while at the same time possibly reducing vehicle weight and cost. The agency is aware that certain manufacturers are already experimenting with two-ply constructions which show much promise. NHTSA does not wish to squelch innovation in this area by restricting the construction of glass-plastic materials, and believes that the specified performance requirements will insure that inferior materials are not produced (e.g., two-ply materials would have to meet the impact resistance test specified in this rule for glass-plastic materials).

Lacerations

Libby-Owens-Ford and PPG expressed concern that no performance requirement was included in the proposal to measure the antilacerative characteristics of glass-plastic glazing. These commenters are concerned that brittle plastics could be used which might actually increase lacerations. The agency does not believe this is a valid concern because there is no reason a manufacturer would choose to use a hard plastic of such thickness that it would be brittle.

Moreover, no reliable laceration test currently exists. The gathering of extensive field experience is absolutely essential before a sound, realistic, and reproducible laceration test can be developed, if it is determined one is even needed. The SAE Glazing Committee established a task force which worked for several years, without success, trying to articulate a laceration test.

The agency believes that the existing data regarding glass-plastic glazing thoroughly establish its great antilacerative potential. Sled-test crash simulations using test dummies having chamois-covered heads clearly indicate that glass-plastic constructions eliminate virtually all lacerations. Further, in spite of the short time period and small number of cars in the current field evaluation projects under way, there are already two real-world crash experiences which dramatically demonstrate the antilacerative properties of glass-plastic windshields. The Maryland State Police have a test fleet of 100 vehicles equipped with Securiflex windshields. One of their patrolmen was involved in a serious accident in which the officer's head struck and broke the windshield, yet no lacerations occurred on his face. General Motors has a rental test fleet of 2,500 vehicles equipped with Securiflex windshields. General Motors has told the agency that it is aware of 11 crashes in which an occupant struck the windshield. General Motors reported that none of the occupants in those cars suffered lacerations caused by the cutting action of broken windshield glass. The agency believes that this experience and the other existing data concerning the antilacerative properties of glass-plastic glazing justify allowing this material at the current time even though no laceration index or test is currently available. (It should be noted that there is also no laceration test for existing HPR windshields; it is known that these windshields cause thousands of lacerative injuries each year.)

Ford Motor Company requested a clarification in the test requirements for glass-plastic glazing to specify that in conducting Test No. 2, Luminous Transmittance, data obtained from Test No. 1, Light Stability, rather than Test No. 16, Weathering, should be used. Ford's point is that in testing glazing, Test No. 1 would precede Test No. 16. Hence, the data from Test No. 1 would be available for use in Test No. 2. Ford argues that the outcome of Test No. 2 would be unaffected by which test data are used, but that this clarification would simplify test procedures. The agency agrees with Ford's assessment, and this clarification is included in this rule.

General Motors suggested that the term "coated glass" be used instead of "glass-plastic" glazing, in case coatings other than plastic are used in the future. The agency does not believe it is necessary to make such a change at the current time since "glass-plastic" is being used in the industry and is totally descriptive of existing and expected technology.

General Motors also requested that manufacturers be given the option of providing a shorter, permanently etched message on the windshield glass, rather than the cleaning instruction label specified in the proposal, to alert owners regarding the proper cleaning methods for glass-plastic windshields. The agency believes that the cleaning instruction label specified in the proposal is necessary because it would contain more information than would be possible with a permanently etched, short message. The cleaning instruction label included in this rule would identify the product, specify instructions and agents for cleaning the material that will minimize the loss of transparency and instructions for removing frost and ice. The agency recognizes the value of having a permanently etched message on the glass-plastic glazing that refers drivers to the owner's manual for cleaning instructions. Thus, the agency will permit the optional use of permanent labels and urges manufacturers to use them in addition to the cleaning instruction label required by this rule. The agency will continue to monitor the field experience of glass-plastic glazing to determine whether a permanent label should be required.

The agency has determined that there is good cause for an immediate effective date for this rule because it will remove a restriction by permitting, but not requiring, manufacturers to install glass-plastic glazing in all windows of motor vehicles. The agency believes this technology will reduce thousands of lacerative injuries each year. Consequently, an immediate effective date is in the public interest.

The agency has examined the impacts of this amendment and determined that this notice is not major within the meaning of Executive Order 12291 or significant according to the Department's regulatory policies and procedures. The agency has prepared a final regulatory evaluation concerning the amendment, which has been placed in the public docket. (A free copy may be obtained by contacting the Docket Section.) The agency estimates that the consumer cost of glass-plastic glazing would be greater than existing laminated or tempered glass, although it is not possible to determine the exact increase in cost at the current time because this material is not being marketed. The agency estimates, however, that costs could be $38 to $45 greater for glass-plastic windshields. It should be noted that this rule will allow the use of glass-plastic glazing, but not require its use. Therefore, any increase in cost would be determined by the number of manufacturers which choose this alternative material for certain windows in their vehicles. The agency has determined, however, that cost increases to consumers would not be significant within the meaning of Executive Order 12291. Moreover, any increase in cost for this material would be offset to a certain extent by the savings which would accrue because of reduced lacerative injuries resulting from the installation of glass-plastic glazing (with the concomitant reduction in medical and insurance costs).

The agency has also considered the impacts of this rule under the Regulatory Flexibility Act. Few, if any, motor vehicle manufacturers would quality as small entities. Small organizations or governmental units that purchase vehicles equipped with glass-plastic glazing might have to pay a slightly higher price, but this option and its cost increase would be somewhat offset by the accruing savings discussed above. This amendment could have some economic impact on small glazing manufacturers and glazing dealers that would be considered small entities for purposes of the Act. If glass-plastic glazing were to become popular, these small entities might be forced, through competition, to stock the new glazing in their inventories, to provide safe and secure types of storage, to develop new material handling procedures (to protect the plastic inner liners), and to develop new shipment procedures. These possible impacts are all speculative at the current time since the agency has no information to determine how many manufacturers would choose the option of producing and installing glass-plastic glazing, and no information on the magnitude of the above possible impacts or on the likelihood of their occurrence. Based on the agency's judgments regarding information that is currently available, I certify that the option included in this rule would not have a significant economic impact on a substantial number of small entities.

As noted earlier, General Motors, the Maryland State Police, and Ford Motor Company currently have (or will have) test fleets of vehicles equipped with glass-plastic windshields. Experience with these test fleets may provide more information in the future concerning any additional handling costs that are necessary to protect glass-plastic glazing materials. The agency will monitor these impacts as glass-plastic glazing is introduced in the market.

In consideration of the foregoing, Safety Standard No. 205, *Glazing Materials*, (49 CFR 571.205) is amended as set forth below.

1. Paragraph S4 is amended to add the following definition:

"Glass-plastic glazing material" means a laminate of one or more layers of glass and one or more layers of plastic in which a plastic surface of the glazing faces inward when the glazing is installed in a vehicle.

Existing paragraph S5.1.2.3 is designated S5.1.2.4 and revised to read as follows:

Section 5.1.2.4 Cleaning instructions.

(a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, or S5.1.2.3 shall affix a label, removable by hand without tools, to each item of such glazing materials. The label shall identify the product involved, specificy instructions and agents for cleaning the material that will minimize the loss of transparency and instructions for removing frost and ice and, at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manufacturer of glazing materials designed to meet the requirements of paragraph 5.1.2.3 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than 1/4 inch high, the following words, "GLASS-PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS."

3. A new paragraph S5.1.2.3 is added to read as follows:

Section 5.1.2.3 Item 14—Glass-Plastics. Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.4 and Tests Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in (a), (b), (c), and (d) of this paragraph, may be used anywhere in a motor vehicle, except it may not be used in convertibles, in vehicles that have no roof, or in vehicles whose roofs are completely removable.

(a) Tests Nos. 9, 16, and 18 shall be conducted on the glass side of the specimen, i.e., the surface which would face the exterior of the vehicle. Tests Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For test No. 19, add the following chemical to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10 percent or less than 5 percent by weight and ammonium hydroxide no greater than 5 percent or less than 1 percent by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of $-40°C$ ($\pm 5°$) $-40°F$ ($\pm 9°$) for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentages of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

Issued on November 9, 1983.

Diane K. Steed
Deputy Administrator

48 FR 52061
November 16, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

[Docket No. 81-04; Notice 5]

ACTION: Final Rule

SUMMARY: This notice amends Standard No. 205, *Glazing materials*, to adopt by reference the 1980 version of American National Standard Z26, the safety code for glazing materials promulgated by the American National Standards Institute. Adoption of the most recent version of Z26 will permit the use of the latest technological developments in glazing. This notice also amends the standard to permit the use of a new type of bullet-resistant glazing material and sets appropriate performance requirements for that glazing. The new glazing would be used in bullet-resistant shields that would be installed inside a vehicle behind the windshields and other areas of the vehicle. Since the new glazing materials are lightweight, small businesses would be able to provide ballistic protection for their employees at a lower cost.

EFFECTIVE DATE: February 23, 1984.

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, *Glazing materials* (49 CFR Part 571.205) sets performance requirements for glazing materials used in motor vehicles and motor vehicle equipment. The standard incorporates by reference the American National Standard Institute's "Safety Code for Safety Glazing Materials for Glazing Motor Vehicle Operating on Land Highways" Z-26.1-1966, as supplemented by Z-26.1a-1969 (ANS Z26). The requirements of Standard No. 205 are set forth in terms of performance tests that the various types or "items" of glazing must meet. Currently there are 14 items of glazing materials permitted under Standard No. 205.

On November 18, 1980, NHTSA granted petitions for rulemaking filed by Rohm and Haas and General Electric (GE). The petitioners requested the agency to amend the standard to incorporate a revised edition of ANS Z26 that was published on January 26, 1977. They said that the revised edition would enable manufacturers to take advantage of the latest technological developments in glazing and would reduce test burdens by eliminating unnecessary testing.

Additionally, GE requested that Standard No. 205 be amended to permit the use of a new type of bullet-resistant glazing, which could be used as a shield in vehicle areas requisite for driving visibility. This transparent barrier would be mounted separately inside the vehicle behind glazing materials that independently comply with the requirements of Standard No. 205. Since the plastic glazing materials are lightweight, GE claimed that small businesses would be able to provide ballistic protection to their employees at a lower cost.

ANS Z26 Revision

Subsequent to the Rohm and Haas and GE petitions, the American National Standards Institute published a 1980 revision to ANS Z26. In July 1982, the agency proposed (47 FR 32749) to incorporate the 1980 revision. (Please refer to the July 29, 1982, notice for an extensive discussion of the provisions of the 1980 version of ANS Z26.)

All commenters supported adoption of the 1980 edition of ANS Z26, citing the advantages gained by using a more modern technical reference. The major benefits of the 1980 version are that it adds metric equivalents to the test procedures and performance requirements, eliminates certain tests which are not necessary to assess the resistance to delamination and light stability of tempered glass, and expands the permissible glazing materials to accommodate technological advances in glazing technology, particularly for bullet-resistant glazing.

The elimination of Humidity Test No. 3 and Boil Test No. 4 for tempered glass will not adversely affect safety. These tests are unnecessary because, unlike laminated glass, which contains intervening layers of glazing materials, tempered glass is a single layer of material and therefore cannot delaminate. Likewise the elimination of ANS Z26 section 5.1.4 of Light Stability Test No. 1 for tempered glass also will not have an adverse safety effect. This section of Test No. 1 is designed to detect decomposition of laminates after exposure to ultraviolet radiation. Since tempered glass does not contain laminates, the test is superfluous. The agency therefore has decided to incorporate by reference the 1980 version of ANS Z26 in Standard No. 205.

Bullet-Resistant Shields

In the July 29, 1982, notice, NHTSA also proposed to amend Standard No. 205 to establish a new item of glazing, "Item 11C." The new item would permit the use of new plastic glazing materials which are lighter and less costly than bullet-resistant glass used on steel-armored vehicles. Use of these lighter glazing materials should increase fuel economy by reducing vehicle weight.

Most commenters favored the use of the new bullet-resistant shields, which would be mounted behind glazing material that also must comply with Standard No. 205. Several manufacturers of armored vehicles and armored-vehicle equipment, however, expressed doubts about the safety, durability, and adequacy of plastic bullet-resistant shields. Those comments are discussed below.

Head Impact

One of the purposes of Standard No. 205 is to reduce glazing-related injuries in motor-vehicle crashes. No commenter specifically addressed the possibility of injuries due to the increased use of bullet-resistant shields made of the new glazing materials. The agency recognizes that bullet-resistant shields are thicker and more rigid than ordinary safety glazing and may cause injury during a crash. However, the same possibility exists for other items of bullet-resistant glazing materials, such as currently used item AS-10 glazing materials.

The agency estimates that the overall effect on occupant injuries due to the use of bullet-resistant shields is minor, since no more than several hundred vehicles per year will be so equipped and the probability of a crash leading to severe injuries is small. The agency also believes that specially armored vehicles are operated by trained drivers who, because of the possibility of having to do sudden high-speed maneuvers, will wear seatbelts while driving. The agency concludes that permitting the use of new bullet-resistant glazing materials represents a reasonable compromise between crash safety and protection from armed attack.

Shield Retention

Several commenters said that bullet-resistant shields are potentially unsafe because the attachment could loosen due to the shock and vibration caused by high-speed maneuvering or could be shot off. Brinks, however, reported that it had not experienced any shock or vibration problem with the bullet-resistant shields it has used.

The agency agrees that the shield attachment must be designed to accommodate shock or vibration. These problems are no different from the problem of designing attachments for other items of automotive glazing for use as windshields or side windows, for example. In the absence of field data showing that there is an actual problem, the agency does not see a need to specify attachment requirements at this time.

Ballistic Adequacy

Goodyear Aerospace expressed concern that the public might be misled as to the ballistic adequacy of the plastic shields. The agency recognizes that there are limitations to the bullet-resistance of any type of glazing. However, all bullet-resistant glazing must meet at least one of the four types of bullet-resistance requirements set forth in Test No. 27 of ANS Z26. Standard No. 205 requires bullet-resistant glazing to be marked to indicate the degree of ballistic protection provided by that particular glazing material. The markings will adequately convey the necessary information to the purchaser, who must then determine whether the shield meets his protection needs.

Light Degradation

Moore and Sons commented that polycarbonate plastics degrade when exposed to ultraviolet radiation. It said that these materials lose their bullet-resisting capability as the plastic continues to be exposed. GE furnished data that illustrated that certain older types of polycarbonates are sensitive to ultraviolet light. However, data gathered on newer, improved versions of polycarbonates, which are coated and ultraviolet-light-stabilized, show substantial resistance to this effect. Purolator, which operates a fleet of armored vehicles, said that its field experience has not found ultraviolet light to cause a problem for the newer polycarbonates.

To insure the ultraviolet-light-resistant performance of bullet-resistant glazing, the agency is adopting in the final rule a requirement that such glazing pass a light-stability test (Test No. 30). Test No. 30 provides an ultraviolet-radiation exposure similar to the light-stability test specified for other glazing materials for use in locations requisite for driving visibility, such as windshields.

Chemical Durability

Moore and Sons also expressed concern that plastic materials could be damaged by ordinary chemicals used in cleaning vehicle interiors. However, Saint-Gobain Vitrage, a manufacturer of automotive glazing, reported that bullet-resistant laminates such as polycarbonates have proved durable after extensive use. GE said that for over 10 years, special U.S. Government vehicles and vehicles designed for use in foreign countries have been equipped with bullet-resistant plastic glazing materials without any reported optical degradation. Based on this information, the agency has concluded that with normal use, plastic ballistic shields meeting the chemical resistance tests set in the final rule should have adequate chemical durability.

In addition, to minimize durability and optical-clarity problems, the agency is requiring manufacturers to provide cleaning instructions on a label on the glazing materials. The instructions will inform owners of the proper choice of cleaning materials and procedure for both cleaning and frost and ice removal. The agency believes that the labels will be adequate to avoid cleaning problems with ballistic shields.

Defogging Problems

Moore and Sons also raised questions about whether the close proximity of the bullet-resistant shield to the vehicle's windshield may cause inadequate defogging and defrosting. Goodyear and GE commented that the defogging or defrosting of the windshield should not be compromised if an air space is maintained between the windshield and the ballistic shield. Since the final rule requires ballistic shields to be installed behind and separate from other glazing materials, the agency does not expect there to be defogging or defrosting problems. Likewise, the final rule requires the ballistic shield to be readily removable, thus making it easy to clean the inside of the windshield and other windows of the vehicles.

Double Vision

Goodyear said that the ballistic shield, because it is mounted behind the windshield, may cause multiple-image problems during nighttime driving. This could occur whenever bright sources of lights, such as headlights, are viewed at an angle through the two separated pieces of glazing. The agency recognizes that the separated glazing materials can cause reflections under certain conditions, leading to an illusion of double vision. The secondary images, however, should be faint, because only a small amount of incoming light is reflected from the surface of a transparent glazing material. As previously mentioned, GE has reported that plastic ballistic shields have been in use for 10 years without any reported optical problems. The agency therefore has concluded that the multiple-image problem, if any, should be minor.

Effective Date

Although the effective date was proposed as 3 months after publication of the final rule, the agency has determined that this delay is not necessary. The portions of the final rule adopting the 1980 version of ANS Z26 will not require glazing-test laboratories to purchase additional test equipment nor require additional training in new test protocols. Since the provision on ballistic shields does not require the use of such glazing, but instead gives the manufacturer the option of using the new glazing, having an immediate date will not impose any burdens on manufacturers. The agency has determined that it is in the public interest to make the new bullet-resistant glazing materials immediately available and therefore has set an immediate effective date for the amendments made by this notice.

Marking

The final rule requires prime glazing-material manufacturers to mark the new bullet-resistant glazing material as "AS 11C" materials. In addition, this rule requires manufacturers of the glass-plastic glazing material permitted by the agency on November 16, 1983 (48 FR 52061) to mark those materials as "AS 14" materials. This marking will help insure that the materials are used in the appropriate locations in motor vehicles.

Costs

The agency has evaluated the economic and other effects of this final rule and determined that they are neither major as defined by Executive Order 12291 nor significant as defined by the Department's Regulatory Policies and Procedures. The agency has determined that the economic effects of this final rule are so minimal that a full regulatory evaluation is not required.

The adoption of the 1980 version of ANS Z26 is likely to reduce costs through the elimination of unnecessary tests. The new bullet-resistant glazing materials permitted by this rule will initially be more costly than conventional bullet-resistant glass. However, the final rule does not mandate the use of the new bullet-resistant shields; it merely gives manufacturers the option of using the new materials. Those materials will only be used on a very limited number of vehicles per year. In addition, although the new materials may initially be more costly, the cost may be offset by reduced vehicle weight and increased fuel economy.

In accordance with the Regulatory Flexibility Act, the agency has evaluated the effects of this action on small entities. As previously discussed, this rule does not mandate the use of the new materials; it permits their use. The rule may assist small businesses by providing ballistic protection to their employees at a lower overall cost. Based on the agency's evaluation, I certify that the final rule will not have a significant economic effect on a substantial number of small entities.

Finally, the agency has analyzed the effects of this action under the National Environmental Policy Act. The agency has determined that the final rule will not have a significant effect on the quality of the human environment.

The information-collection requirements contained in this rule have been submitted to and approved by the the Office of Management and Budget (OMB), pursuant to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). Those requirements have been approved through September 30, 1985 (OMB #2127-0512).

In consideration of the foregoing, Part 571.205, *Glazing materials*, of Title 49 of the Code of Federal Regulations is amended as follows:

1. Section S4 is amended by adding a new definition to read as follows:

"Bullet-resistant shield" means a shield or barrier that is installed completely inside a motor vehicle behind and separate from glazing materials that independently comply with the requirements of this standard.

2. Paragraph S5.1.1 is revised to read as follows:

S5.1.1 Glazing materials for use in motor vehicles, except as otherwise provided in this standard, shall conform to the American National Standard "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways" Z-26.1-1977, January 26, 1977, as supplemented by Z26.1a, July 3, 1980 (hereinafter referred to as "ANS Z26"). However, Item 11B glazing as specified in that standard may not be used in motor vehicles at levels requisite for driving visibility, and Item 11B glazing is not required to pass Test Nos. 17, 30, and 31.

3. Paragraph S5.1.2 is revised to read as follows:

S5.1.2 In addition to the glazing materials specified in ANS Z26, materials conforming to S5.1.2.1, S5.1.2.2., S5.1.2.3., or S5.1.2.4 may be used in the locations of motor vehicles specified in those sections.

4. Paragraph S5.1.2.1 is amended to read as follows:

S5.1.2.1 *Item 11C—Safety Glazing Material for Use in Bullet-Resistant Shields.* Bullet-resistant glazing that complies with Test Nos. 2, 17, 19, 20, 21, 24, 27, 28, 29, 30, and 32 of ANS Z26 and the labeling requirements of S5.1.2.5 may be only in bullet-resistant shields that can be removed from the motor vehicle easily for cleaning and maintenance. A bullet-resistant shield may be used in areas requisite for driving visibility only if the combined parallel luminous transmittance with perpendicular incidence through both the shield and the permanent vehicle glazing is at least 60 percent.

5. Paragraph S5.1.2.2 is amended to read as follows:

S5.1.2.2 *Item 12—Rigid Plastics.* Safety-plastic materials that comply with Test Nos. 10, 13, 16, 19, 20, 21, and 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5, may be used in a motor vehicle only in the following specified locations at levels not requisite for driving visibility.

(a) Windows and doors in slide-in campers and pickup covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield and windows to the immediate right or left of the driver.

(h) Windows and doors in buses, except for the windshield and window to the immediate right and left of the driver.

6. Paragraph S5.1.2.3 is amended to read as follows:

S5.1.2.3. *Item 13—Flexible plastics.* Safety-plastic materials that comply with Tests Nos. 16, 19, 20, 22, and 23 or 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5 may be used in the following specific locations at levels not requisite for driving visibility.

(a) Windows, except forward-facing windows, and doors in slide-in campers and pick-up covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

7. A new paragraph S5.1.2.4 is added to read as follows:

S5.1.2.4 *Item 14—Glass-Plastics.* Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.5 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in (a), (b), (c), and (d) of this paragraph, may be used anywhere in a motor vehicle, except that they may not be used in convertibles, in vehicles that have no roof, or in vehicles whose roofs are completely removable.

(a) Test Nos. 9, 16, and 18 shall be conducted on the glass side of the specimen, i.e, the surface which would face the exterior of the vehicle. Test Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For Test No. 19, add the following chemical to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10 percent or less than 5 percent by weight and ammonium hydroxide no greater than 5 percent or less than 1 percent by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of $-40°C(+5°)$ $(-40°F+9°)$ for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentage of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

8. A new paragraph S5.1.2.5 is amended to read as follows:

S5.1.2.5 *Cleaning instructions.* (a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3, or S5.1.2.4 shall affix a label, removable by hand without tools, to each item of such glazing material. The label shall identify the product involved, specify instructions and agents for cleaning the material that will minimize the loss of transparency, and instructions for removing frost and ice, and at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manfacturer of glazing materials designed to meet the requirements of paragraph S5.1.2.4 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than $\frac{3}{16}$ inch nor more than $\frac{1}{4}$ inch high, the following words, "GLASS-PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS."

9. The second sentence of the paragraph S6.1 is amended to read as follows:

The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3, and S5.1.2.4 shall be identified by the marks "AS 11C," "AS 12," "AS13," and "AS 14," respectively.

Issued on Feb. 14, 1984.

Diane K. Steed
Administrator

49 FR 6732
February 23, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 89-18; Notice 3)
RIN: 2127-AC 14

ACTION: Final rule.

SUMMARY: This notice makes final an amendment to Federal Motor Vehicle Safety Standard (FMVSS) No. 205, Glazing Materials, specifying specimen clamping of Item 14 glass-plastic glazing (glazing with one or more layers of glazing and a layer of plastic on the surface facing the vehicle interior) for Test 26. In Test 26, a 5-pound ball is dropped onto specimens of glazing to determine whether the glazing material has satisfactory penetration resistance. No clamping is specified for conducting Test 26 on Item 1 glazing. Item 1 glazing is similar to Item 14 glazing, except the former has no plastic layer on the inside surface. This notice does not adopt the proposal in the notice of proposed rulemaking to specify clamping of Item 14 glazing in two other drop tests, Test 9 (that determines the behavior of the safety glazing under impact from a small, hard object) and Test 12 (that determines whether the safety glazing has a certain minimum strength and is properly made). The agency also is not adopting a proposal to prohibit the installation of strengthened glass-plastic glazing in windshields and other locations requisite for driving visibility.

EFFECTIVE DATE: The amendments in this rule are effective September 23, 1991.

SUPPLEMENTARY INFORMATION:

I. Background

FMVSS No. 205 specifies requirements for glazing materials for use in motor vehicles and motor vehicle equipment. The standard incorporates by reference, American National Standard (ANSI) Z26.1, "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," as amended through 1980 (Z26). FMVSS No. 205 provides performance specifications for 14 types (known as "items") of safety glazing materials and the locations in which they may be installed in motor vehicles. To ensure compliance, specimens of each item of glazing material are subjected to a selected group of tests, as appropriate for the general use of the material.

The agency first allowed use of glass-plastic safety glazing in 1983, when Item 14 glazing was added to FMVSS No. 205. NHTSA amended FMVSS No. 205 to permit the use of Item 14 glass-plastic glazing in all glazing areas, including the windshield, because the glazing had the ability to reduce the risk of lacerative injuries in crashes. (See 48 FR 52061, November 16, 1983.) This item consists of glass on the outside surface and plastic on the inside surface. In adding Item 14, the agency anticipated that this type of glazing would consist of laminated glass to which a plastic layer was added on the inside surface. However, it is possible to manufacture the item with or without laminated glass. For example, Item 14 could consist of the current high penetration resistant (HPR) three-ply glazing to which one or more layers of plastic have been added to create a windshield of four or more plies or it may simply consist of a single sheet of glass to which a layer of plastic has been added to the surface (two-ply glazing). The first generation of glass-plastic was found to be costly and when used, was limited to use in windshields.

By letter dated July 24, 1986, General Motors Corporation (GM) stated that the current test procedure for penetration resistance is not an appropriate method for two-ply glass-plastic glazing. Test number 26 (in Z26) consists of dropping a 5-pound steel ball onto a 12 inch by 12 inch glass specimen from a height of 12 feet. The specimen is centered on the top of a 17 3/8 inch square wooden frame with an 11 3/8 inch square opening. A specimen is deemed to have failed if the ball passes "through" it. For traditional three-ply HPR glazing, the nonaligned cracks in the inner and outer layers of glass, resulting from impact with the ball, provide the specimen sufficient rigidity to remain in the test fixture. GM reported that the two-ply specimen, which is more flexible, is pushed through the frame by the ball without being penetrated by it.

Since there is no specific prohibition in FMVSS No. 205 against clamping the specimen during testing, GM requested an interpretation of FMVSS No. 205, to allow restraint of the test sample in the test fixture for Test Number 26. By letter dated May 27, 1987, NHTSA's Office of Chief Counsel responded that the agency could not adopt this change in the test procedure through issuing a letter of interpretation. The agency stated that in order to address the problem and to ensure objectivity, it would be necessary to amend the standard to establish uniform requirements for providing additional support to two-ply glazing materials during the drop test. Accordingly, the GM letter was treated as a petition for rulemaking and the petition was granted.

The agency published a Notice of Proposed Rulemaking (NPRM) on October 11, 1989 (54 FR 41636). The NPRM proposed amending FMVSS 205 by specifying specimen clamping of Item 14 glass-plastic glazing for Test 26. Additionally, the notice requested comments on the advisability of extending the clamping procedure to two other drop tests, Test 9 and Test 12. All three of these tests, 26, 9, and 12, are usually performed on laminated glazing, including laminated glass-plastic glazing (Item 14). Test 9 is a drop test in which a 7-ounce round-nosed dart is dropped from 30 feet. This test measures the resistance to impact by a small hard object. Test 12 involves the dropping of an 8-ounce steel ball from a height of 30 feet to determine whether the safety glazing has a certain minimum strength and is made properly. In order to pass Test 12, the ball must not pass through the specimen. Further, "at the point immediately opposite the point of impact, small fragments of glass may leave the specimen, but the small area thus affected shall expose less than 1 square inch of reinforcing or strengthening material, the surface of which shall always be well covered with tiny particles of tightly adhering glass." In addition, the glass may not delaminate from the plastic.

In the NPRM, the agency also proposed prohibiting laminated glass that is "strengthened by any method" from being used in "glass-plastic glazing in any windshield or other location requisite for driving visibility." This restriction was motivated by the agency's concern that the glass remaining adhered to the plastic would obscure visibility. Glass "strengthened by any method," when broken, tends to break up into cubes. When the strengthened glass layer of laminated glazing breaks, the glass often remains adhered to the plastic layer, thus obscuring the view through the glazing.

II. Public Comments to the NPRM

Following its publication of the NPRM, the agency received comments from PPG, Chrysler Motors Corporation, Flachglas AG, Ford Motor Company, General Motors (GM), Motor Vehicle Manufacturers of America (MVMA), the Insurance Institute for Highway Safety (IIHS), Monsanto, and the Flat Glass Association of Japan (FGAJ). The following is a summary of the issues, the principal comments, and the agency's analysis of the issues and comments.

A. Clamping Specimens for Test 26

Numerous issues were addressed in the NPRM concerning this proposed amendment to the test procedure. The most critical were: Should the glazing be clamped? Would clamping either add to or detract from the safety of laminated glazing? Should the clamping be an option? Are there any cost and weight benefits to two-ply glazing? These issues were discussed extensively in the preamble to the NPRM.

Most commenters concurred in general with the agency proposal to specify clamping of test specimens of glass-plastic glazing. However, GM opposed making the test procedure a requirement for glass-plastic glazing. GM stated that clamping increases the stringency of the penetration test beyond a necessary level. GM recommended clamping be an option to be used when necessary to retain the specimen in the test fixture.

For the following reasons, the agency has decided to amend FMVSS No. 205 to specify the clamping of glass-plastic specimens each time the agency conducts Test 26 on Item 14 glazing. Most practical designs of windshield glazing will easily pass the drop test while unclamped. Since two-ply glazing lacks the inherent rigidity of three-ply HPR glazing, the penetration resistance of the two-ply glazing is dependent upon the combined contribution of the glass and plastic layers. However. the plastic layer of a test specimen of two-ply glass/plastic glazing can make its contribution only if the specimen is clamped. When a specimen of that glazing is held rigid by means of clamping, the force of the falling ball is concentrated at the point of impact, and tests the impact resistance of not only the glass layer but also the plastic layer. If the specimen is unclamped, the ball will simply break the glass, flex the plastic, and push it through the test frame. A decision not to specify clamping would have the undesirable effect of allowing and possibly even encouraging manufacturers to increase the penetration resistance of two-ply glass/plastic glazing by increasing the thickness of the glass layer. A thicker layer of glass in glass-plastic glazing would create safety problems because the thicker glass would tend to increase the forces to which an occupant's head or other body part is subject in a crash before the glass breaks, and therefore would increase the potential for injuries. In addition, GM stated that thicker glazing "can add significantly to the weight of a door which would influence the door mounting system design, overall vehicle mass, and fuel economy."

The agency notes that clamping specimens for the purpose of conducting Test 26 will be done only with Item 14 glass-plastic material. Instead of using Item 14 glazing, manufacturers will be able to use Item 1 glazing also, which has the rigidity and penetration resistance necessary to meet Test 26 without being clamped.

B. Clamping for Tests 9 and 12

Clamping for Tests 9 and 12 was proposed in the NPRM because the agency was concerned that clamping may be necessary to properly conduct these tests for glass-plastic two-ply specimens. However, due to the lack of industry experience with two-ply material, this need may not have been evident to industry and commenters when it was raised by this agency in the NPRM.

At the same time, the agency was concerned that since different types of glazing are defined by their ability to pass specific performance tests, specifying clamping during these two drop tests for windshield glass-plastic might inadvertently make it possible for manufacturers to qualify, for use as certain types of glazing, materials that may have some unforeseen adverse effect on occupant safety. For example, clamping might make it possible for tempered glass-plastic windshields to pass Tests 9 and 12. In order to get a better idea of the advantages and disadvantages of clamping for Tests 9 and 12, the agency proposed clamping all glass-plastic specimens for these two tests, in addition to clamping Test 26, and asked two questions concerning this proposal. The first question, identified in the NPRM as Question 1, was: "Is clamping of the test specimens in Test 9 and/or 12 necessary?" The second question, identified in the NPRM as Question 2, asked: "What would be the effect on the specimen design if Tests 9 and/or 12 required clamping?"

PPG, Flachglas, Libbey-Owens-Ford (LOF), and the Flat Glass Association of Japan (FGAJ) stated clamping was not necessary to conduct Test 9 and Test 12. Flachglas stated that the upper frame of the proposed ECE-type test fixture would be sufficient to hold specimens for Tests 9 and 12. Ford and the MVMA, on the other hand, supported the proposal to clamp specimens for the purpose of conducting Test 9 and Test 12. Ford indicated that they experienced a problem with complying with Tests 9 and 12. Ford stated that when conducting Tests 9 and 12, it had "on occasion" experienced cases of developmental two-ply glass-plastic specimens falling through the test frame when unclamped. The MVMA urged clamping of glass-plastic in Tests 9 and 12 to eliminate any need to amend this standard at a later time. Chrysler suggested clamping of Tests 9 and 12 be optional, "where needed to ensure that the specimen does not move in these tests." GM recommended that the agency "review comments from the glazing manufacturers who are more qualified to comment on the need for clamping for these tests." Monsanto stated that more data were needed to answer the issues raised in clamping Tests 9 and 12.

In issuing the NPRM, the agency was concerned that clamping may be necessary for Tests 9 and 12 on glass-plastic two-ply specimens. However, it was also concerned that specifying clamping in these two remaining drop tests may have the unintended effect of modifying the performance requirements of the glazing, thus allowing use of materials such as tempered glass that may result in glazing designs that would create obscured vision when broken. Although the agency's concerns about the unintended effects of specifying clamping were not confirmed by the public comments, NHTSA has decided not to adopt the clamping procedure for Tests 9 and 12 in this final rule. Its review of the public comments on these issues failed to yield any data that would strongly support the necessity for clamping either Test 9 or 12. Ford neither specified the frequency of its problems nor provided information that would explain why the material tested by Ford, but not the material tested by other manufacturers, was forced through the test frame. Further, the original petitioner, General Motors, did not request clamping for Tests 9 and 12. For all of these reasons, amending these tests is not warranted at this time. The agency seeks more specific information about the types of glazing that may have trouble passing Tests 9 and 12.

C. Prohibition of Strengthened Glass-Plastic Glazing

In the NPRM, the agency proposed to prohibit glass "that is strengthened by any method" from being used in "glass-plastic glazing in any windshield or other location requisite for driving visibility." This prohibition was proposed to prevent inadvertently allowing the inclusion of tempered glass-plastic in areas requisite for driving visibility as a result of the modification of the test procedures and therefore a modification of the performance requirements. In the NPRM, the agency expressed concern that a tempered glass-plastic windshield, when broken, would instantly obscure driver vision.

To focus comments on this issue, the NPRM raised two questions. The first question was posed in the NPRM as Question 3: "Would modifying Test 26 inadvertently permit use of tempered glass-plastic in windshields?" The second question, posed as Question 4 asked: "What are the advantages or disadvantages of tempered glass-plastic in windshields, or the side and rear windows?"

Most of the commenters were opposed to the prohibition in some form or another. The commenters on this issue included PPG, Chrysler, Ford, Flachglas, GM, MVMA, IIHS, Monsanto, and FGAJ. In general, the public comments made a distinction between allowing tempered glass-plastic glazing in windshields and allowing such glazing in all other glazing locations requisite for driving visibility. PPG recommended against using "tempered components in glass-plastic glazing for use in windshields," but stated that restrictions in other glazing areas "will severely limit forseeable and needed design trends in the automotive industry." They stated that prohibition would result in numerous problems, among which were: costly body redesign to compensate for loss of strength; shape and mounting restrictions; hindrance of innovative design prohibition of most current processing techniques; and a higher breakage rate for annealed glass. PPG stated that broken side and rear glass would not obscure vision necessary for bringing a vehicle to a safe stop. Finally, PPG stated that the definition of "strengthened by any method" would eliminate the use of even annealed glass as well as tempered glass in glass-plastic glazing. PPG's point apparently is that as glass is formed into sheets, it undergoes final processing in one of two ways. It is either reheated and cooled slowly, creating "annealed glass," or is toughened thermally or chemically, creating "tempered glass." Because the process by which annealed glass is created strengthens the glass, PPG believes the term "strengthened by any method" would encompass the annealing process. PPG said that the "forming process used in the manufacturing of annealed glass does impart some residual stresses, particularly near the edges of the glazing."

Chrysler opposed the prohibition against strengthened glass-plastic in the windshield or other locations requisite for driving visibility. Chrysler pointed out that for many years they used strengthening around the periphery of the windshield to minimize breakage.

Ford was more specific as to the reasons for its opposition, stating that the prohibition would prohibit the current processing of the peripheral region of windshields to reduce breakage. This is apparently because processing of the edges of the glazing is "strengthening" the edge, a practice that was proposed to be prohibited in the NPRM. They further stated that the tempered glass-plastic prohibition would discourage development of new techniques for strengthening. Ford asserted that broken tempered glass-plastic does not curtail visibility. Ford also stated that annealed glass-plastic is undesirable since severe lacerations would result when the plastic was penetrated. Ford stated that annealed glass has only 25 percent the strength of tempered glass, and that since it is more likely to break, it is more likely to cut. Ford stated that annealed glass would have to be about four times thicker (approaching ½ an inch) and four times heavier than tempered glass to be as strong.

GM opposed the proposed prohibition against the use of tempered glass-plastic glazing in non-windshield locations requisite for driving visibility. All its comments on the benefits of tempered glass-plastic glazing were limited to areas other than the windshield. GM stated that tempered glass would have a higher strength-to-weight ratio, lower frequency of laceration and greater consumer satisfaction. As for the agency's concern with tempered glass-plastic glazing that vision can be influenced when diced pieces of shattered tempered glass would remain laminated to the plastic and would obscure vision, GM asserted that broken glass is not common. Additionally, GM stated that the window could be rolled down, could still be seen through, and would be no worse than trash bags, cardboard, or duct tape. GM asserted that by prohibiting tempered glass, the only remaining material authorized for use in motor vehicles is untempered, annealed glass. Using annealed glass rather than tempered glass would necessitate using a thicker glass to attain the same amount of strength as tempered glass, which can add significantly to the weight of a door and would influence the door mounting system, overall vehicle mass, and would reduce fuel economy.

The MVMA opposed the prohibition of tempered glass-plastic glazing, not making a distinction between the windshield and other glazing areas. It raised concerns expressed by other commenters such as the fact that current windshields use compressive stresses on the periphery, the prohibition would preclude future designs, annealed glass is not strong enough and would require new mounting for movable windows, tempered glass would outperform annealed laminated glass, with reduced replacement costs, and that visibility would not be impaired.

The IIHS favored the prohibition of tempered glass-plastic for windshields. But for side glazing, it suggested that NHTSA continue to collect data. They suggested tempered glass-plastic on side windows would not be as subject to breakage, and that the visibility concerns immediately after the breakage would not be so critical as in the case with windshields. IIHS stated that tempered and annealed side glass-plastic would reduce lacerations and contribute to containing occupants in side impacts and rollover crashes.

Monsanto opposed the prohibition of strengthened glass-plastic in areas requisite for driving visibility.

The FGAJ said that in the windshield, visibility could possibly be blocked and ejection mitigation would not be as effective with tempered two-ply. But for side and rear glazing, FGAJ stated that ejection mitigation and laceration protection would be greater than with the current single layer of tempered glass. They stated the only disadvantage would be loss of visibility, but not to the degree that it would hinder driving. FGAJ also discussed performance tests that would result in being able to disinguish between tempered and non-tempered glass/plastic glazing. They tried a fragmentation test, a dart impact test, a strength test and an internal stress test. FGAJ concluded that none of these methods would provide a practical test procedure.

The agency believes the arguments provided by commenters for continuing to allow tempered (or strengthened) glass-plastic in side and rear glazing are compelling. The prohibition against tempered glass-plastic glazing would restrict processes that are used in manufacturing windshields today. Further, a broad prohibition against strengthened glazing may prohibit current windshield strengthening techniques for annealed laminated glazing. This would have an adverse effect on glass technology, automotive safety, and cost benefits for consumers.

The agency has reconsidered the former position that use of tempered glass in laminated glass-plastic glazing could seriously compromise visibility through broken side and rear glass-plastic glazing. It is now believed that safety concerns over the potential for the heavier and thicker non-tempered glazing to cause injuries in crashes outweigh concerns over the potential for crashes as a result of lessened visibility through broken side and rear glazing. The extent to which visibility would be compromised by broken side and rear glazing is still unknown. Saint Gobain Vitrage, in its comments to the concurrent glazing docket concerning creation of Item 15 and Item 16 glazing (54 FR 41632, October 11, 1989) reported that as much as 99 percent of broken side glass was attributable to burglary while the vehicles were stationary. Saint Gobain Vitrage gathered this information through informal contacts with insurance companies. Breaking of side and rear glazing during a burglary attempt does not create a sudden visibility hazard for the driver of a moving vehicle.

While the agency continues to be concerned about the possibility that a broken tempered glass windshield could create a significant visibility hazard, it recognizes that a broken tempered glass-plastic windshield would not cause a complete loss of visibility. Examination of broken tempered glass-plastic reveals partial visibility. We believe that this partial visibility would be sufficient in most cases to bring the vehicle to a safe stop.

Further, the agency has been unable to identify an objective test procedure that would distinguish tempered from nontempered glass and not prohibit strengthening methods that are currently in use in motor vehicle windshields. This means that there is no practical means of enforcing the prohibition against tempered glass-plastic. Even if the agency wished to take the approach of measuring the amount of visibility obscured by the broken glass, the agency knows of no test procedure to measure the amount of visibility that would be lost through broken glass.

For these reasons, in this final rule, the agency is not adopting the prohibition against use of glass that is "strengthened by any method" from being used in glass-plastic glazing "in any windshield or other location requisite for driving visibility."

D. Test Fixture

In the NPRM, the agency proposed adopting a different test fixture for holding and clamping glass-plastic test specimens than the one currently specified for Test 26. The proposed fixture was an adaptation of the test fixture used in the Economic Commission of Europe (ECE) glazing regulation R43. The agency proposed using the ECE R43 test fixture because it would partially harmonize FMVSS No. 205 with ECE R43. In addition, it would not necessitate the extensive fixture redesign and testing modification by testing laboratories or concerns that would be necessary with the FMVSS No. 205 wooden test fixture. The agency asked for comments concerning the objectivity of the proposed test device.

All commenters supported using the proposed test fixture, and were quite receptive to the idea of the agency specifying the use of the proposed test fixture, which would harmonize with the ECE R43 test fixture. The proposed test fixture was reported to be appropriate for the glass-plastic drop test fixture, using clamped specimens. Therefore, the agency adopts in the final rule, the proposed ECE R43 test fixture illustrated in Figure I of the NPRM.

E. Use the Proposed ECE Test Fixture for All Drop Tests

Although not proposed by the agency in the NPRM, Flachglas recommended using the proposed test fixture for all drop tests, not just the clamped glass-plastic drop test (Test 26). The additional tests that would be affected by this proposal would be the nine tests used to verify specific characteristics for tempered glass, Tests 6, 7, 8, 9, 10, 11, 12, 13, and 14. Flachglas did not suggest clamping for these additional tests, only that this single fixture should be used for each test. These drop tests are used for other materials such as tempered glass or rigid plastic, and apply other performance criteria to these glazings.

The agency is not adopting the ECE test fixture for all drop tests. The agency did not propose or discuss such an amendment in the NPRM. Consequently, there has been no opportunity for affected parties to comment on the use of the single fixture. Additionally, Flachglas did not cite a specific safety need to use the ECE test fixture for all drop tests, and the agency is unaware of any such need.

F. Effective Date

In the NPRM, the agency proposed the clamping test procedure amendment be effective immediately. The agency's position was that because this amendment appeared to be a clarification of the test procedure, and would not entail any redesign of materials, the rule should be effective immediately.

PPG suggested the effective date of this rulemaking be delayed at least 90 days from the publication of the final rule. They argued that this would permit companies that did not currently have this test fixture to obtain the fixture and make any changes. They also pointed out that the ECE fixture does not have specific provisions for a clamping technique; the clamping procedure will have to be developed.

The agency concurs with the PPG comment. The agency is not aware of any manufacturer that is currently using glass-plastic glazing as original equipment, nor is there any indication that glass-plastic will be used in the near future. However, the agency wishes to encourage manufacturers to use glass-plastic and believes removing test barriers for two-ply glass-plastic may encourage its use. Therefore, the agency has decided that the clamping procedure and test fixture will be effective 180 days after publication of this final rule. After the effective date, the agency will clamp the test specimens of glazing each time the agency conducts Test 26 on Item 14 glazing.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 205, *Glazing materials* (49 CFR 571.205), is amended to read as follows:

The introductory text to existing paragraph S5.1.2.4 is revised to read as follows:

S5.1.2.4 *Item 14—Glass Plastics.* Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.5 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in (a), (b), (c), (d), and (e) of this paragraph, may be used anywhere in a motor vehicle. except that it may not be used in convertibles, in vehicles that have no roof or in vehicles whose roofs are completely removable.

Paragraph (e) is added after paragraph (d) of S5.1.2.4 as follows:

(e) The glass-plastic glazing specimen tested in accordance with Test No. 26 shall be clamped in the test fixture in Figure 1 of this standard in the manner shown in that figure. The clamping gasket shall be made of rubber 3 millimeters (mm) th1ck of hardness 50 IRHD (International Rubber Hardness Degrees), plus or minus five degrees. Movement of the test specimen, measured after the test, shall not exceed 2 mm at any point along the inside periphery of the fixture. Movement of the test specimen beyond the 2 mm limit shall be considered an incomplete test, not a test failure. A specimen used in such an incomplete test shall not be retested.

Figure 1 is added at the end of Federal Motor Vehicle Safety Standard No. 205.

Issued on: March 20, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 12464
March 26, 1991

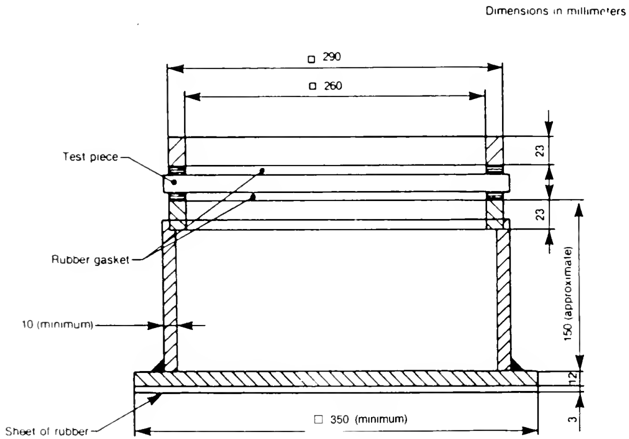

Figure 1—Test Fixture for Clamped Specimens

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 89-18; Notice 4)
RIN: 2127-AC38

ACTION: Final rule.

SUMMARY: This rule amends Standard No. 205, *Glazing Materials*, to permit three new items of glass-plastic glazing. Item 15A, annealed glass-plastic glazing, is permitted to be used anywhere in a motor vehicle except the windshield. Item 16A, annealed glass-plastic glazing, and Item 16B, tempered glass-plastic glazing, may be used in areas not requisite for driving visibility. The agency believes that the addition of these three new types of glazing to Standard No. 205 will facilitate use of glass-plastic glazing in all glazing locations in a motor vehicle. The agency encourages greater use of glass-plastic glazing because of its proven injury-reduction capabilities in crashes. This notice also makes certain technical changes to Standard No. 205.

A supplementary notice of proposed rulemaking (SNPRM) to amend Standard No. 205, published elsewhere in today's edition of the *Federal Register*, proposes to permit a new Item 15B, Tempered glass-plastic glazing, for all areas requisite for driving visibility except the windshield. The SNPRM also requests further public comments, especially data, on the question of deleting Test No. 1 for Item 3 glazing.

DATES: The amendments in this rule are effective May 23, 1991.

SUPPLEMENTARY INFORMATION:

I. Background

Federal Motor Vehicle Safety Standard No. 205, *Glazing Materials* (49 CFR 571.205), specifies performance requirements for the types of glazing that may be used in motor vehicles. It also specifies the vehicle locations in which the various types of glazing may be used. The standard incorporates, by reference, American National Standard Institute (ANSI) Standard Z26.1, "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," as amended through 1980 (ANS Z26). The requirements in ANS Z26 are specified in terms of performance tests that the various types or "items" of glazing must pass. There are 14 "items" of glazing for which requirements are currently specified in Standard No. 205.

To ensure the safety performance of vehicle glazing, Standard No. 205 includes a total of 32 specific tests. Each item of glazing is subjected to a selected group of these tests appropriate for that material. It is the particular combination of tests that dictates the requisite properties of a particular item of glazing, and where in a motor vehicle it may be used. For example, three-ply laminated windshield glazing, Item 1, usable anywhere in a vehicle including the windshield, is subjected to nine tests.

Item 14 (glass-plastic glazing) was added to Standard No. 205 by NHTSA in 1983 (48 FR 52061), without limitation as to the location of its use in a motor vehicle. Item 14 glazing was anticipated to be used primarily in vehicle windshields. In adding Item 14, the agency anticipated that this type of glazing would consist of laminated glass to which a plastic layer was added on the inside surface, facing the interior of the vehicle.

Although there are currently no items of glass-plastic glazing allowed only in areas other than the windshield, there are two main types of nonglass-plastic glazing allowed for use in these areas. Item 2 glazing may be used anywhere in a motor vehicle except windshields. The windows to the left and right of the driver in all vehicles and rearward windows in passenger cars can be made of Item 2 glazing. Item 3 glazing may be used anywhere in a motor vehicle except windshields and other areas requisite for driving visibility. Item 3 is used as side-facing rearward windows of light trucks, vans, and multipurpose passenger vehicles and also for sun roofs and T-tops. Both items 2 and 3 may be manufactured in one of four types of construction: laminated glass, tempered glass, and 2 classes of multiple glazing units. The primary difference between Item 2 and Item 3 glazing is that Item 3 is not subject to any luminous transmittance requirements.

The agency granted a petition from the Taliq Corporation (petitioner) requesting that the agency amend Standard No. 205 by creating a category of glass-plastic glazing without the visibility requirements or the stringent anti-penetration requirements applicable to Item 14. In the notice of proposed rulemaking (54 FR 41632, October 11, 1989) that was subsequently issued, the agency proposed to permit three new items of glass-plastic glazing. The new glass-plastic designated as Item 15, annealed glass-plastic, would meet the same requirements as Item 2, with the addition of requirements applicable to plastics. The agency proposed that the new Item 15 be permitted for use in the locations specified for Item 2, that is, in all locations except for the windshield. The agency did not propose a tempered version of Item 15, because of its concern about potential visibility problems when the glass is shattered. Public comment was solicited on whether the agency should allow tempered glass to be used in glass-plastic glazing in areas requisite for driving visibility. In particular, comment was sought on whether the extra protection offered by tempered glass in side-impact situations would outweigh visibility impairment created when tempered glass fragments are held in position on the plastic layer, blocking the driver's sideward vision. The agency also sought comment on whether prohibition of tempered glass-plastic glazing would unnecessarily hinder innovation or design flexibility.

The agency also proposed that Items 16A, annealed glass-plastic, and 16B, tempered glass-plastic, be allowed in the locations specified for Item 3, that is, in all locations not requisite for driving visibility. Both annealed and tempered glazing would be allowed for Item 16 since laminated tempered glass-plastic would not present a visibility problem upon breakage in areas not requisite for driving visibility. In the NPRM, the agency described in detail the need for these new items of glazing, emphasizing the agency's hope that greater use of glass-plastic at side and rear locations would result in ejection mitigation and laceration reduction, in the event of crashes.

In the NPRM, the agency further proposed three technical changes to Standard No. 205. First, NHTSA proposed deletion of the Light Stability Test No. 1, for Item 3 glazing. The rationale for the proposal was that since Item 3 glazing is not used in areas which require driving visibility, a visibility test would not provide any increased degree of safety. Next, the agency proposed an amendment to the Fragmentation Test No. 7, to require a maximum length-to-width ratio of 3-to-1 and a maximum length of 2 inches for glass fragments resulting from the test. This proposal was intended to prohibit long, thin pieces of tempered glass from being produced after the shattering of glass. Finally, the agency proposed to clarify the definition of gasoline, as was recently done in Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment.* Gasoline is used in a submersion test in Standard No. 205.

II. Public Comments to the NPRM

Comments were received from PPG Industries, Inc. (PPG), Saint-Gobain Vitrage International (SGV), Ford Motor Company (Ford), General Motors Corporation (GM), Motor Vehicle Manufacturers Association of the United States, Incorporated (MVMA), Chrysler Motors Corporation (Chrysler), the Insurance Institute for Highway Safety (IIHS), Monsanto Chemical Company (Monsanto), Flachglas Aktiengesellschaft (Flachglas), Morton International (Morton), Libbey Owens Ford (LOF), and the Flat Glass Association of Japan (FGAJ). The following summarizes and addresses the comments.

A. Promulgation of Items 15A, 16A, and 16B Glass-Plastic Glazing

None of the commenters opposed the adoption of Item 15, annealed glass plastic glazing.

IIHS, however, had certain reservations about the use of Items 16A and 16B glazing, which NHTSA proposed to permit in all locations not requisite for driving visibility. That organization stated that "(i)f these glazing materials were restricted to areas that are, in fact, not requisite for driving visibility, this proposed change would merit adoption." IIHS expressed concern, however, that under the current NHTSA interpretations, areas to the rear of the driver in multipurpose passenger vehicles, trucks, and buses are not considered requisite for driving visibility. It stated that decreased visibility, such as that found in side and rear windows in multipurpose passenger vehicles, trucks, and buses, may result in safety hazards, including additional collisions during lane changes, backing out of driveways, and other maneuvers that require rearward vision. To support this assertion, it cited a study that it says suggests that inadequate rear visibility in multipurpose passenger vehicles and trucks may already be a factor in many pedestrian-vehicle collisions occurring in driveways and parking lots where children are present. IIHS opposed the adoption of Items 16A and 16B until visibility requirements for side and rear windows of multipurpose passenger vehicles, trucks, and buses are treated the same as passenger cars.

The agency notes that both Items 16A and 16B would be used in lieu of the currently approved Item 3 glazing that is allowed in areas in multipurpose passenger vehicles, trucks, and buses not currently considered requisite for driving visibility. There is no reason to believe that allowing these two glass-plastic alternatives to Item 3 glazing would adversely affect safety, since they have essentially the same characteristics with respect to visibility. However, for some time, the agency has been aware of the discrepancy between visibility requirements for side and rear windows in passenger cars versus multipurpose passenger vehicles, trucks, and buses. The agency intends to address this discrepancy in a forthcoming rulemaking action.

Cautionary comments about glass-plastic glazing in general were made by LOF, GM, MVMA, and Chrysler. LOF recommended that testing be done on some of the new items of glazing as a result of this rulemaking to see if differences will be seen between acceptable and inferior automotive glazing. LOF stated that when it conducted impact tests of annealed side glass covered with a layer of polyester film, the samples produced what it believed were unacceptable jagged pieces of glass covered with plastic. The agency believes that the combination of tests in the ANS Z26 standard to be conducted on the new items of glazing assure that the tested materials would perform similarly to currently approved material. The agency states this because in developing performance specifications for Item 15, annealed glass-plastic, all the current tests for Item 2 glazing plus the applicable tests (Tests 17, 19, and 24) for the plastic side of Item 14 were adopted. In creating performance specifications for Item 16A, annealed glass-plastic, and 16B, tempered glass-plastic, the agency adopted performance tests for Item 3, laminated glazing plus the tests (Tests 19 and 24) from Item 14 that are applicable to the interior (plastic) side of the glazing.

GM, MVMA, and Chrysler supported the agency's desire to improve safety through encouraging greater use of glass-plastic glazing. These commenters expressed concerns, however, that improved abrasion resistance is needed before glass-plastic glazing can be successfully used in side window applications. GM noted that its experience with the "Inner-Shield" windshield indicated that glass-plastic glazing is susceptible to damage, even at a windshield location which would be expected to receive less abrasion or mistreatment than side windows. That company stated that mounting glass-plastic glazing in side windows would certainly increase the likelihood of abrasion problems as compared to the windshield, especially as a result of pets and small children. GM also stated that there is great potential for abrasion from moving side windows up and down, particularly after many cycles when dirt and debris have accumulated on the window and/or the weatherseal, and that side windows may become damaged as a result of cleaning.

NHTSA is concerned that the new items of glazing could become damaged as a result of severe use. Nevertheless, the agency believes that if these new types of glazing are permitted, manufacturers may be encouraged to find more durable materials for the plastic layer. Also, customers may come to understand the utility of the glazing, and learn how to care for it. The agency solicits any information or data that any party may obtain in the future concerning the durability of glass-plastic. The agency also intends to continue monitoring this aspect of glass-plastic glazing performance as this product is reintroduced in the market. If future information indicates that changes in requirements are necessary, the agency will take appropriate action.

Accordingly, this final rule adopts the three new items of glass-plastic glazing that were proposed in the NPRM.

B. Proposal for Item 15B, Tempered Glass-Plastic, in Locations Requisite for Driving Visibility Other than the Windshield

In the NPRM, the agency did not propose to create an item of tempered glass-plastic glazing in areas requisite for driving visibility other than the windshield because it was believed that when shattered, the dicing effect of tempered glass in glass-plastic glazing tends to obstruct vision, since the plastic layer tends to hold the diced pieces in place. This tends to adversely affect safety by limiting visibility when such glazing is used in windows that are requisite for driving visibility. The agency requested comments on this issue. The agency further requested information on methods of distinguishing tempered glass from annealed glass.

Although the commenters did not disagree that the dicing effect that occurs when tempered glass-plastic glazing is shattered would obscure vision, none of the commenters believed that concerns about such possible obscuration would outweigh benefits that would be had from glass-plastic glazing in the rear and side windows. Most of the commenters suggested the creation of an Item 15B, tempered glass-plastic glazing for areas requisite for driving visibility other than the windshield. SGV and Morton expressed the opinion that side breakage is most common during burglary attempts when the motor vehicle is parked, and that driving visibility is not an issue. Ford and GM expressed the opinion that some sideward transparency would still remain in a tempered glass-plastic window even after breakage.

Addressing other safety concerns, SGV stated that for tempered glass-plastic, the dicing effect of the broken glass is beneficial since it helps energy absorption. Only the exposed plastic around the cracks acts as an energy absorber. The plastic still bonded to the glass pieces does not absorb energy. Since, when shattered, tempered glass tends to result in more cracks than annealed glass, there would be less of the plastic that would be bonded to the glass pieces, and it would better help absorb energy than annealed glazing. This is significant since in the event of a head contact, a greater amount of plastic separating from the glass along the crack means more energy has been used in separating the plastic from the glazing, and less energy would be available to be transferred to the head. SGV further stated that the plastic on tempered glass will not tear as readily as plastic does on annealed glass. This is apparently due to the longer continuous sharp glass edges on broken annealed glass.

Regarding other benefits to be had from tempered glass, Ford expressed the opinion that the extra protection against lacerations afforded by the dicing of tempered glass when broken and the greater strength of tempered glass which militates against its breakage in day-to-day use (due to door slamming, wind and hail damage, and vehicle road shocks) outweigh whatever impairment in the driver's sideward vision may be created when tempered glass-plastic glazing is broken. Both SGV and Morton emphasized that tempered glass is more appropriate than annealed glazing because it is stronger. Because annealed glass is more fragile than tempered glass, vehicle designers would be discouraged from using annealed glass-plastic, and would defer to traditional Item 2 monolithic tempered glass. Since annealed glass is weaker than tempered glass, the technical costs (of increased reinforcement) and warranty costs (for more frequent replacement) for annealed glass-plastic would be much higher.

The commenters argued that in crashes, tempered glass-plastic glazing would be safer than annealed glass plastic. As has been discussed above, the issue of visibility in the event of the tempered glass-plastic shattering was discussed in the rulemaking at issue. The discussion is bolstered by the public comments presented in another rulemaking to amend Standard No. 205. This rulemaking amended Test No. 26 of the ANS Z26 standard to specify clamping when Item 14 glass plastic-glazing is tested. (See 56 FR 12669; March 27, 1991.) In the NPRM for the Test No. 26 rulemaking (54 FR 41636, October 11, 1989), the agency proposed to amend Standard No. 205 to prohibit glass "that is strengthened by any method" from being used in "glass-plastic glazing in any windshield or other location requisite for driving visibility." (See 49 FR at 41641.) After reviewing the comments in the Test No. 26 rulemaking, the agency stated that it has reconsidered its former position that use of tempered glass in glass-plastic glazing could seriously compromise visibility through broken side and rear glass-plastic glazing. The agency now believes that the above described benefits that may be derived from use of tempered glass-plastic glazing outweigh concerns over its potential for more crashes as a result of lessened visibility through broken side and rear glazing.

Accordingly, in an SNPRM published in this issue of the *Federal Register*, the agency is proposing the creation of Item 15B, tempered glass-plastic glazing, for all locations that are requisite for driving visibility other than the windshield.

C. Deletion of Test No. 1 for Item 3 Glazing

Test No. 1, Light Stability, in the ANS Z26 standard, which has been incorporated by reference into Standard No. 205, is a measure of visual deterioration of the glazing due to exposure to sunlight and humidity. In the NPRM, the agency proposed deletion of this test for glazing that is used in areas that are not requisite for driving visibility, since it saw no safety need for this test requirement in such areas. The NPRM's discussion of the issue of deleting Test No. 1 was somewhat unclear. First, the wrong title was used for the test. Second, although the preamble discussed deletion of Test No. 1 for only Item 3 glazing, the wording in the proposed revision to the standard proposed deletion of the test for Item 3 and Item 9. However, based on the comments on this proposal, the agency believes its intent was understood by at least some of the commenters.

PPG, Flachglas, LOF, and FGAJ commented on this proposal. PPG and Flachglas concurred with the proposal to delete the test for Item 3 glazing but apparently did not note the wording to delete the test from Item 9. PPG stated that deleting this requirement was consistent with the previous deletion of the abrasion resistance requirements for both Item 3 and Item 9 materials. FGAJ pointed out that the NPRM had inaccurately referred to Test No. 1 as *Luminous Transmittance*. Luminous Transmittance is Test No. 2, and is not required for Items 3 and 9 glazing. Test No. 1 is actually called Light Stability, and as stated above, measures the luminous transmittance before and after the environmental tests.

LOF questioned the proposal to eliminate Test No. 1. It noted that the proposal appeared to presume that the test only monitors the light transmittance of the products. LOF stated that a change in light transmittance can also indicate interlayer deterioration. LOF warned that even though presently used polyvinyl butyral (PVB) undergoes very little, if any decomposition, elimination of this test for laminated or glass-plastic glazing may in the future allow plastics that have inferior weathering characteristics, and thus allow production of glazing products that may have long range safety and reliability problems.

The agency believes that the new issues raised by the commenters on the utility of Test No. 1 for Item 3 may have merit. The agency is also concerned that the discussion in the NPRM on this issue may not have been clear to some commenters. Therefore, in the SNPRM that appears in this issue of the *Federal Register*, the agency is providing another opportunity for public comment on this issue and is specifically asking for test data to document the type of safety problems that may arise by using plastics that would fail Test No. 1.

Test No. 7, Fracture (Fragment Size)

Currently, Fracture Test No. 7 measures the fragment size of tempered glass after it has been broken. Standard No. 205 currently allows fragments weighing up to 0.15 ounce and places no restrictions on the size or shape of the fragment. Having been advised by a truck trailer manufacturer in a 1986 meeting with NHTSA's Office of Enforcement that tempered glass could break into long, thin needles, the agency is concerned that these shapes could result in serious injury to vehicle occupants and others in the event of crashes. The agency stated its belief that glass that breaks into pieces larger than two inches may be poorly tempered, and that proper tempering will routinely produce glazing that breaks as intended in Standard No. 205. In the NPRM, the agency proposed to modify the test requirements to impose a maximum length of 2 inches on these fragments and a maximum length-to-width ratio of 3-to-1.

Most commenters expressed strong disagreement with the proposal. The main point of most of the comments was that the fact that the agency has received reports of unusual shapes of broken tempered glass does not mean that glass was improperly tempered. The unusual shapes may be due, they reported, to the forces involved in the breaking of the glass. Some commenters indicated that properly tempered glazing breaks in a variety of patterns, and in general, large deflections at the location of impact increase the probability of long, thin fragments. LOF stated that tempered glazing behaves differently in car accidents than under laboratory conditions because in accidents the glazing is subjected to severe mechanical stress and/or unusual break point locations that affect the size and shape of the glazing. It asserted that unusual pieces of broken tempered glazing from car accidents do not always indicate that the glass was not properly tempered. LOF also argued that the proposed rule of allowing a maximum length-to-width ratio of 3-1 without a lower size limit would eliminate all tempered automotive glazings, whether tempered or not. It stated that its preliminary testing of both laboratory samples and automotive parts indicates that all tempered glass, when broken, produces small pieces of glass that have a length-to-width ratio greater than 3-to-1.

Some commenters suggested several alternate tests to assess fragmentation. Chrysler suggested using the Economic Commission of Europe's (ECE) Regulation 43. PPG and Ford suggested using the test in the then-pending 1990 version of ANSZ26. LOF suggested the use of other criteria such as a variable maximum fragment size based on the thickness of the glazing. The agency has reviewed these alternatives.

The agency is not certain the ECE R43 Regulation prohibits narrow fragments any more than the current Standard No. 205 test does. To summarize, the ECE R43 Fragmentation Test uses a full-size specimen. The description of the mounting of the glass is rather vague. The impact points vary depending on the shape and type of glazing. The specimen is broken with either a hammer or an object with a similarly shaped point. After fracture, compliance with the test is determined by counting the number of fragments in a given area. ECE R43 states in part, that the test shall be deemed to have given a satisfactory result if "[t]he number of fragments in any 5 cm x 5 cm square is not less than 40 or more than 400, or in the case of glazing not more than 3.5 mm thick, 450." There also may be no fragments more than 7.5 cm (3 inches) long.

The agency is also not certain the 1990 version of ANS Z26 would do more to prohibit narrow fragments. Very briefly, the 1990 ANS Z26 contains a modified version of the 1980 version of the ANS Z26 Fracture test. This 1990 test has similarities to the ECE R43 test. Both the 1990 ANS Z26 and ECE R43 tests use a full-size specimen of glazing. A pointed object may be used to break the glass. The 1990 ANS Z26 has no further restriction on shape or size of the fragments than the 1980 version of ANS Z26.

The agency believes there may be problems with LOF's recommendation. LOF suggested a variable maximum weight based on the glass thickness. When the standard was established for a maximum weight of 0.15 ounces, the tempered glass then used was much thicker, approximately 0.250 inch thick. This is in contrast to tempered glass currently used which is about 0.125 inch thick. This reduction in thickness means that if LOF's recommendation were adopted, fragments of an increased length and width would be permitted, for the same weight.

Based on the commenters' assertion that even properly tempered glazing may not comply with the proposed test, and the absence of conclusive data to support or refute that assertion, the agency cannot conclude that the proposal would be practicable. The agency has therefore decided not to adopt the proposal to restrict length and length-to-width ratios of broken fragments in the final rule. However, the agency is still concerned about the need for a more effective fracture test. The agency will continue evaluating the issue and seeks at some point to propose an objective test procedure with a practicable means of compliance.

Clarification of the Definition of Gasoline Used in FMVSS 205 Testing

The chemical test in Standard No. 205 includes submersion in "gasoline," a term that is not defined. Therefore, in the NPRM the agency proposed adopting the definition of "gasoline" currently used in FMVSS No. 108, that is, American Society for Testing and Materials (ASTM) Reference Fuel C. Reference Fuel C

Fuel C consists of 50]ercent toluene and 50 percent isooctane. The composition is similar to typical 89 octane unleaded gasoline without the hazardous material, benzene.

The only comment on this issue was from Chrysler, which concurred with the proposal. Accordingly, the agency is adopting as final the definition of gasoline as ASTM Reference Fuel C for Standard No. 205.

Miscellaneous Issues Raised by Commenters

The following are additional issues raised by the commenters that have not been addressed in the previous sections. The agency has considered each of these issues and addresses them as follows:

In lieu of the numbering system for the new items of glazing proposed in the NPRM, Ford suggested a different system. It suggested that in addition to current Item 14 glass-plastic (for use anywhere in a vehicle), the agency add Items 14a (tempered glass plastic for use in areas requisite for driving visibility), 14b (proposed Item 15), 14c (proposed Item 16A), and 14d (proposed Item 16B). Ford suggested that it would add to clarity to group all these categories of glass-plastic together.

The agency believes the basic issue in numbering is what system would be least confusing. Numbering is important for importation, and for law enforcement purposes by Federal, state, and local governments. To this end, there has been extensive experience with the current numbering system for glazing, that is, numbering the items by where they are located in the vehicles, not by the type of glazing. The agency proposed separate numbers, such as 15 and 16, in the belief that they would be less confusing than a single number distinguished by an alphabetical suffix indicating the location in vehicles in which an item of glazing may be used. The agency's proposal is consistent with the current numbering practice in which new items of glazing are assigned specific numbers. The numbers that have been assigned to the items of glass-plastic glazing, numbers 14, 15A, 16A, and 16B, correspond to the order of the items of conventional glazing, Items 1, 2, and 3, in that the item of glazing that may be used anywhere in a motor vehicle including the windshield appears first, followed by the glazing that may be used in areas requisite for driving visibility, except the windshield, and last, the glazing that may be used only in areas not requisite for driving visibility. Since in the case of both conventional glazing and glass-plastic glazing, identifier numbers are used, and locations specified for the glazing appear in the same order, the existing system makes it easier to remember where the new items of glass-plastic glazing may be used. For these reasons the agency does not agree that Ford's numbering system would add to clarity, and the agency has decided not to adopt Ford's suggestion.

The FGAJ suggested deletion of the Boil Test, Test No. 4, from all the proposed categories of glass-plastic. It also requested deleting Test No. 4 from the list of tests currently required for Item 14. It proposed that Test No. 4 be replaced by the Bake Test, Test No. 5. The Bake Test is used in ANS Z26 for testing whether "multiple glazing units" will withstand tropical temperatures over an extended period of time. A multiple glazing unit has two or more sheets of glazing separated by an air space. The test is conducted at 212 degrees Fahrenheit, the same temperature as the Boil Test.

The main difference between the two tests is the presence of humidity or water in the Boil Test which is absent in the Bake Test. The agency is aware from field reports and certification test failures from independent laboratories that some grades of plastic will become opaque in the presence of moisture. If not detected, this could be a hazardous situation in humid, hot climates. Accordingly, the agency believes that it is inappropriate to replace the Boil Test with the Bake Test.

G. Technical Amendments

In the NPRM, the agency stated its intent to make certain tests for Item 14 glass-plastic glazing applicable to the three new items of glass-plastic glazing. The NPRM did not explicitly state that changes to Tests 17 (Abrasion resistance (plastics)), 19 (Chemical resistance), and 28 (Temperature change), made when Item 14 was promulgated, to make the tests more appropriate for glass-plastic glazing, would also apply to the three new items of glass-plastic glazing. The NPRM also did not explicitly state that Item 15 is prohibited in convertible-type vehicles, as is Item 14, to prevent excessive deterioration of glazing in areas requisite for driving visibility due to ultraviolet radiation. The final rule makes explicit the agency's intent in these areas.

Effective Date

This rule relieves a restriction in Standard No. 205, by facilitating the use of glass-plastic glazing at all glazing locations in motor vehicles. It permits those manufacturers that wish to increase the use of glass-plastic glazing in their vehicles and that are able to do so to use more glass-plastic glazing. On the other hand, those manufacturers that cannot increase the use of glass-plastic glazing at this time or that do not wish to do so will not be required to use glass-plastic glazing. Because this rule permits, but does not require, the increased use of glass-plastic glazing, the agency has concluded that this option should be in place sooner than 180 days after the issuance of this rule. Therefore, the agency finds for good cause that this rule should become effective 30 days after it is published

2. S5.1.1.1(d) of Standard No. 205 is revised to read as follows:

* * * * * *

(d) Gasoline, ASTM Reference Fuel C, which is composed of Isooctane 50 volume percentage and Toluene 50 volume percentage. Isooctane must conform to A2.7 in Annex 2 of the Motor Fuels Section of the *1985 Annual Book of ASTM Standards*. Vol. 05.04, and Toluene must conform to ASTM specification D362-84, *Standard Specification for Industrial Grade Toluene*. ASTM Reference Fuel C must be used as specified in:

(1) Paragraph A2.3.2 and A2.3.3 of Annex 2 of Motor Fuels, Section 1 in the *1985 Annual Book of ASTM Standards*;

(2) OSHA Standard 29 CFR 1910.106—"Handling Storage and Use of Flammable Combustible Liquids."

* * * * * *

3. S5.1.2.4 and S5.1.2.5 are removed and new S5.1.2.4 through S5.1.2.10 are added to Standard No. 205, to read as follows:

* * * * * *

S5.1.2.4 *Item 14—Glass-Plastics*. Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.10 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle, except that it may not be used in convertibles, in vehicles that have no roof, or in vehicles whose roofs are completely removable.

S5.1.2 5 *Item 15A—Annealed Glass-Plastic For Use In All Positions In a Vehicle Except The Windshield*. Glass-plastic glazing materials that comply with Test Nos. 1, 2, 3, 4, 9, 12, 16, 17, 18, 19, 24, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle except the windshield, and may not be used in convertibles, in vehicles that have no roof, or in vehicles with roofs that are completely removable.

S5.1.2.6 [Reserved]

S5.1.2.7 *Item 16A—Annealed Glass-Plastic for Use in all Positions in a Vehicle Not Requisite for Driving Visibility*. Glass-plastic glazing materials that comply with Test Nos. 3, 4, 9, 12, 16, 19, 24, and 28, as those tests are modified in S.1.2.9 *Test Procedures for Glass-Plastics*, may be used in a motor vehicle in all locations not requisite for driving visibility.

S5.1.2.8 *Item 16B—Tempered Glass-Plastic For Use in all Positions in a Vehicle Not Requisite for Driving Visibility*. Glass-plastic glazing materials that comply with Test Nos. 3, 4, 6, 7, 8, 16, 19, 24, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics*, may be used in a motor vehicle in all locations not requisite for driving visibility.

S5.1.2.9 *Test Procedures for Glass-Plastics*. (a) Test Nos. 6, 7, 8, 9, 12, 16, and 18 shall be conducted on the glass side of the specimen, i.e, the surface which would face the exterior of the vehicle. Tests Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For Test No. 19, add the following to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10 percent or less than 5 percent by weight and ammonium hydroxide no greater than 5 percent or less than 1 percent by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of −40°C (±5°C), which is equivalent to −40°F (±9°F), for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentage of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

S5.1.2.10 *Cleaning instructions*. (a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.7, or S5.1.2.8 shall affix a label, removable by hand without tools, to each item of such glazing material. The label shall identify the product involved, specify instructions and agents for cleaning the material that will minimize the loss of transparency, and instructions for removing frost and ice, and, at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manufacturer of glazing materials designed to meet the requirements of paragraphs S5.1.2.4, S5.1.2.5, S5.1.2.7, or S5.1.2.8 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than 1/4 high, the following words, GLASS PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS.

* * * * * *

4. S6.1 of Standard No. 205 is revised to read as follows:

* * * * * *

S6.1 Each prime glazing material manufacturer, except as specified below, shall mark the glazing materials it manufactures in accordance with section 6 of ANS Z26. The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.7, and S5.1.2.8 shall be identified by the marks "AS 11C," "AS 12," "AS 13," "AS 14," "AS 15A," "AS 16A," and "AS 16B,", respectively. A prime glazing material manufacturer is one who fabricates, laminates, or tempers the glazing material.

Jerry Ralph Curry
Administrator

56 F.R 18526
April 23, 1991

PREAMBLE TO AN AMENDMENT FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials
(Docket No. 89-18; Notice 6)

ACTION: Final rule; correction.

SUMMARY: In March and April 1991, this agency published two separate final rules amending the safety standard on glazing materials. This notice corrects errors that occurred because the March 1991 amendments took effect after the April 1991 amendments.

EFFECTIVE DATE: The amendments in this correction notice are effective September 27, 1991.

SUPPLEMENTARY INFORMATION:

Background

On March 27, 1991 (56 FR 12669), and April 23, 1991 (56 FR 18526), the agency published *Federal Register* notices amending Federal Motor Vehicle Safety Standard No. 205 *Glazing materials (49 CFR* § 571.205). The March 1991 rule permits specimen clamping for Test 26, one of the tests applicable to glass-plastic glazing. The April 1991 rule creates three new items of glass-plastic glazing. The amendments were written with the expectation that the March 1991 notice would be published sufficiently before the April notice so that the amendments in the former notice would take effect first. The fact that the March 1991 amendments did not become effective until September 23, 1991, while the April 1991 amendments had an effective date of May 23, 1991, has caused problems in the addition and removal of provisions from Standard No. 205.

Specifically, the juxtaposition in the sequence of the effective dates of the two notices resulted, effective September 23, 1991, in S5.1.2.4 Item 14 *Glass Plastics* making reference to sections of Standard No. 205 that were removed or superseded effective May 23, 1991, and placing the specimen clamping test procedure for Test 26 in an inappropriate section. This notice corrects S5.1.2.4 so that it now refers to the correct sections of Standard No. 205 and moves the clamping procedure from S5.1.2.4 to S5.1.2.9. This notice also corrects errors in the list of applicable tests for S.5.1.2.5 Item 15A *Annealed Glass-Plastic for Use in All Positions in a Vehicle Except the Windshield.*

This amendment imposes no duties or responsibilities on any party, nor does it make any substantive changes to Standard No. 205. This amendment simply ensures that Standard No. 205 reads as the agency intended.

(1) S5.1.2.4 is revised to read as follows:

S5.1.2.4 *Item 14—Glass-Plastics.* Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.10 and Tests Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26 and 28, as those tests are modified in S5.1.2.9 Test Procedures for Glass-Plastics, may be used anywhere in a motor vehicle, except that it may not be used in convertibles, in vehicles that have no roof or in vehicles whose roofs are completely removable.

(2) S5.1.2.5 is correctly revised to read as follows:

S5.1.2.5 *Item 15A—Annealed Glass-Plastic for Use in All Positions in a Vehicle Exceot the Windshield.* Glass-plastic glazing materials that comply with Test Nos. 1, 2, 3, 4, 9, 12, 16, 17, 18, 19, 24, and 28, as those tests are modified in S5.1.2.9 Test Procedures for Glass-Plastics, may be used anywhere in a motor vehicle except the windshield, and may not be used in covertibles, in vehicles that have no roof or in vehicles whose roofs are completely removable.

(3) Paragraph (e) is added after paragraph (d) of S5.1.2.9 as follows:

(e) The glass-plastic glazing specimen tested in accordance with Test No. 26 shall be clamped in the test fixture in Figure 1 of this standard in the manner shown in that figure. The clamping gasket shall be made of rubber 3 millimeters (mm) thick of hardness 50 IRHD (International Rubber Hardness Degrees), plus or minus five degrees. Movement of the test specimen, measured after the test, shall not exceed 2 mm at any point along the inside periphery of the fixture. Movement of the test specimen beyond the 2 mm limit shall be considered an incomplete test, not a test failure. A specimen used in such an incomplete test shall not be retested.

Issued on: September 23, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 49148
September 27, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205
Glazing Materials

(Docket No. 89-18; Notice 7)
RIN 2127-AE31

ACTION: Final rule; response to petition for reconsideration.

SUMMARY: On April 23, 1991, NHTSA published a final rule which amended Safety Standard No. 205, Glazing Materials, to permit three new items of glass-plastic glazing in motor vehicles. One of these, Item 15A, Annealed glass-plastic glazing, was permitted to be used anywhere in a motor vehicle except the windshield. It was not, however, permitted for convertibles. In response to a petition for reconsideration from General Motors, this notice amends Standard No. 205 to remove the standard's prohibition of Item 15A glazing for convertibles. The notice also makes a technical amendment to the standard to permit the use of Item 14 glass-plastic glazing for side and rear windows in convertibles.

EFFECTIVE DATE: The amendments in this final rule are effective February 14, 1992.

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, Glazing Materials, specifies performance requirements for the types of glazing that may be installed in motor vehicles. It also specifies the vehicle locations in which the various types of glazing may be installed. One type of glazing addressed in Standard No. 205 is glass-plastic glazing, a laminate of one or more layers of glass and one or more layers of plastic. It is installed so that a glass layer faces outward and a plastic layer inward.

On April 23, 1991, NHTSA published in the *Federal Register* (56 FR 18526) a final rule permitting three new items of glass-plastic glazing. One of these, Item 15A, Annealed glass-plastic glazing, was permitted to be used anywhere in a motor vehicle except the windshield. It was not, however, permitted for convertibles. The other two items were only permitted to be used in areas not requisite for driving visibility. NHTSA stated that it believed the addition of the three new types of glazing to Standard No. 205 would facilitate the use of glass-plastic glazing in all glazing locations in a motor vehicle, and that it encourages greater use of glass-plastic glazing because of its proven injury-reduction capabilities in crashes.

In prohibiting the use of Item 15A glazing for convertibles, NHTSA followed the same approach it had used earlier for Item 14 glazing, the first type of glass-plastic glazing permitted to be used in areas requisite for driving visibility. The final rule permitting the use of Item 14 glazing was published in the *Federal Register* (48 FR 52061) on November 16, 1983.

NHTSA prohibited the use of Item 14 glazing in convertibles because of concern about possible discoloration of the glazing. In the November 1983 notice, the agency noted that the plastic side of glass-plastic glazing is susceptible to chemical alteration (becoming yellow or cloudy) when exposed to intense and prolonged ultraviolet light. In addressing the use of Item 14 glazing in convertibles, NHTSA stated the following:

> The agency is, however, concerned about the potential exposure of the plastic side of the windshield in convertibles and vehicles that have no or removable tops. While the agency believes that a prolonged test directing ultraviolet radiation against the plastic side of the glazing would be overly stringent, it does believe that it may be appropriate to set some requirement for directing ultraviolet radiation against the plastic-side of glass-plastic glazing for use in convertibles or cars with no or removable tops. At this time, the agency lacks the necessary data to support such a requirement. As an interim solution, the agency has decided to prohibit the use of glass-plastic glazing in those vehicles until such data are available. 48 FR 52062.

In following this same approach for Item 15A glazing, NHTSA stated the following in its April 1991 notice:

> The NPRM did not explicitly state that Item 15 is prohibited in convertible-type vehicles, as is Item 14, to prevent excessive deterioration of glazing in areas requisite for driving visibility due to ultraviolet radiation. The final rule [makes] explicit the agency's intent in [this area]. 56 FR 18530.

General Motors (GM) submitted a petition requesting that NHTSA reconsider its prohibition of Item 15A glazing in convertibles. GM stated that it believes Item 15A glazing would not be exposed to significantly greater amounts of ultraviolet light directed against the plastic side in convertibles than in non-convertibles. That company stated that it believes convertibles are typically operated with the side windows in the open (i.e., down) position, and that, similarly, rear windows are typically part of the removed or stowed roof. Therefore, according to GM, side and rear windows in convertibles are not likely to be exposed to significantly more ultraviolet light when the roof is removed or stowed.

GM also argued that the prohibition of Item 15A glazing for convertibles could discourage development of market-feasible glass-plastic glazing. That company noted that, in some cases, the same glazing material is used in both the base and convertible versions of the same model. According to GM, a vehicle manufacturer wanting to use glass-plastic glazing in the base (i.e., non-convertible) version might be discouraged by the added cost of developing different glazing materials for base and convertible versions.

After considering GM's petition, NHTSA has decided to amend Standard No. 205 to remove the standard's prohibition of Item 15A glazing for convertibles. The agency is persuaded that possible discoloration of glazing resulting from direct sunlight on the inside, plastic side of the glazing is not a significant concern for glazing areas other than the windshield. (As indicated above, Item 15A glazing is not permitted to be used for the windshield of any vehicles.) NHTSA agrees that convertibles are typically driven either with the top up or, when the top is down, with the side windows down and the rear window removed. Thus, the inside, plastic side of Item 15A glazing on the side windows or rear window of convertibles is not likely to be exposed to significantly more ultraviolet light than the same glazing on non-convertibles. NHTSA has therefore determined that its rationale for prohibiting the use of glass-plastic glazing for convertibles is not valid for side windows and the rear window.

NHTSA notes that, in the rulemaking concerning Item 14 glazing, it was generally understood that Item 14 glazing was intended to be used for windshields. Therefore, the agency's analysis for convertibles of possible discoloration resulting from direct sunlight on the plastic side of the glazing focused on windshields. While NHTSA is unaware of any manufacturer plans to use Item 14 glazing for side or rear windows, the agency recognizes that its conclusions about the inappropriateness of prohibiting Item 15 glazing for side and rear windows of convertibles is equally applicable to Item 14 glazing. Therefore, the agency is making a technical amendment to Standard No. 205 to permit the use of Item 14 glazing for convertible side and rear windows.

In its petition, GM also requested clarification of certain wording of Standard No. 205. The issue raised by GM concerning this language was subsequently addressed by NHTSA in a correction notice published in the *Federal Register* (56 FR 49148) on September 27, 1991.

This rule relieves restrictions in Standard No. 205 by permitting the use of two items of glass-plastic glazing in convertible side and rear windows. Manufacturers are not required to use these items of glass-plastic glazing. Because the rule relieves restrictions and facilitates the use of glass-plastic glazing in motor vehicles, NHTSA finds for good cause that the rule should become effective 30 days after it is published.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows: In S571.205, S5.1.2.4 and S5.1.2.5 are revised to read as

S5.1.2.4 Item 14—Glass Plastics.

Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.10 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in S5.1.2.9, *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle, except that it may not be used in windshields of any of the following vehicles: convertibles, vehicles that have no roof, vehicles whose roofs are completely removable.

S5.1.2.5. Item 15A—Annealed Glass-Plastic for Use in All Positions in a Vehicle Except the Windshield.

Glass-plastic glazing materials that comply with Test Nos. 1, 2, 3, 4, 9, 12, 16, 17, 18, 19, 24, and 28, as those tests are modified in S5.1.2.9, *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle except the windshield.

* * * * *

Issued on January 9, 1992.

Jerry Ralph Curry,
Administrator.

57 F.R. 1652
January 15, 1992

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205
Glazing Materials

(Docket No. 89–18; Notice 8)
RIN 2127–AE45

ACTION: Final rule; response to petition for reconsideration.

SUMMARY: On March 27, 1991, NHTSA published a final rule which amended Safety Standard No. 205, Glazing Materials, to specify specimen clamping of glass-plastic glazing (glazing with one or more layers of glass and a layer of plastic on the surface facing the vehicle interior) for Test 26. In Test 26, a five pound ball is dropped onto specimens of glazing material to determine whether the material has satisfactory penetration resistance. In response to a petition for reconsideration from Ford, this final rule amends Standard No. 205 to permit, at the option of the manufacturer, specimen clamping of glass-plastic glazing in two other drop tests, Test 9 (that determines the behavior of the glazing under impact from a small, hard object) and Test 12 (that determines whether the glazing has a certain minimum strength and is properly made).

EFFECTIVE DATE: May 18, 1992.

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, Glazing Materials, specifies requirements for glazing materials that are used in motor vehicles. The standard specifies a number of performance tests which must be met by various types, or items, of glazing materials.

On March 27, 1991, NHTSA published in the *Federal Register* (56 FR 12669) a final rule to specify specimen clamping of glass-plastic glazing (glazing with one or more layers of glass and a layer of plastic on the surface facing the vehicle interior) for Test 26. In Test 26, a five pound ball is dropped onto specimens of glazing material to determine whether the material has satisfactory penetration resistance.

The rulemaking concerning clamping was one of a number of steps that NHTSA has taken to facilitate the use of glass-plastic glazing, which can reduce the risk of lacerative injuries in crashes. The agency first permitted the use of glass-plastic glazing in areas requisite for driving visibility in a final rule published in the *Federal Register* (48 FR 52061) on November 16, 1983.

NHTSA initiated the rulemaking concerning clamping in response to a petition for rulemaking from General Motors (GM). That company stated that the existing procedure for Test 26 was inappropriate for two-ply glass-plastic glazing. In that test, a five pound steel ball is dropped onto a 12 inch by 12 inch specimen of glazing from a height of 12 feet. The specimen is centered on the top of a 17⅜ inch square wood frame with an 11⅜ inch square opening. A specimen is deemed to have failed if the ball passes through it. For traditional three-ply high penetration resistant glazing, the nonaligned cracks in the inner and outer layers of glass, resulting from impact with the ball, provide the specimen sufficient rigidity to remain in the test fixture. GM reported that the two-ply specimen, which is more flexible, is pushed through the frame by the ball without being penetrated by it. That company argued that it was therefore necessary to allow restraint of the test sample in the test fixture for Test 26.

In light of the problem reported by GM, NHTSA published a notice of proposed rulemaking (NPRM) concerning clamping in the *Federal Register* (54 FR 41636) on October 11, 1989. The agency proposed to specify specimen clamping of glass-plastic glazing for Test 26 and, additionally, requested comments on the advisability of extending the clamping procedure to two other drop tests, Tests 9 and Test 12. Test 9 is a drop test in which a seven ounce round-nosed dart is dropped from 30 feet. The test measures the resistance to impact by a small hard object. Test 12 involves the dropping of an eight ounce steel ball from a height of 30 feet to determine whether the glazing has a certain minimum strength and is properly made.

In the NPRM, the agency indicated that it was concerned that clamping might be necessary for Tests 9 and 12, for the same reason it was necessary for Test 26. The agency noted, however, that the objects dropped in those tests are considerably lighter than the five pound object used in Test 26 and therefore appeared less likely to create the problem experienced in conducting Test 26. Further, the petitioner, GM, had not indicated a need for clamping the specimen in Tests 9 and 12. NHTSA also expressed concern that specifying clamping for Tests 9 and 12 might have the unintended effect of modifying the performance requirements of the glazing, thereby allowing use of materials such as tempered glass that may result in glazing designs that would create obscured vision when broken. While the agency stated that it might, depending on the comments, specify clamping for Tests 9 and 12, it indicated that it was inclined not to do so absent evidence of a clear need. See 54 FR 41641.

While the March 1991 final rule did specify clamping of glass-plastic glazing for Test 26, NHTSA declined to adopt the proposal to specify clamping of glass-plastic glazing in Tests 9 and 12. The agency noted that while its concerns about possible unintended effects of specifying clamping were not confirmed by the public comments, its review of the comments had not yielded any data that strongly supported the necessity for clamping in either test. NHTSA concluded that amending Tests 9 and 12 was not warranted at this time. See 56 FR 12671.

Ford submitted a petition requesting that NHTSA reconsider its decision not to allow clamping of glass-plastic specimens for Tests 9 and 12. That company stated that it believed that clamping is necessary for these tests because, in its testing, developmental glass-plastic specimens had on occasion been forced through the frame of the test fixture by the impact of the test projectiles. Ford stated that it believed other manufacturers and testing laboratories would have similar results.

Ford also indicated that, in support of its petition, it planned to perform a series of Test 9 and Test 12 tests in the near future and would provide test results to the agency for review. That company subsequently conducted 19 tests on two-ply specimens and provided NHTSA with a videotape of the tests. The videotape showed a series of tests using the Test 12 procedure, with a 0.5 pound ball dropped from 30 feet. Twelve of the tests were with unclamped specimens, with the remainder using clamped specimens. The specimens were 3 and 4 mm glass coated with a 0.022 mm layer of plastic. The unclamped specimens in the Ford tests bounced and changed position as a result of being impacted by the 0.5 pound ball. In two of the tests, the unclamped specimens bounced far enough out of position to fall sideways through the test stand.

After considering Ford's petition for reconsideration, NHTSA has decided to amend Standard No. 205 to permit, at the option of the manufacturer, specimen clamping of glass-plastic glazing in Tests 9 and 12. After reviewing Ford's petition and testing, the agency is persuaded that the existing test procedure is inappropriate for at least some designs of two-ply glass-plastic glazing since the specimen may fall sideways through the test stand as a result of bouncing. The agency notes that the problem experienced in Tests 9 and 12 relates to the bouncing of the unclamped specimen after the initial impact on the specimen, whereas in Test 26 the problem related to the collapsing of the unclamped specimen during the initial impact. Thus, the Test 26 problem affected the test results at the point of impact, whereas the Test 9 and 12 problem occurs after the impact and may affect the test results by adding specimen damage after the impact.

Since NHTSA is unaware of how general the problem identified by Ford is for various possible designs of glass-plastic glazing, and since test stringency is not directly affected by whether the specimen is clamped or unclamped (given the low weight of the objects dropped in Tests 9 and 12), the agency has decided to make specimen clamping optional rather than mandatory for Tests 9 and 12. The agency is specifying the same test fixture for holding and clamping glass-plastic test specimens for those tests as the one adopted in the March 1991 final rule for Test 26. The test specimen is held in place in that fixture by an upper frame. NHTSA is also specifying use of the same test fixture for testing unclamped specimens, including the upper frame which holds the specimen in place.

In deciding to permit clamping of glass-plastic glazing in Tests 9 and 12, NHTSA has considered its stated concerns about possible unintended effects of modifying the performance requirements of the glazing, such as allowing use of materials such as tempered glass that may result in glazing designs that would create obscured vision when broken. As indicated above, the agency's concerns were not confirmed by the public comments on the October 1989 NPRM. Moreover, after further review of the concerns, NHTSA has concluded that permitting clamping of glass-plastic glazing in Tests 9 and 12 would not encourage the use of tempered glass in windshields. The agency is unaware of any plans to use tempered glass in windshields and further believes that such windshields could be produced under Standard No. 205 in the absence of today's amendments. Since there is no evidence that manufacturers plan to use tempered glass in windshields for vehicles sold in this country, with or without today's amendments, the agency has decided that there is no need to address possible safety concerns about such windshields at this time.

Today's rule relieves a restriction by permitting glass-plastic glazing to be clamped during Test 9 and Test 12 testing. The rule does not impose any new requirements. While the rule does specify use of a different test fixture for testing unclamped specimens, use of the different fixture will not affect the stringency of the test requirements. The agency is unaware of any manufacturer currently using glass-plastic glazing as original equipment, nor is there any indication that glass-plastic will be used in the near future. However, the agency wishes to encourage manufacturers to use glass-plastic and believes removing barriers for two-ply glass-plastic may encourage its use. NHTSA established an effective date of September 23, 1991 for the amendment specifying specimen clamping of glass-plastic glazing for Test 26, and the agency believes that the possible benefits associated with that amendment may not be fully realized until today's amendment becomes effective. NHTSA therefore finds for good cause that the rule should become effective 30 days after it is published.

This final rule does not have any retroactive effect. Under section 103(d) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392(d)), whenever a Federal motor vehicle safety standard is in effect, a state may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard. Section 105 of the Act (15 U.S.C. 1394) sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration other administrative proceedings before parties may file suit in court.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

S5.1.2.9(e) is revised to read as follows:

(e)(1) Except as provided in S5.1.2.9(e)(2), glass-plastic glazing specimens tested in accordance with Test Nos. 9, 12 and 26 shall be clamped in the test fixture in Figure 1 of this standard in the manner shown in that figure. The clamping gasket shall be made of rubber 3 millimeters (mm) thick of hardness 50 IRHD (International Rubber Hardness Degrees), plus or minus five degrees. Movement of the test specimen, measured after the test, shall not exceed 2 mm at any point along the inside periphery of the fixture. Movement of the test specimen beyond the 2 mm limit shall be considered an incomplete test, not a test failure. A specimen used in such an incomplete test shall not be retested.

(2) At the option of the manufacturer, glass-plastic glazing specimens tested in accordance with Test Nos. 9 and 12 may be tested unclamped. Such specimens shall be tested using the fixture in Figure 1 of the standard, including the upper frame (unclamped) which holds the specimen in place.

Issued on April 13, 1992.

Frederick H. Grubbe
Deputy Administrator

57 F.R. 13654
April 17, 1992

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205
Glazing Materials

(Docket No. 89–18; Notice 6)
RIN 2127–AD75

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 205, Glazing Materials, to permit a new item of glass-plastic glazing. The new item of glazing permitted is Item 15B, *Tempered glass-plastic glazing*, that may be used anywhere in a motor vehicle, excluding the windshield. This new item of glazing is a restricted version of existing Item 14 glass-plastic glazing, which may be used anywhere in a motor vehicle, including the windshield. After reviewing public comments to proposals to remove Test No. 1 from the list of tests applicable to Item 3 glazing, the agency concludes that it has insufficient data at this time to support removal of Test No. 1 for Item 3 glazing. Therefore, the agency defers a final decision on this issue.

DATES: *Effective Date:* The changes made in this rule are effective August 7, 1992.

SUPPLEMENTARY INFORMATION:

Background

Federal Motor Vehicle Safety Standard No. 205 Glazing Materials, (49 CFR S571.205) specifies performance requirements for the types of glazing that may be installed in motor vehicles. Standard No. 205 currently incorporates by reference American National Standards Institute Standard Z26.1 "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways" as amended through 1980 (ANS Z26). The requirements of ANS Z26 are specified in terms of performance tests that the various types or "items" of glazing must meet. It also specifies the vehicle locations in which each type of glazing may be installed.

One variety of glazing addressed in Standard No. 205 is glass-plastic glazing, a laminate of one or more layers of glass and one or more layers of plastic. It is installed so that a plastic layer faces inward, towards the interior of the motor vehicle, and a glass layer faces outward. The agency encourages use of glass-plastic glazing because of its proven injury-reduction capabilities in crashes.

April 1991 Final Rule and Supplementary Notice of Proposed Rulemaking

In a final rule of April 23, 1991 (56 *FR* 18526), the agency amended standard No. 205 to permit three new items of glass-plastic glazing. Item 15A *Annealed glass-plastic glazing*, is permitted to be used anywhere in a motor vehicle, except the windshield. Item 16A *Annealed glass-plastic glazing*, and Item 16B *Tempered glass-plastic glazing*, may be used in areas not requisite for driving visibility. In that final rule, the agency also discussed further action on two issues: whether it should permit tempered glass-plastic glazing to be used anywhere in a motor vehicle, except the windshield, and whether it should remove Test No. 1, Light Stability, from the list of tests that Item 3 glazing must meet. These two issues are more fully discussed below.

The issue of permitting an item of tempered glass-plastic glazing for use anywhere in a motor vehicle, except for the windshield, was first raised by NHTSA in the notice of proposed rulemaking (54 *FR* 41632; October 11, 1989) that preceded the April 1991 final rule. In the NPRM, the agency did not propose to permit a tempered version of glass-plastic glazing for use anywhere in a motor vehicle except the windshield, citing its concern about potential visibility problems if the glazing should shatter. However, public comments in response to the NPRM convinced the agency that because of tempered glass-plastic's greater strength, the benefits from permitting a tempered version of glass-plastic glazing for use anywhere in a motor vehicle except the windshield, outweighed possible visibility problems that may result from shattered glazing.

Also in the October 1989 NPRM, the agency proposed removal of Test No. 1 for motor vehicle glazing that is used in areas that are not requisite for driving visibility. Its rationale was that it saw no safety need for glazing used in those areas to meet that test requirement. Test No. 1, *Light Stability*, in the American National Standards Institute Standard (ANS) Z26 (1980 edition), is a measure of visual deterioration of the glazing due to exposure to simulated sunlight and humidity.

In response to that proposal in the NPRM, the agency received comments from four glazing manufacturers. The comments were mixed. Some manufacturers that provided comments concurred with the proposal to remove Test No. 1 from Item 3 glazing. One manufacturer, Libbey-Owens-Ford, however, noted that changes in light transmittance can also indicate deterioration of plastic layers in the glazing. That commenter asserted that if Test No. 1 were no longer applied to Item 3 laminated or glass-plastic glazing, plastics with inferior weathering characteristics may be permitted. These inferior glazing products may have long range safety and reliability problems.

The agency stated in the April 1991 final rule that it had reexamined its position concerning use of tempered glass in glass-plastic glazing in visibility areas other than the windshield. It indicated that the issues raised by commenters on the utility of Test No. 1 for Item 3 glazing might have merit. Accordingly, the agency said that it would provide another opportunity for public comment on these issues.

In a supplementary notice of proposed rulemaking, (SNPRM) (56 *FR* 18559; April 23, 1991) published by NHTSA on the same date as the April 1991 final rule, the agency proposed the creation of Item 15B *Tempered glass-tempered glazing* for use in all locations that are requisite for driving visibility, other than the windshield. Also in the April 1991 SNPRM, the agency again asked for public comment on the issue whether to remove Test No. 1 from the list of tests that an item of glazing must meet in order to be designated as Item 3 glazing. The agency specifically requested test data to document the type of safety problems that may arise by permitting plastics that may fail Test No. 1.

Public Comments on the SNPRM

In response to the SNPRM, the agency received comments from five commenters, Chrysler Corporation (Chrysler), the Flat Glass Association of Japan (FGAJ), General Motors Corporation (GM), Libbey-Owens-Ford Company (LOF), and Monsanto Chemical Company (Monsanto). The commenters addressed the issues raised in the SNPRM as follows:

A. Item 15B Glazing

In general, four commenters, Chrysler, GM, LOF, and Monsanto, concurred with the agency's proposal to permit Item 15B, Tempered glass-plastic glazing. GM and FGAJ offered specific comments about other aspects of the proposal to permit Item 15B glazing. In its comments, GM requested that Item 15B be permitted in the side and rear windows of convertibles. The agency had proposed in the SNPRM to prohibit the use of Item 15B in convertibles. This restriction was proposed because of the agency's belief that excessive exposure to ultraviolet light may make the plastic in glass-plastic glazing deteriorate, possibly degrading visibility in windshields, side or rear windows.

GM stated that, in its opinion, Item 15B glazing would not be exposed to significantly greater amounts of ultraviolet light directed against the plastic side of glazing in convertibles than in non-convertibles. GM stated it believes that convertibles are typically operated with the side windows down. It stated that, similarly, rear windows are typically part of the removed or stowed roof. Therefore, according to GM, the side and rear windows in convertibles are not likely to be exposed to significantly more ultraviolet light when the roof is removed or stowed.

GM further stated that not permitting Item 15B glazing in convertibles could discourage use of this glazing. GM explained that in some cases, the same glazing material is used in both the base and convertible versions of the same passenger automobile. If Item 15B were prohibited in convertibles, a vehicle manufacturer that wanted to use glass-plastic glazing in the base version might be discouraged from using glass-plastic glazing by the additional cost of developing different glazing materials for the base and convertible versions.

Although it did not specifically state its views whether Item 15B glazing should be permitted, the Flat Glass Association of Japan (FGAJ) provided technical comments about some of the tests proposed to be applicable to Item 15B glazing. FGAJ stated that Test No. 4, *Boil*, was not appropriate for glass-plastic glazing and should be replaced with Test No. 5, *Bake;* that Test No. 7, *Fracture*, should be amended to incorporate the 1990 version of Test No. 7 in the ANS Z26 standard; and that the agency should use abrasion resistance Tests Nos. 33 and 34, as stated in the 1990 edition of the ANS Z26 standard, instead of, as proposed in the SNPRM, Test No. 17, *Abrasion Resistance (Plastics)*, and Test No. 18, *Abrasion Resistance (Safety Glass)*.

B. Applicability of Test No. 1 to Item 3 Glazing

Chrysler, GM and FGAJ stated that Test No. 1 should be removed from the list of tests applicable to Item 3 glazing, concurring with the agency's rationale that Test No. 1 is a test of luminous transmittance, and is not, therefore, appropriate for glazing to be used in areas not requisite for driving visibility. Libbey-Owens-Ford stated that it had no objection to the removal of Test No. 1 from the Item 3 glazing list of tests. However, it expressed a concern about the agency's eliminating the applicability of Test No. 1 to laminated glazing. LOF reported a 30 percent loss of strength in certain plastics after exposure to ultraviolet radiation in test situations. LOF stated that the test results indicate removal of Test No. 1 might permit use of plastics in laminated safety glazing that would lose their safety properties with extended exposure to outdoor light. LOF did not identify any specific plastics that were tested. LOF stated that whatever the agency decides to do about Test No. 1, Items 3, 16A and 16B glass-plastic glazing should be treated in the same fashion with respect to the applicability of Test No. 1 since all three items are used in the same locations in a motor vehicle. At present, Test No. 1 applies to neither Item 16A nor 16B.

Monsanto opposed making Test No. 1 inapplicable to Item 3 glazing. It stated that although polyvinyl butyryl (PVB) will meet Test No. 1, Monsanto stated that glazing "which is significantly inferior and will not pass the test" should not be permitted because such materials can develop "color, bubbles, haze, etc." as a result of exposure to ultraviolet light. Monsanto did not specify any particular type of material that may encounter the difficulties that were described.

Agency Analysis of Public Comments and Final Decision

A. Item 15B Glazing

All the comments addressing the issue, whether Item 15B *Tempered glass-plastic glazing* should be permitted, supported the creation of Item 15B glazing. Neither the public comments, nor other information available to the agency indicates that permitting Item 15B glazing would adversely affect safety. Accordingly, for the reasons stated in the notices of April 23, 1991 (56 *FR* 18526; 56 *FR* 18559), the agency is amending Standard No. to permit Item 15B glazing for use in all motor vehicle locations requisite for driving visibility other than the windshield.

As already noted, two other issues were raised by commenters about further defining the parameters of Item 15B glazing: the issue of whether Item 15B should apply to side and rear windows of convertibles; and the issue of tests applicable to Item 15B glazing.

GM raised the issue of permitting glass plastic glazing in side and rear windows of convertible motor vehicles both in comments on the April 1991 SNPRM and in its petition for reconsideration of the April 1991 final rule creating Items 15A, 16A, and 16B glazing (56 *FR* 18526). In that petition, GM requested that a prohibition against use of Item 15A glazing in convertibles be removed. GM's rationale in both rulemakings was that the plastic side of Item 15A glazing on the side windows or rear window of convertibles is not significantly more likely to be exposed to ultraviolet light than the same type of glazing in passenger automobiles that are not convertibles. In a January 15, 1992 notice responding to petitions for reconsideration (57 *FR* 1652), the agency granted GM's request and removed Standard No. 20's prohibition against Item 15A glazing in convertibles. NHTSA took this action because it agreed with GM's rationale.

Since NHTSA has already decided, in the January 1992 final rule, that permitting another type of glass-plastic glazing in side windows and the rear window in convertibles is consistent with motor vehicle safety, the agency adopts the same position regarding the use of Item 15B glazing.

Item 15B glazing will be permitted for use in the side windows and rear window of convertibles.

Most of FGAJ's suggestions concerning amendments to tests applicable to Item 15B glazing appear to have been made with the intent of making Standard No. 205 conform more closely with the 1990 edition of the ANS Z26 standard. FGAJ did not base any of its suggestions on a desire to promote greater reliability in test results, or on a need for greater safety. Regarding FGAJ's first recommendation, that Test No. 5, *Bake*, instead of Test No. 4, *Boil*, should apply to Item 15A, the agency notes that FGAJ previously recommended replacing Test No. 4 with Test No. 5 for other items of glass-plastic glazing. The earlier recommendation was made in response to the agency's NPRM of October 11, 1989 (54 *FR* 41632) proposing to create Items 15A, 16A, and 16B. In the April 23, 1991 final rule (56 *FR* 18526), the agency responded to the FGAJ's recommendation, and noted that the main difference between the two tests is that humidity or water is present in the boil test but not in the bake test. The agency stated that it was aware from field reports and certification test failures from independent laboratories, that some grades of plastic will become opaque in the presence of moisture. If this phenomenon is not detected, glazing with lessened visibility could be hazardous in hot, humid climates. Accordingly, the agency concluded that it was inappropriate to replace Test No. 4, *Boil*, with Test No. 5, *Bake*. (See 56 *FR* at 18530).

In its response to the SNPRM to create Item 15B glazing, the FGAJ again raised the issue of replacing the boil test with the bake test. However, it offered no additional information why the proposed change should be made, did not address the agency's concern about the inappropriateness of the bake test in replicating conditions in hot, humid climates, and offered no safety rationale for its proposal. Since no reason has been given why the agency's decision not to replace the bake test for the boil test (for Items 15A, 16A and 16B) was inappropriate, the agency again adopts the rationale stated in the final rule of April 23, 1991 (56 FR 18526).

The second FGAJ recommendation was that the procedure in Test No. 7, *Fracture*, be amended to be consistent with the 1990 version of ANS Z26. FGAJ noted differences between the Standard No. 205 version (that incorporates the 1980 edition of ANS Z26) and the 1990 test procedures. FGAJ did not cite a safety need to amend the test procedure. Since FGAJ did not show how making the changes would result in more valid results or would promote safety, the agency has decided not to adopt FGAJ's recommendation on Test No. 7.

The third FGAJ recommendation was that abrasion tests 17 and 18 be replaced with different abrasion tests, Test Nos. 33 and 34 (from the 1990 version). Test Nos. 17 and 18 differ from Test Nos. 33 and 34 in that the latter tests indicate on which side (plastic or glass) the test should be run. The agency notes that in S5.1.2.9, of Standard No. 205, Test Nos. 17 and 18 are modified to indicate on which sides the test should be run. Since this addition to Standard No. 205 makes Test Nos. 17 and 18 almost identical to Test Nos. 33 and 34, adopting the third recommendation would have essentially no practical effect. Accordingly, the agency is not adopting that recommendation.

B. Applicability of Test No. 1 to Item 3 Glazing

The agency also requested comments in the SNPRM on its proposal to remove Test No. 1, *Light Stability*, from the list of tests applicable to Item 3 glazing. Test No. 1, as indicated earlier, is intended to measure the reduction of luminous transmittance after the material is exposed to simulated sunlight. The agency initially concluded that there was no apparent safety need to include this visibility test requirement for Item 3 glazing since it is permitted to be used only in areas not requisite for driving visibility.

In both the October 1989 NPRM and April 1991 SNPRM, the agency proposed to remove Test No. 1 from the list of tests for Item 3 glazing because the agency believed that Test No. 1 was included only because of an oversight. Similarly, when the lists of tests applicable to Items 16A and 16B glazing was created, the agency did not include Test No. 1 in the list for either item. The agency took this step because it believed that Test No. 1 would eventually be removed from Item 3, and that since Items 3, 16A and 16B are permitted in identical locations in a motor vehicle, the lists of tests applicable to Items 3, 16A and 16B should be as consistent as possible.

In response to the SNPRM, several commenters characterized Test No. 1 merely as a "reliability" test and stated that the test is irrelevant for an item of glazing specified for use only in areas not requisite for driving visibility. However, two commenters, Libbey-Owens-Ford (LOF) and Monsanto, stated that the test is an indirect detector of inferior plastics. LOF specifically expressed concern that certain materials experienced a 30 percent loss of strength after undergoing several hundred hours of exposure to ultraviolet radiation. The agency agrees with LOF and Monsanto that Test No. 1 may be capable of identifying inferior and potentially unsafe plastic. The agency also concurs with LOF that Standard No. 205 is inconsistent with respect to the applicability of Test No. 1. Test No. 1 applies to Item 3 glazing, but does not apply to Items 16A and 16B glazing, which may be used in motor vehicle locations identical to Item 3.

After carefully reviewing these issues raised by commenters, the agency concludes that it has insufficient information to support either the removal of this test for Item 3 glazing or the extension of its applicability to Items 16A and 16B glazing. Accordingly, the agency again defers its decision on the issue of applicability of Test No. 1 to Items 3, 16A and 16B glazing pending further analysis of the issue.

Effect of Final Rule on Concurrent Standard No. 205 Rulemakings

In anticipation of possible questions from the public, the agency wishes to note that this final rule is independent of, and has no effect on, the NPRM issued by the agency on January 22, 1992 (57 *FR* 2496) that proposed to amend Standard No. 205 to revise light transmittance requirements to replicate real-world conditions more closely. The issues raised in the January 1992 NPRM are different from those addressed in this final rule. Since NHTSA encourages greater use of glass-plastic glazing, it is issuing this final rule primarily to permit Item 15B glazing to be used in designated motor vehicle locations as soon as possible.

Effective Date

This rule is effective 30 days after publication in the FEDERAL REGISTER. The rule relieves a restriction in Standard No. 205 by permitting the use of tempered glass-plastic in all glazing locations, except the windshield. Those manufacturers that do not deem it appropriate to use this material at this time are not required to do so. Since this rule permits but does not require the increased use of glass-plastic glazing, the agency concluded that this optional item of glazing should be permitted sooner than 180 days after the issuance of this rule. Therefore, the agency finds good cause that this rule should become effective 30 days after it is published.

In consideration of the foregoing, 49 CFR Part 571 is amended to read as follows:

In S571.205, a new S5.1.2.6 is added, S5.1.2.10 is revised to read as follows, and the second sentence of S6.1 is revised to read as follows:

S571.205 Standard No. 205, Glazing Materials.

* * * * *

[S5.1.2.6 Item 15B—Tempered Glass-Plastic for Use in All Positions In a Vehicle Except the Windshield. Glass-plastic glazing materials that comply with Tests Nos. 1, 2, 3, 4, 6, 7, 8, 16, 17, 18, 19, 24, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle except the windshield. **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)]**

* * * * *

S5.1.2.10 Cleaning instructions.

(a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, **[**S5.1.2.6,**]** S5.1.2.7, or S5.1.2.8 shall affix a label, removable by hand without tools, to each item of such glazing material. * * * **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)**

(b) Each manufacturer of glazing materials' designed to meet the requirements of paragraphs S5.1.2.4, S5.1.2.5, **[**S5.1.2.6,**]** S5.1.2.7, or S5.1.2.8 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than 1/4 high, the following words, GLASS PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS. **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)**

* * * *

S6.1 * * * The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.6, S5.1.2.7, and S5.1.2.8 shall be identified by the marks "AS 11C", "AS 12", "AS 13", "AS 14", "AS 15A", **[**"AS 15B",**]** "AS 16A", and

"AS 16B", respectively. * * * **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)**

*   *   *   *   *

Issued on July 1, 1992.

Frederick H. Grubbe
Deputy Administrator

57 F.R. 30161
July 8, 1992

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205
Glazing Materials

S1. Scope.

This standard specifies requirements for glazing materials for use in motor vehicles and motor vehicle equipment.

S2. Purpose.

The purpose of this standard is to reduce injuries resulting from impact to glazing surfaces, to ensure a necessary degree of transparency in motor vehicle windows for driver visibility, and to minimize the possibility of occupants being thrown through the vehicle windows in collisions.

S3. Application.

This standard applies to glazing materials for use in passenger cars, multipurpose passenger vehicles, trucks, buses, motorcycles, slide-in campers, and pickup covers designed to carry persons while in motion.

S4. Definitions.

Bullet resistant shield means a shield or barrier that is installed completely inside a motor vehicle behind and separate from glazing materials that independently comply with the requirements of this standard.

Camper means a structure designed to be mounted in the cargo area of a truck, or attached to an incomplete vehicle with motive power, for the purpose of providing shelter for persons.

Motorhome means a multipurpose passenger vehicle that provides living accommodations for persons.

Pickup cover means a camper having a roof, and sides but without a floor, designed to be mounted on and removable from the cargo area of a truck by the user.

Slide-in camper means a camper having a roof floor, and sides, designed to be mounted on and removable from the cargo area of a truck by the user.

Glass-plastic glazing material means a laminate of one or more layers of glass and one or more layers of plastic in which a plastic surface of the glazing faces inward when the glazing is installed in a vehicle.

S5. Requirements.

S5.1 Materials.

S5.1.1 Glazing materials for use in motor vehicles, except as otherwise provided in this standard, shall conform to the American National Standard "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z–26.1–1977, January 26, 1977, as supplemented by Z26.la, July 3, 1980 (hereinafter referred to as "ANS Z26"). However, Item 11B glazing as specified in that standard may not be used in motor vehicles at levels requisite for driving visibility, and Item 11B glazing is not required to pass Test Nos. 17, 30, and 31.

S5.1.1.1 The chemicals specified for testing chemical resistance in Tests Nos. 19 and 20 of ANS Z26 shall be:

(a) One percent solution of nonabrasive soap.

(b) Kerosene.

(c) Undiluted denatured alcohol, Formula SD No. 30 (1 part 100-percent methyl alcohol in 10 parts 190-proof ethyl alcohol by volume).

(d) [Gasoline, ASTM Reference Fuel C, which is composed of Isooctane 50 volume percentage and Toluene 50 volume percentage. Isooctane must conform to A2.7 in Annex 2 of the Motor Fuels Section of the *1985 Annual Book of ASTM Standards*, Vol. 05.04 and Toluene must conform to ASTM specification D362–84, *Standard Specification for Industrial Grade Toluene*. ASTM Reference Fuel C must be used as specified in:

(1) Paragraph A2.3.2 and A2.3.3 of Annex 2 of Motor Fuels, Section 1 in the *1985 Annual Book of ASTM Standards;*

(2) OSHA Standard 29 CFR 1910.106—"Handling Storage and Use of Flammable Combustible Liquids." **(56 F.R. 18526—April 23, 1991. Effective: May 23, 1991).**

S5.1.1.2 The following locations are added to the lists specified in ANS Z26 in which item 4, item 5, item 8 and item 9 safety glazing may be used:

(a)-(i) **[Reserved]**

(j) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(k) Windows and doors in slide-in campers and pickup covers.

(l) Windows and doors in buses except for the windshield, windows to the immediate right or left of the driver, and rearmost windows if used for driving visibility.

(m) For Item 5 safety glazing only: Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

S5.1.1.3 The following locations are added to the lists specified in ANS Z26 in which item 6 and item 7 safety glazing may be used:

(a)-(i) **[Reserved]**

(j) Windows and doors in motorhomes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

(k) Windows, except forward-facing windows, and doors in slide-in campers and pickup covers.

(l) For item 7 safety glazing only:

(1) Standee windows in buses.

(2) Interior partitions.

(3) Openings in the roof.

S5.1.1.4 The following locations are added to the lists specified in ANS Z26 in which item 8 and item 9 safety glazing may be used:

(a)-(e) **[Reserved]**

(f) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(g) Windows and doors in slide-in campers and pickup covers.

S5.1.1.5 The phrase "readily removable" window as defined in ANS Z26, for the purposes of this standard, in buses having a GVWR of more than 10,000 pounds, shall include pushout windows and windows mounted in emergency exits that can be manually pushed out of their location in the vehicle without the use of tools, regardless of whether such windows remain hinged at one side to the vehicle.

S5.1.1.6 Multipurpose passenger vehicles.

Except as otherwise specifically provided by this standard, glazing for use in multipurpose passenger vehicles shall conform to the requirements for glazing for use in trucks as specified in ANS Z26.

S5.1.1.7 Test No. 17 is deleted from the list of tests specified in ANS Z26 for item 5 glazing material and Test No. 18 is deleted from the lists of tests specified in ANS Z26 for item 3 and item 9 glazing material.

S5.1.2 In addition to the glazing materials specified in ANS Z26, materials conforming to S5.1.2.1, S5.1.2.2, S5.1.2.3 or S5.1.2.4 may be used in the locations of motor vehicles specified in those sections.

S5.1.2.1 Item 11C—Safety Glazing Material for Use in Bullet Resistant Shields.

Bullet resistant glazing that complies with Test Nos. 2, 17, 19, 20, 21, 24, 27, 28, 29, 30 and 32 of ANS Z26 and the labeling requirements of S5.1.2.5 may be used only in bullet resistant shields that can be removed from the motor vehicle easily for cleaning and maintenance. A bullet resistant shield may be used in areas requisite for driving visibility only if the combined parallel luminous transmittance with perpendicular incidence through both the shield and the permanent vehicle glazing is at least 60 percent.

S5.1.2.2 Item 12—Rigid plastics.

Safety plastics materials that comply with Test Nos. 10, 13, 16, 19, 20, 21 and 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5, may be used in a motor vehicle only in the following specified locations at levels not requisite for driving visibility.

(a) Windows and doors in slide-in campers and pickup covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield and windows to the immediate right or left of the driver.

(h) Windows and doors in buses except for the windshield and window to the immediate right and left of the driver.

S5.1.2.3 Item 13—Flexible plastics.

Safety plastic materials that comply with Tests Nos. 16, 19, 20, 22, and 23 or 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5 may be used in the following specific locations at levels not requisite for driving visibility.

(a) Windows, except forward-facing windows, and doors in slide-in campers and pick-up covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

S5.1.2.4 Item 14—Glass Plastics.

[Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.10 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in S5.1.2.9, *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle, except that it may not be used in windshields of any of the following vehicles: convertibles, vehicles that have no roof, vehicles whose roofs are completely removable.

S5.1.2.5. Item 15A—Annealed Glass-Plastic for Use in All Positions in a Vehicle Except the Windshield.

[Glass-plastic glazing materials that comply with Test Nos. 1, 2, 3, 4, 9, 12, 16, 17, 18, 19, 24, and 28, as those tests are modified in S5.1.2.9, *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle except the windshield.

[**S5.1.2.6 Item 15B—Tempered Glass-Plastic for Use in All Positions In a Vehicle Except the Windshield.** Glass-plastic glazing materials that comply with Tests Nos. 1, 2, 3, 4, 6, 7, 8, 16, 17, 18, 19, 24, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics*, may be used anywhere in a motor vehicle except the windshield. **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)]**

S5.1.2.7 Item 16A—Annealed Glass-Plastic For Use In All Positions In a Vehicle Not Requisite For Driving Visibility.

Glass-plastic glazing materials that comply with Test Nos. 3, 4, 9, 12, 16, 19, 24, and 28, as those tests are modified in S5.1.2.9 Test Procedures for Glass-Plastics, may be used in a motor vehicle in all locations not requisite for driving visibility.

S5.1.2.8 Item 16B—Tempered Glass-Plastic For Use In All Positions In A Vehicle Not Requisite For Driving Visibility.

Glass-plastic glazing materials that comply with Test Nos. 3, 4, 6, 7, 8, 16, 19, 24, and 28, as those tests are modified in S5.1.2.9 Test Procedures for Glass-Plastics, may be used in a motor vehicle in all locations not requisite for driving visibility.

S5.1.2.9 Test Procedures for Glass-Plastics.

(a) Tests Nos. 6, 7, 8, 9, 12, 16, and 18 shall be conducted on the glass side of the specimen, i.e., the surface which would face the exterior of the vehicle. Tests Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For Test No. 19, add the following to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10% or less than 5% by weight and ammonium hydroxide no greater than 5% or less than 1% by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of −40 °C (±5 °C), which is equivalent to −40 °F (±9 °F), for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentage of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

[(e)(1) Except as provided in S5.1.2.9(e)(2), glass-plastic glazing specimens tested in accordance with Test Nos. 9, 12 and 26 shall be clamped in the test fixture in Figure 1 of this standard in the manner shown in that figure. The clamping gasket shall be made of rubber 3 millimeters (mm) thick of hardness 50 IRHD (International Rubber Hardness Degrees), plus or minus five degrees. Movement of the test specimen, measured after the test, shall not exceed 2 mm at any point along the inside periphery of the fixture. Movement of the test specimen beyond the 2 mm limit shall be considered an incomplete test, not a test failure. A specimen used in such an incomplete test shall not be retested.

(2) At the option of the manufacturer, glass-plastic glazing specimens tested in accordance with Test Nos. 9 and 12 may be tested unclamped. Such specimens shall be tested using the fixture in Figure 1 of the standard, including the upper frame (unclamped) which holds the specimen in place.

S5.1.2.10 Cleaning instructions.

(a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, [S5.1.2.6,] S5.1.2.7, or S5.1.2.8 shall affix a label, removable by hand without tools, to each item of such glazing material. **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)**

(b) Each manufacturer of glazing materials' designed to meet the requirements of paragraphs S5.1.2.4, S5.1.2.5, [S5.1.2.6,] S5.1.2.7, or S5.1.2.8 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than 1/4 high, the following words, GLASS PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS. **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)**

S5.2 Edges.

In vehicles except school buses, exposed edges shall be treated in accordance with accordance with SAE Recommended Practice J673a, "Automotive Glazing," August 1967. In school buses, exposed edges shall be banded.

S6. Certification and marking.

S6.1 The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.6, S5.1.2.7, and S5.1.2.8 shall be identified by the marks "AS 11C", "AS 12", "AS 13", "AS 14", "AS 15A", ["AS 15B",] "AS 16A", and "AS 16B", respectively. **(57 F.R. 30161—July 8, 1992—Effective: August 7, 1992)**

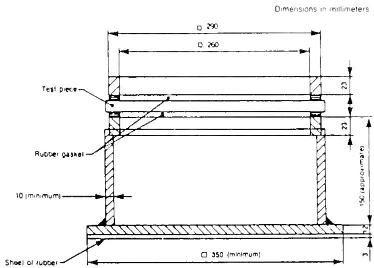

Figure 1—Test Fixture for Clamped Specimens

S6.2 Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed as a component of any specific motor vehicle or camper, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act of 1966, by adding to the mark required by S6.1 in letters and numerals of the size specified in section 6 of ANS Z26, the symbol "DOT" and a manufacturer's code mark, which will be assigned by the NHTSA on the written request of the manufacturer.

S6.3 Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed to be cut into components for use in motor vehicles or items of motor vehicle equipment, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act.

S6.4 Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall mark that material in accordance with section 6 of ANS Z26.

S6.5 Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall certify that his product complies with this standard in accordance with section 114 of the National Traffic and Motor Vehicle Safety Act.

37 F.R. 12237
June 21, 1972

PREAMBLE TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles, and Trucks

(Docket No. 2–16)

A proposal to further amend Federal Motor Vehicle Safety Standard No. 206, extending its applicability to multipurpose passenger vehicles and trucks, was published in the *Federal Register* on December 28, 1967 (32 F.R. 20868).

Interested persons have been afforded an opportunity to participate in the making of this amendment. Their comments and other available information have been carefully considered.

Ejection from passenger cars and trucks, upon impact, has proven to be a primary cause of occupant injury and death. Standard No. 206 was issued to minimize the likelihood of occupants being thrown from passenger cars by providing, among other things, load requirements for door latches and door hinge systems. A study conducted by the Cornell Aeronautical Laboratory disclosed that the rate of occupant ejection from trucks is almost twice that of recent-model passenger cars. Moreover, the study revealed that the rate of severe and fatal injuries among truck drivers who have been thrown from vehicles is four times that of drivers who remained in the vehicle after impact. Extending the requirements of Standard 206 to trucks and multipurpose passenger vehicles clearly meets the need for motor vehicle safety. This conclusion is concurred in generally by the commenters.

Several changes have been made in the text of the standard from that which appeared in the Notice of Proposed Rule Making. The title of the standard has been changed to more accurately describe the items dealt with in the standard. In addition, in response to some of the comments submitted, the category of side doors previously referred to as "hinged doors" has been divided into two new groups—"hinged cargo-type doors" and "hinged doors except cargo-type doors," and separate load requirements and demonstration procedures have been prescribed for each. In light of other comments submitted, the demonstration procedure for "sliding doors" has also been changed for reasons of practicability. Further, a definition of the term "cargo-type doors" has been inserted in the standard. The term "temporary doors" referred to and defined in the notice has been deleted. Finally, several other changes have been made for clarification purposes only.

No multipurpose passenger vehicle manufacturer objected to the proposed effective date of this amendment, January 1, 1970. On the other hand, one heavy truck manufacturer specifically objected to the proposed effective date on the ground that additional lead time would be needed to redesign, test, and retool, in order to comply with the amended standard. Several other truck manufacturers also considered the lead time to be insufficient. A January 1, 1972 effective date for trucks was proposed by the aforesaid heavy truck manufacturer. The Administrator concludes that there is merit to his objection. Heavy truck manufacturers will require more time than was originally anticipated to take the steps necessary to comply with the standard. Accordingly, the effective date of this amendment, insofar as trucks are concerned, is extended to January 1, 1972.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 206, as amended, 49 C.F.R. § 371.21, is amended to read as set forth below, effective January 1, 1970, for passenger cars and multipurpose passenger vehicles, and January 1, 1972, for trucks.

Effective: January 1, 1970
January 1, 1972

This rule-making action is taken under authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority contained in Part I of the Regulations of the Office of the Secretary of Transportation (49 CFR 1.4(c)).

Issued on January 17, 1969.

Lowell K. Bridwell,
Federal Highway Administrator

34 F.R. 1150
January 24, 1969

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles and Trucks

(Docket No. 2–16)

Federal Motor Vehicle Safety Standard No. 206 (49 CFR 371.21), as amended (34 F.R. 1151), specifies strength requirements for door locks and door retention components on passenger cars, multipurpose passenger vehicles, and trucks.

Paragraph S4. of Standard 206 exempts components of detachable doors for vehicles manufactured for use without doors from the requirements of the standard. This was done because such doors are provided not for the purpose of retaining the driver and passengers in case of collision but only as protection from inclement weather.

One manufacturer has noted that strength requirements are equally inapplicable to components of folding and roll-up doors and has petitioned for an amendment which would treat such doors in the same manner as detachable doors. It has been determined that the petition has merit. Accordingly, the standard is amended to remove folding and roll-up doors from the requirements of the standard.

In consideration of the foregoing, paragraph S4. of Federal Motor Vehicle Safety Standard No. 206 is amended to read as follows:

S4. *Requirements.* Side door components referred to herein shall conform to this standard if any portion of a 90-percentile two-dimensional manikin as described in SAE Practice J826, when positioned at any seating reference point, projects into the door opening area on the side elevation or profile view. Components on folding doors, roll-up doors and doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors need not conform to this standard.

* * * * *

Correction: The paragraph title "S5.2.3 "*Sliding Doors*" of Federal Motor Vehicle Safety Standard No. 206 is changed to read "S5.3 *Sliding Doors*".

Since this amendment relaxes a requirement and imposes no additional burden on any person, notice and opportunity to comment thereon are unnecessary, and it becomes effective on publication in the *Federal Register.* This notice of amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the Federal Highway Administrator, 49 CFR 1.4(c).

Issued on August 14, 1969.

F. C. Turner
Federal Highway Administrator

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO 206

Door Locks and Retention Components

(Docket No. 71–5; Notice 2)

The purpose of this notice is to amend Standard No. 206, Door Locks and Door Retention Components, to require that all side doors leading into a passenger compartment containing one or more seating accommodations meet the requirements of the standard, regardless of seat location or whether the seats are within the definition of designated seating positions. This notice also amends the standard to make clear the distinction between front and rear doors.

I. A notice of proposed rulemaking proposing the extension of the requirements of the standard to all side doors leading into passenger compartments was published in the Federal Register on February 3, 1971 (36 F.R. 1913). The three comments which were received in response to the notice were carefully considered. All of them supported the proposed amendment. The amendment in this notice is identical to the proposed amendment except for the effective date. That date has been changed to September 1, 1972 to permit adequate time for compliance.

II. The standard specifies in S4.1.3 different door lock requirements for front and rear doors. The Standard does not, however, precisely differentiate between these two types of doors. The problem of determining whether a door is to be treated as a front door or rear door arises particularly in connection with multipurpose passenger vehicles having a single right side door.

To clarify the application of the requirements of S4.1.3, this notice amends the Standard by adding the word "Side" to the titles of S4.1.3.1 and S4.1.3.2 and by adding definitions of "Side front door" and "Side rear door" to S3. The definitions adopt, as the reference point for differentiating between front and rear doors, the rearmost point on the driver's seatback, when the driver's seat is adjusted to its most vertical and rearward position. A door with 50 percent or more of its opening area in a side view forward of that point is a "side front door". A door with more than 50 percent of its opening area in a side view to the rear of that point is a "side rear door".

These amendments to Standard No. 206 are clarifying and interpretive in nature. Consequently, it is found that notice and opportunity to comment are unnecessary and that, for good cause shown, an effective date earlier than 30 days after issuance is in the public interest.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 206, § 571.206 of title 49, Code of Federal Regulations, is amended ....

Effective dates: Amendment 1. concerning the application of the standard is effective September 1, 1972. Amendment 2. through 4. concerning the distinction between front and rear doors are effective January 8, 1972.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on January 4, 1972.

Douglas W. Toms
Administrator

37 F.R. 284
January 8, 1972

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components

[Docket No. 84-09; Notice 2]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 206, *Door Locks and Door Retention Components*, to expand the list of doors that need not conform to the requirements of the standard. Added to the list are doors with wheelchair lifts that are provided with an audible or visual alarm which signals the driver when the door is unsecured and the ignition is in the "on" position. When in its stowed position, a wheelchair lift barricades the door and prevents occupant ejection from the vehicle if the door were to open while the vehicle is in motion or involved in a collision. The alarm ensures that the wheelchair lift is in its retracted position and the door is shut while the vehicle is in operation. This final rule completes a rulemaking action commenced when a manufacturer requested an exemption from the requirements of Standard No. 206.

EFFECTIVE DATE: July 25, 1985.

SUPPLEMENTARY INFORMATION: Paragraph S4 of Federal Motor Vehicle Safety Standard (FMVSS) No. 206, *Door Locks and Door Retention Components*, excludes from its requirements components on folding doors, roll-up doors, and doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors. Thomas Built Buses, Inc., (hereinafter referred to as "Thomas") requested that Standard No. 206 be amended to exclude from its requirements multipurpose passenger vehicles which are equipped with wheelchair lifts and which are designed for wheelchair occupants.

On September 26, 1984, the agency published a notice of proposed rulemaking (NPRM) in the *Federal Register* (49 FR 37813) which proposed to exclude from the standard's requirements doors with wheelchair lifts that are provided with audible alarms. The notice explained that the agency was proposing to expand the list of excluded doors to include side doors equipped with wheelchair lifts and audible alarms because the wheelchair lifts barricade the door of the vehicle if the door were to open while the vehicle is in motion or involved in a collision. The agency believed that it was unnecessary to require these doors to comply with the requirements of the standard, since the lifts would prevent ejection of the vehicle's occupants, and since there would be an alarm which would ensure that the door is closed and the lift is in its retracted position.

The NPRM explained that wheelchair lifts are designed so that they are secured in the retracted position by either hydraulic pressure in the extension/retraction cylinders and mechanical latches, or by electrically operated drive mechanisms. Metal grate floors of lifts are stowed in a vertical position parallel to and in close proximity with the interior surface of the door of the vehicle. In its retracted position, the wheelchair lift could provide an adequate barrier to occupant ejection from the vehicle if the door were to open while the vehicle is in motion or involved in a collision. An alarm system which is activated if the door is opened while the ignition is in the "on" position would ensure that the wheelchair lift is in its retracted position and the door is shut while the vehicle is in operation.

One comment to the proposal was received by the agency. The commenter generally supported the proposed amendment but suggested two changes. The first suggestion was that a visual alarm, such as a flashing visible signal located in the driver's compartment, be allowed as an alternative to the audible alarm proposed by the NPRM. The commenter explained that an audible alarm which is activated the entire time the lift door is open could be disturbing to special-education passengers.

The agency agrees that a visual alarm conspicuous to the driver would ensure that the wheelchair-lift door is latched and secured. This meets the intent of the requirement for an alarm system, and accommodates the needs of special-education passengers. This final rule thus adopts the first of the commenter's requested changes by allowing an alarm system consisting of either a visual signal located in the driver's compartment, or an alarm audible to the driver.

The second change requested by the commenter was that the amendment apply to all wheelchair-lift doors whether or not a lift is installed at the time the vehicle is certified. The commenter explained that it is common in the industry for a vehicle manufacturer to build and deliver a vehicle to a distributor with just the lift door installed. The distributor then installs the wheelchair lift prior to delivery to the purchaser.

The agency does not agree that this change should be made to Standard No. 206. This amendment exempts doors equipped with wheelchair lifts and alarm systems because the lifts in their retracted position provide an adequate barrier to occupant ejection if the door were to open while the vehicle is in operation or involved in a collision. The agency believes that manufacturers should be prohibited from certifying their vehicles as complying with FMVSS No. 206 if the doors of those vehicles do not contain wheelchair lifts and alarm systems or locks and door-retention components which conform to Standard No. 206.

The agency notes that under NHTSA's requirements set forth in 49 CFR Part 568, *Vehicles Manufactured in Two or More Stages*, the commenter, as the incomplete-vehicle manufacturer, is not prohibited from delivering the vehicle to the distributor without the lift installed. Under Part 568, the distributor or other person installing the lift would be considered the final-stage manufacturer. The incomplete-vehicle manufacturer must furnish a document that explains the specific conditions of final manufacture under which the completed vehicle will conform to the applicable safety standards, which would include FMVSS No. 206. As the final-stage manufacturer, the distributor can install the lift and certify the vehicle as complying with all applicable safety standards.

The agency has considered the comments on the NPRM and has amended FMVSS No. 206 to exclude from the requirements of the standard doors which contain wheelchair lifts that are provided with an alarm system consisting of either a flashing visible signal located in the driver's compartment or an alarm audible to the driver, which is activated when the door is open. The alarms must be sufficient to alert the driver when the door is open, i.e., the audible alarm must be loud enough to be heard and the visual alarm must be conspicuous and located in the driver's compartment. This amendment excludes such doors on passenger cars, multipurpose passenger vehicles, such as vans, and trucks.

Part 571-Federal Motor Vehicle Safety Standards
§571.206 [Amended]

In consideration of the foregoing, 49 CFR 571.206, *Door Locks and Door Retention Components*, is amended as follows:

S4 is revised to read as follows:

* * * * *

S4. *Requirements.* Components on any side door leading directly into a compartment that contains one or more seating accommodations shall conform to this standard. However, components on folding doors, roll-up doors, doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors, and side doors which are equipped with wheelchair lifts and which are linked to an alarm system consisting of either a flashing visible signal located in the driver's compartment or an alarm audible to the driver which is activated when the door is open, need not conform to this standard.

Issued on March 21, 1985.

Diane K. Steed
Administrator

50 FR 12029
March 27, 1985

MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles, and Trucks

S1. Purpose and scope. This standard specifies requirements for side door locks and side door retention components including latches, hinges, and other supporting means, to minimize the likelihood of occupants being thrown from the vehicle as a result of impact.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, and trucks.

S3. Definitions. "Cargo-Type Door" means a door designed primarily to accommodate cargo loading including, but not limited to, a two-part door that latches to itself.

"Side front door" means a door that in a side view, has 50 percent or more of its opening area forward of the rearmost point on the driver's seatback, when the driver's seat is adjusted to its most vertical and rearward position.

"Side rear door" means a door that, in a side view, has more than 50 percent of its opening area to the rear of the rearmost point on the driver's seatback, when the driver's seat is adjusted to its most vertical and rearward position.

S4. Requirements. [Components on any side door leading directly into a compartment that contains one or more seating accommodations shall conform to this standard. However, components on folding doors, roll-up doors, doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors, and side doors which are equipped with wheelchair lifts and which are linked to an alarm system consisting of either a flashing visible signal located in the driver's compartment or an alarm audible to the driver which is activiated when the door is open, need not conform to this standard. (50 F.R. 12031—March 27, 1985. Effective: July 25, 1985)]

S4.1 Hinged Doors, Except Cargo-Type Doors.

S4.1.1 Door Latches. Each door latch and striker assembly shall be provided with two positions consisting of—

(a) A fully latched position; and

(b) A secondary latched position.

S4.1.1.1 Longitudinal Load. The door latch and striker assembly, when in the fully latched position, shall not separate when a longitudinal load of 2,500 pounds is applied. When in the secondary latched position, the door latch and striker assembly shall not separate when a longitudinal load of 1,000 pounds is applied.

S4.1.1.2 Transverse Load. The door latch and striker assembly, when in the fully latched position, shall not separate when a transverse load of 2,000 pounds is applied. When in the secondary latched position, the door latch and striker assembly shall not separate when a transverse load of 1,000 pounds is applied.

S4.1.1.3 Inertia Load. The door latch shall not disengage from the fully latched position when a longitudinal or transverse inertia load of 30g is applied to the door latch system (including the latch and its actuating mechanism with the locking mechanism disengaged).

S4.1.2 Door Hinges. Each door hinge system shall support the door and shall not separate when a longitudinal load of 2,500 pounds is applied. Similarly, each door hinge system shall not separate when a transverse load of 2,000 pounds is applied.

S4.1.3 Door Locks. Each door shall be equipped with a locking mechanism with an operating means in the interior of the vehicle.

S4.1.3.1 Side Front Door Locks. When the locking mechanism is engaged, the outside door handle or other outside latch release control shall be inoperative.

S4.1.3.2 Side Rear Door Locks. In passenger cars and multipurpose passenger vehicles, when the locking mechanism is engaged, both the outside and inside door handles or other latch release controls shall be inoperative.

S4.2 Hinged Cargo-Type Doors.

S4.2.1 Door Latches.

S4.2.1.1 Longitudinal Load. Each latch system, when in the latched position, shall not separate when a longitudinal load of 2,500 pounds is applied.

S4.2.1.2 Transverse Load. Each latch system, when in the latched position, shall not separate when a transverse load of 2,000 pounds is applied. When more than one latch system is used on a single door, the load requirement may be divided among the total number of latch systems.

S4.2.2 Door Hinges. Each door hinge system shall support the door and shall not separate when a longitudinal load of 2,500 pounds is applied, and when a transverse load of 2,000 pounds is applied.

S4.3 Sliding Doors. The track and slide combination or other supporting means for each sliding door shall not separate when a total transverse load of 4,000 pounds is applied, with the door in the closed position.

S5. Demonstration Procedures.

S5.1 Hinged Doors, Except Cargo-Type Doors.

S5.1.1 Door Latches.

S5.1.1.1 Longitudinal and Transverse Loads. Compliance with paragraphs S4.1.1.1 and S4.1.1.2 shall be demonstrated in accordance with paragraph 4 of Society of Automotive Engineers Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965.

S5.1.1.2 Inertia Load. Compliance with S4.1.1.3 shall be demonstrated by approved tests or in accordance with paragraph 5 of SAE Recommended Practice J839b, May 1965.

S5.1.2 Door Hinges. Compliance with S4.1.2 shall be demonstrated in accordance with paragraph 4 of SAE Recommended Practice J934, "Vehicle Passenger Door Hinge Systems," July 1965. For piano-type hinges, the hinge spacing requirements of SAE J934 shall not be applicable and arrangement of the test fixture shall be altered as required so that the test load will be applied to the complete hinge.

S5.2 Hinged Cargo-Type Doors.

S5.2.1 Door Latches. Compliance with S4.2.1 shall be demonstrated in accordance with paragraphs 4.1 and 4.3 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965. An equivalent static test fixture may be substituted for that shown in Figure 2 of SAE J839, if required.

S5.2.2 Door Hinges. Compliance with S4.2.2 shall be demonstrated in accordance with paragraph 4 of SAE Recommended Practice J934, "Vehicle Passenger Door Hinge Systems," July 1965. For piano-type hinges, the hinge spacing requirement of SAE J934 shall not be applicable and arrangement of the test fixture shall be altered as required so that the test load will be applied to the complete hinge.

S5.3 Sliding Doors. Compliance with S4.3 shall be demonstrated by applying an outward transverse load of 2,000 pounds to the load bearing members at the opposite edges of the door (4,000 pounds total). The demonstration may be performed either in the vehicle or with the door retention components in a bench test fixture.

34 F.R. 1150
January 24, 1969

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD 207

Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses (Docket No. 2–12; Notice No. 3)

The purpose of this amendment to Motor Vehicle Safety Standard No. 207 is to extend its application to multipurpose passenger vehicles, trucks and buses, to require a seat to remain in its adjusted position during load application, and to clarify and restructure the standard.

A notice of proposed rulemaking on the subject of amending Motor Vehicle Safety Standard No. 207, and extending it to multipurpose passenger vehicles, trucks and buses was published on September 20, 1969 (34 F.R. 14661).

The need for adequately anchored seating is clear. A seat that tears loose on impact adds to the hazards that are inherent in crash situations. Each seat must remain in place if it is to afford any protection to its occupant. Standard No. 207 accordingly established strength requirements for the anchorage of occupant seats, required that a means be provided for keeping folding seats and seat backs in place, and prescribed strength requirements for seat backs and seat back restraints. The proposal to extend the standard's application to additional types of vehicles is part of an overall effort to afford occupants of these vehicles protection equal to that now available to occupants of passenger cars. The extension of Standard No. 207 is closely allied with the extension of standards for seat belt installation (208) and anchorages (210) to these other vehicle types.

Most of the comments favored the extended application of the standard. Some persons who objected voiced the fear that the seat system requirements would eliminate some seating configurations in multipurpose passenger vehicles and walk-in van-type trucks. Although manufacturers of these vehicles may have to make design changes, it has been determined that strength and convenience in this case are not incompatible, and that the provision of adequate seats is not impracticable for such vehicles. It should also be noted that if a seat is not intended for use while the vehicle is in motion, and therefore provides no designated seating position under the amended definition of that term in section 571.3 of Title 49 CFR, the requirements of this standard do not apply to it.

Several respondents observed that the requirements of S4.2 that a seat sustain the required force "in each position to which it can be adjusted" would impose a substantial burden on power seats, whose "positions" may be very numerous. The intent of the paragraph is to insure that a seat would be able to sustain the specified force in any position that is usable in actual operations, although the manufacturer may choose to test it only in its most vulnerable positions. Thus, the manufacturer may use whatever means are at his disposal to meet the minimum requirements; the standards are not intended to dictate either the nature or the quantity of manufacturer testing. The requirement has been reworded slightly and language has been added to make it clear that the force specified by subparagraph (d) is applied to the seat only in the rearmost position.

The requirement that the seat withstand the load without leaving its adjusted position has been retained, but in response to another group of comments it has been decided to allow nonlocking suspension type seats to travel normally during application of the loads required by S4.2. Any other method of testing would not accurately reflect the actual performance characteristics of such seats.

Several comments questioned the utility of requiring a seat back restraint release to be readily accessible if its use is not required for normal exit from the vehicles. There appears to be merit to this argument with respect to the need for rear seat occupants to use the release and the paragraph has been altered accordingly.

One comment stated that subparagraph S4.3.2.1 of the proposal should be amended to require the restraint on a rearward-facing seat to withstand a rearward load equal to eight times the weight of the pivoting or folding portion of the seat. This suggestion has merit, and the subparagraph has been amended by the addition of a new subparagraph dealing expressly with rearward-facing seats.

Several comments requested that addition of language permitting "approved physical demonstrations" or "approved dynamic tests" in place of the static loading requirements in S4.2 and S4.3. For several reasons, that language has not been added to the amended Standard No. 207. The Bureau adheres to the procedures specified in the standard in its own testing, and it is therefore essential that the procedures be set forth with precision. However, if a manufacturer develops test procedures which are equal to those in the standard, in the sense that the results can be accurately correlated with the standard's requirements, nothing in the Act or in the standard prevents him from using his tests to determine that his product conforms to the standard. The Bureau wishes to encourage new developments in the field of testing, and does not intend that the amended standard should inhibit them.

The proposal has been further changed by incorporating the substance of the test procedures in SAE J879b into the text of the standard and by adopting the accompanying drawings as figures 1-5 of the standard.

Effective date: January 1, 1972.

Several comments indicated that the proposed effective date of January 1, 1971, would leave many manufacturers unable to comply, particularly with respect to multipurpose passenger vehicles and trucks. Therefore, it has been determined that there is good cause for specifying an effective date more than 1 year after the date of publication.

Issued on September 23, 1970.

Charles H. Hartman,
Acting Director.

35 F.R. 15290
October 1, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 207

Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses (Docket No. 2–12; Notice No. 4)

An amendment to Motor Vehicle Safety Standard No. 207, Seating Systems, was published on October 1, 1970 (35 F.R. 15290). Thereafter, pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119), petitions for reconsideration were filed by the Ford Motor Company and Rolls Royce, Ltd.

The petition of Rolls Royce, Ltd., sought to amend § S4.2.1, *Seat adjustment*, to permit a displacement of 2 inches during the application of the required force. The company stated that such an allowance was necessary to accommodate power seats that are continuously adjustable. Although the Administration has determined that it is not advisable to permit a specific displacement, the special circumstances of the power seat warrant a more explicit interpretation of the term "adjusted position" as employed in the standard.

Some types of manual adjustment device have a small amount of slack, that is detected during the test procedure but is not an indication of incipient failure and is therefore not considered to affect the conformity of the system. In reviewing the characteristics of power adjustment devices, the Administration has concluded that some similar amount of slack may exist in such systems and that it should not be the basis for a finding of non-conformity. The Administration will consider a continuously adjustable power seat to have remained in its adjusted position despite some movement, if the movement is small and if it has stopped as the maximum required force level is reached.

The substance of the Ford petition was that the requirement for the seat back release control to be accessible to an occupant of the seat is not appropriate if the occupant does not need to use it to exit from the vehicle. This point was illustrated by the case of a seat in a truck cab that folds for access to a storage compartment. The Administration has determined that the situation used by Ford to illustrate its case is a situation in which relief from the requirement should be granted, but that where there is a seating position behind the folding seat the release control should continue to be accessible to the occupant of the folding seat. This requirement has been a part of the standard from the outset, and by making the latch more easily usable makes it less likely to be intentionally defeated.

Ford also indicated that it understood the standard to require that the seat be releasable from each seating position on the seat. This is not a correct reading of the standard. The Administration's interpretation continues to be that the release conrol must be accessible to at least one occupant of each folding part of a seat.

In consideration of the foregoing, section S4.3.1, *Accessibility of release control*, in Standard No. 207, 49 CFR 571.21, is amended. . . .

Effective date: January 1, 1972.

Issued on April 14, 1971.

Douglas W. Toms,
Acting Administrator.

36 F.R. 7419
April 20, 1971

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 207

Seating Systems
[Docket No. 86-04; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standard No. 207, *Seating Systems,* to remove an unnecessary restrietion. The standard requires most folding seats to be equipped with a self-locking device for restraining the hinged or folding seat or seat back and with a specific control, such as a knob, lever, push button, etc., for releasing that restraining device. The purpose of the latter requirement is to ensure that the restraining device can be released to enable occupants seated behind such seats to exit the vehicle. The requirement was worded so it applied to a folding or hinged seat regardless of whether anyone can sit behind that seat. The agency concluded that this requirement was unnecessarily restrictive and is therefore amending the standard to make it clear that a specific control is not required if there are no seats behind the folding seat.

EFFECTIVE DATE: The amendment made by this rule is effective April 13, 1987.

SUPPLEMENTARY INFORMATION: Section S4.3 of Standard No. 207 requires hinged or folding occupant seats or occupant seat backs, with some exceptions, to be equipped with a self-locking device for restraining the hinged or folding seat or seat back and a specific control for releasing that restraining device. The purpose of the requirement for the self-locking device is to reduce the forces acting on an occupant of the seat in an accident by preventing the seat or seat back from folding onto the occupant. The purpose of the requirement for the control to release the restraining device is to ensure that occupants seated behind such seats are able to exit the vehicle. Section S4.3.1 specifies that if there is a designated seating position immediately behind a seat equipped with a restraining device, the control for releasing the device must be readily accessible to the occupant of the seat equipped with the device. That section also specifies that if access to the control is required in order to exit from the vehicle, the control must be readily accessible to the occupant of the designated seating position immediately behind the seat.

On July 2, 1986, NHTSA published in the *Federal Register* (51 FR 24176) a notice of proposed rulemaking (NPRM) to remove an unnecessary restriction resulting from the language of section S4.3. The agency noted that it had received a letter asking whether a proposed design would meet that section's requirements. The design was for a folding seat which would be installed between the driver's and assistant's seats in large trucks. When the seat back is folded down, the back of the seat could be used as a console box. When the seat back is raised, the seat back would automatically be locked. To fold the seat back after locking, one must lift the seat back manually, thereby raising a pivot, in order to release the folding seat back. A drawing included with the letter indicated that no seats would be located behind the folding seat, either immediately to the rear or to the sides.

The primary interpretation issue raised by the letter was whether section S4.3 required a specific control to release the restraining device for a folding seat even if no seats are located behind that folding seat. The language of section S4.3 was sufficiently broad to require a control in those circumstances. Since the purpose for requiring a specific control is to ensure that occupants in seats located behind folding seats are able to exit the vehicle, the agency tentatively concluded that the requirement should not apply if there are no such seats. Accordingly, NHTSA proposed to amend Standard No. 207 to provide an exception to the requirement that folding seats have a specific control for releasing the required restraining device. Under the proposal, a specific control was not to be required if there are no seats, i.e., no designated seating positions or auxiliary seating accommodations, behind the folding seat.

NHTSA received five comments on the NPRM. Chrysler, Ford, General Motors, and Volkswagen submitted comments agreeing with the proposal and its rationale.

The fifth commenter, Mr. Robert Schlegel, argued that the proposal should not apply to folding seats located in front of the cargo areas of station wagons, mini-vans, and certain sport cars. That commenter stated that while such areas are not designated for passenger travel, children often occupy the areas for short trips. That commenter urged that such passengers should be able to move the seat back forward, if necessary to exit the vehicle.

After carefully considering the comments, NHTSA is issuing a final rule along the lines of the proposal. A typographical error in the regulatory text, pointed out by Ford, has been corrected.

NHTSA shares Mr. Schlegel's concern for the safety of children and urges that parents and other drivers not permit children to travel in cargo areas, and instead ensure that the children are safely restrained in child safety seats or safety belts. To the extent that some children do travel in cargo areas, however, the agency does not believe that requiring specific controls to release the restraining device of folding seats located in front of such areas would result in any safety benefits. Children typically enter such areas by climbing over the forward seat or, for some vehicles, through a transverse rear door, and can thus easily exit the vehicle in one or both of these manners.

This amendment becomes effective in 30 days. Since the amendment does not impose any new requirements but instead relieves an unnecessary restriction, the agency finds good cause for an effective date within that time period.

The agency has analyzed this amendment and determined that it is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation regulatory policies and procedures. The agency has determined that the economic effects of this amendment are so minimal that a full regulatory evaluation is not required. Since the amendment relieves a restriction, it is conceivable that it will result in some minor, nonquantifiable cost savings.

In consideration of the foregoing, §571.207 is amended as follows:

S4.3 is revised to read as follows:

S4.3. *Restraining device for hinged or folding seats or seat backs.* Except for a passenger seat in a bus or a seat having a back that is adjustable only for the comfort of its occupants, a hinged or folding occupant seat or occupant seat back shall—

(a) be equipped with a self-locking device for restraining the hinged or folding seat or seat back, and

(b) if there are any designated seating positions or auxiliary seating accommodations behind the seat, either immediately to the rear or the sides; be equipped with a control for releasing that restraining device.

Issued on: Mar. 10, 1987

Diane K. Steed
Administrator

52 F.R. 7867
March 13, 1987

MOTOR VEHICLE SAFETY STANDARD NO. 207

Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 2-12; Notice No. 3)

S1. Purpose and scope. This standard establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibiilty of their failure by forces acting on them as a result of vehicle impact.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks and buses.

S3. Definition. "Occupant seat" means a seat that provides at least one designated seating position.

S4. Requirements.

S4.1 Driver seat. Each vehicle shall have an occupant seat for the driver.

S4.2 General performance requirements. When tested in accordance with S5, each occupant seat, other than a side-facing seat or a passenger seat on a bus, shall withstand the following forces:

(a) In any position to which it can be adjusted—20 times the weight of the seat applied in a forward longitudinal direction;

(b) In any position to which it can be adjusted—20 times the weight of the seat applied in a rearward longitudinal direction;

(c) For a seat belt assembly attached to the seat—the force specified in subparagraph (a), if it is a forward facing seat, or subparagraph (b), if it is a rearward facing seat, in each case applied simultaneously with the forces imposed on the seat by the seat belt assembly when it is loaded in accordance with section S4.2 of Federal Motor Vehicle Safety Standard No. 210; and

(d) In its rearmost position—a force that produces a 3,300 inch-pound moment about the seating reference point for each designated seating position that the seat provides, applied to the upper cross-member of the seat back or the upper seat back, in a rearward longitudinal direction for forward-facing seats and in a forward longitudinal direction for rearward-facing seats.

S4.2.1 Seat adjustment. Except for vertical movement of nonlocking suspension type occupant seats in trucks or buses, the seat shall remain in its adjusted position during the application of each force specified in S4.2.

S4.3 Restraining device for hinged or folding seats or seat backs. Except for a passenger seat in a bus or a seat having a back that is adjustable only for the comfort of its occupants, a hinged or folding occupant seat or occupant seat back shall be equipped with a self-locking device for restraining the hinged or folding seat or seat back and a control for releasing that restraining device.

S4.3.1 Accessibility of release control. If there is a designated seating position immediately behind a seat equipped with a restraining device, the control for releasing the device shall be readily accessible to the occupant of the seat equipped with the device and, if access to the control is required in order to exit from the vehicle, to the occupant of the designated seating position immediately behind the seat.

S4.3.2 Performance of restraining device.

S4.3.2.1 Static force.

(a) Once engaged, the restraining device for forward-facing seat shall not release or fail when a forward longitudinal force equal to 20 times the weight of the hinged or folding portion of the seat is applied through the center of gravity of that portion of the seat.

(b) Once engaged, the restraining device for a rearward facing seat shall not release or fail when a rearward longitudinal force equal to 8 times the weight of the hinged or folding portion of the seat is applied to the center of gravity of that portion of the seat.

S4.3.2.2 Acceleration. Once engaged, the restraining device shall not release or fail when the device is subjected to an acceleration of 20 g. in the longitudinal direction opposite to that in which the seat folds.

S4.4 Labeling. Seats not designated for occupancy while the vehicle is in motion shall be conspicuously labeled to that effect.

S5. Test procedures.

S5.1 Apply the forces specified in S4.2(a) and S4.2(b) as follows:

S5.1.1 If the seat back and the seat bench are attached to the vehicle by the same attachments, secure a strut on each side of the seat from a point on the outside of the seat frame in the horizontal plane of the seat's center of gravity to a point on the frame as far forward as possible of the seat anchorages. Between the upper ends of the struts place a rigid cross-member, in front of the seat back frame for rearward loading and behind the seat back frame for forward loading. Apply the force specified by S4.2(a) or S4.2(b) horizontally through the rigid cross-member as shown in Figure 1.

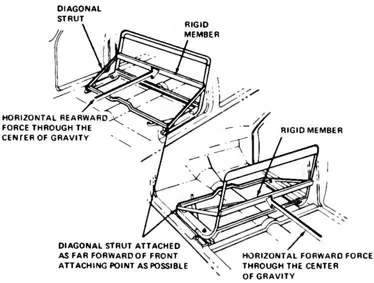

FIGURE 1

S5.1.2 If the seat back and the seat bench are attached to the vehicle by different attachments, attach to each component a fixture capable of transmitting a force to that component. Apply forces equal to 20 times the weight of the seat back horizontally through the center of gravity of the seat back, as shown in Figure 2, and apply forces equal to 20 times the weight of the seat

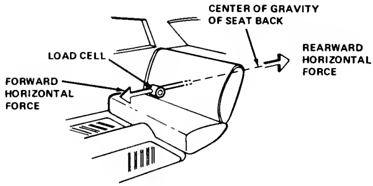

FIGURE 2

bench horizontally through the center of gravity of the seat bench, as shown in Figure 3.

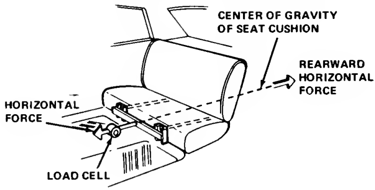

FIGURE 3

S5.2 Develop the moment specified in S4.2(d) as shown in Figure 4.

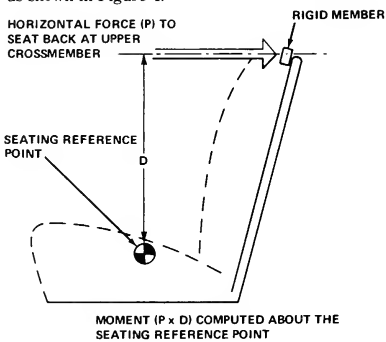

FIGURE 4

S5.3 Apply the forces specified in S4.3.2.1 (a) and (b) to a hinged or folding seat as shown in figure 1 and to a hinged or folding seat back as shown in Figure 5.

S5.4 Determine the center of gravity of a seat or seat component with all cushions and upholstery in place and with the head restraint in its fully extended design position.

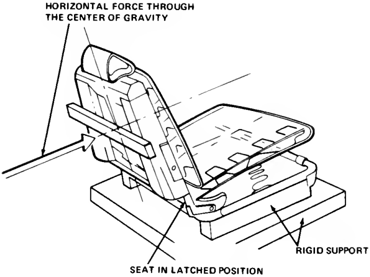

FIGURE 5

35 F.R. 15290
October 1, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

(Docket No. 69–7; Notice No. 9)

The purpose of this amendment to Standard No. 208, 49 CFR 571.21, is to specify occupant crash protection requirements for passenger cars, multipurpose passenger vheicles, trucks, and buses manufactured on or after January 1, 1972, with additional requirements coming into effect for certain of those vehicles on August 15, 1973, August 15, 1975, and August 15, 1977. The requirements effective for the period beginning on January 1, 1972, were the subject of a notice of proposed rulemaking published September 25, 1970 (35 F.R. 14941), and appear today for the first time in the form of a rule. The requirements for subsequent periods were issued in rule form on November 3, 1970 (35 F.R. 16927), and are reissued today in amended form as the result of petitions for reconsideration.

The substantive rulemaking actions that preceded this amendment are as follows:

(a) May 7, 1970 (35 F.R. 7187)—Proposed requirements and a schedule for the adoption of passive restraint systems and interim active systems.

(b) September 25, 1970 (35 F.R. 14941)—Proposal for a modified interim set of requirements effective January 1, 1972.

(c) November 3, 1970 (35 F.R. 16927)—Rule amending Standard No. 208 to specify requirements for passive restraints, effective July 1, 1973.

(d) November 3, 1970 (35 F.R. 16937)—Proposed additional requirements and conditions to be contained in Standard No. 208.

Following issuance of the November 3 amendment, petitions for reconsideration were filed pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119) by Japan Automobile Manufacturers Association, Inc., American Safety Belt Council, Peugeot, Inc., American Motors Corp., Volvo, Inc., Ford Motor Co., Chrysler, Chrysler United Kingdom, Ltd., International Harvester Co., Automobile Manufacturers Association, General Motors Corp., Volkswagen of America, Inc., Takata Kojyo Co., Ltd., Renault, Inc., American Motors (Jeep), Rolls-Royce, Ltd., American Safety Equipment Corp., Hamill Manufacturing Co., Energy Systems Division (Olin), American Association for Automotive Medicine, Checker Motors Corp., Eaton Yale and Towne, Inc., and the American Academy of Pediatrics.

Concurrently with the evaluation of the petitions, the Administration has reviewed the comments received in response to the September 25 and November 3 proposals, and the interim occupant protection requirements are combined herein with the requirements for later periods.

The standard establishes quantitative criteria for occupant injury, as determined by use of anthropomorphic test devices. For the head, the criterion is a severity index of 1,000, calculated according to SAE Information Report J885a; for the upper thorax, it is a deceleration of 60g except for a cumulative period of not more than 3 milliseconds; and for the upper legs it is an axial force of 1,400 pounds. A fourth criterion is that the test devices must be contained by the outer surfaces of the passenger compartment.

For systems that provide complete passive protection there are three vehicle impact modes in which a vehicle is required to meet the injury criteria. In the frontal mode, the vehicle impacts a fixed collision barrier perpendicularly or at any angle up to and including 30° in either direction from the perpendicular while traveling longitudinally forward at any speed up to 30 m.p.h. In the lateral mode, the vehicle is impacted on its side by a barrier moving at 20 m.p.h. In the rollover mode, the vehicle is rolled over from a speed of 30 m.p.h.

On January 1, 1972, a passenger car will be required to provide one of three options for occupant protection: (1) Passive protection system that meets the above injury criteria in all impact modes at all seating positions; (2) lap belts at all positions, with a requirement that the front outboard positions meet the injury criteria with lap-belted dummies in a 30-m.p.h. perpendicular barrier crash; or (3) lap-and-shoulder-belt systems at the front outboard positions that restrain test dummies in a 30-m.p.h. barrier crash without belt or anchorage failure, and lap belts in other positions.

Both the second and third options require warning systems that activate a visible and audible signal if an occupant of either front outboard position has not extended his lap belt to a specified length. Lap belts furnished under the second or third options must have emergency-locking or automatic-locking retractors at all outboard positions, front and rear. Shoulder belts furnished under the third option must have either manual adjustment or emergency-locking retractors.

On August 15, 1973, a passenger car will be required to provide one of two options for occupant protection: (1) Passive protection that meets the injury criteria in all impact modes at all seating positions; or (2) a system that provides passive protection for the front positions in a perpendicular frontal fixed barrier crash, that includes lap belts at all seating positions such that the injury criteria are met at the front positions both with and without lap belts fastened in a perpendicular frontal fixed barrier crash, and that has a seat belt warning system at the front outboard positions.

On and after August 15, 1975, a passenger car will be required to meet the injury criteria in all impact modes at all seating positions by passive means.

Multipurpose passenger vehicles and trucks with gross vehicle weight ratings of 10,000 pounds or less manufactured from January 1, 1972, to August 15, 1975, will have the option of meeting the injury criteria in all impact modes at all seating positions by passive means, or of providing a seatbelt assembly at each designated seating position. From August 15, 1975, to August 15, 1977, these vehicles will be required to meet one of the two options permitted passenger cars during the period August 15, 1973, to August 15, 1975. On and after August 15, 1977, they will be required to meet the full passive crash protection requirements that become effective for passenger cars on August 15, 1975. Forward control vehicles, however, may continue to use belt systems, and certain other specialized types of vehicles may continue to provide only head-on passive protection.

Multipurpose passenger vehicles and trucks with a GVWR of more than 10,000 pounds manufactured on or after January 1, 1972, will have the option of providing protection by passive means that meet all the crash protection requirements or of installing seat belt assemblies at all seating positions. Buses manufactured after January 1, 1972, will be required to provide one of these options for the driver's seating position.

The remainder of this preamble is separated into sections dealing with (I) the comments received in response to the September 25 proposal for the interim system, (II) the petitions for reconsideration of the November 3 rule on the requirements for later periods, and (III) the comments received and action taken pursuant to the November 3 proposal for additional requirements.

I. The September 25 proposal specified a series of options for occupant protection in passenger cars manufactured on or after January 1, 1972. Each option represented a significant advance over the level of protection afforded occupants by present seat belt systems. Upon consideration of comments requesting postponement of the requirements, it has been determined that compliance with one or another of the options by January 1, 1972, is reasonable and practicable. In response to the comments and other available information, however, certain changes have been made.

In the proposal, the first option consisted of a passive protection system that would meet the injury criteria at all seating positions in a 30 m.p.h. perpendicular frontal impact. A large number of respondents (to this notice and to others dealt with herein), both within and outside of the concerned industries, took the position that the requirements for installation of seat belts should not be dropped until the vehicles in question provided protection in angular, lateral, and rollover crash modes, in addition to the direct frontal mode. After detailed consideration of these arguments and other available data, it has been determined that the added cost of seatbelt systems is justified, even where vehicles provide passive frontal-impact protection. Accordingly, the first option, the only one under which manufacturers are allowed not to provide seat belts in their vehicles, requires a passive protection system that meets the injury criteria in all of the impact modes mentioned above.

The second option set forth in the proposal consisted of Type 1 seatbelt assemblies with a warning system at the front outboard positions and Type 1 or Type 2 assemblies at the other positions. The front outboard positions were either to meet the injury criteria in a perpendicular impact by use of the belts, or be protected by energy absorbing materials conforming to amended requirements proposed for Standards No. 201 and 203. The latter alternative was the subject of several adverse comments, and in the light of these comments and the tentative nature of the proposed amendments to Standards No. 201 and 203, the alternative has been deleted. As adopted, the option provides that the front outboard positions must meet the injury criteria in a perpendicular fixed barrier crash with the test dummies restrained by Type 1 belts only. The wording that a vehicle should have "either a Type 1 or a Type 2" seatbelt assembly under this option has been changed to refer simply to Type 1 (lap belt) assemblies. A manufacturer may at his option provide upper torso restraints, which do or do not attach to the lap belts. The essence of the second option, however, is that the vehicle be designed to provide protection with lap belts alone, in view of their much higher level of public use in comparison with lap-and-shoulder combinations. Vehicles under this option, therefore, must provide lap belts that are usable separately.

The third option proposed in the September 25 notice has been adopted with some changes. It consists of an improved combination of lap and shoulder belts in the front outboard seating positions, with lap belts in other positions. The belts and anchorages at the front outboard positions must be capable of restraining a dummy in a 30-m.p.h. frontal perpendicular impact without separtion of the belts or their anchorages.

The seatbelt warning system required under the second and third options has been modified somewhat in the light of the comments, to clarify the requirements and to restrict its operation to situations where the vehicle is likely to be in motion. The notice proposed that the system operate when the driver or right front passenger, or both, occupied the seat but did not fasten the belt about them. It was stated in several comments such systems operating through the buckle are relatively complex and that leadtime would be a significant problem. Upon evaluation of the comments, it has been decided to provide for warning system operation when the driver's belt is not extended to a length that will accommodate a 5th-percentile adult female, or when the right front passenger's seat is occupied and that belt is not extended far enough to fit a 50th-percentile 6-year-old. Keying the system to belt withdrawal is technologically simpler, and still provides protection against tampering. The notice had proposed that the system operate whenever the vehicle's ignition was in the "on" position. It was pointed out in the comments that situations arise in which the vehicle is at rest with the ignition on and the engine running, as when picking up or discharging passengers. To avoid the annoyance to vehicle occupants of the warning system in such situations, the standard provides that the system shall operate only if the ignition is in the "on" position and the transmission is in a drive position.

The seat belt system requirements have also been changed somewhat in response to comments. The notice had proposed to require retractors at all seating positions in those options specifying seat belts. Several comments stated tha the installation of retractors at inboard positions would require extensive redesign of bench-type seats. In the light of the low occupancy rate for the center seats, the difficulties in meeting the requirement, and the short leadtime available, the requirement for center-position retractors has been omitted.

The requirement that the shoulder and pelvic restraints be releasable at a single point by a pushbutton-type action has been retained. The Administration considers that single-point release is essential to the convenient operation of the seat belts, and that standardization of the buckle release device is also important, particularly in emergency situations. However, the additional requirement for one-hand fastening by the driver has been deleted. Adjustable bench seats would require major redesign in many cases, and it has been determined that the additional convenience afforded the driver would not be sufficient to justify the cost and leadtime problems that would result.

A number of comments noted that no dimensions were specified in the notice for the various occupants, and that there were no dimensions of this type in general use. To remedy the problem, the standard provides a table of dimensions for various sizes of adult occupants and 50th-percentile 6-year-olds. The latter set of dimensions has been adopted because of the availability of manikins at that size.

In response to several comments stating that the proposed 8-inch distance between the occupant's centerline and the intersection of the upper torso belt with the lap belt was too great, the distance has been reduced to 6 inches. It has been determined that a 6-inch distance will provide satisfactory protection and lessen the convenience problems that might be created with the greater distance.

II. With few exceptions, the petitions for reconsideration of the November 3 amendment requested that the requirement for mandatory passive protection be postponed. The length of postponement requested varied from 2 months to several years. After full consideration of the issues raised by the petitions, it has been decided to continue to require passive protection for the front seating positions of passenger cars in 1973. In order to ease the problem of model year scheduling, the date is changed from July 1, 1973, to August 15, 1973. The petitions did not offer sufficient reasons to change the Administration's position as set forth in previous notices in this docket, that passive protection systems are a vitally important step in reducing the death and injury toll on our highways, and that the relevant technology is sufficiently advanced to provide this basic protection, in accordance with the performance requirements and the time schedule that have been specified. The petitions that requested a postponement of all passive protection requirements beyond August 15, 1973, are therefore denied.

However, considerable data was presented in the petitions to the effect that the development of passive systems for the various impact modes has not proceeded at an equal rate. It appears that a number of manufacturers may be unable to comply with the lateral crash protection requirements in 1973. Accordingly, it has been decided to establish two restraint options for the front seating positions of passenger cars manufactured on or after August 15, 1973, and before August 15, 1975. A manufacturer may choose, first, to provide a passive system that meets the occupant crash protection requirements at all seating positions, in all impact modes. If he is unable to provide such full passive protection, he may choose to adopt a system that provides passive protection for the front occupants in a head-on collision, and also, includes a lap belt at each seating position with a seatbelt warning system for the front outboard positions. Under this option, the injury criteria must be met at each front position in a perpendicular barrier crash up to 30 m.p.h., both with and without the lap belts fastened. This option thus resembles the second option permitted during the interim period, except that the injury criteria must also be met with the test dummies unrestrained, and at the front center position as well as the front outboard positions.

The date on which a passenger car must provide passive means of meeting the injury criteria in a side impact is changed to August 15, 1975, to reflect the greater leadtime needed to develop such passive systems. To provide uniform phasing, and allow time for development of passive protection in the angular-impact and rollover modes, the effective date for these requirements is also set at August 15, 1975. Thus, after August 15, 1975, each passenger car must meet the crash protection requirements at each seating position in all impact modes by means that require no action by vehicle occupants.

Petitions of manufacturers of multipurpose passenger vehicles and trucks with GVWR of 10,000 pounds or less stated that the trucking industry as a whole would need additional time to assimilate the experience of passenger car manufacturers, before passive systems could be properly installed on their vehicles. The Administration has determined that additional leadtime is required for these vehicles. The standard accordingly provides that the protection required for passenger cars in 1973 will be required for multipurpose passenger vehicles and trucks with a GVWR of 10,000 pounds or less on August 15, 1975. The protection required for passenger cars on August 15, 1975, will be required of these vehicles on August 15, 1977.

The notice of proposed rulemaking published on November 3, 1970, proposed to make the passive protection requirements applicable to open-body type vehicles. Review of the comments and the petitions for reconsideration leads to the conclusion that this type of vehicle, along with convertibles, walk-in van-type vehicles, motor homes, and chassis-mount campers cannot be satisfactorily equipped with a complete passive protection system. Accordingly, the standard provides that only the head-on passive protection system required for passenger cars in 1973 will be required for each of these types on August 15, 1977, and thereafter. It has been further determined that it may not be feasible to provide passive protection in some forward control vehicles, and such vehicles are therefore permitted the option of providing seat belt assemblies at all seating positions.

A number of petitions objected to the requirement for a minimum speed below which a crash-deployed system may not deploy. Upon consideration of the petitions, it has been determined that it is preferable to allow manufacturers freedom in the design of their protective systems at all speeds, and this requirement is hereby deleted from the standard.

The injury criteria specified in the November 3 amendment were the subject of numerous petitions. The basic objections to the head injury criteria were that the 70g–3-millisecond requirement was too conservative, with respect to both acceleration levels and time factors. Review of these objections and a reevaluation of the information available to the Administration leads to the conclusion that the head injury criteria can be more appropriately based on the severity index described in the Society of Automotive Engineers Information Report J885(a), June 1966. Accordingly, the standard adopts as the criterion for head injury a severity index of 1,000 calculated by the method in the SAE report.

The severity index is based on biomechanical data derived from head injury studies and does not adapt itself readily to chest-injury usage. Several petitions stated that the chest injury criteria were set at too low a level. In some respects, a higher "g-level" on the chest actually increases the protective capabilities of the system, if properly designed, since it more effectively utilizes the available space in which the occupant can "ride down" the crash impact—an especially important factor in higher-speed crashes. Therefore, in accordance with data currently available, a chest tolerance level of 60g, except for a cumulative period of 3 milliseconds, is hereby adopted.

No data was received to support the contention of several petitioners that the upper leg load was too conservative. The maximum force level of 1,400 pounds appears well founded and is retained.

Several petitions objected to the condition that vehicles be tested at their gross vehicle weight rating. Under review of the appropriateness of this requirement for passenger cars and a review of loading patterns on trucks, it has been decided to alter the condition to specify that passenger cars are tested at a weight that represents their unloaded vehicle weight (recently defined in the *Federal Register* of Feb. 5, 1971, 36 F.R. 2511) plus the weight of rated cargo capacity and the specified number of test devices. Trucks are to be tested at a weight that approximates a half-loaded vehicle, with the load secured in the cargo area, plus the specified number of test devices.

The use of the anthropomorphic test device described in SAE J963 was objected to by several petitioners, on the grounds that further specifications are needed to ensure repeatability of test results. The Administration finds no sufficient reason to alter its conclusion that the SAE specification is the best available. The NHTSA is sponsoring further research and examining all available data, however, with a view to issuance of further specifications for these devices.

In response to other comments with respect to test conditions, the test devices' hand positions are adjusted to reduce apparent test variability. Also, the frequency filtration criteria of SAE Recommended Practice J211 have been substituted for the filtration criteria employed in the November 3 notice.

III. The notice of proposed rulemaking issued on November 3, 1970, dealt with several aspects of the occupant protection standard for which changes contemplated by the Administration, after review of the comments to the May 7 notice, were thought to require additional opportunity for comment. These aspects included a proposed deletion of the exemption from the rollover requirements previously proposed for open-body type vehicles, the raising of the low-velocity deployment requirement from 10 to 15 m.p.h., the establishment of requirements for the lateral component of head and chest acceleration, and the amendment of the test conditions for the lateral impact and rollover requirements.

Since the subject of low speed deployment and the question of exemptions were also the subjects of petitions for reconsideration under the November 3 rule, the disposition of these matters has been noted in the preceding section. For the reasons given therein, the low-velocity deployment requirement has been omitted, and the exemptions have been expanded to include forward control vehicles, convertibles, walk-in van-type trucks, motor homes, and chassis-mount campers. These type descriptions are in general use among manufacturers to describe vehicles sharing certain well-defined characteristics. Definitions of these types of vehicles may, as found necessary in the future, be added to § 571.3 *Definitions.*

Upon review of the comments and other information available to the Administration, it has been decided that the establishment of requirements for the lateral component of head and chest acceleration is not feasible at this time. However, it is anticipated that biomechanical studies will shortly provide data regarding lateral tolerances on which a requirement can be based and that rulemaking action will thereupon resume.

The conditions proposed for the lateral impact and rollover tests have been adopted as proposed without significant change. Comments on the lateral impact test revealed no significant support for a fixed barrier collision of the type proposed in the May 7 notice, although several recommended use of the moving barrier specified in SAE Recommended Practice J972 and others requested that the height of the barrier be lowered from 65 inches to 36–38 inches as specified in SAE J972. The decision to retain the test and barrier dimensions as proposed in the November 3 notice was made after a full review of the SAE procedures.

The test as adopted is considered to afford greater repeatability than the SAE procedure, which permits a much more complex interaction between the barrier and the impacted vehicle. The height of the barrier has been retained at 65 inches so that it will test the head impact protection afforded by the vehicle when struck by a surface extending to head height. Passenger compartment intrusion of the type that might result from use of a lower barrier is the subject of a separate rulemaking action on side door strength.

Some comments suggested that the wording of the proposed procedures, that the moving barrier undergo no deformation or nonlongitudinal movement, was unduly restrictive. The wording is not, however, intended to describe an actual test, but to establish the condition that the vehicle must be capable of meeting the stated requirements no matter how small the degree of deformation or nonlongitudinal movement of the barrier. This issue, in the case of the moving barrier, is thus analogous to that in the definition of "fixed collision barrier" (35 F.R. 11242, July 14, 1970). To more clearly reflect this position and the legal similarity of the two types of barriers, the word "significant" is added to the conditions relating to movement and deformation of the barrier.

Several comments stated that the rollover test would not produce repeatable results. Although refinements may be made in the procedure before the date on which rollover protection becomes mandatory, the Administration has determined that the test as adopted is more satisfactory than any other suggested thus far. The kinematics of a rollover type accident are such that variability in vehicle behavior may often be more visible than in other test procedures.

A number of other minor issues were raised by the petitions, and each has been carefully evaluated by the Administration. With respect to those objections and suggestions not specifically mentioned elsewhere in this notice, the petitions are hereby denied.

In light of the foregoing, Motor Vehicle Safety Standard No. 208 in § 571.21 of Title 49, Code of Federal Regulations, is amended . . . with effective dates as specified in the text of the standard.

Issued on March 3, 1971.

Douglas W. Toms,
Acting Administrator.

36 F.R. 4600
March 10, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 10)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection*, in § 571.21 of Title 49, Code of Federal Regulations. The petitions addressed herein are those dealing with seat belts and seat belt warning systems. A notice responding to petitions concerning the passive protection aspects of the standard will be issued shortly and the standard republished in its entirety at that time.

The standard as issued March 3, 1971 (36 F.R. 4600), established January 1, 1972, as the first date in the progressive stages of the Occupant Crash Protection requirements. Two petitioners, Mercedes–Benz and American Motors, requested a delay in the introduction of the interim protection systems. American Motors requested a delay until April 1, 1972, to allow for adequate compliance testing, and Mercedes requested a date of July 1, 1972, to avoid disruption of the 1972 model production which begins on July 1, 1971. Upon review of all available information, the NHTSA has concluded that the date is not unreasonably demanding, and the requests are denied.

The improved seat belt systems required in passenger cars that do not provide full passive protection were the subject of several petitions. Primary attention was directed to the belt warning system and the conditions under which it must operate. As issued on March 3, the standard provides that the system shall operate when and only when the ignition is on, the transmission is in any forward or reverse position, and either the driver's lap belt is not extended at least to the degree necessary to fit a 5th-percentile adult female or a person of at least the weight of a 50th-percentile 6-year old is seated in the right front position and the belt is not extended to the length necessary to fit him.

The intent of the transmission position requirement was to require operation of the warning system when the vehicle was likely to be in motion, and the effect of the "when and only when" phrase was to require deactivation in all other positions. Some petitioners argued that rearward motion was not likely to be fast enough to present a hazard. Others stated, on the other hand, that vehicles with automatic transmissions should deactivate the system only in "Park", to encourage drivers to use that position when leaving the vehicle with the engine running. Similarly, it was requested that alternative means of warning system deactivation be permitted on cars with manual transmissions, with one alternative being application of the parking brake. The NHTSA has found these arguments to have merit, and therefore amends S7.3 of the standard in several respects. The amended section requires, as the first condition necessary to activate the warning, that the ignition be "on" and that the transmission be in a forward gear. Actuation is permitted in reverse, but is no longer required. The section is further amended to require that the system on a car with automatic transmissions shall not activate when the transmission is in "park" and that the system on a car with manual transmission shall not activate when the parking brake is on or, alternatively, when the transmission is in neutral.

Several petitions stated that although the length necessary to fit a 50th-percentile 6-year old or a 5th-percentile adult female may be objectively determinable, the sensor in a system may not exactly measure this length due to unavoidable variances in production. To allow for this variance, a manufacturer must calibrate the retractors so that the range of this variance will be beyond the minimum length, and as a result it is likely that the warning will continue to operate in some situations where a small occupant has properly fastened the belt. A similar objection was raised by Mercedes-Benz and illustrated by the case of a small child whose bouncing could cause the belt to retract far enough to trigger the warning intermittently. These objections are considered to have merit, and the NHTSA has therefore decided to specify a range of extensions below which the system must activate and above which it must not activate. The lower end of the range is an extension of 4 inches from the normally stowed position, and the upper end is the extension necessary to fit a 50th-percentile 6-year-old child when the seat is in the rearmost and lowest position. This range will allow manufacturers a tolerance of several inches in most cases and will enable them to avoid the problems of inadvertent activation.

Mercedes-Benz requested that the warning be deactivated by closing the buckle and stated that this would be simpler and more effective than deactivation by belt extension. Although Mercedes' objections are partially met by the amendments made by this notice to the warning system requirements, a related consequence of the amendments is that the extension needed to close the buckle would fall within the range of discretionary deactivation. There does not appear to be good reason to prohibit deactivation by means of the buckle, and the standard is therefore amended to permit buckle deactivation as an alternative to deactivation by measurement of the belt extension.

General Motors requested a minimum duration for the warning signal beyond which it would not be required to operate. On review, this request appears to satisfy the need for warning and to reduce the annoyance of the signal in situations where unfastening of the belt is necessary. A minimum activation period of one minute is therefore provided.

One other request for amendment of the warning system requirements has been found meritorious. American Motors requested that the words "Fasten Belts" be permitted as an alternative to "Fasten Seat Belts." The change would not affect the sense of the message, and the request is granted. Requests in other petitions for the use of symbols in place of words, and for a two-stage warning sequence, have been evaluated and rejected.

In its petition, Chrysler requested the adoption of size specifications for the buttocks of a dummy representing a 6-year-old child, on the grounds that currently available dummies do not correspond to human shape and do not activate the Chrysler warning system as a child would. The problem is not considered serious enough to warrant amendment of the standard in the absence of satisfactory data on the shape of 6-year-old children, and the request is denied.

A number of petitions dealt with other aspects of the seat belt options. The requirement for retractors at all outboard seating positions, including the third seats in station wagons, was objected to by Ford and Chrysler because of installation difficulties and the low frequency of seat occupancy. The similarity of these seating positions to the center positions, which are exempt from the reactor requirements, has been found persuasive and retractors are therefore required only for outboard positions on the first and second seats.

Another petition requested that the shoulder belt of Type 2 assemblies should not adjust to fit 50th-percentile 6-year olds, as presently required for passenger seats by S7.1.1. As pointed out in the petition, the previous rule had specified the 5th-percentile adult female as the lower end of the range for shoulder belts. The change effected by the March 3 rule was inadvertent, and the range of occupants is therefore specified as being from the 5th-percentile adult female to the 95th-percentile male.

Correspondence from Toyo Kogyo requesting an interpretation of S7.1.2 has pointed out a need to clarify the requirement that the intersection of an upper torso belt with a lap belt must be six inches from the occupant's centerline. The phrase "adjusted in accordance with the manufacturer's instructions" is intended to refer to adjustment of the upper torso belt, and not to the lap belt which must adjust automatically. The section is amended to clarify this intent.

The second options under the 1972 and 1973 requirements (S4.1.1.2, S4.1.2.2) are amended to expressly permit a Type 2 seat belt assembly with a detachable upper torso restraint at any seating position. A choice of belt systems is permitted under the third option in 1972, and there was no intent under the second options to limit all positions to Type 1 belts.

Several requests and questions were raised regarding the status of "passive" seat belt systems under the standard as issued March 3. Some belt-based concepts have been advanced that appear to be capable of meeting the complete passive protection options and further regulation of their performance does not appear necessary. With respect to the options other than the complete passive protection options, a question has been raised as to whether a passive belt must be used in conjunction with active belt systems or conform to the adjustment, latching, and warning system requirements applicable to active belts. Upon review, the NHTSA has concluded that the passive belt system that is not capable of full protection in all crash modes is in some respects appropriately regulated by seat belt requirements, and is in other respects entitled to treatment as a passive system.

To deal expressly with passive belts, a new general requirements section is added to state the applicability of various requirements to passive belts and to make it clear that redundant active belts need not be employed if passive belts are used to meet any option requiring Type 1 or Type 2 belts.

Many of the requirements applicable to belts have been adopted because of properties that exist regardless of whether the system is active or passive. The range of the belt's adjustment, the elasticity and width of its webbing, and the integrity of its attachment hardware are all known to affect the protection given. As amended, the standard therefore requires a passive belt to conform to the adjustment requirements of S7.1 and to the webbing, attachment hardware, and assembly performance requirement of Standard No. 209. The petitioners' objections as to the application of the latching requirements to a system that does not require latching and of the warning system requirements to a system that would be functional unless willfuly defeated have been found to have merit. A passive belt system is therefore not required to conform to S7.2 and S7.3.

In order to assure that a passive belt or other passive system will not hinder an occupant from leaving the vehicle after a crash, the NHTSA proposes in a separate notice in today's issue of the *Federal Register* (36 F.R. 12866) to require a release for the occupant that either operates automatically in the event of a crash, or operates manually at a single point that is accessible to the seated occupant.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . . Effective date: January 1, 1972.

Issued on July 2, 1971.

Douglas W. Toms
Acting Administrator

36 F.R. 12858
July 8, 1971

Preamble to Amendment to Motor Vehicle Safety Standard No. 208
Occupant Crash Protection
(Docket No. 69-7; Notice 12)

The purpose of this notice is to respond to petitions filed pursuant to § 553.35 of Title 49, Code of Federal Regulations, requesting reconsideration of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.21, published on March 10, 1971 (36 F.R. 4600).

The petitions covered by this notice deal with the passive restraint requirements, and with the restraint options available after August 15, 1973. Petitions relating to seat belts and seat belt warning systems were answered in a notice published in the *Federal Register* on July 8, 1971 (36 F.R. 12858). Each request contained in the petitions has been evaluated. Particular requests relative to the March 10, 1971, rule not expressly mentioned in this notice or in the notice of July 8 have been denied.

To avoid possible confusion as to the number of test devices to be used in a test, the NHTSA is amending S5.1 at the request of American Motors and General Motors to indicate more clearly that test devices are to be placed at all seating positions unless a lesser number is prescribed in S4.

Several petitioners sought amendment of the readiness indicator requirement in S4.5.2 to limit the components of a deployable system that must be monitored. In particular, it was stated that the integrity of a pressure vessel could be diminished by a pressure gauge, and that the reliability of electrically activated explosive release devices would be impaired if the activating wire had to be monitored. To permit manufacturers to avoid designs that are prone to deterioration, the requirement has been amended by omitting specific reference to compressed gases and electrical circuits.

Several petitions requested changes with respect to the weight at which a multipurpose passenger vehicle, truck, or bus is to be tested. It was stated that the half-loaded weight specified in the standard was unrepresentative of the weights of vehicles involved in crashes, and that it placed an unreasonably severe strain on the vehicle. On consideration of the data and arguments presented, it has been determined that a reduction in the loading of these vehicles is appropriate. The required vehicle weight is accordingly reduced to 300 pounds plus the weight of the necessary anthropomorphic test devices. It should be noted that instrumentation is to be included as part of the 300 pounds.

With regard to the placement of test devices in the vehicle, it was pointed out that the specified position of the driver's right foot often produced an unnaturally awkward result and that the positioning might be achieved in some cases only by sacrificing some portion of underdash padding. In response to these points, the positioning requirement is amended to permit more natural placement, with the foot in contact with the undepressed accelerator pedal.

The petitions included several objections to the requirements for rollover testing. It was argued that the test did not produce repeatable results with respect to vehicle behavior. The NHTSA has given serious consideration to these arguments, and has conducted a series of vehicle tests according to the procedures of the standard. These tests have demonstrated a high degree of repeatability in vehicle behavior. Occupant ejection in rollover accidents, and the retention of occupants in rollovers is a major element in effective crash protection. The petitions to delete the rollover test from the standard are therefore denied.

Some petitions objected to the requirement for barrier tests at "any angle up to 30° in either direction from the perpendicular." The NHTSA is aware that such an all-angles test may be more demanding than a test that arbitrarily selects two angles, such as 15° and 30°. Manufacturers are free, however, to limit their testing to the "worst case." Since accidents occur at all angles, it is considered important that vehicles be capable of meeting the protection requirements at any angle within the prescribed limits.

The lateral moving barrier test was also objected to by several petitioners, particularly by manufacturers of smaller vehicles who consider the 4,000-pound weight of the barrier to be excessive. The lateral moving barrier test is included in the standard because of the disproportionately high number of serious injuries suffered in side impacts. The weight of the barrier was chosen to represent the average weight of domestic passenger cars, the vehicles most likely to strike the side of a vehicle, regardless of the impacted vehicle's size. The requirement is retained.

The use of the Severity Index of 1000 as the criterion for head injury was objected to as too stringent, and a more lenient index requested. Considering the present state of the art in head injury measurement, it has been determined that a Severity Index of 1000 is the most acceptable criterion at this time, and it has therefore been retained. In a related objection, Chrysler stated that the 1000-Hz channel class requirement for accelerometers in the head was too high. In the judgment of the NHTSA, however, the 1000-Hz channel class specification as incorporated in SAE J211 represents an acceptable level of instrument sensitivity. The requirement has therefore been retained.

In the context of the petitions regarding the rollover requirements, it was suggested that the requirement of S6.1 that all portions of the test device be contained within the passenger compartment during the test was unnecessarily stringent. In retaining this requirement the NHTSA intends to require a substantial degree of passenger compartment integrity in all types of accidents. The test condition that specifies windows to be in the up position is retained to restrict random excursions of test devices, and to provide for consistency in the evaluation of test results.

General Motors noted in its petition that there are a large number of State and local laws concerning the shipment, storage and use of pressurized cylinders and explosive devices that might be used in air bag systems. Many of these laws are at variance with the regulations of the Department of Transportation's Hazardous Materials Regulations Board governing these materials (found in Chapter 1, Subtitle B, of Title 49, Code of Federal Regulations). If these State and local laws were to be applied to equipment that is part of a large proportion of the new passenger cars in this country, the distribution, sale, use, and maintenance of those vehicles could be seriously hindered. General Motors suggested that the Federal regulations governing these materials be incorporated into the requirements of Standard No. 208, thus preempting all State and local requirements (i.e., requiring them to be identical) under section 103(d) of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392(d). The NHTSA recognizes this problem, and is considering various methods of solving it, in consultation with other concerned agencies. No regulatory action to that end is taken in this notice, but some such action is anticipated in the near future.

Several petitioners noted that the requirements for anthropomorphic test devices specified in the standard, mainly those set forth in SAE Recommended Practice J963, do not completely define all the characteristics of the dummies that may be relevant to their (and the vehicle's) performance in a crash test. The NHTSA considers the comment valid. It would actually be difficult, if not impossible, to describe the test dummy in performance terms with such specificity that every dummy that could be built to the specifications would perform identically under similar conditions. Of course, since the dummy is merely a test instrument and not an item of regulated equipment, it is not necessary to describe it in performance terms; its design could legally be "frozen" by detailed, blueprint-type drawings and complete equipment specifications. Such an action does not, however, appear to be desirable at this time. Considerable development work is in process under various auspices to refine the dynamic characteristics of anthropomorphic devices, to determine which designs are most practicable, offer the most useful results, and best simulate the critical characteristics of the human body. The NHTSA is monitoring this work (and sponsoring some of it), and intends to propose amendments of the standard in accordance with it to add more detailed performance and descriptive specifications for the test dummies, although no changes are being made in that respect by this notice.

In the meantime, it should be understood that the NHTSA does not intend that a manufacturer's status with respect to compliance will be jeopardized by possible variances in test dummies permitted by the present set of specifications. In the agency's judgment, a test dummy that conforms to the specifications incorporated by the standard is an adequate test tool for determining the basic safety characteristics of a vehicle. If the NHTSA concludes after investigation that a manufacturer's tests are properly conducted, with dummies meeting the specifications, and show compliance with the standard, and that differences in results from tests conducted by the agency are due to differences in the test dummies used by each, the agency tests will not be considered to be the basis for a finding of noncompliance.

A number of the petitioners sought a delay in the effective dates of the standard, particularly the August 15, 1973, date which passenger cars are required to provide at least head-on protection for front-seat occupants by means that require no occupant action. Several vehicle manufacturers argued that further time is needed to prepare for the introduction of passive restraint systems in all passenger car lines. They pointed out that much of their effort during the past year has been spent refining and testing the design of these systems in order to ensure satisfactory performance under the most adverse conditions that may be encountered by vehicles in use. Mandatory introduction of passive restraints in all passenger cars by the August 15, 1973, date, it was argued, would impose severe financial hardships, because of the difficulties that would be encountered in obtaining tools, setting up production lines, and working out the inevitable production and quality-control problems for all their vehicles simultaneously, contrary to the normal practice in the industry.

It has been determined that these petitions have some merit. Materials submitted to the docket concerning the state of passive restraint development indicate that systems now available will meet the requirements of Standard 208 for passive frontal crash protection, and perform satisfactorily in other respects. It does not now appear, however, that tooling and production leadtimes will permit manufacturers to make large-scale introductions of passive systems before the fall of 1973. This agency is aware of the extreme dislocations, and the attendant financial hardships, that would be caused by requiring the world industry (to the extent of the vehicles sold in this country) to introduce major new systems in substantially all their passenger cars at the same time.

For these reasons, it has been determined that manufacturers should be allowed additional time to introduce passive protection systems. To that end, a notice of proposed rulemaking is published in this issue of the *Federal Register* that would allow manufacturers of passenger cars the option of installing seat belt systems with ignition interlocks for the period up to August 15, 1975. It is expected that this added leadtime will enable manufacturers to institute an orderly, phased introduction of passive systems into their vehicles, installing such systems in their various car lines, to the extent feasible, in advance of that date.

The July 8 notice indicated that the standard would be republished in its entirety upon publication of today's action. This has not been done, because of the limited number of amendments made by this notice.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, in § 571.21 of Title 49, Code of Federal Regulations is amended . . . .

Effective dates: January 1, 1972, with additional requirements effective at later dates, as indicated in the text of the rule published March 10, 1971 (36 F.R. 4600).

(Secs. 103, 108, 112, 114, 119, National Traffic and Motor Vehicle Safety Act, U.S.C. 1392, 1397, 1401, 1403, 1407, delegation of authority at 49 CFR 1.51)

Issued on September 29, 1971.

Douglas W. Toms
Administrator

36 F.R. 19254
October 1, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Seat Belt Installations

(Docket No. 2–6; Notice 5)

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard 216, (49 CFR § 571.216) that sets minimum strength requirements for a passenger car roof to reduce the likelihood of roof collapse in a rollover accident. The standard provides an alternative to conformity with the rollover test of Standard 208.

A notice of proposed rulemaking on this subject was issued on January 6, 1971 (36 F.R. 166). As noted in that proposal, the strength of a vehicle roof affects the integrity of the passenger compartment and the safety of the occupants. A few comments suggested that there is no significant causal relationship between roof deformation and occupant injuries in rollover accidents. However, available data have shown that for non-ejected front seat occupants in rollover accidents, serious injuries are more frequent when the roof collapses.

The roof crush standard will provide protection in rollover accidents by improving the integrity of the door, side window, and windshield retention areas. Preserving the overall structure of the vehicle in a crash decreases the likelihood of occupant ejection, reduces the hazard of occupant interior impacts, and enhances occupant egress after the accident. It has been determined, therefore, that improved roof strength will increase occupant protection in rollover accidents.

Standard 208 (49 CFR § 571.208), *Occupant Crash Protection*, also contains a rollover test requirement for vehicles that conform to the "first option" of providing complete passive protection. The new Standard 216 issued herewith is intended as an alternative to the Standard 208 rollover test, such that manufacturers may conform to either requirement as they choose. Standard 208 is accordingly amended by this notice; the effect of the amendment, together with the new Standard 216, is as follows:

(1) From January 1, 1972, to August 14, 1973, a manufacturer may substitute Standard 216 for the rollover test requirement in the first option of Standard 208; Standard 216 has no mandatory application.

(2) From August 15, 1973, to August 14, 1977, Standard 216 is in effect as to all passenger cars except those conforming by passive means to the rollover test of Standard 208, but it may continue to be substituted for that rollover test.

(3) After August 15, 1977, Standard 216 will no longer be a substitute for the Standard 208 rollover test. It is expected that as of that date Standard 216 will be revoked, at least with respect to its application to passenger cars.

A few comments stated that on some models the strength required in the A pillar could be produced only by designs that impair forward visibility. After review of strengthening options available to manufacturers, the Administration has concluded that a satisfactory increase in strength can be obtained without reducing visibility.

Some comments suggested that the crush limitation be based on the interior deflection of the test vehicle rather than the proposed external criterion. After comparison of the two methods, it has been concluded that a test based on interior deflection would produce results that are significantly less uniform and more difficult to measure, and therefore the requirement based on external movement of the test block has been retained.

Several changes in detail have been made, however, in the test procedure. A number of comments stated that the surface area of the proposed test device was too small, that the 10-degree pitch angle was too severe, and that the 5 inches of padded test device displacement was not enough to measure the overall roof strength. Later data available after the issuance of the NPRM (Notice 4) substantiated these comments. Accordingly, the dimensions of the test block have been changed from 12 inches square to 30 inches by 72 inches, the face padding on the block has been eliminated, and the pitch angle has been changed from 10 degrees to 5 degrees.

Several manufacturers asked that convertibles be exempted from the standard, stating that it was impracticable for those vehicles to be brought into compliance. The Administration has determined that compliance with the standard would pose extreme difficulties for many convertible models. Accordingly, manufacturers of convertibles need not comply with the standard; however, until August 15, 1977, they may comply with the standard as an alternative to conformity with the rollover test of Standard 208.

A few comments objected to the optional 5,000-pound ceiling to the requirement that the roof have a peak resistance of 1½ times the unloaded vehicle weight. Such objections have some merit, if the energy to be dissipated during a rollover accident must be absorbed entirely by the crash vehicle. In the typical rollover accident, however, in which the vehicle rolls onto the road shoulder, significant amounts of energy are absorbed by the ground. This is particularly true in heavier vehicles. Some of the heavier vehicles, moreover, would require extensive redesign, at a considerably greater cost penalty than in the case of lighter vehicles, to meet a strength requirement of 1½ times their weight. At the same time, heavier vehicles generally have a lower rollover tendency than do lighter vehicles. On the basis of these factors, it has been determined than an upper limit of 5,000 pounds on the strength requirement is justified, and it has been retained.

It was requested that the requirement of mounting the chassis horizontally be deleted. It has been determined that the horizontal mounting position contributes to the repeatability of the test procedure and the requirement is therefore retained.

The required loading rate has been clarified in light of the comments. The requirement has been changed from a rate not to exceed 200 pounds per second to a loading device travel rate not exceeding one-half inch per second, with completion of the test within 120 seconds.

A number of manufacturers requested that repetition of the test on the opposite front corner of the roof be deleted. It has been determined that, as long as it is clear that both the left and right front portions of the vehicle's roof structure must be capable of meeting the requirements, it is not necessary that a given vehicle be capable of sustaining successive force applications at the two different locations. The second test is accordingly deleted.

Effective date: August 15, 1973. After evaluation of the comments and other information, it has been determined that the structural changes required by the standard will be such that many manufacturers would be unable to meet the requirements if the January 1, 1973 effective date were retained. It has therefore been found, for good cause shown, that an effective date more than one year after issuance is in the public interest. On or after January 1, 1972, however, a manufacturer may substitute compliance with this standard for compliance with the rollover test requirement of Standard 208.

In consideration of the above, the following changes are made in Part 571 of Title 49, Code of Federal Regulations:

1. Standard No. 208, 49 CFR § 571.208, is amended by adding the following sentence at the end of S5.3, *Rollover:* "However, vehicles manufactured before August 15, 1977, that conform to the requirements of Standard No. 216 (§ 571.216) need not conform to this rollover test required."

2. A new § 571.216, Standard No. 216, *Roof Crush Resistance*, is added, as set forth below.

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on December 3, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 23299
December 8, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 15)

The purpose of this notice is to respond to petitions requesting reconsideration of the amendments to the seat belt requirements of Standard No. 208, *Occupant Crash Protection*, issued on July 2, 1971 (36 F.R. 12858, July 8, 1971). The petitions are granted in part and denied in part.

The Chrysler Corporation requested an amendment of the belt warning system requirements in S7.3, to provide that the system shall operate only when the vehicle's engine is running. Section S7.3.1 presently requires the warning to operate whenever the ignition is "on", the transmission is in a forward gear, and seat belts are not in use at occupied front outboard seats. Chrysler stated that basing the warning system operation on engine operation would permit simplification of the warning system circuitry. On review, the NHTSA has concluded that the Chrysler position has merit and that requiring warning system operation only when the engine is operating will satisfactorily include the situations in which the vehicle is likely to be in motion, and thereby satisfy the intent of the warning system requirement. S7.3.1(a) is amended accordingly.

It should be noted that a warning system that operates whenever the ignition switch is "on", in accordance with the prior version of S7.3.1(a), will continue to meet the requirement as amended, since such a system will of necessity operate when the engine is running.

Subsequent to the adoption of the passive seat belt requirement, S4.5.3 (Notice 10, 36 F.R. 12858, July 8, 1971), questions have been raised by Toyota, Renault and Volkswagen as to the configuration required of passive belts used in place of active belts. The NHTSA's intent in adopting S4.5.3 was to permit manufacturers to substitute a Type 2 passive assembly with a detachable or nondetachable shoulder belt for any active seat belt specified under an option of S4, even though the S4 option specifies a Type 1 assembly or a Type 2 assembly with a detachable shoulder belt. The agency also intended to permit the substitution of Type 1 passive assemblies where an option does not require a Type 2 assembly. Thus a passive belt used at the front outboard seating positions to meet the third option in the period beginning January 1, 1972 (S4.1.1.3.1(a)) would have to be a Type 2 assembly. Although no formal petitions have been received on these points, it is considered advisable to amend S4.5.3 to clarify its intent.

The formal petition of JAMA with respect to S4.5.3 requested deletion of the requirement that passive seat belt assemblies must meet the assembly performance and webbing requirements of Standard No. 209. The basis for the request was JAMA's belief that the manufacturer should be allowed as much freedom in the design of a passive belt system to fit the crash characteristics of a particular vehicle as he would have in the design of other types of passive restraints. On reconsideration, the NHTSA has decided that relief from Standard No. 209 should be afforded if a passive belt is capable of meeting the occupant crash protection requirements of S5.1 in a frontal perpendicular impact and amends S4.5.3 accordingly.

The JAMA petition also requested the NHTSA to make it clear that the anchorages of a passive seat belt assembly need not meet the requirements of Standard No. 210. The installation of anchorages is required by Standard No. 210, regardless of the type restraint system in the vehicle. The NHTSA does not consider that a sufficient need has been shown at this time for amendment of

Standard No. 210. Anchorages installed pursuant to that standard are permitted to elongate, so long as they sustain the maximum required force, and such anchorages should therefore be usable in new energy absorbing belt systems.

Ford requested an increase in the minimum warning signal duration from 1 minute to 5 minutes. The NHTSA has considered a variety of alternatives in arriving at the 1-minute level, and remains persuaded that it is a reasonable compromise between the need for warning and the need to avoid undue annoyance in situations where a belt must be temporarily unfastened. The petition is denied.

JAMA requested an amendment to S7.3.3 to provide vehicles with automatic transmissions the option of shutting off the warning signal by use of the parking brake. Although this option is provided for vehicles with manual transmission by S7.3.4 as a concession to cost and leadtime problems of certain manufacturers, there are inconveniences associated with its use on vehicles with automatic transmissions, whose drivers may often prefer to use the "Park" position rather than the parking brake. The petition is therefore denied.

General Motors petitioned for an amendment of S7.3.3 and S7.3.4 to allow warning system activation when the ignition is in the "start" position. The notice issued September 29 proposed amendments to these sections that would require deactivation only when the ignition is in the "on" position. This would permit activation of the system with the ignition in the "start" position, as requested by General Motors. No adverse comment has been received on this proposal, and favorable action will be taken in the rule to be issued pursuant to the notice of September 29.

In another request concerning S7.3.4(b), JAMA suggested an amendment to permit deactivation of the warning system whenever the parking brake lamp is illuminated. The NHTSA considers such a system to be an acceptable means of conforming to S7.3.4(b) under the present language. Since no further amendment is necessary, the petition for amendment is denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, § 571.208 of Title 49, Code of Federal Regulations is amended ....

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on December 9, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 23725
December 14, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket 69–7; Notice 16)

The purpose of this notice is to amend Standard No. 208, Occupant Crash Protection, as proposed September 29, 1971 (36 F.R. 19266, October 1, 1971) with respect to the occupant protection options available between August 15, 1973 and August 15, 1975. The amendments proposed on September 29 are adopted essentially as proposed, with minor modifications.

The notice proposed a third occupant protection option (S4.1.2.3) for passenger cars manufactured between August 15, 1973 and August 15, 1975. The salient feature of the new option was the use of seat belts equipped with an ignition interlock system that would prevent the engine from starting if any front seat occupant did not have his belt fastened. The belts at the front outboard positions would have to meet the injury criteria of the standard in a 30 m.p.h. frontal barrier crash, and any lap belt in the center position would have to remain intact in the same crash. If shoulder belts were provided at the front positions, they would have to be nondetachable and have emergency locking retractors. Additional features of the interlock system as specified in S7.3.5 included an antidefeat measure that would require the belt to be fastened *after* the occupant is seated, a requirement that unfastening the belt would not stop the engine, and a provision for seat belt warning system operation when the ignition is in the "start" position and a belt is unfastened at an occupied front seat position. With minor exceptions noted in the following discussion, the option is adopted as proposed.

Several comments approved of the interlock option. Mr. Ralph Nader and the Center for Auto Safety raised procedural objections concerning the issue of placing intragovernmental communications in the docket. This issue is presently the subject of litigation in the Federal Courts, and would not be appropriate for discussion herein. The Center also objected that both the interlock option, to begin August 15, 1973, and the passive restraint requirement, beginning August 15, 1975, should be instituted one year earlier. The option that includes the interlock system also requires emergency-locking shoulder belt retractors, however, and the agency has determined that the 1974 model year is the earliest practicable time by which the option can be effectuated. As for the passive restraint requirement to become effective on August 15, 1975, the reasons for setting that effective date were discussed at length in Notice 12 (36 F.R. 19254, October 1, 1971), and need not be restated here.

There were differences of opinion among the comments on the desirability of various other aspects of S4.1.2.3. The requirement of greatest concern appears to be S4.1.2.3(b), which requires the injury criteria to be met at the front outboard positions in a 30-mph frontal barrier crash with the test dummy restrained by the seat belt. It was the intent of the proposal to allow another means of providing the requisite level of occupant protection, not to lower the level of protection. Present information indicates that systems meeting the injury criteria are available using current seat belt technology, and the agency therefore adopts the requirement as proposed.

To allow greater diversity in belt system development, it has been decided to accept the suggestion made in a number of comments that conformity to Standard No. 209 should not be required of belt systems that meet the injury criteria. Accordingly, those options that require a seat belt to meet the injury criteria (S4.1.1.2, S4.1.2.2 and S4.1.2.3) are amended by limiting the application of Standard No. 209 to belts other than those meeting the injury criteria. A belt provided at a center front position is not required to meet the injury criteria and is therefore required to conform to Standard No. 209.

Related requests for exemption from the anchorage requirements of Standard No. 210 have not been adopted in that they appear to be unnecessary. An amendment to permit anchorages that absorb energy by elongating under force is not necessary, since Standard No. 210 expressly permits deformation so long as the maximum force is sustained. In the absence of other data indicating a need to amend Standard No. 210, no change is proposed in that standard.

Chrysler's suggestion that a shoulder belt shaped as an inverted Y could be used in lieu of a nondetachable upper torso belt has not been adopted, primarily because of the likelihood that it would often go unused. There is nothing to prevent a manufacturer from installing such a belt along with the lap belt, so long as the lap belt alone is capable of meeting the injury criteria.

The interlock requirements were the subject of diverse comments. Some generally endorsed the requirement for interlock at all front positions, some stated that it should not be required at any position, while others suggested that it should be installed only at the outboard seats or only at the driver's seat. Several comments indicated doubts as to the system's reliability and expressed concern about its possible interference with vehicle operation.

Upon review of the comments, the NHTSA has decided to adopt the interlock system as an option applying to all front seating positions. The 1973 options, whether active or passive, are intended to set minimum protection requirements for all front seating positions. If the third option is to give protection better than that of present belt systems, belt usage must be increased. The interlock system has the potential to increase belt usage and is therefore adopted as part of the third option. Exemption of the center front seat, as proposed by several comments, could result in increased occupancy of the center seat as an easy means of avoiding the effects of the interlock system. The effect of such avoidance would be to substantially lessen the protection afforded occupants, and the requests for center seat exemption are therefore denied. However, in consideration of some technical problems arising from the placement of sensors in the center seats, it has been decided to change the preconditions for warning system and interlock system operation. It was pointed out that the center seat cushion may be depressed far enough to activate the warning signal by the weight of two large men in the outboard positions. To alleviate this problem, S7.3.1(c), S7.3.5.2(b), and S7.4.1(b) are changed to provide for activation by the weight of a child in the front non-driver positions only when a 50th percentile adult male is seated in the driver's position.

Other problems of convenience arising from the interlock system are dealt with by the addition of two new subsections to S7.4. As a convenience in situations such as parking garages or vehicles stalled in traffic, a new S7.4.3 has been adopted, permitting restarting of the engine within three minutes of shutoff without interference by the interlock system. To facilitate repair and maintenance work, a new S7.4.4 is adopted to permit the interlock to be overridden by a switch that is actuated after opening the cover of the engine compartment. To reduce the possibility that the engine compartment switch will be misused, S7.4.4 provides that the switch will not defeat the interlock unless it is operated after each period of engine operation.

The requirements of S7.3.3 and S7.3.4 have been amended by adding engine operation as a necessary condition for mandatory warning system shutoff. This limits the situation in which the system must not operate; it may now operate when the ignition is in the "start" position, as requested by General Motors.

The relationship of the "start" position to system operation is also affected by the interlock system requirements. S7.3.5.4 requires the warning system to operate when the ignition is in the start position to tell the driver of a vehicle with unbelted front seat occupants why the engine fails to start.

One additional feature of the belts used in interlock systems attracted considerable comment. The amendment to S7.1.1 that would require shoulder belts provided under S4.1.2.3 to have emergency-locking retractors has been adopted as proposed. The NHTSA regards the convenience of an emergency-locking retractor as a significant incentive for belt usage. In response to comments requesting an interpretation as to the number of retractors required, the standard permits a system with a single emergency-locking retractor acting on both lap and shoulder belts. In response to requests for allowance of auxiliary manual adjustment devices, such devices are permissible if they cannot be adjusted so as to cause the belt to fail the automatic adjustment requirements of Standard No. 208.

General Motors raised a question concerning the number of test devices to be used in the frontal barrier crash test specified in S5.1. The NHTSA has interpreted the section as requiring test devices only in those seating positions for which a barrier crash test is specified by S4. The question is of general interest and is considered significant enough to warrant a clarifying amendment to S5.1 at this time.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, § 571.208 of Title 49, Code of Federal Regulations is amended. The standard is hereby amended upon publication of this notice in the *Federal Register*; effective dates are as stated in the text of the standard.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on February 17, 1972.

Douglas W. Toms
Administrator

37 F.R. 3911
February 24, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection—Pressure Vessels and Explosive Materials

(Docket No. 69–7; Notice 18)

The purpose of this notice is to add a new section to Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection*, 49 CFR § 571.208, dealing with pressure vessels and explosive devices.

After review of the comments to the notice of proposed rulemaking (Docket 69–7, Notice 14, October 9, 1971; 36 F.R. 19705), the agency has concluded that its original assessment of the need for regulation was essentially correct and that a regulation should therefore be adopted. As indicated in Notice 14, the NHTSA sees a regulation of restraint systems such as air bags containing explosive materials or pressure vessels as having two primary functions: to impose directly on manufacturers the obligation to conform to Federal hazardous materials regulations, and to create a uniform system of regulation that will override any conflicting state or local regulation.

The approach taken in the notice was to propose a general incorporation of all applicable portions of the hazardous materials regulations as found in 49 CFR Parts 170–189. Most of the comments, while agreeing with the general intent of the proposal, objected to the breadth of this incorporation as too vague and too likely to result in difficulties of interpretation. There was a consensus that serious problems would arise as a result of the Hazardous Materials Regulations Board's practice of issuing special permits that allow shipment of regulated items that do not conform to the regulations. The majority of devices used in occupant protection systems vary in some way from the requirements of the regulations and have been shipped under one or more special permits. The comments pointed out that adoption of the regulations without some adjustment to allow for the existence of special permits would effectively prohibit most of these devices.

It has therefore been decided to limit the incorporation of the HMRB regulations by referencing those parts of the regulations from which no variances have been granted. Without exception, the pressure vessels used in air bag systems to date have been manufactured in basic conformity with the recently adopted Specification 39 (49 CFR 178.65). The variances which have caused the manufacturers to obtain special permits have been variances in the choice of materials and in the method of fabrication. All cylinders have been able to conform to the basic performance requirements of the specification, so that an incorporation into Standard 208 of the performance requirements of Specification 39 would enable manufacturers to continue to make their present systems.

Taken together, the performance requirements are considered by the NHTSA to be an adequate regulation of the safety of pressurized containers in occupant restraint systems. The HMRB will continue to exercise its jurisdiction over the shipment of the systems, so that a manufacturer will still have to obtain a special permit in order to ship systems that do not conform to the specification. The adoption of section S9 is not intended in any way to diminish the responsibilities of a manufacturer under the applicable regulations of the HMRB. For example, evidence of the requisite number of tests and inspections will continue to be required for shipment under the HMRB regulations, even though failure to test and inspect will not be a violation of Standard 208.

As adopted, the section consists of two subsections, the first dealing with pressure vessels and the second with explosives. The pressure vessel subsection applies to vessels that are designed to be continuously pressurized, as distinguished from systems that are pressurized only during actuation. A pressure vessel that contains an explosive charge as well as gas under continuous pressure will have to conform to both subsections.

A continuously pressurized vessel is required to conform to the requirements of Specification 39 concerning type, size, service pressure, and test pressure of vessels (paragraph 2 of the Specification); seams (6(b)); wall thickness (7); openings and attachments (9(a) and (b)); safety devices (10); pressure tests (11); and flattening tests (12). The reference to the latter two paragraphs are drafted to make it clear that the quality control aspects of those paragraphs are not included in the standard. The remaining portions of Specification 39, including the inspection requirements of paragraphs 3, 4, and 15, the material specifications of paragraph 5, the rejected cylinder procedure of paragraph 13, and the markings requirement of paragraph 14, are not incorporated.

Review of the explosives provisions of the hazardous materials regulations showed that some of the requirements, if applied literally, would not be appropriate for automotive installations. For instance, certain types of pyrotechnic inflators are categorized as explosive power devices and are required to be shipped in fiberboard or wooden containers. Neither of these types of containers would be proper for a system designed to protect occupants in a vehicle from the effects of a crash. The primary needs are for a requirement that sets limits on the sensitivity of the explosive and one that requires it to be in a container that will protect the occupants of the vehicle from the effects of inadvertent ignition. These requirements are hereby adopted, in accordance with comments made by General Motors.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

Effective date: June 12, 1972. Because of the immediate need to establish a uniform system of regulation, good cause is found for an effective date sooner than 180 days after issuance.

This amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407 and the delegation of authority at 49 CFR 1.51.

Issued on May 3, 1972.

Douglas W. Toms
Administrator

37 F.R. 9222
May 6, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 19)

The purpose of this notice is (1) to adopt the method of calculating head injury proposed in Notice 17 of Docket 69–7 (37 F.R. 5507) as an amendment to S6.2 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, and (2) to respond in part to petitions for reconsideration of the amendments to the standard published in Notice 16, February 24, 1972 (37 F.R. 3911). The issue involving Notice 16 addressed by this notice is the applicability of the head injury criterion of S6.2 to seat belt restraint systems. Action on the remaining issues has been scheduled for completion not later than July 1, 1972.

I. *Calculation of head injury criterion.*

Some substantive objections were raised to the proposed method of calculating the head injury criterion. Several comments questioned the use of resultant accelerations rather than the anterior-posterior accelerations used in the original development of the Wayne State University Tolerance Curve. Although the curve was originally based on anterior-posterior acceleration data, its validity for resultant accelerations appears to be confirmed by subsequent tests using resultant accelerations computed from biaxial accelerometers. Resultant accelerations have therefore been used in the amended criterion.

The question of the permissible level was again raised, with some commenters supporting a level of 1500 even under the revised method of calculation. This agency's position is that adequate justification has not been demonstrated for a numerical increase in the severity level, although adjustments in the method of calculation adopted herein may have the effect of allowing greater cumulative accelerations than would have been allowed under the Gadd Severity Index. With the new calculation, the higher numerical level is less supportable than before and it is accordingly rejected. The amendment to S6.2 is adopted as proposed.

II. *Applicability of the head injury criterion to seat belt systems.*

The decision to postpone the date of mandatory installation of passive restraints until August 15, 1975, was made in consideration of the hardship that would have been imposed on many manufacturers by a requirement to provide passive restraints by the original date of August 15, 1973. The injury criteria of the standard, measured in a barrier crash with instrumented dummies, were applied to belt systems as well as passive systems that might be used to meet the requirements of the standard, beginning August 15, 1973.

Several manufacturers have petitioned for the removal of the injury criteria, particularly those for head injury, from the belt system tests. Their concern arises from their test results indicating that in many vehicles currently available belt systems either do not meet or only marginally meet the head injury criteria. They have argued that much, perhaps most, of the acceleration that contributes to the head Severity Index measurement with a shoulder-belted dummy occurs as the head flops loosely forward without striking anything in the vehicle. Actual field collision data, they maintain, does not indicate that this type of head movement by shoulder-belted vehicle occupants in a crash is a serious injury-producing factor. They question the correlation between results of the dummy tests and the actual protective characteristics of the belt systems.

The NHTSA recognizes the uncertainty concerning the significance of head movement by a shoulder belted occupant whose head does not strike the forward part of the vehicle, although it considers the present evidence too scanty to be conclusive in either direction. It also recognizes that the leadtime for any major design or component changes for the 1974 models has been virtually exhausted. Recent materials submitted to the docket indicate that presently existing inflatable restraint systems can meet the head injury criteria with little difficulty. The inherent limitations in lap-and-shoulder-belt systems make it considerably more difficult for those systems to meet these criteria, although belt systems have been found to provide protection at moderate speeds.

For these reasons, it has been decided that a temporary modification in the head injury measurements for belt systems is justified. The amendment made by this notice in response to the petitions affects vehicles manufactured before August 15, 1975, and provides that measurement of head acceleration begins, for purposes of computing the head injury criterion for belted dummies, only at the moment at which the head strikes some portion of the vehicle other than a belt. The measurement will thus include any contact with the windshield or dashboard, for example, or the effects of rebound against the seat back, but pre-impact accelerations of the head will be excluded.

This agency will examine closely the accident data bearing on the traumatic effect of non-impactive head accelerations, as well as such laboratory data as may be gathered, for example from cadaver studies. Work is also in progress concerning the correlation between dummy and human behavior, with a view to more sophisticated instrumentation and measurement of vehicle performance, and to continued evaluation of the head injury criterion for the entire test crash event.

In consideration of the foregoing, paragraph S6.2 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended . . .

Effective date: July 24, 1972.

Because this amendment modifies an existing rule in a manner that imposes no additional substantive requirements, it is found for good cause shown that an effective date less than 180 days from the date of issuance is in the public interest.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on June 20, 1972.

Douglas W. Toms
Administrator

37 F.R. 12393
June 23, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69-7; Notice 20)

The purpose of this notice is to respond to petitions for reconsideration of the seat belt interlock requirements of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, as published February 24, 1972 (37 F.R. 3911). The issues in the petitions relating to the applicability of the head injury criterion of S6.2 to seat belt systems have been answered in a notice published June 24, 1972 (37 F.R. 12393). The remaining issues are discussed herein.

Several petitions raised issues which, while of considerable importance, lie outside of the immediate scope of the notice under review. Among these are requests to exempt vehicles that meet the injury criteria from the requirements of Standards Nos. 201, 203, 204, and 212, and to waive some of the requirements of Standard No. 209 relating to the width and elongation of webbing. As indicated in the Program Plan for Motor Vehicle Safety Standards, several of these matters are under review at the present time. Their resolution will await the issuance of rule-making notices in the respective dockets.

General Motors reiterated its opposition to the requirements for rollover protection and for the protection of rear seat occupants by passive means. Although these issues may be affected by the receipt of additional information, the NHTSA has not found sufficient cause to alter its position.

With respect to the interlock option itself, the petitioners objected less to the concept of such a system than to the positions at which it would have to be installed and to the level of protection required of it. Some requested an indefinite extension of the interlock requirements beyond August 15, 1975, as a more or less permanent substitute for passive protection. Inasmuch as the NHTSA continues to consider the 1975 date to be a reasonable date for the installation of passive systems, it must again deny the requested delay.

The application of the interlock and belt warning systems to the center front seating position drew a number of adverse comments. It was stated that the center seat occupancy rate was too low to justify the added cost of installing the system and that the system would be prone to inconvenient activation, as when two large men at the outboard positions depress the center seat cushion. On the question of cost effectiveness, the agency has found that the available data do not support the petitioners. Despite the relatively low occupancy rate, the incremental cost of installing the system is low enough to create a favorable ratio. The requirement for center seat installation is therefore retained. To avoid the problems of over-sensitivity, it has been decided to raise the threshold weight at which activation is required, in accordance with a suggestion by American Motors. The relevant sections (S7.3.5.2(b) and S7.4.1(b)) are accordingly amended to refer to a 5th-percentile adult female rather than to a 50th-percentile 6-year-old child.

The petitions directed their strongest objections to the application of the injury criteria to belt systems. Partial relief has been granted to belt systems with respect to the head injury criterion. The chest and femur criteria, to which a lesser amount of criticism has been directed, are not considered to present the same level of difficulty for belt systems of current design as the head.

However, it has been decided to make an interim adjustment of the chest injury criterion with respect to seat belts by applying to them a criterion using the severity index formerly applied to the head. The effect of this is to ease the requirement somewhat without permitting excessive long duration accelerations. A well designed belt system of the current types will be capable of meeting the revised criterion. It is expected that improvements now in prospect will allow belt systems to meet the 60 "g's", 3 millisecond criterion in 1975. Femur loads are not a problem for seat belt systems that do not separate during impact, and the femur criterion is therefore retained.

Ford stated in its petition that two barrier tests would be required under S4.1.2.3(d) and (e) for some vehicles, due to the difficulty of placing three 50th-percentile male dummies in the front seat. Although it may be that correct placement cannot be made in Ford vehicles, Ford is at liberty to devise a method of testing the center position which imposes a stress on the belt system equivalent to that of a 50th-percentile adult male. It does not appear that the size of the dummies will prevent most cars from being tested with the dummies three abreast, if the manufacturers elect to conduct **S4.1.2.3.1**(d) and (e) as a single test. Ford's petition is therefore denied.

General Motors, alone among the petitioners, suggested the use of a sequenced warning system in place of the interlock system. In part the company's position was grounded on the belief that the standard presently requires a sequenced warning and that the interlock is therefore a redundant system. In fact, the opposite is true under the present wording of the standard, in that S7.3.2 states that the warning system shall not operate when the belt is extended to a specified length or, alternatively, when the belt is buckled. Because a sequential warning system would necessarily cause the signal to operate in some situations despite the belt's being extended or buckled, it would not be allowed under S7.3.2.

In response to the GM request to substitute the sequenced warning for the interlock, the NHTSA has concluded that the interlock coupled with a nonsequenced warning provides a somewhat more direct incentive to belt usage with less potential for causing irritation while the vehicle is in operation. The interlock feature is therefore being retained. However, in the light of GM's expressed preference for a sequential warning and in response to a petition by the Japan Automobile Manufacturers Association to permit sequential operation of the warning, it has been decided to amend S7.3.2 to permit manufacturers to use a sequenced warning in conjunction with the interlock system.

The Japan Automobile Manufacturers Association requested the addition of the phrase "after the seat has been occupied" to S7.3.2(a) and (b). Because this would have the effect of requiring all warning systems to be sequenced, paragraphs (a) and (b) are not being amended. Instead, a new paragraph (c) is being added as a third mode of warning system shut off. Although by its terms the new paragraph applies only to front outboard positions, S7.3.5.3 will operate on it as on the other paragraphs to apply it to the center front position as well.

It should be pointed out that a manufacturer adopting the sequential option will be free to incorporate anti-bounce features into the system to prevent its being knocked out of sequence when the occupant lifts off the seat momentarily. This is so because under S7.3.1 the warning system is required to operate only when the belts have not been extended or buckled. If the occupant, in moving about on the seat, does not unbuckle or retract the belt, the warning would not be *required* to operate and the manufacturer could therefore provide for nonoperation in such situations.

Toyota has requested the application of S7.4.3 and S7.4.4 to the warning system as well as the interlock. Because of the possibility that such an amendment would result in the warning system's activating unexpectedly while the vehicle is in motion, the petition is denied.

Several petitions addressed the convenience features of the interlock system in S7.4.3 and S7.4.4. Chrysler stated that it understood the reference in S7.4.3 to "after the engine has been stopped" to mean after the ignition has been turned off, so that a stalled engine could be restarted indefinitely so long as the ignition is not turned off. This interpretation is essentially correct. The quoted phrase refers to the act of stopping the engine, rather than to involuntary engine stoppage. However, to make it clear that the engine may be restarted indefinitely if the engine has not been turned off, the section is being amended to make its intent explicit.

General Motors stated that it would be desirable for the engine starting system to be operable indefinitely without interference from the interlock system after the engine is stopped so long as the driver has not left his seated position. Such a provision would be an alternate means of permitting restarting in emergency road situations and it is therefore being adopted as part of S7.4.3.

As amended S7.4.3 continues to refer to starting after the engine has stopped, to make it clear that the features of S7.4.3 will not interfere with the primary function of the interlock system. Although it is not necessary for the engine to operate under its own power, the engine starting system must at least be operated in a manner that would start a functional engine in order for the convenience features to have any effect.

A related issue arises in the context of S7.4.4, which refers to restarting "after each period of engine operation." Chrysler interprets this to mean the cycling of the ignition switch from "off" to "on" to "off" again. Although the language does not support this meaning, on reconsideration it has been decided that there are advantages to an engine compartment switch that does not require the engine to rotate in order to be reset. The section is therefore being amended to refer to the cycling of the ignition switch rather than to engine operation.

The requirement that the switch be operated each time in order to permit engine starting is being retained despite the request of several petitioners for a system that would permit unlimited restarting so long as the hood is open. The agency's primary objection to such a system is that it is too easy to override permanently. The system allowed by S7.4.4 may be somewhat less convenient, but it is also less defeatable and is therefore preferred. The switch may be located so that it will be operable by the raising of the hood, as requested by several petitioners.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

Effective Date: 180 days after publication in the *Federal Register.*

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. § 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on June 30, 1972.

Douglas W. Toms
Administrator

37 F.R. 13265
July 6, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69–7; Notice 22)

The purpose of this notice is to specify the effective date for the amendment to Motor Vehicle Safety Standard No. 208 published July 6, 1972, (Notice 20; 37 F.R. 13265). In the effective date provision of the notice, it was stated that the amendment became effective 180 days after publication in the *Federal Register*. Calculation of 180 days from July 6, 1972, the publication date, results in an effective date of January 2, 1973. For reasons of consistency and clarity, it has been found preferable to establish January 1, 1973, as the effective date.

The amendment to Motor Vehicle Safety Standard No. 208, 49 CFR 571.208, published at 37 F.R. 13265 is therefore made effective January 1, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on August 3, 1972.

Douglas W. Toms
Administrator

37 F.R. 16186
August 11, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69–7; Notice 23)

The purpose of this notice is to reply to petitions filed pursuant to 49 CFR 553.35 requesting reconsideration of the requirements of Motor Vehicle Safety Standard No. 208 relating to seat belts in vehicles manufactured after August 15, 1973, as amended by Notices 19 and 20 of Docket 69–7 (37 F.R. 12393; 37 F.R. 13265).

1. *Seat belts and the injury criteria of S6.* The primary objection raised by petitioners is that Notices 19 and 20 did not altogether revoke the requirement that seat belts used to meet the 1973 interlock option must be capable of meeting the injury criteria of S6. Although review of the petitions suggests that additional modification of the head injury criterion is advisable, the NHTSA declines to grant petitioners' request for complete relief from the injury criteria.

Review of the petitions for reconsideration of Notice 16 showed that belts would have difficulty meeting the full criteria. Since leadtime was insufficient for major design changes in belts before 1973, it was found necessary either to remove the injury criteria or modify them so that the changes needed to enable belts to conform could be made in 1973.

Upon review, it was concluded that the injury criteria, even in modified form, would have the beneficial effect of regulating the overall protection characteristics of the occupant compartment and belt system. Regulation of the seat belt as a separate component, as in Standard 209, does not insure that the belt will be installed in a manner calculated to insulate the occupant from injurious contact with the interior of the vehicle. It was therefore decided to retain the injury criteria, with such modifications as seemed necessary to allow manufacturers to conform to S4.1.2.3 by August 15, 1973.

The most significant, though by no means the only, agent of head injury is impact with the vehicle interior. In reviewing the petitions on Notice 16, it was decided that no interim criteria would be acceptable that disregarded any impact-related accelerations. Notice 19 therefore amended the head injury criterion in a manner that was intended to include all impact accelerations and to disregard the effect of non-impact accelerations. As several petitioners point out, however, the amendment did not fully carry out this intent. S6.2, as amended, would have disregarded only those accelerations occurring before the head impacted the vehicle and would have counted all accelerations after that point. One effect of this formula was that a glancing impact, in itself insignificant, would cause all subsequent non-impact accelerations to be counted even though such accelerations would not be distinguishable in kind from the pre-impact acceleration. To avoid this result, the agency has decided to include in the calculation of the head injury criterion only those accelerations that occur while the head is in contact with the vehicle.

Some petitioners suggested that even while the head is touching the vehicle, a significant part of the head's deceleration is due to the restraining action of the belt and not to the surface the head strikes. Although there is undeniably more than one force that contributes to head deceleration, the force produced by the impacted surface becomes increasingly important as the duration of the impact increases. If the accelerations during an impact are of such an amplitude and duration that a HIC value of 1,000 is approached, the acceleration caused by the belt is generally insignificant. The criterion therefore counts all accelerations during the impact phase.

The chest injury criterion of S6.2 was modified for seat belts by Notice 20, which substituted a severity index of 1,000 for the 60g 3 millisecond criterion applied to other restraint systems. Although the use of the severity index as an indicator of chest injury has not been common practice, the agency has decided that it provides a reasonable interim measure of the effectiveness of the belt system. The severity index of 1,000 is therefore retained as the criterion for belt systems until August 15, 1975.

2. *Passive belts and injury criteria after August 15, 1975.* Several petitioners stated that any relief granted to seat belts in the period 1973–1975 should be extended to passive belt systems in the period beyond 1975. However, the NHTSA adopted the interim criteria out of consideration for lead time problems, not because it considered them to be fully satisfactory. The agency does not consider any criterion to be acceptable, on a permanent basis, that omits potentially injury-causing accelerations from its computation. Even though impact accelerations may be the major threat to belted occupants, the effects of non-impact accelerations are not negligible and should not be ignored. It is expected that belts will be able to meet the full injury criteria by 1975. The petitions requesting extension of the modified criteria beyond 1975 are therefore denied.

3. *MPV's and trucks manufactured before August 15, 1977.* The adoption of the interlock option for passenger cars under S4.1.2.3 permitted multipurpose passenger vehicles and trucks of less than 10,000 pounds GVWR to continue to use belt systems (with interlocks) in the period between 1975 and 1977. The agency's intent was to permit these vehicles to have the same interlock system during 1975–1977 that is permitted for passenger cars during 1973–1975. In response to several petitioners, who pointed out that S6.2 and S6.3 could be understood to require these vehicles to meet the full injury criteria during this period, the sections are hereby amended to extend the injury criteria modifications until August 15, 1977, for MPV's and trucks of less than 10,000 pounds GVWR.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208, is amended. . . .

Effective date: August 15, 1973.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on October 18, 1972.

Douglas W. Toms
Administrator

37 F.R. 22871
October 26, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 25)

The purpose of this notice is to amend the injury criteria specified for the chest and femur under sections S6.3 and S6.4 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208. The amendments adopted hereby are those proposed in a notice of proposed rulemaking published on October 28, 1972 (Notice 24; 37 F.R. 23115).

The injury criterion for the chest is amended with respect to all vehicles manufactured before August 15, 1975, by substituting a severity index value of 1,000 as the measure of injury potential in place of the criterion of 60g's for 3 milliseconds. The substitution had previously been made for vehicles equipped with seat belt systems manufactured before August 15, 1975. The amendment made hereby is based on a finding that the severity index is an acceptable interim measure for restraint systems other than belt systems.

Several comments noted an oversight in Notice 24 concerning the application of the modified chest criterion to multipurpose passenger vehicles and trucks having GVWR's of 10,000 pounds or less. As a result of a previous notice (Notice 23; 37 F.R. 22871, October 26, 1972), these vehicles had been permitted to meet the modified criterion until August 15, 1977. Notice 24 failed to reflect this change. The omission has been corrected in the amended version of S6.3, and a parallel extension has been made for vehicles other than passenger cars that have restraint systems other than belts.

The injury criterion for the upper legs is amended to specify a maximum force of 1700 pounds on each femur rather than the previously specified force of 1400 pounds. The new requirement is considered to provide a good level of protection in crashes in the 30 m.p.h. range and allows manufacturers greater latitude in designing systems for protection at higher speeds.

None of the comments disagreed with the proposal for an increase in force level, although the Ford Motor Company suggested a further amendment that would permit higher forces for a cumulative interval of not more than 3 milliseconds, thereby disregarding extremely short period acceleration peaks which Ford considers to be artificial products of the dummy's metallic structure. A similar request has been made by General Motors in a recent petition for rulemaking. The agency has not yet completed its evaluation of this issue. If favorable action is decided upon, a notice of proposed rulemaking will be issued to permit additional comment.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208, is amended . . . .

Because this amendment relieves a restriction and imposes no additional burden, an immediate effective date is found to be in the public interest.

Effective date: November 23, 1972.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on November 20, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 24903
November 23, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Seat Belt Interlock Amendments

(Docket No. 69–7; Notice 27)

The purpose of this notice is to amend the seat belt interlock requirements of Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208). The amendments relate to the performance requirements applicable to the belts, the positions at which the interlock is to be provided, and the convenience features allowed in certain driving situations.

The amendments adopted hereby were initially proposed in a notice published April 20, 1973 (Docket 69-7, Notice 26; 38 F.R. 9830). Some of the amendments proposed in Notice 26 have been adopted in revised form as a result of the comments. One proposal, concerning an alternative interlock system, is not adopted by this notice and awaits further rulemaking action as discussed below.

I. *Amendments.* In Notice 26, it was proposed to amend Section S4.1.2.3, the section establishing the seat belt interlock option, by deleting the requirement that the belts in the front outboard positions meet the injury criteria of S5.1 and by deleting the requirement that the belt at the center front position meet a breakage test in a barrier crash. It was also proposed to delete the requirement for an interlock at the center front position.

Subject to continuing reservations about the interlock system itself, the comments were generally favorable to the proposed amendments. The mandatory requirements for meeting the injury criteria at the outboard positions and the breakage test at the center front position are hereby deleted, as proposed.

There were objections to certain details of the proposal. Under the injury criteria version of S4.1.2.3, manufacturers were allowed to install either Type 2 seat belts (lap and shoulder belt combinations) or Type 1 seat belts (lap belt). Without the injury criteria as a control on the performance of the lap belt, it was proposed in Notice 26 to delete the Type 1 belt option under S4.1.2.3.1(a). Ford Motor Company stated that if Type 1 belts were not permitted, evaluation of systems employing lap belts in conjunction with passive upper torso restraint would be inhibited. Although belts may be used with passive restraints under the second restraint option in 1973 (S4.1.2.2), second option systems must be capable of providing fully passive protection in a frontal crash. To permit evaluation of systems that may not have full passive capability, it has been decided to continue to permit Type 1 belts under the third option (S4.1.2.3(a)) on the condition that they are capable of meeting the injury criteria of S5.1 in a frontal perpendicular crash.

As amended, therefore, S4.1.2.3.1(a) provides that at the front outboard positions a manufacturer may install either a Type 2 seat belt assembly that conforms to Standard No. 209, or a Type 1 seat belt assembly that meets the injury criteria of S5.1. Insofar as the injury criteria themselves are contingent upon the establishment of an adequate method of measurement through the adoption of a new test dummy, a manufacturer who intends to produce vehicles with Type 1 belts at the front outboard positions will have to await the adoption of the new dummy regulation and its incorporation into the options under S4.1.2.

The proposed deletion of the interlock requirement for the center front position (S4.1.2.3.1(b)) was favorably received, and the requirement is hereby deleted. It was stated by Ford, Chrysler, and American Motors that the warning system at that position should also be deleted. The merits of the warning system at the center position, in the form of increased belt usage, are considered by NHTSA to outweigh its drawbacks. Although it is fair to say that the warning system will be somewhat more likely to fail with three sensors in the system than with two sensors, the agency does not consider the increment to be sufficient to justify deleting the warning system. The temporary difficulties that Chrysler and American Motors will experience in the severance of the interlock from the warning system are also not considered sufficient grounds for deletion of the warning system. Section S4.1.2.3.1(b) is therefore adopted as proposed in Notice 26. The remaining provisions of S4.1.2.3 were not objected to, and are also adopted as proposed.

A request to clarify section S7.4.1, by amending the second sentence of the section to refer to "each occupied front outboard seating position," has been favorably considered and is adopted hereby.

An amendment to S7.4.3 was proposed to allow an additional "free-start" mode, whereby the manufacturer could install a timer that would be actuated by the seat switch and that would allow the vehicle to be started without belt operation within a period of up to three minutes after the driver leaves his seat. Reaction to the proposal was favorable. In particular, the National Parking Association indicated that such a provision would alleviate most problems in the parking of cars in garages. The amendment is being adopted as proposed.

The proposed addition of section S7.4.5 proved unexpectedly controversial, due to an apparent divergence of opinion on the question of whether, without S7.4.5, a seat bounce switch would be permitted for the interlock system. It has been the opinion of NHTSA that the interlock requirements do not permit the starter to operate in the event that a person who has operated the belt in the correct sequence gets off the seat and returns to it before attempting to start the car. The majority of manufacturers construed the interlock requirements as permitting operation in the situation just described, and had therefore designed their systems with seat bounce switches. Rather than appearing permissive, as intended, the 10 second bounce switch proposed by S7.4.5 was therefore seen by most manufacturers as unduly restrictive.

Upon consideration of the comments, the agency has concluded that the predominant varieties of bounce switch described by the comments can be accommodated by a modest revision of the section. Two main types of switch were described, one involving a timer set for interval of from ten seconds to a minute and a half or more, and the other involving the door switches in the circuit, so that after being correctly sequenced the system would allow the car to be started despite "bounces" of any duration, so long as the doors have not been opened. As adopted, the section permits a manufacturer to choose either system. If he chooses a timed system, he may allow any time up to three minutes. Each of the varying time periods described in the comments would therefore be allowed.

The proposed alternative interlock system, S7.5, was treated favorably or neutrally in the comments, although none indicated plans to adopt such a system. The agency continues to regard the alternative system favorably, but on review of the comments has concluded that there is merit to the suggestion that the convenience features established for the primary interlock system should also be applied to the alternative system. In addition, it appears desirable to incorporate a requirement for warning system operation similar to that of S7.3.5.4 to tell a driver who has not operated his belt why the car cannot be moved. Final action on the proposed S7.5 is therefore being delayed in order to obtain comments on additional features of the system that are to be proposed in an upcoming notice.

II. *Other related matters.* After the publication of Notice 26, several comments and petitions were received on the subject of seat belts and the seat belt options. In its comment to Notice 26, Toyota restated its earlier request for amendment of Standard 209 to permit narrower webbing for portions of the belt that do not touch the occupant. Favorable action on this request is proposed in a notice published in today's edition of the *Federal Register* (38 F.R. 12414).

In a petition for rulemaking submitted May 15, 1973, Nissan Motor Company requested an amendment of the seat belt option that is in effect until August 15, 1973 (S4.1.1.3). The option presently requires all front outboard seat belts to meet a breakage test in a 30 mph barrier crash (S4.1.1.3(c)). Nissan stated that the finding in Notice 26 that the breakage test does not contribute significantly to the strength of the belt should be extended to belts in vehicles manufactured before August 15, 1973, as well as to belts in vehicles manufactured after that date, and that S4.1.1.3(c) should be deleted accordingly. The agency agrees with Nissan that that finding in Notice 26 is equally applicable to pre-August vehicles, but it does not consider an amendment of the standard necessary to afford the relief Nissan requests. Although the opinions in *Chrysler* v. *DOT*, 474 F.2d 659 (6th Circuit 1972) and *Ford* v. *NHTSA*, 473 F.2d 1241 (6th Circuit, 1973), did not deal directly with the non-passive options in effect before August 15, 1973, a side effect of the court's invalidation of the test dummy specifications of S8.1.8 is to leave the belt breakage test of S4.1.1.3(c) without a means of measurement.

The agency has concluded that the belt breakage test of S4.1.1.3(c) is without effect in the absence of a test dummy. It will therefore not seek to enforce the requirement. In view of the short time remaining before S4.1.1.3 and other current options lapse in favor of the August 15, 1973 options, this interpretation will have a marginal effect on currently produced vehicles, all of which have been certified as complying with the breakage test. It may, however, be of benefit to manufacturers who plan to introduce their 1974 models prior to August 15, 1973.

Several comments stated that the passive restraint requirement for August 15, 1975, and August 15, 1977, should be deleted from the text of the standard as a result of *Chrysler* v. *DOT*, *supra*, and reinstated only after issuance of the dummy regulation. A petition filed by the Center for Auto Safety, in contrast, seeks to have the August 15, 1975, date established as promptly as possible. The NHTSA position is that the decision in *Chrysler* v. *DOT* suspends the mandatory passive restraint requirements, regardless of whether they remain in the text of the rule, and that their deletion at this time would have no effect other than to require additional work at a later date.

Rulemaking, in addition to that now in progress with respect to the optional passive requirements, will be necessary in order to reestablish the date when passive restraints will be required. Before such rulemaking can be initiated, NHTSA is obliged to consider the comments it receives on the proposed test dummy regulation.

There has been some residual uncertainty as to the effect of the denial in Notice 26 of the petitions requesting restraint options in place of, or in addition to, the interlock system. The agency denied the petitions "to the extent that the petitions seek removal of the interlock requirement from the front outboard seats. . . ." It intended thereby to deny those petitions that would have added a fourth restraint option in addition to the interlock as well as to deny those that sought deletion of the interlock, and the language of denial in Notice 26 should be so construed.

The alternative interlock system proposed by Mr. Jesse R. Hollins, which was not discussed in detail in Notice 26, had been reviewed at the time of Notice 26 and was intended to be denied. The agency has again reviewed Mr. Hollins' petition and has again concluded that the benefits of his proposed system do not warrant the creation of such an alternative interlock system. His petition is accordingly denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, 49 CFR § 571.208, is amended in pertinent part as set forth below. Because this amendment imposes no additional burdens an effective date earlier than 180 days after issuance of this notice is found to be in the public interest.

Effective date: August 15, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407; delegations of authority at 38 F.R. 12147.

Issued on June 15, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 16072
June 20, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 73-8; Notice 2)

The purposes of this notice are (1) to adopt a regulation that specifies a test dummy to measure the performance of vehicles in crashes, and (2) to incorporate the dummy into Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208), for the limited purpose of evaluating vehicles with passive restraint systems manufactured under the first and second restraint options between August 15, 1973, and August 15, 1975. The question of the restraint system requirements to be in effect after August 15, 1975, is not addressed by this notice and will be the subject of future rulemaking action.

The test dummy regulation (49 CFR Part 572) and the accompanying amendment to Standard No. 208 were proposed in a notice published April 2, 1973 (38 F.R. 8455). The dummy described in the regulation is to be used to evaluate vehicles manufactured under sections S4.1.2.1 and S4.1.2.2, (the first and second options in the period from August 15, 1973, to August 15, 1975), and the section incorporating the dummy is accordingly limited to those sections. The dummy has not been specified for use with any protection systems after August 15, 1975, nor with active belt systems under the third restraint option (S4.1.2.3). The recent decision in *Ford* v. *NHTSA*, 473 F. 2d 1241 (6th Cir. 1973), removed the injury criteria from such systems. To make the dummy applicable to belts under the third option, the agency would have to provide additional notice and opportunity for comment.

By invalidating the former test dummy specification, the decision in *Chrysler* v. *DOT*, 472 F. 2d 659 (6th Cir. 1972), affected the restraint options in effect before August 15, 1975, as well as the mandatory passive restraint requirements that were to be effective after that date. A manufacturer who built cars with passive restraints under one of the options would therefore be unable to certify the cars as complying with the standard, as illustrated by the necessity for General Motors to obtain a limited exemption from the standard in order to complete the remainder of a run of 1,000 air-bag equipped cars.

The immediate purpose of this rulemaking is to reconstitute those portions of the standard that will enable manufacturers to build passive restraint vehicles during the period when they are optional. The test dummy selected by the agency is the "GM Hybird II", a composite developed by General Motors largely from commercially available components. GM had requested NHTSA to adopt the Hybrid II on the grounds that it had been successfully used in vehicle tests with passive restraint systems, and was as good as, or better than, any other immediately available dummy system. On consideration of all available evidence, the NHTSA concurs in this judgment. One fact weighing in favor of the decision is that General Motors has used this dummy to measure the conformity of its vehicles to the passive protection requirements of Standard 208, in preparation for the announced introduction of up to 100,000 air-bag-equipped vehicles during the 1974 model year.

No other vehicle manufacturer has announced plans for the production of passive restraint systems during the optional phase, nor has any other vehicle manufacturer come forward with suggestions for alternatives to Hybrid II. The NHTSA would have considered other dummies had some other manufacturer indicated that it was planning to produce passive restraint vehicles during the option period and that some other dummy had to be selected in order to allow them to proceed with their plans. If there had been any such plans, NHTSA would have made every effort to insure that a test device satisfactory to said manufacturer would have been selected.

This agency recognizes that since various types of dummy systems have been in use under the previous specification, any selection of one dummy, as is required by the *Chrysler* decision, will necessitate readjustments by some manufacturers. However, considering the quantity of GM's production, the scope and advanced state of its passive restraint development program, and the fact that the Hybrid II does not differ radically from other dummies currently in use, in the NHTSA's judgment that dummy represents the best and least costly choice. That conclusion has not been contradicted by the comments to the docket.

The agency will not make any final decision regarding reinstatement of mandatory passive restraint requirements without further notice and opportunity for comment. Should the agency propose mandatory passive restraint requirements, the question of the conformity of the dummy that is chosen with the instructions of the court in *Chrysler* will again be open for comment. The NHTSA strongly encourages the continuance of the dummy test programs mentioned in the comments, in the hope that any problems that may arise can be identified and resolved before the dummy specifications for later periods are issued.

The Hybrid II dummy has been found by NHTSA to be a satisfactory and objective test instrument. In sled and barrier tests conducted by GM with the GM restraint systems and in sled tests conducted by Calspan Corp. on behalf of NHTSA, the Hybrid II has produced results that are consistent and repeatable. This is not to say that each test at the same nominal speed and deceleration has produced identical values.

In testing with impact sleds, and to an even greater extent with crash-tested vehicles, the test environment itself is complex and necessarily subject to variations that affect the results. The test data show, however, that the variance from dummy to dummy in these tests is sufficiently small that a manufacturer would have no difficulty in deciding whether his vehicle would be likely to fail if tested by NHTSA.

The provisions of the dummy regulation have been modified somewhat from those proposed in the notice of proposed rulemaking, largely as a result of comments from GM. Minor corrections have been made in the drawings and materials specifications as a result of comments by GM and the principal dummy suppliers. The dummy specification, as finally adopted, reproduces the Hybrid II in each detail of its design and provides, as a calibration check, a series of performance criteria based on the observed performance of normally functioning Hybrid II components. The performance criteria are wholly derivative and are intended to filter out dummy aberrations that escape detection in the manufacturing process or that occur as a result of impact damage. The revisions in the performance criteria, as discussed hereafter, are intended to eliminate potential variances in the test procedures and to hold the performance of the Hybrid II within the narrowest possible range.

General Motors suggested the abandonment of the definition of "upright position" in section 572.4(c), and the substitution of a set-up procedure in section 572.11 to serve both as a positioning method for the performance tests and as a meansurement method for the dummy's dimensions as shown in the drawings. The NHTSA does not object to the use of an expanded set-up procedure, but has decided to retain the term "upright position" with appropriate reference to the new section 572.11(i).

The structural properties test of section 572.5(c), which had proposed that the dummy keep its properties after being subjected to tests producing readings 25 percent above the injury criteria of Standard No. 208, has been revised to provide instead that the properties must be retained after vehicle tests in accordance with Standard No. 208.

The head performance criteria are adopted as proposed. The procedures have been amended to insure that the forehead will be oriented below the nose prior to the drop, to avoid interference from the nose. In response to comments by the Road Research Laboratory, American

Motors, and GM, an interval of at least 2 hours between tests is specified to allow full restoration of compressed areas of the head skin.

The neck performance criteria are revised in several respects, in keeping with GM's recommendations. The pendulum impact surface, shown in Figure 4, has been modified in accordance with GM's design. The zero time point has been specified as the instant the pendulum contacts the honeycomb, the instructions for determining chordal displacement have been modified, and the pulse shape of the pendulum deceleration curve has been differently specified. The maximum allowable deceleration for the head has been increased slightly to 26g. In response to suggestions by the Road Research Laboratory and the Japan Automobile Manufacturers Association (JAMA), as well as GM, a tolerance has been specified for the pendulum's impact velocity to allow for minor variances in the honeycomb material.

With respect to the thorax test, each of the minor procedural changes requested by GM has been adopted. As with the head, a minimum recovery time is specified for the thorax. The seating surface is specified in greater detail, and the test probe orientation has been revised to refer to its height above the seating surface. The test probe itself is expressly stated to have a rigid face, by amendment to section 572.11, thereby reflecting the probes actually used by NHTSA and GM. A rigid face for the probe was also requested by Mercedes Benz.

The test procedures for the spine and abdomen tests are specified in much greater detail than before, on the basis of suggestions by GM and others that the former procedures left too much room for variance. The test fixtures for the spinal test orientation proposed by GM, and its proposed method of load application have been adopted. The parts of the dummy to be assembled for these tests are specifically recited, and an initial 50° flexion of the dummy is also specified. The rates of load application and removal, and the method of taking force readings are each specified. The direction of force application is clarified in response to a comment by Volvo.

The abdomen test is amended with respect to the initial point of force measurement, to resolve a particular source of disagreement between GM's data and NHTSA's. The boundaries of the abdominal force-deflection curve are modified to accord with the measurements taken by GM subsequent to the issuance of the notice. The rate of force application is specified as not more than 0.1 inch per second, in response to comments by Mercedes Benz, JAMA, and GM.

The test procedures for the knee tests are revised to specify the type of seating surface used and to control the angle of the lower legs in accordance with suggestions by JAMA, the Road Research Laboratory, and GM. The instrumentation specifications of section 572.11 are amended to clarify the method of attachment and orientation of the thorax accelerometers and to specify the channel classes for the chest potentiometer, the pendulum accelerometer, and the test probe accelerometer, as requested by several comments.

The design and assembly drawings for the test dummy are too cumbersome to publish in the *Federal Register*. During the comment period on the April 2 notice, the agency maintained master copies of the drawings in the docket and placed the reproducible mylar masters from which the copies were made with a commercial blueprint facility from whom interested parties could obtain copies. The NHTSA has decided to continue this practice and is accordingly placing a master set of drawings in the docket and the reproducible masters for these drawings with a blueprint facility.

The drawings as adopted by this notice differ only in minor detail from those that accompanied the April 2 notice. The majority of the changes, incorporated into corrected drawings, have already been given to those persons who ordered copies. The letter of June 13, 1973, that accompanied the corrected drawings has been placed in the docket. The June corrections are incorporated into the final drawing package. Additional adjustments are made hereby to reflect better the weight distribution of separated segments of the dummy, to allow other materials to be used for head ballast, and to specify the instrument for measuring skin thickness. The details of these changes are recited in a memorandum incorporated into the drawing package.

Each of the final drawings is designated by the legend "NHTSA Release 8/1/73". Each drawing so designated is hereby incorporated as part of the test dummy specifications of 49 CFR Part 572. Subsequent changes in the drawings will not be made without notice and opportunity for comment.

The incorporation of the Part 572 test dummy into Standard No. 208 makes obsolete several test conditions of the standard that had been adopted to supplement the former test dummy specifications. The location, orientation, and sensitivity of test instrumentation formerly specified by sections S8.1.15 through S8.1.18 are now controlled by Part 572 and are no longer necessary within Standard No. 208. Similarly, the use of rubber components for the head, neck and torso joints as specified in Part 572, supplant the joint setting specifications for those joints in section S8.1.10 of the standard. The NHTSA has determined that the deletion of the above portions of the Standard No. 208 will have no effect on the substantive requirements of the standard and that notice and public procedure thereon are unnecessary.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by the revision of Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208). . . .

In view of the pressing need for a test dummy to permit the continued development of passive restraint systems, and the fact that it presently only relates to a new option for compliance, the NHTSA finds that there is good cause to adopt an immediate effective date. Accordingly, Part 572 is effective August 1, 1973, and the amendment to Standard 208 is effective August 15, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, P.L. 89-563, 15 U.S.C. 1392, 1407, and the delegation of authority at 38 F.R. 12147.

Issued on July 26, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 20449
August 1, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69-7; Notice 29)

The purpose of this notice is to postpone the effective date of the requirements of Standards No. 208, Occupant Crash Protection, and 216, Roof Crush Resistance, applicable to the upcoming model year, from August 15, 1973 to September 1, 1973.

The amendment of the effective date was proposed in a notice published July 17, 1973 (38 F.R. 19049), in response to a petition filed by Chrysler Corporation. Chrysler had stated that the build-out of their 1973 models was in danger of running beyond the August 15 date, due to a variety of factors beyond the company's control. In proposing the postponement of the date, the NHTSA noted that the August 15 date had been chosen to coincide with the normal changeover date and that a delay would not appear to have any effect beyond allowing a slightly prolonged build-out.

The two comments submitted in response to the proposal were both favorable. The agency has not discovered any adverse consequences of a delay which would make it inadvisable, and has therefore decided to postpone the effective date as proposed.

In light of the foregoing, 49 CFR 571.208, Standard No. 208, Occupant Crash Protection, is amended by changing the date of August 14, 1973, appearing in S4.1.1 to August 31, 1973, and by changing the date of August 15, 1973, appearing in S4.1.2 to September 1, 1973. The effective date of 49 CFR 571.216, Standard No. 216, Roof Crush Resistance, is changed from August 15, 1973, to September 1, 1973.

Because this amendment relieves a restriction and imposes no additional burden, an effective date of less than 30 days from the date of issuance is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 10, 1973.

James B. Gregory
Administrator

38 F.R. 21930
August 14, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 73–24; Notice 2)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to permit determination of the maintenance schedule for crash deployed occupant protection systems by reference to vehicle mileage and year and date of vehicle manufacture. The amendment responds to a rulemaking petition submitted by General Motors on May 21, 1973.

The present procedure for determining maintenance necessitates a change in labels each month. The two new methods published in a notice of proposed rulemaking on October 24, 1973 (38 F.R. 29341), avoid the label change and are phrased in typical warranty terms familiar to consumers. All comments received were in favor of the proposal and the standard is being amended accordingly.

In consideration of the foregoing, S4.5.1 of Motor Vehicle Safety Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, is amended....

Effective date: January 10, 1974. Because the amendment relaxes a requirement and creates no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 3, 1974.

James B. Gregory
Administrator

39 F.R. 1513
January 10 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–4; Notice 2)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, by specifying emergency and special release requirements for seat belt assemblies that require no action by vehicle occupants (passive belts). This notice also sets out procedures for determination of whether a belt assembly qualifies as a passive restraint system in accordance with an interpretation published May 4, 1971 (36 F.R. 4600).

The passive belt release mechanism was proposed to grant a petition for rulemaking by Volkswagenwerk Aktiengesellschaft and Volkswagen of America, Inc. directed toward introduction of its passive belt system in its 1975 model cars (39 F.R. 3834, January 30, 1974). The proposed release mechanism, which reflects comments to an earlier proposal on release from passive belt systems (36 F.R. 12866, July 8, 1971) consists of a push-button latch release, guarded by a warning buzzer and interlock.

With the exception of Britax, Ltd., all comments favored a requirement for a manual release mechanism in passive belt systems, although most comments suggested changes in the proposal. One comment addressed to the adequacy of the Volkswagen belt system apparently did not understand that any passive belt syetem must meet the same injury criteria as any other passive system.

Britax pointed out the possibility of abuse of the manual release mechanism, but the NHTSA has concluded that the advantages of a release mechanism, as discussed in Notice 1, outweigh the disadvantages of possible abuse. The temptation to defeat the passive belt is less than it is with active belts, because the vehicle starts with the least inconvenience when the belt is permitted to work correctly.

The American Safety Equipment Corporation suggested that lever or pull-knob action would be a more satisfactory release mechanism than the push-button for occupants who only use the release infrequently and in emergency situations. There is a considerable advantage in uniformity, however, for those who do not normally use passive belt systems. The NHTSA specifies push-button action for all belt systems so that persons familiar with any belt system in any vehicle can operate the belt system of an unfamiliar vehicle. A person who operates typical 3-point active belts in his own car should be able to use the same push-button release action when he is a guest in a passive-belt equipped vehicle.

Manufacturers suggested several changes in the specifications for the warning buzzer and interlock guarding mechanism. American Motors recommended that the manufacturer be able to select either a starter interlock or the alternative power train interlock which has been proposed by the NHTSA. While there appear to be no disadvantages in such an option, the interlock requirements need not be changed until the NHTSA has acted on the alternative interlock proposal.

As proposed, the guarding features would operate if the release mechanism were unfastened. The Japan Automobile Manufacturers Association suggested addition of the option available in sequential interlocks, which operates the features if the belt length on the retractor indicates that the belt is not properly deployed. Such an option would be inappropriate, however, where there were no sequential system, because it would permit easy and permanent defeat of the system by knotting the belt after it had once been drawn from the retractor.

The proposal would have added a reference in S4.1.2.2 to the S4.5.3 passive belt exception in order to clarify their relationship. General Motors stated that, in actuality, the reference confused the relationship of S4 and S4.5.3 by implying that the S4.5.3 exception is limited to S4.1.2.2. The proposed addition will not be made.

Volkswagen suggested a clarification of the S7.2(b) latch mechanism requirement to remove the implication that a lap belt is required with the upper torso restraint, and this change has been made.

Volkswagen, in a March 8, 1974, letter request for interpretation, and General Motors in its comments, addressed the broad question of what constitutes a "passive" restraint system—one that requires "no action by vehicle occupants"—as those concepts are used in Standard No. 208. The NHTSA published an interpretation of what constitutes a "passive" restraint system on May 4, 1971 (36 F.R. 4600):

> The concept of an occupant protection system that requires "no action by vehicle occupants" as used in Standard No. 208 is intended to designate a system that requires no action other than would be required if the protective system were not present in the vehicle.

The NHTSA responded to Volkswagen's request with a letter further interpreting this concept as follows:

The question of what constitutes "no action by vehicle occupants" in a vehicle equipped with (presumptively) passive belts is best considered in two stages: (1) entry and exit from the vehicle, and (2) positioning of the belt for safety and comfort.

Entry and exit action "that requires no action other than would be required if the protective system were not present in the vehicle" means that a person is not hampered in his normal movements by the presence of the belt system. A test of this is whether a human occupant of approximately the dimensions of the 50th percentile adult male finds it necessary to take additional actions to displace the belt or associated components in order to enter or leave the seating position in question. An example of impermissible action would be the necessity of manually pushing a belt out of the way to gain access to the seat. Displacement of the components incidental to entry and exit, or merely for the convenience of the occupant would not be prohibited. Examples of permissible displacement would be brushing against the upper torso restraint during seating, or grasping the torso restraint to close the door.

The second question relates to the usefulness of the system once the occupant has been seated. The essence of a passive restraint is that it provides at least the minimum level of protection without relying on occupant action to deploy the restraint. At this stage, then, the question is whether an occupant who has seated himself without taking any "additional action" is in fact protected in a 30 mi/h impact. This can be measured by conducting the impact tests with the belt positioned on the test dummy in the orientation that results when a human occupant enters the vehicle according to the first test described above. It would not be required that the belt position itself for maximum comfort of the human occupant, if it met the safety requirements. For example, if the belt were to fall across the upper arm instead of the clavicle, but still passed the test, the system would be considered conforming.

The procedure for conducting this evaluation would be to have a human occupant enter the vehicle without taking any "additional actions" to displace the belt, to note the location of the belt on him before he exits, to position the test dummy in accordance with S8.1 of Standard 208, to position the belt as it positioned itself on the sample occupant, and then to conduct the impact tests. The exit evaluation would require the human occupant to be seated with the restraint normally deployed and then exit the vehicle without needing to take any separate actions to displace the belt.

In light of this interpretation, the NHTSA does not believe additional specification is required in the standard as requested by General Motors.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: May 27, 1974. On the basis of a determination that it is in the public interest to permit the introduction of a passive belt system concurrently with the 1975 passenger car model changes, it is found for good cause shown that an effective date earlier than 180 days following the date of issuance of this amendment is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on April 22, 1974.

James B. Gregory
Administrator

39 F.R. 14593
April 25, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–39; Notice 1)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, by eliminating the ignition interlock. Parallel changes are made to the passive seat belt provisions (S4.5.3) and the seat belt assembly requirements (S7.) of the standard.

This amendment is responsive to recently-enacted legislation which prohibits, after February 25, 1975, any Federal motor vehicle safety standard that requires or provides for use of a safety belt interlock system or a "continuous buzzer" warning. Pub. L. 93–492; § 109 (Oct. 28, 1974). The legislation further specifies that lap and shoulder belt assemblies shall be installed until the NHTSA undertakes further rulemaking on alternative systems. The NHTSA concludes that immediate action to delete the interlock option conforms to the intent of the legislation. Accordingly, S4.1.2.3, S4.5.3, and S7.4 have been modified as necessary to specify seat belt assemblies without an interlock that inhibits operation of the vehicle engine.

The legislation does not list the exact specifications of the warning system which will replace the "continuous buzzer" after 120 days, but it restricts the buzzer portion of any future warning to an 8-second period following operation of the ignition. Because the legislation leaves considerable regulatory discretion concerning warning systems, and a new system may require components not presently in manufacturers' inventories, the NHTSA finds it necessary and desirable to propose the new requirements in a separate notice, permitting opportunity for consideration and submission of comments by interested persons. Final action will be taken by December 27, 1974, to specify a new warning system as required by the statute.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: October 29, 1974. Because this amendment relieves a restriction and responds to a Congressional mandate expressed in the Motor Vehicle and Schoolbus Safety Amendments of 1974, the National Highway Traffic Safety Administration finds, for good cause shown, that notice and public procedure hereon are impracticable and unnecessary, and that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 109, 111 Pub. L. 93–492; delegation of authority at 49 CFR 1.51.)

Issued on October 29, 1974.

James B. Gregory
Administrator

39 F.R. 38380
October 31, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74-39; Notice 3)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to establish a new warning system for seat belt assemblies to replace the present warning system after February 24, 1975. The new system is permitted as an alternative to the present requirements until February 24, 1975.

This amendment responds to recently-enacted legislation which prohibits, after February 24, 1975, any Federal motor vehicle safety standard that requires or provides for use of a safety belt interlock or a "continuous buzzer" warning. Pub. L. 93-492; § 109, October 27, 1974 (15 U.S.C. § 1410(b)). An earlier amendment of the standard revoked the interlock option (39 F.R. 38380, October 31, 1974). In prohibiting the "continuous buzzer", the legislation states that an acceptable buzzer would operate only during an 8-second period after the ignition is turned to the "start" or "on" position. The legislation placed no restriction on warning lights. The present warning system provisions in Standard No. 208 do not comply with the legislative limit on "continuous buzzers".

On October 29, 1974, the NHTSA proposed a modified warning that would consist of a continuous or flashing reminder light that operates only during the 4- to 8-second period after the ignition is operated, and a continuous or intermittent audible warning signal which operates only during the 4- to 8-second period after the ignition is operated if the driver's lap belt is not in use (39 F.R. 38391, October 31, 1974). The light would operate independently of belt use, so that the "Fasten Seat Belt" reminder would remain effective even if the belt were disabled to silence the audible warning. With a view to cost-effectiveness, the NHTSA proposed two other alternative courses of action. The first would require only a visual reminder signal as described above and the second would eliminate entirely requirements for belt-use warning or reminder systems.

The notice proposed that the new system be optional until February 25, 1975, so that a manufacturer could effectuate the transition on an orderly basis.

The comments received varied greatly in their recommendations on the principal proposal, the visual-only alternative, and the possibility of no warning system requirements at all. Ford believed that the limited duration of the warning would make it relatively ineffective, and that deleting the belt warning requirements would have the best overall effect on public acceptance of seat belts. General Motors supported a visual-only reminder, and proposed an optional means of providing that visual reminder. Chrysler Corporation argued for a more complex warning system that would sense belt use at the right front passenger position as well as the driver's position, and would include a continuous warning light in place of the 4- to 8-second visual reminder. Volkswagen supported the audible-visual combination but recommended that both signals act as a reminder and function independently of belt use.

Smiths Industries Limited, a manufacturer of interlock units, Economics and Science Planning, and Switches, Inc., recommended that the sequential warning feature remain as an added incentive to operate the belt system. Other comments completely supported or opposed the proposal and in some cases offered totally new suggestions.

The NHTSA has carefully weighed the comments submitted in order to specify the most reasonable belt warning system requirements available. NHTSA studies show that belt usage by front seat occupants of interlock-equipped cars currently is about 38 percent. If from this percentage is subtracted the percentage of persons who would fasten their seat belts regardless of forcing systems, it can be seen that the fraction of the population whose behavior will be affected by any warning system is quite small. Because of the limited benefit, the reminder should be provided at as low a cost as feasible.

Because an irritating light can be easily ignored or disabled, a visual signal can effectively serve only a reminder function, and as such, it should be as simple as possible. The NHTSA concludes that a 4- to 8-second reminder is best calculated to accomplish the advisory function.

Chrysler recommended that the warning and reminder system be installed at the right front passenger position, which would add significant retractor or buckle switch, wiring, and seat sensor costs. The NHTSA calculates that the driver's warning system (or belt use) will offer substantially the same reminder to a front seat passenger as a limited-duration signal at the passenger position.

The Administration has determined that an audible-visual combination will provide the best reminder at a cost commensurate with the benefits achievable in a limited-duration signal. Comments on the alternative proposals and on manufacturer-suggested options did not establish that variations on the principal proposal offered significantly greater safety benefit in the short or long term. Accordingly, Standard No. 208 is amended as proposed to adopt a new belt warning system, as an alternative to the present system until February 24, 1975, and as the only permissible belt warning system thereafter.

With regard to the warning's duration, Ford suggested that the range of signal duration be expanded to a longer 2- to 8-second duration to permit use of a more economical timer. This request is denied. The 4-second minimum duration was selected as the best compromise between the necessary manufacturer's tolerance and the duration necessary to alert the occupants fully.

Some manufacturers, such as American Motors Corporation, have considered the use of thermal timer mechanisms, which can be affected by extremes of ambient temperature and battery voltage, and by repeated cycling. Standard No. 208 does not presently specify an ambient temperature for testing. Because no temperature was proposed, and in view of the necessity of specifying a warning system to comply with the legislation by December 26, 1974, the NHTSA will issue the present amendment without an ambient temperature test condition. Until the question of the need for a temperature specification is resolved, this agency will consider that compliance with the requirements is required at moderate ambient temperatures. Performance of these systems will be observed with a view to further rulemaking on temperature, cycling, and other criteria.

It should be noted that the February 25, 1975, date proposed for mandatory use of the new system was calculated on an October 28, 1974, enactment of the "Motor Vehicle and Schoolbus Safety Amendments of 1974". In fact these amendments were enacted on October 27, 1974, and accordingly the "continuous buzzer" systems must be deleted by February 24, 1975, as is now reflected in the wording of this amendment.

In another area, White Motor Company has pointed out that the amendatory language in both notices of Docket No. 74–39 inadvertently included motor vehicles other than passenger cars in the belt warning requirement. The wording of this amendment corrects this error as to vehicles manufactured in the future. The requirements of S7.3 published in the Federal Register on October 31, 1974 (39 F.R. 38380) were intended to apply, and will be treated by this agency as applying, only to motor vehicles manufactured in accordance with S4.1.2 and S4.1.3.

In a matter related to seat belt modifications, the NHTSA hereby terminates rulemaking on a proposal to amend Standard No. 208 that would have permitted use of a drive train interlock mode in place of the ignition interlock mode to meet the "third option" belt interlock requirements of S4.1.2.3. A proposal on this alternative interlock was published January 23, 1974 (39 F.R. 2610). As noted earlier, the NHTSA has already modified S4.1.2.3 of the standard to specify seat belt assemblies without an interlock that inhibits operation of the vehicle engine. For this reason, it is appropriate to terminate further rulemaking on the alternative interlock mode. No further action in this area will be taken without further notice and opportunity for comment.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: December 3, 1974.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 109, Pub. L. 93–492, 88 Stat. 1470 (15 U.S.C. 1410(b)); delegation of authority at (49 CFR 1.51).

Issued on December 2, 1974.

James B. Gregory
Administrator

39 F.R. 42692
December 6, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 75–14; Notice 2)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to permit until January 1, 1976, the installation of current seat belt assemblies in trucks and multipurpose passenger vehicles (MPV) with a gross vehicle weight rating of 10,000 pounds or less. This amendment was proposed (40 F.R. 23897, June 3, 1975) in response to petitions from Chrysler Corporation and Jeep Corporation.

In both the Jeep and Chrysler petitions and in comments on the proposal, vehicle manufacturers stated that the current economic situation may cause the continued production of 1975-model vehicles beyond August 15, 1975, after their production would normally have been terminated. Significant cost in obsolete material and in running changes would be involved in the introduction of the new 3-point belt systems in vehicles which are designed to accept lap belts only.

Ford Motor Company concurred in the proposal in view of obsolescence costs which might be avoided by the 4-month option. General Motors Corporation only indicated that it did not object to the proposal. The American Safety Belt Council emphasized the readiness of seat belt manufacturers to supply the new systems and the importance of a swift decision. They expressed support for the introduction of 3-point systems as soon as possible. The Recreational Vehicle Industry Association sought confirmation of its understanding that the proposal did not modify requirements for motor homes and forward control vehicles under S4.2. (RVIA's understanding is correct.) Chrysler and Jeep supported the proposal, and Jeep supplied production and retail cost information for which it requested confidentiality.

It is apparent from the nature of data submitted by manufacturers that the 20-day comment period did not allow adequate time for collection and development of the items enumerated in the preamble to the proposal. While it would be preferable to provide manufacturers more time to develop additional data, the NHTSA recognizes that virtually no time remains in which to make decisions for August 1975 production. The cost data already submitted by Jeep and the engineering changes submitted by Chrysler do permit an NHTSA judgment on cost objections of manufacturers under § 113 and on the advisability of the proposed modification.

Using the Chrysler submission as representative of the production changes to be undertaken by any manufacturer in effecting a running change to the seat belt systems of the 1975-model vehicles built after August 14, 1975, it is concluded that the total cost implications of these changes would be substantial if undertaken. The Jeep itemized cost information on production changes bore out this conclusion. In terms of obsolescence, it is confirmed by Ford that the decreased sales will result in obsolescence due to inability to balance out stocks of seat belts and other components in 1975-model vehicles.

Pursuant to § 113(b)(1) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1402(b)(1), the information on which this evaluation is based is available in the NHTSA public docket (Docket No. 75–14, Notice 1; PRM #208–000022; PRM #105–000019) except for the Jeep submission. The NHTSA is presently determining whether the submission is entitled to confidential treatment. If it is not, the submission will be placed in Docket No. 75–14, Notice 1.

In all, the information submitted by manufacturers, particularly Chrysler, indicates that a substantial number of changes would be required to effect a running change to the vehicles in question after August 15, 1975. The cost data submitted by Jeep indicate that these changes will result in significant cost increases. The NHTSA has decided that the significant costs of the running changes in 1975-model vehicles whose production may be continued after August 15, 1975, are not justified for the numbers of vehicles that might be affected.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: July 9, 1975. Because this amendment concerns production decisions that must be made immediately for the model changes in September 1975, it is found for good cause shown that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on July 3, 1975.

James B. Gregory
Administrator

40 F.R. 28805
July 9, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–14; Notice 4)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to continue until August 31, 1976, the present three options available for occupant crash protection in passenger cars. This amendment replaces provisions of the standard which were to have come into effect on August 15, 1975, but were suspended as a result of the decision of the U.S. Court of Appeals for the Sixth Circuit in *Chrysler v. DOT*, 472 F2d 659 (6th Cir. 1972).

This extension of the present occupant crash protection options was proposed April 10, 1975 (40 F.R. 21617). Vehicle manufacturers and the American Safety Belt Council (ASBC) supported the proposal, but requested that the modifications apply indefinitely instead of being limited to a 1-year extension. Ford Motor Company, Chrysler Corporation, and Volkswagen of America also asked that the future provisions for light trucks and multipurpose passenger vehicles (MPV) (S4.2.3) be similarly modified. The California Traffic Safety Foundation and the Vehicle Equipment Safety Commission supported the proposal but only for the 1-year period for which it was proposed.

While the NHTSA recognizes that the present crash protection options will in all likelihood be in effect for some period after August 31, 1976, the agency has not proposed more than the 1-year extension. The Administrative Procedures Act specifies, with limited exceptions, that notice and opportunity to comment be provided interested persons in the case of agency rulemaking proceedings (§ 553(b)). The NHTSA intends to propose the long-term requirements for occupant crash protection, both for passenger cars and for light trucks and MPV's, as soon as possible.

Until that time, the NHTSA finds that manufacturers must be assured of the regulations for occupant crash protection as they apply to upcoming production. In consideration of the foregoing, Standard No. 208 (49 CFR § 571.208) is amended. . . .

Effective date: August 13, 1975. Because the present requirements for occupant crash protection terminate in less than 30 days and manufacturers need to be advised of the continuation of the requirements as soon as possible, it is found for good cause shown that an effective date sooner than 30 days following the date of publication is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on August 8, 1975.

James B. Gregory
Administrator

40 F.R. 33977
August 13, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 75–33; Notice 2)

This notice amends Standard No. 208, *Occupant Crash Protection*, to permit certain U.S. Postal Service vehicles to meet the requirements of the standard that were in effect until January 1, 1976, instead of the new requirements that became effective on that date.

The NHTSA proposed this modification of Standard No. 208 (49 CFR 571.208) in a notice published December 31, 1975 (40 FR 60075). The occupant protection requirements in the standard until January 1, 1976, specified either a Type 1 or Type 2 seat belt assembly at the driver's position of the light delivery vehicles used by the Postal Service on delivery routes. The Postal Service's safety research organization developed a seat belt design that met the requirements and resulted in improved usage by vehicle operators.

The newer requirements now in effect for the light delivery vehicles in question require the same seat belt assembly installations as in most passenger cars, including a Type 2 seat belt assembly with non-detachable shoulder belt at each front outboard designated seating position. The Service judges that installation of Type 2 seat belts at the driver's position with non-detachable shoulder portion will decrease the percentage of seat belt use by their mail delivery personnel.

The Postal Service indicated its support for the proposal. Ford Motor Company objected to the basis of the vehcile category as a "single user exemption." The agency, while in agreement that categorization based on the status of a single user is not generally utilized, recognizes the distinctive scope and nature of U.S. Postal Service operations. The Service is a part of the Federal government, its delivery activities are unique in scope and variety, and the organization has an active safety research effort that addresses the particular enviromnent of mail delivery by motor vehcile. No other comments were received. The agency concludes that the new requirements for Type 2 seat belt assemblies at the driver's position in this limited category of vehicle are not justified, because their interference with the many entries and exits from the vehcile may discourage usage.

In consideration of the foregoing, S.4.2.2 of Standard No. 208 (49 CFR 571.208) is amended by the addition of the phrase "vehicles designed to be exclusively sold to the U.S. Postal Service," following the phrase "motor homes."

Effective date: March 18, 1976. Because this amendment creates no additional requirements for any person, and in view of the Postal Service's need to contract for vehicles with appropriate seat belt assemblies at the earliest opportunity, an immediate effective date is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on March 10, 1976.

James P. Gregory
Administrator

41 F.R. 11312
March 18, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–14; Notice 6)

This notice amends Standard No. 208, Occupant Crash Protection, to continue until August 31, 1977, the present three options available for occupant crash protection in passenger cars.

This extension of the present occupant crash protection options of Standard No. 208 (49 CFR 571.208) was proposed July 19, 1976 (41 FR 29715), along with several other subjects that will be the subject of a future notice. Vehicle manufacturers supported the proposal but requested that the options be extended indefinitely instead of being limited to a 1-year extension. Mr. Benjamin Redmond advocated the use of an interlock system to increase usage of active belt systems. Ms. Lucie Kirylak expressed a preference for active occupant crash protection systems. The National Motor Vehicle Safety Advisory Council did not take a position on the proposal.

The Secretary of Transportation has initiated a process for the establishment of future occupant crash protection requirements under Standard No. 208 (41 FR 24070, June 14, 1976). The Secretary's proposal addresses the long term issues involved, and this 1-year extension of requirements is intended to provide the time necessary to reach that decision. Because a 1-year extension is consistent with the process that has been established and because a longer extension was not proposed for comment, the NHTSA declines to extend the existing requirements as recommended by the manufacturers.

Other matters proposed in the notice that underlies this action will be treated at a later date, following the receipt of comments that are due on October 20, 1976.

The NHTSA notes that no effective date was proposed for the other matters addressed by the proposal. Those matters involve modification of the existing passive protection options so that they conform to the proposal of the Department of Transportation, and to reduce somewhat the femur force requirement. Also, further specification of dummy positioning in the vehicle was addressed. The agency proposes an immediate effective date for these changes, because they represent relaxation of the requirements. However, the views of interested persons, particularly Volkswagen (which is certifying compliance under one passive option), are solicited by October 20, 1976.

In consideration of the foregoing, the heading and text of S4.1.2 of Standard No. 208 (49 CFR 571.208) are amended by changing the date "August 31, 1976" to "August 31, 1977" wherever it appears.

Effective date: August 26, 1976.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 26, 1976.

John W. Snow
Administrator

41 F.R. 36494
August 30, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. OST 44; Notice 77–3)

This notice amends Standard No. 208, *Occupant Crash Protection*, to extend indefinitely the current occupant crash protection requirements for passenger cars.

In a notice published June 14, 1976 (41 FR 24070), I proposed five alternative courses of action for future occupant crash protection requirements under Standard No. 208 (49 CFR 571.208). Based on an analysis of comments received, a decision was reached to call upon the automobile manufacturers to join the Federal government in conducting a large-scale demonstration program to exhibit the effectiveness of passive restraint systems. The reasoning that underlines that decision is contained in a December 6, 1976, document ("The Secretary's Decision Concerning Motor Vehicle Occupant Crash Protection") that is hereby incorporated by reference in this notice. The effect of that decision on Standard No. 208 is to require the continuation of the current requirements for passenger cars, as proposed in the first of the five alternative courses of action.

The first alternative was written as a three-year extension (to August 31, 1979), although the preamble discussion made clear that the length of the extension was open to discussion. It is now apparent that a continuation of the existing requirements is best effectuated by a deletion of any termination date. This action accords with the intent of the first alternative to maintain current occupant crash protection requirements for the indefinite future. Because this action represents a continuation of existing manufacturing practices, it is the Department's finding that no new significant economic or environmental impacts result from this amendment.

I have directed the National Highway Traffic Safety Administration (NHTSA) to propose comparable changes in the requirements for multipurpose passenger vehicles and light trucks. The NHTSA has also been directed to take final action on the substantive changes to Standard No. 208 that were proposed in its notice of July 19, 1976 (41 FR 29715).

The Department hereby closes OST Docket No. 44, which is transferred to the NHTSA's docket on occupant crash protection. I want to make it clear, however, that by closing OST Docket No. 44 and amending Standard No. 208 to extend indefinitely the current occupant crash protection requirements for passenger cars, I have not in any way foreclosed a future Secretary or Administrator of NHTSA from instituting at any time a rulemaking to amend Standard No. 208 either to place a terminate date on Standard No. 208 or to mandate passive restraints on some or all passenger cars.

In consideration of the foregoing, the heading and text of S4.1.2 of Standard No. 208 (49 CFR 571.208) are amended in part to read as follows:

S4.1.2 *Passenger cars manufactured on or after September 1, 1973.* Passenger cars manufactured on or after September 1, 1973, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3. * * *.

Effective date: January 19, 1977.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407.)

Issued on January 19, 1977.

William T. Coleman, Jr.
Secretary of Transportation

42 F.R. 5071
January 27, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–14; Notice 9)

This notice amends Standard No. 208, *Occupant Crash Protection*, to extend indefinitely the current occupant crash protection requirements for light trucks and multipurpose passenger vehicles. The question of future requirements for occupant crash protection is presently being considered by the Secretary of Transportation, and thus the current requirements for light trucks and multipurpose passenger vehicles should be continued for the indefinite future.

Effective date: June 2, 1977.

Addresses: Requests for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Guy Hunter
Motor Vehicle Programs
National Highway Traffic Safety Administration
Washington, D.C. 20590
(202–426–2265)

The requirements of Standard No. 208 (49 CFR 571.208) have been implemented in three stages. The current stage for trucks and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less specifies a choice of three means to provide occupant protections (S4.2.2) and is scheduled to end August 14, 1977. After that date many of these vehicles would be required by S4.2.3 of Standard No. 208 to provide occupant crash protection by means that require no action by vehicle occupants (commonly known as passive protection). In the original promulgation of Standard No. 208 in its present form (36 FR 4600; March 10, 1971) it was established that thic modification of occupant protection should follow a similar modification of protection in passenger cars by two years, to provide manufacturers with time to assimilate and benefit from passenger car experience.

The issue of future occupant protection in passenger cars is being decided at this time, in a notice of proposed rulemaking issued by the Secretary of Transportation (42 FR 15935; March 24, 1977). Thus, light truck and MPV manufacturers have not had the benefit of experience with new systems in passenger cars as originally anticipated. In view of this fact and the fact that they are not prepared to meet requirements other than the existing performance options after August 14, 1977, the agency has decided to continue the existing requirements indefinitely.

This action does not preclude future rulemaking to modify occupant crash protection for the affected vehicles, but notice and opportunity for comment will be provided prior to further action.

Because this action represents a continuation of existing manufacturing practices, it is the agency's finding that no new significant economic or environment impacts result from this amendment.

The lawyer principally responsible for the preparation of this document is Tad Herlihy of the NHTSA Office of Chief Counsel.

The economic and inflationary impacts of this rulemaking have been carefully evaluated in accordance with OMB Circular A–107, and an Inflation Impact Statement is not required.

In view of the fact that future occupant protection requirements are not established and manufacturers are prepared only to meet existing occupant protection requirements after August 1977, the agency finds that notice and public procedure on this amendment to continue existing requirements is unnecessary and contrary to the public interest in knowning next model year's requirements as soon as possible. The agency also finds that this amendment may become effective immediately, because the amendment relieves a restriction.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on May 27, 1977.

Joan Claybrook
Administrator

42 F.R. 28135
June 2, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–14; Notice 11; Docket No. 73–8; Notice 7)

This notice amends occupant crash protection Standard No. 208 and its accompanying test dummy specification to further specify test procedures and injury criteria. The changes are minor in most respects and reflect comments by manufacturers of test dummies and vehicles and the NHTSA's own test experience with the standard and the test dummy.

Date: Effective date July 5, 1978.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Mr. Guy Hunter
Motor Vehicle Programs
National Highway Traffic Safety Administration
Washington, D.C. 20590
(202) 426–2265

Supplemental information: Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), is a Department of Transportation safety standard that requires manufacturers to provide a means of restraint in new motor vehicles to keep occupants from impacting the vehicle interior in the event a crash occurs. The standard has, since January 1968, required the provision of seat belt assemblies at each seating position in passenger cars. In January 1972 the requirements for seat belts were upgraded and options were added to permit the provision of restraint that is "active" (requiring some action be taken by the vehicle occupant, as in the case of seat belts) or "passive" (providing protection without action being taken by the occupant).

In a separate notice issued today (42 FR 34289; FR Reg. 77–19137), the Secretary of Transportation has reached a decision regarding the future occupant crash protection that must be installed in passenger cars. The implementation of that decision will involve the testing of passive restraint systems in accordance with the test procedures of Standard No. 208, and this notice is intended to make final several modifications of that procedure which have been proposed for change by the NHTSA. This notice also responds to two petitions for reconsideration of rulemaking involving the test dummy that is used to evaluate the compliance of passive restraint systems.

DOCKET 74–14; NOTICE 05

Notice 5 was issued July 15, 1976 (41 FR 29715; July 19, 1976) and proposed that Standard No. 208's existing specification for passive protection in frontal, lateral, and rollover modes (S4.1.2.1) be modified to specify passive protection in the frontal mode only, with an option to provide passive protection or belt protection in the lateral and rollover crash modes. Volkswagen had raised the question of the feasibility of small cars meeting the standard's lateral impact requirements: A 20-mph impact by a 4,000-pound, 60-inch-high flat surface. The agency noted the particular vulnerability of small cars to side impact and the need to provide protection for them based on the weight of other vehicles on the highway, but agreed that it would be difficult to provide passive lateral protection in the near future. Design problems also underlay the proposal to provide a belt option in place of the existing passive rollover requirement.

Ford Motor Company argued that a lateral option would be inappropriate in Standard No. 208 as long as the present dummy is used for measurement of passive system performance.

This question of dummy use as a measuring device is treated later in this notice. General Motors Corporation (GM) supported the option without qualification, noting that the installation of a lap belt with a passive system "would provide comparable protection to lap shoulder belts in side and rollover impacts." Chrysler did not object to the option, but noted that the lap belt option made the title of S4.1.2.1 ("complete passive protection") misleading. Volkswagen noted that its testing of belt systems without the lap belt portion showed little loss in efficacy in rollover crashes. No other comments on this proposal were received. The existing option S4.1.2.1 is therefore adopted as proposed so that manufacturers will be able to immediately undertake experimental work on passive restraints on an optional basis in conformity with the Secretary's decision.

There were no objections to the agency's proposal to permit either a Type 1 or Type 2 seat belt assembly to meet the requirements, and thus it is made final as proposed.

The NHTSA proposed two changes in the injury criteria of S6 that are used as measures of a restraint system's qualification to Standard No. 208. One change proposed an increase in permissible femur force limits from 1,700 pounds to 2,250 pounds. As clarification that tension loads are not included in measurement of these forces, the agency also proposed that the word "compressive" be added to the text of S6.4. Most commenters were cautionary about the changes, pointing out that susceptibility to fracture is time dependent, that acetabular injury could be exacerbated by increased forces, and that angular applications of force were as likely in the real world as axial forces and would more likely fracture the femur.

The agency is aware of and took into account these considerations in proposing the somewhat higher femur force limit. The agency started with the actual field experience of occupants of GM and Volkswagen vehicles that have been shown to produce femur force readings of about 1,700 pounds. Occupants of these vehicles involved in crashes have not shown a significant incidence of femur fracture. The implication from this experience that the 1,700-pound figure can safely be raised somewhat is supported in work by Patrick on compressive femur forces of relatively long duration. The Patrick data (taken with aged embalmed cadavers) indicate that the average fracture load of the patella-femur-pelvis complex is 1,910 pounds. This average is considered conservative, in that cadaver bone structure is generally weaker than living human tissue. While these data did not address angular force applications, the experience of the GM and Volkswagen vehicle occupants does suggest that angular force application can go higher than 1,700 pounds.

The agency does not agree that the establishment of the somewhat higher outer limit for permissible femur force loads of 2,250 pounds is arbitrary. What is often ignored by the medical community and others in commenting on the injury criteria found in motor vehicle safety standards is that manufacturers must design their restraint systems to provide greater protection than the criteria specified, to be certain that each of their products will pass compliance tests conducted by the NHTSA. It is a fact of industrial production that the actual performance of some units will fall below nominal design standards (for quality control and other reasons). Volkswagen made precisely this point in its comments. Because the National Traffic and Motor Vehicle Safety Act states that each vehicle must comply (15 U.S.C. § 1392(a)(1)(a)), manufacturers routinely design in a "compliance margin" of superior performance. Thus, it is extremely unlikely that a restraint system designed to meet the femur force load criterion of 2,250 pounds will in fact be designed to provide only that level of performance. With these considerations in mind, the agency makes final the changes as proposed.

While not proposed for change, vehicle manufacturers commented on a second injury criterion of the standard: A limitation of the acceleration experienced by the dummy thorax during the barrier crash to 60g, except for intervals whose cumulative duration is not more than 3 milliseconds (ms). Until August 31, 1977, the agency has specified the Society of Automotive Engineers' (SEA) "severity index" as a substitute for the 60g–3ms limit, because of greater familiarity of the industry with that criterion.

General Motors recommended that the severity index be continued as the chest injury criterion until a basis for using chest deflection is developed in place of chest acceleration. GM cited data which indicate that chest injury from certain types of blunt frontal impact is a statistically significant function of chest deflection in humans, while not a function of impact force or spinal acceleration. GM suggested that a shift from the temporary severity index measure to the 60g–3ms measurement would be wasteful, because there is no "strong indication" that the 60g–3ms measurement is more meaningful than the severity index, and some restraint systems might have to be redesigned to comply with the new requirement.

Unlike GM, Chrysler argued against the use of acceleration criteria of either type for the chest, and rather advocated that the standard be delayed until a dummy chest with better deflection characteristics is developed.

The Severity Index Criterion allows higher loadings and therefore increases the possibility of adverse effects on the chest. It only indirectly limits the accelerations and hence the forces which can be applied to the thorax. Acceleration in a specific impact environment is considered to be a better predictor of injury than the Severity Index.

NHTSA only allowed belt systems to meet the Severity Index Criterion of 1,000 instead of the 60g–3ms criterion out of consideration for lead-time problems, not because the Severity Index Criterion was considered superior. It is recognized that restraint systems such as lap-shoulder belts apply more concentrated forces to the thorax than air cushion restraint, and that injury can result at lower forces and acceleration levels. It is noted that the Agency is considering rulemaking to restrict forces that may be applied to the thorax by the shoulder belt of any seat belt assembly (41 FR 54961; December 16, 1976).

With regard to the test procedures and conditions that underlie the requirements of the standard, the agency proposed a temperature range for testing that would be compatible with the temperature sensitivity of the test dummy. The test dummy specification (Part 572, *Anthropomorphic Test Dummy*, 49 CFR Part 572) contains calibration tests that are conducted at any temperature between 66° and 78° F. This is because properties of lubricants and nonmetallic parts used in the dummy will change with large temperature changes and will affect the dummy's objectivity as a test instrument. It was proposed that the Standard No. 208 crash tests be conducted within this temperature range to eliminate the potential for variability.

The only manufacturers that objected to the temperature specification were Porsche, Bayerische Motoren Werke (BMW), and American Motors Corporation (AMC). In each case, the manufacturers noted that dynamic testing is conducted outside and that it is unreasonable to limit testing to the few days in the year when the ambient temperature would fall within the specified 12-degree range.

The commenters may misunderstand their certification responsibilities under the National Traffic and Motor Vehicle Safety Act. Section 108(b)(2) limits a manufacturer's responsibility to the exercise of "due care" to assure compliance. The NHTSA has long interpreted this statutory "due care" to mean that the manufacturer is free to test its products in any fashion it chooses, as long as the testing demonstrates that due care was taken to assure that, if tested by NHTSA as set forth in the standard, the product would comply with the standard's requirements. Thus, a manufacturer could conduct testing on a day with temperatures other than those specified, as long as it could demonstrate through engineering calculations or otherwise, that the difference in test temperatures did not invalidate the test results. Alternatively a manufacturer might choose to perform its preparation of the vehicle in a temporarily erected structure (such as a tent) that maintains a temperature within the specified range, so that only a short esposure during acceleration to the barrier would occur in a higher or lower temperature. To assist any such arrangements, the test temperature condition has been limited to require a stabilized temperature of the test dummy only, just prior to the vehicle's travel toward the barrier.

In response to an earlier suggestion from GM, the agency proposed further specificity in the clothing worn by the dummy during the crash test. The only comment was filed by GM, which argued that any shoe specification other than weight would be unrelated to dummy performance and therefore should not be included in the specification. The agency disagrees, and notes that the size and shape of the heel on the shoe can affect the placement of the dummy limb within the vehicle. For this reason, the clothing specifications are made final as proposed, except that the requirement for a conforming "configuration" has been deleted.

Renault and Peugeot asked for confirmation that pyrotechnic pretensioners for belt retractors are not prohibited by the standard. The standard's requirements do not specify the design by which to provide the specified protection, and the agency is not aware of any aspect of the standard that would prohibit the use of pretensioning devices, as long as the three performance elements are met.

With regard to the test dummy used in the standard, the agency proposed two modifications of Standard No. 208: a more detailed positioning procedure for placement of the dummy in the vehicle prior to the test, and a new requirement that the dummy remain in calibration without adjustment following the barrier crash. Comments were received on both aspects of the proposal.

The dummy positioning was proposed to eliminate variation in the conduct of repeatable tests, particularly among vehicles of different sizes. The most important proposed modification was the use of only two dummies in any test of front seat restraints, whether or not the system is designed for three designated seating positions. The proposal was intended to eliminate the problem associated with placement of three 50th-percentile male dummies side-by-side in a smaller vehicle. In bench seating with three positions, the system would have to comply with a dummy at the driver's position and at either of the other two designated seating positions.

GM supported this change, but noted that twice as many tests of 3-position bench-seat vehicles would be required as before. The company suggested using a simulated vehicle crash as a means to test the passive restraint at the center seat position. The agency considers this approach unrepresentative of the actual crash pulse and vehicle kinematic response (e.g., pitching, yawing) that occur during an impact. To the degree that GM can adopt such an approach in the exercise of "due care" to demonstrate that the center seating position actually complies, the statute does not prohibit such a certification approach.

Ford objected that the dummy at the center seat position would be placed about 4 inches to the right of the center of the designated seating position in order to avoid interference with the dummy at the driver's position. While the NHTSA agrees that a small amount of displacement is inevitable in smaller vehicles, it may well occur in the real world also. Further, the physical dimensions of the dummy preclude any other positioning. With a dummy at the driver's position, a dummy at the center position cannot physically be placed in the middle of the seat in all cases. In view of these realities, the agency makes final this aspect of the dummy positioning as proposed.

GM suggested the modification of other standards to adopt "2-dummy" positioning. The compatibility among dynamic tests is regularly reviewed by the NHTSA and will be again following this rulemaking action. For the moment, however, only those actions which were proposed will be acted on.

As a general matter with regard to dummy positioning, General Motors found the new specifications acceptable with a few changes. GM cautioned that the procedure might not be sufficiently reproducible between laboratories, and Chrysler found greater variation in positioning with the new procedures than with Chrysler's own procedures. The agency's use of the procedure in 15 different vehicle models has shown consistently repeatable results, as long as a reasonable amount of care is taken to avoid the effect of random inputs (see "Repeatability of Set Up and Stability of Anthropometric Landmarks and Their Influence on Impact Response of Automotive Crash Test Dummies." Society of Automotive Engineers, Technical Paper No. 770260, 1977). The agency concludes that, with the minor improvements cited below, the positioning procedure should be made final as proposed.

The dummy is placed at a seating position so that its midsagittal plane is vertical and longitudinal. Volkswagen argued against use of the midsagittal plane as a reference for dummy placement, considering it difficult to define as a practical matter during placement. The agency has used plane markers and plane lines to define the midsagittal plane and has experienced no significant difficulty in placement of the dummy with these techniques. For this reason, and because Volkswagen suggested no simpler orientation technique, the agency adopts use of the midsagittal plane as proposed.

Correct spacing of the dummy's legs at the driver position created the largest source of objection by commenters. Ford expressed concern that an inward-pointing left knee could result in unrealistically high femur loads because of femur-to-steering column impacts. GM asked that an additional 0.6 inch of space be specified between the dummy legs to allow for installation of a device to measure steering column displacement. Volkswagen considered specification of the left knee bolt location to be redundant in light of the positioning specification for the right knee and the overall distance specification between the knees of 14.5 inches.

The commenters may not have understood that the 14.5- and 5.9-inch dimensions are only initial positions, as specified in S8.1.11.1.1. The later specification to raise the femur and tibia centerlines "as close as possible to vertical" without contacting the vehicle shifts the knees from their initial spacing to a point just to the left and right of the steering column.

As for GM's concern about instrumentation, the agency does not intend to modify this positioning procedure to accommodate instrumentation preferences not required for the standard's purposes. GM may, of course, make test modifications so long as it assures, in the exercise of due care, that its vehicles will comply when tested in accordance with the specification by the agency.

In the case of a vehicle which is equipped with a front bench seat, the driver dummy is placed on the bench so that its midsagittal plane intersects the center point of the plane described by the steering wheel rim. BMW pointed out that the center plane of the driver's seating position may not coincide with the steering wheel center and that dummy placement would therefore be unrealistic. Ford believed that the specification of the steering wheel reference point could be more precisely specified.

The agency believes that BMW may be describing offset of the driver's seat from the steering wheel in bucket-seat vehicles. In the case of bench-seat vehicles, there appears to be no reason not to place the dummy directly behind the steering wheel. As for the Ford suggestion, the agency concludes that Ford is describing the same point as the proposal did, assuming, as the agency does, that the axis of the steering column passes through the center point described. The Ford description does have the effect of moving the point a slight distance laterally, because the steering wheel rim upper surface is somewhat higher than the plane of the rim itself. This small distance is not relevant to the positioning being specified and therefore is not adopted.

In the case of center-position dummy placement in a vehicle with a drive line tunnel, Ford requested further specification of left and right foot placement. The agency has added further specification to make explicit what was implicit in the specifications proposed.

Volkswagen suggested that the NHTSA had failed to specify knee spacing for the passenger side dummy placement. In actuality, the specification in S8.1.11.1.2 that the femur and tibia centerlines fall in a vertical longitudinal plane has the effect of dictating the distance between the passenger dummy knees.

The second major source of comments concerned the dummy settling procedure that assures uniformity of placement on the seat cushion and against the seat back. Manufacturers pointed out that lifting the dummy within the vehicle, particularly in small vehicles and those with no rear seat space, cannot be accomplished easily. While the NHTSA recognizes that the procedure is not simple, it is desirable to improve the uniformity of dummy response and it has been accomplished by the NHTSA in several small cars (e.g., Volkswagen Rabbit, Honda Civic, Fiat Spider, DOT HS-801-754). Therefore, the requests of GM and Volkswagen to retain the method that does not involve lifting has been denied. In response to Renault's question, the dummy can be lifted manually by a strap routed beneath the buttocks. Also, Volkswagen's request for more variability in the application of rearward force is denied because, while difficult to achieve, it is desirable to maintain uniformity in dummy placement. In response to the requests of several manufacturers, the location of the 6-square-inch push plate has been raised 1.5 inches to facilitate its application to all vehicles.

Volkswagen asked with regard to S11.12 for a clarification of what constitutes the "lumbar spine" for purposes of dummy flexing. This refers to the point on the dummy rear surface at the level of the top of the dummy's rubber spine element.

BMW asked the agency to reconsider the placement of the driver dummy's thumbs over the steering wheel rim because of the possibility of damage to them. The company asked for an option in placing the hands. The purpose of the specification on dummy positioning, however, is to remove discretion from the test personnel, so that all tests are run in the same fashion. An option under these circumstances is therefore not appropriate.

Ultrasystems, Inc., pointed out two minor errors in S11.6 that are hereby corrected. The upper arm and lower arm centerlines are oriented as nearly as possible in a vertical plane (rather than straight up in the vertical), and the little finger of the passenger is placed "barely in contact" with the seat rather than "tangent" to it.

Two corrections are made to the dummy positioning procedure to correct obvious and unintended conflicts between placement of the dummy thighs on the seat cushion and placement of the right leg and foot on the acceleration pedal.

In addition to the positioning proposed, General Motors suggested that positioning of the dummy's head in the fore-and-aft axis would be beneficial. The agency agrees and has added such a specification at the end of the dummy setting procedure.

In a matter separate from the positioning procedure, General Motors, Ford, and Renault requested deletion of the proposed requirement that the dummy maintain proper calibration following a crash test without adjustment. Such a procedure is routine in test protocols and the agency considered it to be a beneficial addition to the standard to further demonstrate the credibility of the dummy test results. GM, however, has pointed out that the limb joint adjustments for the crash test and for the calibration of the lumbar bending test are different, and that it would be unfair to expect continued calibration without adjustment of these joints. The NHTSA accepts this objection and, until a means for surmounting this difficulty is perfected, the proposed change to S8.1.8 is withdrawn.

In another matter unrelated to dummy positioning, Volkswagen argued that active belt systems should be subject to the same requirements as passive belt systems, to reduce the cost differential between the compliance tests of the two systems. As earlier noted the NHTSA has issued an advance Notice of Proposed Rulemaking (41 FR 54961, December 16, 1976) on this subject and will consider Volkswagen's suggestion in the context of that rulemaking.

Finally, the agency proposed the same belt warning requirements for belts provided with passive restraints as are presently required for active belts. No objections to the requirement were received and the requirement is made final as proposed. The agency also takes the opportunity to delete from the standard the out-of-date belt warning requirements contained in S7.3 of the standard.

RECONSIDERATION OF DOCKET 73–8; NOTICE 04

The NHTSA has received two petitions for reconsideration of recent amendments in its test dummy calibration test procedures and design specifications (Part 572, *Anthropomorphic Test Dummy*, 49 CFR Part 572). Part 572 establishes, by means of approximately 250 drawings and five calibration tests, the exact specifications of the test device referred to earlier in this notice that simulates the occupant of a motor vehicle for crash testing purposes.

Apart from requests for a technical change of the lumbar flexion force specifications, the petitions from General Motors and Ford contained a repetition of objections made earlier in the rulemaking about the adequacy of the dummy as an objective measuring device. Three issues were raised: lateral response characteristics of the dummy, failure of the dummy to meet the five subassembly calibration limits, and the need for a "whole systems" calibration of the assembled dummy. Following receipt of these comments, the agency published notification in the *Federal Register* that it would entertain any other comments on the issue of objectivity (42 FR 28200; June 2, 1977). General comments were received from Chrysler Corporation and American Motors, repeating their positions from earlier comments that the dummy does not qualify as objective.

The objectivity of the dummy is at issue because it is the measuring device that registers the acceleration and force readings specified by Standard No. 208 during a 30-mph impact of the tested vehicle into a fixed barrier. The resulting readings for each vehicle tested must remain below a certain level to constitute compliance. Certification of compliance by the vehicle manufacturer is accomplished by crash testing representative vehicles with the dummy installed. Verification of compliance by the NHTSA is accomplished by crash testing one or more of the same model vehicle, also with a test dummy installed. It is important that readings taken by different dummies, or by the same dummy repeatedly, accurately reflect the forces and accelerations that are being experienced by the vehicle during the barrier crash. This does not imply that the readings produced in tests of two vehicles of the same design must be identical. In the real world, in fact, literally identical vehicles, crash circumstances, and test dummies are not physically attainable.

It is apparent from this discussion that an accurate reflection of the forces and accelerations experienced in nominally identical vehicles does not depend on the specification of the test dummy alone. For example, identically specified and responsive dummies would not provide identical readings unless reasonable care is exercised in the preparation and placement of the dummy. Such care is analogous to that exercised in positioning a ruler to assure that it is at the exact point where a measurement is to commence. No one would blame a ruler for a bad measurement if it were carelessly placed in the wrong position.

It is equally apparent that the forces and accelerations experienced in nominally identical vehicles will only be identical by the greatest of coincidence. The small differences in body structure, even of mass-produced vehicles, will affect the crash pulse. The particular deployment speed and shape of the cushion portion of an inflatable restraint system will also affect results.

All of these factors would affect the accelerations and forces experienced by a human occupant of a vehicle certified to comply with the occupant restraint standard. Thus, achievement of identical conditions is not only impossible (due to the inherent differences between tested vehicles and underlying conditions) but would be unwise. Literally identical tests would encourage the design of safety devices that would not adequately serve the variety of circumstances encountered in actual crash exposure.

At the same time, the safety standards must be "stated in objective terms" so that the manufacturer knows how its product will be tested and under what circumstances it will have to comply. A complete lack of dummy positioning procedures would allow placement of the dummy in any posture and would make certification of compliance virtually impossible. A balancing is provided in the test procedures between the need for realism and the need for objectivity.

The test dummy also represents a balancing between realism (biofidelity) and objectivity (repeatability). One-piece cast metal dummies could be placed in the seating positions and instrumented to register crash forces. One could argue that these dummies did not act at all like a human and did not measure what would happen to a human, but a lack of repeatability could not be ascribed to them. At the other end of the spectrum, an extremely complex and realistic surrogate could be substituted for the existing Part 572 dummy, which would act realistically but differently each time, as one might expect different humans to do.

The existing Part 572 dummy represents 7 years of effort to provide a measuring instrument that is sufficiently realistic and repeatable to serve the purposes of the crash standard. Like any measuring instrument, it has to be used with care. As in the case of any complex instrumentation, particular care must be exercised in its proper use, and there is little expectation of literally identical readings.

The dummy is articulated, and built of materials that permit it to react dynamically, similarly to a human. It is the dynamic reactions of the dummy that introduce the complexity that makes a check on repeatability desirable and necessary. The agency therefore devised five calibration procedures as standards for the evaluation of the important dynamic dummy response characteristics.

Since the specifications and calibration procedures were established in August 1973, a substantial amount of manufacturing and test experience has been gained in the Part 572 dummy. The quality of the dummy as manufactured by the three available domestic commercial sources has improved to the point where it is the agency's judgment that the device is as repeatable and reproducible as instrumentation of such complexity can be. As noted, GM and Ford disagree and raised three issues with regard to dummy objectivity in their petitions for reconsideration.

Lateral response characteristics. Recent sled tests of the Part 572 dummy in lateral impacts show a high level of repeatability from test to test and reproducibility from one dummy to another ("Evaluation of Part 572 Dummies in Side Impacts"—DOT HS 020 858). Further modification of the lateral and rollover passive restraint requirements into an option that can be met by installation of a lap belt makes the lateral response characteristics of the dummy largely academic. As noted in Notice 4 of Docket 73–8 (42 FR 7148; February 7, 1977), "Any manufacturer that is concerned with the objectivity of the dummy in such [lateral] impacts would provide lap belts at the front seating positions in lieu of conducting the lateral or rollover tests."

While the frontal crash test can be conducted at any angle up to 30 degrees from perpendicular to the barrier face, it is the agency's finding that the lateral forces acting on the test instrument are secondary to forces in the midsagittal plane and do not operate as a constraint on vehicle and restraint design. Compliance tests conducted by NHTSA to date in the 30-degree oblique impact condition have consistently generated similar dummy readings. In addition, they are considerably lower than in perpendicular barrier impact tests, which renders them less critical for compliance certification purposes.

Repeatability of dummy calibration. Ford questioned the dummy's repeatability, based on its analysis of "round-robin" testing conducted in 1973 for Ford at three different test laboratories (Ford Report No. ESRO S–76–3 (1976)) and on analysis of NHTSA calibration testing of seven test dummies in 1974 (DOT–HS–801–861).

In its petition for reconsideration, Ford equated dummy objectivity with repeatability of the calibration test results and concluded "it is impracticable to attempt to meet the Part 572 component calibration requirements with test dummies constructed according to the Part 572 drawing specification."

The Ford analysis of NHTSA's seven dummies showed only 56 of 100 instances in which all of the dummy calibrations satisfied the criteria. The NHTSA's attempts to reproduce the Ford calculations to reach this conclusion were unsuccessful, even after including the HO3 dummy with its obviously defective neck. This neck failed badly 11 times in a row, and yet Ford apparently used these tests in its estimate of 56 percent compliance. This is the equivalent of concluding that the specification for a stop watch is inadequate because of repeated failure in a stop watch with an obviously defective part. In this case, the calibration procedure was doing precisely its job in identifying the defective part by demonstrating that it did not in fact meet the specification.

The significance of the "learning curve" for quality control in dummy manufacture is best understood by comparison of three sets of dummy calibration results in chronological order. Ford in earlier comments relied on its own "round-robin" crash testing, involving nine test dummies. Ford stated that none of the nine dummies could pass all of the component calibration requirements. What the NHTSA learned through follow-up questions to Ford was that three of the nine dummies were not built originally as Part 572 dummies, and that the other six were not fully certified by their manufacturers as qualifying as Part 572 dummies. In addition, Ford instructed its contractors to use the dummies as provided whether or not they met the Part 572 specifications.

In contrast, recent NHTSA testing conducted by Calspan (DOT–HS–6–01514, May and June 1977 progress reports) and the results of tests conducted by GM (USG 1502, Docket 73–8, GR 64) demonstrate good repeatability and reproducibility of dummies. In the Calspan testing a total of 152 calibration tests were completed on four dummies from two manufacturers. The results for all five calibration tests were observed to be within the specified performance criteria of Part 572. The agency concludes that the learning curve in the manufacturing process has reached the point where repeatability and reproducibility of the dummy has been fully demonstrated.

Interestingly, Ford's own analysis of its round-robin testing concludes that variations among the nine dummies were not significant to the test results. At the same time, the overall acceleration and force readings did vary substantially. Ford argued that this showed unacceptable variability of the test as a whole, because they had used "identical" vehicles for crash testing. Ford attributed the variations in results to "chance factors," listing as factors placement of the dummy, postural changes during the ride to the barrier, speed variations, uncertainty as to just what part of the instrument panel or other structure would be impact loaded, instrumentation, and any variations in the dynamics of air bag deployment from one vehicle to another.

The agency does not consider these to be uncontrolled factors since they can be greatly reduced by carefully controlling test procedures. In addition, they are not considered to be unacceptable "chance factors" that should be eliminated from the test. The most important advantage of the barrier impact test is that it simulates with some realism what can be experienced by a human occupant, while at the same time limiting variation to achieve repeatability. As discussed, nominally identical vehicles are not in fact identical, the dynamics of deployment will vary from vehicle to vehicle, and humans will adopt a large number of different seated positions in the real world. The 30-mph barrier impact requires the manufacturer to take these variables into account by providing adequate protection for more than an overly structured test situation. At the same time, dummy positioning is specified in adequate detail so that the manufacturer knows how the NHTSA will set up a vehicle prior to conducting compliance test checks.

"Whole systems" calibration. Ford and GM both suggested a "whole systems" calibration of the dummy as a necessary additional check on dummy repeatability. The agency has denied these requests previously, because the demonstrated repeatability and reproducibility of Part 572 dummies based on current specification is adequate. The use of whole systems calibration tests as suggested would be extremely expensive and would unnecessarily complicate compliance testing.

It is instructive that neither General Motors nor Ford has been specific about the calibration tests they have in mind. Because of the variables inherent in a high energy barrier crash test at 30 mph, the agency judges that any calibration readings taken on the dummy would be overwhelmed by the other inputs acting on the dummy in this test environment. The Ford conclusion from its round-robin testing agrees that dummy variability is a relatively insignificant factor in the total variability experienced in this type of test.

GM was most specific about its concern for repeatability testing of the whole dummy in its comments in response to Docket 74–14; Notice 01:

> Dummy whole body response requirements are considered necessary to assure that a dummy, assembled from certified components, has acceptable response as a completed structure. Interactions between coupled components and subsystems must not be assumed acceptable simply because the components themselves have been certified. Variations in coupling may lead to significant variation in dummy response.

There is a far simpler, more controlled means to assure oneself of correct coupling of components than by means of a "whole systems" calibration. If, for example, a laboratory wishes to assure itself that the coupling of the dummy neck structure is properly accomplished, a simple statically applied input may be made to the neck prior to coupling to obtain a sample reading, and then the same simple statically applied input may be repeated after the coupling has been completed. This is a commonly accepted means to assure that "bolting together" the pieces is properly accomplished.

Lumbar spine flexion. The flexibility of the dummy spine is specified by means of a calibration procedure that involves bending the spine through a forward arc, with specified resistance to the bending being registered at specified angles of the bending arc. The dummy's ability to flex is partially controlled by the characteristics of the abdominal insert. In Notice 04, the agency increased the level of resistance that must be registered, in conjunction with a decision not to specify a sealed abdominal sac as had been proposed. Either of these dummy characteristics could affect the lumbar spine flexion performance.

Because of the agency's incomplete explanation for its actions, Ford and General Motors petitioned for reconsideration of the decision to take one action without the other. Both companies suggested that the specification of resistance levels be returned to that which had existed previously. The agency was not clear that it intended to go forward with the stiffer spine flexion performance, quite apart from the decision to not specify an abdomen sealing specification. The purpose for the "stiffer" spine is to attain more consistent torso return angle and to assure better dummy stability during vehicle acceleration to impact speed.

To assure itself of the wisdom of this course of action, the agency has performed dummy calibration tests demonstrating that the amended spine flexion and abdominal force deflection characteristics can be consistently achieved with both vented and unvented abdominal inserts (DOT HS-020875 (1977)).

Based on the considered analysis and review set forth above, the NHTSA denies the petitions of General Motors and Ford Motor Company for further modification of the test dummy specification and calibration procedures for reasons of test dummy objectivity.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended as proposed with changes set forth below, and Part 572 (49 CFR Part 572) is amended by the addition of a new sentence at the end of § 572.5, *General Description*, that states: "A specimen of the dummy is available for surface measurements, and access can be arranged through: Office of Crashworthiness, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590."

In accordance with Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200; April 16, 1976), the Department has evaluated the economic and other consequences of this amendment on the public and private sectors. The modifications of an existing option, the simplification and clarification of test procedures, and the increase in femur force loads are all judged to be actions that simplify testing and make it less expensive. It is anticipated that the "two dummy" positioning procedure may occasion additional testing expense in some larger vehicles, but not the level of expense that would have general economic effects.

The effective date for the changes has been established as one year from the date of publication to permit Volkswagen, the only manufacturer presently certifying compliance of vehicles using these test procedures, sufficient time to evaluate the effect of the changes on the compliance of its products.

The program official and lawyer principally responsible for the development of this amendment are Guy Hunter and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 30, 1977.

Joan Claybrook
Administrator

42 F.R. 34299
July 5, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–14; Notice 10)

The existing motor vehicle safety standard for occupant crash protection in new passenger cars is amended to require the provision of "passive" restraint protection in passenger cars with wheelbases greater than 114 inches manufactured on and after September 1, 1981, in passenger cars with wheelbases greater than 100 inches on and after September 1, 1982, and in all passenger cars manufactured on or after September 1, 1983. The low usage rate of active seat belt systems negates much of their potential safety benefit. However, lap belts will continue to be required at most front and all rear seating positions in new cars, and the Department will continue to recommend their use to motorists. It is found that upgraded occupant crash protection is a reasonable and necessary exercise of the mandate of the National Traffic and Motor Vehicle Safety Act to provide protection through improved automotive design, construction, and performance.

Dates: Effective date September 1, 1981.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Station, Room 5108—Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

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Supplementary Information:

Considerations Underlying the Standard

Under the National Traffic and Motor Vehicle Safety Act, as amended (the Act) (15 U.S.C. 1381 et seq.), the Department of Transportation is responsible for issuing motor vehicle safety standards that, among other things, protect the public against unreasonable risk of death or injury to persons in the event accidents occur. The Act directs the Department to consider whether a standard would contribute to carrying out the purposes of the Act and would be reasonable, practicable, and appropriate for a particular type of motor vehicle (15 U.S.C. 1392(f)(3)). The standard must, as formulated, be practicable, meet the need for motor vehicle safety, and be stated in objective terms (15 U.S.C. 1392(a)). The Senate Committee drafting the statute stated that safety would be the overriding consideration in the issuance of standards. S. Rep. No. 1301, 89th Cong., 2d Sess (1966) at 6.

The total number of fatalities annually in motor vehicle accidents is approximately 46,000 (estimate for 1976), of which approximately 25,000 are estimated to be automobile front seat occupants. Two major hazards to which front seat occupants are exposed are ejection from the vehicle, which increases the probability of fatality greatly, and impact with the vehicle interior during the crash. Restraint of occupants to protect against these hazards has long been recognized as a means to substantially reduce the fatalities and serious injuries experienced at the front seating positions.

One of the Department's first actions in implementing the Act was promulgation in 1967 of Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), to make it possible for vehicle occupants to help protect themselves against the hazards of a crash by engaging seat belts. The standard requires the installation of lap and shoulder seat belt assemblies (Type 2) at front outboard designated seating positions (except in convertibles) and lap belt assemblies (Type 1) at all other designated seating positions. The standard became effective January 1, 1968.

While it is generally agreed that when they are worn, seat belt assemblies are highly effective in preventing occupant impact with the vehicle interior or ejection from the vehicle, only a minority of motorists in the United States use seat belts. For all types of belt systems, National Highway Traffic Safety Administration (NHTSA) studies show that about 20 percent of belt systems are used (DOT HS 6 01340 (in process)). The agency's calculations show that only about 2,600 deaths (and corresponding numbers of injuries) of front seat occupants were averted during 1976 by the restraints required by Standard No. 208 as it is presently written.

Two basic approaches have been developed to increase the savings of life and mitigation of injury afforded by occupant restraint systems. More than 20 nations and two provinces of Canada have enacted mandatory seat belt use laws to increase usage and thereby the effective lifesaving potential of existing seat belt systems. The other approach is to install automatic passive restraints in passenger cars in place of, or in conjunction with, active belt systems. These systems are passive in the sense that no action by the occupant is required to benefit from the restraint. Passive restraint systems automatically provide a high level of occupant crash protection to virtually 100 percent of front seat occupants.

The two forms of passive restraint that have been commercially produced are inflatable occupant restraints (commonly known as air bags) and passive belts. Air bags are fabric cushions that are rapidly filled with gas to cushion the occupant against colliding with the vehicle interior when a crash occurs that is strong enough to register on a sensor device in the vehicle. The deployment is accomplished by the rapid generation or release of a gas to inflate the bag. Passive belt systems are comparable to active belt systems in many respects, but are distinguished by automatic deployment around the occupant as the occupant enters the vehicle and closes the door.

HISTORY OF STANDARD NO. 208

Because of the low usage rates of active belt systems and because alternative technologies were becoming available, the initial seat belt requirements of Standard No. 208 were upgraded in 1970 to require passive restraints by 1974 (35 FR 16927; November 3, 1970). Most passenger car manufacturers petitioned for judicial review of this amendment (*Chrysler v. DOT*, 472 F.2d 659 (6th Cir. 1972)). The Sixth Circuit's review upheld the mandate in most respects but remanded the standard to the agency for further specification of a test dummy that was held to be insufficiently objective for use as a measuring device in compliance tests. The court stated with regard to two of the statutory criteria for issuance of motor vehicle safety standards:

> We conclude that the issue of the relative effectiveness of active as opposed to passive restraints is one which has been duly delegated to the Agency, with its expertise, to make; we find that the Agency's decision to require passive restraints is supported by substantial evidence, and we cannot say on the basis of the record before us that this decision does not meet the need for motor vehicle safety. 472 F.2d at 675.
>
> . . . we conclude that Standard 208 is practicable as that term is used in this legislation. 472 F.2d at 674.

As for objective specification of the test dummy device, a detailed set of specifications (49 CFR Part 572) was issued in August 1973 (38 FR 20449; August 1, 1973) and updated with minor changes in February 1977 (42 FR 7148; February 7, 1977). A full discussion of the test dummy specifications is set forth in a rulemaking issued today by the NHTSA concerning technical aspects of Standard No. 208 (42 FR 34299; FR Doc. 77-19138).

In March 1974, the Department made the finding that the test dummy is sufficiently objective to satisfy the *Chrysler* court remand (39 FR 10271; March 19, 1974). In the same notice, mandatory passive restraints were again proposed. Based on the comments received in response to that notice, the passive restraint mandate was once again proposed in a modified form in June 1976 (41 FR 24070; June 14, 1976). In the interim, General Motors Corporation manufactured, certified, and sold approximately 10,000 air-bag-equipped full-size Buicks, Oldsmobiles, and Cadillacs. Volkswagen has manufactured and sold approximately 65,000 passive-belt-equipped Rabbit model passenger cars. Volvo Corporation has also introduced a relatively small number of air-bag-equipped vehicles into service. Ford Motor Company had earlier manufactured 831 air-bag-equipped Mercurys. These vehicles were manufactured under one of two options placed in the standard in 1971 to permit optional production of vehicles with passive restraint systems in place of seat belt assemblies otherwise required. In 1972, the standard was also amended to require an "ignition interlock" system on front seat belts to force their use before the vehicle could be started. This requirement, effective in September 1973, was revoked in October 1974 in response to a Congressional prohibition on its specification (Pub. L. 93–492, § 109 (October 27, 1974)).

The Department's final action on its June 1976 proposal ("The Secretary's Decision Concerning Motor Vehicle Occupant Crash Protection," hereinafter "the December 1976 decision") continued the existing requirements of the standard (42 FR 5071; January 27, 1977) and created a demonstration program to familiarize the public with passive restraints. The Department negotiated contracts with four automobile manufacturers for the production of up to 250,000 passive-equipped vehicles per year for introduction into the passenger car fleet in model years 1980–1. Mercedes-Benz agreed to manufacture 2,250 such passenger cars, and Volkswagen agreed to manufacture 125,000 of its passive-belt-equipped Rabbit models. Ford agreed to participate by "establishing the capability of manufacturing" 140,000 compact model passenger cars, and General Motors agreed to "establish production capacity" to manufacture 300,000 intermediate size passenger cars. The December 1976 decision was based on the finding that, although passive restraints are technologically feasible at reasonable cost and would prevent 9,000 fatalities annually when fully integrated into the fleet, possible adverse reaction by an uninformed public after the standard took effect could inspire their prohibition by Congress with substantial attendant economic waste and incalculable harm to the cause of highway safety. This finding was based in large part on the Department's experience with the ignition interlock on 1974- and 1975-model passenger cars, which was prohibited by Congress in response to industry and public opposition.

Early in 1977, the Department reconsidered the December 1976 decision because public acceptance or rejection of passive restraints is not one of the statutory criteria which the Department is charged by law to apply in establishing standards. In addition, the demonstration program introduced a minimum 3-year delay in implementation of mandatory passive restraints. The Department questioned the premise that passive restraint systems would foster consumer resistance as had the ignition interlock system. While the ignition interlock system forced action by the motorist as a condition for operating an automobile, passive restraints eliminate the need for any action by the occupant to obtain their crash protection benefits.

A third reason for reassessment of the December 1976 decision was the certainty that an increasing proportion of the passenger car fleet will be small cars, in response to the energy situation and the automotive fuel economy program established by the Energy Policy and Conservation Act. The introduction of these new, smaller vehicles on the highway holds the prospect of an increase in the fatality and injury rate unless countermeasures are undertaken.

Based on this reconsideration, the Department proposed (42 FR 15935; March 24, 1977) that the future crash protection requirements of Standard No. 208 take one of three forms: (1) continuation of the present requirements, (2) mandatory passive restraints at one or more seating positions of passenger cars manufactured on or after September 1, 1980, or (3) continuation of the existing requirements in conjunction with proposed legislation to establish Federal or State mandatory seat belt use laws.

The proposal for an occupant restraint system other than seat belts invoked a provision of the Act (15 U.S.C. § 1400(b)) that requires notification to Congress of the action. The Act also requires that a public hearing be held at which any member of Congress or any other interested person could present oral testimony. The proposal was transmitted to the Congress on March

21, 1977, with an invitation to appear at a public hearing chaired by the Secretary on April 27 and 28, 1977, in Washington, D.C. A transcript of this meeting, along with written comments on the March 1977 proposal, are available in the public docket.

DISCUSSION OF ISSUES

The March 1977 proposal of three possible courses of action for future occupant crash protection is grounded in a large, complex administrative record that has been developed in the 8 years since passive restraints were first contemplated by the Department. Interested persons are invited to review the NHTSA public docket that has been compiled under designations 69–7, 73–8, and 74–14. Consideration of the issues and questions that have arisen during the years of rulemaking can be found in the preambles to the Department's numerous rulemaking notices on passive restraints. Although many of the comments on the March 1977 proposal raised issues that have been discussed in previous notices, the significant issues will be addressed here again, in light of the most recent information available to the Department.

The need for rulemaking action. An important reason to consider anew the occupant crash protection issue is the basic and positive changes that the automobile will undergo in the years ahead. Until recently, the basic characteristics of automobiles sold to the American public have evolved for the most part in response to the forces of the market place. High premium was placed upon styling, roominess, and acceleration performance. In a cheap-energy society, relatively little attention was paid to efficiency of operation. Nor, until relatively recently, was serious consideration given to minimizing the adverse impact of the automobile upon air quality.

Recent circumstances, however, have drastically altered the situation, and have made it abundantly clear that the automobile's characteristics must reflect broadly defined societal goals as well as those advanced by the individual car owner. The President has announced a new national energy policy that recognizes a compelling need for changes in the American lifestyle. Congress has implemented statutory programs to improve the fuel economy of automobiles, as one result of which this Department has just issued demanding fuel economy standards for 1981 through 1984 passenger cars. Right now, the Congress is deliberating over amendments to the Clean Air Act which will impose relatively stringent emissions requirements effective over the same time frame.

The trend toward smaller cars to improve economy and emissions performance contains a potential for increased hazard to the vehicles' occupants. But technology provides the means to protect against this hazard, and this Department's statutory mandate provides authority to assure its application. The Report of the Federal Interagency Task Force on Motor Vehicle Goals for 1980 and Beyond indicated that simultaneous achievement of ambitious societal goals for the automobile in the areas of fuel economy, emissions, and safety is technologically feasible. Integrated test vehicles developed by this Department confirm that finding and, further, demonstrate that the resulting vehicles need not unduly sacrifice the other functional and esthetic attributes traditionally sought by the American car buyer.

Moreover, the socially responsive automobile of the 1980's need not bring a penalty in economy of ownership. The just-issued passenger car fuel economy standards are calculated to reduce the overall costs of operating an automobile by $1,000 over the vehicle's lifetime. In the case of improved safety performance, the occupant restraint improvements specified in this notice can be expected to pay for themselves in reduced first-person liability insurance premiums during the life of the vehicle.

The issue of occupant crash protection has been outstanding too long, and a decision would have been further delayed while the demonstration programs was conducted. A rigorous review of the findings made by the Department in December 1976 demonstrates that they are in all substantial respects correct as to the technological feasibility, practicability, reasonable cost, and lifesaving potential of passive restraints. The decision set forth in this notice is the logical result of those findings.

In reassessing the December 1976 decision, the Department has considered each available means to increase crash protection in arriving at the most rational approach. As proposed, the possibility of "driver-side only" passive protection was considered, but was rejected because of the unsatisfactory result of having one front-seat passenger offered protection superior to that offered other front-seat passengers in the same vehicle. On balance, there was found to be little cost or lead-time advantage to this approach. The possibility of reinstituting a type of safety belt interlock was rejected because the agency's authority was definitively removed by the Congress less than three years ago and there is no reason to believe that Congress has changed its position on the issue since that time.

Mandatory belt use laws. One of the means proposed in the March notice to achieve a large reduction in highway deaths and injuries is Federal legislation to induce State enactment of mandatory seat belt use laws, either by issuance of a highway safety program standard or by making State passage of such laws a condition for the receipt of Federal highway construction money.

The prospects for passage of mandatory seat belt use laws by more than a few States appear to be poor. None of the commenters suggested that passage of such laws was likely. A public opinion survey sponsored by the Motor Vehicle Manufacturers Association and conducted by Yankelovich, Skelly, and White, Inc. indicated that a 2-to-1 majority nationwide opposes belt use laws. Many such bills have been presented; no State has enacted one up to now. Also, Congress denied funding for a program to encourage State belt use laws in 1974, suggesting that it does not look favorably upon Federal assistance in the enactment of these laws.

More recently, Congress removed the Department's authority to withdraw Federal safety funding in the case of States that do not mandate the use of motorcycle helmets on their highways (Pub. L. 94-280, Sec. 208(a), May 5, 1976). The close parallel between requiring helmet use and requiring seat belt use argues against the likelihood of enactment of belt use laws.

These strong indications that Congress would not enact a belt use program in the foreseeable future demonstrate, in large measure, why the success of other nations in enacting laws is not parallel to the situation in the United States. In the belt use jurisdictions most often compared to the United States (Australia and the Provinces of Canada), the laws were enacted at the State or Province level in the first instance, and not at the Federal level. In the Department's judgment, the most reasonable course of action to obtain effective belt use laws in the United States will be to actively encourage their enactment in one or more States. An attempt to impose belt use laws on citizens by the Federal government would create difficulties in Federal-State relations, and could damage rather than further the interests of highway safety.

Effectiveness of passive restraints. The December 1976 decision concluded that the best estimates of effectiveness in preventing deaths and injuries of the various types of restraint systems under consideration were as set forth in Table I. Using the effectiveness estimates from Table I, the projection of benefits attributable to various restraint systems is summarized in Table II. Several comments concerning the effectiveness of passive restraint systems were submitted in response to the March 1977 proposal.

Insurance company commenters generally supported the Department's estimates. General Motors, however, disputed the validity of the estimates in the December 1976 decision, arguing that the results experienced by the approximately 10,000 GM vehicles sold the public indicated a much lower level of effectiveness. It made comparisons between accidents involving those cars and other accidents with conventional cars, selected to be as similar as possible in type and severity. On the basis of this study, GM stated that the data indicate that the "current air cushion-lap belt system, if available in all cars, would save less than the nearly 3,000 lives that can be saved by only *20* percent active lap/shoulder belt use."

The Department finds the methods used in the General Motors study to be of doubtful value in arriving at an objective assessment of the experience of the air-bag-equipped vehicles. General Motors is a vastly interested party in these proceedings, and the positions that it adopts are necessarily those of an advocate for a particular result. This is in no sense a disparagement; advocacy of desired outcomes by interested parties is an essential part of the administrative process. But if a study advanced by an interested advocate is to be seriously considered from a "scientific" viewpoint, it must be carefully designed to avoid dilution of its objectivity by the bias of the sponsoring party. The GM study fails that test. Its foundation is a long series of qualitative judgments, which are made by employees of the party itself. An equally serious fault is that the basic body of accident data from which the comparison accidents are selected is not available to the public, so that countering analyses cannot be made by opposing parties, nor can the judgments in the original study be checked. General Motors had previously submitted to an earlier Standard No. 208 docket a study of restraint system effectiveness based on similarly qualitative judgments by its own employees (69-07-GR-256-01). The shoulder belt effectiveness figures arrived at in that study were about one-half of what are now generally recognized to be the actual values. While this later study utilizes a somewhat different methodology, it suffers from the same flaws in its failure to preclude dilution of its objectivity by the bias of its sponsor.

Economics and Science Planning, Inc., submitted three studies that made estimates of air bag effectiveness. In one, the estimate of air bag effectiveness was at least as high as the theoretical projections made in Table II. In another, a very low estimate of air bag effectiveness was made—from 15 to 25 percent.

The Insurance Institute for Highway Safety submitted another estimate of air bag effectiveness based on the experience with the GM cars in highway use. A selection was made of accidents in which the air bag was designed to operate, based on frontal damage, direction of impact, and age of occupant. In these accidents, air bags were determined to have reduced fatalities by 66 percent, as compared to 55 percent for three-point belts. However, the narrow selection of accidents limits the application of the figures derived in the IIHS study.

The Department considers that the most reliable method of evaluating the experience of the air-bag-equipped cars at this time is to compare the number of injuries, at various levels, sustained by their occupants with the number that is experienced in the general population of vehicles of this type. The vehicles in question are not a sampling of the general vehicle population: they are relatively new, and mostly in the largest "luxury" size class. Some adjustment must be made for these factors.

The adjustment for the size of the vehicles has been made by multiplying the overall injury figures by a factor of 0.643, which has been found in one study (Joksch, "Analysis of Future Effects of Fuel Storage and Increased Small Car Usage Upon Traffic Deaths and Injuries," General Accounting Office, 1975) as the ratio of fatalities per year for this size of vehicles to the figure for the general population. The newness of the vehicles has a double-edged aspect: newer vehicles are evidently driven more miles per year than older ones, but they also appear to experience fewer accidents per mile traveled (Dutt and Reinfurt, "Accident Involvement and Crash Injury Rates by Make, Model, and Year of Car," Highway Safety Research Center, 1977). These two factors can be accounted for if it is assumed that they cancel each other, by using vehicle years, rather than vehicle miles, as the basis of comparison. With these adjustments, the expected number of all injuries of AIS-2 (an index of injury severity) and above in severity for conventional vehicles equivalent to the air-bag-equipped fleet during the period considered was 91. The actual number experienced was 38, indicating an effectiveness factor for these injury classes of 0.58.

A possibility of bias in these estimates exists in that injuries that have occurred in the air bag fleet may not have been reported, despite the three-level reporting system (owners, police, and dealers) that has been established. This bias is less likely to be present in frontal accidents, where the air bag is expected to (and generally does) deploy. For frontal accidents only, the number of injuries expected is 60, or 66 percent of the total ("Statistical Analysis of Seat Belt Effectiveness in 1973-1975 Model Cars Involved in Towaway Crashes," Highway Safety Research Center, 1976); only 29 have been experienced, indicating an effectiveness factor of 0.52.

These figures confirm (and in fact exceed) the effectiveness estimates of the December 1976 decision. For injuries of higher severity levels, the numbers experienced are much too small to be statistically significant.

The various assumptions and adjustments that must be made to arrive at a valid "expected" figure, and the possibility that some injuries were unreported, leaves substantial room for uncertainty and argument as to the true observed effectiveness of the restraint systems. Nevertheless, the results of the field experience are encouraging. Even if the observed-effectiveness figures arrived at by these calculations were high by a factor of 2, they would still substantially confirm the estimates of the December 1976 decision. Considering all the arguments on both sides of the issues, the Department concludes that the observed experience of the vehicles on the road equipped with air bags does not cast doubt on the effectiveness estimates in the December 1976 decision.

It has been argued that the Department should not issue a passive restraint standard in the absence of statistically significant real world data which confirm its estimates of effectiveness. Statistical "proof" is certainly desirable in decisionmaking, but it is often not available to resolve public policy decisions. It is also clear from the legislative history of the Act that the Department was not supposed to wait for the widespread introduction of a technology before it could be mandated. The Senate report for example refers to the "failure of safety to sell" in automobiles, and describes how the Department was intended to push the manufacturers into adopting new safety technology that would not be introduced voluntarily (S. Rep. 1301, 89th Cong. 2nd Sess. 4 (1966)). The *Chrysler* case found that "The explicit purpose of the Act is to enable the Federal Government to impel automobile manufacturers to develop and apply new technology to the task of improving the safety design of automobiles as readily as possible." (472 F.2d at 671.)

Cost of passive restraints. Passive belts have been estimated in the past by the Department to add $25 to the price of an automobile, relative to the price of cars with present active belt systems. The increased operating cost over the life of a vehicle with passive belts is estimated to be $5. These figures are assumed valid for purposes of this review, and were not contsted in the comments received.

This Department, General Motors, Ford, DeLorean, and Minicars all have produced estimates of the passenger car price increase due to the inclusion of air bags. These are sufficiently detailed and current to be compared, and are set forth in Table III. The Department estimate has been raised somewhat above its previous ones because of the $14 increase in the price of the components of an air bag system quoted by a supplier.

The General Motors estimates have been revised from previous estimates in several respects. Research and development, engineering, and tooling expenses are no longer amortized entirely in the first year, but are spread over 3 years (other estimates spread these costs over 5 years). The allowance for removal of active belt hardware has been reduced to conform more closely to the Department's estimates. The newer figures reflect a somewhat more complex system, including new sensors. Of the $81 spread between the Department and the GM estimates, all but $11 can be attributed to differences in the following areas: GM's estimate of dealer profit which is based on sticker prices (rather than actual sale price), GM's shorter amortization period, added complexity of the 1977 system over the 1976 system, and the cost of major modifications of the vehicle which the agency questions. The remaining $11 difference must be considered as disagreement concerning the elements of cost shown in the table.

The Ford estimate is the same as previously submitted. Forty-two dollars of the difference from the Department estimate is a higher profit figure arising from Ford's use of sticker prices rather than actual price of sale, which gives the dealer less mark-up. A substantial amount of difference is for a complex electronic diagnostic module, extra sensors that the Department does not view as necessary, and the use of a knee bolster instead of a cheaper knee air bag. Thirty-nine dollars represents unreconciled differences.

Operating costs consist mainly of the cost of replacing a deployed bag, fuel cost, and maintenance. Ford also includes an amount for periodic inspection. The Department estimate for replacement cost differs from the GM and Ford estimates almost entirely as a result of the lower estimate for the first cost of the system. The fuel costs differ primarily as a result of different weight figures for the passive systems, which may be design choices of the manufacturers. The Department's evaluation of manufacturers' cost objections is being placed in the public docket as required by § 113 of the Act.

If, as projected, passive restraints are effective in saving lives and reducing injuries, as compared to existing belt systems at present use rate, the insurance savings that will result will offset a major portion and possibly all of the cost to the consumer of the systems. There may be some doubt on this point that arises from skepticism concerning the behavior of insurers.

The vast majority of auto occupant injuries beyond the minor level result in automobile, health, or life insurance claims. In some States, insurers may lack a degree of flexibility in the adjustment of premiums because of pressures from insurance commissions. However, the evidence indicates that premiums are fundamentally based on claims experience.

In its comments to the docket, Nationwide Mutual Insurance Companies estimated that savings in insurance premiums should average $32.50 per insured car per year, if all cars were equipped with air bags. Of this amount, 77 percent is the result of an assumed savings of 24.6 percent in the bodily injury portion of automobile insurance premiums, 21 percent from a 1.5 percent reduction in health insurance premiums (25 percent of the 6 percent of the premiums that pay for auto-related injuries), and the remainder from savings in life insurance premiums. The American Mutual Insurance Alliance and Allstate referred to existing 30 percent discounts in first-party coverage and concluded that comparable reductions would be expected to follow a mandate of passive restraints.

It has been argued that these savings would be largely offset by the increased cost of collision and property damage insurance due to the increased cost of repairing a car with a deployed air bag. This claim appears to be largely unfounded. Using figures based on field tests, it is estimated that each year 300,000 automobiles will be in accidents of sufficient severity to deploy the air bag. (Cooke, "Usage of Occupant Crash Protection Systems," NHTSA, July 1976, #74-14-GR-30, App. A.) Accepting vehicle manufacturer estimates, it is further assumed that the cost of replacing an air bag will be 2.5 times the original equipment cost. If a car more than 6 years old is involved in an air-bag-deploying accident, it is assumed scrapped rather than being repaired. Combining these assumptions with the estimated $112 cost of installing a full front air cushion in a new vehicle gives a total annual cost of replacement of $54.4 million, or a per car cost of less than 51 cents per year. Increases in collision premiums should, therefore, not exceed $1 per car per year. It is noted that deployment in non-crash cases would be covered by "comprehensive" insurance policies.

The $32.50 annual insurance savings estimated by Nationwide would be sufficient to pay for the added operating cost (around $4 per year) of an air-bag-equipped car with enough left over to more than pay for the initial cost of the system. Discounting at the average interest rate on new car loans measured in real terms (6 percent), the air bag would almost recover the initial cost in 4 years, with a savings over operating cost of $107.

Economic and Science Planning, Inc. (ESP) has submitted a differing estimate, that insurance savings with full implementation of passive restraints would be only $3.60, rather than $32.50 per year. About one-half of the difference arises from ESP's assumption that seat belt usage would voluntarily rise to the 44 percent level by 1984. This seems highly improbable, based on experience to date.

Moreover, that assumption does not support the deletion of projected insurance savings resulting from passive restraints, but suggests that other courses of action (such as whatever might be done to increase belt usage to 44 percent) might also produce savings. The remaining differences are based on such factors as the portion of injury costs that is paid for by insurance. If the assumptions of ESP are allowed to remain, the savings per year would be about $16, and the present value of auto-lifetime savings would be $120.

Side effects of air bag installation. Some concerns were expressed in the comments about air bags that might be grouped as possible undesirable side effects. One of these was injuries that might be caused by design deployment. There is no question that any restraint system that must decelerate a human body from 30 mph or more to rest within approximately 2 feet can cause injury. Belt systems often cause bruises and abrasions in protecting occupants from more serious injuries. The main question is whether any injuries caused by air bags are generally within acceptable limits, and are significantly less severe than those that would have been suffered had the occupants in question not been restrained by the air bags. The evidence from the vehicles on the road indicates that this is indeed the case. The injuries cited by GM as possibly caused or aggravated by air bag deployment are in the minor to moderate (AIS–1 and –2) category. From this it can be concluded that injuries caused by design deployment, though worthy of careful monitoring with a view to design improvements by manufacturers, do not provide a serious argument against a passive restraint requirement.

A closely related question that has caused concern in the past is whether air bags pose an unreasonable danger to occupants who are not in a normal seating position, such as children standing in front of a dashboard or persons who have been moved forward by panic braking. Much development work has been devoted to this problem in the past, to design systems that minimize the danger to persons who are close to the inflation source. The most important change in this area has probably been the general shift away from inflation systems that depend on stored high-pressure gas, in favor of pyrotechnic gas generators. With these systems the flow of gas can be adjusted to make the rate slower at the beginning of inflation, so that an out-of-position occupant is pushed more gently out of the way before the maximum inflation rate occurs.

With one exception, there have been no cases where out-of-position occupants have been found to be seriously injured in crashes in which air bags have deployed. Five of the crashes involving GM vehicles have involved children in front seating positions (although not necessarily out of position), and others have involved children unbelted in the rear seat.

The only exception has been the death of an infant that was lying laterally on the front seat unrestrained. Apparently during panic braking that proceeded the crash, the infant was thrown from the seat. While this constitutes an out-of-position situation technically, it is not the type of circumstance in which the air bag contributes to injury of the out-of-position occupant.

Inadvertent actuation of an air bag may be a particular concern to the public, as noted by both General Motors and Ford. The sudden deployment of an air bag in a non-crash situation would generally be a disconcerting experience. The experience with vehicles on the road, and tests that have been performed on 40 subjects who were not aware that there were air bags in their vehicles, indicate the loss of control in such situations should be rare; none has occurred in the incidents up to now. There is little question, however, that inadvertent actuation could cause loss of control by some segments (aged, inexperienced, distracted) of the driving population, and it must be viewed as a small but real cost of air bag protection.

The frequency of inadvertent actuation is therefore of special concern. The Ford fleet of air-bag-equipped cars (about 800 vehicles that have been on the road since late 1972, with around 500 now taken out of service) has experienced no inadvertent actuations at all. The General Motors fleet, about 10,000 sold mostly to private buyers during 1974 and 1975, has experienced three inadvertent actuations on the road. Six others have occurred in the hands of mechanics and body shop personnel, two in externally caused fires or explosions, and one from tampering in a driveway. The Volvo fleet of 77 vehicles has experienced none. It is believed that the causes of the GM inadvertent deployments are understood, and that the means of eliminating or considerably reducing the likelihood of all the known causes of inadvertent deployments have been found. These include shielding of the squibs (the device to ignite the propellant material in the bag inflators) against electromagnetic radiation, automatically disarming the system through the ignition system when the car is not in operation, and routing wiring so that it is less accessible to tampering or degradation.

If the figures for the combined fleets are projected onto the U.S. vehicle population, they would amount to around 7,000 on-the-road inadvertent actuations annually, or one for every 15,000 vehicles. The chances of an individual experiencing one as a vehicle occupant during his or her lifetime would be on the order of 1 in 200. This estimate probably overstates the likelihood of occurrence since the inadvertent actuations in the GM cars to date are believed to be due to design deficiencies that are correctable. Thus, although it will probably continue to be a public concern, the infrequency with which inadvertent actuation occurs leads to the conclusion that it does not constitute a weighty argument against a passive restraint requirement.

Some private individuals expressed, in their comments, concern over possible ear damage, or injuries that might be caused to persons with smoking materials in their mouths, or wearing eyeglasses. Although some early tests with oversized cushions of prototype design produced some temporary hearing losses, later designs have reduced the sound pressures to the point where ear damage is no longer a significant possibility. With respect to eyeglasses and smoking materials, the results from the vehicles on the road have been favorable. Of the occupants that had been involved in air cushion deployments as of a recent date, 71 had been smoking pipes or wearing eyeglasses or other facial accessories. None of these received injuries beyond the minor (AIS–1) level. From this it can be concluded that these circumstances do not create particular hazards to occupants of air-bag-equipped vehicles.

Toyo Kogyo and some private individuals questioned whether air bags might experience reliability problems in high-mileage and older vehicles. The fact that air bags have only one moving part, and most of the critical components rest in sealed containers during their non-deployment life, indicates that they should perform well in this regard. The systems in the vehicles in the field, some of which have been in use for almost 5 years, have demonstrated extremely good durability, with no apparent flaws. Manufacturers use sophisticated techniques such as accelerated test cycles to assure a high level of reliability.

Reliability of restraint systems is, of course, absolutely necessary. Unlike the failure of accident prevention systems such as lights and brakes where failure does not necessarily result in harm to occupants, the failure of a restraint system when needed in a serious crash almost certainly means injury will result. Vehicle and component manufacturers are fully aware of this and take the special precautions to ensure reliability which might not be taken for less critical systems. The Department is equally aware of it and has monitored manufacturer efforts to date to ensure failsafe performance of crash-deployed systems. As an example, copies of reliability information request letters from the Department to manufacturers preparing for the demonstration program or otherwise involved in air bag systems have been made public in the docket.

The projections of reliability to date are, of necessity, based on pilot production volumes, and cannot demonstrate fully that reliability problems associated with mass production will never occur. So that manufacturers can avoid these types of reliability problems, the Department has settled on a phase-in of the requirements which is described later in greater detail.

General Motors and the National Automobile Dealers Association commented that product liability arising from air bag performance would be a major expense. The insurance company commenters, on the other hand, suggested that the presence of air bags in vehicles could reduce auto companies' product liability.

The new risk of liability, attached to a requirement for passive restraints, does not differ from the risk attached to the advent of any device or product whether mandated by the Federal government or installed by a manufacturer by its own choice. Just as liability might arise because of the malfunctioning of a seat belt system or braking system, liability may also arise because of the malfunctioning of a passive restraint system. The mandating of a requirement by the Federal government has, in fact, often served to limit liability, since most jurisdictions accord great weight to evidence showing that a device has met Federal standards.

There is little evidence that the mandating of passive restraints will lead to increases in product liability insurance premiums. Although the advent of new technology has often been accompanied by an increase in products liability insurance, it is unclear how much of the increase is attributable to increased risk and how much to inflation. Officials of the Department of Commerce and at least two major insurance companies doubt that Federal passive restraint requirements will lead to increased risk and insurance premiums. They point out that Federal requirements are imposed to make products safer, and safe products are less likely to cause injury.

It is noteworthy that the Allstate Insurance Company agreed to sell product liability insurance for the GM cars which were to be equipped with passive restraint systems pursuant to the demonstration program, at a rate no greater than the product liability insurance rate for cars not equipped with passive restraint systems.

Small cars. An important consideration in the decision concerning passive restraints is their suitability and availability for small cars, which because of the energy shortage will comprise an increasing segment of the vehicle population in future years. Passive belts have been sold as standard equipment in over 65,000 Volkswagen cars, and must be viewed as a proven means of meeting a passive restraint requirement. Some vehicle body designs may require some modification for their installation, but passive belts could be used as restraints for most bucket-seat arrangements at moderate cost with present technology.

Some manufacturers have expressed doubt that a large proportion of their customers would find passive belts acceptable, because of their relatively obtrusive nature and the resistance shown by the U.S. public to wearing seat belt systems, i.e., belts that occupants must buckle and unbuckle. These manufacturers submitted no supporting market surveys. Further, there is reason to believe that the experience with active belt systems is not an accurate indicator of the experience to be expected with passive belts. The Department anticipates that some manufacturers will install passive belts in the front seats of small cars having only two front seats. Passive belts would not confront the occupants of those seats with the current inconvenience of having to buckle a belt system to gain its protection or of having to unbuckle that system to get out of their cars. Unlike the interlock active belt systems of several years ago, the passive belt systems will have no effect on the ability of drivers to start their cars.

Nevertheless, the question of the acceptability of passive belts may make the suitability of air bags for small cars an important one. Although the shorter crush distance of small cars may impose more stringent limits on air bag deployment time, the evidence from studies conducted by the Department with air bags in small cars is that there are no insuperable difficulties in meeting the 30-mph crash requirements of Standard 208 in cars as small as 2000 pounds gross vehicle weight rating with existing air bag designs (see, for example, "Small Car Driver Inflatable Restraint System Evaluation Program," Contract DOT-HS-6-01412, Status Report April 15, 1977).

The "packaging" problems of installing air bag systems are greater for small cars than for larger ones. They occupy space in the instrument panel area that might otherwise be utilized by other items such as air conditioning ducts, glove compartment, or controls and displays. Toyo Kogyo (Mazda) and Honda indicated that their instrument panels might have to be displaced 4 inches rearward, that some engine compartment and wheelbase changes might be needed, and that some dash-mounted accessories might have to be deleted or mounted elsewhere. This type of problem is expected to be important to the existing choice between air bag and passive belt systems.

It is not the role of the government to resolve these problems since, in the Department's judgment, they reflect design choices of the manufacturers. No manufacturer has claimed, much less demonstrated, that it would be impracticable to install air bags in small cars without increasing vehicle size. Occupation of instrument panel space is certainly one of the unquantified costs of air bags, however, and the cost is more onerous in a small car than in a large one. At the same time, small car makers may choose to use the less costly passive belt system. The evidence presented to date indicates that small-car manufacturers would be able to meet a passive restraint requirement by making reasonable design compromises without increasing vehicle size.

Lead time and production readiness. There was considerable discussion in the comments to the docket about the ability of the automobile industry to develop the production readiness to provide passive restraint systems for all passenger cars. The installation of passive restraint systems requires the addition of new hardware and modification of vehicle structures in such a way that the system provides performance adequate to meet the standard and a high level of safety and reliability on the road. A new industrial capacity will have to be generated to supply components for air bag systems. Major capital expenditures will have to be made by the vehicle industry to incorporate air bag systems into production models. The Department estimates that the total capital required for tooling and equipment for the production of passive restraint systems in new cars is approximately $500 million.

Establishment of an industry to produce components for air bag systems centers on the production of the inflator component. Five major companies have indicated an interest in producing inflators for air bags. The propellant presently being considered for use is sodium azide. The primary source of sodium azide, Canadian Industries Ltd., has a capacity of around 1 million pounds per year, sufficient for only about 500,000 full front seat air bag systems. Thus, additional capacity of 10 million pounds or more of sodium azide will have to be generated, or alternative propellants would have to be used. The Department's analysis of the capital requirements and lead time to develop sufficient capacity indicates that adequate propellant can be available for annual production levels of several million units in less than three years. The production of inflators (from several sources) can reach several million units within two to three years of the receipt of firm orders, including design specifications, from the automobile manufacturers. A new capacity has already been generated to supply the demonstration program which is being pursued at this time.

The vehicle manufacturers face substantial work to incorporate air bags in their production. In the case of domestic manufacturers alone, the instrument panels of approximately half of the new cars that will be manufactured in the early 1980's will have to be completely redesigned to provide space for the passenger bag and structure to accept the loading on the passenger bag. In some cases, relocation of the instrument cluster is needed to facilitate visibility over the bag module in the steering hub.

The burden placed on the vehicle manufacturers to redesign the instrument panel and related components to accept air bags can be reduced considerably by phasing in the passive restraint requirements over several years. With phased introduction, the redesigning of instrument panels and other components can be done at roughly the same pace that these components would ordinarily be redesigned, although perhaps not within the manufacturer's preferred schedule.

The rulemaking docket contained a number of references to additional reasons for phased introduction of new systems like passive restraints: to establish quality systems in production, to obtain experience with these systems in the hands of a more limited segment of the public, and to obtain feedback on the performance and reliability of the systems. If production levels are relatively small at the beginning of a mandated requirement, any unforeseen issues that arise are made more manageable by the limited number of vehicles affected. A major automotive supplier, Eaton Corporation, stressed this aspect of production feasibility over all others.

Based on its evaluation, the Department has determined that a lead time of four full years should precede the requirement for the production of the first passive-equipped passenger cars. This lead time accords with General Motors' requested lead time to accomplish the change for all model lines. Equally important, the 4-year lead time represents a continuation to its logical conclusion of the early voluntary production of passive restraints represented by the December 1976 decision. The continued opportunity for early, gradual, and voluntary introduction of passive restraints to the public in relatively small numbers offers a great deal of benefit in assuring the orderly implementation of a mandatory passive restraint requirement. Experience with the limited quantities of early passive-restraint-equipped vehicles can confirm in the public's mind the value of these systems prior to mandatory production. Because of the value of such a voluntary phase-in approach to both the manufacturer and the public, the Department anticipates that the manufacturers which were parties to the earlier demonstration program agreements will continue their current preparations for voluntary production of passive restraints. The Department also expects that other manufacturers will undertake to produce limited quantities prior to the effectivity of the mandate. The Department intends to vigorously support the efforts of manufacturers to foster sales on a voluntary basis, both through major public information programs and through efforts to encourage their purchase by Federal, other government agencies, and private-fleet users.

The Department also intends to initiate an intensive monitoring program to oversee the implementation plans of both vehicle manufacturers and their suppliers. The purpose of the monitoring program will be not only to confirm that adequate levels of reliability and quality are being achieved in implementing designs to comply with the standard, but also to provide assurance to the public that the issues that have been raised on passive restraint reliability are being resolved under the auspices of the Secretary of Transportation.

In addition to a long lead time, the Department considers that the mandate should be accomplished in three stages, with new standard- and luxury-size cars (a wheelbase of more than 114 inches) meeting the requirement on and after September 1, 1981, new intermediate- and compact-size cars (a wheelbase of more than 100 inches) also meeting the requirements on and after September 1, 1982, and all new passenger cars meeting the requirement on and after September 1, 1983.

Wheelbase was chosen as a measure to delineate the phasing requirements because it is a well-defined quantity that does not vary significantly within a given car line. With the downsizing of most automobiles made in the United States, wheelbases are being reduced by four to six inches on most standard-intermediate- and compact-size cars. As a result, in the period of phased implementation (the 1982 through 1984 model years) standard-size cars will generally have wheelbases in a range of 115" to 120", intermediate-size cars will have wheelbases in a range of 107" to 113", and compact-cars will generally have wheelbases in a range of 102" to 108". Subcompact-size cars will continue to have wheelbases below 100".

The determination of which car sizes to include in each year of the phased implementation was made in consideration of the effect on each manufacturer and the difficulty involved in engineering passive restraints into each size class of automobile. Because of the extensive experience with passive restraints in full-size cars, and the space available in the instrument panels of these cars to receive air bag systems, this size car was deemed to be most susceptible to early implementation.

The gradual phase-in schedule is intended to permit manufacturers to absorb the impact of introducing passive restraint systems without undue technological or economic risk at the same time they undertake efforts to meet the challenging requirements imposed by emissions and fuel economy standards for automobiles in the early 1980's.

OTHER CONSIDERATIONS

Section 104(b) of the Act directs that the Secretary consult with the National Motor Vehicle Safety Advisory Council on motor vehicle safety standards. The Council has announced in an April 26, 1977, letter to the Department that "The Council feels that the time has come to move ahead with a fully passive restraint standard." The Council stated that it was recommending passive protection in the lateral and rollover modes as well as the frontal mode proposed by the Department. The Department therefore will take under consideration the Council recommendation, with a view to expanding the passive restraint requirement as new technology is advanced. The Council also recommended that mandatory seat belt use laws should also be promoted until the entire vehicle fleet is equipped with passive restraints. As noted, the Department intends to encourage States to enact such laws in their jurisdictions.

It is noted that the National Transportation Safety Board supported the mandate of passive restraints, with a cautionary note to preserve the present performance specification that permits meeting the requirement by means of passive belts as well as inflatable passive restraints.

The United Auto Workers Union, which represents the vast majority of the workers whose industry is affected by the mandate, has also advocated mandatory passive restraints to the Department.

The Council on Wage and Price Stability (the Council) supported the mandate of passive restraints, based on the assumptions that no serious technical problems exist with either the air bag or the passive belt system concept and that the Department's cost estimates are substantially correct. The Council based its support on the comparative costs of achieving benefits under the three approaches, finding passive restraints to be the most cost effective.

The Council urged that passive belt systems continue to be permitted as meeting the performance requirements of the standard, because they represent the least costly passive restraint system currently commercially available. Standard No. 208 has always been and continues to be a performance standard, and any device that provides the performance specified may be used to comply with the standards. With regard to passive belt systems, it is important that they remain available, particularly in the case of smaller-volume manufacturers who may not care to provide air bag type protection because of its engineering and tooling costs relative to production volume.

In accordance with S 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)), as implemented by Executive Order 11514 (3 CFR, 1966–1970 Comp., p. 902) and the Council on Environmental Quality's Guidelines of April 23, 1971 (36 FR 7724), the Department has carefully considered all environmental aspects of its three proposed approaches. A Draft Environmental Impact Statement (DEIS) was published March 25, 1977, and comments have been received and analyzed. The Final Environmental Impact Statement (FEIS) is released today. Petitions for reconsideration based on issues and information raised in the FEIS may be filed for the next 30 days (49 CFR Part 553.35).

There was substantial agreement by commenters with the agency's conclusions about impacts on the consumption of additional natural resources, the generation of pollutants in the manufacturing process and in transporting the system throughout the vehicle's life, and on solid waste disposal problems. In response to the comments of General Motors and others on the DEIS, several estimates were revised. In the Department's view, the two most significant consequences of a passive restraint mandate are the use of large amounts of sodium azide as the generator of gas for air bags, and the increased consumption of petroleum fuel by automobiles because of the added weight of air bags.

Sodium azide is a substance that is toxic and that can burn extremely rapidly. The agency is satisfied that the material can be used safety both in an industrial setting and in motor vehicles during its lifetime, due to inaccessibility and strength of the sealed canisters in which it is packed. The problem is to assure a proper means of disposal. Junked vehicles that are shredded have batteries and gas tanks removed routinely, and the air bag could be easily deployed by an electric charge at the same time. A hazard remains, however, for those vehicles that are simply abandoned. However, the agency judges that the chemical's relative inaccessibility will discourage attempts to tamper with it. The proportion of abandoned cars is less than 15 percent of those manufactured. The Department will work with the Environmental Protection Agency to develop appropriate controls for the disposal of air bag systems employing sodium azide.

The additional weight of inflatable passive restraints was judged to increase the annual consumption of fuel by automobiles by 0.71 percent (about 521 million gallons annually). While this increase is not insignificant, the Department believes that it is fully justified by the prospective societal benefits of passive restraints. The Department took full account of the impact of a passive restraint standard in its recent proceeding to set fuel economy standards for 1981–1984 passenger automobiles.

In accordance with Department policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the Department has evaluated the economic and other consequences of this amendment on the public and private sectors. The basic evaluation is contained in a document ("Supplemental Inflation Impact Evaluation") that was developed in conjunction with the Department's June 1976 proposal of mandatory passive restraints. That evaluation has been reviewed and a supplement to it represents the Department's position on the effect of this rulemaking on the nation's economy.

The standard, as set forth below, allows manufacturers two options for compliance. First, a manufacturer may provide passive occupant crash protection in frontal modes only. If this option is chosen, the manufacturer must also provide lap belts at all seating positions in the automobile. The lap belts are provided to give crash protection in side and rollover crashes, and have a demonstrated effectiveness in these crash modes.

A second option for manufacturers is to provide full passive protection for front seat occupants in three crash modes: frontal, side and rollover. If a manufacturer can achieve this performance, it would not have to provide seat belts in the front seat. Under this option, lap belts would continue to be required for all rear seating positions.

The Department has found that use of any seat belt installed in accordance with the standard is necessary to enhance the safety of vehicle occupants. Thus, the Department continues to advocate the use of all seat belts installed at all seating positions in motor vehicles, regardless of whether the vehicle is also equipped with passive restraints.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date finding: Under § 125 of the Act, an amendment of Standard No. 208 that specifies occupant restraint other than belt systems shall not become effective under any circumstances until the expiration of the 60-day review period provided for by Congress under that section "unless the standard specifies a later date." Section 125 also provides that the standard does not become effective at all if a concurrent resolution of disapproval is passed by Congress during the review period. The Department's view of this section is that a "later date" can be established at the time of promulgation of the rule, subject to the possibility of reversal by the concurrent resolution.

The amendment is therefore issued, to become effective beginning September 1, 1981, for those passenger cars first subject to the new requirements. The reasons underlying the effective dates set forth in the standard have been discussed above. The establishment of the effective dates is accomplished at this time to provide the maximum time available for preparations to meet the requirements. The Congressional review period will be completed prior to the commitment of significant new resources by manufacturers to meet the upcoming requirements of the standard.

The program official and lawyer principally responsible for the development of this rulemaking document are Carl Nash and Tad Herlihy, respectively.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407))

Issued on June 30, 1977.

Brock Adams
Secretary of Transportation

42 F.R. 34299
July 5, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Restraint Systems

(Docket No. 74-14; Notice 12)

With the exception of minor perfecting amendments, this notice denies petitions for reconsideration of the Department's decision to require the provision of automatic occupant crash protection in future passenger cars, commencing in some models on September 1, 1981, and in all models by September 1, 1983. Six petitions for reconsideration and one application for stay of the standard's effective date pending judicial review were filed by parties that disagreed with aspects of the DOT decision to upgrade occupant crash protection as a reasonable and necessary exercise of the mandate of the National Traffic and Motor Vehicle Safety Act (the Act) to provide protection through improved automobile design, construction, and performance. This notice denies the petitions and establishes the automatic crash protection requirements and effective dates of S4.1.2 and S4.1.3 as final for purposes of judicial review under § 105(a)(1) of the Act as to any person who will be adversely affected by them. One petition for reconsideration of a related rulemaking action ("Notice 11") is granted in this notice.

Effective date: December 5, 1977.

For further information contact:

Mr. Ralph Hitchcock, Motor Vehicle Programs, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2212).

Supplementary information: On June 30, 1977 (42 FR 34289; July 5, 1977) the DOT upgraded the existing occupant restraint requirements of Standard No. 208, *Occupant Crash Protection*, to require the provision of automatic crash protection in passenger cars with wheelbases greater than 114 inches manufactured on or after September 1, 1981, in passenger cars with wheelbases greater than 100 inches manufactured on or after September 1, 1982, and in all passenger cars manufactured on or after September 1, 1983. In place of the lap/shoulder seat belt combinations provided in the front seats of most of today's passenger cars, the standard mandates a performance standard for crash protection that must be met by means that require no action by the vehicle occupant. The automatic protection must be provided in the frontal mode—specifically, when the vehicle impacts a fixed collision barrier at any speed up to and including 30 mph and at any angle not more than 30 degrees to the left or right of perpendicular, the test dummies installed at the front seating positions must remain in the vehicle and be protected against specified head, chest, and femur injuries by passive means (means that require no action by the vehicle occupants). A manufacturer may meet lateral and rollover crash requirements by the provision of active or passive belt systems.

This amendment to the existing standard invoked a provision of the Act (15 U.S.C. 1400(b)) that provides for a 60-day Congressional review of the action. A resolution of disapproval from both Houses of Congress was specified as necessary to disapprove the action. Hearings were held by both the Senate and the House in September 1977, and votes were conducted in October 1977. The House Committee on Interstate and Foreign Commerce adopted its Subcommittee's adverse report on the disapproval resolution and voted to table it. The Senate also voted to table the disapproval resolution by a vote of 65 to 31. The 60-day review period ended October 14, 1977.

Six petitions for reconsideration of the decision were filed by interested parties, along with an application for stay of the effective date of the decision pending disposition of a petition for judicial review of the standard filed by the Pacific Legal Foundation on September 1, 1977. One petition requested an effective date change in a related rulemaking action.

Disposition of Petitions

Effectiveness. A central factor in the Department's decision to upgrade occupant crash protection requirements was a determination that passive restraint technology could substantially reduce fatalities and injuries in crashes.

Comprehensive analyses of the effectiveness of passive restraints in preventing fatalities and reducing injuries appear in the preamble to the decision, the "Explanation of Rule Making Action" that accompanied the decision, and in underlying research and analyses that were conducted by and for the Department's National Highway Traffic Safety Administration (NHTSA) and placed in the public rule making docket throughout the Standard's eight-year rule making history.

The estimates of restraint system effectiveness are based on extensive field data with active safety belt restraint systems, evaluated in conjunction with thousands of crash and sled tests comparing the performance of various active and passive restraint technologies in occupant protection with each other and with the performance of unrestrained occupants. The analyses show that air bags and passive belt systems are approximately equivalent in overall protective ability to combined lap and shoulder belts when worn. However, usage of passive restraints will be substantially higher than the 20-percent usage rate of active safety belts observed at present.

General Motors (GM) petitioned for suspension of the decision while an organization not involved in the passive restraint issue"audits" the DOT and GM effectiveness estimates. A moderate amount of field experience with the GM 1974–1976 air bag fleet of 10,000 vehicles is now available, and GM sought to obtain an effectiveness estimate from the field data by comparing injuries in the air bag accidents that have occurred with injuries in accidents of comparable severity found in GM insurance company files. Based on this methodology, GM concluded that air bags are little more effective than no restraint at all.

Analysis of GM's "matching case" methodology indicates a failure to correct their statistical conclusions for known differences between the air bag and insurance file fleets. For example, because air bags were only offered in GM's full size and luxury cars, the occupants of the air bag cars were older than the general population of motorists represented in the matching insurance files by an average of about 12 years. Older persons are more susceptible to injury in crashes than the generally younger population of American motorists. This age bias alone could result in an underestimation of air bag effectiveness of about 30 percent.

A further source of error in the GM methodology results from matching the air bag crashes with a range of similar crashes in the insurance files. For example, consider an air bag car crash into a pole resulting in 17 inches of crush to the front of the car. This case was matched against "similar" crashes into poles or trees of non-air bag cars with between 14 and 20 inches of crush. Since the insurance files contain many more lower speed crashes than higher speed crashes, the comparison group of "similar" crashes will always contain a range of severity that is biased toward less severe crashes. When air bag crashes are matched in this way, a downward bias is introduced that could reduce estimates of air bag effectiveness by 50 to 100 percent.

DOT finds that proper analytical corrections for age distribution and downward severity of the case matching technique yields an air bag effectiveness value of about 40 percent for AIS–3 or greater injuries. The Department's decision in June 1977 (Table I) estimated air bag effectiveness for AIS–3 injuries at 30 percent and for AIS–4 to 6 at 40 percent.

A more direct and definitive comparison can be made of passive and active restraint effectiveness using field data on the accident experience of 80,000 VW Rabbits with passive belt systems that have been sold in the U.S. These data show that the rate of fatalities in Rabbits equipped with passive belts is less than one-third of the rate for Rabbits of the same years of manufacture equipped with active lap/shoulder belt systems.

Economics and Science Planning, Inc. (ESP), asked that the passive restraint decision be modified to require passive belts in all 2-front-seating-position passenger cars on and after September 1, 1981, with passive requirements for other cars to follow only after further evaluation of air bag effectiveness. The seating-position distinction recognizes that passive belts may not be practical yet for 3-passenger bench-seat configurations. ESP's basis for advocating passive belts is the preliminary data on experience with passive-belt-equipped Volkswagen Rabbits.

Standard No. 208 is a performance standard that can be met by several designs, including the air bag and passive belt that have already been shown to be commercially feasible. The same performance would be required of any system chosen by the manufacturer.

ESP's preference for passive belts is grounded in its air bag analysis which, in the Department's opinion, seriously underestimates air bag effectiveness. ESP compared the experience of accident-involved 1973, 1974, and 1975 model cars equipped with seat belts (DOT–HS–5–01255–1) (RSEP study) with accident-involved air bag cars from the 10,000-car GM fleet now in highway service.

In attempting the comparison ESP made two major errors. Because the towaway mileage figures for the air-bag fleet are not known, ESP simply speculated what this critical factor would be, with no credible grounds for the validity of its estimates. The other error was to compare the two data sets, ignoring relevant differences in the ratio of urban to rural exposure, the proportions of vehicles of various sizes in the sets, the crash modes and severity of the crashes, and the age and sex of the vehicle occupants involved. When ESP corrected its analysis, in a later submission to the Department to eliminate these errors, it obtained results that tend to support the DOT estimates.

The ESP petition for deferral of air-bag-type passive restraints is also grounded in the unfounded assertion that seat belt usage is or can be expected in the future to rise to 44 percent. ESP relies on a finding from the RSEP study that belt use was as high as 44 percent in 1974 and 1975 model cars observed during 1974 and the first part of 1975. But this isolated finding cannot be used out of context as a general predictor of belt usage rates. Most of these vehicles were originally equipped with ignition interlocks and sequential warning systems, many of which had not yet been disabled and thus induced occupants to buckle up. Subsequent observations confirm that belt usage in those model year cars has now dropped to less than 30 percent. In the most recent model year cars (1976 and 1977 models) with only a brief reminder system, usage is only about 20 percent (DOT–HS–6–01340).

ESP suggested that future belt usage could be higher than DOT observations, based on its belief that usage is higher (1) in rural areas where DOT observations were not concentrated, (2) in high-risk situations because drivers perceive a risk and take appropriate action, and (3) in small cars that will become a higher proportion of the fleet in the future. This speculation has no basis in fact. The RSEP study shows belt usage to be higher in urban areas where DOT observations were concentrated, tending if anything to bias the observation in favor of high usage rates. The same study provides evidence that belt usage is no more likely in higher risk situations. Usage was lower for vehicles that sustained higher levels of damage. The higher belt usage in smaller cars is more likely attributable to the general attitudes of existing small car buyers than simply to occupancy of a smaller vehicle.

Chrysler, Ford, and AMC alluded to air bag effectiveness but raised no points that have not already been addressed as a part of the passive restraint decision at the time of its issuance. No basis in these petitions exists upon which to reconsider the decision.

Implementation schedule. The Center for Auto Safety (the Center) and Ralph Nader petitioned for modification of the effective date and phase-in to make the requirements become effective for all cars on September 1, 1980. The Center argued that installation in that time period is technically feasible, that compliance of large cars first, and less crashworthy small cars last, contradicts the

Act's mandate to reduce death and injury, that phase-in of requirements by wheelbase length is not authorized by the Act, and that insufficient notice of the implementation schedule was provided by the Department.

The introduction of passive restraint systems in all new cars will require the design, testing, and manufacture of components for a variety of passive restraint systems, in many variations to accommodate all sizes and models of passenger automobiles sold in the domestic market. Parties to the rulemaking generally agreed what tasks are necessary to redesign new automobiles to accommodate passive belts and air bags. However, some disputed the length of time needed to accomplish these tasks effectively and in an orderly manner for all cars sold in the United States during the time frame from now into the early 1980's.

A comprehensive discussion of the considerations underlying the establishment of the standard's implementation schedule appears in the *Production Readiness and Introduction Schedule* section of the "Explanation of Rule Making Action" underlying the decision.

The Department estimates that the new requirements will apply to approximately 2.8 million five- and six-passenger full size cars in September 1981, an additional 4.9 million intermediate and compact cars in September 1982, and an additional 3.2 million sub-compact and mini-compact cars in September 1983.

Depending on the amount of research and development conducted to date, the product lines, and the resources of the various manufacturers, lead time required by each will vary significantly. Some manufacturers have done preparatory development work toward the installation of passive systems, and some have done very little. Thus, the varying capabilities and state of the development programs of most manufacturers must be considered in establishing technically feasible lead times, and not simply the capability of the most or least advanced.

Facilities for manufacturing air bag inflator components in large numbers do not exist and must be developed. The development of this new industrial capacity cannot be expected to coincide fully with the development and planning activities of the vehicle manufacturers alone, because component supplier investments will probably not be made without the suppliers having firm orders. This is particularly so where the passive restraint requirements have been issued and remanded several times over the last seven years. Vehicle manufacturers generally do not order components from the suppliers until they have developed, tested, and settled on the configurations necessary to meet the standard in their products. The serial nature of development, design, testing, and tooling processes for mass production strongly affects lead time requirements.

The NHTSA estimates that the lead time for the major and secondary design changes (such as to the instrument panel, steering column, door structure, and "B" pillar) that would be required to place air bags or passive belts in new automobiles can vary from less than 26 months to more than 38 months for a typical large manufacturer.

Another factor affecting lead time is the period of time needed to develop a large scale production capacity for pyrotechnic propellant materials. Based on existing inflator technology and production capacity, the Department estimates that approximately 3 years will be necessary to produce sufficient inflators for the entire annual production of passenger cars without an extraordinary commitment from this industry. The development of large scale inflator manufacturing capacity is likely to occur only after the design and initial testing of air bag systems by the auto manufacturers.

A final and extremely important factor that must be considered in establishing lead time requirements is the necessity to assure that systems furnished to comply with the standard will provide trouble-free, durable, and marketable characteristics in service. Reduction in lead time, or inefficient use of lead time, may increase the probability of defects occurring in service.

From these considerations, it is apparent that installation of either air bags or passive belts would not be practical for all new automobiles within less than 3 years as requested by the Center. To provide reasonable opportunity for development, design, testing, and tooling of passive restraint systems with adequate durability, quality, reliability, and overall performance, 48 months of lead time is justified. This is particularly true for smaller-volume manufacturers who have done little passive restraint development work and are only now studying specific designs for their 1982 and 1983 model year products.

It should be noted that the lead time authorized is required by the facts and circumstances presented in this particular and complex rulemaking and in no way is to be considered as a precedent for the calculation of lead time in any other standard which may later be promulgated by the agency.

The Center also advocated that the changes necessary to install passive restraints should occur at the same time instead of being phased-in over three years. The Center suggested that accommodation of the manufacturers' preferences, specifically their plans to meet future emissions and fuel economy requirements, had dictated the 3-phase implementation. This is not the case. The major vehicle redesign and retooling for materials conservation, fuel economy, and emissions that has been and will occur through the early 1980's must be considered in reaching any determination about the technical and economic feasibility of automotive regulatory actions of DOT. A thorough evaluation of the consequences of this passive restraint decision requires no less.

However, the requirements for improved occupant restraints were not subordinated to the attainment of fuel economy or emissions requirements. The preamble to DOT's fuel economy rulemaking makes clear that downward adjustment in the fuel economy levels was made to accommodate the weight of passive restraints. As earlier explained, a 4-year lead time was judged to be reasonable and apprcpriate to assure that a satisfactory product could be developed by most manufacturers in the United States market for most of their products.

The decision to require only a portion of production to comply in the first year further recognizes the limit on the available tooling industry capacity to accomplish major changes, and the demands this industry will face within the next several years because of an unprecedented combination of regulatory requirements and commercial pressures. A manufacturer with several vehicle offering s ordinarily undertakes major product changes in only a portion of its production at one time. Assuming a 4-year cycle within the industry for substantial changes, for example, it is evident that only about one-fourth of the engineering and tooling capacity resources necessary to change the entire production are in place and available for use in any one year. The lead times provided are based on reasonable utilization of available tooling and the objective that reliable and effective passive restraint systems be developed.

The longer lead time allowed for smaller cars is also intended to provide the alternatives to small-car manufacturers for the installation of air bag systems in lieu of the simpler passive belt systems. The development of either type of occupant crash protection for smaller cars presents a greater engineering challenge than for large cars, and some makers of smaller cars have significantly smaller engineering resources than do the makers of the majority of larger cars. The Department intended to provide sufficient lead time so that the most effective designs can be fully considered and tested before production decisions must be reached. The agency considers that its analysis, reported in the "Explanation of Rule Making Action," provides ample justification for a phase-in as the practicable approach to meeting the need for motor vehicle safety in upgrading automobile occupant crash protection.

The Center argued that a phase-in of requirements in stages that distinguish among vehicles on the basis of a design characteristic (wheelbase length) is not authorized by the Act. The Center argued that "type" distinction does not include wheelbase distinctions. The Center also asserts that the DOT believes it has only "across-the-board" authority to implement standards, and that Congress acquiesed in this view by not providing DOT additional phase-in authority in the 1974 amendments to the Act.

The Department has repeatedly utilized "type" distinctions based on design in carrying out the Act. The basic vehicle type distinctions used to distinguish the phasing of requirements among passenger cars, multipurpose passenger vehicles, and light trucks are not expressly authorized by the Act. DOT established the distinction to rationally implement the Act. The wheelbase distinction has been used in the bumper safety standard No. 215, *Exterior Protection*, to implement upgraded requirements as expeditiously as possible. This regular practice contradicts the assertion that DOT itself believes it has "across-the-board" authority only. The DOT 1974 request for "percentage of production" phase-in authority in no way applies to the question of phase-in authority based on design distinctions such as wheelbase length, weight, or chassis type, that the Department already had.

Congress has in fact implicitly approved phase-in based on design distinction by its 1974 ratification of Standard No. 301–75, *Fuel System Integrity*, in a form that contains a gross vehicle weight rating (GVWR) phase-in criterion. Such design distinctions have been relied on by DOT and acquiesed in by Congress, the industry, and the public since the Act's inception.

Finally, the agency does not agree that the legislative history cited by the Center supports the proposition that phase-ins are illegal. The quoted statement by Senator Magnuson states that standards will apply to every vehicle, but does not address the question of *when* they would. The refusal by Congress to authorize phase-in by "customary model change" criteria in no way excludes the authority to phase-in by design distinction. The Senate Report language addresses particular vehicle changes that take more than a year to implement, and simply notes that the DOT is authorized to set later dates for those changes. This passage does not address the question of later dates for a particular category of vehicle.

The Center asserted that inadequate notice of the implementation schedule had been provided by the Department, because the September 1981 date was adopted in place of the proposed 1980 date, and because the wheelbase phase-in was adopted in place of the proposed phase-in by occupant position. While conceding that "every precise change ultimately adopted need not be published", the Center believed that inadequate opportunity was made available to the public to address the implementation schedule.

The Department has fully considered the Center's objection in the light of its public notices, hearings, and the rulemaking record on Standard 208. The question is whether the public has had sufficient notice of the issue (the timing of mandatory passive restraint installation). As a general matter, some changes from the proposal are inherent in the notice and comment process so that the rulemaker can benefit from comments and modify the rulemaking without having to repropose every time new information is learned.

In this case, the notice proposed a timing schedule, and the notice indicated that the implementation was tentative, even suggesting a phase-in at occupant positions as an alternative timing approach. The Draft Environmental Impact Statement described phase-in alternatives, and many parties in their written and oral comments raised the issue of the timing for the mandate. The Center itself commented on timing which demonstrates that they were sufficiently aware of the issue to comment on it.

Implementation of the Standard

An important element in implementing the passive restraint requirements is to ensure that they are introduced in significant numbers prior to the time they are required by mandate. While passive belt systems are already in use in substantial numbers on the Volkswagen Rabbit (about 80,000 cars), relatively few air bag systems are in highway service. The two major reasons to have passive restraints voluntarily produced prior to the mandate are to familiarize the public with passive restraint technology and to work out early problems in production systems that could interfere with orderly implementation of the mandate and jeopardize success of the program.

The Department is taking steps to provide for voluntary early introduction. In addition to Volkswagen, GM and Ford have indicated plans to introduce passive belts as an option as early as the 1979 and 1980 model years, respectively. Ford and GM have also announced the intention of making an air bag option available in one or more models in the 1981 model year, one year before the mandate. The Department commends this initiative and is encouraging these companies to expand this commitment to introduce air bags voluntarily in the 1980 model year and in other than full-size cars. The Department will continue to monitor the performance of voluntarily introduced systems, both air bags and passive belts, as it has to date.

In support of manufacturers' efforts to market air bags earlier than the mandate, the Department has contacted the General Services Administration, State and local government operators of fleet vehicles, the insurance companies, rental fleet owners, taxi operators, and other institutional users of passenger cars to encourage the purchase of air bag cars. This is the most direct inducement to the manufacturers to make air bags available earlier than the initial September 1981 effective date. Complementary activities to assist the early introduction of the systems are: (1) a DOT public education campaign that is already underway throughout the country, (2) monitoring component and vehicle manufacturers' implementation programs to assure proper attention is given to cost, reliability, and effectiveness, and (3) continued research, development, and evaluation of passive restraint systems to insure that the best overall passive restraint technology is available to manufacturers and the public, both now and in the future.

Other Issues

The Pacific Legal Foundation filed a petition for review of the rule in the Court of Appeals for the District of Columbia. It then asked the Department to stay the effective date of the rule for a period of time equal to the length of judicial review.

The Foundation, in its application for a stay, listed in general terms a number of items it said the Department failed to consider or evaluate appropriately. The Department did, however, review and assess all of those items before announcing the rule. It discussed many of them extensively in the preamble to the rule and the accompanying "Explanation of Rule Making Action". Upon receiving the application for a stay the Department reconsidered all of those items and it finds that the Pacific Legal Foundation's list of objections has no merit.

The Foundation argued that the Department should stay the rule pending judicial review because manufacturers will make capital expenditures preparing to comply with the rule in model year 1982 and if the Court then overturns the rule, manufacturers may abandon the passive restraint program and pass on these preparation expenses to new car buyers. The Foundation thus asks the Department to balance a possible loss of a relatively small amount of money against a certain loss of lives and increase in injuries. The Department does not know how much time the Court will need to review the rule, but each year's continuance of the rule will add only a few dollars to the price of a new car while each year's delay of the rule will ultimately cost the public thousands of preventable fatalities and many more thousands of preventable serious injuries. The potential harm the Pacific Legal Foundation seeks to avoid through a stay is trival compared to the cost of a stay in lives that cannot be restored, injury that cannot be repaired, and suffering that cannot be erased. This rule has already remained unresolved for too long. The Department denies Pacific Legal Foundation's application for a stay.

Some manufacturers repeated many of their earlier objections, all of which were extensively addressed in the preamble that accompanied the decision and the supplementary "Explanation of Rule Making Action". Not only were these issues fully ventilated in the rulemaking action, but they were also extensively treated in the hearings and subsequent reports of the Senate and House Commerce Committees as a part of their review of the standard. The Department does not consider repetitious petitions as a part of the reconsideration process (49 CFR § 553.21) and accordingly denies them.

One new issue raised was Ford's complaint that the NHTSA response on test dummy objectivity had misinterpreted Ford data on testing conducted in 1973. While the Ford dummy test program performed in 1973 may have been an ambitious attempt to investigate all of the variables involved in a vehicle crash test, subsequent development and test programs to reduce sources of test variability have made the Ford test series obsolete. As noted in the preamble to Notice 11, dummy manufacturers have gained experience in the manufacture of dummies, the Part 572 specifications and test procedures have been further defined, and the dummy positioning procedures in Standard No. 208 have been modified for bench-seat cars to eliminate the problem noted in the Ford tests of fitting 3 dummies side-by-side in the test.

Ford did not contest the more recent findings (DOT–HS–6–01514) of hard-seat sled tests of pairs of dummies with belts, air bags, and unrestrained, showing coefficients of variation on the pooled data basis for head accelerations from 1.2 percent to 10.7 percent, for chest acceleration from 1.6 percent to 8.5 percent, and for femur compressive force from 3.51 percent to 24.2 percent. Similar results were obtained in sled test oblique impacts (DOT–HS–802–570). In the face of this unrebutted conclusive evidence of the repeatability of current commercial dummy production, the agency finds the test instrument and associated procedure to be objective.

It has been brought to the attention of the Department that the NHTSA's decision to continue indefinitely the existing requirements for multipurpose passenger vehicles and light trucks was imperfectly stated. A corrective amendment of S4.2.2 is accomplished by this notice.

Volkswagen petitioned to have a longer transition period between the existing requirements for dummy positioning and the upcoming ones published in Notice 11 (42 FR 34299, July 5, 1977), because the company will not be able to evaluate the new requirements by July 5, 1978, yet must continue to certify its passive-belt-equipped Rabbit model. The Automobile Importers Association and General Motors suggested that compliance with either the old or new requirements, at the manufacturer's option, be permitted immediately. The NHTSA considers optional procedures more desirable than specifying the old procedures longer than one year as suggested by Volkswagen. Under optional procedures, Volkswagen can continue its certification of the Rabbit model, effecting a transition at any time, while the manufacturers undertaking new development efforts can immediately utilize the new procedures. To accomplish this, the effective dates of the requirements of Notices 10 and 11 are changed to become effective immediately, with modifications of the language as necessary to preserve the old procedures as an option until September 1, 1981. These minor adjustments are accomplished in this notice.

Ford noted that the dummy head adjustment procedure of S10.4 was not consistent with dummy construction, which positions the head automatically. The NHTSA had intended that the dummy head and neck system be shimmed to compensate for different seat back angles in vehicles being tested. Because of the relative difficulty in accomplishing this in relation to the amount of specificity gained thereby, the NHTSA hereby deletes S10.4 as requested by Ford.

For the reasons stated above and after full consideration of the petitions by all parties submitted, the Department of Transportation denies petitions for reconsideration of its June 30, 1977, decision to require the installation of automatic crash protection in future passenger cars. The requirements set forth at 42 FR 34289 and 42 FR 34299 (July 5, 1977) are final for purposes of review in accordance with § 105(a) of the Act.

In consideration of the foregoing, Standard No. 28 (49 CFR 571.208) is amended. . . .

Effective date finding: Because the amendments provide an option and do not create additional requirements for any person, it is found that an immediate effective date is in the public interest so that manufacturers may take advantage of the new option as rapidly as possible.

The program official and lawyer principally responsible for the development of this rulemaking document are Ralph Hitchcock and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407)

Issued on December 5, 1977.

Brock Adams
Secretary of Transportation

42 F.R. 61466
December 5, 1977

PREAMBLE TO AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 74–14; Notice 14)

Action: Final rule.

Summary: The purpose of this notice is to amend Safety Standard No. 208, Occupant Crash Protection, to provide for the optional use by motor vehicle manufacturers of alternatives to latches for releasing occupants from passive seatbelt systems in emergencies and to allow means other than pushbuttons to operate the emergency release mechanisms of passive belt systems. The amendment is based on a proposal issued in response to a petition from General Motors Corp. to allow manufacturers greater latitude in designing emergency release mechanisms for passive belt systems. The amendment will allow manufacturers to experiment with various emergency release mechanisms aimed at encouraging passive belt use by motorists, prior to the effective date of passive restraint requirements specified in this standard.

Effective date: November 13, 1978.

Address: Petitions for reconsideration should refer to the docket number and notice number and be submitted to: Docket Section, Room 5108, Nassif Building, 400 Seventh Street SW., Washington, D.C. 20590.

For further information contact:

Guy Hunter, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590, 202–426–2265.

Supplementary information: Safety Standard No. 208, 49 CFR 571.208, currently specifies that a seatbelt assembly installed in a passenger car shall have a latch mechanism that releases at a single point by pushbutton action. General Motors petitioned for relief from this requirement for passive belts, following the issuance of the final rule requiring passenger cars to be equipped with passive restraints (air bags, passive belts, or other means of passive, i.e., automatic, protection) (42 FR 34289, July 5, 1977). The petition described a "spool release" design General Motors would like to use on one of its passive belt systems. The system would include a shoulder belt that would not detach at either end. Rather, the design would allow the belt to "play out" or unwind from the retractor in an emergency, allowing sufficient slack for the door to be opened and the occupant to exit from the vehicle. The purpose of such a "spool release" design is to minimize the disconnection of the passive belt system by motorists. Under the current latch mechanism and pushbutton requirements for belts, a passive belt system could be easily disconnected by a buckle release identical to buckles on current active belt systems (i.e., belts that motorists must manually put into place). As long as the belt remains disconnected, the "passivity" of the system would be destroyed for future use.

In response to the GM petition, the NHTSA issued a proposal to amend standard 208 to allow alternative release mechanisms for passive belts (43 FR 21912, May 22, 1978). As noted in that proposal, the NHTSA is very concerned about the usage rate of passive belts by motorists since it appears that there may be many new cars in the 1980's equipped with these systems. If motorists who would prefer air bags in a particular car line can only obtain passive belts from the manufacturer the defeat rate of the belts could be high. The agency is, therefore, interested in fostering any passive belt design that is effective and that minimizes the rate of disconnection. The notice pointed out, however, that there are other factors to be considered in the proposed change.

The original purpose of the latch mechanism and pushbutton requirements of standard 208 was to insure uniformity of buckle design for the purpose of facilitating routine fastening and unfastening of active belts, encouraging belt use by making the belts as convenient as possible and facilitating the exiting of vehicle occupants in emergency situations. Since the proposed amendment would allow various types of release mechanisms, the agency was concerned that the resulting nonuniformity might have adverse consequences in emergency egress situations from passive belts. In order to examine the implications of the General Motors petition thoroughly, the proposal sought public comments on four specific questions concerning the efficacy and advisability of allowing alternative release mechanisms to latches for passive belt systems. The four questions were as follows:

1. "How should the NHTSA or the vehicle manufacturers monitor the efficacy of and public reaction to various systems for discouraging disconnection of passive belts (such as the latch mechanism with a 4–8 second audible/visible warning system that operates if the belt is not connected when the ignition is turned on, a latch mechanism with additional warning or interlock systems voluntarily installed by a vehicle manufacturer, or a lever operated spool release as requested by General Motors)?"

2. "Are there safety or other considerations that would make it inadvisable to allow the spool release at this time as an option to vehicle manufacturers which install passive belts?"

3. "Compared with a passive belt system equipped with the currently required latch mechanism, would a passive belt system equipped with a spool release whose actuation lever is located between the seats have substantial disadvantages for emergency exit or extraction from a vehicle that would offset any possible increase in usage in the passive belts?"

4. "If the NHTSA decides to permit the use of alternative occupant release mechanisms, should such use be permitted indefinitely or only for a finite period, e.g., several years, to allow field testing of the various systems? If a finite period were to be established, when should it begin and end?"

All 15 comments to the May 22, 1978, notice supported the intent of the proposed change to allow alternative release mechanisms for passive belts. Most commenters agreed that a nonseparable passive belt should discourage disconnection by motorists and that this should be given higher priority consideration than possible adverse effects such a belt might have on emergency occupant egress. Volkswagen did express some concern that the benefits achieved by increased belt usage might be somewhat offset if problems with emergency exiting arise, but agreed that more flexibility in passive belt design should be allowed to encourage belt use.

Volkswagen urged the use of the passive belt system utilized on its Deluxe Rabbit—a pushbutton release latch mechanism guarded by an ignition interlock. The company stated that this type system is simple and works well in emergency situations regardless of the condition of the retractor or the positioning of the webbing (potential problems of a "spool release" type design). Volkswagen pointed out that a system that is too complex will require close monitoring to insure effectiveness.

While the Volkswagen system has shown high use rates in the field, there is a possibility that widespread use of this type system could lead to adverse public reaction because of the interlock feature. As pointed out by the Alliance of American Insurers in its support of the proposed amendment, there could be a second public "backlash" from a return to the use of starter interlocks, even if placed on the vehicle voluntarily by the manufacturer. Alliance stated that the "spool release" system proposed by General Motors should be preferable to the interlock from a public acceptance standpoint.

The Center for Auto Safety and the Prudential Property & Casualty Insurance Co. both commented that "spool release" type mechanisms should be self-restoring to insure that in subsequent uses of the vehicle the passive belt is ready to provide the automatic protection for which it was designed. The self-restoring feature would automatically retract the belt after the manual release has been activated to allow the belt to "play-out." The NHTSA believes that both self-restoring "spool release" designs and manual restoration designs have distinct advantages. The automatic restoration does not require the vehicle user to have any knowledge of the system to reactivate the passive belt. However, a manual restoration design would be less complex and would probably be more reliable. The manual design could be coupled with audible and visible warnings to indicate when the lock-up portion of the retractor is inoperative. The amendment set forth in this notice allows both types of restoration systems for "spool release" passive belt designs.

The majority of commenters argued that the proposed amendment should be effective indefinitely, and not merely during the interim period until the passive restraint requirements become effective. The comments stated that manufacturers should be given the greatest possible design latitude to encourage the early introduction of innovative passive belt systems that are designed to minimize disconnection by motorists. The industry noted that manufacturers will be hesitant to initiate such new programs and passive belt designs if alternative release designs are allowed only for an interim period. Further, the commenters stated that an interim rule would not allow time for an adequate examination of the effectiveness of the various new designs that might be developed. The agency has concluded that these arguments have merit. Accordingly, this amendment is effective indefinitely.

Several comments stated that the new passive belt designs should be standardized, so that the public will understand their use and problems of emergency occupant egress will be minimized. While the agency agrees that uniformity in release design is advantageous, it is not practical to standardize systems that are only in the development stage. Further, if manufacturers are not given latitude in their passive belt designs, the purpose of this amendment would be defeated. It is unclear at this time which passive belt systems will be the most effective in encouraging belt use and at the same time be accepted by the public. The agency will, of course, monitor all new passive belt systems as closely as possible, and efforts to standardize systems could be made in the future.

Ford Motor Co. commented that the revision of standard No. 208 as requested in the General Motors petition would provide greater latitude than presently exists, but that the requested wording is restrictive in that it would inhibit the development of methods of release other than those specifically related to the retractor. Ford requested that the proposed revision include language permitting manufacturers the greatest possible design latitude. The agency emphasized in the previous notice that the proposal was tentative as to the language and substance of an amendment that might be adopted in response to the General Motors petition. Accordingly, this amendment is broader than that proposed in the General Motors petition and does not limit the types of passive belt designs that may be developed.

In order to insure that vehicle occupants are aware if their passive belts are inoperable because a release mechanism has been activated, this amendment specifies that the warning light, "Fasten Belts," remain illuminated until the belt latch mechanism has been fastened or the release mechanism has been deactivated. This warning light of indefinite duration is in addition to the 4- to 8-second audible warning signal currently required by the standard. The agency believes a continuous warning light is essential since this amendment will allow various types of unfamiliar release systems for passive belts.

In summary, the agency has concluded that manufacturers should be given considerable latitude in designing emergency release mechanisms for passive belt systems. This will permit the development of innovative systems aimed at limiting passive belt disconnection by motorists. Otherwise, the use rate of passive belt systems could be as low as the current use rate for active belt systems. This amendment will allow manufacturers to experiment with various passive belt designs before the effective date of the passive restraint requirements and determine which designs are the most effective and at the same time acceptable to the public.

The agency does not believe that the use of alternative release mechanisms will cause serious occupant egress problems if manufacturers take precautions to instruct vehicle owners how the systems work through the owner's manual and through their dealers. While uniformity in release mechanisms is certainly important for purposes of emergency occupant egress, the agency has concluded that this consideration is at least temporarily outweighed by the importance of insuring passive belts are not disconnected. The agency will, however, monitor all new passive belt designs to assure that the release mechanisms are simple to understand and operate. If the methods of operation of the various release mechanisms are self-evident, the problem of lack of uniformity in design will be less important in terms of emergency occupant egress.

The agency has concluded that this amendment will have no adverse economic or environmental impacts.

The engineer and lawyer primarily responsible for the development of this rule are Guy Hunter and Hugh Oates, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407), delegation of authority at 49 CFR 1.50.)

Issued on November 1, 1978.

Joan Claybrook
Administrator

43 F.R. 52493
November 13, 1978

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Protection

(Docket No. 78-16; Notice 3)

SUMMARY: This notice responds to petitions for reconsideration of the November 29, 1979, notice (44 F.R. 68470) amending Standard No. 208, *Occupant Crash Protection.* In response to petitions from the Motor Vehicle Manufacturers Association and Chrysler Corporation, the agency is deleting the requirement for emergency-locking or automatic-locking seat belt retractors at the outboard seating positions of the second seat in forward control vehicles. The effect of this deletion is to permit manufacturers to continue to use manual adjusting devices for the seat belts at those seating positions.

EFFECTIVE DATE: March 27, 1980.

FOR FURTHER INFORMATION CONTACT: Mr. William E. Smith, Office of Vehicle Safety Systems, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-2242)

SUPPLEMENTARY INFORMATION: On November 29, 1979, NHTSA published a notice amending Standard No. 208, *Occupant Crash Protection* (44 F.R. 68470). The amendment deleted the exemption for forward control vehicles from several of the occupant restraint system requirements of the standard. (A forward control vehicle is one with a short front end. More than half of the engine is located to the rear of the forward point of the windshield base and the steering wheel hub is in the forward quarter of the vehicle.)

Chrysler Corporation and the Motor Vehicle Manufacturers Association (MVMA) filed petitions for reconsideration concerning the amendment. They argued that the November 1978 notice of proposed rulemaking for the amendment only proposed a change in the requirements for the safety belt systems in the front seat of forward control vehicles and did not give adequate notice about a change in the requirements for belts in the second seat of forward control vehicles (43 F.R. 52264). They said that the amendment adopted in the final rule requires forward control vehicles to have lap and shoulder belts in the front outboard designated seating positions and have automatic-locking or emergency-locking retractors at the outboard designated seating positions of the second seat of the vehicle.

The petitioners have correctly described the requirements added by the amendment. The amendment applies the requirements of § 4.2.2 of Standard No. 208 to all forward control vehicles manufactured after September 1, 1981. Section 4.2.2 requires a manufacturer to meet one of the following three occupant crash protection requirements: § 4.1.2.1, complete automatic protection, § 4.1.2.2, head-on automatic protection or § 4.1.2.3, lap and shoulder belt protection system. Manufacturers choosing to comply with § 4.1.2.3 must install seat belt assemblies meeting the adjustment requirements of § 7.1 of the standard. The provisions of § 7.1 require that the seat belt assemblies installed at the outboard seating positions of the front and second seats adjust by means of an emergency-locking or automatic-locking retractor. Seat belt assemblies installed at all other seating positions can adjust either by an emergency-locking or automatic-locking retractor or by a manual adjusting device. Prior to the November 1979 amendment of Standard No. 208, forward control vehicles did not have to meet the requirements of § 4.2.1.3 but instead could meet § 4.2.1.2, which did not require the use of emergency-locking or automatic-locking retractors in the outboard seating positions of those vehicles.

The agency's November 1978 notice of proposed rulemaking was addressed to the specific portion of Standard No. 208 exempting forward control vehicles from the shoulder belt requirements. The final rule eliminating the exemption inadvertently changed the requirements for the second seats of light trucks and vans as well. Therefore, the agency is amending the standard to retain the current seat belt requirement for the second seat in light trucks and vans. The agency notes that one manufacturer (GM) of forward control vehicles voluntarily equips its vehicles with automatic-locking retractors and urges Chrysler to do the same. The agency will consider eliminating the remaining forward control exemptions from Standard No. 208 in future rulemaking.

The principal authors of this notice are Mr. William E. Smith, Office of Vehicle Safety Systems, and Mr. Stephen L. Oesch, Office of Chief Counsel.

Issued on March 18, 1980.

Joan Claybrook,
Administrator,

45 F.R. 20103
March 27, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket Nos. 1-18 and 74-14; Notices 16 and 18)

ACTION: Final rule (correction).

SUMMARY: The purpose of this notice is to correct an amendment to Safety Standard No. 208, *Occupant Crash Protection,* that was issued September 27, 1979 (44 F.R. 55579). That notice amended the seat belt warning system requirements of the standard to specify the use of the seat belt telltale symbol that is specified in Safety Standard No. 101-80, *Controls and Displays.* In that amendment, certain warning system requirements, which had previously been deleted from Standard No. 208, were incorrectly reinserted in the standard. This notice corrects those errors. Further, this amendment makes clear that the telltale symbol of Standard No. 101-80 will supersede certain existing requirements in Standard No. 208 after Standard No. 101-80 becomes effective September 1, 1980.

DATES: These amendments are effective on July 14, 1980.

FOR FURTHER INFORMATION CONTACT: Mr. Hugh Oates, Office of Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-2992)

SUPPLEMENTARY INFORMATION: The seat belt warning system requirements of Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), currently specify that under certain conditions, when seat belts are not fastened, the words "Fasten Belts" or "Fasten Seat Belts" shall be displayed on the vehicle dashboard. On June 26, 1978, the NHTSA published Safety Standard No. 101-80 (49 CFR 571.101-80) to establish new uniform requirements for the location, identification, and illumination of controls and displays in motor vehicles. That standard specifies a telltale symbol that is to be illuminated when a vehicle's front seat belts have not been fastened. The standard is to become effective September 1, 1980.

On September 27, 1979, the agency amended Safety Standard No. 208 to permit the optional use of the seat belt telltale symbol specified in Safety Standard No. 101-80 prior to the effective date of that standard (44 F.R. 55579). However, that amendment failed to clarify that, after the effective date of Standard No. 101-80 (September 1, 1980), the telltale symbol will be required to be used in a vehicle's belt warning system. This notice clarifies that point.

When the seat belt telltale symbol was added to Safety Standard No. 208, the amendment inaccurately stated the pertinent sections of the standard that were to be modified. Further, paragraph S4.5.3.3(b) (1) inadvertently omitted language concerning the audible warning. This notice adds the omitted language for that paragraph and, additionally, deletes the parenthetical "(1)" in the paragraph heading. Since there is no longer a subparagraph "(2)," the heading should be specified as "S4.5.3.3(b)."

The 1979 amendment also incorrectly added two sections to the warning system requirements that had previously been deleted from the standard, S7.3.1 and S7.3a. This mistake occurred because the warning system requirements are incorrectly codified in Title 49 of the Code of Federal Regulations. On July 5, 1977 (42 F.R. 34299), Safety Standard No. 208 was amended to delete section S7.3 and to redesignate section S7.3a as S7.3 (as the sections were numbered at that time). When this amendment was codified in the Code of Federal Regulations, however, only paragraph S7.3 was deleted, not the entire section (S7.3 through S7.3.5.4). Instead, S7.3a was transposed as S7.3 and S7.3.1 through S7.3.5.4 remained. Unfortunately, these deleted sections were used as a reference when the seat belt telltale symbol amendment was added to Standard No. 208. This notice also corrects that error.

Issued on July 7, 1980.

Michael M. Finkelstein,
Associate Administrator for Rulemaking.

45 F.R. 47151
July 14, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74-14; Notice 19)

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 208, *Occupant Crash Protection,* to specify additional performance requirements for both manual and automatic safety belt assemblies installed in motor vehicles with a Gross Vehicle Weight Rating (GVWR) of 10,000 pounds or less. These performance requirements are specified in order to prevent the installation of particularly inconvenient and uncomfortable belt assemblies and to ensure that people are not discouraged from using belts because of their design or performance. This amendment does not include several provisions that were contained in the notice or proposed rulemaking preceding this rule. Based on comments received in response to the proposal, the agency has determined that only certain of the specifications should become mandatory at the present time. Consideration involving cost, lead-time and the encouragement of innovative seat belt designs have led the agency to conclude that the other provisions should be issued only as performance guidelines that manufacturers should follow where possible, or find alternative means to accomplish the same ends. The performance guidelines will be published in a separate *Federal Register* notice.

DATE: Effective date: September 1, 1982.

ADDRESS: Any petitions for reconsideration should refer to the docket number and notice number and be submitted to: National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT: Mr. Robert Nelson, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590. (202-426-2264)

SUPPLEMENTARY INFORMATION: Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), currently requires most motor vehicles to be equipped with safety belts at each designated seating position. Beginning in September 1981, and phasing in over the following two years, new passenger cars will have to provide automatic occupant crash protection (i.e., occupant restraint that requires no action by occupants, such as fastening seat belts, to be effective). Many new automobiles will be equipped with automatic belts to comply with the automatic restraint requirements (automatic belts move into place around a vehicle occupant automatically when he or she enters the car and closes the door). The requirements specified in this amendment are designed to remove some of the most egregious disincentives to use of current belt designs to ensure that both the automatic belts and the manual belts installed in future vehicles will be comfortable and convenient to use.

The requirements specified in this notice are applicable to seat belt assemblies installed in all vehicles with a GVWR of 10,000 pounds or less, except for Type 2 manual belts (lap and shoulder combination belts) installed in front seating positions in passenger cars through the 1983 model year. As noted in the proposal preceding this amendment (44 F.R. 77210), Type 2 manual belts will be phased out in passenger cars when the automatic restraint requirements of Standard No. 208 become effective. Accordingly, the agency believes that manufacturers should be allowed to focus their efforts and resources regarding comfort and convenience on manual belts in vehicles other than passenger cars and on developing the Type 1 manual belts (lap belts) which will be installed in rear seats in passenger cars and in some front seats in conjunction with air bags and single diagonal automatic belts.

As stated in the notice of proposed rulemaking the discomfort and inconvenience of current seat belt designs are among the most prominent factors resulting in the current low rate of safety belt use (approximately 11 percent). The proposal cited various studies which conclude that comfort and convenience play a determinative role in whether people continue to use the safety belts installed in their vehicles after they first try them (DOT HS-801-594; DOT HS-803-370). Some of the problems identified in these studies include: many belts are difficult to reach; many belts do not fit properly (e.g., they cross the occupant's neck); the pressure of many shoulder belts is felt to be excessive, particularly by women; many belts are difficult to buckle; and many belts become too tight after they have been worn for several minutes and their users have moved around.

In order to alleviate the most serious of these problems, the notice of proposed rulemaking sought to establish a variety of relatively simple, objective performance requirements that would improve the comfort and convenience of seat belt systems. Specifications involving the following performance areas were therefore proposed: torso belt occupant fit; belt retraction; adjustable buckles for certain belts; belt/seat cushion clearance; torso belt body contact pressure; automatic locking retractors (ALR's) were to be restricted; "comfort clips" were to be precluded; latchplate accessibility; webbing guides; convenience hooks for belt webbing clearance between webbing and the occupant's head; and specifications for motorized belt systems.

There were 38 comments in response to the proposal from vehicle manufacturers, seat belt assembly manufacturers, public interest groups and consumers. All comments were considered and the most significant are discussed in this notice. In response to those comments, and for reasons set forth more fully below, the agency has concluded that this amendment will only include specifications relating to: latchplate accessibility; seat belt guides; adjustable buckles for certain belts; shoulder belt pressure; convenience hooks; belt retraction; and comfort devices. The other provisions of the proposal will be issued to the public only as performance guidelines which manufacturers may voluntarily follow if they choose. Those guidelines will be issued in a separate *Federal Register* notice.

Proposed Provisions Not Included In This Amendment

(The following section sets forth the major comments to the proposed provisions that are not being included in this amendment. A general discussion of the agency's response to these comments follows after the summary.)

There were nine comments to the proposed amendment from concerned citizens. Five of these consumers supported the proposed rulemaking and stated that they have experienced extreme comfort and convenience problems with their seat belt systems. Three citizens opposed the proposal on the basis that the rulemaking represents unwarranted government interference. Finally, one commenter objected to the technical nature of the proposal, stating that the specifications were difficult to understand.

Almost all vehicle manufacturers supported the concept of the proposal that seat belt assemblies should be convenient to use and comfortable to wear. However, most manufacturers disagreed with the agency's contention that there is a demonstrable relationship between seat belt comfort and convenience and belt usage rates and that improving comfort and convenience will improve those rates. Additionally, most manufacturers did not agree that the specifications proposed by the agency would lead to belt designs that are appreciably more comfortable and convenient. For example, Ford Motor Company stated that although it does not deny that there may be some correlation between comfort and convenience and wearing rates at the extremes (i.e., for very comfortable belts or belts that are particularly uncomfortable), there is no objective evidence that a measurable relationship exists between comfort and convenience and wearing rates. Ford also stated that certain of the proposed requirements would not accommodate a large number of vehicle occupants (e.g., Ford stated that the fit zone specified in the proposal would only ensure that belts properly fit 60 percent of the population. The proposal stated the agency's belief that the fit zone would ensure over 90 percent of the population had comfortable belts). The Motor Vehicle Manufacturers Association stated that experience has shown that the incorporation of features in belt systems to improve their comfort and convenience has not resulted in increased seat belt use, and that comfort and convenience are highly subjective concepts that are not readily quantifiable. Chrysler Corporation stated that comfort and convenience improvements alone will not result in a substantial increase in belt use. Chrysler stated that the only way to improve seat belt use is to enact mandatory seat belt use laws. Volkswagen of America stated that the proposed modifications would actually eliminate several of the most promising existing automatic seat belt designs because of design restrictions. General Motors Corporation cited a study conducted for it by MOR, Inc., which indicated that removal of all perception of discomfort and inconvenience in belt systems would result in only a 1.7 percent increase in seat belt usage. The NHTSA proposal indicated that usage could be increased about 8 percent, and took exception to the MOR study. General Motors argued that the NHTSA has not adequately demonstrated, however, why the conclusions in the MOR study are invalid. American Motors Corporation stated that manufacturers already incorporate adequate comfort and convenience features in their belt systems and that regulatory action is, therefore, not warranted in this case.

The American Seat Belt Council, Hamill Manufacturing Company and other commenters supported the rationale of the proposal totally. Hamill stated that comfort and convenience is of paramount importance to 75–80 percent of the non-user segment of the driver population, who already perceive that seat belts are effective in mitigating the risk of death and injury in vehicle crashes but are dissuaded from using the belts because of perceived inconvenience and discomfort. Volvo of America Corporation acknowledged that comfort and convenience is one factor that influences usage, but stated that the major reason for the low rates of seat belt use is lack of motivation on the part of the motoring public.

In addition to the general negative comments concerning the relationship between seat belt comfort and convenience and wearing rates, many commenters (vehicle manufacturers) argued that certain of the proposed specifications would adversely affect belt effectiveness in vehicle crashes. For example, several manufacturers argued that the comfort zone for belt webbing specified in the proposal would require belt anchorages in some vehicle models to be in locations that are not the optimum location for belt performance in restraining victims in a crash situation.

Torso Belt Occupant Fit (Manual and Automatic Belts)

To alleviate problems of torso belt fit such as rubbing of the occupant's neck, the proposal specified a zone in which the torso belt would have to lie on a test dummy placed in a vehicle. The zone was established to ensure that belts are installed so that the torso belt crosses the occupant's shoulder and chest approximately midway between the neck and shoulder tip, and crosses the sternum approximately midway between the breasts. The proposed requirements specified geometric criteria to describe the required chest-crossing envelope.

The motor vehicle manufacturers were unanimous in their opposition to the proposed torso belt fit requirement. Their objections were primarily related to: the location of the specified compliance zone on the Part 572 test dummy; the location of the test dummy in the vehicle; the width of the compliance zone on the Part 572 test dummy; and the test procedure to determine compliance.

Manufacturers argued that the test procedure is not objective and repeatable because of the complexities and variability associated with locating the dummy in a specific position in the vehicle. They also argued that the procedure for placing the belt around the test dummy (the "rocking" procedure) is not objectively stated. Most manufacturers argued that the 3-inch width of the fit zone specified in the proposal is too design restrictive. Additionally, Ford argued that its tests show that the 3-inch zone would only assure proper fit on approximately 60 percent of the driving population (the agency stated in the proposal that 90 percent of the population would have the proper fit with the proposed specifications). Ford did not substantiate how it arrived at this conclusion, however. Manufacturers argued that the fit zone should be at least 3.6 inches wide and possibly as much as five inches wide in order to ensure repeatability of the compliance procedure. Manufacturers stated that the location of the compliance zone on the test dummy would not necessarily place the belt in the optimum position for effectiveness in crashes in certain vehicle models. They based this assumption on the fact that in certain current vehicle models both the belt anchorages would have to be moved to place the belt in the specified zone. The manufacturers argued that these new anchorage locations would degrade belt performance in some instances.

Clearance Between Webbing and Seat Cushion (Automatic Belts)

As noted in the notice of proposed rulemaking, the shift from manual to automatic belts may initially lead to confusion on the part of some persons. The lower end of many automatic shoulder belt designs is attached between the two front seating positions. The upper end is attached to the rear upper corner of the front door. If the lap belt or torso belt of an automatic belt system is designed so that it lies on the seat cushion or against the seatback cushion(s) when the belt system is reeled-out in its open-door position, some people are likely to be confused about how to get into the vehicle. Additionally, if the belt is lying on or hanging slightly above the seat cushion, it is likely to pull against clothing in an irritating fashion as the occupant tries to sit down. These factors led the agency to propose minimum specifications for webbing/seat clearance (three inches) so that people would not be encouraged to disconnect automatic belts because of the inconvenience.

Most manufacturers opposed the minimum specification for webbing/seat clearance. The comments stated that there is no safety rationale for the requirement because any misconception concerning the proper way to enter the vehicle would be removed after the occupant became familiar with the vehicle. Peugeot stated that experience has shown that the occupant can easily push the strap aside for a moment in order to enter the vehicle. The company argued that the proposed requirement is tantamount to requiring the installation of an automatic mechanism to move the belt system's top anchor's position. (Note: In response to this specific comment, the agency would not consider a belt system that had to be manually moved out of the way by the occupant to be an "automatic" system that would satisfy the requirements of the standard; see 39 F.R. 14594, April 25, 1974). Several manufacturers stated the minimum specification could degrade belt effectiveness in a crash. These manufacturers argued that the specification would preclude a belt, particularly a lap belt, from fitting securely around the occupant. This could result in the occupant "submarining" under the belt during a crash.

Motorized Track Systems— Webbing/Head Clearance

Some automatic belt designs rely on overhead, motorized track-puller systems instead of the opening of the door to move the webbing automatically out of the occupant's way when getting in and out of the vehicle. These systems pull the webbing toward the dashboard when the vehicle door is opened and then pull it toward the rear of the vehicle to deploy around the occupant after the door is closed. If such a system is used, the vehicle design should be such that the belt webbing does not pass too close to the occupant's head during its movement. Webbing that passes too close to or brushes the occupant's face or head could be annoying or disconcerting (perceived as hazardous by the intended user) and cause the occupant to defeat the automatic belt system (by unbuckling or cutting the belt, for example). The proposal specified a webbing/head clearance envelope that was intended to ensure that a moving torso belt would not come within a certain specified distance of an occupant's head and face.

Industry objected to this proposed requirement on the basis that many small vehicle models could not comply with the requirement without substantial changes to the vehicle structure (i.e., because of limited head room in these small cars). Toyota Motor Company stated that an automatic belt design it has already introduced in the market would have to be withdrawn if this proposed requirement were finalized because there is not sufficient room in its vehicle model to obtain the specified clearance. Volkswagen stated that any specification for webbing/head clearance should only specify that the webbing cannot touch the occupant's face while it is articulating, and that a minimum distance specification is too design restrictive. General Motors stated that the spherical zone specified in the proposal falls outside the vehicle on some GM body styles, and would thus preclude motorized belt systems in these vehicles.

Rate of Movement of Motorized Belts

The agency stated its belief in the proposal that motorized belt systems will be unacceptable to the public if the rate of belt movement is too slow, since the occupant would be delayed in exiting the vehicle. Systems that move too rapidly might also be unacceptable since they could be viewed by vehicle occupants as a possible hazard. Each of these problems could lead vehicle occupants to defeat the automatic belt system. Therefore, the proposal specified minimum and maximum times allowed for belts to move forward and backward on motorized track systems (between 1.5 and 1.9 seconds from start to stop).

Manufacturers stated that this proposed specification should be deleted because of the variation in performance of motorized systems due to environmental conditions. The comments pointed out that ambient temperature greatly affects motor speeds and battery conditions and that the movement time, therefore, could not be held stable. Several commenters argued that a single movement time is impractical because of the wide variety of vehicle sizes and the varying distances a belt system would have to move. The commenters stated that if such a requirement is retained it should be stated as a rate rather than total times allowed. In this way, the movement of all systems would be uniform even though it would take longer for the belt webbing to move down the track in a large vehicle than in a small vehicle.

Agency Response to Comments on Unadopted Proposals

The agency does not agree with the general negative response of most vehicle manufacturers regarding the relationship between seat belt comfort and convenience and belt use. Likewise, the agency believes that the specification in the notice of proposed rulemaking would greatly improve the comfort and convenience of seat belt systems, particularly the new automatic belt systems that will be introduced in the future. Although the agency agrees that many factors influence belt use, it continues to believe that belts which are inconvenient to use and uncomfortable to wear will be used less regardless of these other factors. The research studies cited in the notice of proposed rulemaking clearly establish that there is a definite problem with many current seat belt designs, and that seat belt systems can be improved with relatively minor changes. Removing the most egregious problems with seat belt designs will, at a minimum, remove an impediment that currently thwarts other programs designed to increase seat belt use. For example, seat belt education campaigns will have little effect if people attempt to wear the belts but find them inconvenient and uncomfortable.

The agency also does not agree with many of the comments regarding specific provisions included in the proposal. Proper torso belt fit is an extremely important aspect of ensuring that belts are comfortable to wear and do not cross the neck or face. The problems cited by the industry with the proposed specification and test procedure are problems the agency believes can be solved. While it is true that some vehicle models may require significant modifications to comply with the fit zone, the agency believes that this is due primarily to the fact that in the past vehicles have been designed with little attention given to how the belt system will fit when installed in the vehicle. Belt systems are typically added as an afterthought long after the vehicle's structural design has been completed, with no systematic effort to coordinate a particular belt design to a particular structural design.

The industry's comments that webbing/seat clearance for automatic belts will not be a problem after occupants learn how to get into the vehicle only address part of the problem. In the months since issuance of the proposal, the agency has observed many prototype and production automatic belt designs. These observations have demonstrated that webbing/seat clearance is extremely important to ensure that the belt webbing does not scrub across the occupant's clothing when entering the vehicle. Some of the designs that were observed had such minimal clearance that buttons and shirt pocket contents were snagged by the belt system as an occupant entered the vehicle. This is obviously a problem that would encourage disconnection of the belt system. In addition, if the webbing/seat clearance is so minimal that the person has to manually move the belt out of the way to enter the automobile, the system is not really "automatic" and would not satisfy the automatic restraint requirements of the standard. The agency has concluded that these problems outweigh the perception problem discussed in the proposal. Consequently, the agency believes that the 3-inch specification in the proposal is inadequate and a greater clearance is desirable. While it is true that greater clearance may require innovative designs, the agency believes these are problems that can and should be solved.

Although these basic disagreements do exist between the NHTSA and vehicle manufacturers, the agency does believe that many of the specific comments to the proposal have merit. Also, the agency is aware that many of the problems cited by the industry are legitimate concerns. The agency is cognizant of the fact that there are a multitude of vehicle configurations that would have to be dealt with in complying with all of the provisions included in the notice of proposed rulemaking. In certain situations it may be true that strict compliance with the provisions as originally specified might compromise belt effectiveness in crashes to a limited degree, if applied to existing, unchanged structural configurations. Most manufacturers stated that the injury criteria of the standard could be met under the specifications of the proposal, but that in some instances the margin of safety would not be as great. Obviously, the agency does not want belt system performance to be degraded in the attempt to make belts comfortable and convenient enough that they will be used. However, the agency does not believe that such a compromise is necessary if belt system design and vehicle structural design are coordinated at the outset.

The agency has also considered the numerous comments concerning the leadtime that would be necessary to implement the proposed requirements in certain vehicle models, as well as the costs associated with making the changes after design plans have already been completed.

These considerations and the factors mentioned below have led the agency to conclude that requirements for torso belt fit, webbing/seat clearance, webbing/head clearance, and motorized belt track speed should not be included in this final rule. The agency believes that manufacturers should be encouraged to rapidly develop innovative automatic belt designs that will coordinate belt comfort and convenience and belt effectiveness to the greatest extent possible. In some vehicle configurations, particularly in smaller cars, strict compliance with the proposed specifications mentioned earlier may hamper these efforts. While the agency believes that it is possible and desirable to design comfortable and convenient safety belts meeting all of the proposed specifications, it does not wish to retard the introduction of automatic restraints because of minor technical problems in particular vehicle configurations. If all of the proposed requirements were issued in this final rule, additional leadtime would have to be given because of the special problems in a few vehicle models. The agency believes it is preferable to encourage voluntary compliance with some of the proposed provisions so that a majority of vehicles can be introduced at an earlier date with the comfort and convenience features incorporated.

The agency also intends to continue development of the proposed specifications in order to refine comfort zones and test procedures. Although the provisions as proposed would represent an important improvement in seat belt comfort and convenience if incorporated in current vehicle designs, comments from the industry have led the agency to conclude that some modifications and adjustments in the specifications may be desirable. Instead of delaying the introduction of improvements in seat belt design while the agency continues this development work, it has been determined that it is wiser to urge voluntary compliance with the major provisions included in the proposals so that they may be introduced as soon as possible. As automatic belts are introduced in the market, valuable data will be received concerning consumer perception of comfort and convenience. These data will be helpful to both the agency and the industry in further improving the belt systems.

Another factor influencing the decision not to include the proposed specifications in this final rule is the fact that there are automatic belt designs currently in production that do not comply with all the provisions proposed. The agency does not wish to preclude the continual production of these designs because, for example, they are ¼ inch outside the torso belt fit zone. This is particularly true since the automatic belts currently on the road were introduced voluntarily by the manufacturers prior to the effective date of the standard.

As stated earlier, the agency does urge manufacturers to voluntarily incorporate the performance specifications that were proposed but that are not included in this final rule. The agency believes all of the provisions deal with seat belt design features that substantially affect the comfort and convenience of seat belt systems, and therefore help determine whether a particular belt system will be worn. The agency also believes that the provisions adequately specify performance criteria and that manufacturers can design systems that are in conformity with the specifications and that also optimize belt effectiveness in crash situations. Although some variations may be required for specialized vehicle configurations, the great majority of the specifications should prove to be extremely helpful to manufacturers attempting to develop seat belt designs that are comfortable to wear and convenient to use.

In order to aid both seat belt manufacturers and vehicle manufacturers, the NHTSA will publish in a later *Federal Register* notice suggested performance guidelines for torso belt fit, belt/head clearance, belt/seat cushion clearance, and speed of motorized belt track systems. The agency will also include in that notice tabulation of all research reports, studies and other data concerning the improvement of seat belt comfort and convenience that are available at the National Highway Traffic Safety Administration. The agency urges all manufacturers to use the information that is available and to incorporate these performance guidelines so that vehicle occupants will not be discouraged from using seat belts because of their discomfort or inconvenience.

Provisions Included in This Amendment

In addition to the provisions discussed already, the notice of proposed rulemaking included specifications dealing with seat belt guides, torso belt pressure, latch plate accessibility, adjustable buckles for certain belts having emergency-locking retractors, convenience hooks for automatic belts, emergency-locking retractors in lap belts, belt retraction and belt comfort devices. The proposed provisions relating to these topics were intended to alleviate some of the most serious problems with current seat belt designs. Most manufacturers agreed that there are problems in these areas, although there was not total agreement on all of the remedies specified in the proposal. After considering the comments, the agency has concluded that improvements in these areas can and should be made. The changes required by this amendment are not burdensome and can be accomplished rapidly. The major objections of the industry to the proposal related primarily to the proposed provisions that are not being included in this amendment (discussed earlier in this notice).

Seat Belt Guides

Seat belt webbing and buckles in motor vehicles often fall or are pushed down behind the seat. Consequently, occupants are discouraged or actually precluded from using the belts. Therefore, the proposal specified that belt webbing at any designated seating position shall pass through flexible stiffeners or other guides in the seat cushion to ensure that the belts are easily accessible to occupants. The provision also specified that belt buckles and latchplates are to remain above the rear cushions at all times, even in folding or tumbling seats, and that all buckles are to be "free-standing" to allow one-hand buckling. These provisions were included in response to a petition for rulemaking submitted some time ago by the Center for Auto Safety.

The American Seat Belt Council supported the proposed requirements for both seat belt guides and "free-standing" buckles. Vehicle manufacturers requested that several changes be made in the specification or that it be deleted altogether. Volkswagen stated that it would be difficult to comply with the requirement for seats that both fold and tumble and for seats designed to convert into beds. The agency believes that suitable designs can be developed to ensure that belts remain above seats that both fold and tumble. Two vehicles were furnished by Volkswagen which showed two different rear seat configurations. The agency determined that belts could be developed for either that would comply with the provision. However, one design configuration would require seat-mounted belts, with a considerable increase in cost for the belts and increased weight for the vehicle. Based on its consideration of available designs and their costs, NHTSA has concluded that the cost of requiring seats that both fold and tumble seats to comply with the requirement may not be justified. Therefore, this type of seat is not subject to this amendment.

Several manufacturers stated that the proposed requirement should not apply to fixed seats since the purpose of the requirement can be accomplished without guides or conduits for fixed seats. The agency disagrees. The problem addressed in this proposed requirement has been most prevalent with fixed seats. Latchplates and buckles that get lost behind fixed seat cushions are more difficult to retrieve than buckles behind movable seats. While it is true that fixed seats can be designed so that there is little clearance between seat backs and seat cushions, buckles and latchplates can still be forced down behind the seat when a person sits on the seat.

The proposal specified that the belt latchplate and buckle must remain in fixed positions in relation to the seat cushion and vehicle interior. Several manufacturers pointed out that the belt hardware could not remain in a "fixed" position with adjustable seats. The agency agrees that this aspect of the provision was inaccurately stated.

The intent of the provision was only to require that the belt hardware pass through guides or conduits to maintain the location of the buckle and latchplate on top of the seat cushion. The provision is modified accordingly in this amendment.

Several manufacturers also objected to the specification for the "freestanding" buckles and "one-hand" buckling on the basis that the criteria is design restrictive and not stated in objective terms. The agency continues to believe that these provisions would increase the convenience of buckling a seat belt. Nevertheless, after considering the comments, the agency has decided that the specification would be difficult to enforce and may be too design restrictive in some instances. Additionally, a majority of vehicle manufacturers have already begun using stiffeners and other devices to make buckling of belts more simple. If this trend continues, a provision regarding this aspect of belt performance will not be necessary. Therefore, the agency is not including a requirement for "freestanding" buckles in the amendment at this time. The agency does urge, however, manufacturers to voluntarily design their belt system so that buckles are "freestanding" or of some other design that facilitates easy buckling by consumers.

Torso Belt Body Contact Pressure (Manual and Automatic Belts)

NHTSA research indicates that occupants are likely to complain about belt pressure if the torso belt net contact force is greater than .7 pound. Therefore, the proposal specified that the torso portion of any belt system shall not create a contact pressure exceeding that of a belt with a total net contact force of .7 pound.

Most manufacturers objected to the belt contact force limitation. Many commenters stated that the agency has not adequately demonstrated that .7 pound of belt webbing force is the optimum upper limit in all seating configurations. In lieu of the proposed limitation, various manufacturers suggested force limitations ranging from 1 pound to 11 pounds. Manufacturers also argued that the .7-pound pressure does not allow for engineering tolerances. Ford stated that its tests using the proposed procedure indicate that test variability amounts to $\pm .3$ pound. Other manufacturers stated that the proposed force level is so low that it would be difficult to also meet the proposed requirement that belts retract completely when unbuckled by the vehicle occupant, i.e., the retractor forces would have to be too low to meet the "self stow" provisions. Chrysler Corporation and General Motors stated that a more precise test procedure for measuring belt contact force is needed. This comment was echoed by several foreign manufacturers.

The agency does not agree with most of these objections. In a detailed study conducted by Man Factors, Inc., webbing retractor forces were varied in an experimental belt system mounted in a production vehicle. A series of male and female test subjects experienced each force level during on-the-road driving tests and reported whether the pressure felt was satisfactory or too great. That study showed that belt pressure greater than 0.7 pound was unacceptable to more than 60 percent of the test subjects. Therefore, manufacturers' comments that belt pressure should be as high as 1 to 11 pounds have little, if any, credence. Regarding other comments, the study that was conducted to determine maximum tolerable belt pressure was not conducted for a myriad of seating configurations since a given belt pressure will likely be either acceptable or unacceptable to an occupant regardless of the seating configuration. In automobiles that presently meet this pressure requirement, retraction has not been found to be a problem. Their belts retract in compliance with the proposed retraction requirements. The agency believes that comments stating that a test procedure should be included in the standard to measure the belt pressure have merit. Therefore, this amendment specifies a .7-pound maximum pressure limitation and includes a procedure for measuring belt pressure.

Latch Plate Accessibility

As noted in the proposal, one of the most inconvenient aspects of using many current seat belt designs is the difficulty that seated occupants have in reaching back to grasp the belt latchplate when the belt is unbuckled and in its retracted position. The greater the difficulty in reaching the latchplate to buckle the belt, the more likely that belt usage will cease or never begin. Poor accessibility of latchplates results from two main factors: Location of the latchplate beyond the convenient reach of some seated vehicle occupants, and inadequate clearance between the seats and side of the vehicle to allow easy grasping of the latchplate.

The proposal specified requirements to define limits on reach distance for latchplates and to prescribe minimum clearances for arm and hand access.

There were several comments from the vehicle manufacturers recommending changes in the proposed specifications. The proposed test procedures for this provision specified that the vehicle seat is to be placed in its forwardmost position when testing for compliance with the reach envelope (the position in which there would presumably be the most problems). Ford Motor Company stated that the requirement should be modified to specify that the seat be located in the mid-track position since a 50th percentile adult would not normally have the seat in the forwardmost position (the proposal specified that a 50th percentile dummy be used to test for compliance with the reach envelope). The NHTSA agrees that some difficulty may be encountered in placing the 50th percentile test dummy in the forwardmost seat adjustment position. If this occurs, there is nothing that would preclude manufacturers from removing the test dummy's legs, since legs are irrelevant to the arm reach envelope. However, the agency believes that the requirement should specify that the seat be in its forwardmost adjustment position since many current latchplates are blocked with the seat in this position although they are not when the seat is in its mid-position. Since a significant number of vehicle occupants will have the seat in the forwardmost position (particularly women), the agency believes that the latchplate should be within easy reach for these occupants or they will be discouraged from wearing the belt system.

One manufacturer stated that it is not clear from the proposal whether the latchplate access specifications would apply to all seats or to just the front outboard seating positions. The requirement applies only to the front outboard seats, and the specification is modified in this amendment to clarify this point. Several commenters stated that the size of the test block used to measure latchplate access should be modified and that the block should be designed to articulate to represent the forearm and wrist of a human being. The agency does not agree with this recommendation. This size of the test block was designed to account for the limitation of the human arm and hand as they would articulate through various openings (in this case, between the seat and vehicle structure). The dimension was based on a detailed study conducted by Man Factors (See DOT-HS-7-01617, December 1978). The agency also believes that the test apparatus would be unnecessarily complicated if specifications were included for articulation. For these reasons, the test block specification and test procedure is unchanged in this notice, except for minor technical changes in the string dimensions and the deletion of one illustration (Figure 3) that was included in the proposal. These minor technical changes are in response to comments and are included for clarification purposes.

Convenience Hooks for Automatic Belts

Some automatic belt designs might include a manual "convenience hook" located, for example, on the dashboard near the A-pillar, which would enable occupants to manually move the belt webbing totally out of the way as they are about to exit the vehicle. These devices would only be permitted as additional equipment since automatic belts must operate automatically, i.e., manual hooks could not be used as the sole means of moving the belt webbing out of the occupant's way. The proposal specified that if manufacturers install such "convenience hooks," the hook must automatically release the belt webbing so that it will deploy around the occupant prior to the vehicle being driven. The proposal specified that the hook would have to automatically release the webbing when

(a) The vehicle ignition switch is moved to the "on" or "start" position.

(b) The vehicle's drive train is engaged.

Manufacturers did not object to the proposed requirements for "convenience hooks," although there were several comments that the provision needs clarification. Jaguar Rover Triumph, Inc. stated that it is not clear from the proposal whether conditions (a) and (b) mentioned in the preceding paragraphs are sequential or alternatives. This notice modifies the language of the requirement to clarify that the "hook" must release the belt webbing when the ignition switch is in the "on" or "start" position *and* the vehicle's drive train is engaged at the same time (i.e., when both condition (a) and (b) exist at the same time). An optional condition "(c)" is added in response to a comment by American Honda Motor Co. to allow vehicles with manual transmissions to have the "hook" release the webbing when the ignition is on *and* the vehicle's parking brake is released at the same time.

Belt Retraction

Many persons find seat belts inconvenient because the belt webbing will not retract completely to its stowed position when the system is unbuckled, so that the webbing is an obstacle when the occupant is trying to exit the vehicle. Therefore, the proposal included a specification to ensure that belts do retract completely and automatically when they are unbuckled. While there were no serious objections to the proposed requirement, several manufacturers requested changes in the test procedures. For example, it was requested that manufacturers be allowed to remove the arms on the test dummy during the compliance test since the belt webbing can get hung-up on the dummy's arms while retracting. The agency believes that this suggestion has merit since a human occupant can move his arm out of the way when a seat belt is retracting and that flexibility cannot be incorporated in the test dummies currently available. Manufacturers also requested that the test be conducted with the vehicle door open, since some systems are designed to automatically retract when the door latch is released (i.e., the retraction force is stronger in this mode). The agency agrees with this suggestion also, and it is incorporated in this notice.

Automatic Locking Retractors

Seat belts incorporating automatic locking retractors (ALR's) in the lap belt portion of the system have been identified as a major item of complaint by vehicle occupants because of the feature's discomfort and inconvenience. Many vehicle occupants report that belts incorporating the ALR's tighten excessively under normal driving conditions, making it necessary to unbuckle and refasten the lap belt to relieve pressure on the pelvis and abdomen. This discomfort causes many persons to stop using their belts.

Belt systems having ALR's have also been found very inconvenient to use, particularly if the ALR is incorporated as part of the latchplate assembly. During the process of putting the belt on, the occupant must extend the belt in a single continuous movement to a length sufficient to allow buckling. Otherwise, the retractor locks before sufficient webbing has been withdrawn to accomplish buckling, and the belt has to be fully retracted before the occupant can repeat the donning process. Many persons have found this characteristic of ALR's extremely irritating and consequently have avoided use of the belt. In addition, ALR's inhibit the driver's normal movement to pay tolls, reach the glove compartment, etc. With emergency locking retractors (ELR's) instead of automatic locking retractors, these problems would be alleviated.

Safety Standard No. 208 currently requires lap belts at outboard seating positions to be equipped with either automatic locking retractors or emergency locking retractors, in order to assure that belts are sufficiently tightened to be effective during a crash. However, this effectiveness feature can be achieved by ELR's without the concomitant discomfort and inconvenience associated with ALR's. Therefore, the proposal sought to eliminate ALR's as an alternative in the standard for front outboard designated seating positions.

The proposal also specified that emergency locking retractors for the lap belt portion of the belt system at the front outboard passenger's position shall be equipped with a manual locking device so that child restraint systems can be properly secured. Since emergency locking retractors allow some movement when the belt is fastened, the agency and some child safety experts were concerned that the child restraint system could slide out of position prior to a crash if the retractor cannot be manually locked.

Few manufacturers objected to the requirement that lap belts at front outboard designated seating positions be equipped with emergency locking retractors. However, nearly all manufacturers objected to the requirement that these emergency locking retractors be equipped with a manual locking device for securing child restraint systems. Ford Motor Company stated that the manual lock requirement is design restrictive and will preclude the installation of continuous loop manual belts and certain three-point automatic belts. Also, Ford stated that the proposed requirement is inconsistent with another proposal precluding any device that allows the introduction of slack in a belt system (e.g., comfort devices). Ford argued that the manual lock could be used to introduce excessive slack in the belt when worn by an adult. Toyota Motor Company stated that an emergency locking retractor is definitely superior to an automatic locking retractor from the standpoint of comfort and convenience. Toyota argued, however, that its tests with the GM child seat (braking, fast cornering, driving on rough roads) have demonstrated that the performance of emergency locking retractors in restraining this child seat is satisfactory without a manual locking device.

The Motor Vehicle Manufacturers Association pointed out that the Economic Commission of Europe (which sets international motor vehicle safety standards) does not even permit manual locking devices on emergency locking retractors. Volkswagen of America stated that the proposed requirement would impair the operation of these belts by allowing too much slack in the system, and argued that parents should be encouraged to place their child restraints in rear seating positions that have automatic locking retractors. General Motors argued that the agency's data is totally inconclusive in demonstrating that emergency locking retractors without locking devices cannot adequately secure child restraint systems. General Motors cited its own tests which it states demonstrated child restraints are adequately secured with emergency locking retractors. Finally, several manufacturers stated that the manual locking devices could pose a hazard in emergency situations if the emergency locking retractor is located on the vehicle door. These commenters pointed out that the vehicle door would be impossible to open from the outside if the retractor is locked.

After considering these comments, the agency has decided that while emergency locking retractors should be required for lap belts at front outboard designated seating positions, these retractors should not be required to have manual locking devices. The agency believes that the points raised in the comments represent legitimate concerns. Further, agency tests conducted after the issuance of the proposal indicate that there may not be a substantial problem with Type 2 belts incorporating emergency locking retractors restraining child seats. However, the agency is planning to conduct further research regarding the use of Type 1 belts with ELR's to secure child restraints. Additionally, the agency recently issued a proposal to amend Safety Standard No. 210, *Seat Belt Anchorages,* to require that lap belt anchorages be present at front outboard seating passenger positions that are not equipped with lap belts (e.g., vehicles equipped with a two-point, single diagonal automatic belt). Therefore, if that proposal is adopted, parents wishing to place child seats in front seating positions in the affected vehicles can purchase a lap belt having an automatic locking retractor or a manual webbing adjusting device. In light of these considerations, and the cost of installing manual locking devices on emergency locking retractors, the manual locking device of the proposal is not adopted.

The proposal also included a provision to allow manual adjustment devices on seat belt assemblies in rear seating positions that have emergency locking retractors. Although automatic locking retractors are allowed in rear seating positions, some manufacturers are currently installing emergency locking retractors. These manufacturers have requested that manual webbing adjustment devices be allowed on these belt systems, specifically for facilitating the securement of child restraint systems. Nearly all commenters agreed with this provision and it is included in this amendment.

In summary, although manual locking devices are not being required on emergency locking retractors in front seating positions, these devices or manual webbing adjustment devices are being allowed in rear seating positions. The manual webbing adjustment device would not be permitted in front seating positions, but manufacturers would be permitted to voluntarily install manual locking devices on belts in front seating positions.

Devices That Introduce Slack in Belt Webbing

Some current seat belt designs include devices that are intended to relieve shoulder belt pressure. These "comfort clips," "window-shade" devices, or other tension-relieving devices can reduce the effectiveness of belts in crash situations if the occupant uses the device to put excessive slack in the belt webbing, i.e., so that the belt is not snugly against the occupant. Therefore, the proposal included a provision to prohibit any device, either manual or automatic, that would permit the introduction of slack in the upper torso restraint. The proposal stated that such devices would not be necessary to relieve the discomfort caused by excessive belt pressure since the proposal also included a limitation on belt pressure.

Several manufacturers objected to an outright ban on tension-relieving devices. The American Seat Belt Council stated that an appropriate performance requirement should be developed that will allow a small, controlled amount of slack in belt systems. General Motors stated that its tension-relieving devices allow some slack but that this slack could not be introduced inadvertently. General Motors argued that such devices should be allowed provided the slack is cancelled when the vehicle door is opened, i.e., so that there is no slack at all when an occupant uses the belt on a subsequent occasion. The commenters argued that some persons do not like any belt pressure at all, not even the .7 pounds that would be the maximum allowed under the proposed belt pressure provisions.

The agency believes there is some merit to these arguments particularly in regard to automatic belt systems that are required to comply with the injury criteria of Safety Standard No. 208. Therefore, tension-relieving devices are not prohibited in this amendment in automatic belt systems provided the belt system can comply with the injury criteria of the standard with the belt placed in any position to which it can be adjusted. This means that if six inches of slack can be introduced in the automatic belt system by means of the tension-relieving device, the belt must be able to comply with the injury criteria with the belt webbing in that position. Since manual seat belt systems are not required to comply with the injury criteria of the standard generally, they would also not be required to comply just because they include tension-relieving devices. The agency does urge manufacturers to voluntarily limit the amount of slack that can be introduced in their manual belt systems, however.

Seat Belt Warning System

The proposal included a provision for a new sequential seat belt warning system in all motor vehicles which are not passenger cars and which have a gross vehicle weight rating of 10,000 pounds or less.

Safety Standard No. 208 currently requires a visual and audible warning system to remind vehicle occupants to fasten their manual safety belts. The present standard requires a warning system which activates, for a period of 4 to 8 seconds, a reminder light each time the vehicle ignition is operated, and an audible warning if the driver's lap belt is not in use. Studies of manual seat belt usage in passenger vehicles have shown that a sequential logic system which incorporates a visible reminder light of continuous duration and a 4- to 8-second audible warning could produce usage rates significantly greater than those obtained with the warning systems currently required. The sequential logic warning system activates unless buckling of a person's belt occurred after the person sat down in his seat. Under the current 208 requirement, the warning system can be permanently defeated if the belt is buckled and pushed behind the seat cushion and left there during subsequent occasions on which the vehicle is used.

Only the American Seat Belt Council supported the requirement for a sequential warning system. The vehicle manufacturers uniformly objected to the requirement, stating that such a system would cost $25 to $35 per vehicle (this is much higher than the agency's estimated cost figure). Also, manufacturers disputed the agency's data and argued that there is no documentation demonstrating that a sequential warning system will substantially increase belt use in vehicles other than passenger cars.

The agency agrees that the data relied upon in the proposal dealt primarily with sequential warning systems in passenger cars (The Phoenix Study, DOT-HS-801-953). There is no conclusive evidence that such a system would also improve seat belt use in light trucks and vans to a comparable degree. Although the agency is convinced that an effective warning system similar to or like that proposed would result in some increased seat belt use in these other vehicles, the agency has concluded that manufacturers should be allowed to voluntarily install such systems under an implementation schedule suited to particular vehicle models in order to minimize costs. Therefore, the proposed requirement is not included in this amendment. Specifications for a sequential warning system will, however, be included in the voluntary performance guidelines that will be issued in the near future, however, for the benefit of manufacturers that are interested in such a system.

The proposal also included a specification for warning systems for automatic seat belts, to ensure that motorized systems are locked into place before the vehicle begins moving. If for some reason the motorized belt has not returned and locked into its protective mode, the occupant would be alerted by the continuous light and by a 4-to 8-second audible warning. Although several manufacturers objected to this requirement, again primarily because of cost, the agency believes such a requirement is essential for motorized automatic belt systems. It is therefore included in this amendment.

The proposal also included an illustration chart specifying the weights and dimensions of various human body sizes (e.g., 5th percentile female). The comments to the proposal indicated that some persons were confused about inclusion of the chart. Some commenters interpreted the figures in the chart to represent a change in the Part 572 dummy dimension. The chart was included in the proposal to be republished in the standard since it had been inadvertently deleted by the *Code of Federal Regulations* some time ago. The chart, however, was not intended to make any changes in the Part 572 test dummy.

In order to give manufacturers sufficient lead time to implement the changes required by this notice, and to minimize the cost of such changes, the effective date of this amendment is September 1, 1982.

Note—The agency has determined that this amendment does not qualify as a significant regulation under Executive Order 12221, "Improving Government Regulations," and the Departmental guidelines implementing that order. Therefore, a regulatory analysis is not required. A regulatory evaluation concerning the amendment has been prepared and placed in the public docket under the docket number and notice number of this *Federal Register* notice.

Issued on December 31, 1980.

Joan Claybrook,
Administrator.

46 F.R. 2064
January 8, 1981

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection (Docket No. 208; Notice 21)

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 208, Occupant Crash Protection, to delay for one year the effective date of the first phase of the automatic restraint requirements of the standard. Prior to this notice, the automatic restraint requirements were scheduled to become effective for large cars on September 1, 1981 (model year 1982), for mid-size cars on September 1, 1982 (model year 1983), and for small cars on September 1, 1983 (model year 1984). As amended by this notice, the requirement for equipping large cars with automatic restraints will not take effect until September 1, 1982, or model year 1983.

This one-year delay in the automatic restraint requirements is being specified in light of dramatic changes in production plans for the model-year 1982 fleet (fewer large cars and more small cars) and because the economic and other justifications for the existing phase-in schedule have changed drastically since the standard was adopted in 1977.

The one-year delay will also allow the Department sufficient time to re-evaluate the entire automatic restraint standard as required by the Presidential Executive Order 12291 (February 17, 1981). The Department is simultaneously issuing a notice of proposed rulemaking in today's issue of the *Federal Register* discussing further possible changes in the automatic restraint standard.

DATES: The new effective date of the automatic restraint requirements for large cars is September 1, 1982.

ADDRESSES: Any petitions for reconsideration should refer to the docket number and notice number of this notice and be submitted to: Docket Section, Room 5109, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. Michael Finkelstein, Office of Rulemaking, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-1810)

SUPPLEMENTARY INFORMATION: On February 12, 1981, the Department of Transportation issued a notice of proposed rulemaking to delay for one year the first phase of the automatic restraint requirements of Safety Standard No. 208, Occupant Crash Protection, (46 FR 12033). Automatic restraints are systems that require no action by vehicle occupants, such as buckling a seat belt, to be effective. Two existing systems that qualify as automatic restraints are air cushion restraints (air bags) and automatic seat belts (belts which automatically envelop an occupant when entering the vehicle and closing the door).

The automatic restraint requirements were added to Standard No. 208 on July 5, 1977 (42 FR 34289), and require installation in accordance with the following schedule:

- For full-size cars (wheelbase greater than 114 inches) beginning September 1, 1981 (1982 model year);
- For mid-size cars (wheelbase not more than 114 inches but greater than 100 inches) beginning September 1, 1982 (1983 model year);
- For small cars (wheelbase less than 100 inches) beginning September 1, 1983 (1984 model year).

The February notice issued by the Department proposed to alter this phase-in schedule by deferring the first phase (large cars) for one year, from model 1982 to model year 1983. The proposal noted that such a change may be appropriate because of the effects of implementation in model year 1982 on large car manufacturers, because of the added significance which those effects assume due to the change in economic circumstances since the schedule was adopted in 1977, and because of the undermining by subsequent events of the rationale underlying the original phase-in schedule. (See the notice of proposed rulemaking for a full discussion of the facts which led to the proposed alteration of the phase-in schedule.)

Comments Upon Proposal

The responses to the proposal were equally divided between those commenters adamantly opposed to any delay in the automatic restraint requirement and those commenters in favor of both the delay and a total revocation of the requirements. The comments and data supporting these factions were as diametrically opposed as the competing economic interests involved, in this instance the automobile and the insurance industries. Following is a summary of the major comments submitted in response to the proposal. A more detailed summary of representative comments is included as an appendix at the end of this notice.

The automobile insurance industry was unanimously against the proposed delay in the first phase of the automatic restraint requirements, unless the standard is also amended to require an earlier implementation of automatic restraints for small cars (i.e., a delay and reversal of the current schedule). The commenting insurance companies stated that the automatic restraint requirements will save thousands of lives and prevent hundreds of thousands of serious injuries. They argued that the proposed delay of the 1982 requirements would, therefore, result in a significant number of fatalities and injuries that would not otherwise occur. These companies also argued that the monetary savings that would result from the proposed delay are so small that they would not significantly help the ailing automobile industry. The commenters pointed specifically to the fact that most of the capital expenditures have already been made for installing automatic restraints on 1982-model large cars.

In urging a reversal of the implementation schedule, the insurance companies noted the dramatically increasing number of small cars, and pointed to insurance research which shows small cars are inherently more dangerous for occupants than large cars. (NHTSA statistics show that a person is eight times more likely to be killed in a small car than in a full-size car in a crash between the two.) Since small cars will represent a majority of the 1983-model passenger car fleet, the companies argued that more lives could ultimately be saved if automatic restraints are required on small cars in that model year, than under the existing implementation schedule.

Many of these same sentiments were also voiced by consumer groups and health organizations, the majority of which were also opposed to the proposed delay of the MY 1982 requirements. Like the insurance companies, most of these groups asserted that usage rates for automatic belts will be relatively high and that the automatic restraint standard as a whole will save thousands of lives.

Several consumer groups and air bag component suppliers stated that they could support the proposed delay provided there is also a requirement that vehicle manufacturers at least offer air bags as options on some of their model lines. These groups are concerned that further delay of the automatic restraint standard will drive the remaining air bag component suppliers out of the market and that, as a result, the life-saving potential of air bags will be lost.

The insurance industry and a majority of the consumer groups argued that the benefits of the 1982-model year requirements outweigh the costs. A detailed analysis by Professor William Nordhaus of Yale University was submitted on behalf of several insurance companies. This analysis concludes that the economic costs of the proposed delay would be approximately five times greater than the benefits, for a net cost of $200 million. These figures are based on computations regarding the societal costs of deaths and injuries that would result without the MY 1982 automatic restraint requirement.

Several of the commenting insurance companies and consumer groups also argued that as a matter of law and statutory authority the Department cannot rely on the general economic health of the automobile industry to justify a delay in the automatic restraint standard. The National Traffic and Motor Vehicle Safety Act (the Vehicle Safety Act) (15 U.S.C §1381, *et seq.*) provides that motor vehicle safety standards shall be "reasonable" and "practicable." These commenters noted that the legislative history of the Vehicle Safety Act indicates that in promulgating standards, safety shall be the overriding consideration. The commenters contend that the current poor economic condition of the automobile industry does not make the 1982 model-year requirements impracticable.

In addition to comments from the above groups and organizations, the Department also received comments from numerous private citizens, who were equally divided in their support or opposition to the proposed delay.

The proposed delay in the 1982 model-year requirements was unanimously supported by the automobile industry, both foreign and domestic. In addition, most manufacturers urged the Department to reconsider the entire standard, to provide additional leadtime for all phases of the implementation schedule, or to revoke the automatic restraint requirements altogether. Regarding a possible reversal of the current implementation schedule, nearly all of the foreign automobile manufacturers joined Chrysler Corporation and American Motors in stating that it would be impossible to install automatic restraints on 1983-model small passenger cars because of insufficient leadtime.

In support of a complete rescission of the automatic restraint requirements, the vehicle manufacturers made several arguments. The manufacturers believe that automatic seat belts will be so unacceptable to the public that they will create a consumer "backlash" greater than that caused by ignition interlock devices required by NHTSA to be installed on 1974-75 models. These devices made it impossible to start the vehicle unless front seat belts were fastened, and were specifically precluded by the Congress by amendment to the Vehicle Safety Act in 1974.

The manufacturers contend that automatic seat belts will produce such a reaction because of their coercive nature and obtrusiveness. They also contend that automatic belts must be designed so that they are easily detachable (and presumably thereby more acceptable to the public). In such case, they argue that the usage rate for automatic belts would be no greater than for current manual belts, and that the increased cost of automatic belts would not be justified.

Auto manufacturers also argued that the extremely high price of air bags makes them impractical, and allege that few will be installed on future passenger cars. Consequently, they contend, the only benefits attributable to the automatic restraint standard will be those derived from automatic belts, which for the above reasons will not be effective.

Only two vehicle manufacturers, Ford Motor Company and General Motors, produce any significant number of large cars. Therefore, the existing automatic restraint requirements for 1982 models would only directly affect these two companies.

Ford Motor Company supported the proposed delay and stated that it considers its original 1982-model, three-point automatic belt designs to be "out of date" because of their release concepts (i.e., they include a feature to frustrate release and thus defeat of the system). Ford believes this could lead to significant public dissatisfaction with MY 1982 automatic belts. In response to this concern, Ford had decided to add a conventional release buckle to this three-point belt, so that it can be detached by those motorists who refuse to wear a belt. Ford's submission stated that the company projects that as many as 100,000 purchasers would switch to mid-size cars in the 1982 model year rather than buying large cars with an automatic belt. Ford plans to redesign its automatic belts, but states that such a program has major leadtime implications which would make it impractical to install improved automatic belts in small cars before September 1, 1983.

General Motors Corporation stated that its planned 1982-model automatic belt designs are easily detachable (i.e., there will be a buckle release mechanism without an interlock or other mechanism to discourage defeat of the system). With this type belt, according to GM, the impact on safety will depend upon voluntary use of the automatic belt, so use would not likely be any greater than with current manual belt systems. Therefore, General Motors argues that the proposed delay should have only a minimal adverse safety impact.

General Motors stated that the proposed delay would result in a net increased sales revenue to the company of $760 million, and that the company could realize a savings of approximately $13 million in capital investment for the 1982 model-year program. General Motors explained the $760 million figure with the following rationale:

> Automatic belts will be regarded by many as an unnecessary inconvenience, and they will deprive purchasers of six passenger seating capacity. Thus, 1982 full-size cars equipped with such a restraint will be at a competitive disadvantage in that consumers can avoid the penalties of increased cost and reduced accommodation either by purchasing vehicles not subject to passive restraint requirements in that year, or by deferring their purchases. The proposed delay will allow the consumer to purchase a full size car in 1982, without a cost penalty, which fully meets his needs and expectations.

General Motors' concern in this regard derives from the fact that large cars with automatic seat belts will be able to have only two front seating positions, since no company has developed an automatic belt system for the center seat position. With the automatic restraint requirements delayed, General Motors would be able to install bench front seats with three seating positions in its large cars. General Motors estimates that the reduced seating capacity thus caused by automatic belts will result in 120,000 fewer large car sales: 50,000 purchasers will shift from large cars to GM mid-size cars, and 70,000 potential purchasers will defer buying a new large car in the 1982 model year if they cannot obtain a six-passenger large car. General Motors contends that these factors will result in a revenue loss to the company of $760 million if the automatic restraint requirements are not delayed.

Rationale For Agency Decision

The agency has given thorough consideration to all comments submitted in response to the proposed delay of the first phase of the automatic restraint requirements, and carefully analyzed all such information and data in the Record of this proceeding. The wide diversity among factual, analytical and policy-related positions urged by those supporting and those opposing the proposed delay illustrates the degree to which this proceeding involves questions for which there are currently no concrete answers.

For example, the usage rate of automatic belts will be extremely dependent on the exact design of a particular belt system. Consumer expectations (for example, that six-seat cars will be available), consumer acceptance (for example, the purchase of cars with automatic belt systems which cost more than current belt systems) and actual rates of usage are values crucial to the Department's decision-making process. These factors, which are dependent on the desires and reaction of the American public, cannot be quantified or predicted with certainty.

On the basis of the record herein, the Department has concluded that the applicability of FMVSS 208 in MY 1982 to large cars would be impracticable and unreasonable. Requiring such compliance would reduce sales and profits, and increase unemployment, for the manufacturers of such vehicles. The Department believes that it is in the public interest to avoid these unnecessary costs and impacts by providing an additional year of leadtime.

The February 12, 1981 notice detailed many of the specific reasons which led to the proposed delay. As specified in that notice, many of the factual assumptions and premises which led to adoption of the phase-in schedule have been proven wrong by subsequent events. The economic situation of the industry and of consumers and the economy as a whole have drastically changed since the standard was adopted in 1977.

The current phase-in schedule for automatic restraints was intended to permit manufacturers to introduce automatic restraints without undue technological or economic risk. Such risks would otherwise have had to have been assumed contemporaneously with the risks involved in having to meet the requirements imposed by emission and fuel economy standards applicable to automobiles in the early 1980's.

Large cars were chosen for the first phase of the schedule because at that time there was more experience with air bags in such full-size cars. A phased schedule to cover progressively smaller cars, in stages, was adopted to provide manufacturers with a chance to gain similar levels of experience in smaller cars. To ensure that manufacturers would in fact have the maximum flexibility to choose between equipping smaller cars with air bags or automatic belts, those cars were to be phased in last. This justification for a phased implementation schedule is no longer valid. Gasoline shortages, price increases (especially those occurring since the Iranian oil cut-off in 1979), and continuing uncertainty about levels of future petroleum supplies have led to dramatic increases in production plans for small cars. The small car share of new production is growing at a much faster pace than was anticipated by the Department when the automatic restraint requirements were issued.

In 1977, the Department projected that new car production in the model year 1982-1985 period would be approximately 24 percent large cars, 53 percent mid-size cars, and 23 percent small cars. However, NHTSA now estimates that actual production of large cars will be about 11 percent in model year 1982 while mid-size and small cars are expected to increase commensurately in that model year.

Thus, under the state of facts now facing the Department, about 11 percent of the 1982 model-year cars would be required to have automatic restraints under the 208 standard.

This major shift in the absolute and relative numbers of cars which would be subject to the first year of the standard will have important adverse impacts upon the benefits to be achieved by the first year of application of the standard. Consumer acceptance of the automatic restraints now anticipated to be used in the 1982 model-year cars is likely to be substantially less than was assumed in 1977. There will be more than a million fewer vehicles with automatic restraints than was previously expected. With fewer cars equipped with automatic restraints, the vehicles which are so equipped will be far more vulnerable to negative consumer reaction.

The Department has long recognized that any costly, arguably coercive restraint system will cause a certain percentage of the population to react negatively. The factors leading to such negative reaction will be magnified as the percentage of new 1982-model cars equipped with automatic restraints decreases. Adverse consumer preferences leading to deferral of the purchase of large cars, or to shifts to the purchase of mid-size cars, will predictably occur.

Concern about providing additional leadtime to adapt air bags to small cars is also less important now as a result of changes in facts occurring since 1977. When the standard was issued, the Department assumed that manufacturers would equip a great majority of their vehicles (75%) with air bags in preference to belt systems. However, most manufacturers now indicate that they intend to offer air bags on very few of their large cars, and on almost none of their smaller cars. Almost all 1982 model-year cars are planned to use automatic belts.

The absence of any opportunity to select between automatic restraint systems will materially affect public acceptance of the automatic restraint standard. General Motors has pointed out that two automatic belt designs recently offered as options on its Chevette line produced very low purchaser interest, even though the cost was minimal and the car line was in high demand. GM states that fewer than 13,000 of 415,000 1980-model Chevettes sold were equipped with the automatic belt option, despite the fact that the option was offered at no cost to most purchasers, GM salesmen were to be given an additional commission of $25 for each sale, and over $1 million was spent on advertising and marketing.

Similar low interest has been shown in an automatic belt system offered as an option on General Motor's 1981 Cadillac.

The poor consumer acceptance of these automatic belt options substantiates the Department's assumption that automatic belts installed on only a limited percentage of a particular model-year fleet will have difficult public acceptance problems.

The public acceptance of 1982-model automatic restraints is a valid concern of the Department and is of primary importance in determining the reasonableness and practicability of the standard, and whether there is good cause for the delay. As stated by the Court of Appeals in *Pacific Legal Foundation* v. *Department of Transportation*, 593 F.2d 1338 (D.C. Cir.), *cert. denied*, 444 U.S. 830 (1979):

> We believe that the agency cannot fulfill its statutory responsibility unless it considers popular reaction. Without public cooperation there can be no assurance that a safety system can "meet the need for motor vehicle safety." And it would be difficult to term 'practicable' a system, like the ignition interlock, that so annoyed motorists that they deactivate it.

The Department is unable to conclude from its current data, taking into account the large number of private citizens who took the time and effort to file comments reflecting their opposition to automatic restraints, that the 1982 automatic belt designs planned by the manufacturers will receive "public cooperation."

The proposal stated that the changed economic circumstances may make the current implementation schedule for automatic restraints impracticable. Several commenters argued that the general economic situation of the automobile industry is not a legitimate criterion for determining whether a safety standard is practicable under the National Traffic and Motor Vehicle Safety Act. The legislative history of the Vehicle Safety Act clarifies that economic considerations may be considered in determining the "practicability" of a particular safety standard:

> This would require consideration of all relevant factors, including technological ability to achieve the goal of a particular standard as well as consideration of economic factors. (H.R. Rep. No. 776, 89th Cong., 2d Sess. (1966) at 16.)

One commenter stated that the term "practicable" must be viewed as relating solely to the economic and technological capability of the industry to meet the timetables established by the particular safety standard in question, and not to the general economic health of the industry. The Department disagrees with this reading of the Vehicle Safety Act and its legislative history.

The reasonableness and practicability of the current phase-in schedule cannot be determined in a vacuum. What is reasonable and practicable for a healthy firm or industry may not be for an ailing one. The proposal noted the current financial difficulties of the automobile industry. Vehicle sales remain at depressed levels and unemployment in the domestic industry is extremely high. Approximately 200,000 workers have been indefinitely laid off, and more have been temporarily laid off. These losses come at a time when the domestic manufacturers are spending unprecedented sums to meet the continuing demand for more fuel efficient cars.

The Department concludes further that economic hardship to the affected industry and individual companies must be balanced with all other considerations in determining the "reasonableness" and "practicability" of a particular safety standard. None of the individual factors involved in the deliberations may properly be applied without regard to the other factors. This proposition holds both in promulgating a standard and in retaining a standard when relevant factors have materially changed since the standard was first adopted.

The same commenter also argued that the Department had not shown "good cause" for proposing to delay the effective date of the automatic restraint requirements, in light of the requirements of the Motor Vehicle Safety Act that the leadtime for the effective date of safety standards shall be no longer than one year, unless the Secretary finds, for good cause shown, that an earlier or later effective date is in the public interest (15 U.S.C. 1392).

The leadtimes associated with the existing implementation schedule were much longer than one year. These were upheld by the Court in the Pacific Legal Foundation case, *supra*. In that case, the court relied heavily on the inability of the manufacturers to comply with the requirement in one year's time, and on the need for considering the likelihood that the public will accept the change:

> When dealing with a "technology-forcing" rule like Standard 208, the agency must consider the abilities of producers to comply with the new requirement and of the public to grasp the need for the change.

As was stated earlier, the Department is now concerned that 1982-model large cars might be seriously unacceptable to a large portion of the public.

The Department concludes that "good cause" exists for the proposed delay. The public interest in the economic viability of the industry and, with respect to the proposed delay, the particular circumstances of the manufacturers of the vehicles involved, requires that inequitable burdens and unnecessary costs be avoided where possible in implementing FMVSS 208. Large cars are not expected to be produced beyond MY 1985. Application of the standard to large cars in advance of smaller cars would thus involve such burdens and could involve such costs.

In addition to these considerations, the Department believes that the proposed delay must be viewed as a separate regulatory action insofar as leadtime is concerned. The leadtime specifications for the existing implementation schedule were upheld by the court in *Pacific Legal Foundation*. The proposed delay represents a new consideration of the factors which will determine whether automatic restraints are reasonable and practicable for large cars in the 1982 model year, with primary attention being given to acceptability of these systems by the public.

Opponents of the proposed delay have pointed to the adverse safety impacts that might result, stating specifically that the safety benefits of the 1982 model-year requirements outweigh the costs. The Department's proposal stated that a delay of the first phase requirement could over the ten-year life of the vehicles involved result in a loss of 600 lives, and the accrual of 4,300 more injuries than would have occurred without the delay. After reviewing the information submitted in response to the proposal and analyzing more current data, however, the Department now concludes that its earlier estimate of adverse effects is invalid.

First, the assertion that 600 lives would be lost was based upon earlier estimates of benefits that would arise from 100 percent usage of automatic restraint systems. This calculation in turn had been based primarily on 1977 assumptions that air bags would be the technology of choice. As stated earlier, however, the Department now knows that very few air bags are planned for the 1982 model-year.

Unlike air bags, estimates of benefits arising from compliance with the automatic restraint standard by means of automatic belts must be based upon projected usage rates. The most optimistic expectations of automatic belt use for the 1982 model-year now appear to be a usage rate of 60 percent. Moreover, given the planned design of the 1982-model automatic belts, NHTSA now believes that a much lower usage rate will in fact occur. Both General Motors and Ford plan automatic belt designs which have a release buckle identical to the buckle on current manual belt systems. Motorists would therefore be able to disconnect the proposed belts with the same ease with which current active belt systems can be released. NHTSA believes it is likely that a large percentage of motorists would adopt this usage pattern, and detach the automatic belts. Usage could thus in fact turn out to be low, and approach levels similar to that of current manual belt systems (7%).

The final regulatory analysis thus now includes a range of possible usage rates for 1982-model automatic belts, in analyzing possible benefits to be foregone by deferring the MY 82 standard for one year. If usage rates for the automatic belts otherwise required for that model-year were to be 15 percent, more than double the rate of use of current manual belts, retention of the 1982 requirements might save a total of 75 lives over the projected ten-year life of the large cars involved. If usage rates were to occur at the level of 60 percent, this number could possibly increase to as many as 490 lives over the same ten-year period.

NHTSA now believes that the potential usage of 1982-model automatic belt designs would more likely be near the bottom end of this scale. NHTSA data on observed usage rates for the belt systems employed in some models of the Volkswagen Rabbit, for example, are relevant. All such belts are optional, and were chosen by the purchaser either as a separate option or as a part of the "Deluxe" package. Moreover, the VW system employs an interlock mechanism, so that the engine may not be started if the system is not in place. Despite these factors, usage rates have been observed to be only 81%. That is, of the purchasers who specifically selected this optional system, nearly 20% thereafter in practice enter their vehicles, start their engines, and then deliberately disconnect the belt system when driving.

Moreover, actual accident data relating to such vehicles show even lower usage rates, of 55-57%. (See Regulatory Analysis, at V-11, 13 for discussion.)

After analyzing the data submitted in response to the proposal, the Department has determined that the one-year delay will result in a cost savings to consumers of approximately $105 million. Capital investment savings for the industry will be about $30 million. Net income available for reinvestment would be increased to $292 million by the delay. Over 13,000 jobs will be saved in the automobile manufacturer and supplier industry, a savings of $159 million. The basis for these figures is explained in detail in the final regulatory analysis. Given the current economic situation of the American public and the domestic automobile industry, these savings are significant, particularly when viewed in conjunction with the Department's belief that the safety impact of the delay can be minimized.

While some measure of safety benefits will be foregone by this delay, the Department has concluded that such benefits are relatively minor. Moreover, the Department believes that any such loss of safety benefits can be offset with a coordinated effort by all parties involved. The Department believes that an intense seat belt use education campaign, joined by the Department, industry and consumer groups and targeted directly at the 1982 model-year cars, has the potential of affording even greater safety benefits than would otherwise accrue.

Finally, such a targeted campaign to increase the use of existing manual seat belts will provide further data on the viability of such strategies in increasing active seat belt use. Such information would be especially valuable for future rulemaking purposes, since it would in any event be at least ten years before all cars in the passenger fleet would be expected to be equipped with new safety equipment. Such information would enable the Department, State and local governments, and other interested parties to determine how to make the best use of their scarce resources to increase actual usage of the millions of manual seat belts that will remain on the nation's highways for years to come.

Summary of Agency Conclusion

The Department has determined that the existing schedule for the first year of implementation of FMVSS 208 is no longer reasonable or practicable. The assumptions leading to the 1977 rule are no longer valid. There will be few, if any, air bags installed in passenger cars because manufacturers have chosen automatic belts as the preferred means of compliance with the standard. The number of small cars on the road is increasing drastically and these cars are more unsafe than large cars. Yet, under the current implementation schedule, small cars are to be equipped with automatic restraints last.

The delay of the first phase of the automatic restraint requirements will enable the Department to adequately reassess the most viable alternatives for the occupant crash protection standard. The Department is publishing simultaneously with this final rule a Notice of Proposed Rulemaking addressing alternatives to this standard, and attention is specifically directed to that proposal.

The Department is taking these actions because courts have found that the Department has a statutory responsibility to reexamine its safety standards in light of changing circumstances and new data. In those circumstances, the Department is required to make necessary revisions and schedule changes to ensure that the standards are practicable, reasonable and appropriate. As noted above, key assumptions underlying the issuance of the automatic restraint requirements in 1977 have been substantially undermined by subsequent events.

The delay and reevaluation of FMVSS 208 is also consistent with Executive Order 12291, which directs all executive branch agencies to delay final rules to the extent necessary to reevaluate those rules under criteria specified in the Order.

This amendment has been evaluated as a major rule under the guidelines of new Executive Order 12291 and a final regulatory analysis is being placed in the public docket simultaneously with the publication of this notice. The major findings of that analysis have been discussed in the body of this notice.

The effect of the one-year delay has been evaluated in accordance with the National Environmental Policy Act of 1969. It has been determined that this action is not a major Federal action significantly affecting the quality of the human environment. An evaluation of the environmental consequences of the amendment is included in the regulatory analysis. Further information regarding environmental issues concerning automatic restraints, especially air bags, can be found in the environmental impact statements published in conjunction with the 1977 automatic restraint standard.

The regulatory analysis also includes a discussion of the Department's consideration of the possible impact of this amendment on small entities. The analysis shows that the one-year delay will have a minimal effect on the automatic seat belt-related firms, since it is likely that most of the 1982-model large cars will continue to be equipped with conventional manual type seat belts. Generally, however, the same firms produce both automatic and manual belts, and none of these direct suppliers qualify as "small businesses" under the Regulatory Flexibility Act.

The effect of the delay on air bag suppliers is less certain. Neither Ford or General Motors would have installed air bags in 1982 vehicles regardless of the delay. The analysis determined that some suppliers of the air bag components will be adversely affected by the delay to some extent and that a few of these qualify as small businesses. However, it is doubtful that a substantial number of small businesses will be adversely affected by the delay to a significant degree.

The analysis also considered the effect of the delay on the small governmental units and other small fleet purchasers of cars. Since large cars are not generally sought for fleet purposes, the amendment is likely to have only a minimal effect on all types of small fleet purchasers.

In consideration of the foregoing, Safety Standard No. 208, Occupant Crash Protection (49 CFR 571.208) is amended as follows:

Section S4.1.2 is amended to read:

"S4.1.2 *Passenger cars manufactured from September 1, 1973, to August 31, 1983.* Each passenger car manufactured from September 1, 1973, to August 31, 1982, inclusive, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3. Each passenger car manufactured from September 1, 1982, to August 31, 1983, inclusive, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3, except that a passenger car with a wheelbase of more than 100 inches shall meet the requirements specified in S4.1.3. A protection system that meets requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3."

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407).)

Issued on April 6, 1981.

Andrew L. Lewis, Jr.
Secretary of Transportation

46 FR 21172
April 9, 1981

APPENDIX

DETAILED DISCUSSION OF COMMENTS

A. Comments Opposing the Delay

The insurance industry argued that the automatic restraint requirements will save thousands of lives and prevent hundreds of thousands of serious injuries. The League Insurance Companies stated that the proposed one-year delay would be "tragic and costly," adding that "there is a legitimate place for regulation when the need is great, the cost-benefit is demonstrably high, and the structure of the market place requires uniformity to be imposed on all manufacturers."

Allstate Insurance Companies argued that the growing proportion of small cars will increase deaths and injuries by 35 percent during the next four years, and that the only way to reverse this trend is by implementation of the automatic restraint standard. Allstate also argued that the proposal's analysis of the economic consequences of the scheduled implementation is based only on conjecture. The company stated that there is no substantial evidence of record that the proposed delay would provide any significant financial assistance to car makers. According to Allstate, however, the proposed delay would result in needless deaths and injuries at huge costs to society at large and to insurances-buying customers. Allstate concluded that it could only support a one-year delay in the automatic restraint requirements if the delay is coupled with a requirement that small cars comply with the standard in model year 1983 (i.e., one year earlier than the existing schedule). This sentiment was also expressed by the Alliance of American Insurers and the League Insurance Companies. Alliance stated that a move to install automatic restraints on small cars first is consistent with insurance research which shows small cars to be inherently more dangerous to occupants than large cars, and that such a change could also afford domestic manufacturers some economic relief.

State Farm Mutual Automobile Insurance Company attacked the proposed delay of the automatic restraint requirements on several grounds. First, State Farm argued that the record in this rulemaking proceeding demonstrates that full implementation of the automatic restraint standard will save thousands of lives and avoid tens of thousands of crippling and maiming injuries. The company pointed to the Department's analysis which found that the proposed delay would cost the nation 600 deaths and approximately 4,300 injuries over the lifetime of the 1982-model large cars, and stated that a delay is not justified under any cost/benefit calculations. State Farm also argued that the proposed delay is inconsistent with the overriding mandate of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1381, *et seq.*) and that "the controlling statutes do not permit the Secretary to defer otherwise supportable life-saving regulations solely on the basis of current economic conditions in the auto industry."

State Farm concludes that the current economic situation of the auto industry does not make the implementation of the current automatic restraint schedule impractical. First, nearly all of the necessary capital commitments for automatic restraint implementation for large cars have already been made. Second, the variable costs associated with installing automatic restraints on 1982-model large cars are insignificant to the industry. State Farm also argued that the balance of costs against benefits does not support the proposed delay; rather, it supports an acceleration of the existing schedule if anything. The company cited a recent study by Professor William Nordhaus (discussed below) which contends that the annual economic costs of the proposed deferral of the model year 1982 requirements relative to the current schedule are five times greater than the economic benefits to the auto industry.

It is State Farm's position that as a matter of law and statutory power, the Department cannot rely on the general economic health of the automobile industry to justify a delay in the implementation of the life-saving automatic restraint standard. The comment cites the Senate report concerning the Vehicle Safety Act which stated that safety is "the overriding consideration" in carrying out the purposes of the Act (S. Rep. No. 1301, 89th Cong., 2d Sess. 6 (1966)). State Farm argues that economic considerations in rulemaking by the Department and NHTSA under the Vehicle Safety Act must relate to the costs and benefits of the standard itself and not to the general health of the auto industry: "... if the Secretary were to implement the proposed delay in this rulemaking on the basis of the general employment, production, and economic status of the auto industry, he would be acting arbitrarily and capriciously and outside the scope of his statutory authority." The legal memorandum submitted in support of State Farm's contentions included the following argument:

> If the general economic condition of the auto industry could justify suspending implementation of the automatic restraint standard in the face of such cost and benefit data, the industry's economic condition could also be used to justify suspension or elimination of other safety standards. The industry's current problems could thus be used to effectively nullify the National Traffic and Motor Vehicle Safety Act.

Professor William Nordhaus of Yale University submitted comments concerning the economic ramifications of the proposed delay in the first phase of the automatic restraint requirements. (The submission was sponsored by Allstate, Kemper, Nationwide, and State Farm Insurance Companies.) (For a full discussion of the methodology and bases for these calculations, one should refer to the Nordhaus submission filed at the National Highway Traffic Safety Administration under Docket 74-14, Notice 20. NHTSA's response to this analysis is set forth in detail in the Appendix to the Regulatory Impact Analysis.) The basic conclusions contained in the Nordhaus comment are as follows (verbatim):

1. The current passive restraint requirement (FMVSS 208) has very substantial net benefits compared to current lap and shoulder belt usage. According to the economic analysis presented here, the current rule has net benefits of approximately $10 billion for model years 1982-85. The substantial economic gain from passive restraints should not be ignored in debates on fine-tuning the phase-in.

2. Using standard analysis, the ranking of options in terms of net benefits is as follows (with the first having the highest net benefits and the last the lowest net benefits):

(1) Simultaneous 1983 implementation (all cars equipped with passive restraints in 1983).

(2) Delay and reversal (small cars in 1983, intermediate cars in 1984, large cars in 1985).

(3) The current rule (large cars in 1982, intermediate cars in 1983, and small cars in 1984).

(4) The proposed delay (large and intermediate cars in 1983, small cars in 1984).

(5) General rollback (large cars in 1983, intermediate cars in 1984, large cars in 1985).

3. A sensitivity analysis shows the ranking of alternatives is unchanged under a wide range of alternative assumptions.

4. Any deferral of requirements to install passive restraints on any size automobile has net costs unless it is "traded in" on an acceleration of requirements on a larger number, or a smaller sized, set of automobiles.

5. In terms of the costs and benefits of different options, there is no justification for either the proposed delay or for a general rollback. In particular, the economic costs of the proposed delay are approximately 5 times greater than the benefits, for a net cost of over $200 million. The net costs of the general rollback are significantly greater, in the order of $4.5 billion.

6. There appears to be strong economic justification for the simultaneous 1983 option if it is technically feasible.

7. The analysis indicates that the delay and reversal option has the highest net benefits of any of the four considered in the proposal and regulatory analysis. The superior net benefit of delay and reversal arises because the reversal of the requirement to small cars first affects a larger number of automobiles more quickly and because the net economic benefits per vehicle are greater for small cars than for large and intermediate cars.

8. The estimated impact of the proposed delay on the automobile industry is minuscule. There will be little or no improvement in the "health" of the domestic automobile industry from the proposed delay. For this reason, nonregulatory considerations discussed in the notice (the effect on imports, the conditions of the automobile industry, or freedom-of-choice arguments) should not, from an economic point of view, enter in this rulemaking.

The proposed delay of the automatic restraint requirements was also opposed by various consumer groups and health-related organizations, including: the Consumer Federation of America, the National Spinal Cord Injury Foundation, the Epilepsy Foundation of America, the Consumers Union, the Automotive Occupant Protection Association, the National Safety Council, the Houston Independent School District, the American College of Surgeons, the Georgia Department of Human Resources, the New York Department of Transportation, and the Center for Auto Safety. The National Safety Council conceded that the economic situation of the auto industry is serious, but stated that any adjustment of the implementation schedule for automatic restraints should also include consideration of an earlier implementation for small cars, since the need for protection is much greater in these vehicles.

The Automotive Occupant Protection Association stated that it could support the proposed delay of the automatic restraint requirements for one year, as well as a reversal of the implementation schedule, provided there is a requirement for the major automobile manufacturer to offer optional air bag systems on at least one model line. The association is concerned that further delay of the automatic restraint standard could drive the remaining air bag supplier manufacturers out of the business, and the life-saving potential of air bags could be lost. The Epilepsy Foundation of America echoed this sentiment and stated that "consumers deserve a guarantee that would assure the air bag option will be available in any model they wish to purchase."

The Consumers Union argued that the auto industry's financial condition should not be used to justify "less safe automobiles." Moreover, according to the Union, the proposed delay is unlikely to significantly alleviate the financial problems facing domestic automobile manufacturers.

The Center for Auto Safety argued that the proposed delay of the first-phase automatic restraint requirements will not help the auto industry solve its current economic problems. In addition, the Center stated that the projected savings of 600 lives and 4,300 injuries associated with the first-phase requirements represents an economic gain of approximately $170 million, and this far outweighs any savings to the industry. In regard to a possible reversal of the existing implementation schedule for automatic restraints, the Center stated that automatic belts can be installed on all small cars with a leadtime as short as one year because automatic belts are so well developed.

Comments were also received from two manufacturers which supply air bag system components, Thiokol and Rocket Research Company. Rocket Research stated that it could support the proposed delay and reversal of the implementation schedule provided any such change also contains a requirement that the major manufacturers "tool for and offer for sale" air bag systems on at least one car line. The company stated that without such a guarantee there is little incentive for air bag suppliers to remain in the business. Rocket Research stated that an indefinite delay of the automatic restraint requirements over the next five years would amount to a business loss of 23 percent. The company also stated that cost savings accruing to General Motors and Ford because of the one year delay (estimated in the proposal to be approximately 37 million dollars) would be reduced if air bag programs are delayed or eventually canceled since both Rocket Research and Hamill Manufacturing Company have substantial claims against the two companies for capital expenditures to build and equip production plants to make air bag modules. (Rocket Research stated that these claims are based on letters of agreement and contingent liability statements.)

Thiokol stated that the model year 1982 automatic restraint requirements for large cars resulted in the first major production program for Thiokol, and that substantial funds have been expended for manpower, tooling and facilities to meet this requirement. According to Thiokol, a one-year delay in the program would add substantial additional expenses and result in a reduction of manpower, facility use and vendor capability. In response to questions contained in the notice of proposed rulemaking, Thiokol stated that another year of delay would discourage rather than encourage further design improvements and research efforts in automatic restraint systems.

B. Comments Favoring the Delay

The Pacific Legal Foundation supported the proposed one-year delay, and stated four primary reasons why such a delay is warranted.

1. The proposed delay would create additional time for the Department of Transportation to implement an adequate evaluation program for air bags.
2. The proposed delay would give the American public an additional year of freedom to choose their means of occupant protection.
3. The proposed delay would allow additional time for the public to familiarize itself with passive restraints [which have been or will be voluntarily installed prior to a mandatory effective date].
4. The proposed delay would reduce the likelihood of costly Congressional action on the passive restraint standard after its implementation.

The proposed delay of the first phase of the automatic restraint requirements was unanimously supported by all commenting automobile manufacturers, both domestic and foreign. Additionally, most manufacturers urged the Department to reconsider the entire standard and to provide additional leadtime for all phases of the implementation schedule or to revoke the automatic restraint requirements altogether. Regarding a possible reversal of the current implementation schedule, nearly all of the foreign automobile manufacturers stated that it would be impossible to install automatic restraints on 1983 model small passenger cars because of insufficient leadtime.

Chrysler Corporation also urged that the automatic restraint requirements be withdrawn entirely. The company argued that automatic belts will be disconnected by many motorists and that purchasers will turn to models that are not equipped with automatic belts. Chrysler predicts that automatic belts would create a consumer "backlash" greater than that resulting from ignition interlocks (devices installed on 1974-75 models which made it impossible to start the vehicle unless the seatbelt was fastened).

In lieu of automatic restraints, Chrysler urged the Department to mount a national educational effort to increase the use of current manual seat belt systems: "Increased usage of these systems is the most cost effective and immediate method of reducing injuries and fatalities in motor vehicle accidents." Regarding a possible reversal of the current implementation schedule, Chrysler stated that it would be impossible at this time to advance automatic belt installation for small cars prior to the 1984 model year.

American Motors Corporation recommended that a delay in effective date of the automatic restraint requirements be adopted for all cars to permit a re-evaluation of all issues. The company particularly does not support a reversal of the implementation schedule so that small cars would be phased in first, since the company will rely on technology developed for or by other automobile manufacturers after it is proven in actual volume production. American Motors also recommended that if a new phase-in schedule is adopted, at least a one-year delay for low-volume manufacturers (e.g., less than 200,000 sales) be included in the change.

Foreign vehicle manufacturers produce few, if any, large passenger cars (i.e., cars with wheelbases over 114 inches), but all the foreign manufacturers supported the proposed delay of the first phase of the automatic restraint requirements. However, these manufacturers were unanimously against any reversal of the existing implementation schedule that would require small passenger cars to be equipped with automatic restraints a year earlier than currently required.

Fiat Motors of North America recommended that the entire automatic restraint schedule be delayed for one year (i.e., each phase delayed one year). The company stated that if its small cars were not required to comply until model year 1985, it would give the company more time to develop appropriate automatic belt designs for its convertibles. Fiat stated that it is currently having difficulty with its convertibles in terms of finding adequate automatic belt attachments and fittings for existing vehicle structures. Fiat stated that it would prefer to see the automatic restraint standard revoked and mandatory seat belt use laws implemented.

Nissan Motor Company stated that it would not be possible to equip its small cars with automatic restraints by September 1, 1982. Nissan's objection does not relate to capital expenditure or retail price increase, but rather, to "the lack of proper leadtime needed to develop acceptable, reliable and high quality vehicles for the consumer." Nissan argued that automatic belts already face a tough challenge in winning consumer acceptance without forcing the imposition of hastily developed designs.

Toyota Motor Company also stated that it could not comply with a change in the effective date for small cars from September 1, 1983, to September 1, 1982. Toyota stated that if such a change is adopted, it would have to drop from production certain of its volume passenger car lines for the 1983 model year, thereby limiting the freedom of choice of the customers who wish to purchase Toyota cars.

Volvo of America Corporation requested that the implementation schedule for automatic restraints be amended to reflect the fact that the current market situation has forced the industry to be flexible with respect to model year introductions. Volvo refers specifically to the desire of some manufacturers to continue model lines past the September 1 effective dates for the three phases of the current implementation schedule, and to discontinue these lines at the beginning of the new calendar year. Volvo argues that tooling for installation of automatic restraints on model lines that will be discontinued six months after the effective date of the standard is cost prohibitive. Consequently, without a change in the implementation schedule, manufacturers would be required to cease production of certain models sooner than they would like.

Volvo recommends that the implementation schedule be amended to provide that the effective dates for the three phases is "September 1 or the date of production start of the new model year if this date falls between September 1 and December 31."

Rolls-Royce Motors produces three models that would have to be equipped with automatic restraints by September 1, 1981, under the existing schedule. Rolls-Royce originally planned to offer air bags in these models but changed plans after General Motors announced in 1979 that it would delay the introduction of air bags. Consequently, Rolls-Royce states that it got a late start with automatic belts and the automatic belt system it has planned for the 1982 models is not developed to a degree of refinement normally associated with Rolls-Royce cars. In support of the proposed one-year delay in the automatic restraint requirements, Rolls-Royce made the following comment:

> Refinement, weight and cost will all be subject to continuous development anyway but one year extra leadtime would permit full development of the system before the customer is charged a cost premium for the restraint system.

(NOTE: Allstate Insurance Company requested that a public hearing be held on the one-year delay in the large car requirement. However, due to the limited time available before the previous effective date of this requirement, the agency must deny this request. The issues on which this decision is based are primarily technical and economic, lending themselves well to written presentations. Interested parties have taken full advantage of the opportunity to provide their views in writing in this proceeding. Further, an additional opportunity for comment on issues relating to the automatic restraint standard is provided in the notice of proposed rulemaking issued today.)

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74-14; Notice 25)

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, to rescind the requirements for installation of automatic restraints in the front seating positions of passenger cars. Those requirements were scheduled to become effective for large and mid-size cars on September 1, 1982, and for small cars on September 1, 1983.

The automatic restraint requirements are being rescinded because of uncertainty about the public acceptability and probable usage rate of the type of automatic restraint which the car manufacturers planned to make available to most new car buyers. This uncertainty and the relatively substantial cost of automatic restraints preclude the agency from determining that the standard is at this time reasonable and practicable. The reasonableness of the automatic restraint requirements is further called into question by the fact that all new car buyers would be required to pay for automatic belt systems that may induce only a few additional people to take advantage of the benefits of occupant restraints.

The agency is also seriously concerned about the possibility that adverse public reaction to the cost and presence of automatic restraints could have a significant adverse effect on present and future public acceptance of highway safety efforts.

Under the amended standard, car manufacturers will continue to have the current option of providing either automatic or manual occupant restraints.

DATES: The rescission of the automatic restraint requirements of Standard No. 208 is effective December 8, 1981. Any petitions for reconsideration must be received by the agency not later than December 3, 1981.

ADDRESS: Any petitions for reconsideration should refer to the docket number and notice number of this notice and be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT: Mr. Michael Finkelstein, Associate Administrator for Rulemaking, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-1810)

SUPPLEMENTARY INFORMATION: On April 9, 1981, the Department of Transportation published a notice of proposed rulemaking (NPRM) setting forth alternative amendments to the automatic restraint requirements of Standard No. 208 (46 F.R. 21205). The purpose of proposing the alternatives was to ensure that Standard No. 208 reflects the changes in circumstances since the automatic restraint requirements were issued (42 F.R. 34289; July 5, 1977) and to ensure that the standard meets the requirements of the National Traffic and Motor Vehicle Safety Act of 1966 and Executive Order 12291, "Federal Regulations" (February 17, 1981).

Background and NPRM

The automatic restraint requirements were adopted in 1977 in response to the high number of passenger car occupants killed annually in crashes and to the persistent low usage rate of manual belts. The manual belt is the type of belt which is found in most cars today and which the occupant must place around himself or herself and buckle in order to gain its protection. Then, as now, there were two types of automatic restraints, i.e., restraints that require no action by vehicle occupants, such as buckling a belt, in order to be effective. One type is the air cushion restraint (air bag) and the other is the automatic belt (a belt which automatically envelopes an occupant when the occupant enters a vehicle and closes the door).

In view of the greater experience with air bags in large cars and to spread out capital investments, the Department established a large-to-small car compliance schedule. Under that schedule, large cars were required to begin compliance on September 1, 1981, mid-size cars on September 1, 1982, and small cars on September 1, 1983.

On April 6, 1981, after providing notice and opportunity for comment, the Department delayed the compliance date for large cars from September 1, 1981, to September 1, 1982. As explained in the April 6, final rule, that delay was adopted

. . . because of the effects of implementation in model year 1982 on large car manufacturers, because of the added significance which those effects assume due to the change in economic circumstances since the schedule was adopted in 1977, and because of the undermining by subsequent events of the rationale underlying the original phase-in schedule.

Simultaneous with publishing the one-year delay in the effective date for large cars, the Department also issued a proposal for making further changes in the automatic restraint requirements. This action was taken in response to a variety of factors that raised questions whether the automatic restraint requirements represented the most reasonable and effective approach to the problem of the low usage of safety belts. Among these factors were the uncertainty about public acceptability of automatic restraints in view of the absence of any significant choice between automatic belts and air bags and the nature of the automatic belt designs planned by the car manufacturers, the consequent uncertainties about the rate of usage of automatic restraints, and the substantial costs of air bags even if produced in large volumes.

The three principal proposals were reversal of phase-in sequence, simultaneous compliance, and rescission. The reversal proposal would have changed the large-to-small car order of compliance to a requirement that small cars commence compliance on September 1, 1982, mid-size cars on September 1, 1983, and large cars on September 1, 1984. The proposal for simultaneous compliance would have required all size classes to begin compliance on the same date, March 1, 1983. The rescission proposal would have retained the manufacturers' current option of equipping their cars with either manual or automatic restraints.

In addition, the Department proposed that, under both the first and second alternatives, the automatic restraint requirements be amended so that such restraints would not be required in the front center seating position.

Following the close of the period for written comments on the April NPRM, NHTSA decided, at its discretion, to hold a public meeting on the alternatives. The purpose of the meeting was to permit interested parties to present their views and arguments orally before the Administrator and ensure that all available data were submitted to the agency. The notice announcing the meeting indicated that participants at the hearing would be permitted to supplement their previous comments. The notice also urged participants to consider the issues raised in former Secretary Coleman's June 14, 1976 proposal regarding occupant restraints and in former Secretary Adams' March 24, 1977 proposal regarding automatic restraints.

Rationale for Agency Decision

The decision to rescind the automatic restraint requirements was difficult for the agency to make. NHTSA has long pursued the goal of achieving substantial increases in the usage of safety belts and other types of occupant restraints. Former Secretary Adams clearly believed that he had ensured the achievement of that goal in July 1977 when he promulgated the automatic restraint requirements. Now that goal appears as elusive as ever. Instead of being equipped with automatic restraints that will protect substantially greater numbers of persons than current manual belts, most new cars would have had a type of automatic belt that might not have been any more acceptable to the public than manual belts. The usage of those automatic belts might, therefore, have been only slightly higher than that of manual belts. While most of the anticipated benefits have virtually disappeared, the costs have not. Vehicle price increases would have amounted to approximately $1 billion per year.

This turn of events may in part reflect the failure of the Department in the years following 1977 to conduct a long term effort to educate the public about the various types of restraints and the need to use them. The need for such an undertaking was seen by former Secretary Coleman in announcing his decision in 1976 to conduct an automatic restraint demonstration project prior to deciding whether to mandate automatic restraints. His instruction that NHTSA undertake significant new steps to promote safety belt usage was never effectively carried out. The result of such an effort could have been that a substantial portion of the public would have been receptive to a variety of automatic restraint designs. As a result of concern over public acceptance, manufacturers have designed their automatic restraints to avoid creating a significant adverse reaction. Unfortunately, the elements of design intended to minimize adverse reaction would also minimize the previously anticipated increases in belt usage and safety benefits of requiring new cars to have automatic restraints instead of manual belts.

The uncertainty regarding the usage of the predominant type of planned automatic restraint has profound implications for the determinations which NHTSA must make regarding a standard under the National Traffic and Motor Vehicle Safety Act. NHTSA has a duty under the Vehicle Safety Act and E.O. 12291 to review the automatic restraint requirements in light of changing events and to ensure that the requirements continue to meet the criteria which each Federal Motor Vehicle Safety Standard must satisfy. If the criteria cannot be satisfied, the agency must make whatever changes in the standard are warranted. The agency must also have the flexibility to modify its standards and programs in its efforts to find effective methods for accomplishing its safety mission.

The agency believes that the post-1977 events have rendered it incapable of finding now, as it was able to do in 1977, that the automatic restraint requirements would meet all of the applicable criteria in the Vehicle Safety Act. Section 103(a) of the Vehicle Safety Act requires that each Federal Motor Vehicle Safety Standard meet the need for safety and be practicable and objective. Each standard must also be reasonable, practicable and appropriate for each type of vehicle or equipment to which it applies (Section 103(f) (3)). To meet the need for safety, a standard must be reasonably likely to reduce deaths and injuries. To be found practicable, the agency must conclude that the public will in fact avail themselves of the safety devices installed pursuant to the standard. (*Pacific Legal Foundation* v. *Department of Transportation,* 593 F. 2d 1338, at 1345-6 (D.C. Cir. 1979)). To be reasonable and practicable, a standard must be economically and technologically feasible, and the costs of implementation must be reasonable. (S. Rep. No. 1301, 89th Cong., 2d Sess. 6 (1966).)

In reaching the decision announced by this notice, NHTSA has reviewed the enormous record compiled by this agency over the past decade on automatic restraints. Particular attention was paid to the information and issues relating to the notices which the Agency or Department has issued regarding automatic restraints since 1976. All comments submitted in response to the April 1981 proposal by proponents and opponents of the automatic restraint requirements have been thoroughly considered. A summary of the major comments is included as an appendix to this notice. The agency's analysis of those comments may be found in this notice and the final regulatory impact analysis. A copy of the analysis has been placed in the public docket.

Usage of automatic restraints and safety benefits. As in the case of the comments submitted concerning the one-year delay in automatic restraint requirements for large cars, the commenters on the April 1981 proposal expressed sharply divergent views and arguments and reached widely differing conclusions concerning the likely usage rates and benefits of the automatic restraints planned for installation in response to the automatic restraint requirements. The wide distance between the positions of the proponents and opponents of these requirements stems primarily from the lack of any directly relevant data on the most important issue, i.e., the public reaction to and usage rate of detachable automatic belts. These disagreements once again demonstrate the difficulty in reaching reliable conclusions due to the uncertainty created by the lack of adequate data.

In issuing the automatic restraint requirements in 1977, NHTSA assumed that the implementation of those requirements would produce substantial benefits. According to the analysis which NHTSA performed in that year, automatic restraints were expected to prevent 9,000 deaths and 65,000 serious injuries once all cars on the road were equipped with those devices. That prediction was premised on several critical assumptions. Most important among the assumptions were those concerning the safety benefits of automatic restraints—reductions in death and injury—which in turn are a function of the types of automatic restraints to be placed in each year's production of new cars.

The agency assumed that the combination of air bags and lap belts would be approximately 66 percent effective in preventing fatalities and that automatic belts would have a 50 percent level of effectiveness. The agency assumed also that air bags would be placed in more than 60 percent of new cars and that automatic belts would be placed in the remaining approximately 40 percent. The agency's analysis predicted that air bags would provide protection in virtually all crashes of sufficient severity to cause deployment of the air bags. It was further assumed that the automatic belts would be used by 60 to 70 percent of the occupants of those cars.

As to public reaction, the agency anticipated that the public would, as a whole, accept automatic restraints because it could choose between the two types of those restraints. Those not wanting automatic belts would select an air bag. Partly as a function of the expected large volume of air bag installation, the agency projected that the cost of air bags would be only slightly more than $100 (in 1977 dollars) more than manual belts.

As part of its efforts to monitor and facilitate implementation of the automatic restraint requirements, the agency continued its gathering of data about the use and effectiveness of air bags and of automatic belts with use-inducing features, the only type of automatic belt available to the public. With respect to automatic belts, this effort was carried out through a contract with Opinion Research Corporation. Under that contract, observations were made of seat belt usage during the two year period beginning November 1977. These observations provided data on usage of manual and automatic belts in model year 1975–79 VW Rabbits and of manual belts in model year 1978–79 GM Chevettes. As a result of voluntary decisions by VW and GM, a number of the Rabbits and Chevettes were equipped with automatic belts. The observation data showed usage rates of about 36 percent for manual belts and about 81 percent for automatic belts in the Rabbits. The observed rate of manual belt usage in Chevettes was 11 percent. There were insufficient numbers of model year 1978–79 Chevettes equipped with automatic belts to develop reliable usage figures.

Several telephone surveys were also made under contract with Opinion Research. The first survey involved owners of model year 1979 VW Rabbits and GM Chevettes equipped with automatic belts and was conducted during 1979. This survey showed that 89 percent of Rabbit owners and 72 percent of Chevette owners said that they used their automatic belts. A second survey was conducted in late 1979 and early 1980. It covered owners of model year 1980 Rabbits and Chevettes. The usage rates found by the second survey were almost identical to those in the first survey.

Now, however, the validity of the benefit predictions in 1977 and the relevancy of the extensive data gathered by NHTSA on air bags and on automatic belts with use-inducing features have been substantially if not wholly undermined by drastic changes in the types of automatic restraints that would have been installed under the automatic restraint requirements. Instead of installing air bags in approximately 60 percent of new cars, the manufacturers apparently planned to install them in less than 1 percent of new cars. Thus, automatic belts would have been the predominant means of compliance, and installed in approximately 99 percent of new cars. Thus, the assumed life-saving potential of air bags would not have been realized.

Manufacturers have stated that they chose belt systems for compliance because of the competitive disadvantage of offering the relatively expensive, inadequately understood air bag when other manufacturers would have been providing automatic belts. These explanations seem credible.

The other drastic change concerns the type of automatic belt to be installed. Although some aspects of the car manufacturers' automatic belt plans are still tentative, it now appears reasonably certain that if the automatic restraint requirements were implemented, the overwhelming majority of new cars would be equipped with automatic belts that are detachable, unlike the automatic belts in Rabbits and Chevettes. Most planned automatic belts would be like today's manual lap and shoulder belts in that they can be easily detached and left that way permanently.

Again, this design choice would appear to have arisen out of concern that without such features emergency exit could be inhibited, and, in part as a result of a perception of this fact, public refusal to accept new designs would be widespread. The agency shares this concern, and has since 1977 required that all such belts provide for emergency exit. Agency concerns on this point have been validated by recent related attitudinal research, discussed below.

In its final rule delaying the initial effective date of the automatic restraint requirements, the April 1981 proposal and the associated documents analyzing the impacts of those actions, NHTSA expressly confronted the lack of usage data directly relevant to the type of automatic belts now planned to be installed in most new cars. The agency stated that there were several reasons why the available data was of limited utility in attempting to make any reliable predictions about the usage of easily detachable automatic belts. The most important reason, which has already been noted, is that the predominant type of planned automatic belt would not have had features to ensure that these belts are not detached.

Second, all of the available data relate to only two subcompacts, the Rabbit and the Chevette. Due to a combination of owner demographics and a correlation between driver perception of risk and the size of the car being driven, belt usage rates are typically higher in small cars than in larger ones. Therefore, the usage rates for the two subcompacts cannot simply be adopted as the usage rates for automatic belts in all car size classes.

Third, most of the Rabbit and Chevette owners knew that their new car would come with an automatic belt and had it demonstrated for them, even if many state that they did not consciously choose that type of belt. Having voluntarily invested in automatic restraints, they are more likely to use those restraints than someone who is compelled to buy them.

The significance of the fundamental difference between the nondetachable and detachable automatic belt bears further discussion. The Rabbit automatic belts are, as a practical matter, not permanently detachable since they are equipped with an ignition interlock. If the belt is disconnected, the interlock prevents the starting of the car. Each successive use would therefore require reconnection before engine start. The Chevette automatic belts also were initially equipped with an ignition interlock. Beginning in model year 1980, the Chevette belts were made both practically and literally nondetachable. They consist of a continuous, nondetachable shoulder belt. Additional webbing can be played out to produce slack in the belt; however, the belt remains attached at both ends.

By contrast, the automatic belts now planned for most cars do not have any effect on the starting of the cars and are easily detachable. Some belt designs may be detached and permanently stowed as readily as the current manual lap and shoulder belts. Once a detachable automatic belt is detached, it becomes identical to a manual belt. Contrary to assertions of some supporters of the standard, its use thereafter requires the same type of affirmative action that is the stumbling block to obtaining high usage levels of manual belts. If the car owners perceive the belts as simply a different configuration of the current manual belts, this stumbling block is likely to remain. They may treat the belt as a manual one and thus never develop the habit of simply leaving the belt attached so that it can act as an automatic belt.

The agency recognizes the possibility that the exposure of some new car purchasers to attached automatic belts may convert some previously occasional users of manual belts to full time belt users. Present attitudinal survey data clearly establish the existence of a population of such occupants who could be influenced by some external factor to convert to relatively constant users. However, the agency believes that many purchasers of new cars having detachable automatic belts would not experience the potential use-inducing character of attached automatic belts unless they had taken the initiative themselves to attach the belts.

Thus, the change in car manufacturers' plans has left the agency without any factual basis for reliably predicting the likely usage increases due to detachable automatic belts, or for even predicting the likelihood of any increase at all. The only tentative conclusion that can be drawn from available data is that the installation of *nondetachable* automatic belts in other subcompacts could result in usage rates near those found in Rabbits and Chevettes. Even that use of the Rabbit and Chevette data may be questionable, however, given the element of voluntarism in the purchase of automatic belts by many of the Rabbit and Chevette owners. Thus, the data on automatic belt use in Rabbits and Chevettes may do little more than confirm the lesson of the model year 1974-75 cars equipped with manual belts and ignition interlocks, i.e., that the addition to a belt system of a feature that makes the belt nondetachable or necessitates its attachment before a car can be started can substantially increase the rate of belt usage.

In estimating automatic belt usage rates for the purposes of the April final rule and proposal, the agency recognized the substantial uncertainty regarding the effects of easily detachable automatic belts on belt usage. NHTSA attempted to compensate for the lack of directly relevant data by using two different techniques to predict a potential range of usage.

One technique was to assume a consistent multiplier effect, whereby belt usage in cars of all size classes would be assumed to be more than slightly double as it had in Rabbits. A doubling of the current 10–11 percent manual belt usage rate projected over the general car fleet would mean a 22 percent rate could be achieved with the installation of automatic belts. The other technique was to assume that there would be a consistent additive effect, whereby the same absolute percentage point increase in belt usage would occur as there had been in the case with Rabbits. Use of this method would result in a predicted 50 percentage point increase in belt usage, over the entire fleet, from the current 10–11 percent to approximately 60 percent.

The agency used the results of these two techniques in an attempt to construct a range of possible increases in belt usage. Thus, a range of 15 to 60 percent was used in both the final regulatory impact analysis for the April rulemaking to defer the effective date for one year and the preliminary analysis for the current action. The figure of 15 percent was derived by doubling the observed 7 percent usage levels in the large type cars affected by the deferral. A figure of 22 percent would have been more appropriate as the low end of the range for the current action, since it would represent a doubling of the current usage rate of the car fleet as a whole. This latter figure has been used in addressing this question in the current final regulatory analysis.

Although the agency had no definitive way of resolving the uncertainty about the usage of detachable automatic belts, the agency estimated that belt usage with automatic belts would most likely fall near the lower end of either range. This estimate was based on a variety of factors. Most relate to the previously discussed limitations in the relevancy of the observations and surveys of Rabbit and Chevette owners. In addition, those data were on their face inconsistent with data regarding automatic belt usage in crashes involving Rabbits. Those crash data indicated a usage rate of 55–57 percent instead of the better than 80 percent rate indicated by the observation study and telephone surveys.

Thus, the agency made the preliminary judgment in its impact analyses that the switch from manual belts to detachable automatic belts could approximately double belt usage. However, the April 1981 final rule noted that the actual belt usage might be lower, even substantially so. With respect to cars with current low usage rates, that notice stated that the usage rate of detachable automatic belts might only approach levels similar to those currently achieved with manual belts.

The commenters on the April 1981 NPRM did not present any new factual data that could have reduced the substantial uncertainty confronting the agency. Instead, the commenters relied on the same data examined by the agency in its impact analyses.

The commenters were sharply divided on the question of usage rates. Proponents of the automatic restraint requirements did not in their analyses address the significance of the use-inducing nature of the nondetachable automatic belts in the Rabbits and Chevettes or the demographic factors relating to those car purchasers. Instead, they asserted that the usage rates achieved in Rabbits and Chevettes would, with slight adjustments, also be achieved in other car size classes. In reaching this conclusion, they asserted that the usage rate increases of automatic belts shown by Rabbit and Chevette owners were the same regardless of whether the automatic belts were purchased knowingly or unknowingly. There was an exception to this pattern of comment among the proponents. One public spokesperson for an interest group acknowledged that automatic belts could be designed in a way that they so closely resembled manual belts that their usage rates would be the same.

Opponents of the automatic restraint requirements, relying on the similarity of detachable automatic belts to manual belts, predicted that the automatic belts would not have any substantial effect on belt usage. The opponents of the requirements also dismissed the experience of the Rabbit and Chevette owners on the grounds that the automatic belts in those cars had been voluntarily purchased and were nondetachable.

While the public comments did not provide the agency with any different or more certain basis for estimating belt usage than it already had, they did induce the agency to reexamine its assumption about the possible automatic belt usage rates. Although it is nearly impossible to sort out with precision the individual contributions made by nondetachability, interlocks, car size, demographics and other factors, NHTSA believes that the usage of automatic belts in Rabbits and Chevettes would have been substantially lower if the automatic belts in those cars were not equipped with a use-inducing device inhibiting detachment.

In the agency's judgment, there is a reasonable basis for believing that most of the increase in automatic belt Rabbits and Chevettes is due to the nondetachability feature, whether an interlock or other design feature, of their belt systems. Necessitating the attachment of belts by the addition of interlocks to 1974–75 cars resulted in an increase in manual belt usage by as much as 40 percent in cars subject to that requirement. A similar effect in the case of the Rabbit would account for four-fifths of the increase observed in the automatic belt vehicles. A significant portion of the remaining increase could in fact be attributable to the fact many owners of automatic belt Rabbits and Chevettes knowingly and voluntarily bought the automatic belts. By the principle of self-selection, these people would be more inclined to use their belts than the purchasers of 1974–75 Rabbits who did not have any choice regarding the purchase of a manual belt equipped with an interlock. This factor would not, of course, be present in the fleet subject to the standard.

The most appropriate way of accounting for the detachability problem and other limitations on the validity of that Rabbit and Chevette data would be to recognize that the levels of usage resulting from both the point estimates are based on uncertain conclusion and adjust each appropriately. The agency's estimate in the final regulatory impact analysis for the April 1981 final rule that usage would likely fall near the lower end of the range had the effect of substantially adjusting downward the usage rate (60 percent) produced by the technique relying on the absolute percentage point increase (50 percentage points) in belt usage in automatic belt Rabbits and Chevettes. A similar adjustment could also be made in the usage rate (15 percent) indicated by the multiplier technique.

Throughout these sequential analyses, the agency has examined the extremely sparse factual data, applied those factors which are known to externally affect usage rates, and defined for analytical purposes the magnitude of potential safety effects. Aside from the initial data points, all such analyses in all cases necessarily involve exercises of discretion and informed judgment. Resultant conclusions are indications of probable usage which always have been and always must be relied upon by the agency in the absence of additional objective data.

The agency believes that the results produced by both techniques must be adjusted to account for the effects of detachability and the other factors affecting usage rates. Therefore, as the April 1981 final rule recognized, the incremental usage attributable to the automatic aspect of the subject belts may be substantially less than 11 percent.

The agency's analysis of the public comments and other available information leads it to conclude that it cannot reliably predict even a 5 percentage point increase as the minimum level of expected usage increase. The adoption of a few percentage points increase as the minimum would, in the agency's judgment, be more consistent with the substantial uncertainty about the usage rate of detachable automatic belts. Based on the data available to it, NHTSA is unable to assess the probability that the actual incremental usage would fall nearer a 0 percentage point increase or nearer some higher value like a 5 or 10 percentage point increase.

Thus, the agency concludes that the data on automatic belt usage in Rabbits and Chevettes does not provide a sufficient basis for reliably extrapolating the likely range of usage of detachable automatic belts by the general motoring public in all car size classes. Those data are not even sufficient for demonstrating the likelihood that those belts would be used in perceptibly greater numbers than the current manual belts. If the percentage increase is zero or extremely small due to the substantial similarity of the design and methods of using detachable automatic belts and manual belts, then the data regarding manual belt usage would be as reliable a guide to the effects of detachable automatic belts on belt usage as data regarding usage of nondetachable automatic belts. Indeed, the manual belt data may even be a more reliable guide since the data are based on usage by the general motoring public in cars from all size and demographic classes.

In view of the uncertainty about the incremental safety benefits of detachable automatic belts, it is difficult for the agency to determine that the automatic restraint requirements in their present form meet the need for safety.

In concluding that for this reason detachable automatic belts may contribute little to achieving higher belt usage rates, the question then arises whether the agency should amend the standard to require that automatic belts have a use-inducing feature like that of the Rabbit and Chevette automatic belts. NHTSA believes that such features would increase belt usage. The agency does not, however, believe that such devices should be mandated, for the reasons discussed in detail below.

Costs of automatic restraints. In view of the possibly minimal safety benefits and substantial costs of implementing the automatic restraint requirements, the agency is unable to conclude that the incremental costs of the requirements are reasonable. The requirements are, in that respect, impracticable. While the car manufacturers have already made some of the capital expenditures necessary to comply with the automatic restraint requirements, they still face substantial, recurring variable costs. The average price increase per car is estimated to be $89. The costs of air bags and some designs of automatic belts would be substantially higher. With a total annual production of more than 10 million cars for sale in this country, there would be a price effect of approximately $1 billion.

While the car manufacturers might be able to pass along some or all of their costs to consumers, the necessary price increases would reduce sales. There might not be any net revenue loss since the extra revenue from the higher prices could offset the revenue loss from the lower volume of sales. However, those sale losses would cause net employment losses. Additional sales losses might occur due to consumer uncertainty about or antipathy toward the detachable automatic belts which do not stow so unobtrusively as current manual lap and shoulder belts.

Consumers would probably not be able to recoup their loss of disposable income due to the higher car prices. There does not appear to be any certainty that owners of cars with detachable automatic belts would receive offsetting discounts in insurance costs. Testimony and written comments submitted to the agency indicate premium reductions generally are available only to owners of cars equipped with air bags, not automatic belts. Some large insurance companies do not now offer discounts to any automatic restraint-equipped cars, even those with air bags. If insurance cost discounts were to be given owners of cars having detachable automatic belts, such discounts would be given only after the automatic belts had produced significant increases in belt usage, and in turn significant decreases in deaths and serious injuries. The apparent improbability of any economic effect approaching the magnitude of the consumer cost means that the discounts would not likely materialize on a general basis.

Insurance company statements at the August 1981 public meeting reaffirmed this belief as they state that they could not now assure reductions in insurance premiums but would have to first collect a considerable amount of claim data.

Finally, the weight added to cars by the installation of automatic belts would cause either increased fuel costs for consumers or further new car price increases to cover the incorporation of offsetting fuel economy improvements.

The agency does not believe that it would be reasonable to require car manufacturers or consumers to bear such substantial costs without more adequate assurance that they will produce benefits. Given the plans of the car manufacturers to rely primarily on detachable automatic belts and the absence of relevant data to resolve the usage question, implementation of the automatic restraint requirements amounts to an expensive federal regulatory risk. The result if the detachable automatic belts fail to achieve significant increases in belt usage could be a substantial waste of resources.

The agency believes that the costs are particularly unreasonable in view of the likelihood that other alternatives available to the agency, the states and the private sector could accomplish the goal of the automatic restraint requirements at greatly reduced cost. Like those requirements, the agency's planned educational campaign is addressed primarily to the substantial portion of the motoring public who are currently occasional users of manual belts.

Effect on public attitude toward safety. Although the issue of public acceptance of automatic restraints has already been discussed as it relates to the usage rate of detachable automatic restraints, there remains the question of the effect of automatic restraints on the public attitude toward safety regulation in general. Whether or not there would be more than minimal safety benefits, implementation of the automatic restraint requirements might cause significant long run harm to the safety program.

No regulatory policy is of lasting value if it ultimately proves unacceptable to the public. Public acceptability is at issue in any vehicle safety rulemaking proceeding in which the required safety equipment would be obtrusive, relatively expensive and beneficial only to the extent that significant portions of the motoring public will cooperate and use it. Automatic belt requirements exhibit all of those characteristics. The agency has given the need for public acceptability of automatic restraints substantial weight since it will clearly determine not only the level of safety benefits but also the general public attitude toward related safety initiatives by the government or the private sector.

As noted above, detachable automatic belts may not be any more acceptable to the public than manual belts at any given point in time. If the detachable automatic belts do not produce more than negligible safety benefits, then regardless of the benefits attributable to the small number of other types of automatic restraints planned to be installed, the public may resent being required to pay substantially more for the automatic systems. Many if not most consumers could well conclude that the automatic belts would in fact provide them with no different freedom of choice about usage or levels of protection than manual belts currently offer. As a result, it is not unreasonable to conclude that the public may regard the automatic restraint requirements as an expensive example of ineffective regulation.

Thus, whether or not the detachable automatic belts might have been successful in achieving higher belt usage rates, mandates requiring such belts could well adversely affect public attitude toward the automatic restraint requirements in particular and safety measures in general. As noted in more detail in the 1976 Decision of Secretary Coleman:

> Rejection by the public would lead to administrative or Congressional reversal of a passive restraint requirement that could result in hundreds of millions of dollars of wasted resources, severe damage to the nation's economy, and, equally important, a poisoning of popular sentiment toward efforts to improve occupant restraint systems in the future.

It can only be concluded that the public attitude described by the Secretary at that time is at least as prevalent today. The public might ultimately have sought the legislative rescission of the requirements. Action-forcing safety measures have twice before been overturned by Congress. In the mid-1970's, Congress rescinded the ignition interlock provision and provided that agency could not require the States to adopt and enforce motorcycle helmet use laws. Some people might also have cut the automatic belts out of their cars, thus depriving subsequent owners of the cars of the protection of any occupant restraint system. These are serious concerns for an agency charged by statute with taking steps appropriate for addressing safety problems that arise not only in the short term but also the long term. The agency must be able to react effectively to the expected increases in vehicle deaths and injuries during the 1980's.

Equity. Another relevant factor affecting the reasonableness of the automatic restraint requirements and of their costs is the equity of the distribution of such costs among the affected consumers. Responsible regulatory policy should generally strive to ensure that the beneficiaries of regulation bear the principal costs of that regulation. The higher the costs of a given regulation, the more serious the potential equity problem. The automatic restraint requirements of the standard would have required the current regular user of manual belts not only to pay himself for a system that affords him no additional safety protection, but in part to subsidize the current nonuser of belts who may or may not be induced by the automatic restraints to commence regular restraint usage.

Option of Adopting Use-Compelling Features. As noted above, some commenters have suggested that the only safety belts which are truly "passive" are those with use-compelling features. Such commenters have recommended that the agency amend the standard so as to require such features. For example, an ignition interlock which prohibits the car from starting unless the belt is secured is a use-compelling feature. Another example is a passive belt design which is simply not detachable, because no buckle and latch release mechanism is provided. While NHTSA agrees that such use-compelling features could significantly increase usage of passive belts, NHTSA cannot agree that use-compelling features could be required consistent with the interests of safety. In the case of the ignition interlock, NHTSA clearly has no authority to require such a use-compelling feature. The history of the Congressional action which removed this authority from NHTSA suggests that Congress would look with some disfavor upon any similar attempt to impose a use-compelling feature on a belt system.

But, even if NHTSA were to require that passive belts contain use-compelling features, the agency believes that the requirement could be counterproductive. Recent attitudinal research conducted by NHTSA confirms a widespread, latent and irrational fear in many members of the public that they could be trapped by the seat belt after a crash. Such apprehension may well be contributing factors in decisions by many people not to wear a seat belt at all. This apprehension is clearly a question which can be addressed through education, but pending its substantial reduction, it would be highly inappropriate to impose a technology which by its very nature could heighten or trigger that concern.

In addition, the agency believes there are compelling safety reasons why it should not mandate use-compelling features on passive belts. In the event of accident, occupants wearing belts suffer significantly reduced risk of loss of consciousness, and are commonly able to extricate themselves with relative ease. However, the agency would be unable to find the cause of safety served by imposing any requirement which would further complicate the extrication of any occupant from his or her car, as some use-compelling features would. NHTSA's regulations properly recognize the need for all safety belts to have some kind of release mechanism, either a buckle and latch mechanism or a spool-out release which feeds a length of belt long enough to extricate a car occupant.

Alternative methods of increasing restraint usage. Finally, the agency believes that it is possible to induce increased belt usage, and enhance public understanding and awareness of belt mechanisms in general, by means that are at least as effective but much less costly than the installation of millions of detachable automatic belts.

In the decision noted above, Secretary Coleman noted the obligation of the Department of Transportation to undertake efforts to encourage the public to use occupant restraints, active or passive. Toward this point, Secretary Coleman directed the Administrator of NHTSA to undertake significant new steps to promote seat belt usage during the demonstration program. This instruction of the Secretary was not effectively carried out and, unfortunately, we do not enjoy today the benefits of a prolonged Departmental campaign to encourage seat belt usage. Had such a program been successfully carried out, increased seat belt usage could have saved many lives each year, beginning in 1977.

Rather than allowing the Coleman demonstration program and its accompanying education effort to come to fruition, the Department reconsidered Secretary Coleman's 1976 decision during 1977. At the conclusion of the reconsideration period, the Department reversed that decision, and amended the standard to require the provision of automatic restraints in new passenger cars, in accordance with a phased-in schedule.

The benefits of any such belt use enhancement efforts could have already substantially exceeded those projected for the automatic restraint requirements of this standard. Over the next ten years, the requirements of the standard would have addressed primarily those occasional belt users amenable to change who buy new cars during the mid and late 1980's.

Prior to the initiation of rulemaking in February of this year, the Department had resolved to undertake a major educational effort to enhance voluntary belt usage levels. Such efforts will be closely coordinated with new and preexisting major initiatives at the State level and in the private sector, many of which were discussed at the public meeting on the present rulemaking. These efforts will address not only those users/purchasers amenable to change, but also those currently driving and riding in cars, multipurpose passenger vehicles and trucks on the road today. The potential for immediate impact is thus many times greater. Further, with the much greater number of persons directly impacted, educational efforts would need to raise safety belt usage in the vehicles on the road during the 1980's by only a few percentage points to achieve far greater safety benefits than the automatic restraint requirements could have achieved during the same time period.

This is in no sense to argue or suggest that nonregulatory alternatives are or should be considered in all cases appropriate to limit Federal regulation. However, the existence of such efforts, and their relevance to calculations of benefits in the present case, must be and has been considered to the extent discussed herein.

Summary of Agency Conclusion

As originally conceived, the automatic restraint requirement was a far reaching technology forcing regulation that could have resulted in a substantial reduction in injuries and loss of life on our highways.

As it would be implemented in the mid-1980's, however, the requirement has turned into a billion dollar Federal effort whose main technological advance would be to require seat belts that are anchored to the vehicle door rather than the vehicle body, permitting these belts to be used either as conventional active belts or as automatic belts.

To gain this advantage, under the standard as drafted, consumers would see the end of the six passenger car and an average vehicle price increase on the order of $89 per car. The almost certain benefits that had been anticipated as a result of the use of air bag technology have been replaced by the gravely uncertain benefit estimates associated with belt systems that differ little from existing manual belts.

In fact, with the change in manufacturers' plans that in essence replaced air bags with automatic belts, the central issue in this proceeding has become whether automatic belts would induce higher belt usage rates than are occurring with manual belts.

Many of the comments in the course of this rulemaking were directed specifically at the question of belt use. Most addressed themselves to the information in the docket on the usage witnessed in the VW Rabbit and Chevette equipped with automatic belts.

The Agency's own analysis of the available information concludes that it is virtually impossible to develop an accurate and supportable estimate of future belt use increases based upon the Rabbit and Chevette automatic belt observations. The Agency further believes that it is impossible to disaggregate the roles that demographics, use inducing devices, and automatic aspects of the belt played in the observed increases.

Faced with this level of uncertainty, and the wide margins of possible error, the agency is simply unable to comply with its statutory mandate to consider and conclude that the automatic restraint requirements are at this time practicable or reasonable within the meaning of the Vehicle Safety Act. On the other hand, the agency is not able to agree with assertions that there will be absolutely no increase in belt use as a result of automatic belts. Certainly, while a large portion of the population appears to find safety belts uncomfortable or refuses to wear them for other reasons, there is a sizeable segment of the population that finds belts acceptable but still does not use them. It is plausible to assume that some people in this group who would not otherwise use manual belts would not disconnect automatic belts.

It is this same population that will generate all of the benefits that result directly and solely from this regulation. This is a population that can also be reached in other ways. The Agency, State governments and the private sector are in the process of expanding and initiating major national belt use educational programs of unprecedented scale. While undertaken entirely apart from the pending proceeding, the fact remains that this effort will predominantly affect the same population that the automatic belts would be aimed at.

On the one hand, it could be argued that, the success of any belt use program would only be enhanced by the installation of automatic belts. Individuals who can be convinced of the utility of safety belts would presumably have an easier time accepting an automatic belt. On the other hand, there is little evidence that the standard itself will materially increase usage levels above those otherwise achievable.

However, the agency is not merely faced with uncertainty as to the actual benefits that would result from detachable automatic safety belts. When the uncertain nature of the benefits is considered together with the risk of adverse safety consequences that might result from the maintenance of this regulation, the agency must conclude that such retention would not be reasonable, and would not meet the need for motor vehicle safety.

It is useful to summarize precisely what the agency believes these risks might be. The principal risk is that adverse public reaction could undermine the effectiveness of both the standard itself and future or related efforts.

The agency also concludes, however, that retention would present serious risk of jeopardizing other separate efforts to increase manual belt usage by the Federal government, States and the private sector. A public that believes it is the victim of too much government regulation by virtue of the standard might well resist such parallel efforts to enhance voluntary belt usage. Further, to the extent that States begin to consider belt use laws as an option, a Federal regulation addressing the same issue could undermine those attempts as well.

While one cannot be certain of the adverse effects on net belt usage increases, it would be irresponsible to fail to consider them. A decision to retain the regulation under any of the schedules now being considered would not get automatic belts on the road until 1983 and would not apply to the entire fleet of new cars until 1984. By the end of the 1984 model year, under most options, there would have been fewer than 20 million vehicles equipped with automatic belts on the road.

By the same time, however, there will be upward of 150 million vehicles equipped with only manual belts, drivers and occupants of which will have been exposed to interim belt usage encouragement efforts.

Agency analysis indicates that external efforts of whatever kind that increase usage by only 5 percent, will save more than 1,300 lives per year beginning in 1983. Installation of automatic belts could save an equal number of lives in 1983 only with 95 percent belt usage.

Further, even if one is convinced that automatic belts can double belt usage and alternative efforts would only increase usage by 5 percent, it would not be until 1989 that total life savings attributable to automatic belts installed under the automatic restraint requirements would reach the total life savings achieved through such other efforts.

NHTSA fully recognizes that neither outcome is a certainty. Much closer to the truth is that both outcomes are uncertain. However, neither is significantly more likely than the other. That being the case, to impose the $1 billion cost on the public does not appear to be reasonable.

It is particularly unreasonable in light of the fact that the rescission does not foreclose the option to again reopen rulemaking if enhanced usage levels of both manual and automatic belts do not materialize. Long before there would have been any substantial number of vehicles on the road mandatorily equipped with automatic belts as a result of this standard, NHTSA will conclusively know whether other efforts to increase belt use have succeeded either in achieving acceptable usage levels or in increased public understanding and acceptance of the need for further use-inducing or automatic protection alternatives. If so obviously no further action would be needed. If such is not the case, rulemaking would again be a possibility. Any such rulemaking, following even partially successful efforts to increase belt use, would be much less likely to face public rejection.

It has been said that the Vehicle Safety Act is a "technology-forcing" statute. The agency concurs completely.

However, the issue of automatic restraints now before the agency is not a "technology-forcing" issue. The manual seat belt available in every car sold today offers the same, or more, protection than either the automatic seat belt or the air bag. Instead, the agency today faces a decision to force people to accept protection that they do not choose for themselves. It is difficult to conclude that the Vehicle Safety Act is, or in light of past experience could become, a "people-forcing" statute.

NHTSA cannot find that the automatic restraint requirements meet the need for motor vehicle safety by offering any greater protection than is already available.

After 12 years of rulemaking, NHTSA has not yet succeeded in its original intent, the widespread offering of automatic crash protection that will produce substantial benefits. The agency is still committed to this goal and intends immediately to initiate efforts with automobile manufacturers to ensure that the public will have such types of technology available. If this does not succeed, the agency will consider regulatory action to assure that the last decade's enormous advances in crash protection technology will not be lost.

Impact Analyses

NHTSA has considered the impacts of this final rule and determined that it is a major rulemaking within the meaning of E.O. 12291 and a significant rule within the meaning of the Department of Transportation regulatory policies and procedures. A final regulatory impact analysis is being placed in the public docket simultaneously with the publication of this notice. A copy of the analysis may be obtained by writing to: National Highway Traffic Safety Administration, Docket Section, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590.

The agency's determination that the rule is major and significant is based primarily upon the substantial savings in variable manufacturing costs and in consumer costs that result from the rescission of the automatic restraint requirements. These costs would have amounted to approximately $1 billion once all new cars became subject to the requirements. The costs would have recurred annually as long as the requirements remained in effect. There is also a recurring savings in fuel costs of approximately $150 million annually. Implementation of the automatic restraint requirements would have increased the weight of cars and reduced their fuel economy. In addition, the car manufacturers will be able to reallocate $400 million in capital investment that they would have had to allocate for the purpose of completing their efforts to comply with the automatic restraint requirements.

The agency finds it difficult to provide a reliable estimate of any adverse safety effects of rescinding the automatic restraint requirements. There might have been significant safety loss if the installation of detachable automatic belts resulted in a doubling of belt usage and if the question were simply one of the implementation or rescission of the automatic restraint requirements. The April 1981 NPRM provided estimates of the additional deaths that might occur as a result of rescission. However, those estimates included carefully drafted caveats. The notice expressly stated that the impacts of rescission would depend upon the usage rate of automatic belts and of the effectiveness of the agency's educational campaign. The agency has now determined that there is no certainty that the detachable automatic belts would produce more than a several percentage point increase in usage. The small number of cars that would have been equipped with automatic belts having use-inducing features or with air bags would not have added more than several more percentage points to that amount. Further, any potential safety losses associated with the rescission must be balanced against the expected results of the agency's planned educational program about safety belts. That campaign will be addressed to the type of person who might be induced by the detachable automatic belts to begin regular safety belt usage, i.e., the occasional user of manual belts. Since that campaign will affect occasional users in all vehicles on the road today instead of only those in new cars, the campaign can yield substantially greater benefits than the detachable automatic belts even with a much lower effectiveness level.

The agency has also considered the impact of this action on automatic restraint suppliers, new car dealers and small organizations and governmental units. Since the agency certifies that the rescission would not have a significant effect on a substantial number of small entities, a final regulatory flexibility analysis has not been prepared. However, the impacts of the rescission on the suppliers, dealers and other entities are discussed in the final Regulatory Impact Analysis.

The impact on air bag manufacturers is likely to be minimal. Earlier this year, General Motors, Ford and most other manufacturers cancelled their air bag programs for economic reasons. These manufacturers planned instead to rely almost wholly on detachable automatic belts. Therefore, it is not accurate to say, as some commenters did, that rescission of the automatic restraint requirements will "kill" the air bag. Rescission will not affect the air bag manufacturers to any significant degree. Further, the agency plans to undertake new steps to promote the continued development and production of air bags.

The suppliers of automatic belts are generally the same firms that supply manual belts. Thus, the volume of sales of these firms is not expected to be affected by the rescission. However, there will be some loss of economic activity that would have been associated with developing and producing the more sophisticated automatic belts.

The effects of the rescission on new car dealers would be positive. Due to reduced new car purchase prices and more favorable reaction to manual belts than to automatic belts, sales increases of 395,000 cars were estimated by GM and 235,000 cars by Ford. While these figures appear to be overstated, the agency agrees that rescission will increase new car sales.

Small organizations and governmental units would be benefited by the reduced cost of purchasing and operating new cars. Given the indeterminacy of the usage rate that detachable automatic belts would have achieved, it is not possible to estimate the effects, if any, of the rescission on the safety of persons employed by these groups.

In accordance with the National Environmental Policy Act of 1969, NHTSA has considered the environmental impacts of the rescission and the alternatives proposed in the April 1981 NPRM. The option selected is disclosed by the analysis to result in the largest reductions in the consumption of plastics, steel, glass and fuel/energy. A Final Environmental Impact Statement is being placed in the public docket simultaneously with the publication of this notice.

This amendment is being made effective in less than 180 days because the date on which the car manufacturers would have to make expenditure commitments to meet the automatic restraint requirements for model year 1983 falls within that 180-day period.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), is amended as set forth below.

§ 571.208 [Amended]

1. S4.1.2 is amended by revising it to read:

S4.1.2 *Passenger cars manufactured on or after September 1, 1973.* Each passenger car manufactured on or after September 1, 1973, shall meet the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3. A protection system that meets the requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3.

2. The heading of S4.1.2.1 is amended by revising it to read:

S4.1.2.1 *First option—frontal/angular automatic protection system.*

* * * * * * * * *

3. S4.1.3 is removed.

S4.1.3 [Removed]

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 Stat. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on October 23, 1981.

Raymond A. Peck, Jr.,
Administrator.

46 F.R. 53419
October 29, 1981

Appendix

Editorial

Note—This appendix will not appear in the *Code of Federal Regulations*.

Following is a summary of the major comments submitted in response to the April 9, 1981 notice of proposed rulemaking. A more detailed summary of comments has been placed in NHTSA Docket No. 74-14; Notice 22. This summary is organized in broad terms according to the interest groups from which the comments were received.

Insurance Companies

All commenting insurance companies strongly favored retention of the automatic restraint requirements. Many favored maintaining the present implementation schedule (i.e., September 1, 1982, for large and medium-sized cars and September 1, 1983, for small cars), although several companies stated they would support a change to require that small cars are phased in first or a simultaneous implementation date. Several insurance companies stated that air bags offer the best technology for saving lives and reducing injuries. These companies pointed out that repeated surveys have indicated that consumers appear to favor air bags, even if higher costs are likely. Several insurers argued that a retreat from the standard represents a breach of the Secretary's statutory obligation to reduce traffic accidents and deaths and injuries which result from them. One company argued that a delay in the standard (i.e., the delay and reversal alternative) would produce no measurable economic benefit to car makers and might possibly result in an economic loss to them. Nearly all the companies argued that the standard is cost-beneficial and represents the optimum approach to resolving this country's most pressing public health problem. Many companies stated that reduced insurance premiums resulting from the lives saved and injuries prevented by automatic restraints would help offset the cost of those systems to consumers.

A majority of the insurance companies argued that seat belt use campaigns will not be effective in raising the current use rate of manual belts significantly. The companies pointed to the failures of all past campaigns to have any substantial impact on use rates. On the other hand, these companies believe that the use rate of automatic belts will be significant. The companies point to the current use data for automatic belts on VW Rabbits and Chevettes as evidence that automatic belt use will be significant. The companies believe that seat belt use campaigns should only be complementary to automatic restraints, not a substitute.

Several insurance companies pointed to the huge economic losses resulting from traffic accidents. One company stated that these losses mount to over $1 billion dollars per year and result in recurring costs because of continuing medical problems such as epilepsy and quadriplegia. One company cited Professor William Nordhaus's analysis of the consequences of rescinding the standard as being equivalent to society's loss if the tuberculosis vaccine had not been developed, or if Congress repealed the Clean Air Act. In his submission on behalf of the insurance companies, Professor Nordhaus stated that fatalities will increase by 6,400 each year and injuries by 120,000 if the standard is rescinded. One company argued that the standard is cost-beneficial if automatic belt use rates increase usage only 5 percent. However, this company stated that use rates as high as 70 percent could be expected, and that the costs of rescinding the standard could reach as much as $2 billion dollars per year. This company also argued that the economic condition of the vehicle industry is no excuse for any delay in the standard and is not a statutorily justified reason for rescinding the standard.

Consumer Groups and Health Organizations

There were many consumer groups and health-related organizations which strongly urged that the automatic restraint requirements be maintained and that there be no further delays in the implementation schedule. Most of these groups argued that the cost of both air bags and automatic belts are greatly exaggerated by vehicle manufacturers. One group stated that the three alternative proposals are "naive and exhibit a callous disregard for human lives that flouts the agency's mandated safety mission." This group argued that a worse alternative is to rescind the standard and rely on education programs to increase the use of manual belts, since seat belt campaigns have failed repeatedly in this country. The group stated that the simultaneous implementation alternative in March 1983 ignores the industry's background of introducing safety changes only at the beginning of a new model year. Regarding a reversed phase-in schedule, the group stated that the requirement that small cars have automatic restraints by September 1, 1982, would not likely provide sufficient lead time for small car manufacturers. Additionally, with approximately 2 to 1 difference in seat belt use in small cars versus larger cars, it is not at all clear that the proposed reversal would make up for the delay in implementation in the larger cars in terms of lives saved. The group argued that the best alternative is to maintain the existing implementation schedule.

Several consumer groups argued that the center seating position should not be eliminated from the requirements for several reasons. First, they argued, this position is likely to be occupied by children. Second, the center seat requirement is one factor that will lead to the installation of air bags in some vehicles since current automatic belt designs cannot be applied to the center seat. Nearly all consumer groups argued that benefits of the automatic restraint standard far outweigh the costs.

One association stated that the air bag supplier industry could be forced out of business if substantial modifications and further delays are made to the standard. This would mean, the association argued, that the life-saving air bag technology could be lost forever. The association would support some modifications to the standard if there were some clear commitment by the Department that some car models would be required to offer the consumer the choice of air bags. The group noted that air bag suppliers have indicated that a sufficient production volume would result in air bag systems priced in the $200 to $300 dollar range.

Various health groups and medical experts argued that the pain and suffering resulting from epilepsy and paraplegia, as well as mental suffering and physical disfigurement, could be greatly reduced by the automatic restraint standard. These persons argued that the standard should be implemented as soon as possible.

One consumer oriented group did not support the automatic restraint standard. That foundation argued that the standard is not justified, particularly if it is complied with by means of air bags. The group stated that air bag effectiveness is overestimated since the agency does not include non-frontal crashes in its statistics. The organization argued that in many situations air bags are actually unsafe. This group also argued that the public acceptability of automatic seat belts is uncertain, and that a well-founded finding of additional safety benefits by the Department is required in order to justify retention of the standard.

Vehicle Manufacturers

The vehicle manufacturers, both foreign and domestic, were unanimously opposed to retention of the automatic restraint standard. Most manufacturers stated the predominate means of complying with the standard would be with automatic belts, and that such belts are not likely to increase usage substantially. This is because most automatic belts will be designed to be easily detachable because of emergency egress considerations and to avoid a potential backlash by consumers that would be counterproductive to the cause of motor vehicle safety. The domestic manufacturers argued that the public would not accept coercive automatic belts (i.e., automatic belts with interlocks or some other use-inducing feature). Eliminating any coercive element produces, in effect, a manual belt, which will be used no more than existing manual systems.

The domestic manufacturers also argued that air bags would not be economically practicable and would, therefore, be unacceptable to the public. One manufacturer noted that current belt users will object strenuously to paying additional money for automatic belts that will not offer any more protection than their existing belts.

One manufacturer argued that the injury criteria specified in the standard is not representative of real injuries and should be replaced with only static test requirements for belt systems. The company argued that there are many problems with test repeatability under the 208 requirements.

All manufacturers of small cars stated that it would be impossible for them to comply with the standard by September 1, 1982, i.e., under the reversal proposal. These manufacturers stated that there is insufficient lead time to install automatic restraints in small cars by that date, and several foreign manufacturers stated they would not be able to sell their vehicles in that model year if the schedule is reversed. Most of the manufacturers, both domestic and foreign, stated that it is also too late to install automatic restraints in their small cars even six months earlier than the existing schedule, i.e., under the March 1983 simultaneous implementation proposal. Many manufacturers supported a simultaneous implementation if the standard is not rescinded, but requested that the effective date be September 1, 1983, or later. The manufacturers argued that an effective date for small cars prior to September 1, 1983, would not allow enough time to develop acceptable, reliable and high quality automatic belts.

Nearly all vehicle manufacturers believe that an intensive seat belt education campaign can be just as effective as automatic restraints and without the attendant high costs of automatic restraints. Additionally, most foreign manufacturers recommended that mandatory seat belt use laws be enacted in lieu of automatic restraints.

One foreign manufacturer requested that any effective date for automatic restraints be "September 1 or the date of production start of the new model year if this date falls between September 1 and December 31." The company stated that this would allow manufacturers to continue production for several months of models that would then be phased out of production. However, a domestic vehicle manufacturer argued that this would give foreign manufacturers an unfair competitive advantage, and that current practice of September 1 effective dates should be retained.

Most manufacturers supported the proposal to exclude the center seating position from the automatic restraint requirements, in order to give manufacturers more design flexibility. However, the two domestic manufacturers which would be most affected by such an exception stated that it is too late for them to make use of such an exception for 1983 models. The two companies stated that such an exception would have benefits in the long run, however, and would allow them to continue production of six-seat passenger cars in the mid-1980's.

Suppliers and Trade Groups

Suppliers of air bag system components supported continuation of the automatic restraint requirements. One commenter stated that having to buckle-up is an act which requires a series of psychological and physical reactions which are responsible for the low rate of manual seat belts. Also, this company stated that educational campaigns to increase belt use will not work.

One motor vehicle trade group stated that a study by the Canadian government has established the superiority of manual seat belt systems. This group argued that the automatic restraint requirements cannot be justified because any expected benefits are speculative.

One trade group voiced its concern about sodium azide (an air bag propellant) as it pertains to possible hazards posed to the scrap processing industry.

A group representing seat belt manufacturers stated that the most effective way of guaranteeing belt use is through mandatory belt use laws. That group believes that belt usage can be increased through public education, and that simple, easy to use automatic belts such as are currently on the VW Rabbit will also increase belt usage. This group did not support a simultaneous implementation date for automatic restraints, stating that this could put a severe strain on the supplier industry. The group did support elimination of the automatic restraint requirements for center seating positions.

An automobile association recommended equipping small cars with automatic restraints first. The association stated that a reversed phase-in schedule would protect a significantly large segment of the public at an earlier date, would reduce a foreign competitive advantage (under the existing schedule), and would give needed economic relief to large car manufacturers. This organization also recommended that, as an alternative, automatic restraints be required only at the driver's position. This would achieve three-quarters of the reductions in deaths and serious injuries now projected for full-front seat systems, yet cost only half as much.

Congressional Comments

Mr. Timothy E. Wirth, Chairman of the House Subcommittee on Telecommunications, Consumer Protection and Finance, made the following comments:

—The automatic restraint requirements would produce benefits to society far in excess of costs.

—The Committee findings strongly point to the necessity of requiring the installation of automatic crash protection systems, at a minimum, on a substantial portion of the new car fleet at the earliest possible date. Mr. Wirth suggested that the effective date for small cars be September 1, 1982, and for intermediate and large cars September 1, 1983.

—The economic conditions of the automobile industry should not be relevant to the NHTSA's decision on matters of safety. NHTSA's decision must be guided solely by safety-related concerns.

—The agency should not discount its own findings indicating high use of automatic belts (referring to the existing VW and Chevette automatic belt use data).

In a joint letter to the Secretary, eighteen Congressmen urged that the automatic restraint requirements be maintained. This letter noted that over 50,000 people are killed each year on the highways and stated: "While the tragedy of their deaths cannot be measured in economic terms, the tragedy of their serious injuries cost all of us billions of dollars each year in higher insurance costs, increased welfare payments, unemployment and social security payments and rehabilitation costs paid to support the injured and the families of those who have been killed." The letter stressed the Congressmen's belief that the automatic crash protection standard would produce benefits to society far in excess of its cost.

In a letter addressed to Administrator Peck, fifty-nine Congressmen urged that the automatic restraint standard be rescinded. That letter stated: "The 208 standard persists as one of the more controversial federal regulations to be forced on the automobile industry. . . . The industry continues to spend hundreds of thousands of dollars every day in order to meet this standard, despite considerable evidence that any safety benefits realized by enforcing the standard would be minimal."

Private Citizens

In addition to comments from the above groups and organizations, the agency also received general comments from numerous private citizens. These comments were almost equally divided in their support or opposition to the automatic restraint standard.

Raymond A. Peck, Jr.
Administrator

46 F.R. 53419
October 29, 1981

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 74-14; Notice 24)

ACTION: Final rule; partial response to petitions for reconsideration.

SUMMARY: The purpose of this notice is to delay for one year the effective date of the comfort and convenience requirements for seat belts in Safety Standard No. 208, *Occupant Crash Protection.* Standard No. 208 was amended January 8, 1981, to promote the installation of more comfortable and convenient belts by specifying additional performance requirements for both manual and automatic seat belts installed in motor vehicles with a Gross Vehicle Weight Rating (GVWR) of 10,000 pounds or less. Petitions for reconsideration of these new performance requirements were received from seven vehicle manufacturers.

The agency has determined that the recent rescission of the automatic restraint requirements of Standard 208 has made it necessary to review the comfort and convenience requirements in their entirety. The changed circumstances have made it difficult to respond to the substantive issues raised in the petitions for reconsideration at this time. Since the requirements are currently scheduled to become effective September 1, 1982, the agency has concluded that it is necessary to extend the effective date until September 1, 1983, to give the agency sufficient time to re-evaluate these requirements.

EFFECTIVE DATE: The new effective date for the existing comfort and convenience requirements is September 1, 1983.

SUPPLEMENTARY INFORMATION: On January 8, 1981, Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), was amended to specify performance requirements to promote the comfort and convenience of both manual and automatic safety belts installed in vehicles with a GVWR of 10,000 pounds or less (46 F.R. 2064). Type 2 manual belts (lap and shoulder combination belts) installed in front seating positions in passenger cars were excepted from these additional performance requirements since it was assumed such belts would be phased out in passenger cars as the automatic restraint requirements of Standard No. 208 became effective.

Seven petitions for reconsideration of the January 8, 1981 amendment were received from vehicle manufacturers. These petitions requested that the requirements be revoked entirely, or that at least various modifications be made and that the effective date be delayed.

Since the receipt of these petitions for reconsideration, the agency has revoked the automatic restraint requirements of the standard (46 F.R. 53419, October 29, 1981). This recission alters the circumstances which must be considered in determining appropriate requirements for seat belt comfort and convenience. Therefore, it is difficult for the agency to respond to the substantive issues raised in the petitions for reconsideration at the current time. Many of the issues that were raised are no longer pertinent and many of the rationales discussed by the agency when the requirements were first established must be re-evaluated. Therefore, the agency has determined that the comfort and convenience requirements should be reviewed in their entirety.

In light of these conclusions, the agency has decided that it is necessary to delay the effective date of the current comfort and convenience requirements for at least a year (from September 1, 1982, to September 1, 1983). This will give the agency sufficient time to re-evaluate the requirements and the petitions for reconsideration in light of the changed circumstances. Further, manufacturers should not be required to comply with the requirements by September 1, 1982, since they may be altered substantially.

The agency intends to respond to the substantive issues raised in the petitions for reconsideration at a later date. Moreover, the agency is considering additional changes to the comfort and convenience requirements which would encourage and ensure maximum possible technical improvements and enhancements are included in future seat belt designs.

The NHTSA has considered the economic and other impacts of this one-year delay in effective date and determined that the rule is neither a major rule within the meaning of Executive Order 12291 nor a significant rule within the meaning of the Department of Transportation's regulatory procedures. A regulatory evaluation concerning the one-year delay has been placed in the public docket. This evaluation supplements the regulatory evaluation which was prepared when the regulation was issued in January 1981.

The agency has also analyzed the delay for purposes of the National Environmental Policy Act and has determined that it will not have a significant impact on the quality of the human environment.

No regulatory flexibility analysis has been prepared on this final rule since the proposal underlying this final rule and the January 8, 1981 final rule was issued before the effective date of the Regulatory Flexibility Act.

In consideration of the foregoing, the effective date of the comfort and convience requirements of 49 CFR 571.208 that were issued January 8, 1981 (46 F.R. 2064) is hereby delayed from September 1, 1982 to September 1, 1983.

Issued on February 11, 1982.

Raymond A. Peck, Jr.
Administrator

47 F.R. 7254
February 18, 1982

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Federal Motor Vehicle Safety Standards; Occupant Crash Protection

[Docket No. 74-14; Notice 28]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend the fuel loading test conditions of Safety Standard No. 208, *Occupant Crash Protection.* The amendment is in response to a petition for rulemaking submitted by Mercedes-Benz of North America. Standard No. 208 currently specifies that vehicles are to be crash tested with their maximum capacity of fuel. Several other NHTSA safety standards only require fuel tanks to be filled from 90 to 95 percent of capacity. This amendment makes the fuel loading conditions of Standard No. 208 consistent with these other standards. This change will enable manufacturers to simultaneously determine compliance with several standards during the same crash tests, thereby reducing compliance test costs. In connection with this change, this notice also adds a definition for "fuel tank capacity" to the agency's general definition list in 49 CFR Part 571.3.

EFFECTIVE DATE: October 28, 1982.

SUPPLEMENTARY INFORMATION: The fuel tank loading condition in Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208) differs from that used in several other NHTSA safety standards. Paragraph S8.1.1(a) of Standard No. 208 currently specifies that a passenger car is to be loaded "to its unloaded vehicle weight plus its rated cargo and luggage capacity weight" prior to conducting a barrier crash test. The term "unloaded vehicle weight" is defined in 49 CFR 571.3 as "the weight of a vehicle with maximum capacity of all fluids necessary for operation of the vehicle. . . ." Therefore, under the current test conditions of the standard, fuel tanks are to be filled to 100 percent capacity. The fuel loading conditions of Safety Standards Nos. 301, *Fuel System Integrity*; 212, *Windshield Mounting*; and 219, *Windshield Zone Intrusion*, specify that fuel tanks are only loaded from 90 to 95 percent of capacity.

On January 28, 1982, the agency proposed to amend the loading conditions of Standard No. 208 to make them consistent with those of Standards Nos. 301, 212 and 219 (47 F.R. 4098). The proposed amendment was issued in response to a petition for rulemaking submitted by Mercedes-Benz of North America, which asked that the fuel loading conditions of Standard No. 208 be amended to be consistent with Safety Standard No. 301. Mercedes pointed out that such an amendment would serve to harmonize the two standards and would eliminate the current need for running separate barrier crash tests for the two standards. The company stated that tests being conducted to evaluate occupant crash protection systems yield data which cannot be used to evaluate the integrity of fuel systems because of the variation in fuel tank loading conditions.

Seven parties commented on the proposed change. All of them were vehicle manufacturers which supported lowering the fuel loading conditions of Standard No. 208. All the manufacturers noted that the proposed change would standardize test conditions for the standards employing dynamic crash testing, and would thereby reduce costs. After reviewing these comments, the agency has determined that the standard should be amended as proposed.

As noted in the proposal, the agency believes that filling fuel tanks from 90 to 95 percent capacity for Standard 208 testing will be sufficiently representative of the maximum fuel loading that will occur on the highway. Vehicles are seldom driven with their fuel tanks filled to 100 percent capacity. Moreover, the difference in overall vehicle weight because of the 5 to 10 percent less fuel with this amendment should have no significant effect on the test results of Standard No. 208. Therefore, the change does not significantly reduce the stringency of the standard and realistically maintains the intended purpose of the loading conditions.

The agency also believes it is important to facilitate simultaneous testing for various safety standards, where possible, in order to minimize testing costs. Since Standard Nos. 301, 212, and 219 only require fuel tanks to be loaded from 90 to 95 percent capacity, the agency has determined that Standard No. 208 should be amended to be consistent. In this case, testing costs can be reduced without jeopardizing safety whatsoever.

In its comment, General Motors Corporation suggested that the amendment also include a definition of "fuel tank capacity," so that there will be no questions concerning the proper procedure for filling fuel tanks prior to testing. General Motors' suggestion was prompted by a discussion in the preamble of the proposal concerning what constitutes the "capacity" of a fuel tank. That discussion was included because the agency had previously received several questions asking whether the vapor volume of a fuel tank is included in determining capacity. The discussion clarified the agency's position that "capacity" does not include vapor volume.

The agency believes that General Motors' suggestion has merit. Therefore, a definition for "fuel tank capacity" is added by this amendment to 49 CFR 571.3, the agency's general definition section. The term is defined as the volume of fuel that can be pumped into a previously unfilled tank through the filler pipe with the vehicle on a level surface, but excluding the vapor volume of the tank and the volume of the tank filler pipe. The definition is being added to 49 CFR 571.3, rather than to Standard No. 208, so that it is clear the same term is applicable to all safety standards which specify fuel loading in terms of tank capacity (i.e., Standards Nos. 301, 212, and 219 as well as Standard No. 208).

The agency has determined that this definition can be added to 49 CFR 571.3 without notice and opportunity to comment since it is merely an interpretive amendment and is therefore within the exceptions to rulemaking procedures specified in the Administrative Procedure Act (5 U.S.C. 553 (b) (3) (A)). In fact, the addition of this definition is merely a codification of previous NHTSA interpretations.

Issued on October 5, 1982.

Raymond A Peck, Jr.
Administrator
47 F.R. 47839
October 28, 1982

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

[Docket No. 74-14; Notice 30]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to delay for two years the effective date of the comfort and convenience requirements for seat belts in Safety Standard No. 208, *Occupant Crash Protection.* These requirements were issued January 8, 1981, to promote the installation of more comfortable and convenient belts by specifying additional performance requirements for both manual and automatic belts installed in motor vehicles with a Gross Vehicle Weight Rating (GVWR) of 10,000 pounds or less. The requirements were originally scheduled to become effective September 1, 1982, but in partial response to petitions for reconsideration, and in light of the agency's rescission of the automatic restraint requirements of Standard No. 208, were delayed for one year to September 1, 1983.

The agency has now concluded that a further delay is necessary because of concerns that have arisen within the agency regarding the efficacy and level of stringency of certain of the requirements, and because of the unsettled state of future plans for seat belt designs. The two-year delay set forth in this notice will give the agency sufficient time to complete its review of performance characteristics of restraint design that would lead to enhanced comfort and convenience for users, and to resolve the many questions that have developed regarding particular provisions.

ADDRESS: Any petitions for reconsideration should refer to the docket number and notice number of this notice and be submitted to: Docket Section, Room 5109, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. Docket hours are from 8 a.m. to 4 p.m., Monday through Friday.

DATES: Any petitions for reconsideration of this rule must be received within 30 days after the date of publication of this notice. The new effective date for the seat belt comfort and convenience requirements is September 1, 1985.

SUPPLEMENTARY INFORMATION: On January 8, 1981, Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), was amended to specify additional performance requirements to enhance the comfort and convenience of both manual and automatic safety belts installed in vehicles with a GVWR of 10,000 pounds or less (46 FR 2064). Type 2 manual belts (combination lap and shoulder belts) installed in front outboard seating positions in passenger cars were excepted from these additional requirements because it was then assumed that these belts would be phased out of production in passenger cars as the automatic restraint requirements of Standard No. 208 became effective. However, the agency rescinded the automatic restraint requirements on October 29, 1981 (46 FR 53419). This rescission altered basic assumptions that had been made when the comfort and convenience requirements were first issued. Likewise, it altered the belt designs which manufacturers would be installing in future cars.

In partial response to petitions for reconsideration that were received concerning the comfort and convenience requirements, the agency delayed the effective date of the requirements for one year because of the changed circumstances surrounding the rescission of the automatic restraint requirements (47 FR 7254). The agency noted that it was difficult to respond to the substantive issues raised in the petitions for reconsideration, at that time, because many of the issues are no longer pertinent and because many of the rationales discussed by the agency when the requirements were first established must be re-evaluated.

During the agency's review of the comfort and convenience requirements following the one-year delay, questions arose concerning the efficacy and appropriate level of stringency of certain of the requirements. It became evident that the agency needed additional time to re-evaluate the comfort and convenience requirements in their entirety. Thus, on November 15, 1982, the agency proposed an additional two-year delay, to September 1, 1985 (47 FR 51432).

As noted in the proposal, agency experts have identified concerns about various countervailing safety consequences that could develop depending on the final form of the requirements. For example, tension-relieving devices on belt systems can reduce belt pressure and increase comfort, but there is a concern that the increased belt slack due to misuse could reduce belt effectiveness. The proposal pointed out that the agency must have time to complete its evaluation and resolution of these and other similar conflicting considerations.

Eleven comments were received in response to the proposed two-year delay, and only one of these objected to the proposal. The State of Idaho Transportation Department strongly recommended against a further delay on the basis that this would hinder current national and State level education efforts to encourage the voluntary use of seat belts. All of the vehicle manufacturers which commented vigorously supported the proposed delay, as did the American Seat Belt Council. Three manufacturers, however, urged the agency to delay the requirements indefinitely, rather than to September 1, 1985. These manufacturers agreed that the agency needs additional time to re-evaluate the comfort and convenience requirements in their entirety, but they are concerned that the two-year period proposed would then leave no lead time for manufacturers prior to the effective date. One manufacturer stated, "A new effective date should not be specified before the final requirements are established."

The agency understands the manufacturers' concerns regarding lead time. There were many issues raised in the petitions for reconsideration to which the agency has not yet responded (e.g., objectivity of the requirements, test repeat ability, conflicts with the requirements of other safety standards). However, the agency believes that a specific effective date, September 1, 1985, is preferable to an indefinite delay since it gives all parties, including the agency, a time frame within which to work. The agency will, of course, evaluate whether there is adequate lead time for manufacturers after all the issues have been resolved in this rulemaking, and modify the effective date accordingly if that is necessary.

In spite of the concerns raised by the Idaho Department of Transportation, the agency has concluded that a two-year delay in the effective date of the comfort and convenience requirements is necessary. As noted in the proposal, the issues involved in this proceeding have been clouded in uncertainty since the regulation was first adopted.

Safety belt designs are currently in a state of flux. Therefore, it is not certain exactly what type of restraints will be on the road in the foreseeable future. For this reason, the agency has determined that it would be wise to delay the comfort and convenience requirements, to give the agency sufficient time to re-evaluate the requirements in light of evolving belt systems and avoid imposing possibly unnecessary costs. For example, one commenter to the proposal stated that it had been experimenting with a particular seat belt design for nearly two years and is still uncertain whether the design will consistently meet the somewhat conflicting requirements (in Standard No. 208) for full belt retraction, 0.7 pound chest force limitation and the retractive force requirements of Safety Standard No. 209 (49 CFR 571.209). The agency needs additional time to evaluate these and other similar problems.

Finally, as noted in the proposal, the agency believes that it is impossible at the current time to determine how to achieve or induce effective improvements in the comfort and convenience of belt systems until the occupant crash protection standard can be reviewed in its entirety. The two-year delay will allow the agency time to complete its evaluation of all the current provisions in terms of expected applicabilty, effectiveness, overall safety consequences and appropriate level of detail.

The agency does not believe that this delay will retard the introduction of new improved belt systems, in terms of comfort and convenience. One vehicle manufacturer which commented on the proposal specifically stated that it "plans to proceed voluntarily with a variety of improvements in seat belt comfort and convenience for 1984 and future models regardless of the proposed delay in effective date." The agency encourages other manufacturers to also voluntarily introduce improved comfort and convenience features in their belt designs during this interim period in which the agency is resolving the issues associated with the Standard No. 208 requirements.

The agency has examined the impacts of this amendment and determined that it is not major within the meaning of Executive Order 12291 or significant according to the Department of Transportation regulatory policies and procedures. The agency has prepared a final regulatory evaluation concerning the amendment, which has been placed in the Docket. (A free copy may be obtained by contacting the Docket Section.) That evaluation shows that the safety impact of the proposed delay will not be significant. The precise magnitude of the impact cannot be quantified because the agency has not been able to successfully address in quantified terms the larger question of the effects of the comfort and convenience requirements. That adverse impact will be minimized as a result of the improved seat belt designs that are currently being introduced by manufacturers on a voluntary basis, partly in response to the dialogue generated by the proposal and adoption of the comfort and convenience requirements. The agency believes that manufacturers will experiment further during the two-year delay with innovative designs aimed at increasing the comfort and convenience of belt systems. This effort will at least partially offset any negative impacts that the delay might otherwise cause. The proposed delay will provide slight cost savings for both manufacturers and consumers.

NHTSA has also considered the impacts of this amendment under the Regulatory Flexibilty Act. I hereby certify that amending Standard No. 208 to delay the effective date of the comfort and convenience requirements will not have significant economic impact on a substantial number of small entities for the reasons just discussed. The only small entities that would be affected would be small manufacturers or small organizations or governmental units that purchase vehicles. The effect would not be significant since the cost savings made possible by the delay would be slight.

Issued on May 27, 1983

Diane K. Steed,
Acting Administrator.

48 F.R. 24717

June 2, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection; Automatic Occupant Restraint Requirement

[Docket No. 74-14; Notice 31]

ACTION: Suspension of rule.

SUMMARY: This notice suspends the automatic occupant restraint requirements of Safety Standard No. 208. Occupant Crash Protection. This action permits the agency time for the further review contemplated by the recent Supreme Court decision that found NHTSA's rescission of the requirement to be arbitrary and capricious. This suspension is issued without a prior opportunity for notice and comment; the rule might otherwise be deemed effective on September 1, 1983. However, public comment on the suspension is requested and the suspension will be revised or revoked, if appropriate, in response to the comments received.

DATES: *Suspension*—The mandatory automatic restraint requirement of Standard No. 208 is suspended until September 1, 1984. This suspension is effective on September 1, 1983.

SUPPLEMENTARY INFORMATION: On October 29, 1981 (49 FR 53419), the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) published a notice rescinding the automatic restraint requirements of Safety Standard No. 208, Occupant Crash Protection. (The language of Standard 208 as it was codified prior to the rescission is contained in Appendix A to this notice.) On June 1, 1982, the U.S. Court of Appeals for the D.C. Circuit found the agency's action to be arbitrary and capricious and overturned the agency's action. *(State Farm Mutual Automobile Insurance Co.* v. *Department of Transportation,* 680 F.2d 206.) On August 4, 1982, the Court of Appeals issued an order staying the effective date of the requirement until September 1, 1983.

In June 1983, the United States Supreme Court rejected the scope of review used by the lower court, but also found the rescission to be arbitrary and capricious. The Supreme Court vacated the judgment of the Court of Appeals and remanded the case to that Court with directions to remand it to NHTSA for further consideration consistent with the Supreme Court's opinion. *(Motor Vehicle Manufacturers Association* v. *State Farm Mutual Automobile Insurance Co.* (No. 82-354; June 24, 1983)).

Because the Supreme Court vacated the judgment of the Court of Appeals, it could be argued that the rescission of the automatic restraint requirement technically continues in effect pending the further agency review contemplated by the Supreme Court. However, if that were not the case, compliance with the rule could be considered to be required by September 1, 1983. In order to clarify this situation, the Department has determined that it is appropriate to issue this notice suspending the effect date of the requirement.

The Suprement Court stated that the agency has sufficient justification to suspend Standard 208 pending any further consideration in accordance with the Court's decision. The Department believes that further consideration is necessary and, as part of our review efforts, it is our intention to issue a notice of proposed rulemaking (NPRM) by October 15, 1983. We intended to expedite this rulemaking and reach a final decision as quickly as possible and well before the end of the one-year suspension. At that time, we will establish an appropriate effective date either for the rule that was rescinded, if we decide to retain it, or for any other action that we take, including re-rescission of the rule.

We believe that it would be inappropriate to require compliance with the rule during this short review period. Neither consumers nor manufacturers should be required to incur additional expenses to comply with a requirement that is being actively reviewed.

Moreover, there is substantial evidence showing that a September 1, 1983, effective date is not practicable. After the D.C. Circuit entered its of August 4, 1982, reinstating the automatic restraint requirement on September 1, 1983, NHTSA obtained current information from vehicle and automatic restraint equipment manufacturers concerning their ability to comply with a September 1, 1983, effective date. After reviewing and analyzing the letters and affidavits submitted by the manufacturers, NHTSA concluded, in an October 1, 1982, submission to the D.C. Circuit Court, that a September 1, 1983, effective date was not achievable at that time and that a significantly longer time period would be needed before practicable compliance with the automatic restraint requirements could be achieved. Based on that data, the Department has concluded that it would not be practicable for vehicle manufacturers to comply with the September 1, 1983, requirement because there is not sufficient leadtime for them to make all the necessary design, development, testing, and production preparations by that date.

Because it is not practicable for the manufacturers to comply by September 1, 1983, the Department also has determined that notice and public procedure on this notice of suspension are impracticable, unnecessary, and contrary to the public interest. The recency of the Supreme Court decision and the imminence of the deadline for compliance with the rule justify this determination. We wish to stress, however, that we are providing an opportunity for public comment on this suspension immediately subsequent to its issuance. After reviewing the public comment that is recieved, the Department will determine whether this suspension should be revised or revoked and we will issue a document stating our final decision.

This suspension may be made effective immediately upon publication in the **Federal Register** because it relieves a restriction.

This suspension is a major action within the meaning of Executive Order 12291 and a significant action under the Department's Regulatory Policies and Procedures. The benefits and costs of the automatic restraint requirements have been carefully reviewed in the prior final regulatory impact analysis dated October 1981, which has been placed in the docket for the automatic restraint rulemaking. That analysis also provides an assessment of the impact of this suspension. The prior regulatory impact analysis also discusses the impact of the rescission of the automatic restraint requirements on small businesses and governmental entities. Based on that prior analysis, I hereby certify that this suspension will not have a significant economic impact on a substantial number of small entities. The Department has also evaluated this suspension in accordance with the National Environmental Policy Act and has determined that this action is not a major Federal action significantly affecting the quality of the human environment.

Issued in Washington, D.C. on August 30, 1983.

James H. Burnley, IV,
Acting Secretary of Transportation

Appendix A

The text of S4.1.3 of Standard No. 208, *Occupant Crash Protection,* (49 CFR Part 571.208) that was rescinded on October 29, 1981 (46 FR 53419) reads as follows:

S4.1.3 *Passenger cars manufactured on or after September 1, 1983.* Each passenger car manufactured on or after September 1, 1983 shall—

(a) At each front designated seating position meet the frontal crash protection requirements of S5.1 by means that require no action by vehicle occupants;

(b) At each rear designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and S7.1 and S7.2; and

(c) Either—

(1) Meet the lateral crash protection requirement of S5.2 and the roll-over crash protection requirements of S5.3 by means that require no action by vehicle occupants; or

(2) At each front designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and S7 through 7.3, and meet the requirements of S5.1 with front test dummies as required by S5.1, restrained by the Type 1 or Type 2 seat belt assembly (or the pelvic portion of any Type 2 seat belt assembly which has a detachable upper torso belt) in addition to the means that require no action by the vehicle occupant.

48 F.R. 39908
September 1, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

[Docket No. 74-14; Notice No. 36]

ACTION: Final Rule

SUMMARY: This rule requires the installation of automatic restraints in all new cars beginning with model year 1990 (September 1, 1989) unless, prior to that time, State mandatory belt usage laws are enacted that cover at least two-thirds of the U.S. population. The requirement would be phased in by an increasing percentage of production over a 3-year period beginning with model year 1987 (September 1, 1986). To further encourage the installation of advanced technology, the rule would treat cars equipped with such technology other than automatic belts as equivalent to 1.5 vehicles during the phase-in.

DATES: The amendments made by this rule to the text of the *Code of Federal Regulations* are effective August 16, 1984.

The principal compliance dates for the rule, unless two-thirds of the population are covered by mandatory use laws, are:

September 1, 1986 — for phase-in requirement.

September 1, 1989 — for full implementation requirement.

In addition:

February 1, 1985 — for center seating position exemption from automatic restraint provisions.

SUMMARY OF THE FINAL RULE

After a thorough review of the issue of automobile occupant protection, including the long regulatory history of the matter; the comments on the Notice of Proposed Rulemaking (NPRM) and the Supplemental Notice of Proposed Rulemaking (SNPRM); the extensive studies, analyses, and data on the subject; and the court decisions that have resulted from law suits over the different rulemaking actions, the Department of Transportation has reached a final decision that it believes will offer the best method of fulfilling the objectives and purpose of the governing statute, the National Traffic and Motor Vehicle Safety Act. As part of this decision, the Department has reached three basic conclusions:

- Effectively enforced State mandatory seatbelt use laws (MULs) will provide the greatest safety benefits most quickly of any of the alternatives, with almost no additional cost.
- Automatic occupant restraints provide demonstrable safety benefits, and, unless a sufficient number of MULs are enacted, they must be required for the most frequently used seats in passenger automobiles.
- Automatic occupant protection systems that do not totally rely upon belts, such as airbags or passive interiors, offer significant additional potential for preventing fatalities and injuries, at least in part because the American public is likely to find them less intrusive; their development and availability should be encouraged through appropriate incentives.

As a result of these conclusions, the Department has decided to require automatic occupant protection in all-passenger automobiles based on a phased-in schedule beginning on September 1, 1986, with full implementation being required by September 1, 1989, unless, before April 1, 1989, two-thirds of the population of the United States are covered by MULs meeting specified conditions. More specifically, the rule would require the following:

- Passenger cars manufactured for sale in the United States after September 1, 1986, will have to have automatic occupant restraints based on the following phase-in schedule:
  - Ten percent of all automobiles manufactured after September 1, 1986.
  - Twenty-five percent of all automobiles manufactured after September 1, 1987.
  - Forty percent of all automobiles manufactured after September 1, 1988.
  - One hundred percent of all automobiles manufactured after September 1, 1989.
- The requirement for automatic occupant restraints will be rescinded if MULs meeting specified conditions are passed by a sufficient number of States before April 1, 1989 to cover two-thirds of the population of the United States.
- During the phase-in period, each passenger automobile that is manufactured with a system that provides automatic protection to the driver without automatic belts will be given an extra credit equal to one-half of an automobile toward meeting the percentage requirement.
- The front center seat of passenger cars will be exempt from the requirement for automatic occupant protection.
- Rear seats are not covered by the requirements for automatic protection.

BACKGROUND

INTRODUCTION

The Supreme Court Decision

On October 23, 1981, the National Highway Traffic Safety Administration (NHTSA) issued an order pursuant to section 103 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, amending Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208; "FMVSS 208"), by rescinding the provisions that would have required the front seating positions in all new cars to be equipped with automatic restraints (46 FR 53419; October 29, 1981).

On June 24, 1983, the Supreme Court held that NHTSA's rescission of the new automatic restraint requirements was arbitrary and capricious. *Motor Vehicle Manufacturer's Association* v. *State Farm Mutual Automobile Insurance Co.*, 103 S.Ct. 2856. The agency had rescinded because it was unable to find that more than minimal safety benefits would result from the manufacturers' plans to comply with the requirement through the installation of automatic belts. In particular, the Court found the agency had failed to present an adequate basis and explanation for rescinding the requirement. The Court also stated that the agency must either consider the matter further or adhere to or amend the standard along the lines that its "reasoned analysis" and explanation supports.

By a five to four vote, the Court held that the agency had been too quick in dismissing the benefits of detachable automatic belts. The Court stated that the agency's explanation of its rescission was not sufficient to enable the Court to conclude that the agency's action was the product of reasoned decision making. The Court found that the agency had not taken account of the critical difference between detachable automatic belts and current manual belts. "A detached passive belt does require an affirmative act to reconnect it, but—unlike a manual seatbelt, the passive belt, once reattached, will continue to function automatically unless again disconnected."

The Court unanimously found that, even if the agency was correct that detachable automatic belts would yield few benefits, that fact alone would not justify rescission. Instead, it would justify only a modification of the requirement to prohibit compliance by means of that type of automatic restraint. The Court also unanimously held that having concluded that detachable automatic belts would not result in significantly increased usage, NHTSA should have considered requiring that automatic belts be continuous (i.e., nondetachable) instead of detachable, or that FMVSS 208 be modified to require the installation of airbags.

The 1983 Suspension

On September 1, 1983, the Department suspended the automatic restraint requirement for 1 year to ensure that sufficient time was available for considering the issues raised by the Supreme Court's decision (48 FR 39908).

The NPRM

On October 14, 1983, the Department issued a notice of proposed rulemaking (NPRM) (48 FR 48622) asking for comment on a range of alternatives, including the following:

- *Retain the automatic occupant protection requirements of FMVSS 208.* Under this alternative, the substantive automatic occupant protection requirement of FMVSS 208 would be retained, but a new compliance date would have to be established. Compliance could be any type of automatic restraint, including detachable belts.

- *Amend the automatic occupant protection requirements of FMVSS 208.* Numerous alternatives were proposed. For example, an amendment could require compliance by airbags only or by airbags or nondetachable automatic belts only. Subalternatives included automatic protection for the full front seat, the outboard seating positions, or the driver only. An additional alternative would have required that cars be manufactured with an airbag retrofit capability.
- *Rescind the automatic occupant protection requirements of FMVSS 208.* The Department could again rescind the requirements if its analysis led it to that conclusion. The Supreme Court decision does not bar rescission after the Department "consider[s] the matter further."

The NPRM also proposed other actions that could be taken in conjunction with, or as a supplement to, the above alternatives. They were as follows:

- *Conduct a demonstration program.* Such a program could be along the voluntary lines suggested by Secretary Coleman in 1976 and would be accompanied by a temporary suspension of FMVSS 208's automatic occupant protection requirements. It would be designed to acquaint the public with the automatic restraint technologies so as to reduce the possibility of adverse public reaction and to obtain additional data to refine effectiveness estimates.
- *Seek mandatory State safety belt usage laws.* The Department could seek Federal legislation that would either establish a seatbelt use requirement or provide incentives for the States to adopt and enforce such laws. If large numbers of persons wore existing manual belts, there would be less need for automatic restraints.
- *Seek legislation mandating consumer option.* Under this alternative, the Department would seek Federal legislation requiring manufacturers to provide consumers the option of purchasing any kind of restraint system: airbag, automatic belt, or manual belt.

Following the issuance of the NPRM, the Department held public meetings in Los Angeles, Kansas City, and Washington, D.C. One hundred fifty-two people testified at these hearings. The public comment period on the NPRM closed on December 9, 1983. The Department received over 6,000 comments on that NPRM by the close of the comment period. Since then, the Department has received an additional 1,800 comments. Some of these comments raised issues or led to the identification of other alternatives on which the Department wanted to receive further public comment.

The SNPRM

As a result of the desire for additional public comment, the Department issued a supplemental notice of proposed rulemaking (SNPRM) on May 10, 1984 (49 FR 20460).

The SNPRM asked for comment on issues involving the following areas: the public acceptance of automatic restraints, the usage rates and the effectiveness of the various restraint systems, the benefits that would be derived from the various alternative means of protecting automobile front seat occupants, including potential insurance premium savings, and the testing procedures that would be required for automatic restraints. The SNPRM also sought comment on four additional proposed alternatives for occupant crash protection:

- *Automatic restraints with waiver for mandatory use law States.* Under this proposal, automatic restraints would be required in all cars manufactured after a set date, but this requirement would be waived for vehicles sold to residents of a State which had passed a mandatory safety belt use law (MUL).
- *Automatic restraints unless three-fourths of States pass mandatory use laws.* Under this proposal, automatic restraints would be required in all cars manufactured after a set date, unless three-fourths of the States had passed mandatory use laws before that date.
- *Mandatory demonstration program.* This alternative involves a mandatory demonstration program, which was suggested by the Ford Motor Company. Each automobile manufacturer would be required to equip an average of 5 percent of its cars with automatic restraints over a 4-year period.
- *Driver's-side airbags in small cars.* Under this alternative, airbags would be required only for small cars and only for the driver's position in those cars.

The comment period on the SNPRM closed on June 13, 1984. The Department received over 130 comments.

The Statute

Pursuant to the National Traffic and Motor Vehicle Safety Act of 1966, as amended, the Department of Transportation is directed to "reduce traffic accidents and deaths and injuries to persons resulting from traffic accidents." The Act authorizes the Secretary of Transportation to issue motor vehicle safety standards that "shall be practicable, shall meet the need for motor vehicle safety, and shall be stated in objective terms." In issuing these standards, the secretary is directed to consider "relevant available motor vehicle safety data," whether the proposed standard "is reasonable, practicable and appropriate for the particular type of motor vehicle. . . for which it is prescribed," and the "extent to which such standards will contribute to carrying out the purposes" of the Act.

The Safety Problem

Occupants of front seats in passenger cars account for almost half of the deaths that occur annually in motor vehicle accidents (including pedestrian fatalities). In recent years (1981-83), an average of approximately 22,000 persons have been killed annually in the front seats of passenger cars; another 300,000 suffered moderate to severe injuries and more than 2 million had minor injuries. Approximately 55 percent of these fatalities and injuries occur in frontal impacts and another 25 percent occur in side impacts. Table 1 shows the number of fatalities, by seating position, for 1975-1982, while Table 2 shows data for injuries, by severity and seating position, for 1982, the latest year for which such a breakdown is available. Table 3 provides estimates of similar data for 1990 to illustrate the impact of any rulemaking. For the 1990 data, it was assumed (for purposes of this rulemaking analysis only) that manual belt usage rates would remain the same as current rates.

To fully understand the benefits of various occupant restraint systems, it is helpful to recognize the frequency with which various front seating positions are used in cars involved in injury-producing accidents. As Tables 1 and 2 illustrate, three-fourths of all front seat occupant fatalities and serious injuries are experienced by drivers and almost all of the remainder are passengers in

TABLE 1
FRONT SEAT PASSENGER CAR FATALITIES WITH KNOWN SEATING POSITION

	Driver	Front Middle	Front Right	Other Front	Total
1975	16,270	644	5,601	21	22,536
Percent	72.2	2.9	24.8	0.1	100
1976	16,375	602	5,714	24	22,715
Percent	72.1	2.7	25.1	0.1	100
1977	16,967	577	5,992	14	23,550
Percent	72.0	2.5	25.4	0.1	100
1978	18,224	627	6,180	16	25,047
Percent	72.7	2.5	24.7	0.1	100
1979	18,267	513	5,968	6	24,754
Percent	73.8	2.1	24.1	—	100
1980	17,966	526	6,012	9	24,513
Percent	73.3	2.2	24.5	—	100
1981	17,722	460	5,844	6	24,032
Percent	73.8	1.9	24.3	—	100
1982	15,225	373	5,202	16	20,816
Percent	73.1	1.8	25.0	0.1	100

TABLE 2
DISTRIBUTION OF FRONT SEAT PASSENGER CAR OCCUPANT INJURIES BY SEVERITY LEVEL

Injury Severity	Driver	Front Middle	Front Right	Other Front	Total
Minor	1,388,519	29,914	515,786	2,526	1,936,745
Moderate	187,660	6,467	47,417	1,604	243,148
Serious	45,627	289	16,100	0	62,016
Severe	5,592	0	2,411	0	8,003
Critical	3,233	0	728	0	3,961
Percent of Minor Injuries	71.7	1.5	26.6	0.2	100.0
Percent of Moderate to Critical Injuries	76.3	2.1	21.0	0.6	100.0

the right outboard seat. Thus, automatic protection is likely to have three times the level of benefits for drivers as for front seat passengers. Additionally, not only are occupants of the center seat rarely involved in fatal or injury-producing crashes, but their involvement is declining as shown in the tables. This decline is thought to be occurring, at least in part, because of the decline in the number of automobiles manufactured with bench-style front seats.

TABLE 3
PROJECTIONS OF FATALITIES AND INJURIES FOR 1990

	Driver	Front Middle	Front Right	Total
Fatalities	18,050	370	6,140	24,560
Percent	73.5	1.5	25.0	100.0
Moderate to Critical Injuries	290,000	5,000	75,000	370,000
Percent	78.5	1.5	20.0	100.0
Minor Injuries	2,110,000	40,000	800,000	2,950,000
Percent	71.5	1.5	27.0	100.0

Current Occupant Restraint Technology

Manual belts

Manual belts are safety belts that will provide protection in a crash in the occupant places the belt around himself or herself and attaches it. Manual belts can come in two types: lap belts that fit around the pelvic region and combined lap and shoulder belts, which are found in the majority of all new cars sold today. Manual shoulder belts are equipped with inertial reels that allow the belt webbing to play out so that the occupant can reach forward freely in the occupant compartment under normal conditions, but lock the belt in place if a crash occurs. To remind occupants to use their belts, FMVSS 208 requires the installation of a brief (4-8 seconds) audible and visible reminder.

Automatic belts

The automatic belt is similar in many respects to a manual belt but differs in that it is attached at one end between the seats in a two front seat car and at the other end to the interior of the door or, in the case of a belt with a motorized anchorage, to the door frame. The belt moves out of the way when the door is opened and automatically moves into place around the occupant when the door is closed. Thus, the occupant need take no action to gain the protective benefits of the automatic belt.

Automatic belts differ significantly in their design. Some designs consist of a single diagonal shoulder belt (2-point belt) with a knee bolster located under the dashboard to prevent the occupant from sliding forward under the belt. Other designs include both a lap and a shoulder belt (3-point belt).

The designs differ also in the features and devices included to encourage belt use by motorists and at the same time allow for emergency egress if the car door cannot be opened following a crash. Several designs are described below.

One design takes advantage of the opportunity for the manufacturer to include, on a strictly voluntary basis, an ignition interlock. The belt in that design detaches from the door, but must be reattached before the car can be started the next time. This type of automatic belt (2-point belt with knee bolster) has been installed in more than 390,000 Volkswagen (VW) Rabbits over an 8-year period beginning in 1975. It was also installed on a small number 1978-79 General Motors (GM) Chevettes. It is still available as an option on Rabbits.

Another design is similar in that the belt detaches, but there is no ignition interlock. The belt may be detached and left that way without affecting the starting of the car. This was the type of automatic belt that most manufacturers had planned to use in complying with the automatic restraint requirement before the agency issued its rescission order. It was briefly offered by General Motors as a consumer option on a Cadillac model.

A third type of automatic belt is a continuous belt that does not detach at either end. Some continuous belts use a spool release, which plays out additional webbing length. Sufficient slack is created by an emergency release lever so that the motorist can lift the belt out of his or her way and exit in an emergency. Another type of continuous belt with a spool release mechanism is the motorized belt. The belt's outer anchorage is not fixed to the door but runs along a track in the interior side of the door's window frame. When the door is opened, the anchorage moves forward along the track, pulling the belt out of the occupant's way. When the door is closed, the process is reversed so that the belt is placed around the seated occupant. This type of continuous belt, which is a two-point system with a knee bolster *and* which contains a manual lap belt, has been installed in all Toyota Cressidas for the last several model years and enhances occupant ingress and egress.

Another type of continuous belt was installed on a small number of 1980 Chevettes. The belt consisted of a single length of webbing that passed through a ring near the occupant's inboard hip and served both as a lap and shoulder belt. The end of the lap belt that was connected to the lower rear corner of the door could be detached from door. However, the end could not be pulled through the ring. Thus, the effect of detaching the lap belt was to create an elongated shoulder belt. The extra slack in the belt system enabled occupants to get out of their belt in the event of an emergency.

Airbags

Airbags are fabric cushions that are very rapidly inflated with gas to cushion the occupant and prevent him or her from colliding with the vehicle interior when a crash occurs that is strong enough to trigger a sensor in the vehicle. (Generally, the bag will inflate at a barrier equivalent impact speed of about 12 miles per hour.) After the crash, the bag quickly deflates to permit steering control or emergency egress.

In 1973-76, General Motors produced approximately 11,000 full-sized Chevrolets, Buicks, Oldsmobiles, and Cadillacs equipped with airbags. During the same period, Ford installed airbags in 831 Mercurys. A small number were installed in Volvos also. Today, only a single manufacturer, Mercedes Benz, is offering airbags in the United States. That company began offering airbag-equipped cars in the country beginning with the 1984 model year; it has been selling airbag cars outside the United States since late 1980. Since then, it has sold approximately 22,000 of those cars worldwide, with most sales occurring within the last year or so. GSA has contracted with Ford Motor Company to build 5,000 cars equipped with driver's side airbags. Delivery on these cars is expected to begin in Model Year 1985.

Other Automatic Occupant Protection Technologies

The automatic occupant protection provisions of FMVSS 208 do not specify that particular technologies, such as automatic belts or airbags, be used to comply with the standard. Rather, the standard requires a level of safety performance that can be met by any technology chosen by the manufacturer. Although safety belts and airbags are the most widely discussed technologies, the use of "passive interiors" as a means of compliance is also generating interest.

Under this approach, improvements are made to the vehicle structure, steering column, and interior padding so as to minimize potential occupant injuries. Thus, a "restraint" system, of any kind, is unnecessary for occupant protection in frontal crashes. GM has been actively pursuing "passive interiors."

SUMMARY OF THE PUBLIC COMMENTS

INTRODUCTION

In this section of the preamble we have summarized the public comments on the Department's October 19, 1983, NPRM and the May 14, 1984, SNPRM. We have presented the summaries under headings that generally relate to the headings used in the subsequent portions of the preamble. Some of the comments are very generally stated and may relate to more than one issue. Because of the large number of public comments, we have provided a representative sample of the comments made and the commenters who made them. Subsequent portions of the preamble discuss the issues and alternatives and present the Department's position and response to the public comments. The comments are analyzed and responded to in more detail in the Department's Final Regulatory Impact Analysis (FRIA).

OCCUPANT PROTECTION SYSTEMS

Usage

Vehicle manufacturers generally agreed that mandating automatic belts would increase usage initially. However, based on their expectation of installing detachable automatic belts if required to install some type of automatic protection, some car manufacturers generally predicted that use would fall close to the current levels for manual belts once the belts were disconnected for the first time. GM believes this to be true for detachable automatic belts, and for nondetachable automatic belts as well. Honda also believes that, while there would be an initial increase in restraint usage if automatic belts were mandated, long-term usage of automatic belts might not be higher than current usage of manual belts. The key determinants would be the comfort and convenience of automatic belts. The other manufacturers believed that automatic belts would probably produce some small usage increase. Chrysler stated that usage for automatic belts would be less than 10 percentage points higher than current usage for manual belts. Ford commented that the use of nondetachable automatic belts would initially be higher than the usage level for detachable automatic belts, but that over the long term it would fall to the same level. Ford said further that occasional belt users would use automatic belts more often than they currently use their manual belts, but the overall level of usage would not significantly rise.

The car manufacturers generally believe that nondetachable automatic belts would not be practicable since consumers would object strongly to them and, therefore, would defeat and possible disable them. The manufacturers concluded that there would be little or no increase in usage over manual belt rates.

The Pacific Legal Foundation (PLF) said that mechanically compelled use by unwilling occupants would be no more likely to succeed than legally compelled use by such persons.

On the other hand, the American Seat Belt Council (ASBC) believes that usage of automatic belts would be 50 percent, which is roughly halfway between the current driver usage of 14 percent for manual belts and 80 percent for automatic belts with ignition interlocks. Professor William Nordhaus of Yale University believes that use of automatic belts would increase by 33 percentage points. John Graham of Harvard University found that expert opinion varies on the extent to which automatic belts would increase usage. His survey of seven experts found that detachable automatic belts would increase usage by 10 percentage points with an 80 percent confidence interval of 5 to 40 percentage points.

The issue of use inducing features or reminder mechanisms was raised by several commenters. ASBC believes that a continuous buzzer could double usage, and that buzzers, chimes and lights would all increase usage over levels that could be observed in vehicles without such features. VW stated that a continuous buzzer might be as effective as an interlock. On the other hand, Ford stated that while a continuous buzzer would induce some nonusers to wear their safety belts, driver irritation and actions to permanently defeat the system could also be anticipated.

Effectiveness

Manual Belts

The vehicle manufacturers generally stated that current manual lap and shoulder belts are more effective (when used) than either automatic belts or airbags. However, the combination of an airbag and manual lap and shoulder belts was acknowledged to be the most effective system of all.

The Automobile Importers of America (AIA) estimated manual belt effectiveness at 50 percent. Honda expressed the view that, based upon results of its 35 mile per hour crash testing, manual belts may be more effective than airbags in terms of chest acceleration and femur load injury criteria.

Most commenters on the SNPRM believed that the agency's range of effectiveness estimates for manual belts is too low. ASBC concluded that the estimate is too low because the agency estimate of lives saved from manual belt usage is approximately half the value previously cited by the agency. Renault argued that manual belt effectiveness data should not be adjusted to account for the presumably more cautious driving behavior of belt users, since belt use may lead some individuals to drive faster in the belief that they are better protected. VW provided a procedure for calculating manual belt effectiveness from NHTSA's Fatal Accident Reporting System (FARS) data, which led to a very high effectiveness estimate. Ford concluded that the agency's analysis would support a higher range of manual belt effectiveness (50-60 percent). Ford also challenged agency conclusions that manual belts are more effective in preventing moderate to serious injuries than fatalities and that manual belts are not likely to be effective in accidents involving a velocity change of over 35 miles per hour.

Automatic Belts

The manufacturers stated that automatic belts may be less effective than manual belts. Similarly, the National Automobile Dealers Association (NADA) argued that automatic belts may be less effective than current manual belts if the automatic belt is attached to the door. VW and State Farm disagreed, saying that automatic belts are as effective as manual belts.

Volvo argued that nondetachable automatic belts may be less effective than detachable automatic belts due to a "film spool effect." This effect may occur in 1-door models, if the amount of webbing must be increased to allow entrance of passengers into the rear seat area.

The Insurance Institute for Highway Safety (IIHS) criticized the agency's effectiveness estimates for automatic belts, saying there was no support for the agency's conclusion that such belts, compared with manual belts, may increase the probability of occupant ejection. IIHS also suggested that the agency consider data that show that automatic belts may reduce the probability of the occurrence of head injuries. VW also challenged the conclusion that automatic belts could permit higher rates of occupant ejection. Ford argued that the agency should use a range instead of a point estimate for the fatality reduction of automatic belts. Ford also questioned the agency's conclusion that 3-point automatic belts should be as effective as manual belts, due to the lack of data supporting such a conclusion and the fact that manual belts can be more securely adjusted than automatic belts.

Professor William Nordhaus criticized the agency's adjustment of automatic belt effectiveness data to account for the lower accident experience of drivers who had elected to use belts as compared to nonusers of safety belts. The agency had concluded that as increasing numbers of current nonusers of manual belts were brought into the population of automatic belt wearers, the overall effectiveness of automatic belts would be decreased. Professor Nordhaus argued that the agency overestimated the magnitude of this effect. Professor Nordhaus also argued that automatic belts need not be less effective than current manual belts. In making this argument, he relied on agency crash test data and somewhat different data than those found by the agency to be most probative.

Airbags

Many consumer groups and health organizations indicated their belief that the reliability and effectiveness of airbags has been researched and tested to a far greater extent than any other item of vehicle safety equipment, and that the effectiveness of these devices is "unquestionable."

Allstate stated that airbags are more effective than belts in protecting against head and facial injuries. That company stated that while some of the dummies wearing belts "survive" 35 mph crashes under the injury test criteria, they sustained head and facial injuries far in excess of those produced with airbags at comparable speeds. Allstate noted, also, that belts were not dynamically tested as automatic restraints would be. Citing its field experience, Allstate said that airbags are effective not only in reducing deaths and injuries in frontal crashes but also in reducing injuries in side impact crashes. Allstate challenged the accurancy of the agency's NPRM estimate of airbag effectiveness, pointing out that that analysis was based on the use of restraint technology that is more than 10 years old. Allstate noted that GM itself had admitted that that technology was "obsolete." IIHS stated that, based on its analysis, airbags should be at least 34 percent effective in reducing fatalities.

Ford argued that the number of airbag cars that have been produced to date is too small to adequately answer questions about effectiveness.

PLF expressed the view that the agency really had no evidence that airbags are effective. That group argued that the agency erred in saying that the effectiveness of airbags is probably understated in the field data. According to PLF, DOT cannot know about all of the fatalities that have occurred in accidents involving airbag equipped cars. The group stated that the Department's estimate of airbag effectiveness is overstated to the extent that there are such undetected fatalities. Further, the group believes that the claim of the agency in the Preliminary Regulatory Impact Analysis (PRIA) that the large size of the cars equipped with airbags leads to an understating and obscuring of the potential effectiveness of airbags in smaller size cars is no more reasonable a conclusion than one that the large size of these cars masks the deficiencies of airbags by offering greater protection to out-of-position occupants and allowing longer deployment times for airbags. This group also asked DOT to provide an updated analysis of injury data for the fleet of airbag cars.

The National Head Injury Foundation stated that the airbag offers unique protection against head injury which even the automatic belt does not.

PLF and VW suggested that the presence of airbags might induce drivers to take greater risks while driving in reliance on the perceived increased protection. PLF argued that these increased risks could easily offset any gains in protection available as a result of the airbags. Professor Orr of Indiana University raised the same point, arguing that the "risk compensation" theory is sound but that the magnitude of its effect was unknown. IIHS submitted a study showing that the implementation of a safety belt use law in a Canadian province did not result in any increased risk taking by drivers. The study looked at the frequency with which certain risky maneuvers were made before and after the law was implemented and found no significant difference. John Graham stated that, based on several studies he has undertaken, any risk-compensation effect is significantly lower than the magnitude of benefits derived from the safety improvements.

Several vehicle manufacturers expressed their view that an airbag is relatively ineffective by itself, and should be viewed as a supplement to a belt system. The Motor Vehicle Manufacturers Association (MVMA) emphasized its view that airbags are effective in frontal crashes only.

In their SNPRM comments, several commenters addressed the agency's estimated range of effectiveness for airbags. IIHS concluded that the range is conservative but not unreasonable at the middle and high ends. They cautioned, however, that it would be inappropriate to compare the effectiveness of airbags in relation to safety belts by using the low end of the airbag effectiveness range and the middle or high end of the safety belt range. Mercedes Benz commented that its new "supplemental restraint system," which employs an airbag, has worked according to design in all accident situations in which vehicles equipped with the system have been involved.

PLF and VW also said that the Department's effectiveness studies were subjective. PLF argued that DOT was using precisely the same type of analysis that GM had offered and NHTSA had rejected in the 1977 rulemaking on automatic restraints. That group stated that DOT failed to explain this change of view. The PLF also criticized the agency's studies on airbag effectiveness for failing to take into account data for all vehicles using airbags, i.e., the non-GM Air Cushion Restraint System (ACRS) cars. Renault expressed the view that airbag effectiveness could not exceed 20 percent, due to the inability of airbags to provide protection in non-frontal and ejection accident situations.

Ford argued that notwithstanding the limited amount of actual field data on airbag cars, those data cannot be totally dismissed in arriving at an estimate of airbag effectiveness. Ford also suggests updating field data to include Fatal Accident Reporting System data through 1983, instead of only through 1981 as was done in the PRIA. Ford found two of NHTSA's studies based on the National Crash Severity Study (NCSS) data to provide reasonable estimates of airbag effectiveness but found the third study to be flawed. Ford argued that the latter study was restricted to data from crashes in which airbags would be most likely to be effective. Ford also challenged a fourth agency study, on injury reducing effectiveness, based on field data, since it tended to show airbags to be most effective in accident situations in which the airbag is unlikely to deploy. Ford also stated that there appeared to be no basis for the agency's effectiveness range for airbags used in conjunction with safety belts.

Benefits

Several major insurance companies commissioned Professor William Nordhaus of Yale University to provide an updated economic analysis of alternative approaches to automatic crash protection. In response to the NPRM, Professor Nordhaus concluded that automatic crash protection would have net economic benefits to the nation of between \$2.7 and \$4.1 billion per year, while rescission would cost the nation \$33 billion. Professor Nordhaus stated that every year of delay increases fatalities by approximately 5,000 and increases moderate to critical injuries by at least 70,000. His analysis also concluded that the impact of retaining the rule on profits or jobs in the automobile industry, as well as on the national economy, would be miniscule. He stated that automatic crash protection would be cost beneficial even if automatic belts increased restraint usage by only eight percentage points and even if airbags cost \$825.

Many consumer and health organizations expressed concern that the agency had understated the benefits that would be associated with automatic restraints through their prevention of deaths and injuries. IIHS noted that the agency was relying on police reports to calculate the number of injuries from vehicle accidents. The group submitted evidence that only 70 percent of injuries resulting from vehicle accidents and treated in hospital emergency units were reported to the police. The evidence was taken from a study comparing car accident treatments in northeastern Ohio emergency rooms with police reports of accidents. To compensate for this underreporting of vehicle accident related injuries, this group suggested that the agency multiply its projected number of injuries by 1.4 to give a more accurate indication of the number of vehicular nonfatal injuries that could be expected. Such a step would, of course, increase the benefits associated with automatic restraints. Another group was also concerned that the agency had underestimated the minimum level of effectiveness of airbags and submitted an analysis showing that airbags would have a minimum effectiveness of 35 percent, instead of the 20 percent minimum used by the agency in the PRIA.

Several of the health organizations commenting on the proposal emphasized that the agency ought to reconsider the human costs of the head and spinal injuries suffered by persons in car accidents. One group submitted data projecting 66,000 head injuries annually as a result of vehicle accidents, with nine percent of those injured persons either dying in the hospital or discharged to chronic institutional care. Another 8 percent would be discharged but subject to follow-up medical attention. Many of these victims are young people who have to readjust to life with these injuries, which prevent them from performing even simple tasks they once did for themselves. These impacts are not readily quantifiable in dollars, according to these groups, but are just as significant as economic impacts for the people with family members who have suffered serious head and spinal injuries.

VW asked for an explanation of the methodology used in calculating Table 3 of the SNPRM, since the baseline of fatalities if no restrains were used seems to change with each listed effectiveness rate. This comment also noted that if mandatory usage laws are in effect by 1988, and 70 percent buckle up, the airbags' benefits would not equal the benefits of the mandatory use laws until the 21st century.

Professor Nordhaus states that using NHTSA's effectiveness rates for the various types of restraint systems shows both automatic belts and airbags to be highly cost beneficial, and that further delays cost the country at least $24 billion annually. He also stated that the benefits of mandatory belt use laws are so speculative as to necessarily remove those options from any serious consideration.

IIHS stated that DOT's projected airbag usage rate of 98 percent *a fortiori* means that airbags are the most beneficial alternative, because DOT has consistenly recognized that the benefits of any of the restraint systems depend almost completely on the usage rates. IIHS repeated its contention that belt nonusers constitute such a disproportionate number of crash-involved occupants that actual reductions in deaths and injuries will be noticeably lower than would be projected for that level of belt use until the usage rate approaches 100 percent.

The insurance companies stated that several companies now have in effect 30 percent premium reductions for first and third party bodily injury liability for cars with automatic restraints. They contended, however, that the benefits associated with this rulemaking are not lower insurance premiums. In their view, the benefits are the prevention or reduction in seriousness of thousands of fatalities and serious injuries annually.

Public Acceptance

State Farm stated that it considered public acceptability of restraint systems to be a very important issue. It argued that a regulatory alternative could not be rejected on the grounds of insufficient public acceptability if the benefits of the alternative would exceed the costs of that alternative. It argued further that the legislative history of the Vehicle Safety Act made it clear that safety was the overriding consideration in implementing the Act. Thus, more weight should be given to the safety benefits of a contemplated safety requirement than to the public acceptability of the devices used to comply with that requirement.

State Farm also said that public reaction has regulatory significance as a legal and practical matter only if it is translated into behavior; that is, if people disable automatic restraints. If not, public acceptability meets the statutory criteria. Public opinion surveys over the last decade, including the 1983 GM and IIHS surveys, show public support for mandatory automatic restraints, "All studies of usage rates of automatic belts show levels of incremental usage far above break-even levels."

Contradictory evidence was provided on the attitude of the public toward automatic restraints. Consumer Alert provided a public opinion poll showing that fewer than 15 percent of the respondents wanted mandatory automatic restraints. Public Citizen submitted a public opinion poll which it viewed as showing a clear preference for automatic restraints, especially airbags. IIHS cited a recent public opinion poll indicating that 56 percent of the respondents favored requiring automatic restraints on new cars as standard equipment and 37 percent favored requiring that the type of restraint be offered as an option. AAA stated that while consumers may not rush to purchase automatic restraints as options if manual belts were original equipment, they would accept automatic restraints as original equipment, particularly if they could choose between the various types of automatic restraints. Other groups argued that the increased protection against facial, spinal, and head injuries afforded by airbags would result in consumers choosing airbags as the preferred automatic restraint, if they are allowed to make that choice. Most of these groups indicated that airbags are less intrusive than automatic belts, and would therefore be more readily accepted by the public.

The manufacturers said that nondetachable belts would raise consumer acceptance problems since they are more coercive than current belts. This expectation is based in part on the interlock experience of 1974. NADA said that the experience with VW Rabbits, Toyota Cressidas, and GM Chevettes indicates a lack of consumer acceptance of automatic belt systems and that the GM experience with airbag cars shows a similar lack of consumer acceptance.

Mercedes, on the other hand, said that its system had met with "favorable market acceptance" in Europe and projected it would be accepted in the U.S. VW said, contrary to dealer statements, that it did not believe its automatic belts had been defeated in the sense of being destroyed but only that the interlock had been defeated, perhaps by dealers themselves.

MVMA submitted a memorandum of law with which GM and VW agreed. Ford and AMC also agreed, adding comments. MVMA restated the State Farm argument saying that State Farm believes the Act forbids NHTSA from considering adverse public reaction to a mandatory automatic requirement except to the extent that the public will disable the equipment. MVMA believes the State Farm position is not consistent with the legislative history of the Act, judicial precent, or prior positions of DOT. MVMA says that public acceptability is part of the "all relevant factors" consideration under the Act. Two 1974 congressional actions shed light on what is acceptable: the ignition interlock ban and congressional review of a mandatory automatic restraint rule (MVMA cites the Senate debate on the 1974 Federal highway aid bill on the congressional review issue). MVMA claims Secretary Coleman's decision was made with these factors in mind. Matters of future probability, as raised in the Coleman decision, are relevant to an agency decision even though they cannot be precisely measured.

GM agreed, adding that public acceptability is not a narrow issue.

VW also agreed, stating that public acceptability is a two-faceted problem: State Farm's concern over consumers defeating or destroying the restraint systems and public popularity are equally important. Consumer backlash could result from an expensive or coercive system, such as an ignition interlock. VW claims that airbags have been oversold; fatalities would continue and DOT's credibility would be questioned.

Ford agreed, stating that public acceptance involves far broader issues than disabling unwelcome equipment. Ford asks what percentage of front seat occupants would defeat automatic restraints and whether there would be enough benefits to justify the systems. Ford's best projection is that manual and automatic usage will be equivalent over the long run; that is, positive and negative belt use inducement factors for automatic belts will balance out to produce usage rates equivalent to those for active belts. Ford said also that comfort, entry and egress, and the defeatability of automatic belt systems are still unknowns; therefore, a field test is needed.

Chrysler said the State Farm position is too narrow. There must be widespread public perception that benefits are worth the price. It predicted that the automatic restraint requirement would suffer the same fate as the ignition interlock.

Toyota said the State Farm position is inappropriate. The public may press for legislative rescission of an automatic restraint requirement, even though the public does not or cannot disable the system, citing the ignition interlock experience.

BL Technology Ltd. said that public acceptability and usage should be considered together. It said that the NHTSA definition of public acceptance is correct, i.e., "tolerance and use of restraint system," whether manual or automatic. BL suggests that the U.S. try mandatory seat belt use laws coupled with effective enforcement.

Renault accepts the State Farm interpretation but pointed out that a belt is needed with an airbag. Renault said that public acceptance and use of automatic belts will remain limited.

PLF and Consumer Alert said there is no mandate for an automatic restraint requirement. The issue of public acceptance is not limited to the sole question of deactivating mandatory automatic restraints; it encompasses all factors which may affect DOT's implementation of the Vehicle Safety Act. They said an automatic restraint requirement could cause the public to forestall buying new cars, which would delay the introduction of automatic protection and reduce safety by increasing the age of the total vehicle population. They also said DOT should consider risk compensation by those forced to wear belts or buy bags, citing John Adams' 1982 SAE paper, which PLF claims DOT has ignored. Experience in other countries is also cited to show that restrained occupants are less likely to be involved in fatalities.

IIHS said that earlier evidence submitted by them and others shows that automatic restraints, especially airbags, are acceptable.

Allstate supports State Farm on the acceptance issue. Allstate argues that if public acceptability is a controlling factor, then we cannot continue with the present manual seat belt requirements, due to low usage levels. They said there is no doubt that airbags have the most public acceptance; automatic belts have greater acceptance than manual belts. Therefore, DOT should reinstate the previous automatic restraint standard.

The American Insurance Association supports the State Farm interpretation. It said DOT should require automatic restraints because they only require toleration by the public to be effective. The standard for public acceptance should be public acquiescence, not public preference.

The National Association of Independent Insurors (NAII) said the DOT record shows that mandatory airbags are acceptable.

NADA said State Farm is correct in suggesting that public acceptance should be given a "narrow, legal interpretation." They argued that there are four indicia for determining public acceptance, each with substantial evidence: (1) The public has expressed opposition to coercive occupant restraint devices, e.g., the ignition interlock. The record shows people will disable automatic belts. (2) The cost indicates that airbags will not be replaced; therefore, they will be disabled after one use. (3) A significant number of consumers are unwilling or unable to purchase new vehicles equipped with automatic restraint devices. (4) Consumers will buy vehicles without automatic restraints, such as vans or pickup trucks, or used cars.

Cost and Leadtime

A number of manufacturers provided cost estimates for automatic restraints. The incremental consumer costs of adding a full airbag system were estimated at $838 by GM, $807 by Ford and $800 by Chrysler. Jaguar provided an estimate of $1800.

Breed Corporation submitted an estimate of $140 for its all-mechanical airbag design, assuming a volume of one million units. According to Breed, this estimate has been independently verified by technical experts familiar with auto industry practices, procedures and pricing mechanisms. The estimate does not include necessary vehicle modifications, such as adding knee bolsters. Romeo Kojyo provided an estimate of $150 for a driver airbag retrofit kit, exclusive of installtion and assuming an annual volume of one million units. Ralph Rockow, president of Dynamic Science, stated that airbags could be produced at an incremental consumer price of $185. The Automotive Occupant Protection Association incorporated the Rockow estimate in its comment and provided a detailed breakdown of costs for a $185 full front passenger system at a production volume of two million units annually.

The incremental consumer costs of adding automatic belts were estimated at $45 by General Motors and Richard Lohr, a cost estimating consultant, $115 by Chrysler, $150 by Jaguar and Honda, and $200 or more by Nissan and Renault. Peugeot provided an estimate of $350 for a motorized automatic belt system.

Numerous manufacturers provided comments on required leadtime. In commenting on an automatic belt requirement, GM stated that while 1¾ years is adequate for models already designed, three years are necessary for new designs or non-detachable automatic belts. Chrysler, Mazda and Peugeot also stated that 3 years are needed for automatic belts. Renault said that 24 months were needed for belts, while AMC said 30 to 36 months. Nissan provided an estimate of 30 to 42 months and Ford provided a figure of 4 years. VW said it could comply immediately for some models but would need 4 years for all models.

GM's estimate for a airbag requirement was 3 years for large cars and longer for small cars. Chrysler stated that 4 to 5 years would be needed to implement a requirement for full front airbags. AMC stated that 3 to 3½ years would be necessary for such a requirement, while Ford said 4 years. Renault said 3 years were needed while Saab claimed 58 months were necessary.

The National Safety Council said the automatic restraint requirement should be made effective September 1985, or 1 year thereafter at the latest. Mr. Lohr, a cost estimator, provided an estimate for automatic belts of 18 months, while the Automatic Occupant Protection Association (AOPA) stated that 18-30 months leadtime would be sufficient.

Two studies were submitted to the docket that analyzed the overall economic effects of an automatic restraint requirement. One study was by Dr. Barbara Richardson, of the University of Michigan, and was sponsored by MVMA. The other study was by Professor William Nordhaus and was sponsored by several major insurance companies.

Dr. Richardson concluded that a requirement for airbags costing between $300 and $800 per car would have severe detrimental effects on the automotive industry and the economy as a whole. Dr. Richardson stated that a short-run reduction in vehicle sales of 2.7 percent to 9.7 percent would occur, as well as an increase in unemployment of between 62,000 and 197,000 persons. She also concluded that gross national product (GNP), wages, disposable income, and personal consumption would decrease.

Professor Nordhaus concluded that an automatic restraint requirement would have a minimal effect on the automobile industry and the national economy as a whole. According to his analysis, an automatic restraint rule would result in an increase instead of a decrease in jobs in the automobile and supply industries.

NADA said the dealership operating costs and costs of automatic repair and service would increase.

Insurance Premium Changes

Numerous insurance industry commenters stated that implementation of an automatic crash protection requirement would provide significant economic benefits in the form of insurance premium reductions. Some commenters provided specific estimates of savings. Others argued more generally that an automatic restraint requirement would result in cost savings and that those savings would be reflected in insurance premium reductions. According to insurance commenters, a number of insurance companies have for some time been offering premium discounts for medical payment coverage for cars equipped with automatic restraints. Those commenters indicated that some discounts apply to all types of automatic restraints, while others are restricted to airbags.

Nationwide stated that installation of airbags in all automobiles would reduce private first- and third-party liability premiums by 24.6 percent of $31 annually per insured car. Using the Nationwide data, Professor William Nordhaus, in his NPRM comments, estimated that owners of cars equipped with automatic belts would experience consumer insurance cost savings of $24 per year. Professor Nordhaus estimated that, for vehicles equipped with automatic belts, taking into account consumer cost of the automatic belt, fuel cost and insurance cost, the total direct financial impact over the life of the vehicle would be to lower the cost of operating an automobile by about $60. According to Professor Nordhaus, this underestimates true total consumer savings as it omits noninsurance costs, lost wages, medical costs borne by the consumer and pain and suffering. New York State Insurance Superintendent Corcoran stated that, for average New York premiums, an all airbag requirement would result in insurance savings of $66 per year.

State Farm stated that while it does not now offer a discount to policy holders with automatic restraint equipped vehicles, the substantial financial benefits resulting from an automatic restraint requirement would be reflected in its rates, although it could not give an quantified estimate of that reduction. According to State Farm, its consistent policy in making insurance pricing decisions is to base them upon actual observed on-the-road insurance experience. State Farm also stated that, while that practice remains its policy, in other cases it has responded to competitive pressures where discounts have been made available, and it expects that the same thing would occur in this instance. Several other companies also emphasized that premium reductions would result as fatalities and injuries are reduced by automatic restraints. Emphasizing the relationship between premiums and loss experience, Nationwide noted that since August 1981, it has lowered auto insurance rates in 19 jurisdictions, despite continuing inflation. Insurance Superintendent Corcoran stated that he would mandate reductions in New York to assure that savings to insurers are reflected in premium rate changes to the public and assumes that all other regulators would do the same. Since his comments were submitted, New York has enacted legislation authorizing the superintendent to require such premium reductions.

Not all commenters were certain that insurance costs would be reduced. Dr. Barbara Richardson, of the University of Michigan, stated that estimates of insurance premium changes resulting from airbags range from a large decrease over the lifetime of a vehicle to a net increase in insurance cost. In addition, one insurance company, the Automobile Club of Michigan, expressed concern that the PRIA's estimates of additional insurance costs for airbags, based on replacement frequencies and costs, were substantially understated. The Automobile Club and the General Motors Acceptance Corporation (GMAC) argued that the agency forgot to include increases in insurance premiums to reflect the greater value of cars equipped with airbags.

The commenting insurance companies, including State Farm, also indicated that insurance premium reductions would occur in States that enacted safety belt usage laws, to the extent that real world experience justified such reductions. The American Automobile Association (AAA) of Michigan said it would lower personal injury premiums by 20 percent upon enactment of a seatbelt use law. Commenters indicated that some companies now offer an incentive of increased benefits at no additional cost if manual belts are worn. Commenters pointed out difficulties in implementing a discount program for seatbelt usage, since verification of such usage, both generally and in the case of specific accidents, is not easy to obtain.

In response to the SNPRM, State Farm referred to the discounts offered for 5 mph bumpers as an example of the industry's quick reaction to reduce rates when new safety features are introduced. Citing the D.C. Circuit's decision in *State Farm v. DOT*, State Farm argued that insurance companies' practices have no significance for the decision that DOT has to make. It argued that if this concern were relevant, insurers have already given premium discounts for automatic restraint cars. It further argued that the issue of premium reductions is irrelevant to the conclusion that an automatic restraint rule will be cost beneficial. It said this is so "because a proper cost-benefit analysis weighs the costs and benefits of a standard to society as a whole. That balance cannot be determined from an analysis of the insurance effects of a rule, since there are enormous societal losses that go uncompensated under any insurance coverage." Finally, State Farm argued that DOT has a statutory obligation to require implementation of new technology where necessary to further the Safety Act and that consideration is different from the actuarial considerations that determine whether an insurance company will offer a premium discount.

The American Insurance Association (AIA) said that the industry has previously addressed the issue of insurance reductions. AIA pointed out that many of its members currently offer a 30 percent discount for medical payment and/or no-fault coverage for automatic restraint equipped vehicles. It referred to Nationwide's estimate of a potential annual premium savings per insured car that would equal $31 if all cars had airbags. AIA also noted that Nationwide and United Services Automobile Association (USAA) currently provide incentives for wearing manual belts.

Nationwide criticized the agency for allegedly ignoring Nationwide's previous testimony on insurance premium reductions. Nationwide said that, for the past 10 years, it has provided a 30 percent discount for first-party injury coverages for cars equipped with airbags. It further noted that, in its DOT testimony in 1976, it submitted its estimate of premium savings and its methodology for deriving that estimate. Nationwide updated that estimate to 1982, and said the potential insurance saving per policy holder is $31 annually. That estimate is for a full front-seat airbag system; Nationwide said that it is currently studying what discount it would give to a driver-side only system. It expects to offer a 25 percent discount on first-party medical coverage.

Nationwide also pointed out that, since 1963, it has offered extra medical insurance coverage, at no cost, to policyholders wearing their safety belts; last year it began providing a $10,000 death benefit and doubled medical payments coverage at no extra cost to policyholders wearing belts.

Allstate said that since 1974 it has had a 30 percent discount on first-party injury coverages for airbag-equipped cars. It said that if airbags were installed in the entire fleet, there would be a 30 percent reduction in all insurance premiums, including medical payments, no-fault personal injury protection, death benefits, uninsured motorist coverage and bodily injury liability protection. Allstate said it could not provide an estimate of the insurance cost savings for automatic belts.

NAII pointed to prior testimony by USAA and Allstate providing details of insurance savings and observed that Nationwide specifically responded to the Secretary's questions at the public hearing concerning savings. NAII provided an attachment summarizing the prior industry testimony on the insurance savings issue.

NAII criticized the SNPRM's suggestion that insurers are not providing incentives for belt use. It cited Nationwide's policy and Leon Robertson's study that found that insurance incentives have not increased belt use. It also cited a 1980 National Academy of Sciences report done for DOT which questioned whether insurance incentives would be effective.

The Kemper Group said it currently offers a discount of up to 30 percent on first-party medical payment and no-fault auto insurance rates for cars with automatic belts or airbags. Kemper said that the cost of replacing an airbag could raise the physical damage insurance cost, but the increase would be minimal compared to the costs of the deaths and injuries that could be avoided with airbags.

Aetna estimated that the reduction in first-party no-fault, medical payments and uninsured motorist coverage premiums would be 25 to 30 percent for airbag equipped cars. As the percentage of automatic restraint equipped cars increases in the fleet, Aetna said there could be a similar reduction in third-party bodily injury premiums.

Conversely, Mercedes said "no company to our knowledge has reduced its rates on Mercedes-Benz Supplementary Restraint System (SRS) equipped vehicles" and Volkswagen stated that, to their knowledge, "no major insurance company offers a discount to owners of automatic restraint equipped vehicles," despite the fact that VW has been approached by insurers ostensibly for that purpose. VW said it has provided information to insurance companies because it desires to see its customers who have purchased automatic belt equipped Rabbits rewarded through lower insurance premiums.

Other Issues

Product Liability

The Automotive Service Council of Michigan raised the issue of the potential liability of independent repair shops that would service automatic restraint equipped vehicles. In addition, individual new car dealers and NADA raised the issue of whether the use of automatic restraints will increase a dealer's product liability costs. William C. Turnbull, President of NADA, testified that:

> The reliability of passive restraint systems, particularly airbags, has been a matter of grave concern to dealers and consumers alike. No mass-produced product can ever be "fail-safe." Components deteriorate due to passage of time, usage and climate. There are reports of inadvertent airbag deployments in the past. We fear that, with any widespread usage of airbags, incidences of inadvertent deployments and system failure will occur, with perhaps tragic consequences to vehicle occupants. In such cases, dealers may be the innocent victims of product liability lawsuits.

However, Willi Reidelbach of Mercedes-Benz, which is currently marketing an airbag-equipped car in Europe and the U.S., testified that he was not aware of any product liability concerns expressed by Mercedes dealers about the airbag system.

Several insurers provided comments on the potential of automatic restraints to reduce product liability claims and the availability and cost of manufacturer product liability insurance. Mr. Donald Schaffer, Senior Vice President, Secretary, and General Counsel of Allstate, testified that:

> Our product liability people believe that the airbag equipped cars, if you insure the total vehicle, will produce better experience than the non-airbag cars because the airbag reliability factors are much higher than anything on the car. They are much higher than the brake failure rates or anything else.

Mr. Schaffer also testified that at the time of Secretary Coleman's proposed demonstration program, Allstate was Ford's product liability insurer and had informed Ford that there would be no increase in its product liability insurance costs if Ford built an airbag fleet. He also testified that Allstate entered into a written agreement with General Motors that "we would write all of their product liability insurance for cars in the Coleman demonstration fleet at the same price they were getting from their regular product liability insurer per unit for non-airbag cars of the same make and model year."

NAII also addressed the product liability concerns raised by manufacturers and dealers. NAII said that:

> The potential for product liability suits is always present for any manufacturer or seller of consumer goods. That threat is present at the current time for anyone in the distribution chain. We in the insurance industry expect that savings (not increased costs) would accrue to manufacturers and dealers, as a result of automatic crash protection systems being installed in all cars, as lives are saved and injuries are reduced, thus reducing potential litigation over safety deficiencies.

Another potential source of manufacturer liability was raised by Stephen Teret, representing the National Association for Public Health Policy. Teret argued that:

> If a reasonable means of protection is being denied to the motoring public, that denial should lead to liability, even if the liability can be imposed on each and every car manufacturer. People whose crash injury would have been averted had the car been equipped with an airbag can sue the manufacturer to recover the dollar value of that injury.

Sodium Azide

The Institute of Scrap Iron and Steel (ISIS) and the Automotive Dismantlers and Recyclers Association (ADRA) said that they were concerned about potential health hazards posed to their employees by sodium azide contained in airbag systems. Both ISIS and ADRA noted that sodium azide is toxic and a mutagent and that there is a general correlation between mutagenicity and carcinogenicity. In addition, they raised the issue of possible air canister explosions during the recycling and scrapping process.

To reduce potential hazards they recommended a number of actions:

1) Place a warning on the vehicles with airbags so their employees can easily identify them.

2) Design airbag systems so that they can be deployed by remote control or so that they can be easily removed from a vehicle.

3) Provide financial incentives, such as a bounty or fee, for removing the airbag canister.

Breed System

The Breed Corporation estimates the cost to the consumer of a Breed airbag system for the driver and one passenger to be $140 installed, based on an initial production rate of 1 million units annually. Breed states that its cost estimates have been independently verified by technical experts familiar with auto industry practices, procedures and pricing mechanisms. Breed says that the system still requires a "good" year of research before it can be put into production.

Ford and GM expressed doubts about the readiness and performance of the Breed System.

Breed urged DOT to require car makers to design airbag cavities in steering wheels and dashboards to facilitate the retrofitting of cars with airbags.

Automatic Belt Detachability

Virtually all commenters who addressed the issue of detachability expressed concerns that nondetachable belts should not be required. The vehicle manufacturers generally agreed that the public, especially the hard core belt nonusers, would react adversely to nondetachable automatic belts. They also doubted that the difference in the long run usage rates for detachable belts and for nondetachable belts would be significant.

GM suggested that its experience with the 1980 Chevette shows that the public will not accept nondetachable belts. According to GM, general annoyance and fear of entrapment will lead many hard core nonusers to defeat that type of belt. As to detachable automatic belts, GM says that the inertia effect cited in the *State Farm* decision can be expected to operate only until the belts are first detached. While there would be an initial increase in usage, in the long run neither detachable nor nondetachable automatic belts would yield any increase in usage. Ford agreed that fear of entrapment would produce some adverse reaction to nondetachable automatic belts. Ford stated that detachable automatic belts would produce some undefinable amount of usage increase. While nondetachable belts would produce higher increases in the short run, in the long run the usage rate for nondetachable belts would fall to the level of the usage of detachable belts. Honda commented that nondetachable belts would not be accepted by the public because of entry and exit problems, entrapment fears and poor appearance. Nissan anticipated no difference in the long-run usage rates of detachable and nondetachable belts. VW said that the high usage rate of their automatic belt is due largely to the interlock. Without the interlock, VW said, the usage rate would be between that for manual belts and the current VW Rabbit automatic belt system. VW suggested also that it was important in designing an automatic belt to locate the release mechanism near the window so that persons assisting an injured occupant could release the belt. ASBC predicted that 10 to 20 percent of car occupants are hard-core nonusers who will cut out nondetachable belts. The Council said that, in the long run, usage of detachable belts would fall between current manual belt usage rates and the rates for automatic belts in cars on the road today, i.e., usage would be about 50 percent. IIHS submitted a survey indicating that 68 percent would never detach a detachable belt, 21 percent would occasionally and 8 percent would do so permanently. John Graham stated that his survey of experts indicated that detachable automatic belts would increase usage by 10 percentage points and that 55 percent of motorists would dismantle nondetachable belts.

Alternatives

Retain

Most of the manufacturers indicated that they would comply by installing detachable automatic belts, since those belts would facilitate emergency escape from a vehicle after a crash and would face the least consumer resistance due to their lower price (compared to airbags) and the fact that they can be detached by occupants who do not choose to use safety belts for whatever reason.

Several insurance companies argued that the agency is required by law, based on the record, to implement some form of an automatic restraint requirement. According to State Farm, the effect of the Supreme Court's decision in *State Farm* is to require the Department to go forward with an automatic restraint requirement unless it has a rational basis for concluding that effective automatic restraint technology is not within reach of the car manufacturers. That company argued that the record amply demonstrates the existence of such technology.

Allstate argued that the record demonstrates that cost beneficial technology exists which, when included in all new cars, could save up to 10,000 lives each year and prevent more than 100,000 serious injuries annually. Allstate also argued that under the decisions of the United States Court of Appeals and the United States Supreme Court in the *State Farm* case, the Department lacks authority to look beyond that fact. That company stated that in its view, all proposed options that do not include the implementation of some form of automatic restraint requirement must, under the law, be rejected.

Similarly, NAII urged that the case for automatic protection has been fully documented. According to NAII, further delays for studies, demonstrations and so on are totally unwarranted and would only result in many more needless deaths and injuries. Such delays would also be inconsistent with the mandate of the Supreme Court.

Almost all commenting insurance companies favored implementation of the automatic restraint requirement as soon as possible. These commenters generally argued that the requirement is cost beneficial and would save many thousands of lives and prevent tens of thousands of injuries annually. Several insurance companies stated that airbags offer the greatest possible safety benefits. However, the insurance companies generally urged that such issues as requiring compliance by means of airbags only or barring compliance with detachable automatic belts should be considered only after a general automatic restraint requirement has been implemented. Allstate stated that the airbag-only requirement is preferable, but said that simple retention of the automatic restraint requirement is acceptable.

IIHS supported retention, noting, as did various commenters associated with medical and health organizations, that public health measures depending for their success upon repeated cooperation of the intended individual beneficiaries, as would mandatory belt-use laws, have historically had limited effectiveness.

Insurance Superintendent Corcoran of New York State maintained that it has been clearly established that, for whatever reasons, people do not generally use their manual belts, and efforts to modify this behavior have been unsuccessful for the past 15 years. He believed that it is incumbent on DOT to mandate automatic restraints as the only means for increasing usage.

The manufacturers said that if automatic belts are less effective than manual belts, then persons who regularly use manual belts would end up paying more in the future for an inferior restraint system, raising fairness questions. Most of the companies indicated that, if the automatic restraint requirement were retained, they would use detachable automatic belts to comply, since those systems facilitate emergency escape from a vehicle after a crash and would face the least consumer resistance due to their lower price (compared to airbags) and the fact that they can be detached by occupants who do not choose to use safety belts for whatever reason. However, if such belts were left detached by most occupants, little safety benefit would be gained through their installation.

PLF and Consumer Alert and vehicle manufacturers argued that DOT should concentrate on educating the public about the value of manual belts in providing protection in the event of a crash. Once the public is convinced of the need to buckle up, fatalities and injuries will decline without having to mandate expensive new equipment in cars.

GM argued that implementation of the automatic restraint requirement would divert engineering resources away from the development of more publicly acceptable alternatives, such as the "built-in" safety of energy absorbing interiors. Increasing safety through the redesign of vehicle interiors instead of the installation of add-on devices like occupant restraints would benefit unbelted as well as belted occupants at a cost far below that of airbags.

Amend

Airbag Only

Several health organizations argued that the agency should mandate airbags because that type of automatic restraint is the least intrusive for the occupant and because young drivers were the least likely to buckle manual belts and the most likely to try to defeat automatic belts. The Center for Auto Safety (CFAS) argued that small car occupants need the protection of airbags. The organization suggested that belts properly fit less than 50 percent of the population.

Many consumer groups and health organizations supported agency action that would mandate the installation of airbags in at least some new cars. To avoid the Congressional intervention that they thought might follow adoption of a requirement for nondetachable automatic belts, some consumer groups and health organizations urged adoption of either a requirement for airbags only or a requirement for airbags or nondetachable automatic belts.

The manufacturers objected to an airbag-only requirement for several reasons. First, it was stated that an airbag is effective only in single impact, frontal crashes, and does not protect against occupant ejection from vehicles. The manufacturers view airbags as supplemental protection devices, to be used in conjunction with safety belts. The manufacturers also expressed concern as to the real world reliability of airbags, the difficulties in applying airbag technology to small cars, the effects of airbag inflation on out-of-position occupants (particularly small children), the potential adverse environmental impacts of using sodium azide as a propellant to inflate the airbag, and product liability impacts. The economic effects of an airbag only requirement were a major concern of the manufacturers. The additional cost of that restraint system was projected to raise vehicle prices significantly, adversely affecting industry sales and thereby employment and profitability.

Some commenters, including MVMA, argued that adopting an automatic restraint requirement that specified the installation of a specific type of restraint, i.e., airbags, would violate the requirement of the Safety Act that safety standards be stated in terms of performance instead of design.

Congressman Dingell questioned the legal authority for an airbag-only requirement in light of *Chadha*, which declared the legislative veto to be unconstitutional. The Congressman suggested that if the legislative veto provision were invalid, then because of the absence of any severability provision and because of the importance attached by Congress to the veto provision, the exception to the prohibition in the Vehicle Safety Act against nonbelt standards must fall with the veto provision.

One public interest group (PLF) and one economist, Professor LLoyd Orr, argued that airbags would encourage motorists to drive less safely since they would be given more safety than they desire and would compensate accordingly. Their argument is based on the "risk compensation hypothesis," which states, for example, that given better brakes, a driver is likely to follow more closely, negating some of the benefits associated with the safer braking system. The IIHS and John Graham, another economist, presented data which contradicted the above hypothesis. Those data concern the behavior of drivers in Newfoundland which indicate that safety belt users were not any more likely than nonusers to make risky driving maneuvers. John Graham referred to papers he had authored, criticizing the concept of "risk compensation hypothesis."

Airbags and Nondetachable Automatic Seatbelts

Some consumer groups and health organizations argued that permitting readily detachable automatic belts would only encourage those consumers not already in the habit of wearing belts to detach the belts and would result in a minimal increase in protection for car occupants. These groups urged therefore that the agency mandate that automatic belts not be easily detachable.

Some consumer groups and health organizations argued that automatic belts should be detachable to allow ready escape in emergency situations and to permit those confirmed nonusers of seatbelts (estimated by these groups at 10 to 20 percent of the population) to deactivate the belts for themselves by something other than permanent means, such as cutting the belts. These groups argued that nondetachable automatic belts would lead to Congressional action overturning the entire automatic restraint standard just as Congress had overturned the ignition interlock requirement in 1974. The car manufacturers opposed this option because it would limit their flexibility by requiring the installation of the most expensive and/or controversial types of automatic restraints. Manufacturers also argued that, given a choice, they would not produce nondetachable automatic belts because of anticipated adverse consumer reaction and difficulty in emergency egress with such systems.

Passive Interiors

GM stated that, since the original issuance of FMVSS 208, there have been significant advances in the state of the art of occupant protection. These advances have been made available in large part because of the increased use of advanced computer technology in the design and development of new vehicles. GM has implemented a Vehicle Safety Improvement Program which is aimed at increasing the "built-in" safety of its vehicles for restrained and unrestrained occupants.

GM said that the purpose of the "built-in" safety strategy is to maximize the reduction in total harm resulting from vehicle crashes. It argued that "no promising technology should be excluded simply because it either cannot meet arbitrary laboratory requirement or can only meet them on selected types of vehicles. Nor should new and promising technologies be discouraged because they are not envisioned in a regulatory scheme." GM urged that implementation of FMVSS 208 would "impede, or at lesat greatly dilute the effects that are needed to increase the state-of-the-art of other promising occupant protection technology."

In its comments on the SNPRM, GM suggested that DOT consider a more flexible approach to reducing deaths and injuries. They propose a three-step approach consisting of:

1) Retain the current requirements of FMVSS 208, but give manufacturers the option of meeting it with manual belts;

2) If a manufacturer chooses to comply with Standard 208 using manual belts, test the vehicle as follows:

(a) fastened manual belts must satisfy the same dynamic criteria as airbags or automatic belts, and

(b) the vehicle would be subjected to a 25 mph barrier crash with unfastened manual belts. The same injury criteria would be used to evaluate acceptable performance in this test as is used in the 30 mph test above; and

3) Approve various changes in the Standard 208 test procedures, most notably using the Hybrid III dummy, instead of the Hybrid II.

GM stated that this option would offer protection to all unbelted front seat occupants, not just the 5 percent of current non-users who would use automatic belts. GM estimated that this step would yield a 12 percent reduction in fatalities and serious injuries, which is equivalent to attaining 36 percent manual belt usage.

Small Cars

Several car manufacturers expressed concern about the difficulty of applying airbag technology to small cars. The shorter "crush space" between the fronts of small cars and the passenger compartments of those cars means that small cars decelerate faster in a frontal crash, leaving less time for an airbag system to sense the crash and inflate the airbag. The limited time means that the airbags must inflate more rapidly than in a large car, raising concerns as to airbag induced injuries, particularly to out-of-position occupants. GM expressed the view that the faster airbag inflation rate needed for small cars, in conjunction with the thicker airbag needed to decelerate the faster moving occupant of a small car, could cause fatal lesions in out-of-position occupants.

Honda expressed the view that airbags provide inferior protection as compared to manual belts in small cars at crash speeds above 30 miles per hour. Attempts to improve airbag performance in small cars through the use of a knee bolster were not particularly successful, since the resulting limited available space in such cars made entry inconvenient and the weight of the knee bar adversely affected fuel economy.

IIHS noted that two studies compared the effectiveness of airbags and manual lap/shoulder belts in small cars. One study, using Ford Pintos, showed that airbags performed slightly better than belts. The other study, using Renault R-12's, showed that the two types of restraints performed approximately the same, according to IIHS.

GM agreed that small cars needed the highest priority, but argued that the rapid inflation rate required to meet a 30 mph test poses an unacceptable risk to out-of-position occupants.

State Farm said that the analysis by Professor William Nordhaus of Yale University showed that it is significantly more cost beneficial to require installation of automatic restraints in both outboard seating positions and to require automatic protection for all size cars.

NADA restated its general opposition to any mandated automatic restraint and said that it was specifically opposed to a driver airbag-only option for small cars. NADA said that such a standard would be a design standard in violation of the Vehicle Safety Act and current airbag technology is not adequate for small cars.

Ford estimated that the cost of a driver-side airbag system would be about $600, which represents a large cost increase for vehicles at the lower end of the price range. Ford also questions the effectiveness of airbags in any size vehicle, the public acceptability of airbags, and the authority of the agency to issue an airbag-only standard.

VW also opposed driver-side airbags for small cars, saying that the technology is not proven for those vehicles and the Department should set performance and not design standards.

AMC supported the concept of requiring driver-side-only automatic restraints. AMC, however, said that airbags should not only be required on small cars since it "was not aware of any technical information that suggests that restraint requirements are fundamentally variable as a function of car size."

Nissan argued that requiring airbags for small cars is unfair to purchasers of those cars "because people buy small cars for economic reasons and the small car buyer should not be singled out to pay for expensive devices." Nissan also argued that if drivers assume that the airbag provides sufficient protection, then they might stop wearing their manual belts which are needed for protection in rollover and other accidents.

Toyota restated its general opposition to mandated automatic restraints and its specific opposition to a design (airbag) standard rather than a performance standard. It further argued that airbag technology has not been developed for small cars.

Allstate said that automatic protection should not be limited to small cars, but should be available on all cars.

The American Safety Belt Council (ASBC) said that a lap belt should also be required for a driver-only airbag. It recommended that for the right front passenger position, an automatic belt should be required.

Honda said that more development time is needed and that the added cost of airbags will substantially increase the cost of small cars.

Renault said airbag technology for small cars has not advanced far enough. It recommended waiting for the results of the Breed research program.

Jack Martens recommended that all cars with a wheelbase of less than 101 inches be equipped with airbags and with either manual or automatic belts for all front seat positions. Cars greater than 101 inches would be equipped with either nondetachable automatic lap and shoulder belts or airbags.

Public Citizen argued that if drivers of small cars can readily be protected then it is even more unreasonable not to protect the passenger in small cars and drivers and passengers in all cars.

IIHS supported mandating driver-side airbags in all cars, if it would lead to full front airbags.

Center Seating Position

Ford suggested that six-seat cars would probably no longer be produced if the center front seating position were required to be equipped with an automatic restraint. There is no known practical design for an automatic belt system that could be used for a three-position front seat. Hence, the only known automatic restraint system that could be used for the center position would be an airbag. Citing its concern about the hazards it believes would be posed by airbags to an out-of-position occupant, Ford indicated that it would probably choose to eliminate the front center seating position. The American Automobile Association (AAA), Chrysler, AMC and Consumers Union agreed that the center position should be excluded, noting that the agency's 1982 data show that 98.1 percent of front seat fatalities occur to persons sitting either in the driver's seat or in the passenger's seat next to the right door.

One commenter strongly urged that the front center seating position not be excluded from the automatic protection requirements since young children are the most frequent occupants of this position and thus would be the ones who would suffer the most from the absence of automatic protection.

Rescind

Those commenters who favored rescission opposed adoption of the other alternatives and vice-versa. Since this section of the preamble discusses each alternative separately, the views of commenters who favored one alternative are not necessarily included as negative comments to the other alternatives.

Generally, rescission was favored by all automobile manufacturers and by all new car dealers. Insurance companies and health associations all favored some form of retention and thus opposed the rescission alternative.

Most of the individual commenters opposed automatic restraints, especially airbags, on the basis of excessive government interference, high cost, and fear about the failure of airbags to operate properly. A very substantial number of these commenters were GM stockholders or employees.

Automobile manufacturers favored the standard's rescission on several grounds; that it was not as effective or cost-effective as mandatory belt use laws, that it unnecessarily would add to vehicle costs without commensurate benefits and that the technologies available for compliance would be rejected by the public as being too costly or intrusive.

For instance, Ford said that it could not support mandatory passive restraints by either amending or reinstating FMVSS 208 because of serious questions on restraint effectiveness and consumer acceptance.

GM said that detachable automatic belts are unlikely to increase belt usage and nondetachable belts would be rejected by the public. Because of technical concerns regarding airbags, particularly for out-of-position occupants in small cars, and because reinstatement would divert engineering resources from the development of passive interiors, GM believes the automatic occupant protection requirements should be rescinded.

The Automobile Importers of America (AIA) favored the adoption of mandatory use laws and said that questions of consumer acceptance, particularly regarding airbag technology and consumers' fear of entrapment, still need to addressed.

BMW said that the passive restraint issue should be "decided in the free market" and not by regulation.

One airbag supplier, Breed, recommended that the agency retain the current manufacturer option of installing either manual or automatic restraints. The commenter believed that this approach would impose minimal costs on the car manufacturers. After this supplier's airbag has been proven in more field tests, it believed that many car manufacturers would elect to provide airbags as readily available options.

The automobile dealers urged rescission because they thought that car purchasers are unlikely to accept automatic restraints. NADA cited the VW and Toyota experience with automatic belts and GM's experience with automatic belts and airbags as support for this contention. NADA also said automatic restraints would have an adverse impact on sales.

Most insurance companies and most consumer, medical and safety organizations opposed rescission or suspension, whether taken as a single action or in conjunction with a demonstration program or seeking legislation to mandate a consumer option, but organizations such as the Pacific Legal Foundation favored rescission. The PLF argued that the data did not support the Department's analysis of the effectiveness of automatic restraints.

State Farm said that a decision to rescind would be arbitrary and capricious. They referenced Professor Nordhaus' study as showing that rescission would impose enormous net costs on society. Nordhaus said that, for every year during which no automatic protection is required, it will cost society $2 to 2.5 billion. The American Association for Automotive Medicine said that "from a public health perspective, maximum protection requiring no action by the occupant is obviously preferable and desirable."

Congressman John Dingell argued that as long as the Department applied a reasoned analysis, rescision is possible and the best course to follow. Congressman Timothy Wirth contended that the statute requires that DOT move forward as promptly and expeditiously as possible to the implementation of meaningful automatic crash protection.

Joan Claybrook, of Public Citizen, said that there is more information on the benefits of automatic restraints than on any standard ever issued by NHTSA. Consumers Union "strongly" urged DOT "to promulgate promptly" FMVSS 208.

Demonstration Program

Ford argued that the effectiveness of automatic restraints could be determined only after a large-scale demonstration program is conducted. It proposed a program for the installtion of automatic restraints in 5 percent of the new car fleet over a 4-year period. The comments of several other manufacturers suggested that they would not oppose a demonstration program.

Ford said that the SNPRM misstated its proposed demonstration program requirement as at least 5 percent of each manufacturer's annual production for four years. Ford corrects this to mean an average of 5 percent of annual production manufactured for sale in the U.S. over a period of 4 years. Ford continues to believe that its proposal is the most effective means to resolve the stalemate on how best to improve occupant protection.

In response to the SNPRM, AMC said that a demonstration/test program similar to Ford's proposal is absolutely necessary prior to any effective date for requirement of automatic restraints. In the interim, the automatic restraint requirements should be suspended and a rule drafted so that rescission would occur if the findings of the test program were negative. AMC supports a demonstration program, but it does not feel that a mandatory program should necessarily be imposed on all low-volume car manufacturers. In some cases, the minimum added information to be gained would be more than overshadowed by excessive resultant cost. A five percent program for a 2- to 4-year test period would be acceptable, utilizing various automatic restraint systems for the driver only. AMC could launch such a program between early 1987 and fall 1987.

VW endorses a demonstration program and proposes an alternative plan, which would give credit to manufacturers that have already produced large numbers of automatic restraint cars. VW also said that any demonstration program should permit automatic belts to continue to be permitted. VW said that DOT should take into account the fact that costs will be higher for smaller manufacturers and that DOT has proposed no mechanism to "guarantee" that the public will buy automatic restraints.

Chrysler prefers mandatory seat belt use laws. If there is a demonstration program, companies would need adequate time to evaluate test results regarding airbag performance and public acceptability. Chrysler will cooperate in such a program, with up to 5 percent of its production for FY 1987 and 1988, provided that it applies to all domestic and foreign manufacturers. Chrysler believes there should be an automatic restraint for the driver only and that the program should only require a manufacturer's "best effort" to sell 5 percent of its total production, all on one car line, with appropriate pricing to validate public acceptance.

Volvo said the idea has some merit, but any airbag system should be for the driver only. The five percent figure should apply to total vehicle sales, not to a percentage of each car line.

Renault said that the program would produce concrete evidence in an uncertain area and that it should apply to foreign manufacturers selling more than one million vehicles per year in the U.S.

Honda said the program should be voluntary and include ways to encourage use of manual belts. Honda believes there are R&D problems that must be solved prior to an automatic restraint mandate. Honda opposes the requirement of two kinds of tooling on production lines and views the 5 percent requirement as unreasonable, regardless of demand.

Lotus said that since it imports only 300 cars into the U.S., at 5 percent, there would be 15 Lotus autos involved. It suggests an exemption for manufacturers selling less than 10,000 cars per year in the U.S. It points out this this is the small manufacturer definition used by EPA, and that DOT has overlooked the impact of this proposal on small entities, including manufacturers and dealers.

BMW would not be adverse to the program, if the manufacturer has a choice of driver-only systems, a choice of restraint type and vehicle models, and the initiation of the program was not earlier than September 1986.

Mazda suggested that DOT limit the program to high-volume production vehicles and to models produced in volumes exceeding 200,000 units per year. This will permit recovery of investment and development costs.

Peugot said that the demonstration program is the best approach. Peugeot believes that conclusions can be drawn 4 years after implementation and that the program must take into account both manual and automatic restraints. The only disadvantages of the demonstration program are economic, but this can be alleviated by letting the manufacturer choose 5 percent of each model, or 5 percent of one model.

The American Seat Belt Council said that the program should be used only for airbags to determine market suitability. Any automatic belt system should be permitted to be detachable.

The Pacific Legal Foundation (PLF) said that if DOT is to proceed with the automatic occupant protection issue, it should use the demonstration program to acquire a data base.

General Motors (GM) said that a mandatory automatic restraint demonstration program does not answer the basic question of whether the public will accept or use automatic belts or accept the higher cost of airbags.

AMC said in response to the NPRM that it was inappropriate to require a small company like AMC to participate in a demonstration program.

Toyota was generally opposed to a demonstration program. However, if one were undertaken, the DOT program should: (1) contain performance, not design, requirements; (2) permit the manufacturer to select the car lines to be affected; and (3) have the same requirements for all manufacturers, small and large.

Nissan said that the problem with the program is that sales projections of any percentage are impossible to forecast. Only customer preference can dictate the numbers sold. But if the program is mandated, then: (1) Nissan would need 30 months leadtime; (2) it should permit either automatic or 3-point belts; (3) let the manufacturers decide the type of restraint on any mode; and (4) it agrees with Ford on amending the test injury criteria.

NADA said that automatic restraints have not been proven to be more effective than manual belts and that a demonstration program was a counterproductive idea due to delays in implementation (21 to 42 months) and assessments (6 to 8 years), which would divert manufacturer resources. It would also have an adverse effect on franchised dealers, who would have to attempt to sell the automatic restraint equipped cars.

IIHS opposed the program because it does not meet the statutory responsibility of DOT. There would be no economies of scale; therefore, higher costs could result. However, if it were done very quickly, the program could be a useful supplement to this rulemaking. IIHS reiterated its belief that a mandatory automatic restraint standard was needed as soon as possible.

Allstate said that a demonstration program could delay the safety needs of the public for 7 years, 4 for the demonstration, and 3 for leadtime to equip the rest of the fleet.

State Farm said such an alternative was unlawful, irrational, arbitrary, and capricious. Adoption of the Ford proposal would impose a costly, harmful and unjustified delay.

The National Association of Independent Insurers (NAII) opposed the program as a form of delay.

The Center for Auto Safety (CFAS) said the demonstration is outside the limit of DOT's statutory authority, as illustrated by former Secretaries Volpe's and Brinegar's requests to the Congress for explicit authority for a standard's phase-in based on percentage of production. The CFAS said that NHTSA has recognized that percentage phase-in is of questionable legality, citing the DOT brief in *PLF* v. *Adams*, 593 F.2d 1338 (D.C. Cir. 1979).

Public Citizen said that a demonstration was not authorized by the Act.

The Breed Corporation said that a mandatory demonstration program, since it would result in a safety standard which did not apply to all motor vehicles of a particular type, would be unlawful.

Mandatory Belt Use Laws

General

Almost all car manufacturers supported belt use laws in lieu of some form of automatic restraint requirement. They stated that these laws would be the most effective and least costly approach. The automobile dealers also supported these laws. Most individuals who opposed automatic restraints and supported an alternative named belt used laws as that alternative.

The American Seat Belt Council said that belt use laws would be the most effective approach, but expressed the belief that some sort of financial incentive would be necessary to get individual States to consider passage of such laws. Congressman Dingell supported belt use laws and noted his bill to encourage state enactment of them.

Many vehicle manufacturers and other commenters noted that belt usage laws would begin producing benefits over the entire fleet of cars on the road as soon as the laws became effective. By contrast, they noted, the benefits associated with automatic protection would accrue only as new vehicles equipped with automatic protection were added to the fleet of vehicles in use. It would take at least 10 years for car equipped with that type of protection to fully replace nonautomatic cars. Because of this factor, many commenters suggested that the agency mandate automatic restraints, to provide that protection to occupants of new cars, and seek belt usage laws, to provide increased protection to occupants of older cars.

The Motor Vehicle Manufacturers Association (MVMA) and several individual manufacturers stated that the minimum criteria specified in the SNPRM for belt usage laws deny State legislatures the flexibility to design belt use laws consistent with the demographics, motor vehicle statutes, and law enforcement practices of the individual States. These commenters suggested that rather than DOT specifying the means which must be used to achieve the goal of increased belt usage, it should simply specify the desired end (in terms of the percentage of front seat occupants wearing their belts) and allow the State legislatures to select the most effective means to that end for their particular State.

Several insurance companies opposed safety belt use laws as a substitute for the automatic restraint requirement because all front seat occupants of a car equipped with automatic restraints would be protected while a belt use law would protect only those front seat occupants who complied with it. The insurance companies, Congressman Wirth, and Public Citizen argued also that safety belt use laws were not an alternative that would satisfy the Safety Act or the *State Farm* decision. However, the insurance industry generally favored these laws as a supplement to an automatic restraint requirement.

Although virtually all medical and health organizations opposed substituting safety belt use laws for the automatic restraint requirement, they noted that recent experience in Canada and Great Britain has shown that introduction of these laws produced sizable reductions in injuries and deaths.

Both the Insurance Institute for Highway Safety (IIHS) and the Pacific Legal Foundation (PLF) submitted studies indicating that while belt use laws do increase usage, the resulting reductions in deaths and injuries are proportionately smaller than increases in usage. These studies led both groups to conclude tentatively that the population with the greatest likelihood of being in vehicle accidents is also the least likely to comply with belt use laws. A similar point was made by New York Insurance Superintendent Corcoran. Hence, both groups urged DOT not to overstate the benefits that would result from belt use laws. Ralph Nader opposed safety belt use laws as an alternative because of his belief that such laws would not be adopted by the States and would not be complied with by those who most need to buckle up.

As to the question of the likelihood of enactment of state safety belt use laws, IIHS said the closest analogy was not the child restraint use laws or the recent wave of more stringent drunk driving laws, but the motorcycle helmet use laws that have been repealed or weakened in a signficant number of States.

Several commenters including the National Association of Governors' Highway Safety Representatives (NAGHSR) stated that the DOT approach was fundamentally wrong in that it sets automatic restraints and belt usage laws as an either/or proposition. These commenters argued that both of these requirements are needed to ensure maximum use of restraints by front seat passengers. Further, these commenters asked why the Federal government was intruding on the States' prerogative to shape the usage laws by specifying minimum criteria.

The Governor of Wyoming stated that there was little or no chance of ever passing a belt usage law in that State, and recited a list of enforcement problems which would be posed for that State if it were to pass a belt usage law.

The insurance companies generally argued that DOT's options of pursuing belt usage laws were illegal as an abdication of DOT's statutory responsibilities. The proposals in the SNPRM, it was argued, would result in a lack of uniformity nationwide. As a practical matter, these commenters believed that either of the options which would eliminate the requirement for automatic restraints if States passed belt usage laws would encourage manufacturers to develop the cheapest automatic restraints which would satisfy the standard, since it was possible that the manufacturers would never be required to put these restraints in their vehicles and they would thus wish to minimize any investment losses. It was also stated that these systems would be the least effective automatic restraints. The insurance companies noted the serious enforcement problems which belt usage laws would impose on the States. IIHS stated that there is no evidence anywhere in this record to support the claims that belt usage laws would be obeyed without vigorous enforcement, and such enforcement would be a headache for the States. Their researchers found that in New York, where an administrative regulation requires holders of learner's permits to wear their belts while driving, 39 percent, 32 percent, and 6 percent of drivers with learner's permits actually wore their belts at three different locations. Further, IIHS noted that, as of the time of their docket submission, no State had yet passed a belt usage law and such laws were being considered in only 11 States.

Volvo responded to the claim that belt usage laws would not protect those who are most likely to be in accidents, and that therefore belt use laws will not achieve the reductions in deaths and injuries which would accompany a particular level of belt use. Volvo argued that these drivers would also be the most likely to defeat any automatic belts, and so would not be protected by those restraints, and the most likely to be in rollover crashes, in which they would not be protected by airbags.

SNPRM Alternative: No Automatic Restraints Required in a State That Passes a MUL

The manufacturers generally opposed this alternative on the grounds that it would create major distribution problems, it would create serious enforcement problems for the States (for instance, will residents of a State be permitted to cross the border to purchase a car equipped with the restraint system they want?), and it would force the manufacturers to produce two different types of otherwise identical vehicles.

The State of Washington asked why DOT would waive an automatic restraint requirement, and stated that it believed the existence of automatic restraints would be as much of an incentive to pass a mandatory belt use law as would a waiver. Similarly, NAGHSR stated that the waiver would be an administrative nightmare for the States, and that this waiver would make it difficult for a consumer to purchase a car with automatic restraints if the State has a mandatory use law.

NADA stated that this alternative would create uncertainty and a patchwork pattern of automatic restraint requirements, which would cripple product planning, pricing, advertising, and distribution.

A Michigan legislator and the Michigan secretary of state supported this proposal, saying the most effective protection available to front seat occupants is the manual belt already in the vehicle.

SNPRM Alternative: Automatic Restraints Required Unless 75 Percent of States Pass Mandatory Belt Use Laws by a Certain Date

The manufacturers strongly objected to this alternative, since they would be forced to immediately begin investing time and money on a device which might never be needed. They said that this alternative would raise car prices even if the automatic restraints were never required. The manufacturers also stated that the progress reports were an unnecessary burden since a manufacturer that was not prepared to install automatic restraints when those were required would be completely forced out of the market until such time as it could install automatic restraints. That is incentive enough to ensure that the manufacturers will be ready to install those restraints.

Ford would change this alternative to suspend FMVSS 208 while a good faith effort is made to pass mandatory use laws, and, if this is unsuccessful, specify an effective date for FMVSS 208. Volkswagen (VW) suggests setting an effective date on a sliding scale after seeing if enough States pass mandatory use laws. For instance, if 10 percent of the States have not passed mandatory use laws in two years, Standard 208 would become effective three years after that date, if 25 percent had not passed mandatory use laws in 4 years, Standard 208 would become effective 3 years after that date, and so forth. American Motors Corporation (AMC) would amend the alternative to specify no automatic restraints when 75 percent of the driving public is subject to mandatory use laws or when 75 percent are using the manual belts in their vehicles.

The National Automobile Dealers Association (NADA) stated that there is no basis for imposing automatic restraints, whether or not 75 percent of the States pass a mandatory belt use law.

The insurance companies wondered how DOT had decided that residents of 25 percent of the States could be left without enhanced occupant protection in their cars when the record was so clear on the need for enhanced protection. The National Association of Governor's Highway Safety Representatives (NAGHSR) stated that Federal intrusion was not needed to get States to pass mandatory use laws.

Two Michigan officials stated that the 75 percent figure should be lowered, since it was doubtful that it could be achieved, and argued that greater flexibility should be allowed to the States.

Test Procedures

Repeatability

Most automobile manufacturers raised several issues concerning the automatic occupant protection provisions of FMVSS 208. Statements were made that the test procedures, in general, fail to meet the "objective" criterion of the statute. Suggestions were also offered to change the procedures, the anthropomorphic test dummy, and the standard's injury prevention criteria.

Manufacturers stated that the test procedures do not produce repeatable results. Relying on data from the agency's New Car Assessment Program (NCAP) repeatability tests, the manufacturers argued that there is substantial, uncontrollable variability in the test results. As a result, they argue that the standard is not practicable.

NHTSA's New Car Assessment Program, which is an experimental program designed to develop consumer ratings of vehicle crashworthiness, is similar in test procedure to FMVSS 208 in that is uses instrumented Part 572 test dummies to ascertain potential injuries to human occupants in a frontal barrier crash. The program differs from FMVSS 208 in that its purpose is to rate cars. Therefore, there is no minimum level of performance specified as in FMVSS 208, and the tests are conducted at 35 mph instead of the safety standard's specification of 30 mph.

In 1983, NHTSA conducted tests to determine the repeatability of test results from the NCAP. Twelve Chevrolet Citations were tested in three different laboratories (four in each laboratory) to help determine the magnitude of variability surrounding a single test result. GM supplemented the agency's program by crashing an additional four Citations at their own facilities.

In commenting on the October 1983 NPRM, AMC referenced the NCAP repeatability tests and stated that based on the high degree of variability in injury criteria test results, the FMVSS 208 test procedures were "unacceptable" and lacked the necessary objectivity required by a safety standard. To compensate for this large variability, AMC suggested the agency use a "design-to-conform" approach as a means of compliance.

Chrysler also stated its concern over test repeatability and variability, as evidenced in the NCAP program, and argued that testing airbags under the current test procedure could lead to even greater variability. Chrysler suggested testing airbags with a belt, exempting the front center seat from any passive requirements, eliminating the 30-degree oblique test and waiving all injury criteria.

Volkswagen referenced the NCAP repeatability program and concluded from its results that the current test procedures were "not appropriate," particularly for safety belts. VW argued that the test procedures, and the dummy, were developed for testing compliance with airbags. It suggests that the procedures be revised to only use dynamic testing if a vehicle is equipped with airbags.

GM also spoke of excessive variability and stated that the test procedures must be improved. GM urged NHTSA to approve its petition to use the Hybrid III dummy as an alternative test device and to develop different compliance tests for different technological safety improvements.

Ford claimed that the test procedures are neither objective nor practicable and, based on the NCAP tests, manufacturers would have to "overdesign" their vehicles to ensure that all vehicles were in compliance. Ford stated that the procedures do not comply with the Court's ruling in the *Chrysler* case that test procedures must be capable of producing identical results when test conditions are exactly duplicated. Ford argued that repeatable results are impossible to achieve with the current FMVSS 208 test procedures. The company supplied results of early 1970's sled tests to show that variability was inherent in the test procedures and test dummy and was not solely related to vehicle-to-vehicle differences. Ford suggested that test variability could be compensated for by using a design to conform approach, eliminating the 30-degree oblique test, not dynamically testing automatic belts, changing the FMVSS 210 anchorage location requirements, and testing airbags with a belt.

MVMA emphasized their concern that the NPRM failed to address the issue of test repeatability. Its concern was based on the NCAP test results. MVMA urged the agency to publish a supplemental notice to address the issue.

Several commenters to the NPRM suggested that there was no reason to be concerned over test procedures or repeatability. Byron Bloch, an automotive safety consultant, pointed out that cars are designed using crash tests and sophisticated dummies and he supplied the text of a GM advertisement to that effect.

The Insurance Institute for Highway Safety reviewed the results of the NCAP repeatability test program and concluded that these tests "produced repeatable results when the correct procedures were adhered to. . ."

Allstate Insurance Company claimed that the current test procedures assure individual purchasers of automatic restraints of protection and that the agency should also test manual belts dynamically.

Because of the above, the issue of repeatability, as well as other test procedure concerns, was raised in the SNPRM. In the SNPRM, the Department stated that it believed that the Part 572 test dummy was not a major source of the variability found in the NCAP repeatability tests, that the proposed adoption of two of the NCAP procedures into FMVSS 208 would further reduce variability, and that additional changes in the test procedures to reduce variability were not necessary. Any remaining variability was assumed to be due llargely to vehicle-to-vehicle differences, which are outside the control of the Department.

In commenting on the SNPRM, auto manufacturers took exception to the Department's conclusions.

Ford reiterated its prior arguments about repeatability and criticized the agency for not clearly setting out what are the proposed NCAP changes to the 208 standard. It characterized what it understood to be the revisions to the NCAP test procedures as minor, subjective, and unverified. Ford said that the agency was still conducting its repeatability research study and questioned how the agency could conclude that the test dummy is not a major source of variability.

Ford further argued that the agency had not shown that the "test device and test procedure are separable in their influence on test results from the performance of the vehicle, so that any variability in test results 'must be' attributable to vehicle-to-vehicle differences in manufacture or performance."

Ford also argued that overdesign should be used only to compensate for manufacturing variances, which can be estimated and controlled for by the manufacturer and that overdesign should not be required of manufacturers because of deficiencies in test procedures.

Ford concluded that the test procedures were "flawed," that variability was inherent in barrier crashes and was likely "irreducible," and that the current procedures, with their large associated test result variability, placed a manufacturer in "unacceptable jeopardy" in terms of assuring compliance with the standard.

The company also claimed that "comparable variability," to that observed in the NCAP Citation tests would be expected for other models. It based its conclusion on the coefficient of variation (COV) of 33 Mercury airbag sled tests, scaled to 35 mph, and seven Volvo barrier crash tests.

GM said that the driver HIC results of the NCAP repeatability tests, which incorporated the test procedure changes proposed in the SNPRM, already demonstrate that the range of variability is too large. GM argued that the amount of variability is not due to vehicle differences. It referred to a series of controlled sled tests it conducted, in which the coefficient of variation of the HIC data was as high as 11 percent for the driver and 8 percent for the passenger. For the NCAP series, the COV was 21 percent for the driver and 11 percent for the passenger. GM said that a comparison of the two data sets shows that the major portion of the variability is test-related, not vehicle-related.

GM argued that because of the variability, the amount of overdesign needed to provide a reasonable certainty of compliance would be impracticable. It said that the design level of HIC protection could not be justified in terms of a "minimum" safety requirement. GM said that it does "not believe that a practicable dynamic test requirement can be devised to provide manufacturers with the assurance of 'certainty' specified by the *Paccar* court. The only solution may be the one suggested by that court: ". . . it must propose some alternative method for those manufacturers which, if followed, it will recognize as fulfilling the due care requirement.'"

Mazda commented that the NCAP repeatability study dealt with a compact size vehicle, which has more available crush space than a subcompact. It recommended that a similar repeatability study is necessary for subcompact vehicles. Mazda agreed with NHTSA that adoption of the NCAP test procedures would eliminate some of the existing variability, although further refinements are possible.

American Motors said that adopting the NCAP modified test procedures cannot be expected to reduce test variability since the modifications are minor. AMC said that there are other test variables, such as safety belt tension and actual dummy position just prior to impact, that have a similar effect on dummy positioning, but those variables are not controlled for in the test procedure.

AMC also claimed that because of the lack of repeatability in the FMVSS 208 test procedures, the standard does not meet the requested statutory criteria. AMC believes the above because the unreliability of test results demonstrated in the NCAP program are "indicative" that a similar level of variability will exist in FMVSS 208.

Peugot stated that it "can but reluctantly accept as valid a test procedure" with a COV of 21 percent. It suggested that the level of performance (e.g., HIC criterion of 1000) be raised by the amount of variation.

Chrysler, based on the NCAP data, concluded that the test procedures are not capable of producing identical results when a given vehicle is repeatedly tested. They believe the current procedures only measure a manufacturer's ability to conduct the test and do not measure the adequacy of the restraint system. Chrysler said that because differences in dummy foot placement and ambient temperature make a difference in test results, the test is not practicable. Chrysler also argued that the agency must develop a test which takes into account the inherent crash variability of the vehicle itself.

Volvo said that the modified NCAP procedures only address a portion of the variability and that it has not been demonstrated that the new positioning requirements will in fact result in a repeatable positioning of the test dummy. It noted that the procedures do not ensure that the same webbing location is used in each test. Volvo also said that because of the effect of temperature on dummy performance, either the permitted range for crash testing must be narrowed or new materials be used in dummy construction. Volvo also said the NCAP repeatability program shows that there is a certain amount of unreliability in the signals obtained from the accelerometers and that different laboratories have used different methods to process crash data.

Volvo also supplied the results of 10 sled tests in which there was a stable crash pulse and no contact between the dummy's head and vehicle interior, thus eliminating most vehicle-to-vehicle parameters. The mean HIC was 466.5 with a COV of 12.5 percent.

Nissan said that under the current test procedures, it is difficult to maintain the same relative positioning of the test dummy for several tests. It recommended that the agency maintain the same initial relative measurements between the dummy and steering wheel and instrument panel for each test of a particular model. It also said that the positioning of the seatbelt should correlate to design measurements submitted to the agency by manufacturers. It urged changing the seat position requirement (it is currently set at the mid-position) since passengers in small cars tend to move the seat rearward. Nissan recommended that the meassurement between the hip point and ankle should be constant for the positioning of the seat.

Toyota said there are still unresolved problems concerning the variability in electronic crash data collection systems. It also recommended that the test procedure specify the "timing of dummy installation prior to crash....Such timing will affect test results depending upon the extent of the breaking-in (sic) between the dummy's hip and the seat materials."

Mercedes said that the Part 572 dummy is not sufficiently repeatable for compliance test purposes, that the Hybrid III dummy provides no improvement in this regard and that adoption of the NCAP test procedures is a step in the right direction.

Volkswagen also contended that the variances resulting from the NCAP repeatability tests were too large for compliance test purposes of a safety standard. VW argued that overdesign to comply with FMVSS 208 has nothing to do with improved safety but only costs the company time, effort, and money in overcoming the inherent variability in the test itself.

Renault said that the current COV of 21 percent (which permits a variation of 63 percent) is too large; it said the COV should not exceed 10 percent. It said that as long as the COV remains at 21 percent, the HIC limit should be raised by 63 percent.

MVMA again reiterated its concern over test variance and said that FMVSS 208 is not objective.

IIHS said that overdesign is standard industry practice and current test data show that compliance is "easily achieveable."

Allstate again contrasted the lack of any dynamic testing of seatbelts with the detailed test procedures for testing of automatic restraints. It cited the *Public Citizen* v. *Steed* decision on tire treadwear grading (UTQGS) for the proposition that "no test procedures...are going to approach perfection." Allstate said that it seemed "strange" for the Department to be concerned over "minute details" of test procedures and to refuse to implement FMVSS 208 because of minor test details would be absurd. Allstate said that the test procedures were developed over many years and have proven highly acceptable.

State Farm concurred with the SNPRM analysis of crash test variability and cited the UTQGS decision as undercutting the manufacturers' arguments.

State Farm concluded that FMVSS 208 is both practicable and objective, that the test procedures have been subject to court challenge and have been improved, and that the results of the NCAP repeatability program were conducted at 35 mph, not 30 mph as in FMVSS 208, where the vehicle must absorb 36 percent more energy. They said testing at 30 mph should result in less variance as well as lower readings.

British Leyland suggested "that at this point in the rulemaking process, the subject of test procedures is not supremely important for discussion..."

Design to Conform

Because manufacturers believe that the variability in test results, particularly HIC, is so large that extensive overdesign would be required to ensure that all vehicles would comply with the standard, the concept of "design to conform" was suggested as a more appropriate measure of compliance.

Both Ford and American Motors suggested this concept in response to the NPRM. Ford said that to overcome the unacceptable jeopardy of being in noncompliance, as a result of the test procedure's lack of objectivity, compliance should be based on the design-to-conform concept, similar to that used in FMVSS 108. AMC favored the design-to-conform approach for the same reason as Ford, and also said that excessive variability was the same reason design-to-conform was adopted in standard 108.

In the SNPRM, the Department sought public comment on whether an approach which required a manufacturer to show that a vehicle was "designed to conform" to FMVSS 208, instead of requiring actual conformity with the standard's requirements, could be reconciled with the Sixth Circuit Court of Appeals decision in *Chrysler Corp.* v. DOT, 472 F.2d 659 (6th Cir. 1972), wherein the Court stated that compliance should be "obtained from measuring instruments as opposed to the subjective opinions of human beings," 472 F.2d at 676, and that "compliance be made by specified measuring instruments; there is no room for an agency investigation in this procedure." 472 F.2d at 678. Since the design-to-conform approach would require the manufacturer to justify to NHTSA that it had taken reasonable steps in the vehicle's design and testing to certify that it had been designed to conform to the standard's requirements, it appeared that adoption of this proposal would introduce unacceptable levels of subjectivity, contrary to the *Chrysler* court's direction, into what was heretofore an objective compliance procedure. Comments were also sought on the potential effects on vehicle design and construction under a design to conform approach.

Responses to the SNPRM by manufacturers showed agreement with the concept of design to conform as applied to FMVSS 208. Ford argued that if Standard 121, regarding air-braked heavy trucks (subsequently overturned by the courts) had had a design to conform provision, "it might well have been judged to be practicable, for manufacturers would have had the assurance that bona fide results of their own compliance tests would have to be taken into account in determining whether their products were in fact noncompliant." It said that dictum in *Wagner Electric* supports the lawfulness of a design to conform alternative to a strict compliance scheme.

Ford said that adopting a design to conform approach would not "materially" affect a vehicle's design and that its main effect would be to permit a manufacturer to not be judged in noncompliance based on failure to meet the specified injury criteria in a single test, if the manufacturer had *bona fide* test results to verify that the designed level of performance had been achieved.

GM also supported the design to conform concept. GM argued that such a concept does not contravene the *Paccar* decision. It said design to conform is "compatible with the court's finding that all relevant factors must be considered in establishing a standard and would not require manufacturers to overcompensate for test variability to assure compliance."

GM added that a design to conform requirement would not materially change a manufacturer's approach to assuring conformity with FMVSS 208. GM believes that a manufacturer would still be required to demonstrate that the performance of its design would meet the requirement. GM also said that the philosophy of adopting design to conform in FMVSS 108 was based on the recognition of test variabilities and thus applies equally well to this standard.

VW said that it was uncertain about the effect of adopting design to conform language in the standard. VW contrasted what it called the accurate and precise test of Standard 108 with the variable test procedure of Standard 208. VW also believes that the Department essentially operates under such a concept.

Mercedes, Renault, and MVMA supported adoption of a design-to-conform standard.

Peugeot termed the concept "interesting" and said that NHTSA's concern was understandable. Peugeot suggested that an in-depth study of the "reasonable steps" a manufacturer should take might be necessary.

Jack Martens, an automotive safety consultant, opposed a switch to the design-to-conform standard arguing that there will no longer be any means to ensure that the vehicle as purchased meets the performance requirement.

Thirty Degree (30°) Oblique Test

In commenting on the NPRM, both Chrysler and Ford suggested deleting the oblique test requirement in the standard. Ford argued that the test is redundant, since dummy readings are lower than in perpendicular barrier crashes, that it not only adds to development costs and time but also increases test result variability, and that it is a hindrance to airbag development. Chrysler's recommendation for deletion also was in the context of airbag development.

Although not directly addressing the test requirement, Renault said that airbags are not as effective as manual belts in oblique crashes and that their effectiveness limit corresponds to the 30° barrier impact conditions. Beyond 30°, Renault believes, airbag effectiveness is slight or nonexistent.

Puegeot claimed that airbags are less effective than manual belts at oblique crashes of 25 to 30 degrees, while Allstate said that the field experience with airbags indicates that they will be effective in crashes at frontal angles of 30° or greater.

The Department, in the May 10, 1984, SNPRM, voiced its own concerns over the necessity of the 30° oblique test to assure proper passive restraint performance. NHTSA test data indicate that the instrumented dummy readings in such tests are consistently lower than in direct frontal barrier crashes due to a less severe crash pulse. Although the original rationale for the requirement appeared to be ensure that car occupants were protected in oblique crashes, the data available to NHTSA indicated that the 30° test was unnecessary to achieve that goal. That is, the protection was provided regardless of whether or not the test was conducted. The elimination of the oblique test was proposed in the SNPRM and specific data were sought to support commenters' positions on the issue.

Most of the auto manufacturers and several other commenters offered remarks on the proposal. However, the manufacturers' opinions were split into three categories—in favor, against, or retain the oblique test but eliminate the direct frontal barrier crash requirement.

Ford restated its belief that the oblique test is redundant and merely adds to the cost of testing, adversely affects leadtime and adds more unpredictability to the testing.

Ford referenced material it had submitted to NHTSA previously which contained data on 30° angular vs. frontal tests. These data related to Ford's 33-car barrier crash tests of 1972 Mercury airbag vehicles. Ford's February 1976 report on the subject, "Airbag Crash Test Repeatability" (ESRO Report No: S-76-3), stated that the results of the angular crashes were lower in magnitude and had less variability than the frontal crashes. In 12 frontal tests, average driver and passenger HIC values were 479 and 462, respectively. In angular tests, the respective means for HIC were 185 and 330, well below the values in the frontal crashes.

Favoring the deletion of the oblique test, due to its stated redundancy and its adding to costs, leadtime, and variability, were BMW, Volvo, Nissan, Mercedes, Honda, and Mazda. Mazda supplied data which showed a driver HIC of 779 and a passenger value of 758 in a frontal crash test using an experimental two-point passive belt while the corresponding values in the angular test were 488 and 302. Mercedes also stated that the oblique test is an obstacle to producing airbags.

Peugeot and Renault supported retention of the oblique test, arguing that it is more representative of the majority of actual crashes, and deletion of the perpendicular test. They stated this would be harmonized with a European regulation (WP 29/R237/REV 1).

Two manufacturers opposed the elimination of the test outright, while a third expressed concern over deleting the oblique test for airbag-equipped cars.

GM opposed deletion of the oblique test. It said that while "most angular tests would result in lower injury numbers than obtained from a perpendicular barrier test, angular tests are more representative of the variety of frontal crashes that actually occur in the field."

GM further stated that it was their experience that the oblique test is "important in the evaluation of airbag performance."

Saab also opposed its deletion, terming the proposal "a way to cover up for a weakness in the airbag system." Saab stated that a test requirement must cover a large part of real world accidents.

VW supported, with reservation, the proposal to delete the 30 degree oblique test. VW recommended dropping the perpendicular test since the forthcoming Economic Commission for Europe (ECE) regulation on crash protection will only have an oblique test. VW said that an oblique test should be retained for vehicles which do not include upper torso belts, that is, airbag equipped cars.

The CFAS opposed deletion of the oblique test since it could compromise occupant protection.

IIHS supported the deletion of the oblique test if its elimination will promote the use of airbags.

The Breed Corporation favored the deletion of the oblique test, citing confidential data it had seen from manufacturers.

Adequacy of the Part 572 Dummy

In its December 1983 response to the NPRM, GM said that better diagnostic tools are needed to assure improved occupant safety, including better dummies. GM argued these tools should lead to improved test result repeatability. According to GM, the Part 572 dummy "is deficient as a tool on which to base assessments of the potential of all occupant protection technologies." GM believes their development of the Hybrid III dummy provides for such assessments and, as part of their response, petitioned NHTSA to permit the use of the Hybrid III dummy as an alternative test device (i.e., as a substitute for the Part 572 dummy) in measuring compliance with FMVSS 208.

Although not responding directly to the relative adequacy of the GM Hybrid III dummy, the Department concluded, in the SNPRM, "that the test dummy [i.e., the Part 572 dummy] is a repeatable test device and is not a major source of the variability found in NHTSA's 35 mph repeatability test series." It was further stated that NHTSA would address the merits of GM's petition to permit the use of the Hybrid III as an alternative test device in a separate rulemaking action at a later date.

Several manufacturers took exception to the Department's conclusion that the Part 572 dummy was a repeatable test instrument and met the appropriate statutory criteria. Peugeot said that the current dummy is one cause of test result variability and thus it does not meet the statutory criteria. But, since manufacturers need some reference test instrument, Peugeot said that even though its use is questionable, "it must be maintained."

American Motors described the dummy as "a state-of-the-art compromise—it lacks in reasonable measurement fidelity."

Volvo said that "the present Part 572 test dummy has serious limitations with respect to its use for determining compliance with FMVSS 208." Volvo believes design and material improvements are necessary to make the dummy more durable, repeatable, and trouble-free.

Toyota said that there was "uncertainty of the influence of [the] Part 572 dummy tolerances on crash test results" while Ford said that although the calibration of the dummy is repeatable, its performance in barrier crashes may not be. Ford questioned the Department's conclusion that the dummy is not a major source of variability.

GM again reiterated the potential benefits of the Hybrid III dummy and called for quick action on its petition, saying that a delay could hamper installation of new technology in its vehicles.

This view was supported by Nissan which said it believes the Hybrid III demonstrates greater repeatability than does the Part 572 dummy. Nissan believes the Hybrid III has a more controlled twisting motion and offers a greater degree of control and stability.

Mercedes disagreed with the conclusion that the Part 572 dummy satisfies all legal criteria because it is "not sufficiently repeatable for compliance test purposes." Mercedes also stated that "the Hybrid III provides no improvement in this regard."

Conversely, Renault said that it agreed with NHTSA that "the present Part 572 dummy is not the major cause of the dispersion of results."

Adoption of NCAP Test Procedures

As a result of its repeatability test program, NHTSA amended the test procedures (IP 212-02) for the New Car Assessment Program to reduce any variability associated with the test procedures themselves. Since the NCAP procedures are more specific than the current FMVSS 208 requirements (in terms of dummy foot placement, placement in the seat, etc.) and since the test procedure is an integral part of complying with the standard, it was proposed in the SNPRM that the NCAP test procedures, aside from those aspects solely related to the consumer rating program such as the need for high-speed cameras, testing at 35 mph, etc., be adopted in FMVSS 208. It was argued that the increased specificity of these procedures would further reduce any variability associated with the test procedures themselves.

Most manufacturers favored, or at least took no exception to, the adoption of the NCAP procedures, although many felt it would do little to reduce variability. AMC said that the changes associated with adopting the NCAP procedures were "very minor" and could not be expected to significantly reduce variability. AMC contended that other sources of test procedure variability, such as safety belt tension and actual dummy position just prior to impact, are still not accounted for in the NCAP procedures.

Volvo said that the procedures were "a step in the right direction" but doubted whether variability would be reduced significantly by their adoption. Volvo said that other sources of variability, such as belt geometry and identical dummy positioning, still exist.

Nissan did not comment on the adoption of the procedures themselves, but also stated that dummy positioning may not be properly specified. To aid in this regard, Nissan recommended that dummy placement be further specified by dimensions of dummy-to-car part distances.

Toyota deemed the adoption incomplete and said that the timing of dummy installation prior to impact and the extent of the breaking-in between the dummy's hip and the seat materials was also important.

Mercedes, as did Volvo, said that the NCAP procedures were "moving in the right direction."

Conversely, VW said it "has no confidence that the changes proposed will cause a significant reduction in... variability" and that the Department has not provided any data to show that variability will be reduced. The lack of data to support the contention of reduced variability was also cited by MVMA and Ford.

While Honda said that the NCAP test procedures were "inadequate" to reduce variability, Renault stated it had "no objection" to their incorporation in FMVSS 208. Mazda agreed that there would be some reduction in variability with their adoption. Renault also asked whether all these types of problems are solved by their adoption.

MVMA, Ford, and GM also claim that the latest revisions to the NCAP test procedures, dummy foot placement and seat placement, were already incorporated when the repeatability tests were conducted by NHTSA; thus, no reduction in variability from the values shown in those tests could be expected from their adoption. Ford also contended that adequate public notice was not provided on this issue since the precise NCAP procedures to be incorporated in FMVSS 208 were never specified.

Head Injury Criteria (HIC) Measurements

The SNPRM sought public comment on whether HIC should be measured in the absence of the dummy's head contacting the vehicle interior. It was pointed out in the notice that the historic derivation of HIC was based on the head striking something. It was also noted in the SNPRM that NHTSA had permitted, for belt systems, the compliance with the HIC criterion only when head contact was made and only for the duration of head contact. The Department pointed out that because of some conflicting data and because it believed that a noncontact HIC criterion could act as a surrogate for neck injury, it was not proposing to change the standard.

Peugeot, AMC, Volvo, Mercedes, VW, Renault, MVMA, Ford, GM, and Mazda favored eliminating measurement of HIC in the absence of head contact. Only Allstate opposed this, claiming that it prevents cervical and spinal injuries. BMW, VW, and Mercedes also favored raising the HIC criterion, even if there is dummy head contact, to a level of 1500, as proposed in a petition to NHTSA by the Committee on Common Market Automobile Constructors (CCMC).

Peugeot said that they believe HIC is not a good criterion to protect against neck injury and that further research needs to be done on the subject. This view was supported by Volvo, Renault, and Ford. Peugeot, Honda, and GM also said that there is no basis to use a different—for example, 1500—value for HIC in the absence of head contact. They believe HIC should not be measured at all in such circumstances.

Volvo said that the origin of HIC was based on forehead impacts and only for accelerations in the anterior-posterior components. Volvo said it was little wonder, as HIC is now used in FMVSS 208 for noncontact accelerations, including those in lateral directions, that HIC readings have little real-world relevance. AMC and Chrysler also claimed little relevance between HIC and the potential for real-world injury. Conversely, IIHS submitted data, based on calculation of HIC and associated real-world injuries to baseball players who were struck in the head, that there is a real-world relevance of HIC and that serious injuries, even death, occur at HIC values of 1,000. The CFAS also said that higher HICs would compromise occupant protection.

Ford, although agreeing that noncontact head accelerations can produce injury, claimed that there was no correlation between the likelihood of such brain injuries and HIC values, nor was there any relation between neck injuries and HIC.

In commenting on HIC in general, Peugeot and Renault asked that HIC values based on dummy head-to-knee contacts also be eliminated from measurement because the dummy's knee is much harder than the human knee, leading to higher values of HIC than would be expected in actual crashes.

Testing of Safety Belts

Commenting on the NPRM, Chrysler, VW, and Ford said that there was no need to dynamically test automatic safety belts, and that the static test requirements of FMVSS 209 and FMVSS 210, as currently related to manual belts, be applied instead. It was argued that current manual belts, which are not tested dynamically, have been proven effective as evidenced by worldwide data. Thus, the companies argue, there is no reason to test automatic belts any differently than manual belts. Dynamic testing of belts only adds to development time and costs without resulting in a higher level of safety. Recognizing the problem of assuring prevention of submarining for two-point automatic belts, VW suggested that a compliance test be added for knee bolsters. Ford also suggested that the anchorage location requirements of FMVSS 210 be waived for automatic belts.

Allstate said that the fact that manual belts are not dynamically tested results in the consumer having no assurance that the restraint system in a particular vehicle will perform as it is supposed to and, thus, is the "safety scandal of the century."

No new comments were offered on this subject in responding to the SNPRM except from Jack Martens, who said that replacing the dynamic test requirement of FMVSS 208 for automatic belts with the static tests of standards 209 and 210 could result in lower quality levels for restraints. Instead, he agreed with Allstate that manual belts be dynamically tested for compliance.

Impact Test Speed

In responding to the SNPRM, GM proposed an additional set of test criteria for NHTSA to consider. GM said that if some form of passive requirements should be retained, then in addition to the current test procedures in FMVSS 208 for automatic restraints, an additional alternative of complying with manual belts, at two test speeds, should be provided. GM's proposal would permit compliance with manual belts if all FMVSS 208 criteria were met at 30 mph, with the manual belts buckled around the test dummies, *and* all criteria were also met at 25 mph, with the dummies unrestrained (i.e., belts unbuckled). GM believes this proposal would allow both consumers and manufacturers to choose between active and passive restraints while improving overall motor vehicle safety. GM also asked that the Hybrid III, or equivalent dummy in terms of biofidelity, be permitted as the test instrument.

GM claims safety benefits for their proposal equivalent to 36 percent belt usage. Their estimate is based on the reduction of total harm (which is a surrogate for the weighting of various severities of injuries by their dollar consequences) of 12 percent, which is derived by calculating the percent reduction of harm which occurs at 25 mph assuming that all current injuries were reduced in severity by one AIS level. Since GM believes that no more than a 5 percent increase in belt usage would occur with passive belts, and since the 85 percent of individuals who currently do not use their safety belts would benefit by their proposal, total safety benefits oculd be nearly 17 times higher. GM further states that although they only calculated benefits for reductions in harm due to frontal crashes, benefits could also be extended to other crash modes.

GM envisions that its proposal would result in greater manufacturer flexibility in offering improved occupant safety than does the current FMVSS 208 criteria and would subsequently result in the development of a variety of occupant safety technologies, such as "safer" steering columns, interior padding, door latches to prevent ejection, windshield glazing, etc. GM stated in its NPRM response that reimposition of FMVSS 208 without changes so as to permit such "built-in" safety to be developed could result in the reduction of the firm's efforts in this area due to diversion of engineering resources.

ANALYSIS OF THE DATA

USAGE OF OCCUPANT PROTECTION SYSTEMS

General

Restraint systems will only have safety value if they are used by occupants or are in a state of readiness such that they provide protection from harm when required to do so. The following paragraphs describe these characteristics of the various restraint systems.

Manual Belts

Various changes have been required over the last 15 years to seatbelt designs to improve manual belt usage (replacing separate lap and shoulder belts and buckles with an integrated lap and shoulder belt having a single buckle and adding an inertial reel to give occupants freedom of movement) and to remind occupants to use their belts (adding brief audible and visible reminders). Nevertheless, the rate of manual belt usage has not changed substantially over the 15-year history of FMVSS 208 (except during the brief period around 1973 when interlocks and continuous buzzers were used).

Based on recent NHTSA data, the overall safety belt usage rate for front seat occupants is 12.5 percent. This information also showed that usage varies significantly by seating position—14 percent for drivers, 8.4 percent for passengers in the right front seat, and 5 percent for passengers in the center seat.

Departmental studies have noted other interesting statistics about usage of manual belts:

- People involved in more severe accidents use their restraint systems less often than the general driving public. (One theory is that belt wearers are more cautious and less prone to severe accidents.)
- Import car occupants have substantially higher seatbelt usage than domestic car occupants. (For example: usage in domestic subcompacts was 12.3 percent, while in import subcompacts usage was 22.1 percent in 1981-82.)
- Seatbelt usage increases as car size decreases. (In 1981-82, usage was 16.8 percent in subcompacts, 10.5 percent in compacts, 7.4 percent in intermediates and 5.4 percent in full-size cars.)
- Usage is higher in newer cars than in older cars. (In 1981-82, the usage in MY 81-82 cars was 16.0 percent; the usage in MY 79-80 cars was 13.6 percent.)

Automatic Belts

Usage rates for automatic belts vary substantially depending on the particular type of belt design and on the method of measuring usage. (Around 500,000 American fleet automobiles have been equipped with automatic belts; they include some 1975-1984 VW Rabbits and 1978-1980 GM Chevettes, and the 1981-1984 Toyota Cressidas.) Studies of usage rates of existing automatic restraints are not necessarily applicable to systems that would be used to comply with an automatic restraint requirement. For example, nearly 80 percent of the existing systems (in VW Rabbits) are voluntarily equipped with starter interlocks (which DOT is prohibited by law from requiring), some owners purchased the systems voluntarily, disconnection and storage of the belts on some systems was very easy, some were installed only on rental vehicles (drivers may be atypical and, also, may not try to take long-term action to defeat the system), and some involved the more expensive motorized (with easier ingress and egress) systems. Based on the record of this and previous rulemakings, manufacturers are unlikely to equip automatic restraint vehicles with either interlocks or motorized systems. The most likely system, given that manufacturers have freedom of choice, may be the detachable automatic belt. Since this is the system for which little field experience exists, application of the current usage data to a future fleet of all automatic belt equipped vehicles may not be appropriate.

Current usage estimates for the VW Rabbit range from about 50 percent based on accident data to 80 percent based on traffic observations to 90 percent from telephone surveys. Chevette usage, based on an extremely small number of observations, is about 70 percent (a similar value is derived from telephone surveys), while Cressida belt usage appears to exceed 90 percent (observations and telephone surveys.)

The Department's estimate of future usage is based on an analysis of existing systems and surveys of usage and attitudes. Essentially, the Department tried to determine whether certain features of automatic belts might overcome some of the reasons people do not use manual belts, while recognizing the wide range of belt systems likely to be produced under a mandate. Our current estimate for automatic belt use covers a broad range: 20 to 70 percent. We expect usage rates for automatic belts to be higher than current manual belt usage because of the automatic nature of the belt, which would overcome some of the stated reasons for not buckling up: laziness, forgetfulness, and not wanting to be bothered. Although precise estimates are impossible, it seems reasonable that some increment of increased usage should be imputed to nondetachable belts, since some effort would be required to deactivate them.

There is no way to know precisely where within the range the automatic seatbelt usage rate would actually fall. The actual rate will depend on many considerations, such as comfort and convenience (including ease of entry and exit) and appearance. Education programs and proven on-the-road effectiveness could also affect usage.

Airbags

Impact protection benefits for airbags do not depend on usage since the occupant does not have to do anything. (However, as discussed elsewhere in this preamble, for greater protection, a lap belt should also be used.) As to whether airbags will deploy when they should, the Department believes that airbag technology is reliable and that airbags would function properly (they will not activate inadvertently and they will activate when they should) in virtually all instances. The automobile manufacturers agree. Two manufacturers stated their goal for reliability of airbags to be at least 99.99 percent.

Although usage is not a factor with airbags, "readiness" is. In the Department's Final Regulatory Impact Analysis (FRIA), based on an analysis of the number of automobiles involved in accidents, the Department determined that, if all automobiles were equipped with airbags and none of the airbags were repaired after an accident, 1.2 percent of the fleet would be without airbags at all times. This figure would be slightly higher if there were inadvertent deployments and they were not repaired. The Department has no reliable methodology for determining what percent of these airbags would, if fact, not be repaired. Because it would be very difficult to dismantle or remove an airbag—much more difficult than a belt system—and because it is not obtrusive, the Department estimates that only a small percent of car owners—perhaps 1 percent—would defeat the airbag. If, as a result of these two problems, 2 percent of all automobiles were without airbags at any one time, airbags would still be ready to deploy in 98 percent of the fleet. Thus, for analysis purposes, the Department estimates that airbag readiness would be 98 percent.

As explained in the next section, a lap belt or a lap/shoulder belt should be worn with an airbag to obtain maximum protection in side and roll-over accidents, as well as in frontal crashes. Becuase of this, questions arise over the usage rate of the belt system supplied with an airbag. (The Department does not know whether manufacturers would supply lap/shoulder belts or just lap belts.) One argument is that belt use would decline because people would believe that airbags give ample protection. On the other side, it is contended that usage will increase if just lap belts are provided because the shoulder belt portion makes the belt uncomfortable to some people and lap belt usage in the past was near 20 percent. Education may help overcome the "decrease" argument, but habit (people are unlikely to change their habits) may also overcome the "increase" argument. As a result, in its benefit calculations, the Deparment has assumed that current belt usage will continue with respect to the belts accompanying airbags (12.5 percent).

Other Automatic Occupant Protection Technologies

As with airbags, passive interiors do not have a "usage" rate applicable to them. However, unlike airbags, there are no deployment, replacement, or inactivation problems associated with them. Thus, the readiness factor of other known technologies is assumed to be 100 percent. As with airbags, lap belts or lap/shoulder belts might be required for protection in other crash modes (i.e., side, rear, rollover).

Effectiveness of Occupant Protection Systems

General

The safety benefits to be derived from any occupant restraint system are a function of both the usage (or readiness) of the system and its effectiveness, when used, to reduce injuries or deaths. Effectiveness of an occupant restraint system is expressed as a percentage reduction in injuries or deaths when compared to the situation when an occupant is unrestrained. If, in 100 crashes, a system would prevent the death of 60 percent of the occupants who would have been killed if they were unrestrained, then it would be rated as 60 percent of the occupants who would have been killed if they were unrestrained, then it would be rated as 60 percent effective in reducing fatalities. It is important to note two points in this regard: (1) some crashes are so severe that no occupant protection system could prevent death or injury; (2) when a device prevents a fatality or serious injury that otherwise would have occurred, the individual may suffer a less serious injury instead. (As a result, a device that is more effective at reducing serious injuries, may appear less effective, statistically, at reducing minor injuries.)

The Department's estimates for the effectiveness of the various occupant restraint systems are presented in Table 4.

Finally, it should be noted that, in general, the Department has less confidence in the effectiveness estimates for minor injuries than for more severe injuries due to reporting problems; many people do not report minor injuries or do not know they are injured until the next day and thus the injuries may not appear on police reports (the main source of injury data). While the relative effectiveness of the various systems should be unaffected, there is some doubt about whether the overall level of effectiveness for minor injuries is accurate.

TABLE 4
SUMMARY OF EFFECTIVENESS ESTIMATES
(All Accident Directions)

Injury	Manual Lap Belts	Manual Lap and Shoulder Belts	Automatic Belts	Airbags Alone	Airbags and Lap Belts	Airbags and Lap/Shoulder Belts
Fatal	30-40	40-50	35-50	20-40	40-50	45-55
Moderate to critical	25-35	45-55	40-55	25-45	45-55	50-60
Minor	10	10	10	10	10	10

Manual Belts

The effectiveness of manual belts is based on a comprehensive analysis of accident data, involving thousands of accidents. The estimates take into account various factors, such as the fact that occupants who wear their belts are generally involved in less severe accidents then unrestrained occupants. If factors such as this were not "controlled," the raw data would over estimate effectiveness. Although "controlling" the data helps, it cannot pinpoint an exact effectiveness estimate. For that reason, ranges were used. Nevertheless, the Department has the greatest confidence in the estimates of manual belt effectiveness.

Automatic Belts

To determine the effectiveness of automatic belts, the Department reviewed a number of different data sources: analyses of accidents involving existing automatic belt systems, crash tests, and a study by the Canadian Government, referred to below. Since most of the available accident data involve a 2-point automatic belt with a knee bolster, the Department's conclusions on the effectiveness of all types of automatic belts lack a statistically reliable base. In addition, in our analysis of accident data involving VW Rabbits with automatic belts, the Department was unable to determine with certainty the usage rates of the automatic belts. Because of the lack of firm usage data, effectiveness could not be estimated with as much confidence as was done for manual belts.

Furthermore, recent research by the Canadian Government has indicated that the absence of a lap belt may result in the 2-point automatic belt being less effective in preventing ejection. In addition, the door mounted, 2-point belt may have little capability of preventing ejection of an occupant in the event of an accidental door opening during a collision. However, even a 3-point automatic belt will not prevent all fatalities involving ejection, since some fatalities occur as a result of impacting interior components before ejection, while others occur as a result of occupant contact with objects outside the vehicle after partial ejection. Moreover, the door mounted belt in the 2-point system may actually prevent door openings in many instances, since the "loading" of the belt (which is attached to the door) can tend to keep the door closed during a crash.

Three-point automatic belts should be as effective as manual belts, and the Department's estimates for effectiveness of automatic belts reflect this. Automatic belt effectiveness estimates have been adjusted downward by 5 percent at the lower end of the range because there is some evidence that 2-point belts may be less effecitve than 3-point belts.

Airbags

Because of limited field experience with airbags, estimating the effectiveness of these devices is very difficult. There are so few cars equipped with airbags and so few cases or serious or fatal injuries that the field experience has no statistical meaning. Based on field experience through December 31, 1983, (excluding prototype and test fleet vehicles) and a front seat fatality count of 10, the computed airbag and manual belt effectiveness (as used in the equivalent cars) for fatalities is now the same. This means that airbags would not save any more lives than the belt systems as used in those cars. But because the data base is so small, we cannot place any confidence in this effectiveness figure. Based on a normal "confidence interval" (statistical certainty) of 90 percent, all that can be stated based on the field data is that airbags could range from being 46 percent more effective than the manual belts as used in the same cars to 70 percent less effective. Small changes in the number of fatalities would have drastic changes in these effectiveness estimates. Also, the comparisons are to manual belt usage in equivalent 1972-1976 cars. Belt usage is these cars was high compared to usage in later models, because they had, first, continuous light and buzzer reminders and, then, interlock systems. The airbag and equivalent manual belt cars also were very large and had low fatality rates. Finally, the accidents—small in number—were frequently atypical and involved a greater than normal number of circumstances where a restraint system could not provide protection (such as a drowning). All of these factors indicate that the "true" effectiveness could be significantly higher than in this small fleet.

Current estimates of airbag effectiveness are based principally upon four new analyses which have recently been conducted by NHTSA. The three studies concerned with fatality effectiveness all use the National Crash Severity Study (NCSS), a major accident data collection program designed to result in a nationally representative sample. Effectiveness was estimated by partitioning the NCSS accidents into various subgroups by distinguishing characteristics and then making judgments about whether an airbag could prevent the fatalities that occurred in that subgroup. A fourth study estimated moderate to critical injury effectiveness by comparing injury rates sustained in the airbag fleet cars to a comparable non airbag group in the NCSS file.

We have relied on these new studies primarily because they are based on a relatively large, representative set of unrestrained fatal accident cases. These data, as well as the now available 8-year census of fatal accidents, were unavailable to NHTSA when the automatic occupant protection requirements were first promulgated in 1977. Thus, effectiveness estimates which are not derived from field experience now have a large file of accident data upon which to be based. Further, NHTSA assembled a task force comprised of experts in the field of restraint design, crash testing and accident data analyses to ensure that the resulting estimates represented a consensus of varying judgments and expertise.

However, it must be noted that even these new analyses have a significant degree of uncertainty associated with them. For the most part, they rely on judgments about airbag performance based on limited field experience and controlled crash testing. This technique has obvious limitations, because death and injury in highway accidents are very unpredictable.

There is little disagreement that airbags will function very well in noncatastrophic, frontal or near frontal collisions up to speeds approaching 45 mph and will offer little or no protection in rear end collisions. The real issue concerns airbag effectiveness in side or angle impacts, rollover, and catastrophic frontal crashes. Because the Department is undecided on airbag effectiveness in the latter three situations, a wide range of estimated effectiveness for airbags has been provided. The lower portion of the range (20 to 25 percent) is generally consistent with the assumption that airbags will have fairly low effectiveness in side and rollover crashes. With progressively more optimistic assumptions regarding their performance in these types of crashes, the overall effectiveness estimate approaches the higher end of the range (40 percent). The 20 to 40 percent range fully encompasses the above dichotomy of assumptions. The zero percent field experience figure is discounted because of its statistical unreliability, crash test data showing superior performance of airbags at higher speeds than for manual belts, and statements to the docket.

Other Occupant Protection Technologies

Effectiveness estimates for other technologies are currently unavailable.

Conclusions

Some conclusions can be drawn from the general effectiveness data that have been developed. First, the most effective system is an airbag plus a lap and shoulder belt. To obtain maximum protection in not only frontal, but also side and roll over accidents, occupants of cars with airbags and lap belts must use a lap belt to supplement the airbag. An airbag plus a lap belt provides an equivalent level of effectiveness to a manual lap and shoulder belt system. Finally, an airbag alone is less effective than a manual lap and shoulder belt or automatic belt, when those systems are used.

Benefits of Occupant Restraint Systems

Safety Benefits

With its estimates for usage and effectiveness, the Department can determine benefits by multiplying the product of those two estimates by the fatality or injury figure. The final result is the number of fatalities or injuries prevented. Table 5 shows the incremental benefits; i.e., the benefits over and above those accruing from current levels of restraint usage. The numbers provided in Table 5 are annual benefits assuming full implementation. They are based on *all* cars on the road having the restraint system noted (which would

TABLE 5
ANNUAL INCREMENTAL REDUCTION IN FATALITIES AND INJURIES

	Fatalities			Moderate-Critical Injuries		
	Low	Mid-Point	High	Low	Mid-Point	High
Airbags only	3,780	6,190	8,630	73,660	110,360	147,560
Airbags with Lap Belts (12.5% usage)	4,410	6,670	8,960	83,480	117,780	152,550
Airbag with Lap/Shoulder Belts (12.5% usage)	4,570	6,830	9,110	85,930	120,250	115,030
Automatic Belts						
Usage						
20%	520	750	980	8,740	12,180	15,650
70%	5,030	6,270	7,510	86,860	105,590	124,570
Mandatory Belt Use Laws (Manual Belts)						
Usage						
40%	2,830	3,220	3,590	47,740	53,440	59,220
70%	5,920	6,720	7,510	110,430	112,410	124,570

not be the case until at least 10 years after full implementation). Mixes of restraint systems, for example, half of the cars with airbags and half with automatic belts, would lead to results between the values shown for those systems. The numbers also reflect the mid points, as well as the extremes, of the effectiveness ranges provided in Table 4. For these calculations, belt usage with airbags was assumed to be at current levels of restraint usage. The Department has also provided data on the benefits of airbags even if belts were not used. A range of benefits is provided for automatic belts and mandatory belt use laws, because of uncertainty over usage rates.

Another aspect of the analysis of benefits is the difference in short-term benefits of the different alternatives. Roughly one-tenth of the American fleet of automobiles is replaced every year. Although some automobiles are kept beyond 10 years, the Department generally assumes that, ten years after a rule requiring a safety device on new automobiles has been implemented, the device would be in place in virtually the entire American fleet. In this regard, mandatory seatbelt use laws that are enforced can have a distinct advantage in that they can be applied to all automobiles in the existing fleet immediately rather than only new cars. Since the precise date at which different States would pass and implement a mandatory belt use law can not be judged, it is difficult to predict with certainty when benefits would accrue and what the level of those benefits would be.

However, comparisons can be made based upon reasonable assumptions. For example, if all states pass a mandatory belt use law and usage throughout the nation increased to 70 percent or more within three years, the short-term benefits (over the next 10 years) would be 2.5 times higher for such laws than those associated with airbags or with automatic belts at the 70 percent usage level. As the amount of time necessary to pass the laws increases, or the number of States passing such legislation decreases, or if usage does not increase to 70 percent, the shortrun (and longrun) benefits of mandatory belt usage would decrease compared to the benefits of airbags (and possible automatic belts if they are used at high levels). Nevertheless, the benefits of mandatory belt use compared to the introduction of automatic restraints are substantial.

Table 6 compares benefits for the first 10 and 15 years after the introduction of automatic restraints into the fleet with those associated with mandatory belt use laws. Three use-law scenarios are examined. If all States quickly pass a mandatory belt use law and usage increased to 70 percent or more, short term benefits (over the next 10 years) would be about 2.5 times higher than benefits with airbags or automatic belts with 70 percent usage. Thus, unless all cars had airbags, or automatic belt usage approached 70 percent, the longrun (15 years) benefits of automatic restraints would be unlikely to approach those associated with rapid passage of State belt use laws. The short-run safety benefits of such laws are always likely to be higher.

Conversely, if a large number of States do not pass a law, or it takes a long time to get the State laws passed, or usage does not increase to 70 percent, then the shortrun and longrun benefits of mandatory belt usage and automatic restraints may be equal.

Insurance Savings

The potential reduction in fatalities and injuries that would result from mandating automatic restraints could produce a corresponding decrease in funeral, medical, and rehabilitation expenses. A reduction in these expenses could, in turn, result in reductions in premiums for any insurance that covers them. (Automobile insurance premiums could also increase to cover added expenses due to accidents or thefts involving airbag equipped automobiles. This is discussed later in the preamble.) The Department cannot be certain that consumers would receive any premium reductions or, if they would, what their magnitude might be. Most insurance industry representatives are reluctant to provide quantitative estimates of potential savings to consumers. However, at least one company provided an independent estimate and one State official assured the Department that he will mandate such reductions in his State.

The Department, based on the potential safety benefits discussed previously and an estimate of the portion of premiums associated with front seat occupant fatalities, estimates that the discounted value of automobile insurance savings (assuming a 10 percent discount rate and a 10-year vehicle life) could be, based on the midpoints of the effectiveness ranges, $95 for cars equipped with airbags. Spread over the entire vehicle fleet (including uninsured vehicles), the discounted value is $89. For belt systems the savings would depend upon usage rates but could be as high as $85 per insured car

TABLE 6
TIME PHASE ANALYSIS OF FATALITY BENEFITS

	Air Bag With Automatic Belt:		Mandatory Belt Use Law: 40-70% Usage		
Year	12.5% Usage of Lap Belt	20-70% Usage	Scenario 1[1]	Scenario 2[2]	Scenario 3[3]
1	400	50-380	3,220-6,720	2,160-4,500	680-1,650
2	1,000	110-940	3,220-6,720	2,160-4,500	730-2,100
3	1,590	180-1,500	3,220-6,720	2,160-4,500	790-2,540
4	2,180	250-2,050	3,220-6,720	2,160-4,500	840-2,980
5	2,730	310-2,570	3,220-6,720	2,160-4,500	890-3,400
6	3,230	360-3,030	3,220-6,720	2,160-4,500	930-3,770
7	3,690	410-3,470	3,220-6,720	2,160-4,500	970-4,120
8	4,130	460-3,880	3,220-6,720	2,160-4,500	1,010-4,450
9	4,560	510-4,280	3,220-6,720	2,160-4,500	1,250-4,770
10	4,960	560-4,660	3,220-6,720	2,160-4,500	1,090-5,070
TOTAL (1-10)	28,470	3,200-26,760	32,330-67,200	21,600-45,000	8,980-34,850
11	5,340	600-5,010	3,220-6,720	2,160-4,500	1,120-5,350
12	5,660	640-5,320	3,220-6,720	2,160-4,500	1,160-5,600
13	5,900	660-5,550	3,220-6,720	2,160-4,500	1,170-5,780
14	6,090	680-5,720	3,220-6,720	2,160-4,500	1,190-5,920
15	6,240	700-5,860	3,220-6,720	2,160-4,500	1,200-6,030
TOTAL (1-15)	57,700	6,480-54,220	48,300-100,800	32,400-67,500	14,820-63,530

[1]Scenario 1—It is assumed that all States have mandatory belt use laws which are in effect at the time that an automatic occupant protection standard becomes effective for new cars.

[2]Scenario 2—It is assumed that 57 percent of the population is subject to mandatory belt use laws which are in effect at the time that an automatic occupant protection standard becomes effective for new cars.

[3]Scenario 3—It is assumed that 20 percent of the population is subject to mandatory belt use laws which are in effect at the time that an automatic occupant protection standard becomes effective for new cars. The remaining 80 percent of the population would have cars equipped with automatic belts, with usage in the 20-70 percent range.

and $79 when spread over all cars, if usage rose to 70 percent; at 2 percent usage, the figures would be $10 and $9, respectively.

The Department's analysis also showed that between $49 million and $1,100 million could be saved annually in health, life, and worker's compensation insurance and governmental payments for social services such as Medicare, Medicaid, disability insurance, etc. The discounted value of these insurance and governmental payment savings expressed on a per vehicle basis would be in the range of $2 to $61.

Table 7 summarizes the insurance savings that couls result from a requirement 'for automatic occupant restraints. These potential insurance savings do not account for some offsetting insurance premium increases for airbag equipped cars, which are discussed later.

Public Acceptance of Occupant Protection Systems

The public acceptance of safety devices likely to be installed in compliance with Federal motor vehicle safety standards is one of the factors which must be considered by the Department in establishing those standards. In *Pacific Legal Foundation* v. *DOT*, the court found that in order for a safety standard to be practicable and meet the need for safety, the safety devices to be installed pursuant to the standard must be acceptable to the

TABLE 7
SUMMARY OF POTENTIAL SAVINGS
ON INSURANCE PREMIUMS FROM AUTOMATIC RESTRAINT REQUIREMENTS

Savings ($)	Per Vehicle Annual Savings ($)	Per Vehicle Lifetime Savings ($)	Total Annual Savings (M) 1990 Fleet
Air Bags			
Automobile Insurance	9-17	62-115	1108-2046
Health Insurance	4-8	29-54	521-962
Life Insurance	0-1	3-7	62-136
Total	13-26	94-176	1691-3144
Automatic Belts (For 20 Percent Assumed Usage)			
Automobile Insurance	1-2	5-14	89-243
Health Insurance	0-1	2-7	42-114
Life Insurance	0	0-1	7-14
Total	1-3	7-22	138-371
Automatic Belts (For 70 Percent Assumed Usage)			
Automobile Insurance	10-14	65-94	1146-1676
Health Insurance	5-7	31-44	539-788
Life Insurance	1	4-6	71-105
Total	16-22	100-144	1756-2570

public. The Department has attempted to determine the likely public attitudes toward manual and automatic restraints and mandatory safety belt usage laws based on public opinion surveys. In analyzing these surveys, the Department recognizes that the usefulness of the surveys as predictors of future public attitudes is limited by several factors. One is the public's lack of experience with automatic restraints on which to base its opinions. In view of the increase in favorable attitudes toward automatic belts by owners of automatic belt cars between the time of initial ownership and a later time, the Department believes that gradual exposure of the public to automatic restraints will increase the acceptability of those restraint systems above the levels indicated in the surveys. Equally important, most of the surveys are more than several years old. Since public opinion appears subject to change in relatively short periods of time in this area, as is evidenced by the fairly rapid enactment of child restraint usage laws in most States, there is additional reason to believe that these surveys may not accurately reflect future public attitudes and perhaps not even current public opinion.

Awareness/Knowledge of Automatic Restraints

The extent of the survey respondent's knowledge about automatic restraints is important in assessing the validity of the surveys as predictors of public reaction to automatic restraints. The less knowledgeable the respondents are, the less weight can be given to the survey results. Several surveys made in the late 1970's and early 1980's show that considerably higher percentages of the people surveyed were aware of airbags than automatic belts. The figures for airbags were 62 to 93 percent of the respondents, while those for automatic belts were much smaller.

Government's Role in Making Automatic Restraints Available

There were a variety of deficiencies in the surveys which included questions about public attitudes toward a government requirement for airbags or automatic restraints. For example, most surveys did not attempt to ascertain the degree of the respondents' knowledge of airbags and did not inform respondents about the cost of automatic restraints. Eight of the 12 surveys which attempted to ascertain public attitudes found that respondents favored a Federal requirement. Based on its analysis of those surveys, the Department concluded that while many people do not favor such a requirement on all new cars, there is also a substantial number who state their willingness to purchase cars with automatic restraints. Thus, initial public reaction will be divided. Public education and the performance of automatic restraints will be the key factors in determining the long run public acceptance of automatic restraints.

How Much Would the Public Pay for Airbags?

The surveys on the willingness of the public to purchase airbags indicate that only a small percentage appears willing to pay more than $400 or would expect to pay less than $100 for any airbag system. The majority of respondents cluster around the $200 to $300 levels, covering a range of approximately $150 to $350. Toward the upper end of this cost range, the driving public is roughly evenly divided in its willingness to buy airbags. This suggests that a substantial potential market for airbags exists and that a significant portion of the public would opt for them if they were priced within the $150 to $350 range and available in sufficient quantities.

Attitudes Toward Manual Belts, Automatic Belts, and Airbags

The surveys generally indicate that the public views automatic belts as superior to manual belts in comfort and convenience and that these characteristics would apparently override some of the reasons respondents give for not using manual belts. Those reasons include not wanting to be bothered with belt usage and being lazy and forgetful. At the same time, some of the reasons for not using manual belts appear equally applicable to automatic belts, e.g., fear of entrapment, doubting the value of safety belts, and not wanting to be restrained.

Airbags were rated highest on comfort, convenience and appearance and were perceived to be safer than other restraint systems by infrequent belt users. Primary concerns expressed about airbags relate to reliability, whether they will work when needed or deploy accidentally, and cost.

Public Attitudes Toward a Mandatory Safety Belt Usage Law

Surveys made in the 1970's indicate that the public is divided on the issue of mandatory belt usage laws when the concept of sanctions is not mentioned; two 1983 surveys found the public to favor mandatory use laws. When the possibility of sanctions was mentioned as part of several surveys taken in the 1970's, there was increased opposition to mandatory use laws. Since the newest of these surveys involving sanctions is 6 years old, the Department does not have a current reading of nationwide public opinion.

Public Opinion Surveys—Docket Submissions

Two public opinion surveys on occupant restraint issues were submitted to the docket, one by GM and the other by IIHS. Since both surveys included questions whose wording appears to have affected the answers, the Department does not believe that the answers to those questions can be regarded as accurately reflecting current public attitudes. For example, some questions failed to mention either the benefits or the costs of automatic restraints. In addition, there are reasons for questioning the representatives of the sample of respondents.

As to whether there should be airbags in new cars, the GM survey found that 51 percent of the respondents favored installtion if the price were $100. That number dropped to 35 percent if the price were $320 and to 19 percent if the price were $500. The GM survey also asked whether the respondents would favor installation of automatic belts at an additional cost of $100. Thirty-eight percent answered affirmatively.

IIHS' survey asked whether airbags and automatic belts should be standard or optional equipment. Fifty-six percent favored installation as standard equipment and 40 percent as optional equipment. When the 44 percent who did not believe that automatic restraints should be standard equipment were asked if manufacturers should be required to offer those restraints as options, 84 percent answered affirmatively.

Of the two surveys, only the IIHS survey directly queried the respondents about their preference for automatic restraints at various price levels. At a cost of $100 over the cost of manual belts, 30 percent favored automatic belts over manual belts and at a cost of $150, 25 percent did so. Similarly, at a cost of $100 for airbags 55 percent favored airbags over manual belts. The percentage fell to 47 percent at $200 and 42 percent at $350.

Both surveys asked about preferences for airbag requirements versus a safety belt usage law. The GM survey found that 28 percent would most like to see a combination of a belt usage law and a 65 mph speed limit on the Interstate System, 24 percent preferred airbags in all cars, and 16 percent favored a belt usage law by itself. To measure dislikes, the GM survey asked which requirement the respondents would least like to see enforced. Airbags were picked by 44 percent, a belt usage law by 14 percent, and the combination of a belt usage law and a 65 mph speed limit by 11 percent. The IIHS survey showed a preference of 2 to 1 in favor of an airbag requirement over a belt usage law. The results of both surveys in these areas were at least in part due to the particular information provided the respondents and to the wording of the questions.

The Department does not believe that it is necessary to resolve the dispute between the commenters over the precise role of public acceptability in establishing safety requirements. The nature and significance of public acceptability issues varies greatly depending on the particular factual circumstances of individual rulemakings. Since *Pacific Legal Foundation* v. *DOT*, it has been beyond dispute that public acceptability must be considered in rulemaking under the Act. The Department agrees that public acceptability involves more than considering consumer preferences. As Allstate noted, if preferences alone were a controlling factor, then that would call into question the current provisions under which manual belts are installed in new cars. However, the Department also agrees that behavior other than disabling occupant restraint systems may be relevant in considering public acceptability. The Department believes that its consideration of public acceptability would satisfy whatever definition might be applied in assessing its actions.

Based on the likelihood that the car manufacturers will install detachable automatic belts or airbags instead of nondetachable automatic belts, the Department does not believe that there will be a significant reduction in benefits due to persons disabling automatic restraints. Neither the detachable automatic belt nor the airbag have the intrusive or coercive qualities that the combination of manual belts and ignition interlocks had in 1974. However, the Department recognizes the need for the public to become accustomed to the technology and the need for protection, and believes that an across-the-board mandate too quickly could engender adverse public reaction. The Department's decision to gradually phase in the requirements of this rule will help build public acceptance of this rule. Additionally, although the added costs of automatic restraints will theoretically have some effect on new car sales, those effects, as discussed in the FRIA, would not be substantial.

Costs and Lead Time for Occupant Protection Systems

Equipment

General

Table 8 provides the Department's estimates for the incremental increase in equipment and fuel costs and required lead time for automatic belts and airbags. The increment is the cost over that of the current manual lap/shoulder belts. The Department estimates that installation of airbags in compact and larger cars would require 3 to 4 years lead time and automatic belts in all cars would require 2 to 3 years; installtion could begin sooner for a small fraction of annual production, and is likely to take even longer for airbags in small cars. Greater detail on the estimates is provided in the Department's Final Regulatory Impact Analysis.

The costs of manual and automatic belts and airbags are based on tear-down studies and comments to the docket. The cost for belts are believed to be typical of high volume production costs; the estimates for airbags are based on production of 1 million units, which is believed to be representative fo full production system costs if airbags were widely used.

Table 9 presents industry estimates on costs and lead time. It shows investment costs separately because of its effect on cash flow. Investment costs are not, however, additive to equipment; they are already included in equipment costs.

Manual Lap and Shoulder Belts

Based on Departmental analyses, the increase in a new car's price attributable to the addition of a

TABLE 8
PER VEHICLE COST IMPACTS

	Incremental Cost	Lifetime Energy Costs	Total Cost Increase	Required Leadtime
Manual Belt System	Base			
Automatic Belt System (2 pt or 3 pt non-power high volume)	$40	$11	$51	24-36 Mo.
Air Bag—Driver Only (High volume)	$220	$12	$232	36 Mo.*
Air Bag—Full Front (High volume)	$320	$44	$364	36-48 Mo.*

*For compact-sized and larger cars

manual lap and shoulder belt to the front outboard seating positions and a manual lap belt to the front center position is approximately $64, based on a production volume of one million units per year. The added weight for the manual belt would increase fuel usage at a cost of $22 over the life of the car.

Industry estimates for the cost of existing manual seatbelts ranged from $50 (Honda and Peugeot for two seating positions) to $90 (Nissan for two positions). GM and Chrysler said seatbelts for three positions cost $65 (GM said $59 for two positions).

Automatic Belts

For the various designs of automatic belts having a fixed anchorage on the door, the increase in a new car purchase price over that for a car with manual seatbelts has been estimated at $40. Added fuel costs over the life of the car would be $11. Some manufacturers may offer motorized belt systems, such as Toyota currently offers in its Cressida. Incremental cost increases for such systems are estimated by manufacturers to be as high as $300 to $400, but the NHTSA teardown study of the Cressida system shows incremental consumer cost increases of only $115 for such systems. Although motorized systems may lead to higher usage levels because of their convenience, they were not required under FMVSS 208 prior to its rescission in 1981, and are not required by this amendment to the rule.

Of the major automakers, only GM provided a detailed cost estimate in its comments to the rulemaking docket. GM's estimate was for a high volume, four-door sedan with two front seats and 3-point detachable automatic belts with single door-mounted retractors. No provision was necessary for knee bolsters. Their estimate, as well as that of an experienced cost estimator (Lohr) was $45, similar to our estimate of $40. The NHTSA tear-down studies of the Rabbit and Chevette systems, including modifications to fit other cars, yielded costs of $11 to $34. Other manufacturers' estimates are higher than NHTSA's because of "extras" (i.e., equipment not required under FMVSS 208; providing manual lap belts with 2-point automatic belts, knee bolsters with 3-point belts or extra retractors to "hide" detached automatic belts) and different assumptions about markups (profit and overhead) over actual variable costs.

The NHTSA teardown studies were adjusted to account for a mix of 2- and 3-point belts as well as for provision of items *not* required by the standard, but which could increase usage or safety. Two items that fit in the latter categories are motorized systems and the provision of manual lap belts with 2-point automatic belts. These additions increase the tear-down study estimates to $40.

The NHTSA estimate of incremental weight associated with automatic belts is 5 pounds. This compares with GM's estimate of no increase in weight with such systems, VW's estimate of

TABLE 9
INDUSTRY STATEMENTS* INCREMENTAL ON COSTS OF OCCUPANT RESTRAINT SYSTEMS AND LEAD TIME
($ 1983)

	Equipment Cost of Consumer per Vehicle ($)			Investment Cost** ($ Millions)		Fuel Cost (lbs)		Lead Time (mos.)	
	Automatic Belts	Airbags: Driver	Airbags: Full Front	Auto matic Belts	Airbags	Automatic Belts	Airbags	Automatic Belts	Airbags
GM	$45	510[2]	838[2]	125	573[8]	0	56	36	36
Ford	—	—	807[3]	—	—	25	40	36-48	48
Chrysler	115	500[1]	800[1]	37	89[8]	—	—	36	36-60
AMC	—	—	—	—	—	—	—	30-36	36-42
Mercedes	—	880[5]	-	—	—	—	—	—	—
Renault	200	—	1,000[7]	1.5	—	—	—	24	36
Jaguar	150	900	1,800[7]	—	31	—	35	—	—
VW	—	—	—	—	—	7	—	48	—
Saab	—	—	—	—	—	—	—	30	58
Nissan	130-150	—	—	—	—	—	—	30-42	—
Honda	150-170	—	—	5	—	—	—	36-48	—
Mazda	—	—	—	—	—	—	—	36	36
Peugeot	380	—	—	—	—	—	—	36	36
American Seat Belt Council	—	—	—	—	—	—	—	24	—
AOPA	—	—	185[4]	—	—	—	—	18-30	18-30
Breed	—	45[4]	141[4]	—	—	—	—	18	—
Lohr	45	—	—	little	—	—	—	—	—
Romeo Kojyo	—	150[6]	—	—	—	—	—	—	—

* A "—" indicates no data was submitted or the commenter claimed it was confidential.
** Already included in equipment costs. Also shown separately because of effect on cash flow.
[1] At 1 million units
[2] At 3 million units
[3] At 200,000 units
[4] At 2 million units
[5] Includes pretensioned passenger belt plus driver lap/shoulder belt
[6] Retrofit; does not include installation
[7] Estimate
[8] For driver only airbags, GM said that investment costs would be $428 million and Chrysler said $12 million.

7 pounds and Ford's 25 pound estimate. Assuming an equal increment of secondary weight, NHTSA estimates that the total 10 pound weight increase would result in $11 extra in fuel consumption over the vehicle's lifetime.

Airbags

The Department estimates that the vehicle price increase resulting from the installtion of airbags in all three front seating positions of cars would be $320 over the cost of a car with manual lap and shoulder seatbelts, based on a production volume of one million units. The replacement cost for a deployed airbag is estimated to be $800. There would also be a fuel penalty of $44 over the life of the car, above that for a car with manual lap and shoulder belts. The cost for a driver-only airbag and lap belt is estimated to be $220, plus a $12 fuel penalty.

The price of airbags is sensitive to volume changes. At annual volumes of less than 300,000 units, full front airbags may cost anywhere from $400 to $1,500 per car. For volumes of 10,000 units per year or less, the latter figure is most representative. A successful, all mechanical airbag system (such as the Breed system) may reduce the unit price of a full front airbag system to about $250 at an annual volume of one million units.

NHTSA's airbag tear-down study involved a 1979 Ford and a 1981 Mercedes Benz driver and passenger airbag system. The systems were disassembled into their component parts and, using automotive engineering cost estimating techniques, a NHTSA contractor estimated a variable or "piece" cost of each component exclusive of any fixed overhead expenses incurred in the production of airbag systems. These estimates are similar to those supplied by the actual airbag manufacturers through their association. The estimates that were developed include our best estimate of the cost of required vehicle modifications. The estimates also include certain component modifications suggested by the contractors for high volume production. Estimates were developed for annual production volumes of 300,000, 1,000,000 and 2½ million for both systems. In arriving at a unit retail price, unit variable costs were marked up by a factor of 1.33 to arrive at "wholesale" or "dealer" cost and a dealer discount of 12 percent was assumed.

The difference between the Department's estimates and industry's estimates is basically due to differences in design and pricing assumptions. For example, one major cost difference involves the price of the diagnostic module and associated electronics. In its comments to the docket, Ford indicated that it believes that military specification grade electronics are necessary in view of product liability considerations; we have assumed that automotive grade electronics will suffice, although we recognize that, initially, manufacturers may resort to military specification grade electronics until the reliability of automotive grade electronics is proven sufficiently. Significant differences also exist in the number of required crash sensors, module costs (NHTSA used supplier quoted costs) and vehicle markups. The Department also found the estimates provided by the major U.S. manufacturers for driver-only airbag costs difficult to justify at their stated volumes. For example, even recognizing that there are vast differences in basic design between Mercedes and GM vehicles, Mercedes appears to be charging its customers a price 25 percent higher than GM's estimate for a driver-only system even though the Mercedes system is optional and sold at an annual volume which is 42 times lower than that estimated by GM.

Other Occupant Protection Technologies

Costs for other technologies are currently unavailable.

Investment

Investment costs, which are defined as outlays for property, plant, machinery, equipment, and special tools to be used in the production of automatic occupant restraint systems, are estimated to be $1.3 billion if airbags were required in all new cars and $500 million if automatic belts were required. These estimates are for the multiyear period prior to full implementation of an automatic restraint requirement. Industry's estimate for these expenses are contained in Table 9.

The implementation of automatic occupant restraint requirements should not substantially alter the magnitude of planned capital spending over the next several years, since domestic manufacturers alone are investing nearly $10 billion annually.

Insurance

If airbags were required in all automobiles, collision and property damage liability insurance policies would have to absorb additional costs for replacing deployed airbags, for the value airbags add to vehicles that are "totaled", and for the added cost that would result when some damaged vehicles are considered "totaled" instead of repairable because of the added cost of replacing the airbag. The Department estimates that the maximum expected loss, because of a requirement for airbags in the entire automobile fleet, that would be borne by collision insurance policies would be approximately $177 million per year. For property damage liability policies, the cost would be $118.2 million.

Comprehensive insurance policies will also have to absorb additional costs for the value that airbags add to vehicles that are stolen or damaged by such things as fire and flood. The cost to insurance companies for these vehicles would be increased by the average depreciated value of airbags in the vehicles. The Department estimates that the maximum loss that would be covered by this insurance would be approximately $55 million per year.

These additional losses from airbags may cause annual premium increases, per insured vehicle, of about $2.60 per vehicle per year or $16.60 over a vehicle's lifetime. Table 10 shows these costs.

TABLE 10
SUMMARY OF POTENTIAL AUTOMOBILE PHYSICAL DAMAGE PREMIUM COSTS RESULTING FROM AIRBAGS
($ 1982)

	Per Insured Vehicle Annual Cost	Per Insured Vehicle Lifetime Cost	Per Vehicle Annual Cost	Per Vehicle Lifetime Cost	Total Annual Costs, Millions
Collision	1.90	13.45	1.31	8.85	177.2
Property Damage Liability	.94	6.35	.88	5.95	118.1
Comprehensive	.54	3.65	.41	2.77	55.4
TOTAL[1]			2.60	17.57	350.7

[1] No total is provided for per insurance vehicle figures because each type of insurance covers a different number of vehicles. The addition of these numbers would therefore be meaningless.

Economic Impact

In response to the comments about the potential economic impact of any rulemaking, the Department's analysis indicates that, with a labor force of over 115 million projected for the mid-1980's, it would be difficult to conclude that a restraint system costing the consumer no more than $500 would result in any measurable impact on national employment. Any perceptible effect on GNP is unlikely. Finally, as to the consumer price index, the Bureau of Labor Statistics generally considers higher consumer costs due to safety equipment as quality improvements, not inflationary increases, having no effect on the consumer price index. The projection of effects on the GNP and the price index have one thing in common: the relative changes are small. Long-term effects on auto sales are expected to be minor and auto industry revenue and employment would be expected to *increase.* In any event, any significant changes would result only from an all airbag requirement, not from the installation of automatic belts.

There are also positive economic benefits associated with automatic occupant protection. Based on the previously mentioned estimates of lives saved and injuries avoided (see Table 5), and the economic losses associated with those casualties as contained in a recent NHTSA study, "The Economic Cost to Society of Motor Vehicle Accidents" (January 1983), as much as $2.4 billion in protection. Although we do not wish to—and cannot—place a value on human life or injury, there are some costs associated with those deaths and injuries that can be measured, and only these are included in the study. Because they do not include such things as pain and suffering or loss of consortium, they will obviously understate total benefits of the life savings and injury reducing potential of occupancy restraint systems.

ANALYSIS OF THE ALTERNATIVES

General

Introduction

Numerous alternatives have been considered as part of the response to the Supreme Court decision on automatic occupant restraints. Before analyzing each of the specific alternatives, this portion of the paper first looks at some of the general pros and cons of each automatic protection system. It also discusses the pros and cons of other general features of many of the alternatives: a demonstration program, mandatory State seatbelt use laws, legislation to require that the consumer be given the option of buying an automatic restraint system, airbag retrofit capability, passive interiors, and the center seat issue.

Airbags

Airbags offer a distinct advantage over other occupant restraints in that they ensure a usage rate of nearly 100 percent for both drivers and passengers. Used alone, they do offer protection, but, to equal the effectiveness of a manual lap and shoulder belt, airbags must be used with lap belts. Lap belts in airbag equipped cars would probably be used only at a level near the current level of seatbelt use, 12.5 percent. Because manual belt use is so low, however, airbags would provide much greater safety benefits.

Airbags with lap belts also provide protection at higher speeds than safety belts do, and they will provide better protection against several kinds of extremely debilitating injuries (e.g., brain and facial injuries) than safety belts. They also generally spread the inpact of a crash better than seatbelts, which are more likely to cause internal injuries or broken bones in the areas of the body where they restrain occupants in severe crashes. However, the airbag does not provide protection at less than 10 to 12 miles per hour, nor does it provide protection in rollover or read-end crashes. Its level of effectiveness in side crashes is uncertain, hence the large range of effectiveness estimates for airbags. To attain protection in these nonfrontal crashes, a lap belt, or lap/should belt must be worn.

Full front airbags also can provide protection for the center seating position. No other automatic restraint system can do this, because, as with manual seatbelt systems, a shoulder belt cannot practicably be offered for the center seat.

The use of airbags would overcome possible public objections to the obtrusiveness of continuous automatic belts, lessen concerns about entrapment and avoid problems of shoulder belt comfort and convenience. Although there are significant public concerns about the alleged hazards associated with airbags, the Department believes that many of these (e.g., inadvertent activation, sodium azide, and lack of assurance that they work when needed) are unfounded.

The public might also be very concerned about the cost associated with airbags—especially current belt users who may argue that they would be getting very little additional protection at much greater cost. The cost of airbags is one of their biggest disadvantages.

One problem with respect to costs is the wide disparity between the Department's cost estimates and industry's. Although the Department can explain its estimate and the reasons for the differences, it cannot control the price at which the system is offered to the consumer. Thus, although the Department believes full front airbags need cost no more than $320, they could, especially in the near term, cost much more, since airbag costs are very sensitive to production volume. Any alternative that does not result in the use of a large number (for example, 300,000) of airbags may result in their per unit costs being very high.

Repair shop owners have raised concerns about their potential liability if an automobile's airbag fails to work after repair work was done on the car. The Department believes this concern is over stated; the introduction of an airbag into an automobile is no different from the introduction of other safety features that may not work after repair work is done on an automobile. Moreover, the insurance companies have indicated in their testimony and docket comments that there would be very little if any increase in premiums to provide insurance protection against such risks. Indeed, some insurance companies testified that product liability claims should decrease with automatic restraints. The expected reduction in deaths and injuries should result in fewer claims, for example, alleging that the brakes or steering were defective. Although some consumers might view airbags as a panacea and bring suit if subsequently injured, such "nuisance" suits are unlikely to be successful and, thus, should be short-lived.

Concerns were also raised about the dangers of sodium azide, the gas generant in most airbag systems. The sodium azide pellets are hermetically sealed and the potential of exposing motorists to a harmful dose is remote. Additional concerns involved the dangers posed by persons tampering with unfired sodium azide canisters and by the scrapping of cars with unfired canisters. While the Department believes that disposal problems can be resolved, further action on this issue is required, and the Department will work with automobile manufacturers and scrappers to ensure the safe retirement of airbag equipped vehicles. Although it is possible that individuals may tamper with or try to steal an unfired sodium azide canister, the Department believes that this is highly unlikely. The amount of sodium azide contained in the canister is small and it is more readily available through other sources. Other items in the automobile—antifreeze, gasoline, battery acid, or flares—are either more poisonous or explosive.

Dealers are also concerned that car sales will decline with an all airbag fleet. They fear that potential buyers may stay out of the market, hoping to buy in later model years when an all airbag decision would have been overturned by subsequent agency or congressional action. However, as discussed in the FRIA, the price increases associated with an all airbag new car fleet, would, at most, result in one to three postponed sales per dealership. In the long term, lost sales would not, on average, be expected to exceed one per dealer. Since airbags are not being required by this amendment to FMVSS 208, a consumer need not purchase an airbag-equipped vehicle unless he or she so desires. Thus, there should not be any reduction in sales resulting from the fact that airbags are one of several systems made available to consumers.

Another concern involves the technical problem of out-of-position occupants in small cars. The out-of-position occupant problem primarily affects children less than 3 years old. (The size of the child and the speed with which the bag must open in small cars are the primary reasons for the problem.) Overall, the safety benefits are greater for an out-of-position occupant with an airbag than without one. Moreover, technical modifications (e.g., sensors that could detect an out-of-position occupant and adjust the opening of the airbag to account for the occupant's position) and child restraint laws should lessen the problem. Nevertheless, the Department can not state for certain that airbags will never cause injury or death to a child. This situation is similar to current safety belts where the benefits are well-known, but they do on occasion cause injuries that otherwise would not have occurred. Again, the Department is not mandating the use of airbags.

In addition, manufacturers have commented that space limitations in small cars would inhibit the installation of current airbag systems and adversely affect their effectiveness. While this problem can be resolved, more time would be needed. At least 4 years lead time would be needed if airbags were required in small cars.

Still another issue is raised by some manufacturers who contend that tests required under the rule are not sufficiently repeatable to enable manufacturers to assure themselves of compliance. They argue that they get too wide a variation in results when they test the same automobile under the test procedure. To protect against some cars not passing the test, they say they will have to design the restraint systems to a more stringent standard then should be necessary. Although difficulties in the testing procedures are still of concern to the manufacturers, we believe that the testing device and testing procedure have matured greatly in the last decade. Furthermore, based on the result of NHTSA's NCAP tests, most cars (albeit with manual belts) already meet the injury prevention criteria of FMVSS 208, at 35 mph—a 36 percent more severe crash than required by the standard (with is a 30 mph test). Compliance by airbags is even less of a problem since the injury levels of the test dummy tend to be well below the maxima of the standard (much lower than for belt systems), providing a large margin of safety. In summary, we do not think that test repeatability is such a severe problem as to preclude an airbag or other occupant restraint standard, although the Department will subsequently address possible improvements in this area.

Some people are concerned that the failure to issue a rule that will result in at least some airbags being placed in automobiles might mean the end of the development of airbag technology. In this regard, it must be remembered that some improvements—such as those made by the Breed Corporation—have come about without regulation. Moreover, four manufacturers are currently planning to offer driver-only airbags in their automobiles, even though not required. It is, therefore, possible that others may follow suit to meet the competition. Most important, the Department believes that this rule will result in the use of airbags in a far larger number of automobiles than is the case today.

It should be noted that improvements are possible in the airbag system that might overcome some of the remaining problems. For example, the airbag system being developed by Breed might make airbags available at less cost than current airbag systems.

Some may argue that consumer fears and dislike of airbags may come close to generating a level of public disapproval equivalent to the seatbelt interlock system. On the other hand, the unobtrusiveness of the system may result in the airbag generating the least disapproval.

Nondetachable Automatic Seatbelts

The usage rate for nondetachable automatic belts should be higher than that for manual belts, but some people will certainly find them uncomfortable, combersome, and obtrusive. Others will fear entrapment. Although they are much less costly than airbags and not much more expensive than manual seatbelts, these concerns with nondetachable belts might hamper automobile sales.

Finally, it is possible that, in an emergency, people may find nondetachable belts harder to get out of than detachable belts. Although data do not exist on this issue, the Department has long expressed concern about the possibility that an unfamiliar egress mechanism could impede emergency exit. In the early 1970's, DOT issued a rule requiring all automatic belts to be detachable to permit emergency exit. Even in a later amendment in 1978 allowing the "spool-release" feature on continuous belts, NHTSA continued to express some concerns about ease of exit in case of emergency. The Department believes, however, that current designs of continuous belts will not create a safety problem.

Perhaps the most serious concern with respect to nondetachable belts is that the public's dislike of them may lead to defeat of the system (e.g., by cutting the belt). A number of surveys have found that 10 to 20 percent of the public might do so. This would result in not only the original owner but subsequent owners and passengers being deprived of any occupant restraint system. Since the average car has two to three owners during the useful life, belt availability could decrease to nearly 50 percent for a 10-year-old car.

Nondetachable belts are probably the most coercive type of automatic restraint. Combining this with the fears of entrapment and the concerns over obtrusiveness could cause enough public clamor to result in the same type of problem that arose out of the interlock requirement in the mid 1970's when Congress forbade the Department from requiring that device. (In the NHTSA authorization bill of 1980, which barely failed enactment, there was a provision to ban nondetachable seatbelts.)

Nondetachable belts would also force manufacturers to eliminate the center front seat (by the use of bucket seats and consoles). There is no commercially developed technology to provide an automatic belt for the center seat; even if it were exempted from the requirement for an automatic restraint, occupants would have a difficult time getting by the nondetachable belts to reach the center seat.

Another problem with nondetachable belts is that they make it difficult to install a child restraint seat properly.

Detachable Automatic Seatbelts

Detachable belts should alleviate some consumer concern about automatic belts and government involvement in the consumer's decision about belt usage. Although it is easy not to use the automatic feature (by detaching the belt and leaving it stowed), the availability of the automatic feature would make it easier to overcome some of the problems of manual seatbelt usage.

Detachable belts would also be only slightly more expensive than manual belts, but the additional expenditure would be made for what are likely to be relatively small safety benefits, if usage does not increase substantially over than for manual belts. In this regard, however, it must be remembered that NHTSA rescinded the automatic restraint requirement in 1981 because it found that detachable automatic belts would be installed in most cars and thought that those belts might not increase belt usage enough to justify them. The Supreme Court, in reviewing this action, then found that the evidence in the record indicated a possible doubling of usage with automatic belts. The Court also said that the inertia factor provided grounds for believing that seatbelt use by the 20 to 50 percent who wear their belts occasionally would increase substantially. The manufacturers also now agree that detachable belts will increase usage, at least initially.

Demonstration Program

Although we may gain more data on usage and effectiveness, the main purpose of a demonstration program would be to obtain detailed data on the issue of public acceptability of automatic occupant restraints. To the extent consumer purchases under a demonstration program would be voluntary, data that were gathered on usage or effectiveness would be too small to determine the reaction of the general population under an automatic occupant restraint mandate. To obtain statistically reliable data within a reasonably short period of time, a large number of automobiles would have to be included in the program. If such a program were to be conducted, the Department believes that it should include provision for producing at least 500,000 cars per year over a 4 year period with airbags, detachable and nondetachable automatic belts. The three types of automatic restraints would be divided evenly among the cars produced. This should provide statistically reliable results in 4 to 5 years from the date the first car is sold. (If the program is limited to airbags, 250,000 cars should be manufactured per year over a four year period. This would provide results in about 4 to 5 years.) The program could be conducted in essentially the same fashion as envisioned by Secretary Coleman when he announced his plans in 1976 to conduct a demonstration program. At that time, the Department negotiated contracts with four car manufacturers for the production of up to 250,000 automatic restraint equipped cars per year for model years 1980 and 1981.

During our recent public hearings, Ford indicated support for a mandatory demonstration program. Other manufacturers are receptive to a voluntary program, but only as an alternative to an automatic restraint requirement, and only under several conditions regarding the manufacturer's freedom to choose the type of restraint and model, test procedure changes, etc. Several manufacturers would not voluntarily participate in any demonstration program.

Three methods could be considered for conducting a demonstration program: (1) a voluntary contract program such as that suggested by Secretary Coleman; (2) use existing National Traffic and Motor Vehicle Safety Act authority to mandate such a program; and (3) seek Federal legislation. A mandated demonstration program would be difficult to justify under the Safety Act. Ford now believes that such authority exists, but the Department thinks that new legislation would be necessary. It is unclear whether Congress would provide the necessary legislation or any funding that might be required. Moreover, the time necessary to obtain any legislation would have to be added to the time necessary to conduct an effective program. There also may be serious objection to a demonstration program after so many years of attempted rulemaking, and especially so many years after Secretary Coleman's efforts.

Mandatory State Safety Belt Usage Laws

A number of analyses of seatbelt use in countries that have mandatory use laws show that such laws do increase usage. Survey results, based on responses from officials in foreign countries, show that when seatbelt usage was required and the requirement was properly enforced, usage increased dramatically and remained high. Tables 11 and 12 clearly illustrate these dramatic increases. Table 11 provides data available to the Department on 17 nations that have passed MULs; the table shows the difference in usage rates before and after the enactment of MULs. In addition, a number of Canadian provinces have enacted MULs. Those

TABLE 11
CHANGES IN SEAT BELT USAGE RATES UNDER MANDATORY USE LAWS

Country	Effective Date of Law	Belt Usage Before	Belt Usage After
Australia	1-72	30%	73-87%
New Zealand	6-72	40%	89%
France	7-73	20-25%	95% highways
			75% country roads
			50% night in cities
			35% day and night in built up areas
Puerto Rico	1-74	5%	14%
Sweden	1-75	22%	75%
Belgium	6-75	17%	87%
Netherlands	6-75	11% urban	58% urban
		24% rural	75% rural
Finland	7-75	30% highways on weekdays	68% highways on weekdays
		9% urban traffic	53% urban traffic
Israel	7-75	6%	70%
Norway	9-75	13% urban	77% urban
		35% rural	88% highway
Denmark	1-76	25%	70%
Switzerland	1-76		
	(repealed 10-77)	19% city streets	75% city streets
	Reenacted 11-80	35% highways	81% highways
		42% expressways	88% expressways
West Germany	1-76	55% autobahns	77% autobahns
		32% country roads	64% country roads
		20% city streets	47% city streets
		33% weighted average	58% weighted average
Austria	7-76	10% urban	20% urban
		25% rural	30% rural
South Africa	12-77	10%	62%
Ireland	2-79	20%	45%
Great Britain	1-83	40%	95%

provinces and the data on their experience are contained in Table 12. (More detail on the information in these tables can be found in the FRIA.)

The data in these two tables clearly illustrate the significant effect MULs have on seatbelt usage. As Table 11 shows, usage rates ranged from 5 to 40 percent before MULs went into effect, and from 14 to 95 percent after enactment. Usage typically at least doubled and in some cases increased three times or more. The average usage for the 17 countries in the table was 23 percent before mandatory belt usage and 66 percent after, an increase of 43 percentage points.

The Peat, Marwick, Mitchell and Company (PMM) study from which most of the data included in Table 11 were obtained concluded that the main factors that influence the frequency with which individuals wear their seatbelts under MULs are: (1) the level of enforcement applied by the police; (2) the natural propensity of indivuduals to be law abiding; and/or (3) the individual's personal perspective regarding their own safety.

Given the geographical proximity of Canada to the U.S. and the many similarities between our societies, the Canadian experience with MULs is especially valuable. MULs are in effect in seven prov-

TABLE 12
CHANGES IN DRIVER SEAT BELT USAGE IN CANADA UNDER MANDATORY USE LAWS

Province	Effective Date of Law	Use Before	Use in 1983
Ontario	1-76	23%	60%
Quebec	8-76	18%	61%
Saskatchewan	1-77	32%	54%
British Columbia	10-77	37%	67%
Newfoundland	7-82	9%	76%
New Brunswick	6-83	4%	68%
Manitoba	1-84	12%	12%
Averages weighted by Traffic Counts at Data Collection Sites:			
Provinces with Mandatory Use Laws			61%
Provinces with No Mandatory Use Laws			15%
Unweighted Average Usage Before Laws Passed (Excl. Manitoba)		21%	

inces in Canada, but, since Manitoba's did not go into effect until January 1984, data are not yet available from the province. Usage rates before MULs went into effect for the six other provinces averaged 21 percent. Usage rates for those six averaged 61 percent in 1983. This is an increase of 40 percent under MULs. The PMM and other studies of MULs, which are more fully discussed in the FRIA, have concluded that success is dependent on how well the public is prepared for these laws, the severity of sanctions, and on the diligence of enforcement. For this reason, the Department has established critieria in the amended rule to ensure an appropriate level of educational, sanction, and enforcement efforts.

The 1982 background paper on "Mandatory Passive Restraint Systems in Automobiles," prepared by the Congressional Office of Technology Assessment, stated that "Mandatory belt use laws are potentially the most effective approach to ensuring passenger restraint. Experience in other industrialized countries suggests that a mandatory law might result in usage rates exceeding those achievable with passive belts because so many passive belts would be detached. Nevertheless, in today's political climate in the United States, mandatory seatbelt-use laws seem unrealistic." The Department agrees with the potential for belt use laws, but feels that the political climate and public attitudes have changed significantly since then, making the possibility of enactment of such laws considerably higher.

Currently, one State legislature, New York's, has passed a mandatory use law which provides for a $50 fine, allows waivers for medical reasons only, and requires the Governor to conduct a public education program in conjunction with the law. Eleven other States are reported as actively considering seatbelt usage laws.

A number of statewide and nationwide surveys have been taken in the United States to determine the public acceptability of mandatory State belt use laws. Surveys taken in 1979 or earlier generally indicate that the public is strongly divided on mandatory seatbelt use laws. However, public attitudes about automobile safety have changed markedly over the past few years, in part because of the grass roots uprising in opposition to drunk driving. The public now strongly supports laws and innovative enforcement action to reduce the needless deaths and injuries caused by drinking and driving. This movement has spilled over into other highway safety areas such as safety belt and child safety seat usage. Evidence of this attitudinal change can be seen in the fact that 46 States and the District of Columbia have enacted child safety seat laws since the beginning of 1981 (bringing the total to 48), the New York State Legislature's recent enactment of the adult MUL law, and the significant progress made toward the enactment of

MULs in other States—notably Illinois, Minnesota, and Michigan. Recent surveys taken by several States found 66 percent in favor of mandatory belt usage laws in Michigan, 69 percent in Delaware, 52 percent in New York, and 56 percent in Ohio.

Many of the commenters who support such legislation stress the need to have public education programs before the actual enactment of the laws and Federal incentive grants as an effective impetus to stimulate the States. Indeed, the success of the mandatory law in Great Britain can be attributed to an intensive public information and education program conducted during the 2 preceding years before enactment of the law.

Legislation to Require Consumer Option

The option would ensure that consumers were given the widest possible choice of both whether to purchase an automatic occupant restraint and, depending on the requirement, what type of automatic restraint. Unlike the current market situation, those who wish to purchase an automatic occupant restraint system could do so. This would probably not be as effective in generating safety benefits as a requirement for automatic restraints in all cars. Those drivers who are involved in more serious accidents are probably the ones least likely to purchase such systems. Depending on how "controlling" the legislation that was adopted was, numerous other problems could develop. For example, dealers might not stock vehicles with automatic restraints, requiring consumers to wait a long time so as to "force" many people to purchase manual safety belts. In addition, the small number of automatic restraints produced under this alternative would likely mean high prices per unit due to a lack of economy of scale. There also would be significant costs imposed on manufacturers because of extra design and tooling costs, if it were necessary to provide more than one type of automatic restraint for each model. As a result, the overall costs for manufacturers and consumers might far outweigh the benefits, and if an insufficient volume of different types of restraints were produced, there might not even be enough data to permit further evaluation of the different types of systems.

Airbag Retrofit Capability

Requiring an airbag retrofit capability would make it easier for owners of automobiles to have airbags installed in their cars in the "aftermarket." It would also allow purchase of an airbag by a second or third owner, if the original owner failed to purchase one. This would be especially valuable if systems like Breed's airbag eventually proved successful. However, it could be argued that only the more safety conscious consumers are likely to purchase such airbags; the high risk drivers might not take advantage of the option. In addition, all automobiles would become more expensive, even if the airbags were installed in relatively few cars, and the cost of airbags could be very high if they are purchased in low volumes that do not permit economies of scale. Moreover, this alternative would not ensure that airbags would be available to consumers who wish to have them installed.

Passive Interiors

GM has been doing research to develop "passive interiors"—to build in safety by improving such things as the steering columns and padding. It believes this would be better than automatic occupant restraints and contends that it cannot afford to do both. Although an attractive alternative, this approach is still being developed, and even GM is not willing to say that it will meet FMVSS 208 in the immediate future. Moreover, FMVSS 208 does not require airbags or automatic belts; GM's passive interior concept is an acceptable compliance method, which should be encouraged. It holds the promise of being a low cost, nonobtrusive method of complying with the standard.

GM also asked that the Department consider dropping the barrier standard from 30 mph to 25 mph for passive interiors. The Department has virtually no data on what dimunution in safety would occur if the lower standard were to be used. Thus, it has no basis for making such a change.

Nevertheless, the Department encourages further research in this area. From the limited test data available, it is generally evident that it is within the state-of-the-art to pass FMVSS 208 criteria at 25 mph (using unrestrained Hybrid III dummies). General Motors, in their docket submission, indicated that the Oldsmobile Omega and the Pontiac Fiero have passed the injury prevention criteria of FMVSS 208 at 30 mph. Nissan engineers indicated in 1974 that the 260Z would come close to meeting the FMVSS 208 criteria at 25 mph. In a NHTSA test of a Ford Crown Victoria, the driver dummy's performance met the FMVSS 208 injury criteria in a 30 mph barrier test. However, even though these vehicles met the FMVSS 208 criteria, none of the manufacturers have expressed confidence in their ability to so certify to the government. Nonetheless, the Department remains optimistic about further development of this technology.

Center Seating Position

Intertwined with most of the alternatives is the issue of what to do about the center seating position. Automatic seatbelts (and even 3-point manual belts) cannot be used for the center seat. As a result, the only automatic protection available for front center seat occupants is an airbag or passive interiors. If automatic seatbelts were used to comply with a requirement for automatic occupant restraints, the center seat would have to be eliminated as an occupant position, unless it were exempted from coverage. Moreover, even if it were exempted from coverage, if nondetachable belts were required, occupants would have a difficult time getting to the center seat. Finally, even if airbags were used to meet a requirement for automatic restraints, at least one commenter (Ford) indicated that the center seat position might be eliminated due to the problem of out-of-position occupants.

If the center seat were exempted from coverage and detachable belts (or airbags) were used to provide automatic protection for the outboard seats, the center seat could still be used because the automatic belts are detachable. If they are detached to let a passenger sit on the center seat, the question then arises as to how often they would be reattached. In this regard, a recent study by Market Opinion Research is noteworthy. It indicated that the interaction between the driver and the passengers was a significant factor affecting belt usage; i.e., if the driver wore a belt, this made it more likely that a passenger would. Since passengers normally enter the front seat from the passenger side of the automobile, the driver's automatic belt would not have to be disconnected for them to enter. Therefore, if the driver does not disconnect his belt, the fact that the passenger side automatic belt is disconnected to permit entrance to the center seat may not have a serious adverse effect; since the driver is wearing his belt, it may encourage reconnection of the right front belt and/or the use of the center seat lap belt. Conceivably, center seat lap belt usage could increase compared to the expected usage in cars with only manual belts.

If the center seat were not exempted, the loss of the center seat would affect both manufacturers and consumers. In arguing for exempting the center seat, Consumer's Union and the AAA pointed out that consumers would lose vehicle utility due to a reduction in the maximum seating capacity. Manufacturers could be affected if customers opt to purchase smaller cars if they lose the center seat in larger cars. This could cause a loss of profits, since larger cars yield more profit per unit than smaller ones.

The indirect safety effects are quite complex. Moving a child, for example, from the center seat to a back seat has the advantage of significantly improving the child's safety, but the disadvantage of possibly leading to a driver who may frequently turn around to check a child in the back seat. There are also fuel economy and safety implications, if two cars are necessary when one would have otherwise been sufficient for a particular trip. The issue is made even more complex by the fact that some center seat passengers may move to the right seat and others may move to the back seat, if the right seat is already occupied. The front right seat is statistically the least safe position in the automobile, but sitting in the back is slightly safer for adults than sitting in the front.

On the other side, only one-third of the cars sold in 1982 were six seat cars, and that number has been declining as cars are being downsized. (Recent trends, however, indicate some increasing consumer preference for larger cars). An estimated 1.5 percent of front seat fatalities and injuries involve the front center seat occupant. Automatic restraints for the front center seating position would not yield as many benefits as when FMVSS 208 was originally imposed in 1977 and would not provide the same benefits per dollar spent as providing protection for the two outboard seats.

Although the center seat is rarely used, about one-third of its present occupants are children. For that reason, many are concerned about the equity of not providing automatic protection to this position. However, with child restraint laws becoming effective in 48 States and the District of Columbia, this argument loses a great deal of its merit.

Rationale for Adoption of the Rule

The Requirement for Automatic Occupant Restraints

The final rule requires, in accordance with the phase-in schedule, that automatic occupant protection be provided in passenger cars. The requirement can be complied with through any of the occupant protection technologies discussed earlier in the preamble, if those systems meet the testing requirements of the rule; i.e., manufacturers may comply with the rule by using automatic detachable or nondetachable belts, airbags, passive interiors, or other systems that will provide the necessary level of protection.

The requirement also only applies to the outboard seating positions of passenger cars. The center seat in those cars that have one is exempt from the requirement for automatic occupant protection. In addition, the requirement does not apply to other than passenger cars; for example, trucks, tractors, or multipurpose vehicles such as jeeps are not covered by the rule.

The National Traffic and Motor Vehicle Safety Act of 1966, as amended, directs the Department of Transportation to reduce fatalities and injuries resulting from traffic accidents. In its decision in the *State Farm* case, the Supreme Court held that, in carrying out its responsibilities under the Safety Act, the Department "must either consider the matter further or adhere to or amend Standard 208 along the lines which its analysis supports" 103 S. Ct. at 2862. In a number of instances throughout its opinion, the Court indicated where it found NHTSA's 1981 rescission to be inadequately supported or explained. The Department has now completed its further review of this matter, giving special consideration to the Supreme Court's decision.

Based on this review, the Department has determined that the data presented in this preamble and more fully analyzed in the Department's Final Regulatory Impact Analysis support the following conclusions:

- After assessing the data now available to it, the Department has revised its 1981 analysis concerning the likelihood of increased usage if automatic detachable belts are installed to meet FMVSS 208; it cannot project either widespread usage, or a widespread refusal to use such systems by automobile occupants.

- While it is clear that airbags will perform as expected in virtually all cases, it is also clear that the effectiveness of the airbag system is substantially diminished if the occupant does not use a belt. Consumer acceptability is difficult to predict, with the major variables being cost, fear, and the unobtrusiveness of airbags.

- Nondetachable automatic belts may result in sharply increased usage, but there may also be substantial consumer resistance to them.

- The installation of automatic occupant protection in passenger cars may significantly reduce both fatalities and injuries.

- The costs of the existing automatic restraint systems are reasonable, and the potential benefits in lives saved, injuries reduced in severity and costs avoided are substantial.

- Technologically, the systems are feasible and practicable.

Even if we assume the lower level of the range for the effectiveness of automatic belts (35 percent) and very little increase in usage (an increase on only 7½ percent over the current 12½ percent usage rate for manual belts places us at the 20 percent level used in Table 5), there still would be significant incremental annual reductions in deaths and injuries as a result of an automatic occupant restraint rule complied with entirely by the installation of belts; 520 fatalities and 8,740 moderate to critical injuries would be prevented. Using the higher effectiveness figure (50 percent) and still only 20 percent usage, we would come close to doubling the benefits; 980 fatalities and 15,650 moderate to critical injuries would be prevented annually. If usage increases to 70 percent, 5,030 to 7,510 deaths and 86,860 to 124,570 injuries would be prevented annually.

With respect to airbags, even assuming low effectiveness and no use of lap belts, the record supports the conclusion they would provide significant incremental reductions in deaths and injuries. Airbags without a lap belt could save 3,780 to 8,630 lives and prevent 73,660 to 147,560 injuries each year. With lap belts used at the current manual belt usage rate (12.5 percent), the evidence in the record indicates that airbags could save 4,410 to 8,960 lives and prevent 83,480 to 152,550 injuries.

The potential reduction in fatalities and injuries that would result from automatic restraints could produce a corresponding decrease in funeral, medical, and rehabilitation expenses. A reduction in these expenses could, in turn, result in reductions in premiums for any insurance that covers them and a reduction in the burden on taxpayers of various medical, rehabilitation, and welfare costs.

As discussed earlier, collision and property damage liability and comprehensive insurance policies will have to absorb some additional costs to the extent that airbags are used.

In attempting to provide any relationship between costs and benefits of occupant protection systems, three important points must be kept in mind: (1) The statute directs us to "reduce... deaths and injuries," and, in doing so, to consider whether the standard we issue "is reasonable, practicable and appropriate." The Supreme Court noted in the *State Farm* case that it is "correct to look at the costs as well as the benefits of Standard 208," 103 S. Ct. at 2873, but we should also "bear in mind that Congress intended safety to be the preeminent factor under the Motor Vehicle Safety Act." *Id.* (The Senate Report said safety was "the paramount purpose." The House Report called it "the overriding consideration.") (2) The net result of any calculations will only provide information on *measurable* benefits. They would not represent the full benefits of reducing fatalities and injuries because the Department cannot measure the intangible value of a human life or a reduced injury. It cannot adequately measure, for example, the value of pain and suffering or loss of consortium. (3) The data developed on usage and effectiveness are not always precise and in many instances involve broad ranges. As a result, they can have an effect on figures derived from them and the various relationships that ensue.

With this in mind and recognizing that insurance premium reductions alone only identify a portion of the economic benefits resulting from an automatic occupant protection rule, it is interesting to note some breakeven points for the cost related to automatic belts using low and high effectiveness estimates. The breakeven point occurs when lifetime cost (retail price increases and additional fuel cost) equals lifetime insurance premium reductions. At the high effectiveness level, the breakeven point occurs at the 32 percent usage level. At the low effectiveness level, the breakeven point occurs at the 44 percent usage level. Thus, by increasing current usage by approximately 20 to 30 percent, automatic belts will pay for themselves simply based on estimated insurance premium reductions. Inclusion of noninsurance benefits would lower these breakeven points, perhaps significantly.

Although airbag systems do not attain similar breakeven points based just on insurance premium reductions, it is interesting to note that a significant portion of airbag costs would be paid for just by insurance premium reductions. The estimated lifetime cost of a full front airbag system is $364, including increased fuel cost; the lifetime insurance premium reductions are estimated to range from $76 to $158 assuming 12.5 percent usage of the lap belt.

By issuing a performance standard rather than mandating the specific use of one device such as airbags or prohibiting the use of specific devices such as nondetachable belts, the Department believes that it will provide sufficient latitude for industry to develop the most effective systems. The ability to offer alternative devices should enable the manufacturers to overcome any concerns about public acceptability by permitting some public choice. If there is concern, for example, about the comfort or convenience of automatic belts, the manufacturers have the option of providing airbags or passive interiors. For those who remain concerned about the cost of airbags, automatic belts provide an alternative. This approach also has the advantage of not discouraging the development of other technologies. For example, the development of passive interiors can be continued and offered as an alternative to those who have objections to automatic belts or airbags.

Because one manufacturer has already begun to offer airbags and three others have indicated plans to do so, the Department expects that airbags will be offered on some cars in response to this requirement. Moreover, the continued development of lower cost airbag systems, such as the system being developed by Breed, may result in their use in even larger numbers of automobiles. By encouraging the use of such alternatives to automatic belts through this rulemaking, the Department expects that more effective and less expensive technologies will be developed. In fact, the Department believes it is in the public interest to encourage the development of technologies other than automatic belts to reduce the chance that the purchaser of an automobile will have no other option. *See* 103 S. Ct. at 2864. Thus, the rule is designed to encourage nonbelt technologies during the phase-in period. The Department's expectation is that manufacturers who take advantage of this "weighting" will continue to offer such nonbelt systems should the standard be fully reinstated. It also expects that improvements in automatic belt systems will be developed as more manufacturers gain actual experience with them.

Center Seat

The Department has also decided to exempt the center seat of cars from the requirement for automatic occupant protection. This has been done for a number of reasons described in more detail earlier in this preamble. First, limitations in current automatic belt technology would probably result in the elimination of the center seat for most cars if it were required to be protected. Balancing the loss of vehicle utility, and the numerous effects that this could have, with the limited number of occupants of the center seat and, thus, the limited benefits to be gained from protecting it, warrant exempting its coverage. It should be noted that different protection by seating position already exists as rear seat requirements differ from front seat requirements; the center front seat itself is already exempt from the requirement to provide shoulder belts. Thus, there is ample precedent for this action.

Mandatory Use Law Alternative

The rule requires the rescission of the automatic occupant protection requirement if two-thirds of the population of the United States are residents of States that have passed MULs meeting the requirements set forth in the regulation. The requirement would be rescinded as soon as a determination could be made that two-thirds of the population are covered by such statutes. However, if two-thirds of the population are not covered by MULs that take effect by September 1, 1989, the manufacturers will be required to install automatic protection systems in all automobiles manufactured after September 1, 1989. As discussed in an earlier section, use of the three-point seatbelt (which our analysis indicates is exceeded in its effectiveness range only by an airbag with a three-point belt) is the quickest, least expensive way by far to significantly reduce fatalities and injuries. "We start with the accepted ground that if used, seatbelts unquestionably would save many thousands of lives and would prevent tens of thousands of crippling injuries." 103 S. Ct. at 2871. As set out in detail earlier in the preamble, coverage of a large percentage of the American people by seatbelt laws that are enforced would largely negate the incremental increase in safety to be expected from an automatic protection requirement.

The rule also contains minimum criteria for each State's MUL to be included in the determination by the secretary that imposition of an automatic protection standard is no longer required. Those minimum criteria are as follows:

- A requirement that each outboard front seat occupant of a passenger car, which was required by Federal regulation, when manufactured, to be equipped with front seat occupant restraints, have those devices properly fastened about their bodies at all times while the vehicle is in forward motion.
- A prohibition of waivers from the mandatory use of seatbelts, except for medical reasons;
- An enforcement program that complies with the following minimum requirements:
- An enforcement program that complies with the following minimum requirements:
    - *Penalties.* A penalty of $25 (which may include court costs) or more for each violation of the MUL, with a separate penalty being imposed for each person violating the law.
    - *Civil litigation penalties.* The violation of the MUL by any person when involved in an accident may be used in mitigating any damages sought by that person in any subsequent litigation to recover damages for injuries resulting from the accident. This requirement is satisfied if there is a rule of law in the State permitting such mitigation.
    - *The establishment of prevention and education programs to encourage compliance with the MUL.*
    - *The establishment of a MUL evaluation program by the State.* Each State that enacts a MUL will be required to include information on its experiences with those laws in the annual evaluation report on its Highway Safety Plan (HSP) that it submits to NHTSA and FHWA under 23 U.S.C. 402.
- An effective date of not later than September 1, 1989.

The data in Table 5 indicate the important safety benefits that can be derived from an effective MUL. The relative benefits of a MUL compared to an automatic occupant restraint rule are dependent on two unknowns: the percentage of cars equipped with each restraint and the usage or readiness rates for them. For example, if most cars were equipped with automatic belts and seatbelt usage increased 15 to 20 percent, some people would consider the automatic occupant restraint rule quite successful. A MUL would more than match the safety benefits of this rule, however, even if it was only half as successful as the data indicate foreign MULs have been. Unlike an automatic occupant restraint, MULs achieve these safety benefits without adding any cost to the car.

Moreover, a MUL can save more lives immediately. It covers all cars as soon as it is passed and put into effect. An automatic occupant restraint rule requires lead time before the manufacturers can begin installing the devices, and then it would take 10 years before most of the American fleet was replaced with cars with the automatic restraints.

At the same time, the Department recognizes that MULs must be enacted before they can have any effect. Although a number of States are considering MULs, only one State legislature has passed one that is applicable to the general population. Many commenters have argued that the possibility that MULs may be passed is an insufficient basis for the Department of Transportation to decide not to issue an automatic occupant restraint rule; such inaction would violate the Department's obligations under the National Traffic and Motor Vehicle Safety Act.

This rule allows the Department to meet the concerns over the obstacles to enactment of MULs and still be able to take advantage of their benefits if they are enacted. To the extent that automatic protection systems encounter substantial consumer resistance, it encourages State legislatures to seriously consider what some may view as a more attractive alternative. Regardless of the ultimate course the country takes, the end result will be a significant improvement in automobile safety, which is the Department's goal.

This approach avoids many of the problems associated with the other MUL proposal set forth in the SNPRM. That alternative would have resulted in waivers being granted on an individual, State-by-State basis, for those States that passed MULs. The chosen approach eliminates the need to "regulate" the sale of manual belt automobiles to prevent them from being purchased by people in States without MULs. In addition, under the rule, consumers should not have to delay purchases of cars if they want to avoid automatic protection systems. Before September 1, 1989, they will have a choice, since not all cars will be manufactured with automatic protection systems. After that, either MULs will be in effect or automatic protection will be required in all cars. Under the other SNPRM MUL alternative, some consumers might have delayed the decision to buy a car while waiting for their State to pass an MUL.

Under this aspect of the regulation, the Department will review each State MUL as it is passed to determine whether it meets the minimum criteria established by the regulation. If, at any time before April 1, 1989, the Secretary determines that the total population covered by MULs that meet the minimum criteria of the regulation reaches or exceeds two-thirds of the population of the United States, the Secretary will declare the rule rescinded. If, on April 1, 1989, the Department's information indicates that two-thirds of the population are not covered by MULs, the Department will publish a notice asking for public comment on these data. If no new data are presented to the Department establishing that, prior to April 1, 1989, two-thirds of the population were covered by MULs, the automatic occupant protection requirement will remain in effect.

Some have argued that as soon as the rule is rescinded, one or more States may rescind their MULs. The Department must presume the good faith of State legislators. It also believes that the advantages of MULs will be so clear that it would be extremely difficult and unlikely that any State would rescind its statute. The Department's position on this matter is fortified by the success of MULs in foreign jurisdictions and the fact that only one of those jurisdictions has ever withdrawn a MUL, and that nation subsequently reinstated the law. Furthermore, it would be completely impractical to tie reinstatement/rescission in short cycles to the action of one or two State legislatures. The Department will, of course, continue to monitor the general issue of the protection of automobile occupants and, in accordance with its statutory responsibilities, take whatever action is deemed necessary in the future to ensure that the objective of the National Traffic and Motor Vehicle Safety Act are met.

If the automatic occupant protection requirements are rescinded because of the passage of MULs, up to one-third of the population may have no automatic occupant protection systems in their automobiles and their States may not pass MULs. However, as discussed at length above, there are disadvantages to each of the automatic restraint systems. No approach will completely eliminate deaths and injuries. The National Traffic and Motor Vehicle Safety Act's very purpose is "reduc[ing] traffic accidents and deaths and injuries to persons resulting from traffic accidents." 15 U.S.C. §1381. Coverage of two-thirds or more of the American people by MULs will be a major achievement and is clearly consistent with the Act, and it will result in a more substantial reduction in deaths and injuries more quickly and at a lower cost than any other practical alternative. In the interim, this rule will have required the automobile manufacturers to make automatic protection systems available on an unprecedented scale.

A number of points must be kept in mind while considering the relative merits of an automatic restraint as compared to MULs: (1) MULs immediately cover the entire fleet of automobiles within the State. We do not have to wait 10 or more years for a system to become installed in the entire fleet. (2) The Department expects that, under a simple automatic occupant restraint requirement, the primary method of compliance would have been through the use of automatic belts. Although automatic seatbelts would likely result in some increased usage, MULs, based on foreign experience, should result in higher usage rates. (3) Although automatic belts are relatively inexpensive in terms of the significant safety benefits they achieve, MULs have no cost increment over the existing system. (4) If only two-thirds of the population are covered by MULs and the MULs result in what the Department estimates to be the lowest possible usage rate based on our analysis of foreign experience—40 percent of the occupants—they will still result in a reduction in fatalities of from 1,900 to 2,400 and a reduction in moderate to critical injuries of 32,000 to 40,000 on an annual basis. This compares to automatic restraints, which, if installed in all automobiles, would result in a reduction in fatalities of between 520 and 980 and a reduction in moderate to critical injuries of between 8,740 and 15,650 at 20 percent usage, after they are installed in all automobiles. Moreover, during the first 10 years, MULs would save a total of from 19,000 to 24,000 lives and prevent from 320,000 to 400,000 moderate to critical injuries. During those same 10 years, while they were being installed in the American fleet, automatic belts at 20 percent usage, for example, would save a total of between 2,900 and 5,400 lives and prevent between 48,000 and 86,000 moderate to critical injuries. Thus, the overall safety benefits of the rule should exceed the benefits of a simple automatic protection requirement, *even if one-third of the population are not covered.* (5) We also expect that residents of MUL States will develop the habit of wearing seatbelts and will wear them even in non-MUL States. Residents of non-MUL States will be required to wear them while traveling in MUL States. This should increase the protection level somewhat.

In addition to the tremendous safety benefits of MULs, we also have the advantage of providing some local option in the decision-making. If enough States prefer MULs to automatic occupant protection, they can pass such laws and the requirement will be rescinded. We believe that offering this "option" should lessen any public resistance to an automatic occupant protection requirement. Having some ability to choose one alternative over the other should make both alternatives more acceptable. As noted earlier, public acceptance is an appropriate and important concern of the Department in its rulemaking under the National Traffic and Motor Vehicle Safety Act. Some commenters argued that automatic restraints should be used in conjunction with and not as an alternative to MULs. This argument ignores both the public acceptability concerns set forth above and the incentive for passage of such laws—to the extent there is significant consumer resistance to automatic protection devices—created by the Department's approach.

A number of commenters disagreed with the SNPRM proposal to establish criteria for the MULs. They argued that the criteria should be left to State governments and that establishment of criteria by the Department of Transportation might discourage a number of States from enacting MULs. Although the Department understands this concern, it believes that, under the National Traffic and Motor Vehicle Safety Act, in order for it to accept MULs as an alternative to requiring automatic crash protection, MULs must provide a level of safety equivalent to that which would be expected to be provided under existing technology by the automatic systems. The Department, therefore, believes it is imperative that it establish minimum criteria that will ensure that the MULs will achieve a usage level high enough to provide at least an equivalent level of safety. Otherwise, for example, a State could pass an MUL that permitted so many waivers or exceptions as to be meaningless.

The Department would like to note that, rather than requiring a State to amend an existing MUL, the Department will consider granting a waiver from the minimum requirements for an MUL for any State that, before August 1, 1984, has passed an MUL that substantially complies with these requirements.

In the SNPRM, the Department asked whether a rule such as the one the Department has adopted should be based on the number of States passing MULs or the population that is covered by the MULs.

The Department has decided to base the final rule on the percentage of the population rather than the number of States for the following reasons. If three-quarters of the States passed MULs, it might result in as little as 41 to 42 percent of the population being covered. The Department believes that the percentage of the people who are covered is the important aspect of any MUL alternative. As the Department has already clearly explained, the valuable safety benefits of MULs warrant encouraging their enactment.

It is the position of the Department that it has both the legal authority and the justification to require automatic occupant protection in all passenger automobiles. It is also the Department's position that it has the legal authority and the justification for rescinding the automatic occupant restraint requirement if two-thirds of the population are covered by MULs before September 1, 1989. It believes that either alternative would provide tremendous safety benefits; both meet all the standards of the Act and both carry out the objective and purpose of the statute.

The Phase-In

The rule requires the manufacturers to follow a phase-in schedule for compliance with the automatic occupant protection requirements. A minimum of 10 percent of all cars manufactured after September 1, 1986, must have automatic occupant crash protection. After September 1, 1987, the percentage is raised to 25 percent; after September 1, 1988, it is raised to 40 percent; and after September 1, 1989, all new cars must have automatic occupant crash protection.

To enable the manufacturers to determine at the beginning of the model year how many automobiles must be manufactured with automatic crash protection, the percentage of automobiles to be covered will be based upon each manufacturer's average number of automobiles produced in the United States during the prior three model years. If, for example, the manufacturer sold 3 million cars in model year 1984, 3.2 million in model year 1985, and 3.7 million in model year 1986, its 3-year average would be 3.3 million automobiles; for model year 1987 (beginning September 1, 1986) it would have to equip 10 percent of 3.3 million—330,000 automobiles—with automatic occupant crash protection systems.

The Department decided to phase in the requirement for automatic occupant crash protection for a number of reasons.

First, by phasing-in, some automatic protection systems will be available earlier than if implementation were delayed until the systems could be installed in all automobiles. The earliest the Department could have required automatic protection in 100 percent of the fleet would have been September 1, 1987. Manufacturers' comments to the docket on lead time for automatic belts ranged from immediately, for some cars such as the VW Rabbit, on which automatic belts are now offered as an option, to 3 to 4 years for all cars. Estimates for airbags ranged from 2 years for driver side airbags on some models on which these devices were already planned to be offered as options (some Mercedes, BMW, and Volvo car lines) to 5 years for airbags for some companies (e.g., Chrysler and Saab). Differences in lead times among manufacturers are due to such factors as the number of model lines a company has, previous research and development efforts and supplier considerations. The 36 months lead time needed for automatic belts, *inter alia*, is required to develop spool-out features and other components on some nondetachable belts in order to maximize consumer acceptability in terms of entry/egress. Detachable belts could require vehicle modifications to strengthen belt attachment points on the door or integrate door and roof strength to accommodate the belt anchorage. While some driver airbags could be introduced with 24 months lead time, available evidence suggests that many vehicle models will require major modifications to the steering wheel and column and extensive instrument panel modifications or redesign, including glove box relocation, for passenger airbags. Testing of occupant kinematics on the passenger side is also required. Because of the number of models involved, differing car sizes and available industry resources, it is the Department's judgment that at least a 48-month leadtime would have been required for full front airbags.

If the Department had required full compliance by September 1, 1987, it is very likely all of the manufacturers would have had to comply through the use of automatic belts. Thus, by phasing-in the requirement, the Department makes it easier for manufacturers to use other, perhaps better, systems such as airbags and passive interiors.

Phasing-in also permits consumers and the Department to develop more information about the benefits of these systems, thus enhancing the opportunity to overcome any public resistance to automatic protection. Over the first 3 years, consumers will have a choice as to whether they purchase an automobile with automatic protection. Since they will not be forced to accept them, the Department expects that they will be more likely to be openminded about their benefits.

Another advantage of phasing-in the requirement for automatic protection is that is possible that by the time two-thirds of the population are covered by MULs, the manufacturers will have made progress in designing and producing these systems at a lower cost and a significant number of consumers will continue to demand them from the manufacturers as either standard or optional equipment.

The specific percentages used for the phase-in were chosen because they balance technological feasibility with the need to encourage technological innovation. These percentages should also provide the gradual phase-in that the Department believes will help build up public acceptance.

To ensure compliance with the phase-in requirement, it will be necessary for each manufacturer to submit a report to the Department of Transportation within 60 days of the end of each model year certifying that it has met the applicable percentage requirement. The report would have to separately identify, by Vehicle Identification Number (VIN) number, those cars that the manufacturer has equipped with automatic seatbelts and those cars that it has equipped with automatic airbags or some form of occupant protection technology. The Department will issue an NPRM on this matter in the very near future. In the event that a manufacturer fails to comply with the percentage requirement under the phase-in schedule, the Department has appropriate enforcement authority, e.g., civil penalties.

Thus, the use of a phase-in appropriately takes into account the abilities of the different manufacturers to comply with the requirement, encourages the use of different, and perhaps better, means of compliance, and provides the public with an opportunity to better understand the value of automatic protection. The phase-in will permit the manufacturers to ensure that whatever system they use is effective, trouble-free, and reliable. By starting off with a relatively small percentage and building up to full compliance, the phase-in will provide the manufacturers with a better opportunity to manage unforeseen development and production problems and, as a result, also make it less likely that consumers will develop adverse impressions based upon earlier experience.

Some commenters suggested that the manufacturers would use the cheapest system to comply with an automatic restraint requirement under our SNPRM MUL alternatives. They said the short time allowed for passage of MULs would force the manufacturers to choose the least expensive alternative so that they would lose little in investments if sufficient numbers of MULs passed. The Department does not agree with this contention. It believes that competition, potential liability for any deficient systems and pride in one's product would prevent this. The phase-in schedule should provide adequate time to design and produce high quality systems.

The Credit for Nonbelt Restraints

The rule also permits manufacturers to receive extra credit during the phase-in period if they use something other than an automatic belt to provide the automatic protection to the driver. For each car in which they do so, they will receive credit for an extra one-half automobile towards their percentage requirement. It will be the manufacturer's option whether to use the same nonbelt technology to provide the automatic protection to the passenger; however, such protection must be automatic—the manufacturer may not use a manual belt for the right front seat. As a result of this option, manufacturers will be able to get extra credit for the use of airbags, passive interiors, or other systems that meet the test requirements of the rule.

There are a number of reasons for the Department's decision to permit this option. First, it believes that the primary system that would be used under this "extra credit" alternative would be the airbag. As the data in Table 5 clearly illustrate, airbags should provide very significant safety benefits. Even though fewer cars would be equipped with automatic protection if extra credit is given for airbag automobiles, airbags—when used with belts—are very effective. In addition, the Department believes that there is a definite advantage in the initial stages of compliance with this rule to encourage the use of various automatic protection technologies. This should promote the development of what may be better alternatives to automatic belts than would otherwise be developed. If enough alternative devices are installed in automobiles during the phase-in period, it will also enable the Department to develop a sufficient data base to compare the various alternatives to determine whether any future modifications to the rule to make it more effective are necessary or appropriate.

Both the Act and the Supreme Court's decision last year provide the Department with the necessary flexibility to establish safety standards that are tailored to engineering realities. Recognizing some of the technological problems, for example, that have been discussed earlier with respect to airbags and small cars and coupling this with a desire to comply with the statutory safety objectives with the best possible systems, the Department believes it appropriate to establish a regulatory scheme that provides enough flexibility for the best possible systems to be developed.

Rationale for Not Adopting Other Alternatives

Retain

We have determined, for reasons more fully explained in the prior section—"Rationale for Adoption of the Rule," not to simply retain the existing requirements for automatic occupant crash protection. Simply retaining the existing rule would result in the use of detachable automatic seatbelts in nearly all (i.e., 98 or 99 percent) cars. The amended rule the Department has adopted will encourage more effective solutions to the nation's safety problems, and it should result in the prevention of even more deaths and injuries.

Amend

Airbags Only

Despite the potentially large safety benefits that would result from the use of airbags, there are a number of reasons why the Department has determined that airbags should not be required in all cars.

Costs. As we have discussed in more detail elsewhere in this preamble, the Department has estimated that airbags will cost $320 more per car than manual belts. They will also increase fuel costs by $39 over the life of the car. In addition, the replacement cost for a deployed airbag is estimated to be $800. Because of the high cost of airbags, physical damage and comprehensive insurance premiums will also increase, adding over $18 to the lifetime cost of the vehicle. On the other hand, automatic belts would only add $40 for the equipment, $11 in increased fuel costs, and would not adversely affect physical damage and comprehensive insurance premiums. Thus, although airbags may provide greater safety benefits, when used with belts, and potentially larger injury premium reductions than automatic belts, they are unlikely to be as cost effective.

Moreover, there is still a great discrepancy between the Department's airbag cost estimates and those of industry, while the Department's estimates for the cost of automatic belts are much closer to those of industry. If, despite the Department's ability to fully justify our cost estimates, airbags are priced much higher than it has estimated, it will further compound this problem.

Finally, the high cost of replacing an airbag may lead to its not being replaced after deployment. The result would be no protection for the front seat occupants of such an automobile.

Technical Problems. Several technical problems concerning airbags have been mentioned by manufacturers, consumers, and the vehicle scrapping industry. One technical concern involves the alleged dangers of sodium azide. Some commenters claim that sodium azide, the solid propellant which is ignited and converts to nitrogen gas to inflate the air cushion, is hazardous. It is claimed that it is an explosive, is mutagenic, toxic, and an environmental hazard. As explained in the FRIA, sodium azide is not an explosive. Rather it ignites, under controlled conditions, to form harmless nitrogen gas. Furthermore, studies have continually shown that it is not mutagenic or carcinogenic in mammals, due to its inactivation by the liver. Sodium azide can be toxic, but its transport in hermetically sealed containers does not pose a hazard to manufacturers, dealers, repairmen, or consumers. The scrapping of vehicles with undeployed airbag canisters does have to be done under controlled conditions so as to avoid adverse environmental effects and, although the risk is small, the Department will continue to work with manufacturers and the vehicle scrapping industry in this area.

Another concern involves the technical problem of out-of-position occupants in small cars. Manufacturers claim that little development work has been done with airbags for small (e.g., subcompact or smaller) cars and that a particular problem in these vehicles is how to protect small children, who are not properly restrained, from the more rapidly deploying air cushion in such vehicles. The Department believes that this problem can be mitigated and that technical solutions are available, as described in the FRIA. However, the lack of experience in this area, as well as the lack of experience for some companies in any form of airbag development, make the Department reluctant to mandate across-the-board airbags.

Some people have argued that the failure to issue a rule that will require at least some airbags might mean the end of the development of airbag technology. In this regard, it must be remembered that some improvements—such as those made by Breed Corporation—have come about without regulation. Moreover, three manufacturers—Mercedes, Volvo, and BMW—are currently planning to offer driver only airbags in their automobiles even though not required, and Ford will produce driver airbags for 5,000 U.S. General Services Administration cars next year. It is, therefore, possible and likely that others may follow suit to meet the competition. Furthermore, the extra credit provided during the phase-in should encourage manufacturers to equip at least some of their cars with airbags.

Public Acceptability. Airbags engendered the largest quantity of, andmost vociferously worded, comments to the docket. Some people have serious fears or concerns about airbags. If airbags were required in all cars, these fears, albeit unfounded, could lead to a backlash affecting the acceptability of airbags. This could lead to their being disarmed, or, perhaps, to a repeat of the interlock reaction. Some people are, for example, fearful of the dangers of the sodium azide used to deploy the airbag. People are also concerned that the airbag will inadvertently deploy and cause an accident or that it will not work at the time of an accident. Some people are also concerned because they feel less secure in an automobile unless they have a 3-point belt wrapped around them (and if the Department requires a 2-point belt with an airbag, the costs will be even higher) and are thus unsure that they will be protected at the time of an accident.

Although the Department believes that these concerns can be adequately addressed, these consumer perceptions must be recognized as real concerns. It may be easier to overcome these concerns if airbags are not the only way of complying with an automatic occupant protection requirement. Under the rule being issued, if people have concerns about airbags, they can purchase automobiles that use automatic belts. The real world experience that will come with the production of airbag equipped cars during the phase-in period should help to mitigate these fears.

Effectiveness. Airbags are not designed to provide protection at barrier equivalent impact speeds less than approximately 12 mph. In addition, in order to provide protection comparable to that of a 3-point belt, they must be used in conjunction with at least a lap belt. Despite this, the overall benefits provided by an airbag, because of its extremely high "usage" rate, may be much better than those provided by automatic belts. Widespread use of both systems is the only way to develop definitive data.

Performance Standards. Several commenters questioned the Department's authority to issue an airbag only standard, claiming it would be a "design" standard. Even if the Department could legally issue a performance standard that could only be met by an airbag under present technology, it believes that by taking away the manufacturers' discretion to comply with an automatic occupant restraint requirement through the use of a variety of technologies, it creates a number of problems. First, by restricting the manufacturers, the Department runs the risk of killing or seriously retarding development of more effective, efficient occupant protection systems. With real world experience, the Department may find, for example, that automatic belts would be used by much higher percentages of occupants than currently anticipated. The manufacturers also would not be able to develop better automatic belt systems that may be more acceptable and, therefore, used by larger numbers of people. This may result in automatic belts that save as many lives but at a much lower cost than airbags. Similarly, the development of passive interiors, being pursued by GM, would be stymied under such an option. The Department believes an airbag only decision would unnecessarily stifle innovation in occupant protection systems.

In addition, if airbags were not mandated in every car, people may be more willing to give them a chance to prove themselves than they would be if they were forced to buy them. If consumers are concerned about automatic belts, it may cause manufacturers to make greater efforts to lower the costs of airbags to make them more acceptable as an alternative.

Airbags and/or Nondetachable Seatbelts

The rationale provided in the preceding sections for adopting the new rule and for not retaining the old rule or amending it to require airbags in all cars essentially provides the basis for the Department's decision not to amend the old rule to require either airbags or nondetachable belts or just nondetachable belts; (i.e., would not permit the use of detachable belts to comply with the automatic protection requirements). It is also concerned that nondetachable belts may be too inconvenient and restrictive, resulting in serious adverse public reaction if required in all cars. (See the discussion on nondetachable belts in the first part of the "Analysis of the Alternatives.")

Limited Seating Positions

Several of the alternatives would have required all or some particular type of automatic protection for specified seating positions. For example, airbags would have been required for only the driver position under one alternative. As explained under the section on "Rationale for Adoption of the Rule," the Department has determined that the data on center seats warrants exempting that position from automatic protection requirements. It also has decided that, during the phase-in period, it is appropriate to give "extra credit" for providing automatic protection to the driver through nonbelt technology, such as airbags and passive interiors, to provide an incentive for developing and producing these other, possibly better, systems. The Department has determined that existing data, discussed earlier in the preamble and in the FRIA, does not warrant exempting the front right seat or providing any other special protection to the driver.

Small Cars

The SNPRM raised for comments the alternative of providing airbag protection for the drivers of small cars and questioned the safety justification for this. We have not received data that indicate that small cars are always less safe than large cars. For that reason, we have no justification for requiring any special protection for small cars.

Rescind

After a full review of the rulemaking docket and performing the Analysis contained in our FRIA, we have concluded that the Supreme Court decision in the *State Farm* case precludes us from rescinding the automatic occupant protection requirements at this time based on the present record in this rulemaking.

The Supreme Court noted that "an agency changing its course by rescinding a rule is obligated to supply a reasoned analysis for the change *beyond that which may be required when an agency does not act in the first instance.*" 103 S. Ct. at 2866 (emphasis supplied).

To avoid having its actions labeled "arbitrary and capricious," the Supreme Court said that "the agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" 103 S. Cr. at 2866-67.

The Supreme Court also held that, if automatic belts are not justifiable, the agency should have considered requiring airbags in all automobiles. The Court found that:

> Given the effectiveness ascribed to airbag technology by the agency, the mandate of the Safety Act to achieve traffic safety would suggest that the logical response to the faults of detachable seatbelts would be to require the installation of airbags. 103 S. Ct. at 2869.

It added that:

> Given the judgment made in 1977 that airbags are an effective and cost-beneficial life-saving technology, the mandatory passive restraint rule may not be abandoned without any consideration whatsoever of an airbags-only-requirement. 103 S. Ct. at 2871.

The primary issue concerning automatic belts is the anticipated usage of the detachable belts. Although the Department cannot establish with certainty the level of usage it can expect with automatic belts, the information gathered during the comment periods on the current rulemaking NPRM and SNPRM does assist DOT in answering the Supreme Court's finding that:

> [T]here is no direct evidence in support of the agency's finding that detachable automatic belts cannot be predicted to yield a substantial increase in usage. The empirical evidence on the record, consisting of surveys of drivers of automobiles equipped with passive belts, reveals more than a doubling of the usage rate experienced with manual belts. 103 S. Ct. at 2872.

Although some would argue that the belts will merely be detached after most drivers or passengers first enter the car and never used more than current manual belts are used, no evidence has been found to support this. In responding to NHTSA's 1981 rescission argument that "it cannot reliably predict even a 5 percentage point increase as the minimum level of increased usage," the Supreme Court said:

> But this and other statements that passive belts will not yield substantial increases in seatbelt usage apparently take no account of the critical difference between detachable automatic belts and current manual belts. A detached passive belt does require an affirmative act to reconnect it, but—unlike a manual seatbelt—the passive belt, once attached, will continue to function automatically unless again disconnected. Thus, inertia—a factor which the agency's own studies have found significant in explaining the current low usage rates for seatbelts—works in favor of, not against, use of the protective device. Since 20 to 50% of motorists currently wear seatbelts on some occasions, there would seem to be grounds to believe that seatbelts used by occasional users will be substantially increased by detachable passive belts. Whether this is in fact the case is a matter for the agency to decide, but it must bring its expertise to bear on the question. 103 S. Ct. at 2872.

Although the Department believes that the existing automatic belt usage data is not generally applicable to the entire vehicle population, there is an *absence of data* that indicate that there will be no increase in usage associated with detachable automatic belts. The record of this rulemaking only has assertions that this will be so, but it lacks support for those assertions.

The Supreme Court has made it clear that it believes the better arguments support increased usage. Not only does the Department have no new evidence to counter this, but, for the first time, the manufacturers have acknowledged that, at least initially, automatic detachable belts will result in an increase in usage. The Department also now believes that some level of increase will occur based on the reasons people give for not using manual belts (e.g., "forget" or are "lazy"). Thus, it has no evidence that the belts will not be used, but merely questions about how large an increase will occur. The Supreme Court said:

> [An agency may not] merely recite the terms "substantial uncertainty" as justification for its actions. The agency must explain the evidence which is available, and must offer a "rational connection between the facts found and the choice made."... Generally, one aspect of that explanation would be a justification for rescinding the regulation before engaging in a search for further evidence. 103 S. Ct. 2871.

It could also be argued that the public will not accept automatic belts because of such problems as their obtrusiveness and inconvenience. Although an argument about public acceptability can be made, strong data on which to base it do not exist. As is discussed in more detail elsewhere in this preamble, the public opinion surveys that have been taken are flawed to the extent that they will not withstand close scrutiny and support a rescission decision that has already been struck down once by the Supreme Court.

The Supreme Court also found that, if detachable belts were unacceptable to the agency, than it "failed to articulate the basis for not requiring nondetachable belts under Standard 208." 103 S. Ct. at 2873. The Court added that, "while the agency is entitled to change its view on the acceptability of continuous passive belts, it is obligated to explain its reasons for doing so." 103 S. Ct. at 2873. Finally, the Court said that:

> The agency also failed to offer any explanation why a continuous passive belt would engender the same adverse public reaction as the ignition interlock, and, as the Court of Appeals concluded "every indication on the record points the other way."... We see no basis for equating the two devices: the continuous belt, unlike the ignition interlock, does not interfere with the operation of the vehicle. 103 S. Ct. at 2873-74.

Again, "substantial uncertainty," 103 S. Ct. at 2871, will not suffice and there is no substantive evidence in the rulemaking record to refute the point made by the Court.

The Department has no new evidence that nondetachable belts are not an acceptable means for reducing deaths and injuries. Although there are some comments in the current docket that some people will dislike tham and may even cut them or otherwise destroy them, it is primarily speculation; there is no clear data. Moreover, even if 20 or 30 or even 40 or 50 percent of the people find some method for defeating the belt, the evidence in the record indicates that it will still result in a significant reduction in deaths and injuries for the remainder who do not.

Some people expressed concern about emergency egress from nondetachable belts. The Supreme Court had the following to say on this:

> ...NHTSA did not suggest that the emergency release mechanisms used in nondetachable belts are any less effective for emergency egress than the buckle release system used in detachable belts. In 1978, when General Motors obtained the agency's approval to install a continuous passive belt, it assured the agency that nondetachable belts with spool releases were as safe as detachable belts with buckle releases. 103 S. Ct at 2873.

Manufacturers commented that it would likely be more difficult to extricate oneself from a nondetachable as compared to detachable automatic belt. However, they did not claim that it represented an "unsafe" condition, and again, there is no new evidence to buttress their concerns.

Finally, there are a number of attractive arguments that are based in part on the following theme: the presence of the government in the middle of the debate over passive restraints has distorted the activities of both automobile manufacturers and insurance companies; if the marketplace had been allowed to work, insurance incentives would have led to the voluntary adoption of one or more systems by the manufacturers. Whether these arguments are correct or not, they cannot be considered in a vacuum. In fact, the context provided by the Supreme Court is quite harsh:

> For nearly a decade, the automobile industry waged the regulatory equivalent of war against the airbag and lost—the inflatable restraint was proven sufficiently effective. Now the automobile industry has decided to employ a seatbelt system which will not meet the safety objectives of Standard 208. This hardly constitutes cause to revoke the standard itself. Indeed the Motor Vehicle Safety Act was necessary because the industry was not sufficiently responsive to safety concerns. The Act intended that safety standards not depend on current technology and could be "technology-forcing" in the sense of inducing the development of superior safety design. 103 S. Ct. at 2870. (Footnotes omitted).

The history of this rulemaking, the *State Farm* decision, and the rulemaking record have put us in a position where rescission of the automatic occupant restraint requirements—unless there is a very substantial increase in use of seatbelts in the future—cannot be justified. On the other hand, as discussed in detail elsewhere in the preamble, such a substantial increase as a result of the widespread enactment of MULs would provide increased safety benefits much more quickly and at a much lower cost, thus making rescission clearly justifiable. As the Supreme Court said, "We start with the accepted ground that if used, seatbelts unquestionably would save thousands of lives and would prevent tens of thousands of crippling injuries." 103 S. Ct. at 2871. It also noted that the Department originally began the passive restraint rulemaking exercise because "[i]t soon became apparent that the level of seatbelt usage was too low to reduce traffic injuries to an acceptable level" 103 S. Ct. at 2862. The data set out elsewhere in this preamble and in the Final Regulatory Impact Analysis demonstrate the dramatic reductions in deaths and injuries that widespread usage of the manual belt systems would achieve. Thus, the Department has concluded that if two-thirds or more of the American people are covered by such laws, the need for an automatic occupant restraint requirement would be obviated.

Demonstration Program

Because of the length of time a demonstration program would take, the Department believes that it would be necessary to justify rescission of the old rule under this alternative. It also believes that the phase-in portion of the amended rule will achieve the public education/acceptance aspects of any demonstration program.

Other Mandatory Use Law Alternatives

The Department's rationale for not adopting the other MUL alternatives is explained more fully in the preceding sections. These other alternatives are generally deficient in one of two respects: they either make it necessary for the Department to justify rescission under current circumstances or the requirements they impose are much too burdensome.

Under the alternative raised in the NPRM, the Department would have sought the enactment of MULs. The Department could not be certain that a sufficient number of MULs would pass or that, if passed, they would contain the necessary provisions concerning penalties, enforcement, sanctions, education, and waivers. As a result, the Department could not determine whether the necessary level of benefits would be achieved.

Under the other SNPRM alternative, the Department would have waived the requirement for automatic restraints in individual States that enacted MULs. This alternative would have required the "regulation" of the sale of the manual belt cars to ensure that they were not covered by people not covered by MULs. It also would have had adverse market impacts if consumers delayed their purchases of cars, in anticipation of their States passing MULs, in order to avoid purchasing automatic restraints.

Legislation to Require Consumer Option

As with some of the previous alternatives, this approach would require the Department to justify rescission of the old rule. In addition, it would place a tremendous economic burden on the manufacturers to have to be able to provide a variety of systems on each model. It would, in turn, raise the cost of all automobiles for the consumer.

Airbag Retrofit Capability

This, too, would require justification for rescission. It would also result in increasing the cost of all cars even if no one ever retrofitted a car.

TESTING PROCEDURES

Repeatability

The single most significant repeatability issue related to test procedures, as reflected in comments to the docket, was that of the repeatability of the barrier crash test results. Nearly all manufacturers claim that because test result differences are encountered in repeated tests of the same car, and since these differences are large, they can not be certain that *all* their vehicles will be in compliance even when their development and compliance tests show that the vehicles are. These large differences, or test variability, place a manufacturer in jeopardy, it is claimed, because NHTSA, while checking for compliance, may find a single vehicle with test results exceeding the maximum values in the standard, even though the manufacturer's results are to the contrary. Thus, they stated, they might have to recall vehicles and make vehicle modifications (which they claim they would not know how to make) even though the vehicles actually comply with the standard. The auto companies say that the test result variances are essentially due to deficiencies in the test procedures themselves as well as the prescribed Part 572 test dummy.

Because of these alleged deficiences, the argument goes, the standard is neither "objective" nor "practicable" as required by statute. Manufacturers cite court decisions in *Chrysler Corp.* v. *DOT* 472 F.2d 659 (6th Cir. 1972) and *Paccar, Inc.* v. *NHTSA*, 573 F.2d 632 (9th Cir. 1978), to argue their point. In *Chrysler*, the court said that for a standard to be "objective"

> tests to determine compliance must be capable of producing identical results where test conditions are exactly duplicated, that they be decisively demonstrable by performing a rational test procedure, and that compliance is based upon the readings obtained from measuring instruments as opposed to the subjective opinion of human beings. 472 F.2d at 676.

Because manufacturers claim that the only way they can assure compliance is to "overdesign" their vehicles (e.g., because of alleged variances in results, to comply with a HIC requirement of 1000 manufacturers would design their vehicles to only have an HIC of 500), resulting in excessive costs without safety benefit, the *Paccar* case has relevance. In overturning a truck braking standard, the Court said that although the standard's test procedures were "objective," they were not "practicable" because variations in test surface skid numbers required manufacturers

> not simply to comply with the stated standard, but to over-compensate by testing their vehicles on road surfaces substantially slicker than official regulations require. 573 F.2d at 644.

The Department continues to believe, however, that FMVSS 208 is both objective and practicable. Manufacturers have not supplied for the record data to support their claims of excessive test variability nor have they demonstrated that the bulk of any variability is due to test procedures and instruments as compared to vehicle-to-vehicle differences.

The primary, and for most manufacturers the sole, basis for claims of variability was the Repeatability Test Program conducted by NHTSA under its New Car Assessment Program. NHTSA tested 12 Chevrolet Citations in an attempt to ascertain the reliability of publishing barrier crash test results based on a single test. The results of the testing program for HIC (only HIC was mentioned by manufacturers as a variability "problem") were:

	Mean	Standard Deviation	Coefficient of Variation
Driver	655	137	21%
Passenger	694	77	11%

The manufacturers focused on the COV of the driver HIC values—21 percent—and claimed that this is too large. They claim that with this large a COV, they would have to design their vehicles to achieve an HIC no higher than 560 to assure than 95 percent of their cars, when tested, would have HIC values below 1000.

This argument is faulty for several reasons. First, the NCAP results were based on the testing of a single car—the Citation—at a *higher* test speed (35 mph) than required in FMVSS 208 (30 mph). Passing the FMVSS 208 criteria at 35 mph requires a vehicle to absorb 36 percent more energy—since the energy dissipated in a crash is proportional to the square of the speed—then in the required 30 mph crash. The Department would expect that test result differences would be lower at 30 mph since at 35 mph the design limit of certain structural members has been exceeded. Assuming that the COV at 35 mph would be identical or lower than that at 30 mph is without foundation and is counterintuitive to sound engineering theory.

Second, the NCAP data can only be used to derive a COV, at 35 mph, for the Citation. Extending the Citation results to other vehicles is again without basis. For example, Volvo tested four MY 1983 760 GLE vehicles according to the NCAP procedures (although an additional 3 760 GLEs were tested by a laboratory, MIRA, for Volvo, the NCAP procedures may not have been fully followed by that organization and thus can not be combined with Volvo's own data). The results of the four Volvo tests are:

	Mean	Standard Deviation	COV
Driver	898	71	8%
Passenger	731	27	4%

Here, we see coefficients of variation about 60 percent lower than that shown for the Citation. Although not as many tests were run as for the Citation, the Volvo 760 GLE results cast doubt as to whether the Citation results can be applied to all vehicles. The Department also points out that even the Citation results for the *passenger*, which tended to be ignored in the docket comments (manufacturers instead tended to focus on the higher COV for the driver) exhibit half the COV cited by the auto companies.

Ford commented that the Volvo data, "though nominally somewhat lower, was not significantly different than that found in the Citation . . ." Ford, however, used all seven Volvo tests. Since these tests were not all conducted similarly, they are from two different statistical "universes" and cannot be combined for statistical purposes. Nor does Ford disagree that the Volvo results are lower than for the Citation. And, Ford only compared the standard deviation of the Citation and 760 GLE results. Since the *mean* was higher for the 760 GLE than the Citation, and since the COV is equal to the standard deviation divided by the mean, had Ford compared COVs it might have found that these differences *were* statistically significant. Thus, Ford's use of the Volvo is inaccurate in that it: (1) combines two unlike data sets—the MIRA and Volvo 760 GLE tests; (2) fails to examine coefficients of variation, a better descriptor of variance than the standard deviation; and (3) only examines the larger differences associated with driver HIC, and ignores the lower, passenger variances.

Ford also supplied, in response to the SNPRM, data which the company claims shows that their 33 Mercury tests, with airbags, conducted in 1974 also exhibited the same variances. Ford took the results of these tests on MY 1972 Mercurys, which were conducted at 30 mph, and "scaled" them to 35 mph. They claim that after "scaling," the Mercurys exhibited the same standard deviation as the Citation.

The Department has examined the actual 30 mph test results of these Mercurys, contained in Ford's February 1976 report, "Airbag Crash Test Repeatability," ESRO Report No. S-76-3, and finds that the results are not just for frontal barrier tests but also 30 degree angle tests. At least nine of the 24 frontal tests were at the oblique angle. Although FMVSS 208 requires angle tests, the comparison of angle plus frontal results to only frontal results is somewhat inappropriate.

Furthermore, Ford again compares only the standard deviations of driver HICs. After "scaling," Ford shows the driver HIC standard deviation to be 137. However, the standard deviation based on Tables 4-1 of the Ford report show driver HIC standard deviations, without "scaling," in frontal crashes to be only 80, and the COV in frontal crashes, given the mean of 479, is 16.7 percent. As Ford somehow *converted* these values, or some other value representing both frontal and oblique crashes, from 30 mph to 35 mph, Ford is implicitly agreeing with NHTSA that one can not compare statistical results from crash tests conducted at different speeds.

These Departmental positions—that the Citation tests may not be applicable to all cars and that 35 mph test results may not be applicable to results at 30 mph—were raised in the SNPRM wherein the Department stated "We are also interested in comments on the relevance of the Citation variability tests (conducted at 35 mph) to the FMVSS 208 compliance tests (specified to be conducted at 30 mph) and the applicability of the new Citation results to other vehicles." Other than the above cited Ford data, responses were submitted by only GM, which provided data based on 30 mph sled tests which showed COVs of 11 and 8 percent for the driver and passenger, respectively, and Volvo, which also provided sled test data showing a mean of 467 and a COV of 12.5 percent. Further, only Ford claimed that "comparable variability" to that resulting from the Citation tests "would be expected for other vehicle models." Other manufacturers failed to address the issue.

Based on the above, the Department concludes that the Citation test results cannot, without the analysis of data for other vehicles, be applied to other cars models at lower speeds.

The second reason the Department does not accept manufacturer claims of excessive variability is also related to test speeds. Variability by itself is not a crucial factor for a manufacturer to be concerned about. Rather, it is the combination of variability *and* the mean (or average) value which can be cause for concern. For example, assume that a manufacturer is 95 percent confident that all its HIC test results will be within ± 150 points of the mean. If the mean value is 900, then the manufacturer may not be certain that all its vehicles will comply with a criterion whose maximum value is 1000. However, if the mean is 500, then the ± 150 variation is of little consequence in ascertaining assurance of compliance.

It is clearly intuitive, due to the 36 percent less energy involved in a 30 mph crash compared to a 35 mph crash, that average test results will be lower at the 30 mph barrier crash speed than at the 35 mph speed used in the NCAP program. No commenter to the docket argued to the contrary. Therefore, the issue of variability can not be examined in isolation but *must* be analyzed in the context of the mean value.

Reexamining the Ford Mercury data, conducted with airbags at 30 mph, the mean HIC value, taken from page 4-20 of the Ford report, is 319.9. With such a low mean, the derived variance is irrelevant for compliance purposes. The Department wishes to point out that: (1) based on its NCAP testing, even with manual belt systems and when tested at 35 mph, 80 percent of the dummy drivers and about 60 percent of the passenger dummies meet the FMVSS 208 injury prevention criteria with mean HICs of 899 and 845, respectively. These percentages would of course increase and the means decrease at 30 mph. And (2) all *airbag* tests shown mean HICs in the 400 to 500 range, a range wherein variability again becomes meaningless for assuring compliance. For instance, tests with airbags for MY 1972 Pintos showed maximum HICs in the 500 to 600 range with the median value less than 400; the maximum and mean for MY 1972 Mercurys were less than 700 and less than 400, respectively; and for MY 1974-76 GM airbag cars the values were under 600 and about 450, respectively.

Thus, mean HICs for automatic belt systems in 30 mph barrier crashes would be lower than the 899 and 845 values observed from the 35 mph NCAP program and for airbag equipped cars would likely be in the 400 to 500 range, making variability a moot issue.

A third reason that the Department believes that variability is not so significant as issue as to preclude the standard's reinstatement is that manufacturers have not demonstrated that the test procedures and test dummy are the major causes of variability. GM and Volvo provided sled test data which showed COVs of about 10 percent. Since a sled test provides a steady crash pulse, it was argued that most of, if not all, the variability seen was due to dummy and test procedure variances. Without arguing the point, the Department notes that these manufacturers failed to address the question of whether this 10 percent level of variability, when combined with an expected mean, is unacceptable. For instance, if it is assumed that the mean 30 mph passive belt HIC is 800—which is not unreasonable given current means of between 845 and 899 at 35 mph—a COV of 10 percent translates into a standard deviation of 80. Since 95.45 percent of all test results fall within the mean ± 2 standard deviations, a manufacturer can be sure than more than 95 percent of its cars will have HICs below 960 (800 + 2[80]) and the manufacturer could be about 98 percent certain that all tested cars will have values below 1,000. A lower mean would increase the above-mentioned percentages.

In the SNPRM, the Department requested comments on what level of variability was deemed "reasonable," given that some variability will always exist. Only Renault provided a quantitative answer, saying the "the variation coefficient must not exceed a maximum of 10 percent." Although Renault provided no further justification for its recommendation, the Department notes it is nearly identical to the variation contributed by the test procedures and dummy, according to Volvo and GM.

Manufacturers generally asserted that the observed variability was not caused by vehicle-to-vehicle differences but by the test procedures and use of Part 572 dummy. In the SNPRM, the Department said that it did not believe that the dummy contributed significantly to test variability. The Department, after reviewing the docket, still retains this conclusion. The 1976 Ford repeatability test report concluded that "that portion of the variability in the test results which can be attributed to differences between the nine part 572 dummies . . . is small for the HIC measurements and virtually nil for the chest g and femur load measurements." Ford engineers also said in an SAE paper (SAE paper 750935) the "differences in test readings from one test dummy to another were rather small, especially when compared to other factors . . . In fact, the variance in test readings associated with differences among dummies was essentially zero for chest g and for femur loads." Renault, in response to the SNPRM, said that "the present Part 572 dummy is not the major cause of the dispersion of results."

In its NCAP repeatability program, NHTSA found that differences in dummy calibration results have "no correlation . . . to dummy response results in the vehicle crash event." (SAE paper 840201, February 1984). NHTSA further noted that the Citation's "structural response . . . displayed significant variability" from vehicle-to-vehicle. These differences included variations in engine cradle buckling, floor pan and toe board buckling, and irregular motion of the steering column. NHTSA concluded that "previous safety research has demonstrated that these structural behavior characteristics do have influence on dummy HIC values, possible of major proportions." Because of the large variations among vehicles and the lack of correlation of dummy calibration to HIC results, NHTSA believes that a large part of the test variability is due to vehicle variability.

In summary, the Department finds that FMVSS 208 meets all statutory criteria for objectivity and practicability, that manufacturers have not demonstrated that there would be either excessive variability in total or due to the test procedures alone, and that compliance with FMVSS 208, particularly with airbags, does not represent an insurmountable burden to manufacturers.

Compliance Procedure

Having concluded that any test variability is not sufficient to delay the standard's reinstatement, the Department is still concerned that manufacturers believe themselves to be in unacceptable compliance jeopardy. To reduce this jeopardy, manufacturers suggested that a "design to conform" policy be adopted. They claimed this was neither inconsistent with court decisions regarding the required objectivity of standards nor would it materially affect vehicle design, since they would still have to demonstrate, through crash tests, that their design could achieve the required levels of compliance. Furthermore, it was argued by VW that NHTSA presently operates under this concept.

We agree with VW that, in the event of a nonconforming test result, NHTSA will seek to obtain manufacturer compliance, test data and/or conduct a second compliance test itself, prior to asserting that a particular model is in noncompliance. The Department is unaware of any instance in which NHTSA has sought remedy under the statute for noncompliance with a safety standard based on only a single test result. Thus, for example, if NHTSA found a car with an HIC value of 1050 and, after reviewing manufacturer test data and/or conducting another test, both of which demonstrated compliance, it would likely determine that the manufacturer had exercised "due care" and would not seek remedy under the statute.

However, the *Chrysler* Court disapproved of any agency offering to investigate whether differences in test results (between manufacturer tests and agency compliance tests) were sufficient to determine a noncompliance. The court stated that manufacturers needed objective assurances and there was no room for agency investigations. Thus, the Department recognizes that automobile companies need some guarantee that should one car out of a million, for example, be found to fail the compliance test, that all one million will not have to be recalled.

The guarantee sought by the industry, "design to conform," though, is not acceptable. As pointed out in the SNPRM, the Department believes such an approach introduces unacceptable subjectivity into the determination of compliance with the standard, in contravention to the decisions of the courts to minimize nonobjective determinations of noncompliance. Instead, since NHTSA already exercises discretion in compliance cases, we will seek, through a subsequent Notice to be issued shortly, to provide such assurances without compromising either safety or the necessary statutory objectivity. Essentially, we will propose to amend FMVSS 208 by recognizing that a vehicle shall not be deemed in noncompliance if a manufacturer has exercised "due care" in designing and producing such vehicle. Rather than increase the subjectivity of the compliance process by introducing a "design to conform" concept, NHTSA will explicitly recognize in FMVSS 208 the statutory direction expressed in section 107(b)(2) of the National Traffic and Motor Vehicle Safety Act (15 USC 1397), that the penalties associated with producing a noncomplying vehicle "shall not apply to any person who establishes that he did not have reason to know *in the exercise of due care* that such vehicle. . . is not in conformity with applicable Federal motor vehicle safety standards. . ." (emphasis added).

Test Dummies

As stated earlier, the Department continues to believe that the Part 572 test dummy fully meets all statutory criteria and is not a major source of test result variability. Most manufacturers, however, disagreed. Volvo contended that the dummy has "serious limitations" and must be more durable, repeatable, and trouble-free. Toyota said it could not be sure of the influence of the dummy on test results. Mercedes also said that the Part 572 dummy is not sufficiently repeatable while Ford said that the dummy's calibration is repeatable but its crash test performance may not be. American Motors said that the Part 572 dummy is a state-of-the-art compromise and lacks in measurement fidelity.

While not claiming that that Part 572 dummy is not repeatable or fails to meet statutory criteria, GM urged NHTSA to approve the use of the Hybrid III dummy as an alternative test device. GM said that the Hybrid III "offers significant improvements over the part 572 dummy relative to biofidelity of frontal head, chest and knee responses, fore-aft neck bending, ankle and knee articulation and automotive seated posture." Nissan agreed that the Hybrid III is a superior dummy which demonstrates greater repeatability. Conversely, Mercedes said that the Hybrid III is not any more repeatable than the Part 572 dummy.

As part of its petition to use the Hybrid III, GM submitted a paper by Mertz ("Anthropomorphic Models," GM USG 2284, Part III, Attachment I, Enclosure 3) which stated that the Part 572 dummy (actually, the Hybrid II dummy, also developed by GM) has "good repeatability, durability, and serviceability." "The Part 572 dummy represents the state-of-the-art of dummy technology in the early 1970's."

Based on the conclusions of the Ford Mercury testing and the agency's NCAP testing, NHTSA has concluded that the dummy does not contribute significantly to test variability. Renault agreed with this conclusion. Industry characterizations of the dummy, as shown above, vary considerably, from the Part 572 being a major cause of variability to it not being a major cause, to the Hybrid III being an improvement, to it not being an improvement. Only a few manufacturers provided data to support their contentions but these data, supplied by Ford, GM, and Volvo, based on sled tests, could neither separate the contribution of variability associated with the dummy alone nor demonstrate why any dummy-induced test result variances were so high as to be unacceptable. Since the Department recognized, in the SNPRM, that some variability will always be present in specifically sought comment on the levels of variance which were deemed "unacceptable." Only Renault replied to this direct question and it did not supply a rationale for its conclusion. In the absence of data to the contrary, the Department continues to believe that the current Part 572 test dummy is adequate to use as a compliance test device in standard 208.

Nevertheless, it is recognized that the Part 572 dummy is more than 10 years old and, we agree with AMC and GM in this regard, is a state-of-the-art compromise. Recognizing that dummy development, especially improved biofidelity—that is, the dummy's replication of actual human motion and potential for injury—is crucial for continued improvements in vehicle safety, NHTSA has been utilizing the Hybrid III dummy in its research and development work, as have GM and other manufacturers. NHTSA recognizes that the Hybrid III dummy does have additional measurement capability over the Hybrid II (Part 572) and, assuming injury criteria can be agreed upon and its repeatability, durability, etc. verified, it could be viewed as an improvement over the Hybrid II. Because of these views, and the data presented in the GM position, NHTSA will address these issues in a separate rulemaking. Because we have concluded that the current Part 572 dummy is fully adequate to use in testing to the injury criteria specified in FMVSS 208, action on the Hybrid III dummy is irrelevant for the purposes of this rulemaking. Should NHTSA decide to permit the use of the Hybrid III as an alternative test device, as GM has petitioned, it would not pose any additional burden on manufacturers since they could still use the current Part 572 dummy for compliance purposes. If NHTSA decides to substitute the Hybrid III for the Hybrid II as the compliance test device specified in Part 572, a gradual phase-in period would be provided so as not to interfere with manufacturer leadtime and the timely implementation of the automatic occupant protection provisions of FMVSS 208.

Injury Criteria

Several manufacturers recommended that the injury criteria associated with potential head injury be adjusted in two ways: (1) to eliminate the measurement of HIC in the absence of head contact, and (2) to increase the HIC in case of a head strike to 1500 from its current level of 1000.

It is recognized by NHTSA that the Head Injury Criterion (HIC) was primarily developed from tests of forehead impacts, resulting in acceleration of the brain in the anterior-posterior (i.e., forward and backward) directions. This was pointed out in the SNPRM, wherein the Department also briefly discussed accident and test data, including information from NHTSA itself, which suggested a very low probability of brain injury in the absence of head contact. However, it was suggested that measuring HIC in noncontact situations could serve as a surrogate for potential neck or other injuries.

Volvo supplemented the above arguments by stating that the use of HIC for other than what was the basis of its development—forehead impacts in the anterior-posterior directions—results in less dummy biofidelity. Volvo suggested that this expanded use of HIC, beyond what it was intended to measure, is inappropriate. They stated that if neck injuries are of concern, then other criteria, related solely to the neck, be used. This position on neck injuries was supported by Peugeot, Renault, Ford, and GM. Mercedes and MVMA also opposed measuring HIC in noncontacts but did not mention its use as a surrogate in potentially preventing neck injuries. Allstate opposed its elimination in such crash situations, claiming it protects occupants from cervical and spinal injuries.

The primary derivation of HIC from head impact tests is not in question. HIC was developed from the Wayne State Tolerance Curve (WSTC) which was itself based on the hypothesis that the dominant head injury mechanism was linear acceleration.

The Department agrees with the commenters, based on its own review of the origins of HIC, that its predictive capability of neck injuries is weak. The Department further agrees that the prevention of neck injuries, through assuring that excessive head motion is prevented, is important for automobile safety since neck injuries account for 78.2 percent of all crash-related noncontact-harm in passenger cars (see SAE Paper 820242, "A Search for Priorities in Crash Protection," Milliaris, et al, February 1982). The Department also notes that the Hybrid III dummy is capable of neck injury measurements, by monitoring the dummy's neck's axial loading, shear load, and bending movement (see GM's petition, USG 2284 Part III, Attachment I, Enclosure 2). Although the Hybrid III's neck biofidelity may be deficient in that its lateral bending response may not be humanlike and its neck too stiff in axial compression, its measurement of fore/aft bending provides superior biofidelity to the Part 572 dummy, which is incapable of direct injury measurements (see ibid, Enclosure 3).

The Department thus believes that prevention of neck injury would be better served by direct dummy measurement, measurement which can be made with the Hybrid III. This position was also expressed by the U.S. delegation to ISO/TC 22/SC

12/WG 6 which stated that "the head injury criterion should not be applied in the event of no head impact. . .other injury criteria, perhaps based on neck loads. . ." should be used instead. As part of the subsequent rulemaking mentioned previously, the adoption of neck injury criteria will be proposed. In addition, the issue of noncontact HICs will be further addressed in the context of the current Part 572 dummy. Data relating to the biofidelity of the dummy, in this regard, will be specifically sought.

This issue is not viewed as one which affects the decision regarding FMVSS 208 contained in this notice. Any action by NHTSA in this area should only result in reducing the required test burden, thus additional leadtime should not be required. Action regarding the dummy is viewed by the Department as seeking to continually improve the biofidelity of its anthropomorphic test devices, and is thus separate from, although related to, the 208 decision.

Although several manufacturers requested that the HIC criterion, even when there is a head strike, be raised to 1500, the Department will not take any action on that issue at this time. The 1500 HIC level is the subject of a petition for rulemaking by the CCMC. NHTSA will respond directly to this petition at the same time that it prepares the aforementioned rulemaking action.

Oblique Test Requirement

The SNPRM contained a proposal to eliminate the requirement to test compliance at angles up to 30° from the longitudinal direction. The basis for this proposal was data from Ford's Airbag Crash Test Repeatability report, which consistently showed lower dummy injury readings in angular crashes, especially for HIC and chest g's, and NHTSA test data which agreed with that from Ford. Chrysler, BMW, Volvo, Nissan, Mercedes, Honda, and Mazda agreed with the proposal, claiming that no insight in restraint performance was provided by the test, it was not essential for verifying compliance since test results were lower than in the direct frontal tests, and thus it only contributed to lead time and testing costs. Mazada was the only company to provide data to support its conclusion. Mazda provided the results of a single test which showed lower readings in the angular than the frontal crash.

GM and Saab opposed the deletion of the oblique test. GM, in further discussions with NHTSA, based its objection on the belief that the oblique test is more representative of real world crashes than the frontal test. GM also said that regardless of the agency's decision it would continue to conduct oblique tests; thus, although it believed such tests to be more representative it has no objection to their being deleted from the standard. Saab, in subsequent discussion with NHTSA, did not elaborate on their assertion that deletion of the test would be a "cover-up" for airbag deficiencies nor did VW, when contacted by NHTSA, explain why they believed the test necessary for airbags but not automatic belts.

The Department continues to believe, as expressed in the SNPRM, that the oblique test requirement may not meet the need for motor vehicle safety and thus may unnecessarily add to compliance costs. However, prior to taking final action the Department wishes to have additional test data and/or supporting and dissenting arguments. This information will be sought as part of the notice described earlier, as will comments from the public on the issue of international harmonization of test requirements, as sought by Peugeot and Renault.

Other Test Procedure Issues

The Department still believes that adoption of the NCAP test procedures will reduce test result variability. The added specificity of these procedures, as compared to the current FMVSS 208 compliance criteria, can have no other effect than to reduce variability compared to inconsistent dummy placement, albeit by some unknown amount.

However, we also agree with manufacturer comments concerning the inadequacy of notice as to the specific parts of the NCAP procedure to be adopted. In addition, several commenters suggested other test procedure changes to even further reduce variability. The soon to be issued NPRM will thus repropose the specific NCAP procedures to be adopted, plus propose additional changes as suggested in comments to Notice 35 of Docket 74-14.

Ford, Chrysler, and VW suggested that if automatic belts are the means of compliance, then the static test requirements of FMVSS 209 and 210, instead of the dynamic test requirements of FMVSS 208, be used to check compliance. The Department disagrees. The concept behind FMVSS 208 is that it is an overall vehicle standard, not just a restraint standard. To simply test the restraint system, statically, would not assure the occupant that injury protection, equivalent to that of other types of restraints which would continue to have to be dynamically tested, was being provided. In this regard, the Department agrees with Allstate that dynamic testing (as is also done for child restraint systems as required by FMVSS 213) is superior to static testing and the requests cited above are responded to in the negative.

The Department also rejects GM's proposal to amend FMVSS 208 by permitting compliance with manual belts if the vehicle complies with the injury criteria at 30 mph with the dummies belted and at 25 mph with the dummies unbelted. The Department does not believe, based on data in its possession on crash tests at 25 mph with unrestrained dummies, that equivalent safety benefits are possible with this proposal. GM's estimate of benefits is not complete in that it is based on vehicles in NHTSA's NCSS file, vehicles which, on average, are of early 1970's vintage. A more complete analysis would be based on the ability of *current* production vehicles to supply such protection. Data available to NHTSA indicate that some current vehicles are capable of supplying automatic occupant protection at speeds up to 25 mph. Without data to the contrary, there is no assurance of the magnitude of safety improvement associated with the GM proposal. Since it has not been demonstrated as an equal alternative, it will not be further considered in this rulemaking, although the Department applauds GM for its work in the area of passive interiors and encourages both it and other companies to continue to provide protection for otherwise unprotected occupants. The Department also notes that nothing in FMVSS 208 precludes compliance through the use of "passive interiors" as being developed by GM. But such compliance must be demonstrated at 30 mph, not 25 mph as GM has suggested.

Finally, Ford requested that convertibles by exempted from the automatic occupant protection requirements. Ford argues that automatic belts are not feasible in convertibles and that the only means of compliance would be airbags, thus resulting in a "design" standard for these vehicles. Since the statute requires that safety standards be "appropriate for the class of vehicles to which they apply," and since convertibles are already exempt from the requirement that all front outboard seating positions have lap and shoulder belts, Ford argues that exemption for convertibles is appropriate. Although we disagree with Ford that providing automatic belts in convertibles is not feasible, it may be not acceptable or appropriate to do so. NHTSA will seek additional guidance from the public on this issue in subsequent rulemaking.

REGULATORY IMPACTS

The Department has considered the impacts of this final rule and determined that it is a major rulemaking within the meaning of E.O. 12291 and a significant rule within the meaning of the Department of Transportation Regulatory Policies and Procedures. A Final Regulatory Impact Analysis is being placed in the public docket simultaneously with the publication of this notice. A copy of the Analysis may be obtained by writing to: National Highway Traffic Safety Administration, Docket Section, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590.

The Department's determination that the rule is major and significant is based on the substantial benefits and costs resulting from the requirement for the installation of automatic protection systems. The Department's determinations regarding these matters are discussed elsewhere in this preamble. As noted above, the number of lives saved and injuries prevented will depend on the type of automatic restraints installed in new cars and on the usage and effectiveness of those restraints. Estimates range from 520 to 9,110 lives saved, 8,740 to 155,030 moderate to critical 2 to 5 injuries prevented and 22,760 to 255,770 minor injuries prevented. The total incremental cost increase for a new car would be $51 for automatic belt cars (incremental cost of $40 and lifetime energy costs of $11), $232 for a high volume of cars with driver position airbags (incremental cost of $220 and energy costs of $12), and $364 for a high volume of cars with airbags for all front seat occupants (incremental cost of $320 and energy costs of $44). Assuming 10 million cars sold annually, total economic costs, exclusive of insurance or other savings, would be between $510 million and $3,640 million.

The Department has also assessed the impacts of this final rule on car manufacturers, automatic restraint suppliers, new car dealers, and small organizations and governmental units. Based on that assessment, I certify that this action will not have a significant economic effect on a substantial number of small entities. Accordingly, the Department has not prepared a final regulatory flexibility analysis. However, the impacts of the final rule on suppliers, dealers and other entities are discussed in the FRIA.

The impact on airbag manufacturers is not likely to be significant, but will be positive. The final rule does not require any car manufacturer to install airbags in any new cars. To the extent that car manufacturers respond to the incentive provided by this final rule to install airbags, airbags sales will increase. The Department is not able to assess precisely the extent to which car manufacturers will so respond.

Similarly, the suppliers of automatic belts are not likely to be significantly affected. These are generally the same firms that currently supply manual belts. Therefore, their volume of sales is not expected to increase significantly as a result of this final rule. There may be some economic benefits associated with developing and producing the more sophisticated types of automatic belts.

Since the Department anticipates that most car manufacturers will comply with the final rule by installing detachable automatic belts, the cost impacts on new cars will not be large enough to have a significant effect on new car sales. Similarly, the Department does not expect that the design or operation of the automatic restraints will affect new car sales. The Department expects that the detachable automatic belts will be sufficiently acceptable to the public so that their presence in new cars will not be a factor in the purchasing of new cars.

For the reasons discussed in the preceding paragraph, the Department does not expect that small organizations or governmental units would be significantly affected. The price increases associated with the installation of detachable automatic belts should not affect the purchasing of new cars by these entities. A somewhat greater effect would occur to the extent that any of these entities decide to purchase airbag cars.

In accordance with the National Environmental Policy Act of 1969, the Department has considered the environmental impacts of this final rule. A Final Environmental Impact Statement (FEIS) is being placed in the public docket simultaneously with the publication of this notice. The FEIS focuses on the environmental impacts associated with the alternative having the largest potential impacts. The alternative incorporated in this final rule will have substantially smaller impacts. The Department has concluded that there is no significant effect on the environment. Since most automatic restraints will be automatic belts, the amount of safety belt webbing manufactured should not change significantly.

The Department finds good cause for making this final rule effective more than 1 year from the date of issuance, since the possibility exists that a substantial number of cars would comply with other than belt systems. As discussed earlier in this preamble and in the FRIA, the provision of automatic restraints requires significant vehicle modification. Airbag installation requires steering column changes and instrument panel redesign. The lead time to accomplish these alternatives, based on the time necessary to design and test the structural changes and to order tooling, especially for small cars, is several years. Similarly, a multiyear leadtime is necessary to provide automatic belts due to structural changes in seat and door strength and floor pan reinforcements. Passive interiors can require even longer leadtimes if structural modifications to a vehicle's front end, to better absorb the energy of a 30 mph crash, are necessary. The leadtime provided will provide car manufacturers with an effective choice about the type of automatic restraint they install in their cars. Providing less leadtime would limit their choices and tend to necessitate their selecting detachable automatic belts, the means of compliance with the least certainty as to level of benefits, in place of more advanced technology such as airbags or passive interiors.

THE RULE

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection*, (49 CFR 571.208), is amended as set forth below.

§571.208 (Amended)

1. S4.1.2 through S4.1.2.2 of Standard No. 208 are revised to read as follows:

S4.1.2 *Passenger cars manufactured on or after September 1, 1973, and before September 1, 1986.* Each passenger car manufactured on or after September 1, 1973, and before September 1, 1986, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3. A protection system that meets the requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3.

S4.1.2.1 *First option—frontal/angular automatic protection system.* The vehicle shall:

(a) At each front outboard designated seating position meet the frontal crash protection requirements of S5.1 by means that require no action by vehicle occupants;

(b) At the front center designated seating position and at each rear designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2; and

(c) Either: (1) Meet the lateral crash protection requirements of S5.2 and the rollover crash protection requirements of S5.3 by means that require no action by vehicle occupants; or

(2) At each front outboard designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 through S7.3, and that meets the requirements of S5.1 with front test dummies as required by S5.1, restrained by the Type 1 or Type 2 seabelt assembly (or the pelvic portion of any Type 2 seat belt assembly which has a detachable upper torso belt) in addition to the means that require no action by the vehicle occupant.

S4.1.2.2 *Second option—head-on automatic protection system.* The vehicle shall:

(a) At each designated seating position have a Type 1 seatbelt assembly or Type 2 seatbelt assembly with a detachable upper torso portion that conforms to S7.1 and S7.2 of this standard.

(b) At each front outboard designated seating position, meet the frontal crash protection requirements of S5.1, in a perpendicular impact, by means that require no action by vehicle occupants;

(c) At each front outboard designated seating position, meet the frontal crash protection requirements of S5.1, in a perpendicular impact, with a test device restrained by a Type 1 seatbelt assembly; and

(d) At each front outboard designated seating position, have a seatbelt warning system that conforms to S7.3.

2. S4.1.3 of Standard No. 208 is revised to read as follows:

S4.1.3 *Passenger cars manufactured on or after September 1, 1986, and before September 1, 1989.*

S4.1.3.1 *Passenger cars manufactured on or after September 1, 1986, and before September 1, 1987.*

S4.1.3.1.1 Subject to S4.1.3.1.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1986, and before September 1, 1987, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

S4.1.3.1.2 Subject to S4.1.5, an amount of the cars specified in S4.1.3.1.1 equal to not less than 10 percent of the average annual production of passenger cars manufactured on or after September 1, 1983, and before September 1, 1986, by each manufacturer, shall comply with the requirements of S4.1.2.1.

S4.1.3.2 *Passenger cars manufactured on or after September 1, 1987, and before September 1, 1988.*

S4.1.3.2.1 Subject to S4.1.3.2.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1987, and before September 1, 1988, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

S4.1.3.2.2 Subject to S4.1.5, an amount of the cars specified in S4.1.3.2.1 equal to not less than 25 percent of the average annual production of passenger cars manufactured on or after September 1, 1984, and before September 1, 1987, by each manufacturer, shall comply with the requirements of S4.1.2.1.

S4.1.3.3 *Passenger cars manufactured on or after September 1, 1988, and before September 1, 1989.*

S4.1.3.3.1 Subject to S4.1.3.3.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1988, and before September 1, 1989, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

S4.1.3.3.2 Subject to S4.1.5, an amount of the cars specified in S4.1.3.3.1 equal to not less than 40 percent of the average annual production of passenger cars manufactured on or after September 1, 1985, and before September 1, 1988, by each manufacturer, shall comply with the requirements of S4.1.2.1.

S4.1.3.4 For the purposes of calculating the number of cars manufactured under S4.1.3.1.2, S4.1.3.2.2, or S4.1.3.3.2 to comply with S4.1.2.1, each car whose driver's seating position will comply with these requirements by means other than any type of seatbelt is counted as 1.5 vehicles.

3. Standard No. 208 is amended by adding the following new sections:

S4.1.4 *Passenger cars manufactured on or after September 1, 1989.* Except as provided in S4.1.5, each passenger car manufactured on or after September 1, 1989, shall comply with the requirements of S4.1.2.1.

S4.1.5 *Mandatory seatbelt use laws.*

S4.1.5.1 If the Secretary of Transportation determines, by not later than April 1, 1989, that State mandatory safety belt usage laws have been enacted that meet the criteria specified in S4.1.5.2 and that are applicable to not less than two-thirds of the total population of the 50 States and the District of Columbia (based on the most recent Estimates of the Resident Population of States, by Age, Current Population Reports, Series P-25, Bureau of the Census), each passenger car manufactured under S4.1.3 or S4.1.4 on or after the date of that determination shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

S4.1.5.2 The minimum criteria for State mandatory safety belt usage laws are:

(a) Require that each front seat occupant of a passenger car equipped with safety belts under Standard No. 208 has a safety belt properly fastened about his or her body at all times when the vehicle is in forward motion.

(b) If waivers from the safety belt usage requirement are to be provided, permit them for medical reasons only.

(c) Provide for the following enforcement measures:

(1) A penalty of not less than $25 (which may include court costs) for each occupant of a car who violates the belt usage requirement.

(2) A provision specifying that the violation of the belt usage requirement may be used to mitigate damages with respect to any person who is involved in a passenger car accident while violating the belt usage requirement and who seeks in any subsequent litigation to recover damages for injuries resulting from the accident. This requirement is satisfied if there is a rule of law in the State permitting such mitigation.

(3) A program to encourage compliance with the belt usage requirement.

(d) An effective date of not later than September 1, 1989.

Sec.103, 119, Pul. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407)

Issued on July 11, 1984

Elizabeth H. Dole
Secretary of Transportation
49 F.R. 28962
July 17, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection; Improvement of Seat Belt Assemblies [Docket No. 74-14; Notice 40]

ACTION: Final rule.

SUMMARY: This notice adopts a one-year delay, from September 1, 1985, to September 1, 1986, in the effective date for the safety belt comfort and convenience requirements issued by NHTSA in January 1981. The agency proposed a one-year delay in a notice issued in April of this year. The April notice also proposed several minor modifications to the comfort and convenience requirements, which will be addressed in a subsequent notice.

This notice also denies the petitions submitted by American Motors Corporation and the Motor Vehicle Manufacturers Association for an indefinite delay in the proposed effective date of these amendments. The denial is based on the agency's belief that the substantive issues in the proposal will be quickly resolved in a separate final rule and that delaying the effective date for one year will give the motor vehicle industry sufficient time to meet the modified comfort and convenience requirements.

SUPPLEMENTARY INFORMATION: On January 8, 1981, NHTSA amended Standard No. 208, *Occupant Crash Protection*, to specify additional performance requirements to promote the comfort and convenience of both manual and automatic safety belt systems installed in motor vehicles with a GVWR of 10,000 pounds or less (46 FR 2064). The requirements have not yet become effective. In partial response to seven petitions for reconsideration, the agency extended the effective date of the comfort and convenience requirements for one year, from September 1, 1982, to September 1, 1983 (47 FR 7254). Subsequently, the agency adopted (48 FR 24717) a further extension of the effective date for the requirements to September 1, 1985.

On April 12, 1985, the agency proposed to change the effective date of the comfort and convenience requirements to September 1, 1986, to coincide with the effective date of the Department's July 11, 1984, rule requiring the installation of automatic restraints. This notice also proposed modifications to certain aspects of the comfort and convenience performance requirements in order to clarify the agency's intent and to address the concerns raised in the petitions for reconsideration (50 FR 14580).

After the April 12, 1985, notice of proposed rulemaking was issued, American Motors Corporation and the Motor Vehicle Manufacturers Association petitioned NHTSA to postpone the effective date immediately and indefinitely, until all issues concerning the comfort and convenience requirements are resolved. They stated their belief that a final rule on the former effective date is unlikely to be issued before production of 1986 model year vehicles begins in July 1985; that manufacturers will be uncertain of the standard's applicable requirements; and that it is unreasonable to have this critical timing issue tied to the rulemaking process. Chrysler Corporation, General Motors Corporation and Volkswagen of America, Inc., supported this request in submission to the docket. General Motors stated that deferral is essential to provide time to resolve the many interrelated issues of Notices 37, 38, and 39, as well as to provide time to meet the final requirements flowing from these rulemaking actions. The agency disagrees. Although each of these proposals concerns Standard No. 208, the agency maintains that the issues are separable, as are the notices proposing them.

The agency realizes that September 1, 1985, is an inappropriate effective date for the comfort and convenience requirements because there is insufficient lead time before the beginning of the new model year to comply with the requirements either in the currently adopted version or in the version proposed in April 1985. The agency believes that an effective date of September 1, 1986, provides sufficient time for industry to meet either version of the comfort and convenience requirements. This conclusion is based on NHTSA's own analysis and on the absence of indication in the comments of the other domestic and foreign motor vehicle manufacturers, seat belt manufacturers, and a technical representative that a September 1, 1986, effective date would pose any problems in complying with the proposed requirements. Since its range of choices regarding the substantive differences in the two versions is not large, the agency does not foresee that there will be any changes to the comfort and convenience requirements which would necessitate additional lead time beyond September 1, 1986. Therefore, the agency is adopting that date as the new effective date for all requirements except the one discussed immediately below. However, if the final rule on the substantive issues does include changes for which the industry might need additional lead time, the agency will consider these circumstances and, if necessary, take appropriate steps to adjust the effective date.

In a separate final rule to be issued in the very near future, the agency will respond to the substantive issues raised in the notice of proposed rulemaking and the comments thereon.

In consideration of the foregoing, 49 CFR 571.208 is amended as follows:

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1391, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

2. S7.1.1.3 is revised to read as follows:

A lap belt installed at any front outboard designated seating position in a vehicle manufactured on or after September 1, 1986, shall meet the requirements of this section by means of an emergency-locking retractor that conforms to Standard No. 209 (571.209) of this chapter.

3. S7.4 is revised to read as follows:

S7.4 *Seat belt comfort and convenience.*

(a) Automatic seat belts installed in any vehicle with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1986, shall meet the requirements of S7.4.1, S7.4.2, and S7.4.3.

(b) Manual seat belts, other than manual Type 2 belts in front seating positions in passengers cars, installed in any vehicle with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1986, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

Issued on August 19, 1985

Diane K. Steed
Administrator

50 F.R. 34152
August 23, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
[Docket No. 74-14; Notice 41]

ACTION: Response to Petitions for Reconsideration.

SUMMARY: On July 11, 1984, the Secretary of Transportation issued a final rule requiring automatic occupant protection in all passenger cars based on a phased-in schedule beginning on September 1, 1986, with full implementation being required by September 1, 1989, unless, before April 1, 1989, states covering two-thirds of the population of the United States have enacted mandatory safety belt use laws meeting specified criteria, with such laws becoming effective by September 1, 1989. Subsequently, sixteen interested parties filed petitions for reconsideration of the final rule. This notice responds to the issues raised in those petitions.

EFFECTIVE DATE: October 14, 1985

SUPPLEMENTARY INFORMATION:

Background

On July 11, 1984 (49 FR 28962), the Secretary of Transportation issued a final rule requiring automatic occupant protection in all passenger cars based on a phased-in schedule beginning on September 1, 1986, with full implementation being required by September 1, 1989, unless, before April 1, 1989, states covering two-thirds of the population of the United States have enacted mandatory safety belt use laws (MULs) meeting specified criteria, with such laws becoming effective by September 1, 1989.

More specifically, the rule requires:

- Front outboard seating positions in passenger cars manufactured on or after September 1, 1986, for sale in the United States, will have to be equipped with automatic restraints based on the following schedule:
- Ten percent of all cars manufactured on or after September 1, 1986.
- Twenty-five percent of all cars manufactured on or after September 1, 1987.
- Forty percent of all cars manufactured on or after September 1, 1988.
- One hundred percent of all cars manufactured on or after September 1, 1989.
- During the phase-in period, each car that is manufactured with a system that provides automatic protection to the driver without automatic belts will be given an extra credit equal to one-half car toward meeting the percentage requirement.
- The requirement for automatic restraints will be rescinded if MULs meeting specified conditions are passed by a sufficient number of states before April 1, 1989, to cover two-thirds of the population of the United States.

Sixteen interested parties subsequently petitioned for reconsideration of the standard. The issues raised by the petitioners and the agency's response are discussed below.

Rescind the Standard

One petitioner asked the agency to reconsider the decision not to rescind the automatic restraint requirements of Standard No. 208. He argued that the Secretary's decision was apparently based on a belief that rescission was not a possible result under the Supreme Court decision in *Motor Vehicle Manufacturer's Association* v. *State Farm Mutual Automobile Insurance Co.* (State Farm). The petitioner further argued that the record in the Standard No. 208 proceeding in fact supports rescission. In particular, the petitioner argued that the rulemaking record shows that air bag technology is not an effective automatic restraint alternative. Quoting from portions of the July 1984 final decision, the petitioner specifically argued that air bag systems require the use of a lap belt and do not provide protection at less than 10–12 mph, the disposal problem related to the gas generation agent in air bag systems needs more action, air bag systems may cause injury to out-of-position occupants, the cost of air bag systems is a major disadvantage, and the use of air bag systems in small cars requires more lead time. The petitioner concluded that few manufacturers will use air bag systems, thus leaving automatic belts as the only automatic restraint alternative. As to automatic belts, the petitioner argued that the record does not show that detachable automatic belts would increase usage. The petitioner specifically argued that there has been no showing that the combination of motorist inertia and automatic belts will increase belt usage.

NHTSA's position is that the *State Farm* decision allows the agency to make a reasoned choice between rescinding or retaining the standard. However, the agency stated in the July 1984 final rule, and still believes, that the rulemaking record does not justify rescission—unless there is a very substantial increase in the use of manual safety belts in the future. The data set forth in the July 1984 final rule demonstrate the dramatic reductions in deaths and injuries that widespread usage of the safety belt systems would achieve. Thus, if twothirds or more of the American people are covered by mandatory use laws, that would increase useage of safety belts, the need for an automatic occupant restraint requirement would be obviated and the rule would be rescinded.

The agency believes that the rulemaking record, taken as a whole, shows that air bag systems are an effective automatic restraint technology. The discussion in the final rule concerning the need to use a safety belt with an air bag system and the ability of such systems to provide protection at low speeds concerned the relative advantages and disadvantages of different restraint technologies. As noted in that discussion, air bag systems have an advantage over other occupant restraints in that they ensure a usage rate of nearly 100 percent for both drivers and passengers. Even without use of a lap belt, an air bag system will offer protection; however, to equal the effectiveness of a manual lap-shoulder belt, air bag systems must be used with a lap belt.

Likewise, while air bag systems do not inflate in low speed crashes, other standards, such as those on energy-absorbing steering columns and instrument panel padding, ensure that occupants will still be provided with protection in low speed collisions. In addition, research data indicate that air bag systems will provide protection at higher speeds than safety belts.

As to potential problems with the disposal of the gas generator, the July 1984 final rule pointed out that as long as appropriate procedures are followed by vehicle recyclers and scrappers, disposal should not pose a problem. Subsequent to issuance of the rule, the agency has had discussions with recyclers and scrappers concerning the joint NHTSA-General Services Administration air bag fleet demonstration program to discuss safe and reasonable disposal procedures. We believe that this effort will lead to further improvements in the safe disposal of the chemical agents in air bag systems.

The July final rule acknowledged concerns about the effects of air bag systems on out-of-position occupants; however, it also explained that technical solutions are available to address the out-of-position occupant problem. The final rule also acknowledged the higher costs of air bag systems in comparison to automatic belts; the high cost of replacing an air bag system, which could lead to its not being replaced after deployment; public uncertainty and concern associated wiht air bag systems; and the longer lead time needed for air bag systems, particularly in small cars. It was a balancing of those factors, plus the factors discussed above, that led to the decision that air bag systems should not be mandated for all cars. However, as discussed in the final rule, the agency believes that air bag systems are an effective restraint technology which, along with other types of automatic restraint technology, will provide demonstrable safety benefits. The provision in the final rule providing manufacturers that use non-belt automatic restraints with extra credit in complying with the phase-in requirements was intended to encourage alternative technologies, including enhanced availability of air bag systems.

As to detachable automatic belts, as discussed in the July 1984 final rule, the agency cannot project either widespread usage for detachable automatic belts or a widespread refusal to use such systems. As discussed by the Supreme Court in the *State Farm* decision, it is reasonable to expect that inertia will work to increase usage, since once an automatic belt is connected, it continues to function automatically until it is disconnected. However, using even the lowest level of the range for the effectiveness of automatic belts and a very little increase in usage (only a 7 1/2 percentage point increase), automatic belts will result in a significant incremental annual reduction in deaths and injuries.

For the above reasons, the agency concluded in July 1984 that automatic restraint systems are reasonable in cost, feasible, and practicable, and the potential benefits in lives saved and injuries reduced in severity are substantial. At that time, the agency stated that rescission, in the absence of a substantial increase in manual belt usage, has not been justified. Since the petitioner has not provided any new data to support rescission, the petition is denied.

Require Automatic Restraints

Several petitioners urged the agency to reconsider the decision to rescind the automatic restraint requirements if two-thirds of the population of the United States is covered by State MULs. They urged the agency to retain the automatic restraint requirement, regardless of what action the States take in adopting MULs.

The petitioners have offered no new evidence to justify modifying the July 11 final rule. As explained in that rule, the Secretary determined that if enough people are covered by State mandatory belt use laws, usage rates will be sufficiently high so that the additional requirement for automatic restraints should not be required. The evidence from Canada and other countries with MULs supports the conclusion that State belt use laws will bring higher usage rates and immediate and inexpensive benefits. The petitioners' requests to mandate automatic restraints even if two-thirds of the population is covered by MULs is therefore denied.

Phase-In Requirements

A number of petitioners asked for several modifications of the phase-in requirements of the standard. Each of the modifications sought by the petitioners is addressed in the following discussions.

Change September 1st Effective Date

One modification was to change the September 1 effective date used for each part of the phase-in. The petitioners argued that they would be precluded from applying any portion of their vehicles produced prior to that date to meet the required percentage of automatic restraint equipped cars. The agency has already, in effect, proposed to grant a portion of the petitioners' request in another notice (Docket 74-14; Notice 38; 50 FR 14602) issued on Standard No. 208. The agency proposal would not change the September 1 effective date, but it does propose that manufacturers be allowed to count any automatic restraint vehicle produced during the one year preceding the first year of the phase-in. In addition, the agency proposes, in Notice 38, to permit manufacturers which exceed the minimum percentage phase-in requirements in the first or second years to count those extra vehicles toward meeting the requirement in the second or third year.

Several petitioners sought a change in the provision of the final rule specifying that the computation of the minimum vehicle production to be equipped with automatic restraints must be based on the average of the production for the three preceding model years. The petitioners argued that if car sales were to drop drastically during the phase-in period, then the number of vehicles that they would have to equip with automatic restraints based on their prior three year sales volume would be a significantly greater percentage of their actual production than intended by the final rule. The agency has already responded to this request in Notice 38 by proposing to adopt an alternative that would permit a manufacturer to equip the required percentage of its vehicles with automatic restraints based on its actual production of passenger cars during each affected year.

Manufactured for Sale in the U.S.

Several petitioners asked the agency to amend the rule to clarify that the rule applies only to cars manufactured for sale in the United States. As discussed in the preamble to the final rule, the determination of the base years' production figures and the calculation of the number of vehicles that must comply with the percentage phase-in requirements of the standard is to be based on vehicles manufactured for sale in the United States. Since all of the agency's safety standards apply only to vehicles manufactured for sale in the United States, the agency does not believe that an amendment to the rule is necessary. Nevertheless, today's preamble should serve as the clarification requested; that the rule applies only to vehicles manufactured for sale in the United States.

Carry-Forward/Carry-Back

A number of petitioners urged the agency to provide manufacturers more flexibility in meeting the phase-in requirements. They proposed that manufacturers be able to carry-forward credits for the number of automatic-restraint equipped vehicles they produce in excess of the required percentage. One petitioner also asked that manufacturers be permitted to carry-back credits earned in the second and third year to the first year.

The agency agrees that it would be appropriate to permit manufacturers that exceed the minimum percentage phase-in requirements in earlier years to count those extra vehicles toward meeting the minimum percentage requirements of later years and has proposed such a carry-forward credit in Notice 38. Such a credit would encourage early introduction of larger numbers of automatic restraints and provide increased safety to the public and flexibility for manufacturers. The agency has decided to deny requests for any carry-back credits because their use would delay the safety benefits of the rule and undermine the purpose of the phase-in, which is to introduce automatic restraints on a prompt and orderly basis.

Definition of Manufacturer

Several petitioners asked the agency to further define the term "manufacturer." The agency has responded to this request in Notice 38 by proposing to permit manufacturers to determine, by contract, which of them will count passenger cars as its own for the purposes of meeting the percentage goals set forth in the phase-in. Notice 38 proposes two rules of attribution in the absence of such a contract. First, a passenger car which is imported for purposes of resale would be attributed to the importer. Second, a passenger car manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, would be attributed to the manufacturer which markets the vehicle. Readers are referred to Notice 38 for a more detailed discussion of the proposed attribution rules.

Credits for Non-Belt Technology

The July 11 final rule provided that manufacturers that used non-belt technology, such as air bags or passive interiors, to meet the automatic restraint requirement for the driver's seating position and any type of automatic restraint at the passenger's seating position during the phase-in period, would receive additional credit. For each car in which they use a non-belt system, they will receive credit for an extra one-half car toward meeting their percentage requirement. One petitioner said that the text of the rule does not achieve the agency's intention, as stated in the July 1984 final rule, to encourage the use of automatic restraints other than automatic belts, since the rule precludes giving the additional credit for a system that requires the use of a safety belt, whether automatic or manual, to enable the non-belt technology to provide full protection. That petitioner pointed out that all current air bag systems must also use safety belts for full protection; belts are permitted by the standard to be used as an alternative to the use of automatic restraints to meet the lateral and rollover tests. It was not the agency's intention to deny the extra credits to air bag or other systems that also use such safety belt systems to ensure protection in other than frontal crashes. Therefore, the agency is amending the rule to ensure that those systems are eligible for the additional credit.

The agency was also petitioned for another modification to the credit provision. It was asked that manufacturers be allowed, during the phase-in, to receive a one vehicle credit for vehicles which are equipped with non-belt technology at the driver's position and manual safety belts at the front outboard position. The petitioner argued that this would encourage manufacturers to produce driver-side air bag systems or other non-belt system technology sooner than if they had to complete development of passenger-side automatic restraint systems as well, significantly advancing the Secretary's goal in this regard.

The agency has decided to modify the credit provision as requested by the petitioners. The purpose of the phase-in period is to provide a rapid introduction of the lifesaving benefits of automatic restraints and to facilitate the earliest possible introduction of such restraints to permit the public to become familiar with their operation and benefits. The purpose of the credit provision is to encourage the production of a wide variety of such restraints especially in the early years. The agency believes that permitting manufacturers to receive a 1.0 car credit for driver-only non-belt systems with manual belts on the passenger side will encourage the introduction of non-belt technologies into passenger cars, earlier than would otherwise occur.

The agency is aware that one company is currently offering driver-side air bags to the public. Other manufacturers have indicated that they may offer driver-side air bags to the public within the next few years. The agency is aware neither of any manufacturers that currently plan to offer a passenger-side air bag system nor of any firm plans for other types of non-belt automatic protection on the passenger side of vehicles. The longer lead time estimated in the Final Rule to be required for non-belt automatic protection on the passenger side, coupled with the advanced stage of design of vehicles that will be available at the early stage of the phase-in period, mitigates against such full-front non-belt protection being available. Increasing public awareness of the benefits of a variety of automatic protection techniques is one of the primary objectives of the phase-in and credit provisions. Achieving this objective will depend, therefore, on the availability of an adequate number of cars equipped with non-belt protection of the driver's side. We now believe that there are a number of factors that might discourage manufacturers from making such equipment available in significant numbers.

Under the current rule, cars equipped with non-belt driver's-side automatic protection would qualify for credit only if passive protection were made available on the passenger side. As noted above, such protection is most likely to be provided by automatic belts. Some models in which driver's-side air bags are being considered by manufacturers, however, are at an advanced stage of design. It is unlikely the redesign required to equip these cars with automatic belts will be undertaken. Even if these cars could be modified to incorporate automatic belts, manufacturers would be faced with a complex, and expensive, marketing task. Not only would they have to convince customers of the safety and utility of automatic belts, but they must also perform this task for the more expensive air bag. Unwillingness on the part of manufacturers to assume this added task may create a serious disincentive to the prompt offering of air bag technology.

Alternatively, these manufacturers considering driver-side air bags might also elect to meet phase-in requirements by producing a sufficient number of automatic belt equipped cars. Under these circumstances, it is likely that the marketing efforts of the manufacturers during the phase-in will concentrate on marketing the automatic belts, possibly to the detriment of the public's acceptance of the driver-side air bags. As the agency learned in recent research studying the marketing efforts used by General Motors to sell its air bag equipped cars in the mid-1970's effective, affirmative marketing of an air bag system is essential to overcome consumer concerns about such things as the fear of inadvertent deployment, price and post-crash replacement cost. ("A Retrospective Analysis of the General Motors Air Cushion Restraint System Marketing Effort, 1974 to 1976") If cars equipped with driver-only air bags do not count toward compliance with the phase-in, the manufacturers will have less incentive to market the air bags aggressively, and these circumstances may even lead to decisions to drop the early offering of air bags. The agency's goal of encouraging significant public exposure to alternative protection technologies may not be realized. Therefore, the agency has determined that permitting manufacturers to receive a 1.0 car credit during the phase-in by installing driver-only non-belt automatic protection systems in their vehicles will encourage earlier introduction of alternative automatic protection technologies, wider public availability of such technologies, and more effective marketing of such technologies than would be achieved by the original decision. The final rule is amended to permit such vehicles to be counted toward the phase-in requirements.

The agency has fully considered the safety implication of this amendment. An important safety consideration is the number of occupants at the risk of injury at each seating position, not just the number of seating positions that are covered by the automatic restraint requirement. Accident data, presented in the agency's Final Regulatory Impact Analysis, show that there are approximately 2 1/2 to 3 times as many driver injuries and fatalities as there are to front right seat passengers. Therefore, the agency believes that it is reasonable to encourage manufacturers to provide automatic restraint protection as soon as possible to the driver—the person who is most at risk.

Convertibles

Several petitioners asked that convertibles be exempted from the automatic restraint requirements. They argued, for example, that the installation of automatic lap and shoulder belts is not feasible in convertibles, thus air bag systems must be used in those cars. The result, according to the petitioners, is a design standard for convertibles. They also stated that an exemption would be appropriate since convertibles are already exempt from the requirement in Standard No. 208 that all front outboard seating positions have lap and shoulder belts. The agency has already responded to these petitions in Notice 38 by proposing that manufacturers have the option of installing manual lap belts instead of automatic restraints in convertibles. Readers are referred to Notice 38 for a more detailed discussion of the petitions and the reasons for the agency's proposed alternative requirements for convertibles.

Oblique Crash Test

A number of petitioners requested the agency to delete the oblique barrier crash test of Standard No. 208. They argued, among other things, that the test is unnecessary since it generates a lower crash pulse than the frontal crash test. As discussed in detail in Notice 38, the agency is also concerned that the oblique test may not be necessary and has therefore requested commenters to provide additional data on the safety and cost effects of deleting the tests. Readers are referred to Notice 38 for a more detailed discussion of the issues involved in the proposed deletion of the oblique test.

Lead Time

One petitioner requested a change in the two year lead time for the automatic restraint standard. Citing the table on lead time requirements included with the July 11 final rule, the petitioner argued that only one manufacturer, Renault, has said that it can comply in 24 months. The table showed that most companies have said they needed at least 30 to 48 months. The petitioner asked for the lead time to be extended.

The table cited by the petitioner reflects the lead time required by a manufacturer to equip its entire fleet with automatic restraints. The agency agrees that a longer lead time would be necessary if the automatic restraint requirement were simultaneously applied to the entire vehicle fleet. The final rule, however, phases-in the automatic restraint requirement so that only a portion of a manufacturer's fleet must be equipped initially. Based on a study of current automatic restraint equipped vehicles and manufacturers' comments, the agency has determined that automatic belt systems can be added on to existing vehicle designs with approximately 24 months of lead time. The manufacturers generally agree with that estimate. For example, GM said that lead time for models for which detachable belts had previously been designed would be 21 months and Ford said that a driver-side air bag system could be in production for some of its cars within the allotted lead time. The Agency therefore does not believe that additional lead time is necessary for the percentage requirements during the phase-in period and the petition is denied.

AIA raised a separate lead time issue. It said that the July 1984 final rule identified a number of issues, primarily related to test procedures, that would be the subject of further rulemaking. AIA argued that the implementation schedule for automatic restraints should not begin until those issues are resolved. Any changes due to the unresolved issues are not expected to increase lead time and, indeed, should relieve some burdens associated with preparing for compliance. At this time, the agency believes that the resolution of the remaining issues, which does not involve the imposition of more stringent performance requirements, should be accomplished shortly and therefore is denying AIA's petition.

Repeatability

One petitioner raised arguments about the repeatability of the test procedures used in Standard No. 208 compliance testing. The petitioner's fundamental argument is that the agency's Repeatability Test Program found what the petitioner says is an unacceptable level of variability in the test results and thus, the petitioner argues, the agency has failed to demonstrate that the test procedures can be reproduced, car-to-car and test site-to-test site. The petitioner noted that for a manufacturer to certify its vehicles, it must meet maximum limits for each of eight separate requirements: HIC for driver and passenger dummy heads, "g" loads for driver and passenger chests; and femur loads for each dummy's right and left leg. Because of the test variability, the petitioner said that it cannot confidently predict that its vehicles will comply with the standard. It urged the agency to develop an alternative method of determining compliance with the standard.

The petitioner did not, however, provide any new data which demonstrate that the crash test procedures and the test dummy pose significant repeatability problems. More importantly, the petitioner did not provide new data indicating that the test procedure and the dummy are incapable of measuring compliance with Standard No. 208.

The agency believes that the test procedure, test dummy, and test instrumentation are repeatable within the statutory requirements of objectivity and practicability. The agency does recognize that because of the complexity of the requirements of Standard No. 208, manufacturers are concerned about certifying compliance with each of the requirements of the standard. To address this concern, the agency has proposed in Notice 38 that the rule be amended to state that a vehicle shall not be deemed in noncompliance if its manufacturer establishes that it did not have reason to know in the exercise of due care that the vehicle is not inconformity with the standard.

Comfort and Convenience

Several petitioners asked the agency to answer promptly the pending petitions for reconsideration of the comfort and convenience requirements of Standard No. 208. The agency has already issued a separate notice (Docket 74-14, Notice 37; 50 FR 14580) proposing changes to the comfort and convenience requirements in response to the petitions for reconsideration. Readers are referred to that notice for a detailed discussion of the proposed revisions.

Judicial Review

One petitioner asked the agency to clarify the extent to which a challenge to the legality of the final rule must be made now, rather than when the Secretary makes a determination that two-thirds of the U.S. population is covered by a mandatory belt use law. The reviewability of the final rule and any subsequent agency action is a matter for the courts, not the agency, to decide.

Mandatory Seat Belt Use Law Criteria

A number of petitioners sought reconsideration of the minimum criteria for mandatory safety belt use laws. The agency is still considering the issues raised in those petitions and will respond to them at a later date.

Corrections

MVMA pointed out two minor errors in the text of the final rule. First, in section 4.1.2 of the rule, the word "before" should be used instead of the word "after." Likewise in section 4.1.2.2(b), the word "outboard" is misspelled. Both of those errors are corrected by this notice.

In addition, the agency wants to clarify a conflict between the preamble to the MUL provisions of the final rule and the text of the final rule's provisions on MULs. The preamble to the rule stated that one of the minimum criteria for a MUL was that each front outboard occupant of a passenger car be required to wear a safety belt. The text of the final rule provides that each front seat occupant, which would include the outboard and the center seating positions, would have to be covered *by a MUL. The text of the final rule, requiring a MUL to cover all the front seating positions, is the correct version.*

Cost and Benefits

NHTSA has examined the impact of this rulemaking action and determined that it is not major within the meaning of Executive Order 12291 or significant within the meaning of the Department of Transportation's regulatory policies and procedures. A Preliminary Regulatory Evaluation has been prepared on the changes proposed in Notice 38 and discussed in this notice. A copy of that evaluation is available for public inspection and copying in the agency's docket section. The agency has determined that the economic and other effects of the rulemaking action in this notice are so minimal that a full regulatory evaluation is not required. The changes adopted in this action concern minor adjustments to the phase-in requirements, which will give manufacturers more flexibility without imposing any economic costs.

Regulatory Flexibility Act

NHTSA has also considered the effects of this rulemaking action under the Regulatory Flexibility Act. I hereby certify that it will not have a significant economic impact on a substantial number of small entities. Accordingly, the agency has not prepared a regulatory flexibility analysis.

Few if any motor vehicle manufacturers would qualify as small entities. The suppliers of webbing and other manual or automatic restraint components will not likely be significantly affected, since this notice is not making a change in the performance requirements of the standard. Small organizations and governmental units will not be significantly affected since there are no price increases associated with this action.

In consideration of the foregoing, Part 571.208, Occupant Crash Protection, of Title 49 of the Code of Federal Regulations is amended as follows:

1. Section 4.1.3.4 is revised to read as follows:

S4.1.3.4 For the purposes of calculating the numbers of cars manufactured under S4.1.3.1.2, S4.1.3.2.2, or S4.1.3.3.2 to comply with S4.1.2.1:

(a) Each car whose driver's seating position will comply with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose front right seating position will comply with the requirements of S4.1.2.1(a) is counted as 1.5 vehicles.

(b) Each car whose driver's seating position will comply with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose front right seating position is equipped with a Type 2 seat belt is counted as a vehicle conforming to S4.1.2.1.

2. The first sentence of section 4.1.2 is revised to read as follows:

Each passenger car manufactured on or after September 1, 1973, and before September 1, 1986, shall meet the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

3. Section 4.1.2.2(b) is revised to change the word "outbord" to the word "outboard."

Issued on August 27, 1985

Diane K. Steed
Administrator

50 FR 35233
August 30, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Improvement of Seat Belt Assemblies
[Docket No. 74-14; Notice 42]

ACTION: Final rule

SUMMARY: On April 12, 1985, NHTSA issued a notice proposing modifications to certain aspects of the comfort and convenience performance requirements in Standard No. 208, *Occupant Crash Protection*. The agency's purpose was to clarify the intent of the requirements and to address the concerns raised in petitions for reconsideration received from seven vehicle manufacturers regarding the final rule on comfort and convenience issued on January 8, 1981. This notice sets comfort and convenience performance requirements for both manual and automatic safety belt assemblies installed in motor vehicles with a Gross Vehicle Weight Rating of 10,000 pounds or less. The April 12, 1985, notice also proposed to change the effective date of the comfort and convenience requirements. A final rule setting the effective date as September 1, 1986, was issued on August 23, 1985.

EFFECTIVE DATE: September 1, 1986.

SUPPLEMENTARY INFORMATION: On January 8, 1981 (46 FR 2064), NHTSA amended Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), to specify additional performance requirements to promote the comfort and convenience of both manual and automatic safety belt systems installed in motor vehicles with a GVWR of 10,000 pounds or less. The final rule included specifications relating to the following aspects of safety belt performance and design: latchplate accessibility; safety belt guides; adjustable buckles for certain belts; shoulder belt pressure; convenience hooks; belt retraction; and comfort devices. Type 2 manual belts (lap and shoulder combination belts) installed in front seating positions in passenger cars were excepted from these additional performance requirements, since it was assumed such belts would be phased out in passenger cars as the automatic restraint requirements of Standard No. 208 became effective.

Seven petitions for reconsideration of the January 8, 1981, amendment were received from vehicle manufacturers. On February 18, 1982 (47 FR 7254), the agency issued a partial response to the petitions for reconsideration by extending the effective date of the comfort and convenience requirements for one year, from September 1, 1982, to September 1, 1983. Subsequently, the agency proposed (47 FR 51432) and then adopted (48 FR 24717) a further extension of the effective date for the requirements until September 1, 1985.

The April 12, 1985 (50 FR 14580), notice proposed to delay the effective date until September 1, 1986, in order to give the industry sufficient leadtime to meet the proposed changes in the rule. A final rule delaying the effective date to September 1, 1986, was issued on August 23, 1985 (50 FR 34152).

As discussed in the April 12, 1985, notice, the agency continues to believe that certain of the performance requirements included in the final rule will tend to enhance safety belt use by providing occupants with safety belts which are more comfortable to wear and more convenient to use. The requirements in this final rule are important to support the agency's program to increase safety belt use in the United States.

This rule makes minor changes to the modifications proposed in April 1985 in response to concerns raised by the commenters. A discussion of these changes is set forth below. (For a complete understanding of the performance requirements discussed in this notice, including the relationship of the requirements to safety belt comfort and convenience, interested persons should refer to both the December 31, 1979 (44 FR 77210), notice of proposed rulemaking and the January 8, 1981 (46 FR 2064), final rule).

Application to Manual Lap/Shoulder Belts in Passenger Cars

The January 1981 final rule exempted manual Type 2 safety belts installed in the front seats of passenger cars from the comfort and convenience requirements. This was done to allow manufacturers to devote their resources to automatic restraints in these vehicles since Type 2 manual belts in the front seats would have been phased out when the automatic restraint requirements became effective. However, the subsequent July 1984 (49 FR 28962) final rule mandating automatic restraints specifies that if States representing two-thirds or more of the nation's population enact qualifying mandatory safety belt usage laws before April 1, 1989, the requirement for automatic protection will no longer apply. The April 1985 notice proposed that, in the event that this occurs, the comfort and convenience requirements would be extended to Type 2 manual belts installed in the front seats of passenger cars, effective September 1, 1989.

Two domestic manufacturers objected to the extension of the comfort and convenience requirements to manual Type 2 safety belts in front outboard seating positions of passenger cars until a decision has been made in 1989 regarding the future of automatic restraints. They stated that there is no justification for setting such a requirement now, which could cause manufacturers to incur design and tooling costs, because manual belts could be phased out in 1989 if an insufficient number of States pass qualifying mandatory safety belt use laws.

The September 1, 1989, effective date provides a leadtime of four years to comply with the comfort and convenience requirements for Type 2 front seat manual belts in passenger cars. The agency is therefore adopting the proposed September 1, 1989, effective date for Type 2 front seat manual belts in passenger cars if the automatic restraint requirement is rescinded.

The agency recognizes that the possibility exists that the industry will have to discontinue manual belts after 1989 if the automatic restraint requirement for all cars becomes effective. However, the agency believes that comfort and convenience technology developed for automatic belts and for Type 2 manual belts in light trucks and multipurpose passenger vehicles (MPV's) should be transferable to passenger cars with a minimum of design and tooling cost with a four-year leadtime. The agency notes that a large number of passenger cars will have been manufactured with manual belts between 1986 and 1989, and the agency believes it is desirable, from a safety standpoint, to have the front outboard seating positions of these cars incorporate comfort and convenience features which will contribute to increased belt usage. The agency therefore encourages manufacturers to begin voluntarily incorporating comfort and convenience features in their Type 2 front seat manual belts. Since the technology is available, the cost to incorporate these features should be minimal, especially if they are made part of the design process for newly introduced vehicles.

Emergency Locking Retractors (ELR) and Child Restraints

Paragraph S7.1.1.3 of Standard No. 208 was amended in the January 1981 final rule to specify that certain lap belts installed at front outboard seating positions are required to have an emergency-locking retractor rather than an automatic-locking retractor (which was previously allowed as an option). Some manufacturers also incorporate emergency-locking retractors in rear seats as well. Automatic-locking retractors are inconvenient to use since they must be extended in a single continuous movement to a length sufficient to allow buckling or they will lock. They also tend to tighten excessively under normal driving conditions, sometimes making it necessary to unbuckle and refasten the lap belt to relieve pressure on the pelvis and abdomen. Neither of these problems exists with the emergency-locking retractor, which allows occupant movement without tightening and which locks only upon rapid occupant movement, vehicle deceleration or impact.

The April 12, 1985, notice proposed a revised version of this requirement. The proposed revision reflected the agency's tentative judgment that use of child restraints in the front outboard passenger position with a lap belt equipped with an emergency-locking retractor could result in the child restraint moving forward during normal, low-speed driving and braking, or pre-crash vehicle maneuvering or braking. (At higher speeds or upon impact, the locking mechanism in existing belt designs would work to restrain the child seat appropriately.) Therefore, the agency proposed that Type 1 safety belts or the lap belt portion of Type 2 belts with emergency-locking retractors, used in any designated seating position other than the driver's position, be equipped with a locking means to prevent forward motion of child restraint devices.

A majority of vehicle manufacturers objected to this proposal. The main arguments they raised were: (1) the locking means could degrade the performance of the belt system for adult passengers; (2) the proposed language would exclude alternative designs, such as owner-installed "locking clips," which could serve the same purpose; (3) the requirement would not be cost effective, because not all vehicle owners need a locking means to secure a child restraint system in the front seat; and (4) the proposed effective date for the requirement, September 1, 1986, does not provide sufficient design and development time for compliance. They also argued that, if this requirement is maintained, it should be delayed until the agency decides whether it will require dynamic testing of manual safety belts.

Two manufacturers of child restraint devices and a child passenger safety association supported the proposed amendment. They stated that the approach cited in the proposal would solve potential problems relating to child seats and ELR's, and would eliminate the need to devise what they termed makeshift solutions.

Child restraint manufacturers stated that some restraint devices, when positioned by safety belt systems which are adjusted by ELR's, become unstable when occupied by very active children. Agency testing of child restraint devices under conditions of low-speed braking and vehicle maneuvers indicates that, although improvements in belt systems could improve the stability of these devices, there are no data to show that low-speed movement of child safety seats is affecting the safety performance of child restraint devices in motor vehicle accidents (Docket 80-18-GR-004).

Because the agency's research did not show that low-speed movement of the seats is actually reducing the effectiveness of child restraints in accidents, and because after-market locking devices are available which achieve the same goal, it has decided not to adopt a manual locking requirement for ELR's at this time. The agency will continue to monitor the potential problems associated with the restraint of child restraint devices by ELR safety belt systems and consider whether to address these problems in future rulemaking actions.

Additional ELR Issues

Regarding S7.1.1.3, one manufacturer asked NHTSA to clarify whether an ELR located at the point of shoulder belt retraction on a Type 2 belt system, which combines the lap and torso belt in a continuous running loop, complies with the requirement. NHTSA confirms that a Type 2 continuous belt system, which incorporates an ELR to control slack in the lap and torso belt portions, would comply with the requirement.

Another manufacturer asked for clarification on the use of lap belts in passenger cars equipped with air bags versus those equipped with single automatic diagonal belts. The requirement of S7.1.1.3 only applies to lap belts installed in a vehicle to comply with Standard No. 208. Thus, a lap belt installed in conjunction with an air bag, in order to meet the lateral and rollover requirements of S4.1.1.2(c)(2), would be required to have an emergency locking retractor. However, a Type 1 lap belt voluntarily installed by a manufacturer in conjunction with a single diagonal automatic belt would not have to comply with the provisions of S7.1.1.3, since the single diagonal automatic belt would fully meet the belt requirements of the standard by itself.

Open-Body Vehicles, MPV's, and ELR's

One manufacturer stated that open-body vehicles should be exempted from the ELR requirement of S7.1.1.3, because these vehicles are designed to perform numerous off-road, heavy-duty tasks, and both the lap and upper torso portions of the belt system are subjected to design criteria far different from typical passenger car belt systems. In particular, occupants may want the belts tightly fastened around them when the vehicle is used on rough terrain. The agency agrees that open-body vehicles do perform numerous off-road, heavy-duty tasks, but they are also commonly used in normal highway driving to perform the same functions as passenger cars, where tight belts may discourage belt use. Furthermore, belt systems are available for open-body vehicles as well as passenger cars, which can function as ELR's for the lap belt or lap belt portion of a combined lap and shoulder belt, and still be capable of being manually or automatically locked by occupants when they want the belt to be tightly fastened around them. These systems can also provide tension relieving and ELR functions for the torso portion of a Type 2 belt system.

Incorporating a single retractor, which can function as either an ALR or an ELR, into a lap belt or the lap belt portion of a Type 2 belt for off-road use, would accommodate the desire of occupants to be tightly restrained when needed and would also provide a more comfortable belt when this is sufficient for normal operation of the vehicle. Such an ALR/ELR feature may be desirable in some vehicles and is currently available in some imported and sports cars. The agency estimates the cost to range from $1.00 to $5.00 per seating position. Alternatively, a locking D-ring in the lap belt, which enables users to snugly fasten the lap belt, could be provided for virtually no increase in cost to the consumer. For these reasons, the agency is not exempting open-body vehicles from the requirement of S7.1.1.3.

Another manufacturer requested an exemption from the requirements of S7.1.1.3 for all multipurpose passenger vehicles, stating with no supporting rationale that the ELR requirement is design restrictive. The agency does not believe that the ELR requirement is design restrictive for the reasons discussed above. In addition, multipurpose passenger vehicles provide the same functions as passenger cars. While some types may also be designed for heavy-duty, off-road use, the same rationale set out in the discussion of open-body vehicles applies to other multipurpose passenger vehicles. The agency concludes that multipurpose passenger vehicles should continue to be subject to the requirement of S7.1.1.3.

Corrections

Two technical corrections are made in this final rule relating to paragraph S7.1.1.3. As proposed in the April 12, 1985, notice paragraph S7.1.1.3(b) exempts manual Type 2 safety belts installed in the front outboard seating position of passenger cars. That exemption was inadvertently omitted from paragraph S7.4(b), which specifies requirements for passenger cars after September 1, 1986. Clarifying language is added to paragraph S7.4(b) in this final rule.

The second technical change clarifies the agency's intent to require passenger cars, manufactured on or after September 1, 1989, to have ELR's for the lap belts or the lap portion of lap/shoulder belts used in the front outboard seating positions, if the automatic restraint requirement is rescinded. Paragraph S7.1.1.3(b) is revised to include the September 1, 1989, effective date for manual Type 2 belts in the front outboard seats of passenger cars.

Convenience Hooks for Automatic Belts

Some automatic belt design plans include a manual "convenience hook" which enables occupants manually to stow the belt webbing totally out of the way as they are about to exit the vehicle. Paragraph S7.4.1 was included in the January 1981 final rule to ensure that such convenience hooks would not affect compliance with the automatic restraint requirements. Automatic belts installed for compliance with the injury criteria of FMVSS 208 must operate without requiring any manual procedures by the vehicle occupant. Thus, manual hooks could not be a necessary component to move or hold the belt webbing out of the occupant's way since this would defeat the automatic aspect of performance. Paragraph S7.4.1 currently provides that any such hook must automatically release the belt webbing prior to the car being driven.

In response to comments in one petition for reconsideration of the 1981 final rule, the April 1985 proposal contained revised language to make it clear that convenience hooks are intended to release the webbing only when the automatic belt is otherwise operational. One commenter objected to the revision, stating that it would not promote the use of detachable automatic belts which have been disconnected. These objections appear to be based on a misunderstanding of the function of the convenience hook. The convenience hook concept was developed to allow it to be used in conjunction with automatic belt systems which would be in the automatic operational mode. In this way, the convenience hook could promote the use of detachable or nondetachable automatic belts, because the hook would facilitate entering or exiting the vehicle by the front seat occupants, who would then be less prone to detach or mutilate the belt system.

The commenter apparently believed that the "stowage hook," which is used to stow the latchplate of a disconnected, detachable belt, should also be covered by the requirement of S7.4.1. The stowage hook is not a convenience hook; nor is it subject to the provisions of S7.4.1. The commenter's suggestion that the "stowage hook" also release a disconnected detachable belt automatically could, in theory, increase usage, but it might also encourage owners to damage the belt physically or remove it, thus making it unavailable to subsequent owners and vehicle users. In the case of a disconnected automatic belt, the warning system would indicate to the vehicle occupants that the belt is disconnected and remind them to reconnect the belt. For these reasons, the agency denies the suggestion for automatic release of stowage hooks.

Webbing Tension-Relieving Devices

Some safety belt designs include devices intended to relieve shoulder belt pressure. These "windowshade" mechanisms or other tension-relieving devices increase the comfort of the belt, but may reduce the effectiveness of belts in a crash situation if they are misused so as to introduce excessive slack in the belt webbing. The January 1981 final rule specified that any such tension-relieving devices may be used on automatic belt systems only if the system would comply with the injury criteria of the standard with the device adjusted to *any possible position.* (The notice of proposed rulemaking preceding that final rule would have banned tension-relieving devices outright.) The 1981 final rule was adopted in recognition of the fact that tension-relieving devices can improve belt fit and increase belt comfort in certain circumstances, and was intended to allow manufacturers somewhat wider latitude in designing automatic belts, but, as discussed below, would probably have had the effect of banning these devices.

Several manufacturers objected to the wording of the January 1981 final rule on the basis that the belt system would have to meet the injury criteria even when the device had been misused to produce excessive slack in order, essentially, to defeat the system, even if such a usage was not intended by the manufacturer.

In the April 1985 proposal, the agency proposed rewording this provision to require manufacturers to include instructions in their vehicle owner's manual concerning the proper use of any tension-relieving devices incorporated in their automatic belt systems. These instructions must state the maximum amount of slack that can safely be introduced and include a warning to vehicle occupants that if excessive slack is introduced into the system, the protection offered by the belt system would be substantially reduced or even eliminated. The agency will test for compliance with the injury criteria by adjusting the belt within the slack levels recommended by the manufacturer. With one exception, those manufacturers who commented on this proposal supported the revision to allow tension-relieving devices.

However, one domestic manufacturer and a consumer group objected to the provision related to dynamic testing with the tension-relieving device adjusted to the manufacturer's recommended slack position. The manufacturer objected to a dynamic test that would require any slack at all to be introduced into the belt system, on the grounds that uncontrolled variability would be introduced into the dynamic test procedure, which would then lack objectivity. The manufacturer asserted that it might have to eliminate all tension-relieving devices for its safety belts.

The agency's proposed test procedure was intended to accommodate the view that tension-relieving devices increase the comfort of belts while, at the same time, limiting the potential reduction in effectiveness for safety belt systems in which excessive slack is introduced. The agency does not agree that this test procedure would eliminate tension-relieving devices from the marketplace. As mentioned earlier, other manufacturers supported the proposal and did not indicate they would have to remove tension-relieving devices from their belt systems. This commenter did not show that injury levels cannot be controlled within the specified injury criteria by testing at the recommended slack adjustment, as determined by the manufacturer. The recommended slack could be between zero and any level selected by the manufacturer as appropriate to relieve belt pressure without being unsafe. As a practical matter, most tension relievers automatically introduce some slack into the belt for all occupants. Testing without such slack would be unrealistic.

The same commenter objected to the requirement that belt slack be cancelled each time the vehicle door is opened *and* the buckle is released, because this requirement would encourage occupants to disconnect automatic belts. In addition, this commenter stated that the requirement is inconsistent with non-detachable, automatic belts and requested that the belt slack be required to be cancelled each time the door is opened whether or not the buckle is released. The agency believes this request has merit and has revised the requirement to reflect this change.

The consumer group objected to the proposal for automatic belt systems using tension-relieving devices to meet the injury criteria with only the specified amount of slack recommended in the owner's manual. They stated that most owners would not read the instructions in the owner's manual regarding the proper use of the tension-relieving device. It said an occupant could have a false sense of adequate restraint when wearing an automatic belt system adjusted beyond the recommended limit.

The agency's views on allowing the use of tension relievers in automatic safety belts were detailed in the April 1985 notice. The agency specifically noted the effectiveness of a safety belt system could be compromised if excessive slack were introduced into the belt. However, the agency recognizes that a belt system must be used to be effective at all. Allowing manufacturers to install tension-relieving devices makes it possible for an occupant to introduce a small amount of slack to relieve shoulder belt pressure or to get the belt away from the neck. As a result, safety belt use is promoted. This factor could outweigh any loss in effectiveness due to the introduction of a recommended amount of slack in normal use. This is particularly likely in light of the requirement that the belt system, so adjusted, must meet the injury criteria of Standard No. 208 under 30 mph test conditions. Further, the inadvertent introduction of slack into a belt system, which is beyond that for normal use, is unlikely in most current systems. In addition, even if too much slack is introduced, the occupant should notice that excessive slack is present and a correction is needed, regardless of whether he or she has read the vehicle owner's manual.

Torso Belt Body Contact Force

NHTSA research indicates that a substantial number (approximately 61 percent) of occupants are likely to complain about belt pressure if the torso belt net contact force on an occupant is greater than 0.7 pound (DOT HS–803 597). Therefore, the January 8, 1981, final rule specified that the torso portion of any manual or automatic belt system shall not create a contact pressure exceeding that of a belt with a total net contact force of 0.7 pound. Most of the petitions for reconsideration objected to this requirement, but gave no new reasons which would cause the agency to reverse its prior decision on this issue.

The April 1985 proposal contained a revised S7.4.2 which retained the 0.7-pound contact force requirement and proposed applying the requirement to tension relievers. Several commenters objected to the requirement that automatic belt systems with tension-relieving devices must meet the 0.7-pound contact force limit when the tension reliever is deactivated. Both domestic and foreign manufacturers questioned whether imposing this contact force requirement on belt systems with tension relievers would advance safety, because the belt contact force requirement could result in insufficient force to retract webbing reliably in some systems.

The agency has decided to exempt safety belt systems incorporating tension-relieving devices, such as window-shade devices, which can completely relieve belt tension, from the 0.7-pound torso belt contact force requirement. The agency is still concerned that some occupants may introduce belt slack, who otherwise would not, in a belt system incorporating a tension-reliever, if the belt force exceeds 0.7 pound. However, the agency does not want compliance with the body contact force requirement to limit manufacturers' design flexibility in meeting the retraction and other requirements in the rule.

The 0.7-pound contact force limit is retained for belt systems without tension-relieving devices, which have either a constant or variable force. The tension in these belt systems cannot be completely removed, as it can in a belt system incorporating a window-shade or other type of tension reliever. Therefore, the agency believes it is important to limit belt contact force in those systems to promote belt usage.

One manufacturer requested that the 0.7-pound contact force level be increased to ensure belt retraction. Another manufacturer stated that occupants of open-body vehicles may prefer to have the secure feeling of the upper torso belt webbing tight against their chests, i.e., a force greater than 0.7 pound. The company asked that open-body vehicles be excluded from the 0.7-pound limit. As previously noted, manufacturers may use an ALR/ELR belt system or other means to allow occupants to have belts with a tight fit. In addition, the agency believes that such an exclusion, or an increase in the 0.7-pound contact force level, is unnecessary with the modification of S7.4.3 to allow tension-relieving devices in lieu of meeting the 0.7-pound force requirement. Both manufacturers will have the option of meeting this requirement by installing a tension-relieving device in a belt system with a contact force of more than 0.7 pound.

One commenter stated that the standard should be revised to specify requirements for manual belts with tension-relieving devices. The agency did propose requirements for these manual belts in Notice 38, in conjunction with the dynamic tests for manual belts. If the agency does adopt a dynamic test requirement for manual belts, the provision on tension-relievers for manual belts would be expected to be identical to those for automatic belts.

Belt Contact Test Procedures

The April 1985 NPRM proposed that the test dummy be unclothed during the belt contact force test to avoid drag produced by clothing. The agency was concerned that such drag could cause unwanted deviations in the measurement of belt contact force, as specified in S10.6. Three commenters supported the change to remove the dummy clothing for the test. However, two other commenters stated that test variability would be greater with the test dummy's clothes removed based on the variability of skin friction due to changes in test temperature and humidity. They also said that a clothed dummy would more closely represent real world conditions. After consideration of the comments, NHTSA agrees that the clothed test dummy would more closely represent real world conditions. The agency has therefore revised the rule to require testing on a clothed test dummy, using the clothing specified in Part 572.

Two commenters asked that the test for belt contact force set maximum limits for belt release speed. The agency believes that adding a belt release speed requirement would add an unnecessary complication to the test without providing any significant improvement in controlling repeatability.

Several commenters correctly pointed out that the proposed text for S7.4.3 should reference the test procedure of S10.6 instead of S10.5. This notice adopts that correction.

Latchplate Accessibility

One of the most inconvenient aspects of using many current manual safety belt designs is the difficulty that a seated occupant has in reaching back to grasp the belt latchplate when the belt is unbuckled and in its retracted position. The greater the difficulty in reaching the latchplate to buckle the belt, the more likely the occupant will be discouraged from using the belt.

Paragraph S7.4.4 of the January 1981 final rule specified requirements to define limits on the distances an occupant has to reach for latchplates and to prescribe minimum clearances for arm and hand access. The latter requirement was specified in terms of a test block which must be able to move to the latchplate unhindered. The April 12, 1985 proposal contained a revision in the dimensions of the test block, reducing it from 3 x 4 x 12 inches to 1½ x 4 x 5 inches.

Two manufacturers requested a test procedure revision which would provide for seat cushion deflection in determining access to a latchplate with the test block shown in Figure 4. One suggested that force applied to the test block, not to exceed a certain limit, should be used to allow for seat cushion deflection. The other stated that the requirement should be deleted until such time as a test device that simulates the human hand can be developed to address seat cushion deflection.

The agency believes that reducing the size of the test block is simpler than developing an objective method for measuring and limiting seat cushion deflection. The agency also believes that the test block with its new dimensions, which are based on hand length and thickness dimensions referenced by the Society of Automotive Engineers, is sufficiently representative of the human hand. Therefore, the agency is adopting the new test block in the test procedure.

One manufacturer stated that Figure 3 in Standard No. 208, which gives the location of the reach strings for the latchplate accessibility test, does not state whether the view of the dummy is intended to depict the dummy being tested in the left or right side of the vehicle. Therefore, the implication is that the outboard reach string is always located on the right side of the dummy, according to the manufacturer. The view in Figure 3 is meant to depict the dummy being tested in the right side of the vehicle. The agency would use the string placements in Figure 3 to perform an accessibility test for the right front outboard passenger seating position, because the outboard reach string is located on the right side of the test dummy. This string would be reversed for the driver position because the outboard side would be located on the left side of the dummy with the dummy facing forward. The string in Figure 3 is labeled "outboard" and the agency believes this explanation is sufficient without changing Figure 3.

Several manufacturers stated that a latchplate accessibility test using the test block representing a human hand to check the clearance between the arm rest and seat cushion should not be necessary, if the belt system is designed so that the latchplate is retained in an accessible area. For example, one manufacturer said that it uses a sliding plastic bar on its belt webbing which positions the latchplate in an accessible area near the upper torso anchorage point. The manufacturer said that the plastic bar prevents the latchplate from sliding down the webbing to a position under the arm rest or between the seat and side of the vehicle. The manufacturer said that it could also use a fixed plastic button to retain the latchplate near the upper torso anchorage. The agency agrees that if a latchplate is permanently retained in an accessible area, reachable by the test block, there is no need to conduct a clearance test between the arm rest and seat cushion.

The purpose of the latchplate accessibility requirement is to address designs in which the latchplate can freely move on the belt webbing. In those cases, the latchplate may initially be located in an accessible area, but the design of the belt may permit the latchplate to slide along the webbing into the area between the seat cushion and the door interior, or below the door arm rest when the belt is retracted. If this situation is likely to occur in normal use with any regularity, such a belt system would be required to comply with the test for accessibility at the point where the latchplate normally slides along the webbing into the area between the seat cushion and the door interior, or below the door arm rest. The agency believes that the addition of language stating that access to the latchplate should be tested with the latchplate in its "normally stowed position" to the requirement should clarify this requirement. If the belt system incorporates a design which ensures that the latchplate cannot move near an arm rest or move down between the seat and the vehicle's side structure, the system will have no problem passing the hand access test.

Several commenters apparently believed that S7.4.4 requires the latchplate to be mounted on the outboard side of a vehicle seat. They said that the requirement was design-restrictive for a Type 1 safety belt assembly because such an assembly could otherwise be designed so that the latchplate is located at either the inboard or outboard position. The requirement was developed to test for access of the latchplate or buckle on belt assemblies which are located outboard of the designated seating position for which the latchplate is installed. This is because access to a latchplate located in that position can be hindered by the vehicle's side structure. The requirement was not intended to specify that the latchplate or buckle be located outboard of a designated seating position. The language of the rule is therefore revised to indicate that the test applies only to latchplates or buckles located outboard of the designated seating position.

One manufacturer recommended that the compliance test for accessibility be made similar to the requirement for safety belt anchorages in Standard No. 210, *Seat Belt Anchorages*. Compliance arcs would be generated from a point on the SAE two-dimensional manikin, whose H-point is positioned at the full-forward position of the design H-point, or on a full-scale design drawing. This commenter stated that such a procedure would eliminate test variability, reduce the compliance test burden, and allow manufacturers to determine compliance while the vehicle is in the advance design stage.

Manufacturers are free to determine compliance with a requirement by any method they choose, while exercising due care. There is no reason to believe that the procedure suggested by the commenter is not compatible with the procedure defined in Standard No. 208. Therefore, it is unnecessary to revise the current test procedure for latchplate accessibility.

Another manufacturer requested that the language of S7.4.4 be amended to specify that the access requirement be met with the seat within the adjustment range of a person whose dimensions range from those of a 50th percentile six-year-old child to those of a 95th percentile adult male. The rationale for the request is that, when securing a child restraint in some of their vehicles, the latchplate is located at a very low height near the floor, after locking. In this situation, the ability of small cars to comply with the latchplate access requirement is severely compromised. To achieve compliance, the seat back would have to be deeply cut away at the outboard side.

The latchplate access requirement is meant to address access problems when the latchplate is in its normally stowed position. It was not meant to address potential access problems with child restraints that might occur in specific vehicles. Therefore, the agency does not believe an amendment is necessary.

Belt Retraction

The April 12, 1985, notice proposed to revise S7.4.5 to allow for the stowage of arm rests on vehicle seats, such as captain's chairs, which must have the outboard arm rests stowed before the occupant can exit the vehicle. One commenter asked the agency to permit all arm rests, which protrude into the door opening in a manner which encumbers egress, to be placed in their stowed position for the retraction test. The agency believes this comment has merit and has revised S7.4.5 to permit the stowage of outboard arm rests if they protrude into the door opening in a manner which encumbers egress. The agency notes that folding arm rests are usually designed that way for the purpose of facilitating egress or ingress by moving them out of the way to a stowed position.

The April notice also proposed to allow tension-relieving devices on the safety belts of open-body vehicles without doors to be manually deactivated for the retraction test. One commenter objected to allowing these tension-relieving devices to be manually, rather than automatically, cancelled. The commenter said that there are belt systems currently available which will automatically cancel a tension-relieving device when the latchplate is released from the buckle.

At the time the agency proposed the requirement for open-body vehicles, it was not aware that there were belt systems which would automatically deactivate tension-relieving devices solely through the action of unbuckling the belt. Therefore, the agency only proposed that belt systems in open-body vehicles be tested with their tension-relieving devices manually deactivated. The agency will consider the commenter's suggestion as one for future rulemaking. The agency notes that manufacturers can voluntarily adopt the use of other automatic means for deactivating the tension-relieving device in open-body vehicles.

The April notice also proposed that the latchplate must retract to its "completely stowed position." Two commenters objected to this proposal saying that determining whether the belt is "completely" stowed is difficult. They believe that, if the stowed position prevents the safety belt from extending out of the vehicle's adjacent open door, the requirement for belt retraction should be satisfied. The agency believes that this comment is reasonable and consistent with the intent of this section to prevent belts from getting dirty as a result of being caught in the door and from hindering ingress or egress of occupants. The language in the rule is revised accordingly.

Seat Belt Guides

The April notice proposed clarifications in the language of S7.4.6.1(a) to increase the accessibility of belt buckles and latchplates and belt webbing to the vehicle occupant, while giving manufacturers flexibility to use stiffeners, guide openings, cables, or conduits of any type. The notice also proposed modifying S7.4.6.1(b) to exempt seats which are movable to serve a dual function.

Two commenters stated that the language in S7.4.6.1(b) did not adequately address seats which are removable or seats which are movable to serve a secondary function. NHTSA believes these comments are valid, because a seat belt latchplate, a buckle, or a portion of the webbing cannot be maintained on top of a seat which has been removed or moved to serve a secondary function. Therefore, the requirement does not apply to seats which are removable or movable so that the space formerly occupied by the seat can be used for a secondary function, such as cargo space. However, the term, secondary function, does not include the movement of a seat to provide a comfortable driving and riding position for different size occupants.

Two manufacturers requested that the words "seat cushion" in S7.4.6.1(b) be amended by adding the words "and/or seat backs." The agency specifically excluded "seat backs" from the exemption because there is no evidence that seats with folding seat backs cannot comply with the requirements. Adding movable seat backs to the language in S7.4.6.1(b) could exempt front seats in passenger cars and the second seat in some vehicles, such as station wagons. The agency believes that there is no reason for exempting these seats.

One manufacturer stated that the center safety belt in the rear seat of a motor vehicle should be exempted from the requirement in S7.4.6.1(a) concerning seat guides. This commenter stated that there is little chance of this belt ever becoming "lost" behind the seat due to the abundance of webbing material available for the center rear safety belt; therefore, a webbing guide seems unnecessary. The agency disagrees. The agency believes that the requirements are necessary since they address specific problems associated with belts which are not adjusted by retractors, such as the rear center seat belts. (Center seats are not required to have safety belt retractors, which automatically stow the webbing after the belt is taken off. Instead, they usually have more of the webbing lying on the seat cushion and have a manually adjustable buckle which slides along the webbing so that an occupant can tighten the belt around himself or herself.) Having more of the belt lying on the seat can make the belt more accessible; it can also cause the user to stuff the belt behind the seat cushion to get the webbing out of the way when the center seating position is not being used. In addition, one company, such as the commenter, may provide ample webbing which will lie on the seat cushion, while another company may not. The agency is therefore not exempting center seats.

One manufacturer stated that a 3-point belt assembly, with the lap webbing portion designed to pass between the seat cushion and seat back, will not necessarily have the latchplate positioned on the top of the seat, when the webbing is retracted. It urged that the requirement be revised to read, "maintain the accessibility of the safety belt latchplate or buckle," and to strike the words "or a portion of the safety belt webbing on top of the seat cushion." The agency agrees that the latchplate and buckle do not necessarily have to be located on the seat cushion to be accessible. NHTSA does believe that as long as the webbing is accessible on top of or above the seat, an occupant should be able to retrieve the latchplate and buckle. Therefore, the rule is revised to require that only one of the three belt parts (the seat belt latchplate, the buckle, or seat belt webbing) be maintained on top of or above the seat cushion under normal conditions. Although the other two parts will not be required to be on the seat cushion, the agency has revised the rule to require that they remain accessible under normal conditions.

Another manufacturer stated that the provision that a buckle be accessible in S7.4.6.2 with an adjustable arm rest in any position of adjustment lacked objectivity and should be deleted. The agency does not agree and continues to believe that a simple visual inspection should be sufficient to determine whether or not the buckle is accessible when the arm rest is in the down position.

Warning System Requirements

The purpose of the proposed revision to these requirements in the April notice was to allow for a warning light which activates for at least 60 seconds if condition (A)—the vehicle's ignition switch is moved to the "on" or "start" position, exists simultaneously with condition (B)—the driver's automatic belt is not in use or, if the belt is non-detachable, the emergency release mechanism is in the released position. Specifying a minimum activation time was intended to allow the manufacturer the option of providing for additional warning time. The proposal would also require that condition (C)—the belt webbing of a motorized automatic belt is not in its locked, protective mode at the anchorage point—be indicated only by a continuous or flashing warning light in lieu of a buzzer each time the ignition switch is turned to the "on" position. The light would remain lit as long as condition (C) existed.

Two manufacturers raised concerns about determining when condition (B) exists—the driver belt is not in use or the emergency release mechanism is released—in a motorized belt system. They, in effect, made the point that with certain motorized designs, the April proposal would have required the audible warning required for condition (B) to sound while the belt webbing is moving along its track to its fully locked position. For example, one manufacturer stated that in some motorized belt systems the emergency release belt latch mechanism sensing is done by a proximity switch in the (B) pillar which senses the presence of a magnet in the part attached to the webbing. In this case, the system will sense that the latch is unfastened until the motorized belt is in its fully locked position and, thus, under the proposal, would activate the audible warning during the period that the belt is in motion. This commenter requested that to prevent an audible warning from being given when the mechanism is being operated normally, the manufactuer should be given the option of starting the audible warning period from the time that the belt reaches the fully locked position.

The agency believes that it is important that an audible warning sound when the driver's belt is not in use or the belt's emergency release mechanism is actuated. However, to prevent the sounding of the audible warning when a motorized belt is moving into place, the agency is revising the warning system requirement. The revision provides that, in the case of a motorized belt, the existence of condition (B) is determined once the belt is in its fully locked position. Once a motorized belt has reached its fully locked position, an audible warning must sound if condition (B) exists. The agency wishes to emphasize that all motorized belts, regardless of their design, should have an audible warning that sounds if the driver's belt is not in use or the belt's emergency release mechanism is actuated.

One of the same commenters also said it is planning to use detachable automatic belts in some of its new belt system designs. Its concern is that condition (B), which is determined by the belt latch mechanism not being fastened, would require them to locate the electrical sensor in the emergency release buckle. In a motorized system, the wire harness for the electric sensor would have to be moved along a track, because the "emergency release buckle" slides along the track with the buckle end. The location of the electrical sensor in the buckle makes the wire harness less reliable, because of the constant movement, according to the commenter. After the close of the comment period on the April notice, NHTSA received a petition for rulemaking to amend the requirements of paragraph S4.5.3.3(b) of Standard No. 208 from Chrysler Corporation which raised the same issues. Chrysler petitioned for an alternative means to determine when the belt latch mechanism is not fastened. It asked that the warning requirement be modified to permit actuation of the warning when less than 20 inches of webbing has been withdrawn from the driver's seat belt retractor.

The agency believes the problems identified by the commenter and the Chrysler petition are valid. NHTSA did not intend to imply in the April 1985 notice that the method for determining that the belt latch is not fastened must be by a sensor located in the belt buckle. The agency believes that manufacturers should have maximum design flexibility to develop systems to determine if the latch is not fastened. The condition could be determined by any means, such as a predetermined amount of belt webbing spool-out, or the location of a sensor in the overhead, motorized track area or in the working mechanism of the buckle/latchplate, which would show that the automatic belt is not fastened. The agency does note that if a manufacturer decides to use belt webbing spool-out that it determine the least amount of webbing necessary to go around a person in the driver's position with the seat in its rearmost position. If less than this minimum amount of webbing spools out of the retractor in an attempt to defeat the system, the warning should be activated.

Two manufacturers requested that NHTSA confirm that the same light signal may be activated under both conditions (B) and (C), since the required audible signal suffices to differentiate between the two conditions. The agency agrees that this comment has merit and confirms that the same light signal may be activated under both conditions (B) and (C).

Use of Additional Warnings

One manufacturer sought permission to use additional warnings to supplement those required by the standard. This manufacturer stated that its warning system provided for an audible warning system in addition to the warning light to indicate that condition (A) + (C) exists. Further, the passenger seating position is also equipped with a warning system, which is not required by the standard. The agency notes, again, that a manufacturer is free to provide features in addition to those required by the standard, as long as the standard's requirements are met. No change in the standard is necessary to permit the commenter to install additional features in its warning systems.

Another company stated that, for non-detachable automatic belts, the proposed 60-second visual warning and the 4- to 8-second audible warning may not be sufficient to indicate that the emergency spool release is in the released position. This company believes that the visual warning should remain on for as long as the emergency release mechanism remains in the release or "emergency" position. The agency notes that the requirement specifies a minimum 60-second visual warning and does not limit it to 60 seconds for condition (B). The agency specified a minimum period of time, which is believed sufficient to warn occupants of this condition. Manufacturers have the choice of extending the time for a warning light to more than 60 seconds to indicate that the emergency release mechanism is in the release or emergency condition. Therefore, no change in the language of the standard is required.

Walk-in Van Vehicles

The agency tentatively proposed to exclude walk-in step vans from the safety belt comfort and convenience requirements in the April 12, 1985, notice. By the term, "walk-in vans," NHTSA is referring to city delivery type vehicles used, for example, to deliver parcels or dry cleaning where the drivers can walk directly into the vans without stooping. A consumer group objected to the proposed exemption for walk-in step vans on the basis that NHTSA should promote belt use in these vehicles by making them easier to use. The agency is not persuaded that the increase in belt usage which might result from the redesign of walk-in vans to meet the comfort and convenience requirements would justify the cost of such a modification. Moreover, these vehicles do not normally have a secondary use, for example, as a family vehicle, as do other utility vehicles which are required to meet the comfort and convenience requirements for safety belts. Due to the problems with cost and vehicle redesign, the agency does not believe that it is appropriate to apply the comfort and convenience requirements to these vehicles.

Weights and Dimensions

In the April 12, 1985, notice, the agency proposed a chart of weights and dimensions which included small dimension changes and tolerances for the 50th percentile adult male. One manufacturer commented that the agency has supplied no rationale for these changes and that such dimensional revisions to the Part 572 dummy should be the subject of a separate rulemaking under Part 572. This commenter also objected to inclusion of a seated hip circumference in the chart. The agency notes that the chart of weights and dimensions of vehicle occupants was included in Standard No. 208 as a guide for manufactuers. The seated hip circumference was included in this chart because it is referred to in Standard No. 208. There is no requirement in Part 572 for a seated hip circumference; therefore, this dimension is not a requirement for the Part 572 test dummy. The agency proposed the minor changes to the chart to ensure that the dimensions set forth in the chart agreed with the dimensions specified on drawing SA 150 M002 of the test dummy, which is incorporated by reference in Part 572.5. The agency is therefore adopting the proposed changes.

Another company said that the dimensions of a six-year-old child are contained in the table defining the vehicle occupants. Although it highly recommends safety belt use for a child of this age, this commenter stressed that optimum protection for a person of these dimensions can only be obtained by using an additional special booster cushion equipped with a safety belt guide system. These types of cushions are readily available in the United States. The commenter therefore requested that the standard be amended to permit the commenter to recommend the use of such a cushion in order to ensure correct positioning of the belt around a six-year-old child. The agency agrees that, in some instances, booster seats do facilitate the use of adult restraints by this size occupant. However, the agency also believes that the average six-year-old child should be suitably accommodated by the adult belt system in such a way that the child is adequately protected from injury and fatality. Therefore, the agency declines to make this change to the standard.

Automatic Safety Belt Interpretation

In 1974 (39 FR 14594), the agency issued an interpretation that it would not consider a belt system which had to be manually moved out of the way by the occupant to be an "automatic" system that would satisfy the requirements of Standard No. 208. In the April 12, 1985, notice, the agency stated its belief that such an interpretation may be overly stringent and requested public comment.

Four commenters argued that the past interpretation was overly stringent, because it would have allowed no manual movement of the belt to accommodate ingress into the vehicle. As a minimum, these commenters stated, such an interpretation should acknowledge that a safety belt design should be considered "passive" or "automatic" if an occupant would normally push the webbing aside upon entering the vehicle. In addition, an automatic belt requiring a slight adjustment for comfort should be considered an automatic restraint system. The commenters urged that any belt design, which would perform its protective restraining function after a normal process of ingress, without separate deliberate action by the vehicle occupant to deploy the restraint system, should be allowed. Finally, the commenters said that to provide an automatic lap and shoulder belt design which would comply with the original interpretation could increase the tendency for the occupant to submarine under the belt. The reason is that the lap belt portion, which would enable an occupant to enter or exit the vehicle without manually moving the belt, could be raised too high. To solve this problem, a very expensive motorized system would be required to move the belts out of the occupant's ingress/egress area.

The agency believes these comments have merit and has revised its interpretation. The concept of an occupant protection system which requires "no action by vehicle occupants," as that term is used in Standard No. 208, is intended to designate a system which will perform its protective restraining function after a normal process of ingress or egress without separate deliberate actions by the vehicle occupant *to deploy* the restraint system. Thus, the agency considers an occupant protection system to be automatic if an occupant has to take no action to deploy the system but would normally slightly push the safety belt webbing aside when entering or exiting the vehicle or would normally make a slight adjustment in the webbing for comfort. The agency believes that the marketplace will help curb use of automatic belt systems which are complicated, or require excessive adjustments before ingress or egress, since prospective purchasers would reject vehicles with such systems. The agency believes that adoption of the comfort and convenience requirements will help ensure that manufacturers provide automatic belt systems which will promote belt usage.

In consideration of the foregoing, 49 CFR 571.208 is amended as follows:

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

2. S7.1.1.3 is revised to read:

S7.1.1.3(a) Except as provided in S7.1.1.3(b), a Type 1 lap belt or the lap belt portion of any Type 2 belt installed at any front outboard designated seating position for compliance with this standard in a vehicle (other than walk-in van-type vehicles) manufactured on or after September 1, 1986, shall meet the requirements of S7.1 by means of an emergency-locking retractor that conforms to Standard No. 209 (§ 571.209).

(b) The requirements of S7.1.1.3(a) do not apply to the lap belt portion of any Type 2 belt installed in a passenger car manufactured before September 1, 1989, or to walk-in van-type vehicles.

3. S7.4 is revised to read:

S7.4 *Seat belt comfort and convenience.* (a) Automatic seat belts installed in any vehicle, other than walk-in van-type vehicles, with a GVWR of 10,000 pounds or less, manufactured on or after September 1, 1986, shall meet the requirements of S7.4.1, S7.4.2, and S7.4.3.

(b) Except as provided in S7.4(c), manual seat belts, other than manual Type 2 belt systems installed in the front outboard seating position in passenger cars, installed for compliance with this standard in any vehicle which has a GVWR of 10,000 pounds or less, and is manufactured on or after September 1, 1986, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6. Manual Type 2 seat belts in the front outboard seating positions of passenger cars manufactured on or after September 1, 1989, shall meet the requirements of S7.1.1.3(a), S7.4.3, S7.4.4, S7.4.5, and S7.4.6, if the automatic restraint requirements are rescinded pursuant to S4.1.5.

(c) The requirements of S7.4(b) do not apply to manual belts installed in walk-in van-type vehicles.

4. S7.4.1 is revised to read:

S7.4.1 *Convenience hooks.* Any manual convenience hook or other device that is provided to stow seat belt webbing to facilitate entering or exiting the vehicle shall automatically release the webbing when the automatic belt system is otherwise operational and shall remain in the released mode for as long as (a) exists simultaneously with (b), or, at the maufacturer's option, for as long as (a) exists simultaneously with (c)—

(a) The vehicle ignition switch is moved to the "on" or "start" position;

(b) The vehicle's drive train is engaged;

(c) The vehicle's parking brake is in the released mode (nonengaged).

5. S7.4.2 is revised to read:

S7.4.2 *Webbing tension-relieving device.* Each automatic seat belt assembly that includes either manual or automatic devices that permit the introduction of slack in the webbing of the shoulder belt (e.g., "comfort clips" or "window-shade" devices) shall comply with the occupant crash protection requirements of S5 of this standard with the belt webbing adjusted to introduce the maximum amount of slack that is recommended by the vehicle manufacturer in the vehicle owner's manual to be introduced into the shoulder belt under normal use conditions. The vehicle owner's manual shall explain how the device works and shall specify the maximum amount of slack (in inches) which is recommended by the vehicle manufacturer in the owner's manual to be introduced into the shoulder belt under normal use conditions. These instructions shall also warn that introducing slack beyond the specified amount could significantly reduce the effectiveness of the belt in a crash. Any belt slack that can be introduced into the belt system by means of any tension-relieving device or design shall be cancelled each time the safety belt is unbuckled or the adjacent vehicle door is opened except for belt systems in open-body vehicles with no doors.

6. S7.4.3 is revised to read as follows:

S7.4.3 *Belt contact force.* Except for seat belt assemblies which incorporate a webbing tension-relieving device that complies with S7.4.2, the upper torso webbing of any seat belt assembly, when tested in accordance with S10.6, shall not exert more than 0.7 pound of contact force when measured normal to and one inch from the chest of an anthropomorphic test dummy, positioned in accordance with S10 in the seating position for which that assembly is provided, at the point where the centerline of the torso belt crosses the midsagittal line on the dummy's chest.

7. The first sentence of S7.4.4 is revised to read as follows:

S7.4.4 *Latchplate access.* Any seat belt assembly latchplate which is located outboard of a front outboard seating position in accordance with S4.1.2, shall also be located within the outboard reach envelope of either the outboard arm or the inboard arm described in S10.5 and Figure 3 of this standard, when the latchplate is in its normal stowed position. There shall be sufficient clearance between the vehicle seat and the side of the vehicle interior to allow the test block defined in Figure 4 unhindered transit to the latchplate or buckle.

8. S7.4.5 is revised to read as follows:

S7.4.5 *Retraction.* When tested under the conditions of S8.1.2 and S8.1.3, with the anthropomorphic test dummies whose arms have been removed and which are positioned in accordance with S10 and restrained by the belt systems for those positions, the torso and lap belt webbing of any of those seat belt systems shall automatically retract when the adjacent vehicle door is in the open position, or when the seat belt latchplate is released, to a stowed position. That position shall prevent any part of the webbing or hardware from being pinched when the adjacent vehicle door is closed. A belt system with a tension-relieving device in an open-bodied vehicle with no doors shall fully retract when the tension-relief device is manually deactivated. For the purpose of the retraction requirement, outboard armrests may be placed in their stowed positions if they are on vehicle seats which must have the armrests in the stowed position to allow an occupant to exit the vehicle.

9. S7.4.6.1 is revised to read as follows:

S7.4.6.1(a) Any manual seat belt assembly whose webbing is designed to pass through the seat cushion or between the seat cushion and seat back shall be designed to maintain one of the following three seat belt parts (the seat belt latchplate, the buckle, or the seat belt webbing) on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant). In addition, the remaining two seat belt parts must be acessible under normal conditions.

(b) The requirements of S7.4.6.1(a) do not apply to: (1) seats whose seat cushions are movable so that the seat back serves a function other than seating, (2) seats which are removable, or (3) seats which are movable so that the space formerly occupied by the seat can be used for a secondary function.

10. S4.5.3.3(b) is revised to read as follows:

S4.5.3.3(b) In place of a warning system that conforms to S7.3 of this standard, be equipped with the following warning system: At the left front designated seating position (driver's position), a warning system that activates a continuous or intermittent audible signal for a period of not less than 4 seconds and not more than 8 seconds and that activates a continuous or flashing warning light visible to the driver for not less than 60 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position) when condition (A) exists simultaneously with condition (B), and that activates a continuous or flashing warning light, visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of Standard No. 101 (49 CFR 571.101), or, at the option of the manufacturer if permitted by Standard No. 101, displaying the words "Fasten Seat Belts" or "Fasten Belts," for as long as condition (A) exists simultaneously with condition (C).

(A) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(B) The driver's automatic belt is not in use, as determined by the belt latch mechanism not being fastened or, if the automatic belt is non-detachable, by the emergency release mechanism being in the released position. In the case of motorized automatic belts, the determination of use shall be made once the belt webbing is in its locked protective mode at the anchorage point.

(C) The belt webbing of a motorized automatic belt system is not in its locked, protective mode at the anchorage point.

11. The first sentence of S10.5 is amended to delete "S7.4.7" and to insert in its place "S7.4.4."

12. S10.6 is amended to read as follows:

S10.6 To determine compliance with S7.4.3 of this standard, position the anthropomorphic test dummy in the vehicle in accordance with S8.1.11, and under the conditions of S8.1.2, S8.1.3, and S8.1.9. Close the vehicle's adjacent door, pull 12 inches of belt webbing from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Pull the belt webbing three inches from the dummy's chest and release until the webbing is within one inch of the dummy's chest and measure belt pressure.

13. Figure 4 of this standard is modified as follows:

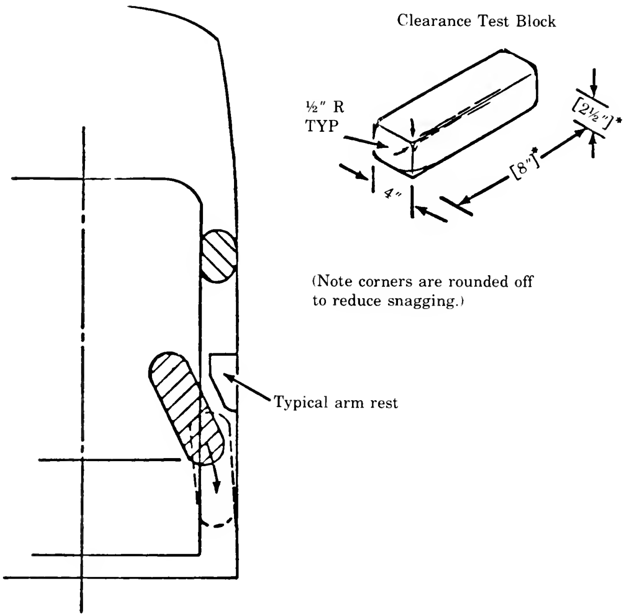

Figure 4—USE OF CLEARANCE TEST BLOCK TO DETERMINE HAND/ARM ACCESS

14. The weights and dimensions of the vehicle occupants referred to in this standard and specified in S7.1.13 are modified to read as follows:

	50th-percentile 6-year-old child	5th-percentile adult female	50th-percentile adult male		95th-percentile adult male
Weight	47.3 pounds	102 pounds	164 pounds	± 3	215 pounds
Erect sitting height	25.4 inches	30.9 inches	35.7 inches	±10	38 inches
Hip breadth (sitting)	8.4 inches	12.8 inches	14.7 inches	± 7	16.5 inches
Hip circumference (sitting)	23.9 inches	36.4 inches	42 inches		42.5 inches
Waist circumference (sitting)	20.8 inches	23.6 inches	32 inches	+60	42.5 inches
Chest depth		7.5 inches	9.3 inches	±20	10.5 inches
Chest circumference:					
(nipple)		30.5 inches			
(upper)		29.8 inches	37.4 inches	±6	44.5 inches
(lower)		26.6 inches			

15. The Note following paragraph S11.8 is revised to read as follows:

Note: The concept of an occupant protection system which requires "no action by vehicle occupants," as that term is used in Standard No. 208, is intended to designate a system which will perform its protective restraining function after a normal process of ingress or egress without separate deliberate actions by the vehicle occupant to deploy the restraint system. Thus, the agency considers an occupant protection system to be automatic if an occupant has to take no action to deploy the system but would normally slightly push the seat belt webbing aside when entering or exiting the vehicle or would normally make a slight adjustment in the webbing for comfort.

Issued on November 1, 1985

Diane K. Steed
Administrator

50 FR 46056
November 5, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208 OCCUPANT CRASH PROTECTION [Docket No. 74-14; Notice 43]

ACTION: Final rule.

SUMMARY: On April 12, 1985, NHTSA issued a notice proposing a number of amendments to Standard No. 208, *Occupant Crash Protection.* Based on its analysis of the comments received in response to that notice, the agency has decided to take the following actions: retain the oblique crash test for automatic restraint equipped cars, adopt some New Car Assessment Program test procedures for use in the standard's crash tests, provide in the standard for a due care defense with respect to the automatic restraint requirement, and require the dynamic testing of manual lap/shoulder belts in passenger cars. This notice also creates a new Part 585 that sets reporting requirements regarding compliance with the automatic restraint phase-in requirements of the standard.

EFFECTIVE DATE: The amendments made by this notice will take effect on May 5, 1986, except the requirement for dynamic testing of manual safety belts in passenger cars will go into effect on September 1, 1989, if the automatic restraint requirement is rescinded.

SUPPLEMENTARY INFORMATION:

Background

On July 11, 1984 (49 FR 28962), the Secretary of Transportation issued a final rule requiring automatic occupant protection in all passenger cars. The rule is based on a phased-in schedule beginning on September 1, 1986, with full implementation being required by September 1, 1989. However, if before April 1, 1989, two-thirds of the population of the United States are covered by effective state mandatory safety belt use laws (MULs) meeting specified criteria, the automatic restraint requirement will be rescinded.

More specifically, the rule requires:

- Front outboard seating positions in passenger cars manufactured on or after September 1, 1986, for sale in the United States, will have to be equipped with automatic restraints based on the following schedule:
  - Ten percent of all cars manufactured on or after September 1, 1986.
  - Twenty-five percent of all cars manufactured on or after September 1, 1987.
  - Forty percent of all cars manufactured on or after September 1, 1988.
  - One hundred percent of all cars manufactured on or after September 1, 1989.
- During the phase-in period, each car that is manufactured with a system that provides automatic protection to the driver without the use of safety belts and automatic protection of any sort to the passenger will be given an extra credit equal to one-half car toward meeting the percentage requirement. In addition, each car which provides non-belt automatic protection solely to the driver will be given a one vehicle credit.
- The requirement for automatic restraints will be rescinded if MULs meeting specified conditions are passed by a sufficent number of states before April 1, 1989, to cover two-thirds of the population of the United States. The MULs must go into effect no later than September 1, 1989.

In the July 1984 notice, the Secretary identified various issues requiring additional rulemaking. On April 12, 1985, the agency issued two notices setting forth proposals on all of those issues. One notice (50 FR 14589), which is the basis for the final rule being issued today, proposed: reporting requirements for the phase-in, deletion of the oblique test, alternative calculations of the head injury criterion (HIC), allowing the installation of manual belts in convertibles, use of the New Car Assessment Program (NCAP) test procedures, and adoption of a due care defense. The notice also proposed the dynamic testing of manual lap/shoulder belts for passenger cars, light trucks and light vans. The second notice (50 FR 14602) set forth the agency's proposals on the use of the Hybrid III test dummy and additional injury criteria. NHTSA has not yet completed its analysis of the comments and issues raised by the Hybrid III proposal or the proposal regarding convertibles and dynamic testing of safety belts in light trucks and light vans. The agency will publish a separate *Federal Register* notice announcing its decision with regard to these issues when it has completed its analysis.

Oblique Crash Tests

Standard No. 208 currently requires cars with automatic restraints to pass the injury protection criteria in 30 mph head-on and oblique impacts into a barrier. The April 1985 notice contained an extensive discussion of the value of the oblique test and requested commenters to provide additional data regarding the safety and other effects of deleting the requirements.

The responses to the April notice reflected the same difference of opinion found in the prior responses on this issue. Those favoring elimination of the test argue that the test is unnecessary since oblique crash tests generally show lower injury levels. They also said the additional test adds to the cost of complying with the standard – although manufacturers differed as to the extent of costs. Four manufacturers suggested that any cost reduction resulting from elimination of the test would be minimal, in part because they will continue to use the oblique tests in their restraint system developmental programs, regardless of what action the agency takes. Another manufacturer, however, said that while it would continue to use oblique testing during its vehicle development programs, the elimination of the oblique test in Standard No. 208 would result in cost and manpower savings. These savings would result because the parts used in vehicles for certification testing must be more representative of actual production parts than the parts used in vehicles crashed during development tests.

Those favoring retention of the test again emphasized that the test is more representative of real-world crashes. In addition, they said that occupants in systems without upper torso belts, such as some air bag or passive interior systems, could experience contact with the A-pillar and other vehicle structures in the oblique test that they would not experience in a head-on test. Although, again, there were conflicting opinions on this issue – one manufacturer said that oblique tests would not affect air bag design, while other manufacturers argued that the oblique test is necessary to ensure the proper design of air bag systems. The same manufacturer that said air bag design would not be affected by the oblique test, emphasized that vehicles with 2-point automatic belts or passive interiors, "may show performance characteristics in oblique tests that do not show up on perpendicular tests." Similarly, one manufacturer said that oblique tests will not result in test dummy contact with the A-pillar or front door – while another manufacturer argued that in the oblique test contact could occur with the A-pillar in vehicles using non-belt technologies.

After examining the issues raised by the commenters, the agency has decided to retain the oblique tests. There are a number of factors underlying the agency's decision. First, although oblique tests generally produce lower injury levels, they do not consistently produce those results. For example, the agency has conducted both oblique and frontal crash tests on 14 different cars as part of its research activities and NCAP testing. The driver and passenger HIC's and chest acceleration results for those tests show that the results in the oblique tests are lower in 31 of the 38 cases for which data were available. However, looking at the results in terms of vehicles, 6 of the 14 cars had higher results, exclusive of femur results, in either passenger or driver HIC's or chest accelerations in the oblique tests. The femur results in approximately one-third of the measurements were also higher in the oblique tests. Accident data also indicate that oblique impacts pose a problem. The 1982 FARS and NASS accident records show that 14 percent of the fatalities and 22 percent of the AIS 2-5 injuries occur in 30 degree impacts.

The agency is also concerned that elimination of the oblique test could lead to potential design problems in some automatic restraint systems. For example, air bags that meet only a perpendicular impact test could be made much smaller. In such a case, in an oblique car crash, the occupant would roll off the smaller bag and strike the A-pillar or instrument panel. Similarly, the upper torso belt of an automatic belt system could slip off an occupant's shoulder in an oblique crash. In belt system with a tension-relieving device, the system will be tested with the maximum amount of slack recommended by the vehicle manufacturer, potentially increasing the possibility of the upper torso belt slipping off the occupant's shoulder. In the case of passive interiors, an occupant may be able to contact hard vehicle structures, such as the A-pillar, in oblique crashes that would not be contacted in a perpendicular test. If the A-pillar and other hard structures are not designed to provide protection in oblique crashes then there would be no assurance, as there presently is, that occupants would be adequately protected. Thus, the oblique test is needed to protect unrestrained occupants in passive interiors, and to ensure that air bags and automatic or manual safety belts are designed to accommodate some degree of oblique impact.

The agency recognizes that retention of the oblique test will result in additional testing costs for manufacturers. The agency believes, however, that there are a number of factors which should minimize those costs. First, even manufacturers opposing retention of the oblique test indicated that they will continue to perform oblique crash tests to meet their own internal requirements as well as to meet the oblique test requirements of the Standard No. 301, *Fuel System Integrity.* Since the oblique tests of Standard No. 208 and Standard No. 301 can be run simultaneously, the costs resulting from retention of the oblique crash test requirements of Standard No. 208 should not be significant.

Dynamic Testing of Manual Belts

The April notice proposed that manual lap/shoulder belts installed at the outboard seating positions of the front seat of four different vehicle types comply with the dynamic testing requirements of Standard No. 208. Those requirements provide for using test dummies in vehicle crashes for measuring the level of protection offered by the restraint system. The four vehicle types subject to this proposal are passenger cars, light trucks, small van-like buses, and light multipurpose passenger vehicles (MPV's). (The agency considers light trucks, small van-like buses, and light MPV's to be vehicles with a Gross Vehicle Weight Rating (GVWR) of 10,000 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. The 5,500 pound unloaded vehicle weight limit is also used in Standard No. 212, *Windshield Retention*, and Standard No. 219, *Windshield Zone Intrusion.* The limit was adopted in those standards on April 3, 1980 (45 FR 22044) to reduce compliance problems for final-stage manufacturers. Readers are referred to the April 1980 notice for a complete discussion of the 5,500 pound limit.)

Currently, manual belts are not subject to dynamic test requirements. Instead they must be tested in accordance with Standard No. 209, *Seat Belt Assemblies*, for strength and other qualities in laboratory bench tests. Once a safety belt is certified as complying with the requirements of Standard No. 209, it currently may be installed in a vehicle without any further testing or certification as to its performance in that vehicle. The safety belt anchorages in the vehicle are tested for strength in accordance with Standard No. 210, *Seat Belt Assembly Anchorages.*

The April 1985 notice also addressed the issue of tension-relieving devices on manual belts. Tension-relieving devices are used to introduce slack in the shoulder portion of a lap-shoulder belt to reduce the pressure of the belt on an occupant or to effect a more comfortable "fit" of the belt to an occupant. The notice proposed that manufacturers be required to specify in their vehicle owner's manuals the maximum amount of slack they recommend introducing into the belt under normal use condition. Further, the owner's manual would be required to warn that introducing slack beyond the maximum amount specified by the manufacturer could significantly reduce the effectiveness of the belt in a crash. During the agency's dynamic testing of manual belts, the tension-relieving devices would be adjusted so as to introduce the maximum amount of slack specified in the owner's manual.

The agency proposed that the dynamic test requirement for passenger cars take effect on September 1, 1989, and only if the Secretary determines that two-thirds of the population is covered by effective safety belt use laws, thereby rescinding the automatic restraint requirement. Should such a determination be made, it is important that users of manual belts be assured that their vehicles offer the same level of occupant protection as if automatic restraints were in their vehicles. Absent a rescission of the automatic restraint requirement, application of the dynamic testing requirements to manual safety belts in passenger cars would be unnecessary since those belts would not be required in the outboard seating positions of the front seat. In the case of light trucks, light MPV's and small van-like buses, the agency proposed that the dynamic test requirement take effect on September 1, 1989. The proposed effective date for light trucks, light MPV's and van-like buses was not conditional, because those vehicles are not covered by the automatic restraint requirement and will likely continue to have manual safety belts.

Adoption of the requirement

As discussed in detail below, the agency has decided to adopt a dynamic test requirement for safety belts used in passenger cars. The agency is still analyzing the issues raised in the comments about dynamic testing for safety belt systems in other vehicles and will announce its decision about safety belt systems in light trucks, MPV's and buses at a later date.

Most of the commenters favored adopting a dynamic test requirement for manual belts at least with respect to passenger cars, although many of those commenters raised questions about the lead-time needed to comply with the requirement. Those opposing the requirement argued that the field experience has shown that current manual belts provide substantial protection and thus a dynamic test requirement is not necessary. In addition, they argued that dynamic testing would substantially increase a manufacturer's testing costs, and its testing workload. One commenter said that because of the unique nature of the testing, it could not necessarily be combined with other compliance testing done by a manufacturer. The same commenter argued that vehicle downsizing, cited by the agency as one reason for dynamically testing belts, does not create safety problems since the interior space of passenger cars has remained essentially the same as it was prior to downsizing. The commenter also argued there is no field evidence that the use of tension-relieving devices in safety belts, the other reason cited by the agency in support of the need to test dynamically manual safety belts, is compromising the performance of safety belts.

The agency strongly believes that current manual belts provide very substantial protection in a crash. The Secretary's 1984 automatic protection decision concluded that current manual safety belts are at least as effective, and in some cases, more effective than current automatic belt designs. That conclusion was based on current manual safety belts, which are not certified to dynamic tests. However, as discussed in the April 1985 notice, the agency is concerned that as an increasing number of vehicles are reduced in size for fuel economy purposes and as more tension-relieving devices are used on manual belts, the potential for occupant injury increases. The agency agrees that downsizing efforts by manufacturers have attempted to preserve the interior space of passenger cars, while reducing their exterior dimensions. Preserving the interior dimensions of the passenger compartment means that occupants will not be placed closer to instrument panels and other vehicle structures which they could strike in a crash. However, the reduction in exterior dimensions can result in a lessening of the protective crush distance available in a car. Thus the agency believes it is important to ensure that safety belts in downsized vehicles will perform adequately. In the case of tension-relieving devices, agency tests of lap/shoulder belt restrained test dummies have shown that as more slack is introduced into a shoulder belt, the injuries measured on the test dummies increased. Thus, as discussed in detail later in this notice, the agency believes it is important to ensure that safety belts with tension-relievers provide adequate protection when they are used in the manner recommended by vehicle manufacturers. This is of particular concern to the agency since the vast majority of new cars (nearly all domestically-produced cars) now are equipped with such devices. For those reasons, the agency is adopting the dynamic test requirement.

The adoption of this requirement will ensure that each and every passenger car, as compared to the vehicle population in general, offers a consistent, minumum level of protection to front seat occupants. By requiring dynamic testing, the standard will assure that the vehicle's structure, safety belts, steering column, etc., perform as a unit to protect occupants, as it is only in such a test that the synergistic and combination effects of these vehicle component can be measured. As discussed in detail in the Final Regulatory Evaluation (FRE), vehicle safety improvements will result from dynamic testing; and, as discussed later in this notice, such improvements can often be made quickly and at low cost.

The agency recognizes that manufacturers may have to conduct more testing than they currently do. However, the dynamic testing of manual belts in passenger cars, as with testing of automatic restraints, can be combined with other compliance tests to reduce the overall number of tests. The agency notes that in its NCAP tests, it has been able to combine the dynamic testing of belts with measuring the vehicle's compliance with other standards. The agency has followed the same practice in its compliance tests. For example, the agency has done compliance testing for Standard Nos. 208, 212, 219, and 301 in one test. The agency would, of course, recognize a manufacturer's use of combined tests as a valid testing procedure to certify compliance with these standards.

Effective Date

Two commenters argued that the requirement should become effective as soon as practical. As discussed in the April 1985 notice, the agency proposed an effective date of September 1, 1989, because it did not want to divert industry resources away from designing automatic restraints for passenger cars. The agency continues to believe it would be inappropriate to divert those resources for the purposes of requiring improvements on manual belt systems that might not be permitted in passenger cars.

Other commenters asked for a delay in the effective date–one asked for a delay until September 1, 1991, while another asked that the effective date be set 2-3 years after the determination of whether a sufficient number of States have passed effective mandatory safety belt use laws. NHTSA does not agree there is a need to delay the effective date beyond September 1, 1989 for passenger cars. Commenters argued that the time span between any decision on rescission of the automatic restraint requirements (as late as April 1, 1989) and the effective date of the dynamic testing of manual belts (September 1, 1985) is too short to certify manual belts.

The agency believes there is sufficient leadtime for passenger cars. Most of the vehicle components in passenger cars necessary for injury reduction management are the same for automatic restraint vehicles and dynamically tested manual belt vehicles. Additionally, as indicated and discussed in the April notice, approximately 40 percent of the passenger cars tested in the agency's 35 mph (NCAP) program meet the injury criteria specified in Standard No. 208, even though a 35 mph crash involves 36 percent more energy than the 30 mph crash test required by Standard No. 208. In addition, the FRE shows that with relatively minor vehicle and/or restraint system changes some safety belt systems can be dramatically improved. This is further evidence that development of dynamically tested manual belts for passenger cars in 30 mph tests should not be a major engineering program. Thus, a delay in the effective date for passenger cars is not needed.

Webbing tension-relieving devices

With one exception, those manufacturers who commented on the proposal concerning tension-relieving devices supported testing safety belts adjusted so that they have the amount of slack recommended by the manufacturer in the vehicle owner's manual. However, one manufacturer and two other commenters objected to the provision related to dynamic testing with the tension-relieving device adjusted to the manufacturer's maximum recommended slack position. The manufacturer objected to a dynamic test that would require any slack at all to be introduced into the belt system, on the grounds that uncontrolled variability would be introduced into the dynamic test procedure, which would then lack objectivity. The manufacturer asserted that it might have to eliminate all tension-relieving devices for its safety belts.

The agency's proposed test procedure was intended to accommodate tension-relieving devices since they can increase the comfort of belts. At the same time, the proposal would limit the potential reduction in effectiveness for safety belt systems with excessive slack. The agency does not agree that this test procedure need result in the elimination of tension-relieving devices from the marketplace. As mentioned earlier, other manufacturers supported the proposal and did not indicate they would have to remove tension-relieving devices from their belt systems. The commenter opposing the requirement did not show that injury levels cannot be controlled within the specified injury criteria by testing with the recommended amount of slack, as determined by the manufacturer. The recommended slack could be very small or at any level selected by the manufacturer as appropriate to relieve belt pressure and still ensure that the injury reduction criteria of Standard No. 208 would be met. As a practical matter, most tension-relievers automatically introduce some slack into the belt for all occupants. Testing without such slack would be unrealistic.

The two other commenters objected to the proposal that manual belt systems using tension-relieving devices meet the injury criteria with only the specified amount of slack recommended in the owner's manual. They stated that most owners would not read the instructions in the owner's manual regarding the proper use of the tension-relieving device. They said an occupant could have a false sense of adequate restraint when wearing a belt system adjusted beyond the recommended limit.

The agency's views on allowing the use of tension relievers in safety belts were detailed in the April 1985 notice. The agency specifically noted the effectiveness of a safety belt system could be compromised if excessive slack were introduced into the belt. However, the agency recognizes that a belt system must be used to be effective at all. Allowing manufacturers to install tension-relieving devices makes it possible for an occupant to introduce a small amount of slack to relieve shoulder belt pressure or to divert the belt away from the neck. As a result, safety belt use is promoted. This factor should outweigh any loss in effectiveness due to the introduction of a recommended amount of slack in normal use. This is particularly likely in light of the requirement that the belt system, so adjusted, must meet the injury criteria of Standard No. 208 under 30 mph test conditions. Further, the inadvertent introduction of slack into a belt system, which is beyond that for normal use, is unlikely in most current systems. In addition, even if too much slack is introduced, the occupant should notice that excessive slack is present and a correction is needed, regardless of whether he or she has read the vehicle's owner's manual.

Exemption from Standard Nos. 203 and 204

One commenter suggested that vehicles equipped with dynamically tested manual belts be exempt from Standard Nos. 203, *Impact Protection for the Driver from the Steering Control Systems*, and 204, *Steering Column Rearward Displacement*. The agency does not believe such an exemption would be appropriate because both those standards have been shown to provide substantial protection to belted drivers.

Latching procedure in Standard No. 208

One commenter asked that Standard No. 208 be modified to include a test procedure for latching and adjusting a manual safety belt prior to the belt being dynamically tested. NHTSA agrees that Standard No. 208 should include such a procedure. The final rule incorporates the instructions contained in the NCAP test procedures for adjusting manual belts, as modified to reflect the introduction of the amount of slack recommended by the vehicle manufacturer.

Revisions to Standard No. 209

The notice proposed to exempt dynamically tested belts from the static laboratory strength tests for safety belt assemblies set forth in S4.4 of Standard No. 209. One commenter asked that such belts be exempted from the remaining requirements of Standard No. 209 as well.

NHTSA agrees that an additional exemption from some performance requirements of Standard No. 209 is appropriate. Currently, the webbing of automatic belts is exempt from the elongation and other belt webbing and attachment hardware requirements of Standard No. 209, since those belts have to meet the injury protection criteria of Standard No. 208 during a crash. For dynamically-tested manual belts, NHTSA believes that an exemption from the webbing width, strength and elongation requirements (sections 4.2(a)-(c)) is also appropriate, since these belts will also have to meet the injury protection requirements of Standard No. 208. The agency has made the necessary changes in the rule to adopt that exemption.

The agency does not believe that manual belts should be exempt from the other requirements in Standard No. 209. For example, the requirements on buckle release force should continue to apply, since manual safety belts, unlike automatic belts, must be buckled every time they are used. As with retractors in automatic belts, retractors in dynamically tested manual belts will still have to meet Standard No. 209's performance requirements.

Revisions to Standard No. 210

The notice proposed that dynamically tested manual belts would not have to meet the location requirements set forth in Standard No. 210, *Seat Belt Assembly Anchorages*. One commenter suggested that dynamically tested belts be completely exempt from Standard No. 210; it also recommended that Standard No. 210 be harmonized with Economic Commission for Europe (ECE) Regulation No. 14. Two other commenters suggested using the "out-of-vehicle" dynamic test procedure for manual belts contained in ECE Regulation No. 16, instead of the proposed barrier crash test in Standard No. 208.

The agency does not believe that the "out-of-vehicle" laboratory bench test of ECE Regulation No. 16 should be allowed as a substitute for a dynamic vehicle crash test. The protection provided by safety belts depends on the performance of the safety belts themselves, in conjunction with the structural characteristics and interior design of the vehicle. The best way to measure the performance of the safety belt/vehicle combination is through a vehicle crash test.

The agency has already announced its intention to propose revisions to Standard No. 210 to harmonize it with ECE Regulation No. 14; therefore the commenters' suggestions concerning harmonization and exclusion of dynamically tested safety belts from the other requirements of Standard No. 210 will be considered during that rulemaking. At the present time, the agency is adopting only the proposed exclusion of anchorages for dynamically tested safety belts from the location requirements, which was not opposed by any commenter.

Belt Labelling

One commenter objected to the proposal that dynamically tested belts have a label indicating that they may be installed only at the front outboard seating positions of certain vehicles. The commenter said that it is unlikely that anyone would attempt to install a Type 2 lap shoulder belt in any vehicle other than the model for which it was designed. The agency does not agree. NHTSA believes that care must be taken to distinguish dynamically tested belt systems from other systems, since misapplication of a belt in a vehicle designed for use with a specific dynamically tested belt could pose a risk of injury. If there is a label on the belt itself, a person making the installation will be aware that the belt should be installed only in certain vehicles.

Use of the Head Injury Criterion

The April 1985 notice set forth two proposed alternative methods of using the head injury criterion (HIC) in situations when there is no contact between the test dummy's head and the vehicle's interior during a crash. The first proposed alternative was to retain the current HIC calculation for contact situations. However, in non-contact situations, the agency proposed that a HIC would not be calculated, but instead new neck injury criteria would be calculated. The agency explained that a crucial element necessary for deciding whether to use the HIC calculation or the neck criteria was an objective technique for determining the occurrence and duration of head contact in the crash test. As discussed in detail in the April 1985 notice, there are several methods available for establishing the duration of head contact, but there are questions about their levels of consistency and accuracy.

The second alternative proposed by the agency would have calculated a HIC in both contact and non-contact situations, but it would limit the calculation to a time interval of 36 milliseconds. Along with the requirement that a HIC not exceed 1000, this would limit average head acceleration to 60g's or less.

Almost all of the commenters opposed the use of the first proposed alternative. The commenters uniformly noted that there is no current technique that can accurately identify whether head contact has or has not occurred during a crash test in all situations. However, one commenter urged the agency to adopt the proposed neck criteria, regardless of whether the HIC calculation is modified. There was a sharp division among the commenters on the second proposed alternative. Manufacturers commenting on the issue uniformly supported the use of the second alternative; although many manufacturers argued that the HIC calculation should be limited to a time interval of approximately 15 to 17 milliseconds (ms), which would limit average head accelerations to 80-85 g's. Another manufacturer, who supported the second alternative, urged the agency to measure HIC only during the time interval that the acceleration level in the head exceeds 60 g's. It said that this method would more effectively differentiate results received in contacts with hard surfaces and results obtained from systems, such as airbags, which provide good distribution of the loads experienced during a crash. Other commenters argued that the current HIC calculation should be retained; they said that the proposed alternatives would lower HIC calculations without ensuring that motorists were still receiving adequate head protection.

NHTSA is in the process of reexamining the potential effects of the two alternatives proposed by the agency and of the two additional alternatives suggested by the commenters. Once that review has been completed, the agency will issue a separate notice announcing its decision.

NCAP Test Procedures

The April 1985 notice proposed adopting the test procedures on test dummy positioning and vehicle loading used in the agency's NCAP testing. The commenters generally supported the adoption of the test procedures, although several commenters suggested changes in some of the proposals. In addition, several commenters argued that the new procedures may improve test consistency, but the changes do not affect what they claim is variability in crash test results. As discussed in the April 1985 notice, the agency believes that the test used in Standard No. 208 does produce repeatable results. The proposed changes in the test procedures were meant to correct isolated problems that occurred in some NCAP tests. The following discussion addresses the issues raised by the commenters about the specific test procedure changes.

Vehicle test attitude

The NPRM proposed that when a vehicle is tested, its attitude should be between its "as delivered" condition and its "loaded" condition. (The "as delivered" condition is based on the vehicle attitude measured when it is received at the test site, with 100 percent of all its fluid capacities and with all its tires inflated to the manufacturer's specifications. For passenger cars, the "loaded" condition is based on the vehicle's attitude with a test dummy in each front outboard designated seating position, plus carrying the cargo load specified by the manufacturer).

One commenter said that the weight distribution, and therefore the attitude, of the vehicle is governed more by the Gross Axle Weight Rating (defined in 49 CFR Part 571.3) than the loading conditions identified by the agency. The commenter recommended that the proposal not be adopted. Another commenter said that the agency should adopt more specific procedures for the positioning of the dummy and the cargo weight. For example, that commenter recommended that the "cargo weight shall be placed in such manner that its center of gravity will be coincident with the longitudinal center of the trunk, measured on the vehicle's longitudinal centerline." The commenter said that unless a more specific procedure is adopted, a vehicle's attitude in the fully loaded condition would not be constant.

The agency believes that a vehicle attitude specification should be adopted. The purpose of the requirement is to ensure that a vehicle's attitude during a crash test is not significantly different than the fully loaded attitude of the vehicle as designed by the manufacturer. Random placement of any necessary ballast could have an effect on the test attitude of the vehicle. If these variables are not controlled, then the vehicle's test attitude could be affected and potential test variability increased.

NHTSA does not agree that the use of the Gross Axle Weight Rating (GAWR) is sufficient to determine the attitude of a vehicle. The use of GAWR only defines the maximum load-carrying capacity of each axle rather than in effect specifying a minimum and maximum loading as proposed by the agency. In addition, use of the GAWR may, under certain conditions, make it necessary to place additional cargo in the passenger compartment in order to achieve the GAWR loading. This condition is not desirable for crash testing, since the passenger compartment should be used for dummy placement and instrumentation and not ballast cargo. Thus the commenter's recommendation is not accepted.

The other commenter's recommendations regarding more specific test dummy placement procedures for the outboard seating positions were already accommodated in the NPRM by the proposed new S10.1.1, *Driver position placement*, and S10.1.2, *Passenger position placement*. Since those proposals adequately describe dummy placement in these positions, they are adopted.

NHTSA has evaluated the commenter's other suggestion for placing cargo weight with its center of gravity coincident with the longitudinal center of the trunk. The agency does not believe that it is necessary to determine the center of gravity of the cargo mass, which would add unnecessary complexity to the test procedure, but does agree that the cargo load should be placed so that it is over the longitudinal center of the trunk. The test procedures have been amended accordingly.

Open window

One commenter raised a question about the requirement in S8.1.5 of Standard No. 208 that the vehicle's windows are to be closed during the crash test. It said adjustment of the dummy arm and the automatic safety belt can be performed only after an automatic belt is fully in place, which occurs only after the door is closed. Therefore, the window needs to be open to allow proper arm and belt placement after the door is closed.

NHTSA agrees that the need to adjust the slack in automatic and dynamically-tested manual belts prior to the crash test may require that the window remain open. The agency has modified the test procedure to allow manufacturers the option of having the window open during the crash test.

Seat back position

One commenter recommended that proposed S8.1.3, *Adjustable seat back placement*, be modified. The notice proposed that adjustable seat backs should be set in their design riding position as measured by such things as specific latch or seat track detent positions. The commenter suggested two options. The first option would be to allow vehicle manufacturers to specify any means they want to determine the seat back angle and the resulting dummy torso angle. As its second option, the commenter recommended that if the agency decides to adopt the proposal, it should determine the "torso angle with a H-point machine according to SAE J826." The commenter said that depending on how the torso angle is established, different dummy torso angles could result in substantial adjustment deviations that can affect seat back placement.

The purpose of the requirement is to position the seat at the design riding position used by the manufacturer. The agency agrees with the commenter that manufacturers should have the flexibility to use any method they want to specify the seat back angle. Thus, the agency has made the necessary changes to the test procedure.

Dummy placement

One commenter made several general comments about dummy placement. It agreed that positioning is very important and can have an influence on the outcome of crash tests. It argued that both the old and the proposed procedures are complicated and impractical to use. The commenter claims this sitution will become more complicated if the Hybrid III is permitted, since the positioning must be carried out within a narrow temperature range (3°F) for the test dummy to remain in calibration.

The commenter also believes that the positioning of the dummy should relate to vehicle type. It said that the posture and seating position of a vehicle occupant will not be the same in a van as in a sports car. For example, it said it has tried the proposed positioning procedures and found that they can result in an "unnatural" position for the dummy in a sports vehicle. The commenter argued that this "unnatural" position would then lead to a knee bolster design which would perform well in a crash test, but would likely not provide the same protection to a real occupant because of difference in positioning. The commenter recommended that the old positioning procedure be retained and the new procedure be provided as an option for those manufacturers whose vehicles cannot be adequately tested otherwise.

Because consistency in positioning the dummy is required prior to test, NHTSA believes that a single set of procedures should apply. As discussed in the April 1985 notice, the agency proposed the new procedures because of positioning problems identified in the NCAP testing. Allowing the use of the old positioning procedures could lead to sources of variability, thus negating a major objective of the procedures. The commenter's suggestion is therefore not adopted. The agency also notes that during its NCAP testing, which has involved tests of a wide variety of cars (including sports cars), trucks and MPV's, NHTSA has not experienced the "unnatural" seating position problem cited by the commenter.

Knee pivot bolt head clearance

Two commenters said that the proposal did not specify the correct distance between the dummy's knees, as measured by the clearance between the knee pivot bolt heads. The commenters are correct that the distance should be 11¾ inches rather than the proposed value of 14½ inches. The agency has corrected the number in the final rule.

Foot rest

One commenter believes that a driver of cars equipped with foot rests typically will place his or her left foot on the foot rest during most driving and therefore this position should be used to simulate normal usage. The commenter said that using the foot rest will minimize variations in the positioning of the left leg, thus improving the repeatability of the test. In a discussion with the commenter, the agency has learned that the type of foot rest the commenter is referring to is a pedal-like structure where the driver can place his or her foot.

For vehicles without foot rests, the commenter recommended the agency use the same provisions for positioning the left leg of the driver as are used for the right leg of the passenger. It noted that positioning the driver's left leg, as with the passenger's right leg, can be hampered by wheelwell housing that projects into the passenger compartment and thus similar procedures for each of those legs should be used.

NHTSA agrees that in vehicles with foot rests, the test dummy's left food should be positioned on the foot rest as long as placing the foot there will not elevate the test dummy's left leg. As discussed below, the agency is concerned that foot rests, such as pads on the wheelwell, that elevate the test dummy's leg can contribute to test variability. The agency also agrees that the positioning procedures for the driver's left leg and the passenger's right leg should be similar in situations where the wheelwell housing projects into the passenger compartment and has made the necessary changes to the test procedure.

Wheelwell

One commenter believes that the wheelwell should be used to rest the dummy's foot. It said that positioning the test dummy's foot there is particularly appropriate if the wheelwell has a design feature, such as a rubber pad, installed by the manufacturer for this purpose.

NHTSA disagrees that the dummy's foot should be rested on the wheelwell housing. The agency is concerned that elevating the test dummy's leg could lead to test variability by, among other things, making the test dummy unstable during a crash test. Although the wheelwell problem is similar to the foot rest problem, placement of the test dummy's foot on a separate, pedal-like foot rest can be accomplished while retaining the heel of the test dummy in a stable position on the floor. That is not the case with pads located on the wheelwell.

Another commenter also said that the proposed procedure for positioning the test dummy's legs in vehicles where the wheelwell projected into the passenger compartment was unclear as to how the centerlines of the upper and lower legs should be adjusted so that both remain in a vertical longitudinal plane. In particular, it was concerned that in a vehicle with a large wheelhousing, it may not be possible to keep the left foot of the driver test dummy in the vertical longitudinal plane after the right foot has been positioned. It believes that the procedure should specify which foot position should be given priority; it recommended that the position of the right leg be required to remain in the plane, while bringing the left leg as close to the vertical longitudinal plane as possible. The agency agrees that maintaining the inboard leg of the test dummy in the vertical plane is more easily accomplished since it will not be blocked by the wheelwell. The agency has modified the test procedure to specify that when it is not possible to maintain both legs in the vertical longitidinal plane, that the inboard leg must be kept as close as possible to the vertical longitudinal plane and the outboard leg should be placed as close as possible to the vertical plane.

Lower leg angle

One commenter argued that proposed sections on lower leg positioning (S10.1.2.1 (b) and S10.1.2.2 (b)) will not result in a constant positioning of the test dummy's heels on the floor pan, thus causing differences in the lower leg angles. It stated that the lower leg angles will affect the femur load generated at the moment the foot hits the toe board during a collision. The commenter therefore proposed that the test procedure be revised to include placing a 20 pound load on the test dummy's knee during the foot positioning procedure. The commenter did not, however, explain the basis for choosing a force of 20 pounds.

NHTSA believes that use of the additional weight loading and settling procedure proposed by the commenter will add an unnecessary level of complexity to the test procedure without adding any corresponding benefit. The positioning of the test dummy's heel has not been a problem in the agency's NCAP tests. Accordingly, the agency is not adopting the commenter's recommendation.

Shoulder adjustment

One commenter asked the agency to specify that the shoulders of the test dummy be placed at their lowest adjustment position. While the shoulders are slightly adjustable, the agency believes that specifying an adjustment position is unnecessary. The agency's test experience has shown that the up and down movement of the shoulders is physically limited by the test dummy's rubber "skin" around the openings where the arms are connected to the test dummy's upper torso.

Dummy lifting procedure

One commenter was concerned about the dummy lifting proposed in (Section S10.4.1, Dummy Vertical Upward Displacement). It said that if the dummy lifting method is not standardized, test results could be affected by allowing variability in the position of the dummy's H point (the H point essentially represents the hip joint) through use of different lifting methods. It recommended use of a different chest lifting method to avoid variability in the subsequent positioning of the test dummy H-point.

The agency is not aware of any test data indicating that the use of different lifting methods is a significant source of variability. As long as a manufacturer follows the procedures set forth in S10.4.1 in positioning the test dummy, it can use any lifting procedure it wants.

Dummy settling load

One commenter was concerned about the proposed requirements for dummy settling (S10.4.2, *Lower torso force application*, and S10.4.5, *Upper torso force application*). The commenter believes that the proposals are inadequate because they do not prescribe the area over which to apply the load used to settle the test dummy in the seat. The commenter said that if the proposed 50 pound settling force is applied to an extremely small contact area, then the dummy may be deformed. It recommended that the load be applied to a specified area of 9 square inches on the dummy. In addition, it recommended that the agency specify the duration of the 50 lb. force application during the adjustment of the upper torso; it suggested a period of load application ranging from 5 to 10 seconds.

NHTSA and others have successfully used the proposed settling test procedures in their own tests without having any variability problems. Unless abnormally small contact areas are employed, or extremely short durations are used, standard laboratory practices should not result in any such problems. The agency believes that further specifying the area and timing of the force application is not necessary.

Dummy head adjustment

One commenter pointed out that it is impossible to adjust the head according to S10.6, Head Adjustment, because the Part 572 test dummy does not have a head adjustment mechanism. The agency agrees and has deleted the provision.

Additional dummy settling and shoulder belt positioning procedures

One commenter suggested a substantial revised dummy settling procedure and new procedures for positioning of the shoulder belt. NHTSA believes that its proposed procedures sufficiently address the settling and belt position issues. In addition, the commenter did not provide any data to show that variability would be further reduced by its suggested procedures. A substantial amount of testing would be needed to verify if the commenter's suggested test procedures do, in fact, provide any further decrease in variability than that obtained by the agency's test procedures. For those reasons, the agency is not adopting the commenter's suggestions for new procedures.

Due Care

In the April 1985 notice, the agency proposed amending the standard to state that the due care provision of section 108(b)(2) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1397(b)(2)) applies to compliance with the standard. Thus, a vehicle would not be deemed in noncompliance if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the standard.

Commenters raised a number of questions about the proposal, with some saying that the agency needed to clarify what constitutes "due care," others recommending that the agency reconsider the use of "design to conform" language instead of due care and another opposing the use of any due care provision.

A number of commenters, while supporting the use of a due care provision, said that the proposal provides no assurance that a manufacturer's good faith effort will be considered due care. They said that the agency should identify the level of testing and analysis necessary to constitute due care. Another commenter emphasized that in defining due care, the agency must ensure that a manufacturer uses recognized statistical procedures in determining that its products comply with the requirements of the standard.

Another group of commenters requested the agency to reconsider its decision not to use "design to conform" language in the standard; they said that the agency's concerns about the subjectivity of a "design to conform" language are not greater and could well be less than that resulting from use of due care language.

One commenter opposed the use of any due care language in the standard. It argued that the National Traffic and Motor Vehicle Safety Act requires the agency to set objective performance requirements in its standards. When a manufacturer determines that it has not met those performance requirements, then the manufacturer is under an obligation to notify owners and remedy the noncomplying vehicles. It argued that the proposed due care provision, in effect, provides manufacturers with an exemption from the Vehicle Safety Act recall provisions.

As discussed in the July 1984 final rule and the April 1985 notice, the agency believes that the test procedure of Standard No. 208 produces repeatable results in vehicle crash tests. The agency does, however, recognize that the Standard No. 208 test is more complicated than NHTSA's other crash test standards since a number of different injury measurements must be made on the two test dummies used in the testing. Because of this complexity, the agency believes that manufacturers need assurance from the agency that, if they have made a good faith effort in designing their vehicles and have instituted adequate quality control measures, they will not face the recall of their vehicles because of an isolated apparent failure to meet one of the injury criteria. The adoption of a due care provision provides that assurance. For the reasons discussed in the July 1984 final rules, the agency still believes use of a due care provision is a better approach to this issue than use of a design to conform provision.

As the agency has emphasized in its prior interpretation letters, a determination of what constitutes due care can only be made on a case-by-case basis. Whether a manufacturer's action will constitute due care will depend, in part, upon the availability of test equipment, the limitations of available technology, and above all, the diligence evidenced by the manufacturer.

Adoption of a due care defense is in line with the agency's long-standing and well-known enforcement policy on test differences. Under this long standing practice if the agency's testing shows noncompliance and a manufacturer's tests, valid on their face, show complying results, the agency will conduct an inquiry into the reason for the differing results. If the agency concludes that the difference in results can be explained to the agency's satisfaction, that the agency's results do not indicate an unreasonable risk to safety, and that the manufacturer's tests were reasonably conducted and were in conformity with standard, then the agency does not use its own tests as a basis for a finding of noncompliance. Although this interpretation has long been a matter of public record, Congress, in subsequent amendments of the Vehicle Safety Act, has not acted to alter that interpretation. The Supreme Court has said that under those circumstances, it can be presumed that the agency's interpretation has correctly followed the intent of the statute. (*See United States* v. *Rutherford*, 442 U.S. 544, 544 n. 10 (1979))

Phase-In

Attribution rules

With respect to cars manufacturered by two or more companies, and cars manufactured by one company and imported by another, the April 1985 notice proposed to clarify who would be considered the manufacturer for purposes of calculating the average annual production of passenger cars for each manufacturer and the amount of passenger cars manufacturered by each manufacturer that must comply with the automatic restraint phase-in requirements. In order to provide maximum flexibility to manufacturers, while assuring that the percentage phase-in goals are met, the notice proposed to permit manufacturers to determine, by contract, which of them will count, as its own, passenger cars manufactured by two or more companies or cars manufactured by one company and imported by another.

The notice also proposed two rules of attribution in the absence of such a contract. First, a passenger car which is imported for purposes of resale would be attributed to the importer. The agency intended that this proposed attribution rule would apply to both direct importers as well as importers authorized by the vehicle's original manufacturer. (In this context, direct importation refers to the importation of cars which are originally manufactured for sale outside the U.S. and which are then imported without the manufacturer's authorization into the U.S. by an importer for purposes of resale. The Vehicle Safety Act requires that such vehicles be brought into conformity with Federal motor vehicle safety standards.) Under the second proposed attribution rule, a passenger car manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, would be attributed to the manufacturer which markets the vehicle.

These two proposed rules would generally attribute a vehicle to the manufacturer which is most responsible for the existence of the vehicle in the United States, i.e., by importing the vehicle or by manufacturing the vehicle for its own account as part of a joint venture, and marketing the vehicle. (Importers generally market the vehicles they import.) All commenters on these proposals supported giving manufacturers the flexibility to determine contractually which manufacturer would count the passenger car as its own. The commenters also supported the proposed attribution rules. Therefore, the agency is adopting the provisions as proposed.

Credit for early phase-In

The April 1985 notice proposed that manufacturers that exceeded the minimum percentage phase-in requirements in the first or second years could count those extra vehicles toward meeting the requirements in the second or third years. In addition, manufacturers could also count any automatic restraint vehicles produced during the one year preceding the first year of the phase-in. Since all the commenters addressing these proposals supported them, the agency is adopting them as proposed. The agency believes that providing credit for early introduction will encourage introduction of larger numbers of automatic restraints and provide increased flexibility for manufacturers. In addition, it will assure an orderly build-up of production capability for automatic restraint equipped cars as contemplated by the July 1984 final rule.

One commenter asked the agency to establish a new credit for vehicles equipped with non-belt automatic restraints at the driver's position and a dynamically-tested manual belt at the passenger position. The commenter requested that such a vehicle receive a 1.0 credit. The commenter also asked the agency to allow vehicles equipped with driver-only automatic restraint systems to be manufactured after September 1, 1989, the effective date for automatic restraints for the driver and front right passenger seating positions in all passenger cars. In its August 30, 1985 notice (50 FR 35233) responding to petitions for reconsideration of the July 1984 final rule on Standard No. 208, the agency has already adopted a part of the commenter's suggestion by establishing a 1.0 vehicle credit for vehicles equipped with a non-belt automatic restraint at the driver's position and a manual lap/shoulder belt at the passenger's position. For reasons detailed in the July 1984 final rule, the agency believes that the automatic restraint requirement should apply to both front outboard seating positions beginning on September 1, 1989, and is therefore not adopting the commenter's second suggestion.

Phase-In Reporting Requirements

The April 1985 notice proposed to establish a new Part 585, *Automatic Restraint Phase-in Reporting Requirements.* The agency proposed requiring manufacturers to submit three reports to NHTSA, one for each of the three automatic restraint phase-in periods. Each report, covering production during a 12-month period beginning September 1 and ending August 31, would be required to be submitted within 60 days after the end of such period. Information required by each report would include a statement regarding the extent to which the manufacturer had complied with the applicable percentage phase-in requirement of Standard No. 208 for the period covered by the report; the number of passenger cars manufactured for sale in the United States for each of the three previous 12-month production periods; the actual number of passenger cars manufactured during the reporting production (or during a previous production period and counted toward compliance in the reporting production period) period with automatic safety belts, air bags and other specified forms of automatic restraint technology, respectively; and brief information about any express written contracts which concern passenger cars produced by more than one manufacturer and affect the report.

One commenter questioned the need for a reporting requirement, saying that the requirement was unnecessary since manufacturers must self-certify that their vehicles meet Standard No. 208. The agency believes that a reporting requirement is needed for the limited period of the phase-in of automatic restraints so that the agency can carry out its statutory duty to monitor compliance with the Federal motor vehicle safety standards. During the phase-in, only a certain percentage of vehicles are required to have automatic restraints. It would be virtually impossible for the agency to determine if the applicable percentage of passenger cars has been equipped with automatic restraints unless manufacturers provide certain production information to the agency. NHTSA is therefore adopting the reporting requirement.

The same commenter said that requiring the report to be due 60 days after the end of the production year can be a problem for importers. The commenter said that production records may accompany the vehicle, which may not actually reach the United States until 30 or 45 days after the production year ends. The commenter asked the agency to provide an appeal process to seek an extension of the period to file the report. The agency believes that the example presented by the commenter represents a worst case situation and complying with the 60 day requirement should not be a problem for manufacturers, including importers. However, to eliminate any problems in worst case situations, the agency is amending the regulation to provide that manufacturers seeking an extension of the deadline to file a report must file a request for an extension at least 15 days before the report is due.

Calculation of average annual production

The agency also proposed an alternative to the requirement that the number of cars that must be equipped with automatic restraints must be based on a percentage of each manufacturer's average annual production for the past three model years. The proposed alternative would permit manufacturers to equip the required percentage of its actual production of passenger cars with automatic restraints during each affected year. Since all commenters addressing this proposal supported it, the agency is adopting it as an alternative means of compliance, at the manufacturer's option. In the case of a new manufacturer, the manufacturer would have to calculate the amount of passenger cars required to have automatic restraints based on its production of passenger cars during each of the affected years. Since the agency has decided to adopt the alternative basis for determining the production quota, it has made the necessary conforming changes in the reporting requirements adopted in this notice.

One commenter also requested the agency to clarify whether a manufacturer does have to include its production volume of convertibles when it is calculating the percentage of vehicles that must meet the phase-in requirement. The automatic restraint requirement applies to all passenger cars. Thus, a manufacturer's production figures for passenger car convertibles must be counted when the manufacturer is calculating its phase-in requirements.

Retention of VINs

In order to keep administrative burdens to a minimum, the agency proposed that the required report need not use the VIN to identify the particular type of automatic restraint installed in each passenger car produced during the phase-in period. Since that information could be necessary for purposes of enforcement, however, the agency proposed to require that manufacturers maintain records until December 31, 1991, of the VIN and type of automatic restraint for each passenger car which is produced during the phase-in period and is reported as having automatic restraints. Although direct import cars are not required to have a US-format VIN number, those cars would still have a European-format VIN number and thus direct importers would be required to retain that VIN information. (The agency is considering a petition from Volkswagen requesting that direct import cars be required to have US-format VINs.)

The reason for retaining the information until 1991 is to ensure that such information would then be available until the completion of any agency enforcement action begun after the final phase-in report is filed in 1990. The agency believes this requirement meets the needs of the agency, with minimal impacts on manufacturers, and therefore is adopting it as proposed. One commenter asked whether a manufacturer is required to keep the VIN information as a separate file or whether keeping the information as a part of its general business records is sufficient. As long as the VIN information is retrievable, it may be stored in any manner that is convenient for a manufacturer.

In consideration of the foregoing, 49 CFR Part 571.208 is amended as follows:

The authority citation for Part 571 would continue to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

1. Section S4.1.3.1.2 is revised to read as follows:

S4.1.3.1.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars, specified in S4.1.3.1.1 complying with the requirements of S4.1.2.1 shall be not less than 10 percent of:

(a) the average annual production of passenger cars manufactured on or after September 1, 1983, and before September 1, 1986, by each manufacturer, or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.1.1.

2. Section 4.1.3.2.2 is revised to read as follows:

S4.1.3.2.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars specified in S4.1.3.2.1 complying with the requirements of S4.1.2.1 shall be not less than 25 percent of:

(a) the average annual production of passenger cars manufactured on or after September 1, 1984, and before September 1, 1987, by each manufacturer, or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.2.1.

3. Section 4.1.3.3.2 is revised to read as follows:

S4.1.3.3.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars specified in S4.1.3.3.1 complying with the requirements of S4.1.2.1 shall not be less than 40 percent of:

(a) the average annual production of passenger cars manufactured on or after September 1, 1985, and before September 1, 1988, by each manufacturer or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.3.1.

4. Section S4.1.3.4 is revised to read as follows:

S4.1.3.4 *Calculation of complying passenger cars.*

(a) For the purposes of calculating the numbers of cars manufactured under S4.1.3.1.2, S4.1.3.2.2, or S4.1.3.3.2 to comply with S4.1.2.1:

(1) each car whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose front right seating position will comply with the requirements of S4.1.2.1(a) by any means is counted as 1.5 vehicles, and

(2) each car whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front seat seating position is equipped with a manual Type 2 seat belt is counted as one vehicle.

(b) For the purposes of complying with S4.1.3.1.2, a passenger car may be counted if it:

(1) is manufactured on or after September 1, 1985, but before September 1, 1986, and

(2) complies with S4.1.2.1.

(c) For the purposes of complying with S4.1.3.2.2, a passenger car may be counted if it:

(1) is manufactured on or after September 1, 1985, but before September 1, 1987,

(2) complies with S4.1.2.1, and

(3) is not counted toward compliance with S4.1.3.1.2

(d) For the purposes of complying with S4.1.3.3.2, a passenger car may be counted if it:

(1) is manufactured on or after September 1, 1985, but before September 1, 1988,

(2) complies with S4.1.2.1, and

(3) is not counted toward compliance with S4.1.3.1.2 or S4.1.3.2.2.

5. A new section S4.1.3.5 is added to read as follows:

S4.1.3.5 *Passenger cars produced by more than one manufacturer.*

S4.1.3.5.1 For the purposes of calculating average annual production of passenger cars for each manufacturer and the amount of passenger cars manufactured by each manufacturer under S4.1.3.1.2, S4.1.3.2.2 or S4.1.3.3.2, a passenger car produced by more than one manufacturer shall be attributed to a single manufacturer as follows, subject to S4.1.3.5.2:

(a) A passenger car which is imported shall be attributed to the importer.

(b) A passenger car manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, shall be attributed to the manufacturer which markets the vehicle.

S4.1.3.5.2 A passenger car produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified by an express written contract, reported to the National Highway Traffic Safety Administration under 49 CFR Part 585, between the manufacturer so specified and the manufacturer to which the vehicle would otherwise be attributed under S4.1.3.5.1.

6. A new section S4.6 is added to read as follows:

S4.6 *Dynamic testing of manual belt systems.*

S4.6.1 If the automatic restraint requirement of S4.1.4 is rescinded pursuant to S4.1.5, then each passenger car that is manufactured after September 1, 1989, and is equipped with a Type 2 manual seat belt assembly at each front outboard designated seating position pursuant to S4.1.2.3 shall meet the frontal crash protection requirements of S5.1 at those designated seating positions with a test dummy restrained by a Type 2 seat belt assembly that has been adjusted in accordance with S7.4.2.

S4.6.2 A Type 2 seat belt assembly subject to the requirements of S4.6.1 of this standard does not have to meet the requirements of S4.2(a)-(c) and S4.4 of Standard No. 209 (49 CFR 571.209) of this Part.

7. S7.4.2 is revised to read as follows:

S7.4.2 *Webbing tension relieving device.* Each vehicle with an automatic seat belt assembly or with a Type 2 manual seat belt assembly that must meet S4.6 installed in a front outboard designated seating position that has either manual or automatic devices permitting the introduction of slack in the webbing of the shoulder belt (e.g., "comfort clips" or "window-shade" devices) shall:

(a) comply with the requirements of S5.1 with the shoulder belt webbing adjusted to introduce the maximum amount of slack recommended by the manufacturer pursuant to S7.4.2.(b);

(b) have a section in the vehicle owner's manual that explains how the tension-relieving device works and specifies the maximum amount of slack (in inches) recommended by the vehicle manufacturer to be introduced into the shoulder belt under normal use conditions. The explanation shall also warn that introducing slack beyond the amount specified by the manufacturer can significantly reduce the effectiveness of the shoulder belt in a crash; and

(c) have an automatic means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device each time the safety belt is unbuckled or the adjacent vehicle door is opened, except that open-body vehicles with no doors can have a manual means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device.

8. Section 8.1.1(c) is revised to read as follows:

S8.1.1(c) *Fuel system capacity.* With the test vehicle on a level surface, pump the fuel from the vehicle's fuel tank and then operate the engine until it stops. Then, add Stoddard solvent to the test vehicle's fuel tank in an amount which is equal to not less than 92 and not more than 94 percent of the fuel tank's usable capacity stated by the vehicle's manufacturer. In addition, add the amount of Stoddard solvent needed to fill the entire fuel system from the fuel tank through the engine's induction system.

9. A new section 8.1.1(d) is added to read as follows:

S8.1.1(d) *Vehicle test attitude.* Determine the distance between a level surface and a standard reference point on the test vehicle's body, directly above each wheel opening, when the vehicle is in its "as delivered" condition. The "as delivered" condition is the vehicle as received at the test site, with 100 percent of all fluid capacities and all tires inflated to the manufacturer's specifications as listed on the vehicle's tire placard. Determine the distance between the same level surface and the same standard reference points in the vehicle's "fully loaded condition". The "fully loaded condition" is the test vehicle loaded in accordance with S8.1.1(a) or (b), as applicable. The load placed in the cargo area shall be centered over the longitudinal centerline of the vehicle. The pretest vehicle attitude shall be equal to either the as delivered or fully loaded attitude or between the as delivered attitude and the fully loaded attitude.

10. S7.4.3 is revised by removing the reference to "S10.6" and replacing it with a reference to "S10.7."

11. S7.4.4 is revised by removing the reference to "S10.5" and replacing it with a reference to "S10.6."

12. S7.4.5 is revised by removing the reference to "S8.1.11" and replacing it with a reference to "S10."

13. Section 8.1.3 is revised to read as follows:

S8.1.3 *Adjustable seat back placement.* Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer. Place each adjustable head restraint in its highest adjustment position.

14. Sections 8.1.11 through 8.1.11.2.3 are removed.

15. Sections 8.1.12 and 8.1.13 are redesignated 8.1.11 and 8.1.12, respectively.

16. Section 10 is revised to read as follows:

S10 *Test dummy positioning procedures.* Position a test dummy, conforming to Subpart B of Part 572 (49 CFR Part 572), in each front outboard seating position of a vehicle as specified in S10.1 through S10.9. Each test dummy is:

(a) not restrained during an impact by any means that require occupant action if the vehicle is equipped with automatic restraints.

(b) restrained by manual Type 2 safety belts, adjusted in accordance with S10.9, if the vehicle is equipped with manual safety belts in the front outboard seating positions.

S10.1 *Vehicle equipped with front bucket seats.* Place the test dummy's torso against the seat back and its upper legs against the seat cushion to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10. Center the test dummy on the seat cushion of the bucket seat and set its midsagittal plane so that it is vertical and parallel to the centerline of the vehicle.

S10.1.1 *Driver position placement.*

(a) Initially set the knees of the test dummy $11\frac{3}{4}$ inches apart, measured between the outer surfaces of the knee pivot bolt heads, with the left outer surface 5.9 inches from the midsagittal plane of the test dummy.

(b) Rest the right foot of the test dummy on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, set it perpendicular to the lower leg and place it as far forward as possible in the direction of the geometric center of the pedal with the rearmost point of the heel resting on the floor pan. Except as prevented by contact with a vehicle surface, place the right leg so that the upper and lower leg centerlines fall, as close as possible, in a vertical longitudinal plane without inducing torso movement.

(c) Place the left foot on the toeboard with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toeboard and the floor pan. If the foot cannot be positioned on the toeboard, set it perpendicular to the lower leg and place it as far forward as possible with the heel resting on the floor pan. Except as prevented by contact with a vehicle surface, place the left leg so that the upper and lower leg centerlines fall, as close as possible, in a vertical plane. For vehicles with a foot rest that does not elevate the left foot above the level of the right foot, place the left foot on the foot rest so that the upper and lower leg centerlines fall in a vertical plane.

S10.1.2 *Passenger position placement.*

S10.1.2.1 *Vehicles with a flat floor pan/toeboard.*

(a) Initially set the knees $11\frac{3}{4}$ inches apart, measured between the outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet on the vehicle's toeboard with the heels resting on the floor pan as close as possible to the intersection point with the toeboard. If the feet cannot be placed flat on the toeboard, set them perpendicular to the lower leg centerlines and place them as far forward as possible with the heels resting on the floor pan.

(c) Place the right and left legs so that the upper and lower leg centerlines fall in vertical longitudinal planes.

S10.1.2.2 *Vehicles with wheelhouse projections in passenger compartment.*

(a) Initially set the knees $11\frac{3}{4}$ inches apart, measured between outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet in the well of the floor pan/toeboard and not on the wheelhouse projection. If the feet cannot be placed flat on the toeboard, set them perpendicular to the lower leg centerlines and as far forward as possible with the heels resting on the floor pan.

(c) If it is not possible to maintain vertical and longitudinal planes through the upper and lower leg centerlines for each leg, then place the left leg so that its upper and lower centerlines fall, as closely as possible, in a vertical longitudinal plane and place the right leg so that its upper and lower leg centerlines fall, as closely as possible, in a vertical plane.

S10.2 *Vehicle equipped with bench seating.* Place a test dummy with its torso against the seat back and its upper legs against the seat cushion, to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10.1.

S10.2.1 *Driver position placement.* Place the test dummy at the left front outboard designated seating position so that its midsagittal plane is vertical and parallel to the centerline of the vehicle and so that the midsagittal plane of the test dummy passes through the center of the steering wheel rim. Place the legs, knees, and feet of the test dummy as specified in S10.1.1.

S10.2.2 *Passenger position placement.* Place the test dummy at the right front outboard designated seating position as specified in S10.1.2, except that the midsagittal plane of the test dummy shall be vertical and longitudinal, and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the test dummy at the driver's position.

S10.3 *Initial test dummy placement.* With the test dummy at its designated seating position as specified by the appropriate requirements of S10.1 or S10.2, place the upper arms against the seat back and tangent to the side of the upper torso. Place the lower arms and palms against the outside of the upper legs.

S10.4 *Test dummy settling.*

S10.4.1 *Test dummy vertical upward displacement.* Slowly lift the test dummy parallel to the seat back plane until the test dummy's buttocks no longer contact the seat cushion or until there is test dummy head contact with the vehicle's headlining.

S10.4.2 *Lower torso force application.* Using a test dummy positioning fixture, apply a rearward force of 50 pounds through the center of the rigid surface against the test dummy's lower torso in a horizontal direction. The line of force application shall be 6½ inches above the bottom surface of the test dummy's buttocks. The 50 pound force shall be maintained with the rigid fixture applying reaction forces to either the floor pan/toeboard, the 'A' post, or the vehicle's seat frame.

S10.4.3 *Test dummy vertical downward displacement.* While maintaining the contact of the horizontal rearward force positioning fixture with the test dummy's lower torso, remove as much of the 50 pound force as necessary to allow the test dummy to return downward to the seat cushion by its own weight.

S10.4.4 *Test dummy upper torso rocking.* Without totally removing the horizontal rearward force being applied to the test dummy's lower torso, apply a horizontal forward force to the test dummy's shoulders sufficient to flex the upper torso forward until its back no longer contacts the seat back. Rock the test dummy from side to side 3 or 4 times so that the test dummy's spine is at any angle from the vertical in the 14 to 16 degree range at the extremes of each rocking movement.

S10.4.5 *Upper torso force application.* With the test dummy's midsagittal plane vertical, push the upper torso against the seat back with a force of 50 pounds applied in a horizontal rearward direction along a line that is coincident with the test dummy's midsagittal plane and 18 inches above the bottom surface of the test dummy's buttocks.

S10.5 *Placement of test dummy arms and hands.* With the test dummy positioned as specified by S10.3 and without inducing torso movement, place the arms, elbows, and hands of the test dummy, as appropriate for each designated seating position in accordance with S10.3.1 or S10.3.2. Following placement of the arms, elbows and hands, remove the force applied against the lower half of the torso.

S10.5.1 *Driver's position.* Move the upper and the lower arms of the test dummy at the driver's position to their fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the palm of each hand contacts the outer part of the rim of the steering wheel at its horizontal centerline. Place the test dummy's thumbs over the steering wheel rim and position the upper and lower arm centerlines as close as possible in a vertical plane without inducing torso movement.

S10.5.2 *Passenger position.* Move the upper and the lower arms of the test dummy at the passenger position to fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the upper arm contacts the seat back and is tangent to the upper part of the side of the torso, the palm contacts the outside of the thigh, and the little finger is barely in contact with the seat cushion.

S10.6 *Test dummy positioning for latchplate access.* The reach envelopes specified in S7.4.4 are obtained by positioning a test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

S10.7 *Test dummy positioning for belt contact force.* To determine compliance with S7.4.3 of this standard, position the test dummy in the vehicle in accordance with the appropriate requirements specified in S10.1 or S10.2 and under the conditions of S8.1.2 and S8.1.3. Pull the belt webbing three inches from the test dummy's chest and release until the webbing is within 1 inch of the test dummy's chest and measure the belt contact force.

S10.9 *Manual belt adjustment for dynamic testing.* With the test dummy at its designated seating position as specified by the appropriate requirements of S8.1.2, S8.1.3 and S10.1 through S10.5, place the Type 2 manual belt around the test dummy and fasten the latch. Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 2 to 4 pound tension load to the lap belt. If the belt system is equipped with a tension-relieving device introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer for normal use in the owner's manual for the vehicle. If the belt system is not equipped with a tension relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor.

17. S11 is removed.

18. S4.1.3.1.1, S4.1.3.2.1, S4.1.3.3.1, S4.1.4 and S4.6.1 are revised by adding a new second sentence to S4.1.3.1.1, S4.1.3.2.1, S4.1.3.3.1 and S4.1.4 and a new second sentence to S4.6.1 to read as follows:

A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

19. S8.1.5 is amended to read as follows:

Movable vehicle windows and vents are, at the manufacturer's option, placed in the fully closed position.

20. S7.4 is amended to read as follows:

S7.4. *Seat belt comfort and convenience.*

(a) *Automatic seat belts.* Automatic seat belts installed in any vehicle, other than walk-in van-type vehicles, which has a gross vehicle weight rating of 10,000 pounds or less, and which is manufactured on or after September 1, 1986, shall meet the requirements of S7.4.1, S7.4.2, and S7.4.3.

(b) *Manual seat belts.*

(1) *Vehicles manufactured after September 1, 1986.* Manual seat belts installed in any vehicle, other than manual Type 2 belt systems installed in the front outboard seating positions in passenger cars or manual belts in walk-in van-type vehicles, which have a gross vehicle weight rating of 10,000 pounds or less, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

(2) *Vehicles manufactured after September 1, 1989.*

(i) If the automatic restraint requirement of S4.1.4 is rescinded pursuant to S4.1.5, then manual seat belts installed in a passenger car shall meet the requirements of S7.1.1.3(a), S7.4.2, S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

(ii) Manual seat belts installed in a bus, multipurpose passenger vehicle and truck with a gross vehicle weight rating of 10,000 pounds or less, except for walk-in van-type vehicles, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

571.209 *Standard No. 209, Seat belt assemblies.*

1. A new S4.6 is added, to read as follows:

S4.6 *Manual belts subject to crash protection requirements of Standard No. 208.*

(a) A seat belt assembly subject to the requirements of S4.6.1 of Standard No. 208 (49 CFR Part 571.208) does not have to meet the requirements of S4.2 (a)-(c) and S4.4 of this standard.

(b) A seat belt assembly that does not comply with the requirements of S4.4 of this standard shall be permanently and legibly marked or labeled with the following language:

This seat belt assembly may only be installed at a front outboard designated seating position of a vehicle with a gross vehicle weight rating of 10,000 pounds or less.

571.210 *Standard No. 210, Seat Belt Assembly Anchorages.*

1. The second sentence of S4.3 is revised to read as follows:

Anchorages for automatic and for dynamically tested seat belt assemblies that meet the frontal crash protection requirement of S5.1 of Standard No. 208 (49 CFR Part 571.208) are exempt from the location requirements of this section.

PART 585–AUTOMATIC RESTRAINT PHASE-IN REPORTING REQUIREMENTS

1. Chapter V, Title 49, Transportation, the Code of Federal Regulations, is amended to add the following new Part:

PART 585–AUTOMATIC RESTRAINT PHASE-IN REPORTING REQUIREMENTS

Secs.

Authority: 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.50.

585.1 *Scope.*

This section establishes requirements for passenger car manufacturers to submit a report, and maintain records related to the report, concerning the number of passenger cars equipped with automatic restraints in compliance with the requirements of S4.1.3 of Standard No. 208, *Occupant Crash Protection* (49 CFR Part 571.208).

585.2 *Purpose.*

The purpose of the reporting requirements is to aid the National Highway Traffic Safety Administration in determining whether a passenger car manufacturer has complied with the requirements of Standard No. 208 of this Chapter (49 CFR 571.208) for the installation of automatic restraints in a percentage of each manufacturer's annual passenger car production.

585.3 *Applicability.*

This part applies to manufacturers of passenger cars.

585.4 *Definitions.*

All terms defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used in their statutory meaning.

"Passenger car" is used as defined in 49 CFR Part 571.3.

"Production year" means the 12-month period between September 1 of one year and August 31 of the following year, inclusive.

585.5 *Reporting requirements.*

(a) *General reporting requirements.*

Within 60 days after the end of each of the production years ending August 31, 1987, August 31, 1988, and August 31, 1989, each manufacturer shall submit a report to the National Highway Traffic Safety Administration concerning its compliance with the requirements of Standard No. 208 for installation of automatic restraints in its passenger cars produced in that year. Each report shall–

(1) Identify the manufacturer;

(2) State the full name, title and address of the official responsible for preparing the report;

(3) Identify the production year being reported on;

(4) Contain a statement regarding the extent to which the manufacturer has complied with the requirements of S4.1.3 of Standard No. 208;

(5) Provide the information specified in 585.5(b);

(6) Be written in the English language; and

(7) Be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

(b) *Report content.*

(1) *Basis for phase-in production goals.*

Each manufacturer shall provide the number of passenger cars manufactured for sale in the United States for each of the three previous production years, or, at the manufacturer's option, for the current production year. A new manufacturer that is, for the first time, manufacturing passenger cars for sale in the United States must report the number of passenger cars manufactured during the current production year.

(2) *Production.*

Each manufacturer shall report for the production year being reported on, and each preceding production year, to the extent that cars produced during the preceding years are treated under Standard No. 208 as having been produced during the production year being reported on, the following information:

(i) the number of passenger cars equipped with automatic seat belts and the seating positions at which they are installed,

(ii) the number of passenger cars equipped with air bags and the seating positions at which they are installed, and

(iii) the number of passenger cars equipped with other forms of automatic restraint technology, which shall be described, and the seating positions at which they are installed.

(3) *Passenger cars produced by more than one manufacturer.*

Each manufacturer whose reporting of information is affected by one or more of the express written contracts permitted by section S4.1.3.5.2 of Standard No. 208 shall:

(i) Report the existence of each contract, including the names of all parties to the contract, and explain how the contract affects the report being submitted,

(ii) Report the actual number of passenger cars covered by each contract.

585.6 *Records.*

Each manufacturer shall maintain records of the Vehicle Identification Number and type of automatic restraint for each passenger car for which information is reported under 585.5(b)(2), until December 31, 1991.

585.7 *Petition to extend period to file report.*

A petition for extension of the time to submit a report must be received not later than 15 days before expiration of the time stated in 585.5(a). The petition must be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington, DC 20590. The filing of a petition does not automatically extend the time for filing a report. A petition will be granted only if the petitioner shows good cause for the extension and if the extension is consistent with the public interest.

Issued on March 18, 1986

Diane K. Steed
Administrator

51 F.R. 9801
March 21, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Protection-Improvement of Seat Belt Assemblies

(Docket 74-14; Notice 44)

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: In November 1985, NHTSA published a final rule setting comfort and convenience performance requirements for both manual and automatic safety belt assemblies installed in motor vehicles with a gross vehicle weight rating of 10,000 pounds or less. This notice responds to two petitions for reconsideration and corrects certain technical and typographical errors in that final rule.

EFFECTIVE DATE: The amendments made by this notice to the text of Standard No. 208 will take effect on June 17, 1986. Manufacturers do not have to comply with the comfort and convenience requirements of S7.4 until September 1, 1986.

SUPPLEMENTARY INFORMATION: The agency published a final rule on November 6, 1985 (50 FR 46056), which modified the comfort and convenience performance requirements in Standard No. 208, *Occupant Crash Protection*. Petitions for reconsideration of that final rule were received from Ford Motor Company (Ford) and General Motors Corporation (GM).

Webbing Tension-Relieving Devices

Both Ford and GM requested modification of the requirement in S7.4.2 of the final rule that any belt slack that can be introduced into an automatic safety belt system by means of any tension-relieving device or design "shall be cancelled each time the safety belt is unbuckled or the adjacent vehicle door is opened except for belt systems in open-body vehicles with no doors." Both petitioners said that the language in the rule could be interpreted as requiring belt slack to be cancelled each time a safety belt is unbuckled, whether or not the adjacent door is open. The petitioners also stated that the language in the amendment did not reflect the agency's intent as expressed in the preamble to the final rule. They urged the agency to amend the requirement so that belt slack in an automatic belt system must be cancelled only when the adjacent vehicle door is opened.

The agency's intent, as expressed in the preamble (50 FR at 46059), was that belt slack in automatic belt systems must be cancelled each time that the adjacent vehicle door is opened, whether or not the belt is buckled. Anticipating the adoption of a dynamic test requirement for manual belts, the language of the final rule was also intended to give manufacturers increased design flexibility by providing them the option of linking cancellation of tension-relievers in dynamically-tested manual belt systems to, at their choice, either opening of the door or releasing of the belt. Therefore NHTSA is amending the requirement to clarify that for automatic belts, cancellation of the tension-reliever is linked to opening the adjacent vehicle door and for dynamically-tested manual safety belts, a manufacturer has the option of using either opening the door or releasing the belt as the event leading to cancellation of the tension-reliever.

Torso Belt Body Contact Force

In the final rule, the agency exempted certain automatic and manual safety belt systems incorporating tension-relieving devices, such as window-shade devices, from the 0.7-pound torso belt contact force requirement. The reason for this exemption was the agency's concern that compliance with the body contact force requirement could limit manufacturers' design flexibility in meeting the retraction and other requirements in the rule. In their comments on the notice of proposed rulemaking, both foreign and domestic manufacturers had questioned whether imposing a contact force requirement on belt systems with tension-relievers would advance safety. They said that the necessity for complying with the belt contact force requirement could result in the production of some belt systems in which there was insufficient force to retract webbing reliably.

Ford and GM objected to the language in the final rule, because the exemption was limited to safety belt systems "which incorporate a webbing tension-relieving device that complies with S7.4.2." Section 7.4.2 requires automatic belt systems with webbing tension-relieving devices to meet the injury criteria of the standard when the belt is adjusted to have the maximum amount of slack recommended by the vehicle manufacturer. The petitioners stated that they do not believe the reference to S7.4.2 was intended to discourage the use of tension-relief devices on manual seat belt systems or to imply that manual seat belt systems incorporating tension-relief devices should not be eligible for the exemption now accorded automatic seat belt systems.

In the preamble to the final rule (50 FR at 46060), the agency noted that the tension-relieving requirements for manual safety belts were proposed in Notice 38 of this docket, in conjunction with the dynamic tests for manual safety belts. The agency also said that if a dynamic test requirement for manual belts was adopted, the provisions on tension-relievers for manual belts would be expected to be identical to those for automatic belts. On March 21, 1986 (51 FR 9800), the agency published a final rule setting dynamic test requirements for manual safety belts in passenger cars. The March 1986 rule adopted the same requirements for tension-relieving devices in dynamically-tested manual safety belts that were adopted in the November 1985 final rule for automatic belts. (In the March 1986 rule, the agency deferred action on whether to adopt the proposed dynamic testing for manual safety belts in light trucks and vans. If such a requirement is adopted, NHTSA will apply the same requirement on tension-relievers to those manual belts that are applied to other dynamically-tested manual safety belts.)

In the November 1985 final rule, the agency did not intend to preclude the use of tension-relieving devices on non-dynamically-tested manual safety belts or to imply that manual belt systems incorporating tension-relieving devices should not be eligible for the exemption from the belt contact force requirement now accorded automatic safety belt systems and dynamically-tested manual safety belts. The agency has revised the language of S7.4.3 to exempt all belts, whether manual or automatic, incorporating tension-relievers from the belt contact force requirement. The agency encourages manufacturers to provide information in their owner's manual on properly adjusting non-dynamically-tested manual safety belts with tension-relievers.

Belt Retraction

In the final rule, the retraction requirement for manual safety belts stated that torso and lap belt webbing must automatically retract to a stowed position, when the adjacent vehicle door is in the open position, or when the seat belt latchplate is released. Both Ford and GM interpreted this requirement to mean that retraction must occur when the latchplate is released whether or not the adjacent door is opened. They requested that the wording be revised to require retraction only when both conditions exist, i.e., release of the latchplate and opening of the adjacent door. They stated that the belt cannot retract until it is unbuckled and that they see no safety need to require retraction before the adjacent door is opened.

As stated in the April 1985 notice of proposed rulemaking, many persons find seat belts inconvenient because the belt webbing will not retract completely to its stowed position when the system is unbuckled, thus creating an obstacle when the occupant is trying to exit the vehicle or soiling the belt if it is caught in the door. The intent of the retraction requirement in the final rule was to provide manufacturers increased flexibility by giving them the option of triggering tension-relief cancellation and belt retraction by either release of the latchplate or opening of the adjacent vehicle door. As noted by the American Safety Belt Council in its comments on the April 1985 NPRM, new safety belt designs are available which will cancel a tension-relieving device and retract the belt when the latchplate is released from the buckle, regardless of whether the door is open or not. The agency did not intend that each condition trigger the retraction mechanism, but instead intended to allow manufacturers the option of using either condition to initiate belt retraction. For these reasons, the agency is amending the requirement to make it clear that manufacturers have the option of determining whether door opening or latchplate release is the mechanism that triggers retraction of a manual safety belt.

The rule will continue to provide that in an open-body vehicle with no doors, a manufacturer has the option to provide either automatic or manual deactivation of a tension-relieving device. Thus, in the retraction test in those vehicles, the agency will deactivate the tension-relieving devices in the manner provided by the manufacturer.

Armrests

The petitioners also requested a further clarification of the language of the final rule on belt retraction. That requirement permits an outboard armrest of a seat to be placed in its stowed position for the purpose of the retraction test, if the armrest must be stowed to allow the seat occupant to exit the vehicle. The agency stated in the preamble to the final rule that it intended to allow the stowage of folding armrests during the retraction test if "they protrude into the door opening in a manner which encumbers egress." (50 FR at 46061).

Ford noted that the common dictionary meaning of "encumber" is "impede," or "hinder," so that egress would be made difficult although not necessarily impossible. Ford said that the language of the final rule limited the stowage of armrests to situations in which armrests, unless stowed, make egress impossible.

To eliminate the possibility of having to make subjective judgments as to whether an armrest "hinders" occupant egress, the agency is modifying the retraction requirement to provide that any folding armrest must be stowed prior to initiation of the retraction test.

Technical Corrections

Ford pointed out a typographical error in amendment 14 of the final rule, which referred to S7.1.13, instead of referring to S7.1.3. The agency has made the necessary correction. Ford also stated that decimal points should be added, where appropriate, to the specified dimensional tolerances in the table of weights and dimensions of vehicle occupants. These corrections would conform the dimensions set forth in the chart, which is in amendment 14 in the final rule, to the corresponding dimensions specified on drawing SA 150 M002 or the test dummy. The agency agrees and has made the necessary corrections.

The comfort and convenience requirements in S7.4 of Standard No. 208 apply to automatic and manual safety belt assemblies installed in any vehicle with a GVWR of 10,000 pounds or less. The title of S7 in this standard, *Seat belt assembly requirements—passenger cars,* is no lonqer accurate, because the paragraphs of S7., by their terms, apply to passenger cars and several other types of vehicles. Therefore, the title is corrected in this notice to read S7. *Seat belt assembly requirements.* The agency is also amending the retraction requirements of S7.4.5 to make clear that, as proposed in the April 1985 NPRM, the retraction test only applies to the front outboard designated seating positions.

The remaining amendments are made to remove an extra "and" in paragraph S7.4.6.1(a), and to correct a typographical error in S4.5.3.3(b) (change "set" to "seat").

Effective Date

This notice makes minor clarifications and typographical and technical corrections to the text of Standard No. 208. NHTSA has determined that it is in the public interest to have these amendments to the language of the standard go into effect on publication of this notice in the *Federal Register,* since these amendments will provide manufacturers with more flexibility in developing designs to comply with the safety belt comfort and convenience requirements, which will go into effect on September 1, 1986.

In consideration of the foregoing, 49 CFR 571.208 is amended as follows:

1. The title of S7. is revised to read:

S7 Seat belt assembly requirements.

2. S7.4.2 is revised to read:

S7.4.2 Webbing tension-relieving device. Each vehicle with an automatic seat belt assembly, or with a Type 2 manual seat belt assembly that must meet S4.6, installed in a front outboard designated seating position that has either manual or automatic tension-relieving devices permitting the introduction of slack in the webbing of the shoulder belt (e.g., "comfort clips" or "window-shade" devices) shall:

(a) Comply with the requirements of S5.1 with the shoulder belt webbing adjusted to introduce the maximum amount of slack recommended by the vehicle manufacturer pursuant to S7.4.2(b).

(b) Have a section in the vehicle owner's manual that explains how the tension-relieving device works and specifies the maximum amount of slack (in inches) recommended by the vehicle manufacturer to be introduced into the shoulder belt under normal use conditions. The explanation shall also warn that introducing slack beyond the amount specified by the manufacturer could significantly reduce the effectiveness of the shoulder belt in a crash; and

(c) Have, except for open-body vehicles with no doors, an automatic means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device. In the case of an automatic safety belt system, cancellation of the tension-relieving device shall occur each time the adjacent vehicle door is opened. In the case of a manual seat belt required to meet S4.6, cancellation of the tension-relieving device shall occur, at the manufacturer's option, either each time the adjacent door is opened or each time the latchplate is released from the buckle. In the case of open-body vehicles with no doors, cancellation of the tension-relieving device may be done by a manual means.

3. S7.4.3 is revised to read as follows:

S7.4.3 Belt contact force. Except for manual or automatic seat belt assemblies which incorporate a webbing tension-relieving device, the upper torso webbing of any seat belt assembly, when tested in accordance with S10.6, shall not exert more than 0.7 pounds of contact force when measured normal to and one inch from the chest of an anthropomorphic test dummy positioned in accordance with S10 in the seating position for which that assembly is provided, at the point where the centerline of the torso belt crosses the midsagittal line on the dummy's chest.

4. S7.4.5 is revised to read as follows:

S7.4.5 Retraction. When tested under the conditions of S8.1.2 and S8.1.3, with anthropomorphic test dummies whose arms have been removed and which are positioned in accordance with S10 in the front outboard designated seating positions and restrained by the belt systems for those positions, the torso and lap belt webbing of any of those seat belt systems shall automatically retract to a stowed position either when the adjacent vehicle door is in the open position and the seat belt latchplate is released, or, at the option of the manufacturer, when the latchplate is released. That stowed position shall prevent any part of the webbing or hardware from being pinched when the adjacent vehicle door is closed. A belt system with a tension-relieving device in an open-bodied vehicle with no doors shall fully retract when the tension-relieving device is deactivated. For the purpose of the retraction requirement, outboard armrests, which are capable of being stowed, on vehicle seats shall be placed in their stowed positions.

5. S7.4.6.1(a) is amended by removing the second occurrence of the word "and" in the first sentence.

6. S4.5.3.3(b) is amended by correcting the word "set" to read "seat" and the word "show" to read "shown."

7. Condition (B) of S4.5.3.3(b) is amended by removing the second occurrence of the word "the" and by correcting the word "relases" to read "release."

8. The weights and dimensions of the vehicle occupants referred to in this standard and specified in S7.1.3 are revised to read as follows:

	50th-percentile 6-year-old child	*5th-percentile adult female*	*50th-percentile adult male*	*95th-percentile adult male*
Weight	47.3 pounds	102 pounds	164 pounds ±3	215 pounds
Erect sitting height	25.4 inches	30.9 inches	35.7 inches ±.1	38 inches
Hip breadth (sitting)	8.4 inches	12.8 inches	14.7 inches ±.7	16.5 inches
Hip circumference (sitting)	23.9 inches	36.4 inches	42 inches	47.2 inches
Waist circumference (sitting)	20.8 inches	23.6 inches	32 inches ±.6	42.5 inches
Chest depth		7.5 inches	9.3 inches ±.2	10.5 inches
Chest circumference:				
(nipple)		30.5 inches		
(upper)		29.8 inches	37.4 inches ±.6	44.5 inches
(lower)		26.6 inches		

Issued on: June 11, 1986.

Diane K. Steed
Administrator
51 F. R. 21912
June 17, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Anthropomorphic Test Dummies

(Docket No. 74-14; Notice 45)

ACTION: Final Rule.

SUMMARY: This notice adopts the Hybrid III test dummy as an alternative to the Part 572 test dummy in testing done in accordance with Standard No. 208, Occupant Crash Protection. The notice sets forth the specifications, instrumentation, calibration test procedures, and calibration performance criteria for the Hybrid III test dummy. The notice also amends Standard No. 208 so that effective October 23, 1986, manufacturers have the option of using either the existing Part 572 test dummy or the Hybrid III test dummy until August 31, 1991. As of September 1, 1991, the Hybrid III will replace the Part 572 test dummy and be used as the exclusive means of determining a vehicle's conformance with the performance requirements of Standard No. 208.

The notice also establishes a new performance criterion for the chest of the Hybrid III test dummy which will limit chest deflection. The new chest deflection limit applies only to the Hybrid III since only that test dummy has the capability to measure chest deflection.

These amendments enhance vehicle safety by permitting the use of a more advanced test dummy which is more human-like in response than the current test dummy. In addition, the Hybrid III test dummy is capable of making many additional sophisticated measurements of the potential for human injury in a frontal crash.

DATES: The notice adds a new Subpart E to Part 572 effective on October 23, 1986.

This notice also amends Standard No. 208 so that effective October 23, 1986, manufacturers have the option of using either the existing Part 572 test dummy or the Hybrid III test dummy until August 31, 1991. As of September 1, 1991, the Hybrid III will replace the Part 572 test dummy and be used as the exclusive means of determining a vehicle's conformance with the performance requirements of Standard No. 208. The incorporation by reference of certain publications listed in the regulation is approved by the Director of the Federal Register as of October 23, 1986.

SUPPLEMENTARY INFORMATION: In December 1983, General Motors (GM) petitioned the agency to amend Part 572, *Anthropomorphic Test Dummies*, to adopt specifications for the Hybrid III test dummy. GM also petitioned for an amendment of Standard No. 208, *Occupant Crash Protection*, to allow the use of the Hybrid III as an alternative test device for compliance testing. The agency granted GM's petition on July 20, 1984. The agency subsequently received a petition from the Center for Auto Safety to propose making Standard No. 208's existing injury criteria more stringent for the Hybrid III and to establish new injury criteria so as to take advantage of the Hybrid III's superior measurement capability. The agency granted the Center's petition on September 17, 1984. On April 12, 1985 (50 FR 14602), NHTSA proposed amendments to Part 572 and Standard No. 208 that were responsive to the petitioners and which, in the agency's judgment, would enhance motor vehicle safety. Twenty-eight individuals and companies submitted comments on the proposed requirements. This notice presents the agency's analysis of the issues raised by the commenters. The agency has decided to adopt the use of the Hybrid III test dummy and some of the proposed injury criteria. The agency has also decided to issue another notice on the remaining injury criteria to gain additional information about the potential effects of adopting those criteria.

This notice first discusses the technical specifications for the Hybrid III, its calibration requirements, its equivalence with the existing Part 572 test dummy, and the applicable injury criteria. Finally, it discusses the test procedure used to position the dummy for Standard No. 208 compliance testing and the economic and other effects of this rule.

Test Dummy Drawings and Specifications

Test dummies are used as human surrogates for evaluation of the severity of injuries in vehicle crashes. To serve as an adequate surrogate, a test dummy must be capable of simulating human impact responses. To serve as an objective test device, the test dummy must be adequately defined through technical drawings and performance specifications to ensure uniformity in construction, impact response, and measurement of injury in identical crash conditions.

Virtually all of the commenters, with the exception of GM, said that they have not had sufficient experience with the Hybrid III to offer comments on the validity of the technical specifications for the test dummy. Since the issuance of the notice, GM has provided additional technical drawings and a Society of Automotive Engineers-developed user's manual to further define the Hybrid III. These new drawings do not alter the basic nature of the test dummy, but instead provide additional information which will enable users to make sure that they have a correctly designed and correctly assembled test dummy. The user's manual provides information on the inspection, assembly, disassembly, and use of the test dummy. Having the user's manual available will assist builders and users of the Hybrid III in producing and using the test dummy. GM also provided information to correct the misnumbering of several technical drawings referenced in the notice.

In addition, the agency has reviewed the proposed drawings and specifications. While NHTSA believes the proposed drawings are adequate for producing the test dummy, the agency has identified and obtained additional information which should make production and use of the test dummy even more accurate. For example, the agency has obtained information on the range of motions for each moving body part of the test dummy. Finally, to promote the ease of assembly, NHTSA has made arrangements with GM to ensure that the molds and patterns for the test dummy are available to all interested parties. Access to the molds will assist other potential builders and users of the Hybrid III since it is difficult to specify all of the details of the various body contours solely by technical drawings.

The agency has adopted the new drawings and user manual in this rule and has made the necessary corrections to the old drawings. The agency believes that the available drawings and technical specifications are more than sufficient for producing, assembling, and using the Hybrid III test dummy.

Commercial Availability of the Hybrid III

A number of commenters raised questions about the commercial availability of the Hybrid III test dummy, noting problems they have experienced in obtaining calibrated test dummies and the instrumentation for the neck and lower leg of the Hybrid III. For example, Chrysler said that it had acquired two Hybrid III test dummies, but has been unable to obtain the lower leg and neck instrumentation for five months. Likewise, Ford said that it has been unable to obtain the knee displacement and chest deflection measurement devices for the Hybrid III. It also said that of the test dummies it had received, none had sufficient spine stiffness to meet the Hybrid III specifications. Ford claimed to have problems in retaining a stable dummy posture which would make it difficult to carry out some of the specified calibration tests. Subsequent investigation showed that the instability was caused by out-of-specification rubber hardness of the lumbar spine, and was eliminated when spines of correct hardness were used. In addition, Ford said that the necks and ribs of the test dummy would not pass the proposed calibration procedures. Finally, Ford said that the equipment needed for calibrating the dummy is not commercially available.

Although the commenters indicated they had experienced difficulty in obtaining the instrumentation for the Hybrid III's neck and lower legs, they did not indicate that there is any problem in obtaining the instrumentation needed to measure the three injury criteria presently required by Standard No. 208, the head injury criterion, chest acceleration, and femur loading and which are being adopted by this rule for the Hybrid III. For example, Volkswagen said it had obtained Hybrid III test dummies with sufficient instrumentation to measure the same injury criteria as with the Part 572. VW did say it had ordered the additional test devices and instrumentation for the Hybrid III but was told the instrumentation would not be available for six months.

The agency notes that there are now two commercial suppliers of the Hybrid III test dummy, Alderson Research Labs (ARL) and Humanoid Systems. Humanoid has built nearly 100 test dummies and ALR has produced five prototype test dummies as of the end of December 1985. Both manufacturers have indicated that they are now capable of producing sufficient Hybrid IIIs to meet the demand for those dummies. For example, Humanoid Systems said that while the rate of production is dependent on the number of orders, generally three test dummies per week are produced. Thus, in the case of the basic test dummy, there appears to be sufficient commercial capacity to provide sufficient test dummies for all vehicle manufacturers.

As to test dummy instrumentation, the agency is aware that there have been delays in obtaining the new neck, thorax, and lower leg instrumentation for the Hybrid III. However, as Humanoid commented, while there have been delays, the supplies of the needed parts are expected to increase. Even if the supply of the lower leg instrumentation is slow to develop, this will not pose a problem, since the agency is not adopting, at this time, the proposed lower leg injury criteria. In the case of the neck instrumentation, the supply problem should be minimized because each test facility will only need one neck transducer to calibrate all of its test dummies. The neck instrumentation will not be needed for a manufacturer's crash testing since at this time, the agency is not adopting any neck injury criteria. In the case of the instrumentation for measuring thoracic deflection, the supplier has indicated that it can deliver the necessary devices within 3 months of the time an order is placed. As to Ford's comment about calibration test equipment, the agency notes that current equipment used for calibrating the existing Part 572 test dummy can be used, with minor modification, to calibrate the Hybrid III test dummy.

Calibration Requirements

In addition to having complete technical drawings and specifications, a test dummy must have adequate calibration test procedures. The calibration tests involve a series of static and dynamic tests of the test dummy components to determine whether the responses of the test dummy fall within specified performance requirements for each test. The testing involves instrumenting the head, thorax and femurs to measure the test dummy's responses. In addition, there are tests of the neck, whose structural properties may have considerable influence on the kinematics and impact responses of the instrumented head. Those procedures help ensure that the test dummy has been properly assembled and that, as assembled, it will provide repeatable and reproducible results in crash testing. (Repeatability refers to the ability of the same test dummy to produce the same results when subjected to several identical tests. Reproducibility refers to the ability of one test dummy to provide the same results as another test dummy built to the same specifications.)

Lumbar Spine Calibration Test

The technical specifications for the Hybrid III set out performance requirements for the hardness of the rubber used in the lumbar spine to ensure that the spine will have appropriate rigidity. NHTSA's test data show that there is a direct relationship between rubber hardness and stiffness of the spine and that the technical specification on hardness is sufficient to ensure appropriate spine stiffness. Accordingly, the agency believes that a separate calibration test for the lumbar spine is not necessary. Humanoid supported the validity of relying on the spine hardness specification to assure adequate stability of the dummy's posture, even though it found little effect on the dummy's impact response. Humanoid's support for this approach was based on tests of Hybrid III dummies which were equipped with a variety of lumbar spines having different rubber hardnesses.

Subsequent to issuance of the notice, the agency has continued its testing of the Hybrid III test dummy. Through that testing, the agency found that commercially available necks either cannot meet or cannot consistently meet all of the calibration tests originally proposed for the neck. To further evaluate this problem, NHTSA and GM conducted a series of round robin tests in which a set of test dummies were put through the calibration tests at both GM's and NHTSA's test laboratories.

The test results, which were placed in the docket after the tests were completed, showed that none of the necks could pass all of the originally specified calibration tests.

In examining the test data, the agency determined that while some of the responses of the necks fell slightly outside of the performance corridors proposed in the calibration tests, the responses of the necks showed a relatively good match to existing biomechanical data on human neck responses. Thus, while the necks did not meet all of the calibration tests, they did respond as human necks are expected to respond.

In discussions with GM, the agency learned that the calibration performance requirements were originally established in 1977 based on the responses of three prototype Hybrid III necks. GM first examined the existing biomechanical data and established several performance criteria that reflected human neck responses. GM then built necks which would meet the biomechanically based performance criteria. GM established the calibration tests that it believed were necessary to ensure that the necks of the prototype test dummies would produce the required biomechanical responses. Although extensive performance specifications may have been needed for the development of specially built prototype necks, not all of the specifications appear to be essential once the final design was established for the mass-produced commercial version. Based on the ability of the commercially available test dummies to meet the biomechanical response criteria, NHTSA believes that the GM-derived calibration requirements should be adjusted to reflect the response characteristics of commercially available test dummies and simplified as much as possible to reduce the complexity of the testing.

Based on the results of the NHTSA-GM calibration test series, the agency is making the following changes to the neck calibration tests. In the flexion (forward bending) calibration test, the agency is:

1. increasing the time allowed for the neck to return to its preimpact position after the pendulum impact test from a range of 109–119 milliseconds to a range of 113–128 milliseconds.

2. changing the limits for maximum head rotation from a range of 67°–79° to a range of 64°–78°.

3. expanding the time limits during which maximum moment must occur from a range of 46–56 milliseconds to 47–58 milliseconds.

4. modifying the limits for maximum moment from a range of 72–90 ft-lbs to a range of 65–80 ft-lbs.

5. increasing the time for the maximum moment to decay from a range of 95–105 milliseconds to a range of 97–107 milliseconds.

In the extension (backward bending) calibration test, the agency is:

1. expanding the time allowed for the neck to return to its preimpact position after the pendulum impact test from a range of 157–167 milliseconds to a range of 147–174 milliseconds.

2. changing the limits for maximum head rotation from a range of 94°–106° to a range of 81°–106°.

3. expanding the time limit during which the minimum moment must occur from a range of 69–77 milliseconds to 65–79 milliseconds.

4. modifying the limits for minimum moment from a range of –52 to –63 ft-lbs to a range of –39 to –59 ft-lbs.

5. increasing the time for the minimum moment to decay from the range of 120–144 milliseconds, contained in GM's technical specifications for the Hybrid III, to a range of 120–148 milliseconds.

In reviewing the NHTSA-GM test data, the agency also identified several ways of simplifying the neck's performance requirements. In each case, the following calibration specifications appear to be redundant and their deletion should not affect the performance of the neck. The agency has thus deleted the requirement for minimum moment in flexion and the time requirement for that moment. For extension, the agency has eliminated the limit on the maximum moment permitted and the time requirement for that moment. The agency has deleted those requirements since the specification on maximum rotation of the neck in flexion and minimum rotation of the neck in extension appear to adequately measure the same properties of the neck. Similarly, the agency has simplified the test by eliminating the pendulum braking requirement for the neck test, since GM's testing shows that the requirement is not necessary to ensure test consistency. Finally, the agency is clarifying the test procedure by deleting the specification in the GM technical drawings for the Hybrid III calling for two pre-calibration impact tests of the neck. GM has informed the agency that the two pre-calibration tests are not necessary.

Based on the NHTSA-GM calibration test data, the agency is making two additional changes to the neck calibration test procedure. Both NHTSA and GM routinely control the calibration pendulum impact speed to within plus or minus one percent. Currently available dummy necks are able to meet the calibration response requirements consistently when the pendulum impact speed is controlled to that level Thus, NHTSA believes that the proposed range of allowable velocities (± 8.5 percent) for the pendulum impact is excessive. Reducing the allowable range is clearly feasible and will help maintain a high level of consistency in dummy neck responses. The agency has therefore narrowed the range of permissible impact velocities to the neck to ± 2 percent. This range is readily obtainable with commercially available test equipment. In reviewing the neck calibration test data, GM and NHTSA noted a slight sensitivity in the neck response to temperature variation. In its docket submission of January 27, 1986, GM recommended controlling the temperature during the neck calibration test to 71° ± 1°. NHTSA agrees that controlling the temperature for the neck calibration test will reduce variability, but the agency believes that a slightly wider temperature range of 69° to 72°, which is the same range used in the chest calibration test, is sufficient.

Neck Durability

Nissan commented that, in sled tests of the two test dummies, the neck bracket of one of the Hybrid III test dummies experienced damage after 10 tests, while the Part 572 test dummy had no damage. The agency believes that Nissan's experience may be the result of an early neck design which has been subsequently modified by GM. (See GM letter of September 16, 1985, Docket 74-14, Notice 39, Entry 28.) The agency has conducted numerous 30 mile per hour vehicle impact tests using the Hybrid III test dummy and has not had any neck bracket failures.

Thorax Calibration Test

As a part of the NHTSA-GM calibration test series, both organizations also performed the proposed calibration test for the thorax on the same test dummies. That testing showed relatively small differences in the test results measured between the two test facilities The test results from both test facilities show that the chest responses of the Hybrid III test dummies were generally within the established biomechanical performance corridors for the chest. In addition, the data showed that the Hybrid III chest responses fit those corridors substantially better than the chest responses of the existing Part 572 test dummy. The data also showed that the chest responses in the high speed (22 ft/sec) pendulum impact test more closely fit the corridors than did the chest responses in the low speed (14 ft/sec) test. In addition, the data showed that if a test dummy performed satisfactorily in the low speed pendulum impact test, it also performed satisfactorily in the more severe high speed test.

Based on those results, GM recommended in a letter of January 27, 1986, (Docket No. 74-14, Notice 39, Entry 41) that only the low speed pendulum impact be used in calibration testing of the Hybrid III chest. GM noted that deleting the more severe pendulum impact test "can lead to increasing the useful life of the chest structure."

Based on the test data, the agency agrees with the GM recommendation that only one pendulum impact test is necessary. NHTSA recognizes that using only the low speed pendulum impact will increase the useful life of the chest. However, the agency has decided to retain the high speed rather than the low speed test. While NHTSA recognizes that the high speed test is more severe, the agency believes the high speed test is more appropriate for a number of reasons. First, the data showed that the high speed chest impact responses compared more closely with the biomechanical corridors than the low speed responses. Thus, use of the high speed test will make it easier to identify chests that do not have the correct biofidelity. In addition, since the higher speed test is more severe it will subject the ribcage to higher stresses, which will help identify chest structural degradation. Finally, the high speed impact test is more representative of the range of impacts a test dummy can receive in a vehicle crash test.

Although the NHTSA-GM test data showed that the production version of the Hybrid III chest had sufficient biofidelity, the data indicated that proposed calibration performance requirements should be lightly changed to account for the wider range in calibration test responses measured in commercially available test dummies. Accordingly, the agency is adjusting the chest deflection requirement to increase the allowable range of deflections from 2.51–2.75 inches to 2.5–2.85 inches. In addition, the agency is adjusting the resistive force requirement from a range of 1186–1298 pounds to a range of 1080–1245 pounds. Also, the hysteresis requirement is being adjusted from a 75–80 percent range to a 69–85 percent range. Finally, the agency is clarifying the chest calibration test procedure by deleting the specification in GM's technical drawing for the Hybrid III that calls for two pre-calibration impact tests of the chest. GM has informed the agency that these tests are not necessary. These slight changes will not affect the performance of the Hybrid III chest, since the NHTSA-GM test data showed that commercially available test dummies meeting these calibration specifications had good biofidelity.

Chest Durability

Testing done by the agency's Vehicle Research and Test Center has indicated that the durability of the Hybrid III's ribs in calibration testing is less than that of the Part 572 test dummy. ("State-of-the-Art Dummy Selection, Volume I" DOT Publication No. HS 806 722) The durability of the Hybrid III was also raised by several commenters. For example, Toyota raised questions about the durability of the Hybrid III's ribs and suggested the agency act to improve their durability.

The chest of the Hybrid III is designed to be more flexible, and thus more human-like, than the chest of the Part 572 test dummy. One of the calibration tests used for the chest involves a 15 mph impact into the chest by a 51.5 pound pendulum; an impact condition which is substantially more severe than a safety belt or airbag restrained occupant would experience in most crashes. The chest of the Hybrid III apparently degrades after such multiple impacts at a faster rate than the chest of the Part 572 test dummy. As the chest gradually deteriorates, the amount of acceleration and deflection measured in the chest are also affected. Eventually the chest will fall out of specification and will require either repair or replacement.

In its supplemental comments to the April 1985 notice, GM provided additional information about the durability of the Hybrid III ribs. GM said that it uses the Hybrid III in unbelted testing, which is the most severe test for the dummy. GM said that the Hybrid III can be used for about 17 crash tests before the ribs must be replaced. GM explained that it does not have comparable data for the Part 572 test dummy since it does not use that test dummy in unbelted tests. GM said, however, that it believes that the durability of the Part 572 test dummy ribs in vehicle crash testing would be comparable to that of the Hybrid III.

Having reviewed all the available information, the agency concludes that both the Hybrid III and existing Part 572 test dummy ribs will degrade under severe impact conditions. Although the Hybrid III's more flexible ribs may need replacement more frequently, particularly after being used in unrestrained testing, the Hybrid III's ribs appear to have reasonable durability. According to GM's data, which is in line with NHTSA's crash test experience, the Hybrid III's ribs can withstand approximately 17 severe impacts, such as found in unrestrained testing, before they must be replaced. Ford, in a presentation at the MVMA Hybrid III workshop held on February 5, 1986, noted that one of its belt-restrained Hybrid III test dummies was subjected to 35 vehicle and sled crashes without any failures. The potential lower durability of the ribs in unrestrained testing should be of little consequence if the Hybrid III test dummy is used in air bag or belt testing.

Chest Temperature Sensitivity

The April 1985 notice said NHTSA tests have indicated that the measurements of chest deflection and chest acceleration by the Hybrid III are temperature sensitive. For this reason, GM's specifications for the Hybrid III recognize this problem and call for using the test dummy in a narrower temperature range (69° to 72° F) to ensure the consistency of the measurements. GM has also suggested the use of an adjustment factor for calculating chest deflection when the Hybrid III is used in a test environment that is outside of the temperature range specified for the chest. While this approach may be reasonable to account for the adjustment of the deflection measurement, there is no known method to adjust the acceleration measurement for variations in temperature. For this reason, the agency is not adopting GM's proposed adjustment factor, but is instead retaining the proposed 69° to 72° F temperature range.

A number of commenters addressed the feasibility and practicability of maintaining that temperature range. BMW said that although it has an enclosed crash test facility, it had reservations about its ability to control the test temperature within the proposed range. Daihatsu said that it was not sure it could assure the test dummy's temperature will remain within the proposed range. Honda said that while it had no data on the temperature sensitivity of the Hybrid III, it questioned whether the proposed temperature range was practical. Mercedes-Benz said it is not practicable to maintain the proposed temperature range because the flood lights necessary for high speed filming of crash tests can cause the test dummy to heat up. Nissan said it was not easy to maintain the current 12 degree range specified for the existing Part 572 test dummy and thus it would be hard to maintain the three degree range proposed for the Hybrid III. Ford also said that maintaining the three degree range could be impracticable in its current test facilities.

Other manufacturers tentatively indicated that the proposed temperature range may not be a problem. VW said the temperature range should not be an insurmountable problem, but more experience with the Hybrid III is necessary before any definite conclusions can be reached. Volvo said it could maintain the temperature range in its indoor test facilities, but it questioned whether outdoor test facilities could meet the proposed specification. Humanoid indicated in its comments, that it has developed an air conditioning system individualized for each test dummy which will maintain a stable temperature in the test dummy up to the time of the crash test.

The agency believes that there are a number of effective ways to address the temperature sensitivity of the Hybrid III chest. The test procedure calls for placing the test dummy in an area, such as a closed room, whose temperature is maintained within the required range for at least four hours before either the calibration tests or the use of the test dummy in a crash test. The purpose of the requirement is to ensure that the primary components of the test dummy have reached the correct temperature before the test dummy is used in a test. As discussed below, analytical techniques can be used to determine the temperature within the test dummy, to calculate how quickly the test dummy must be used in a crash test before its temperature will fall outside the required temperature range.

Testing done by the agency with the current Part 572 test dummy, whose construction and materials are similar to the Hybrid III, has determined how long it takes for various test dummy components to reach the required temperature range once the test dummy is placed in a room within that range. ("Thermal Responses of the Part 572 Dummy to Step Changes in Ambient Temperature" DOT Publication No. HS-801 960, June 1976) The testing was done by placing thermocouples, devices to measure temperature, at seven locations within the dummy and conducting a series of heating and cooling experiments. The tests showed that the thermal time constants (the thermal time constant is the time necessary for the temperature differential between initial and final temperatures to decrease from its original value to 37% of the original differential) varied from 1.2 hours for the forehead to 6.2 hours for the lumbar spine. Using this information it is possible to estimate the time it takes a test dummy originally within the required temperature range to fall out of the allowable range once it has been exposed to another temperature. The rib's thermal time constant is 2.9 hours. This means, for example, that if a test dummy's temperature has been stabilized at 70.5 ° F and then transferred to a test environment at 65 ° F, it would take approximately 0.8 hours for the rib temperature to drop to 69 ° F, the bottom end of the temperature range specified in Part 572.

Thus, the NHTSA test results cited above show that the chest can be kept within the range proposed by the agency if the test dummy is placed in a temperature-controlled environment for a sufficient time to stabilize the chest temperature. Once the chest of the test dummy is at the desired temperature, the test data indicate that it can tolerate some temperature variation at either an indoor or outdoor crash test site and still be within the required temperature range as long as the crash test is performed within a reasonable amount of time and the temperature at the crash site, or within the vehicle, or within the test dummy is controlled close to the 69 to 72 degrees F range. Obviously, testing conducted at extremely high or low temperatures can move the test dummy's temperature out of the required range relatively quickly, if no means are used to maintain the temperature of the test dummy within the required range. However, auxiliary temperature control devices can be used in the vehicle or the test environment to maintain a stabilized temperature prior to the crash test. Therefore, the agency has decided to retain the proposed 69 to 72 degrees F temperature range.

Chest Response to Changes in Velocity

The April notice raised the issue of the sensitivity of the Hybrid III's chest to changes in impact velocities. The notice pointed out that one GM study on energy-absorbing steering columns ("Factors Influencing Laboratory Evaluation of Energy-Absorbing Steering Systems," Docket No. 74-14, Notice 32, Entry 1666B) indicated that the Hybrid III's chest may be insensitive to changes in impact velocities and asked commenters to provide further information on this issue.

Both GM and Ford provided comments on the Hybrid III's chest response. GM said that since the Hybrid III chest is designed to have a more human-like thoracic deflection than the Part 572 test dummy, the Hybrid III's response could be different. GM referenced a study ("System Versus Laboratory Impact Tests for Estimating Injury Hazard" SAE paper 680053) which involved cadaver impacts into energy-absorbing steering columns. The study concluded that the force on the test subject by the steering assembly was relatively constant despite changes in test speeds. GM said that this study indicated that "rather than the Hybrid III chest being insensitive to changes in velocity in steering system tests, it is the Part 572 which is too sensitive to changes in impact velocity to provide meaningful information for evaluating steering systems."

GM also presented new data on chest impact tests conducted on the Hybrid III and Part 572 test dummies. The tests involved chest impacts by three pendulum impact devices with different masses and three impact speeds. GM said that the test results show that "the Hybrid III chest deflection is sensitive to both changes in impact velocity and impactor mass." Ford also noted that the Hybrid III appears sensitive in the range of speed and deflections that are relevant to Standard No. 208 testing with belt-restrained dummies.

Ford noted that the GM testing referenced in the April notice was conducted at higher impact speeds than used in the calibration testing of the Hybrid III. Ford said it agreed with GM that the indicated insensitivity of chest acceleration to speed and load is a reflection of the constant-force nature of the steering column's energy absorption features. After reviewing the information provided by Ford and GM, NHTSA agrees that in an impact with a typical steering column, once the energy-absorbing mechanism begins to function, the test dummy's chest will receive primarily constant force. The lower stiffness of the Hybrid III chests would make it respond in a more human-like manner to these forces than the existing Part 572 test dummy.

Chest Accelerometer Placement

Volvo pointed out that the chest accelerometer of the Hybrid III is located approximately at the center of gravity of the chest, while the accelerometer is higher and closer to the back in the Part 572 test dummy. Volvo said that since the biomechanical tolerance limits for the chest were established using a location similar to that in the Part 572, it questioned whether the acceleration limits should apply to the Hybrid III. Volvo recommended changing the location of the accelerometer in the Hybrid III or using different chest acceleration criteria for the Hybrid III.

The agency recognizes that Hybrid III accelerometer placement should more correctly reflect the overall response of the chest because it is placed at the center of gravity of the chest. However, the dimensional differences between the accelerometer placements in the two test dummies are so small that in restrained crash tests the differences in acceleration response, if any, should be minimal.

Repeatability and Reproducibility

As discussed previously, test dummy repeatability refers to the ability of one test dummy to measure consistently the same responses when subjected to the same test. Reproducibility refers to the ability of two or more test dummies built to the same specifications to measure consistently the same responses when they are subjected to the same test.

Ford said that it is particularly concerned about the repeatability of the chest acceleration and deflection measurements of the Hybrid III and about the reproducibility of the Hybrid III in testing by different laboratories. Ford said that once a test dummy positioning procedure has been established, the agency should conduct a series of 16 car crash tests to verify the repeatability and reproducibility of the Hybrid III.

In its comments, GM provided data showing that the repeatability of the Hybrid III is the same as the existing Part 572 test dummy. Volvo, the only other commenter that addressed repeatability, also said that its preliminary tests show that the Hybrid III has a repeatability comparable to the Part 572. The agency's Vehicle Research and Test Center has also evaluated the repeatability of the Hybrid III and the Part 572 in a series of sled tests. The data from those tests show that the repeatability of the two test dummies is comparable. ("State-of-the-Art Dummy Selection, Volume I" DOT Publication No. HS 806 722.)

GM also provided data showing that the reproducibility of the Hybrid III is significantly better than the Part 572. In its supplemental comments filed on September 16, 1985, GM also said that Ford's proposed 16 car test program was not needed. GM said that "in such test the effects of vehicle build variability and test procedure variability would totally mask any effect of Hybrid III repeatability and reproducibility."

The agency agrees with GM that additional testing is unnecessary. The information Provided by GM and Volvo shows that the repeatability of the Hybrid III is at least as good as the repeatability of the existing Part 572 test dummy. Likewise, the GM data show that the reproducibility of the Hybrid III is better than that of the existing Part 572 test dummy. Likewise, the recent NHTSA-GM calibration test series provides further confirmation that tests by different laboratories show the repeatability and reproducibility of the Hybrid III.

Equivalence of Hybrid III and Part 572

As noted in the April 1985 notice, the Hybrid III and the Part 572 test dummies do not generate identical impact responses. Based on the available data, the agency concluded that when both test dummies are tested in lap/shoulder belts or with air cushions, the differences between the two test dummies are minimal. The agency also said that it knew of no method for directly relating the response of the Hybrid III to the Part 572 test dummy.

The purpose of comparing the response of the two test dummies is to ensure that the Hybrid III will meet the need for safety by adequately identifying vehicle designs which could cause or increase occupant injury. The agency wants to ensure that permitting a choice of test dummy will not lead to a degradation in safety performance.

As mentioned previously, one major improvement in the Hybrid III is that it is more human-like in its responses than the current Part 572 test dummy. The primary changes to the Hybrid III that make it more human-like are to the neck, chest and knee. Comparisons of the responses of the Part 572 and Hybrid III test dummies show that responses of the Hybrid III are closer than the Part 572 to the best available data on human responses. (See Chapter II of the Final Regulatory Evaluation on the Hybrid III.)

In addition to being more human-like, the Hybrid III has increased measurement capabilities for the neck (tension, compression, and shear forces and bending moments), chest (deflection), knee (knee shear), and lower leg (knee and tibia forces and moments). The availability of the extra injury measuring capability of the Hybrid III gives vehicle manufacturers the potential for gathering far more information about the performance of their vehicle designs than they can obtain with the Part 572.

To evaluate differences in the injury measurements made by the Hybrid III and the existing Part 572 test dummy, the agency has reviewed all of the available data comparing the two test dummies. The data come from a variety of sled barrier crash tests conducted by GM, Mercedes-Benz, NHTSA, Nissan, and Volvo. The data include tests where the dummies were unrestrained and tests where the dummies were restrained by manual lap/shoulder belts, automatic belts, and air bags. For example, subsequent to issuance of the April 1985 notice, NHTSA did additional vehicle testing to compare the Part 572 and Hybrid III test dummies. The agency conducted a series of crash tests using five different types of vehicles to measure differences in the responses of the test dummies. Some of the tests were frontal 30 mile per hour barrier impacts, such as are used in Standard No. 208 compliance testing, while others were car-to-car tests. All of the tests were done with unrestrained test dummies to measure their impact responses under severe conditions. The agency's analysis of the data for all of the testing done by NHTSA and others is fully described in the Final Regulatory Evaluation for this rulemaking. This notice will briefly review that analysis.

One of the reasons for conducting the analysis was to address the concern raised by the Center for Auto Safety (CAS) in its original petition and the Insurance Institute for Highway Safety (IIHS) in its comments that the Hybrid III produces lower HIC responses than the existing Part 572 test dummy. As discussed in detail below, the test data do not show a trend for one type of test dummy to consistently measure higher or lower HIC's or femur readings than the other. Based on these test data, the agency concludes that the concern expressed by CAS and IIHS that the use of the Hybrid III test dummy will give a manufacturer an advantage in meeting the HIC performance requirement of Standard No. 208 is not valid.

In the case of chest acceleration measurements, the data again do not show consistently higher or lower measurements for either test dummy, except in the case of unrestrained tests. In unrestrained tests, the data show that the Hybrid III generally measures lower chest g's than the existing Part 572 test dummy. This difference in chest g's measurement is one reason why the agency is adopting the additional chest deflection measurement for the Hybrid III, as discussed further below.

HIC Measurements

The April 1985 notice specifically invited comments on the equivalence of the Head Injury Criterion (HIC) measurements of the two test dummies. Limited laboratory testing done in a University of California at San Diego study conducted by Dr. Dennis Schneider and others had indicated that the Hybrid III test dummy generates lower acceleration responses than either the Part 572 test dummy or cadaver heads in impacts with padded surfaces. The notice explained that the reasons for those differences had not yet been resolved.

In its comments, GM explained that it had conducted a series of studies to address the Schneider results. GM said that those studies showed that the Schneider test results are "complicated by the changing characteristics of the padding material used on his impact surface. As a result, his tests do not substantiate impactor response difference between the Hybrid III head, the Part 572 head and cadaver heads. After examining our reports, Dr. Schneider agreed with the finding that padding degradation resulting from multiple impact exposures rendered an input-response comparison invalid between the cadaver and the dummies." (The GM and Schneider letters are filed in Docket 74-14, General Reference, Entry 556.)

The agency's Vehicle Research and Test Center has also conducted head drop tests of the current Part 572 and Hybrid III heads. The tests were conducted by dropping the heads onto a two inch thick steel plate, a surface which is considerably more rigid than any surface that the test dummy's head would hit in a vehicle crash test. One purpose of the tests was to assess the performance of the heads in an impact which can produce skull fractures in cadavers. The tests found that the response of the Hybrid III head was more human-like at the fracture and subfracture acceleration levels than the Part 572 head. The testing did show that in these severe impacts into thick steel plates, the HIC scores for the Hybrid III were lower than for the Part 572. However, as discussed below, when the Hybrid III is tested in vehicle crash and sled tests, which are representative of occupant impacts into actual vehicle structures, the HIC scores for the Hybrid III are not consistently lower than those of the Part 572 test dummy.

The agency examined crash and sled tests, done by GM, Mercedes-Benz, NHTSA and Volvo, in which both a Hybrid III and the existing Part 572 test dummy were restrained by manual lap/shoulder belts. (The complete results from those and all the other tests reviewed by the agency are discussed in Chapter III of the Final Regulatory Evaluation on the Hybrid III.) The HIC responses in those tests show that the Hybrid III generally had higher HIC responses than the Part 572 test dummy. Although the data show that the Hybrid III's HIC responses are generally higher, in some cases 50 percent higher than the Part 572, there are some tests in which the Hybrid III's responses were 50 percent lower than the responses of the Part 572.

For two-point automatic belts, the agency has limited barrier crash test data and the direct comparability of the data is questionable. The tests using the existing Part 572 test dummy were done in 1976 on 1976 VW Rabbits for compliance purposes. The Hybrid III tests were done in 1985 by the agency's Vehicle Research and Test Center as part of the SRL-98 test series on a 1982 and a 1984 VW Rabbit. Differences in the seats, safety belts, and a number of other vehicle parameters between these model years and between the test set-ups could affect the results. In the two-point automatic belt tests, the data show that the Hybrid III measured somewhat higher head accelerations than the existing Part 572 test dummy. In two-point automatic belts, the differences appear to be minimal for the driver and substantially larger for the passenger. In air bag sled tests, the Hybrid III's HIC responses were generally lower: in almost all the air bag tests, the HIC responses of both the Hybrid III and the Part 572 test dummies were substantially below the HIC limit of 1,000 set in Standard No. 208. Because of the severe nature of the unrestrained sled and barrier tests, in which the uncontrolled movement of the test dummy can result in impacts with different vehicle structures, there was no consistent trend for either test dummy to measure higher or lower HIC responses than the other.

Chest Measurements

For manual lap shoulder belts, NHTSA compared the results from GM, Mercedes-Benz, NHTSA, and Volvo sled tests, and GM frontal barrier tests. The NHTSA sled test results at 30 and the Volvo sled test results at 31 mph are very consistent, with the mean Hybrid III chest acceleration response being only 2–3 g's higher than the response of the existing Part 572 test dummy. In the 35 mph Volvo sled tests, the Hybrid III chest acceleration response was up to 44 percent higher than the existing Part 572 response. The GM 30 mph sled and barrier test data were fairly evenly divided. In general, the Hybrid III chest acceleration response is slightly higher than that of the existing Part 572 test dummy. The agency concludes from these data that at Standard No. 208's compliance test speed (30 mph) with manual lap shoulder belts there are no large differences in chest acceleration responses between the two dummies. In some vehicles, the Hybrid III may produce slightly higher responses and in other vehicles it may produce slightly lower responses.

As discussed earlier, the agency has limited test data on automatic belt tests and their comparability is questionable. The Hybrid III chest acceleration responses are up to 1.5 times higher than those for the existing Part 572 test dummy. Only very limited sled test data are available on air bags alone, air bag plus lap belt, and air bag plus lap shoulder belt. In all cases, the Hybrid III chest acceleration responses were lower than those for the existing Part 572 test dummy.

For unrestrained occupants, the Hybrid III produces predominantly lower chest acceleration responses than the existing Part 572 test dummy in sled and barrier tests, and in some cases the difference is significant. In some tests, the Hybrid III chest acceleration response can be 40 to 45 percent lower than the Part 572 response, although in other tests the acceleration measured by the Hybrid III can exceed that measured by the Part 572 test dummy by 10 to 15 percent.

In summary, the test data indicate the chest acceleration responses between the Hybrid III and the existing Part 572 test dummy are about the same for restrained occupants, but differ for some cases of unrestrained occupants. This is to be expected since a restraint system would tend to make the two dummies react similarly even though they have different seating postures. The different seating postures, however, would allow unrestrained dummies to impact different vehicle surfaces which would in most instances produce different responses. Since the Hybrid III dummy is more human-like, it should experience loading conditions that are more human-like than would the existing Part 572 test dummy. One reason that the agency is adding a chest deflection criterion for the Hybrid III is that the unrestrained dummy's chest may experience more severe impacts with vehicle structures than would be experienced in an automatic belt or air bag collision. Chest deflection provides an additional measurement of potential injury that may not be detected by the chest acceleration measurement.

Femur Measurements

The test data on the femur responses of the two types of test dummies also do not show a trend for one test dummy to measure consistently higher or lower responses than the other. In lap shoulder belt tests, GM's sled and barrier tests from 1977 show a trend toward lower measurements for the Hybrid III, but GM's more recent tests in 1982–83 show the reverse situation. These tests, however, are of little significance unless there is femur loading due to knee contact. These seldom occur to lap shoulder belt restrained test dummies. Also, in none of the tests described above do the measurements approach Standard No. 208's limit of 2250 pounds for femur loads. The air bag test data are limited; however, they show little difference between the femur responses of the two test dummies. As would be expected, the unrestrained tests showed no systematic differences, because of the variability in the impact locations of an unrestrained test dummy.

Injury Criteria

Many manufacturers raised objections to the additional injury criteria proposed in the April 1985 notice. AMC, Ford, and MVMA argued that adopting the numerous injury criteria proposed in the April 1985 notice would compound a manufacturer's compliance test problems. For example, Ford said it "would be impracticable to require vehicles to meet such a multitude of criteria in a test with such a high level of demonstrated variability. Notice 39 appears to propose 21 added pass-fail measurements per dummy, for a total of 25 pass-fail measurements per dummy, or 50 pass-fail measurements per test. Assuming these measurements were all independent of one another, and a car design had a 95% chance of obtaining a passing score on each measurement, the chance of obtaining a passing score on all measurements in any single test for a single dummy would be less than 28% and for both dummies would be less than 8%." Ford, Nissan, VW and Volvo also said that with the need for additional measurements, there will be an increase in the number of tests with incomplete data. BMW, while supporting the use of the Hybrid III as a potential improvement to safety, said that the number of measurements needed for the additional injury criteria is beyond the capability of its present data processing equipment.

VW said there is a need to do additional vehicle testing before adopting any new criteria. It said that if current production vehicles already meet the additional criteria then the criteria only increase testing variability without increasing safety. If current vehicles cannot comply, then additional information is needed about the countermeasures needed to meet the criteria. Honda said there are insufficient data to determine the relationship between actual injury levels and the proposed injury criterion.

As discussed in detail below, the agency has decided to adopt only one additional injury criterion, chest deflection, at this time. The agency plans to issue another notice on the remaining criteria proposed in the April 1985 notice to gather additional information on the issues raised by the commenters.

Alternative HIC Calculations

The April 1985 notice set forth two proposed alternative methods of using the head injury criterion (HIC) in situations when there is no contact between the test dummy's head and the vehicle's interior during a crash. The first proposed alternative was to retain the current HIC formula, but limit its calculation to periods of head contact only. However, in non-contact situations, the agency proposed that an HIC would not be calculated, but instead new neck injury criteria would be calculated. The agency explained that a crucial element necessary for deciding whether to use the HIC calculation or the neck criteria was an objective technique for determining the occurrence and duration of head contact in the crash test. As discussed in detail in the April 1985 notice, there are several methods available for establishing the duration of head contact, but there are questions about their levels of consistency and accuracy.

The second alternative proposed by the agency would have calculated an HIC in both contact and non-contact situations, but it would limit the calculation to a time interval of 36 milliseconds. Along with the requirement that an HIC not exceed 1,000, this would limit average head acceleration to 60 g's or less for any durations exceeding 36 milliseconds.

Almost all of the commenters opposed the use of the first proposed alternative. The commenters uniformly noted that there is no current technique that can accurately identify whether head contact has or has not occured during a crash test in all situations. However, the Center for Auto Safety urged the agency to adopt the proposed neck criteria, regardless of whether the HIC calculation is modified.

There was a sharp division among the commenters regarding the use of the second alternative; although many manufacturers argued that the HIC calculation should be limited to a time interval of approximately 15 to 17 milliseconds (ms), which would limit average long duration (i.e., greater than 15–17 milliseconds) head accelerations to 80–85 g's. Mercedes-Benz, which supported the second alternative, urged the agency to measure HIC only during the time interval that the acceleration level in the head exceeds 60 g's. It said that this method would more effectively differentiate results received in contacts with hard surfaces and results obtained from systems, such as airbags, which provide good distribution of the loads experienced during a crash. The Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm argued that the current HIC calculation should be retained; they said that the proposed alternative would lower HIC calculations without ensuring that motorists were still receiving adequate head protection.

NHTSA is in the process of reexamining the potential effects of the two alternatives proposed by the agency and of the two additional alternatives suggested by the commenters. Once that review has been completed, the agency will issue a separate notice announcing its decision.

Thorax

At present, Standard No. 208 uses an acceleration-based criterion to measure potential injuries to the chest. The agency believes that the use of a chest deflection criterion is an important supplement to the existing chest injury criterion. Excessive chest deflection can produce rib fractures, which can impair breathing and inflict damage to the internal organs in the chest. The proposed deflection limit would only apply to the Hybrid III test dummy, since unlike the existing Part 572 test dummy, it has a chest which is designed to deflect like a human chest and has the capability to measure deflection of the sternum relative to the spine, as well as acceleration, during an impact.

The agency proposed a three-inch chest deflection limit for systems, such as air bags, which symmetrically load the chest during a crash and a two-inch limit for all other systems. The reason for the different proposed limits is that a restraint system that symmetrically and uniformly applies loads to the chest increases the ability to withstand chest deflection as measured by the deflection sensor, which is centrally located in the dummy.

The commenters generally supported adoption of a chest deflection injury criterion. For example, Ford said it supported the use of a chest deflection criterion since it may provide a better means of assessing the risk of rib fractures. Likewise, the Insurance Institute for Highway Safety said the chest deflection criteria."will aid in evaluating injury potential especially in situations where there is chest contact with the steering wheel or other interior components." IIHS also supported adoption of a three-inch deflection limit for inflatable systems and a two-inch limit for all other systems. However, most of the other commenters addressing the proposed chest deflection criteria questioned the use of different criteria for different restraint systems.

GM supported limiting chest deflections to three-inches in all systems. GM said that it uses a two-inch limit as a guideline for its safety belt system testing, but it had no data to indicate that the two-inch limit is appropriate as a compliance limit.

Renault/Peugeot also questioned the three-inch deflection limit for systems that load the dummy symmetrically and two inches for systems that do not. It said that the difference between those systems should be addressed by relocation of the deflection sensors. It also asked the agency to define what constitutes a symmetrical system. VW also questioned the appropriateness of setting separate limits for chest compression for different types of restraint systems. It recommended adoption of a three-inch limit for all types of restraint systems.

Volvo also raised questions about the appropriateness of the proposed deflection criteria. Volvo said that the GM-developed criteria proposed in the April 1985 notice were based on a comparison of accident data gathered by Volvo and evaluated by GM in sled test simulations using the Hybrid III test dummy. Volvo said that the report did not analyze "whether the chest injuries were related to the chest acceleration or the chest deflection, or a combination of both."

The agency recognizes that there are several different types of potential chest injury mechanisms and that it may not be possible to precisely isolate and measure what is the relevant contribution of each type of mechanism to the final resulting injury. However, there is a substantial amount of data indicating that chest deflection is an important contributing factor to chest injury. In addition, the data clearly demonstrate that deflection of greater than three inches can lead to serious injury. For example, research done by Neathery and others has examined the effects of frontal impacts to cadaver chests with an impactor that represents the approximate dimensions of a steering wheel hub. Neathery correlated the measured injuries with the amount of chest deflection and recommended that for a 50th percentile male, chest deflection not exceed three inches. (Neathery, R. F., "Analysis of Chest Impact Response Data and Scaled Performance Recommendations," SAE Paper No. 741188)

Work by Walfisch and others looked at crash tests of lap/shoulder belt restrained cadavers. They found that substantial injury began to occur when the sternum deflection exceeded 30 percent of the available chest depth ("Tolerance Limits and Mechanical Characteristic of the Human Thorax in Frontal and Side Impact and Transposition of these Characteristics into Protective Criteria," 1982 IRCOBI Conference Proceedings). With the chest of the average man being approximately 9.3 inches deep, the 30 percent limit would translate into a deflection limit of approximately 2.8 inches. Since the chest of the Hybrid III test dummy deflects somewhat less than a human chest under similar loading conditions, the chest deflection limit for systems which do not symmetrically and uniformly load the chest, such as lap/shoulder belts, must be set at a level below 2.8 inches to assure an adequate level of protection.

To determine the appropriate level for non-symmetrical systems, the agency first reviewed a number of test series in which cadaver injury levels were measured under different impact conditions. (All of the test results are fully discussed in Chapter III of the Final Regulatory Evaluation on the Hybrid III.) The impact conditions included 30 mph sled tests done for the agency by Wayne State University in which a pre-inflated, non-vented air bag system symmetrically and uniformly spread the impact load on the chest of the test subject. NHTSA also reviewed 30 mph sled tests done for the agency by the University of Heidelberg which used a lap/shoulder belt system, which does not symmetrically and uniformly spread chest loads. In addition, the agency reviewed 10 and 15 mph pendulum impact tests done for GM to evaluate the effects of concentrated loadings, such as might occur in passive interior impacts. The agency then compared the chest deflection results for Hybrid III test dummies subjected to the same impact conditions. By comparing the cadaver and Hybrid III responses under identical impact conditions, the agency was able to relate the deflection measurements made by the Hybrid III to a level of injury received by a cadaver.

The test results show that when using a relatively stiff air bag, which was pre-inflated and non-vented, the average injury level measured on the cadavers corresponded to an Abbreviated Injury Scale (AIS) of 1.5. (The AIS scale is used by researchers to classify injuries an AIS of one is a minor injury, while an AIS of three represents a serious injury.) In tests with the Hybrid III under the same impact conditions, the measured deflection was 2.7 inches. These results demonstrate that a system that symmetrically and uniformly distributes impact loads over the chest can produce approximately threeinches of deflection and still adequately protect an occupant from serious injury.

The testing in which the impact loads were not uniformly or symmetrically spread on the chest or were highly concentrated over a relatively small area indicated that chest deflection measured on the Hybrid III must be limited to 2-inches to assure those systems provide a level of protection comparable to that provided by systems that symmetrically spread the load. In the lap/shoulder belt tests, the average AIS was 2.6. The measured deflection for the Hybrid III chest in the same type of impact test was 1.6 inches. Likewise, the results from the pendulum impact tests showed that as the chest deflection measured on the Hybrid III increased, the severity of the injuries increased. In the 10 mph pendulum impacts, the average AIS was 1.3 and the average deflection was 1.3 inches. In the 15 mph pendulum impacts the average AIS rose to 2.8. Under the same impact conditions, the chest deflection measured on the Hybrid III was 2.63 inches.

Based on these test results NHTSA has decided to retain the two-inch limit on chest deflection for systems that do not symmetrically and uniformly distribute impact loads over a wide area of the chest. Such systems include automatic safety belts, passive interiors and air bag systems which use a lap and shoulder belt. For systems, such as air bag only systems or air bag combined with a lap belt, which symmetrically and uniformly distribute chest forces over a large area of the chest, the agency is adopting the proposed three-inch deflection limit. This should assure that both symmetrical and non-symmetrical systems provide the same level of protection in an equivalent frontal crash.

In addition to the biomechanical basis for the chest deflection limits adopted in this notice, there is another reason for adopting a two-inch deflection limit for systems that can provide concentrated loadings over a limited area of the test dummy. The Hybrid III measures chest deflection by a deflection sensor located near the third rib of the test dummy. Tests conducted on the Hybrid III by NHTSA's Vehicle Research and Test Center have shown that the deflection sensor underestimates chest displacement when a load is applied to a small area away from the deflection sensor. (The test report is filed in Docket No. 74-14, General Reference, Entry 606.)

In a crash, when an occupant is not restrained by a system which provides centralized, uniform loading to a large area, such as an air bag system, the thorax deflection sensor can underestimate the actual chest compression. Thus, in a belt-restrained test dummy, the deflection sensor may read two-inches of deflection, but the actual deflection caused by the off-center loading of a belt near the bottom of the ribcage may be greater than two inches of deflection. Likewise, test dummies in passive interior cars may receive substantial off-center and concentrated loadings. For example, the agency has conducted sled tests simulating 30 mile per hour frontal barrier impacts in which unrestrained test dummies struck the steering column, as they would do in a passive interior equipped car. Measurements of the pre- and post-impact dimensions of the steering wheel rim showed that there was substantial non-symmetrical steering wheel deformation, even though these were frontal impacts. (See, e.g., "Frontal Occupant Sled Simulation Correlation, 1983 Chevrolet Celebrity Sled Buck," Publication No. DOT HS 806 728, February 1985.) The expected off-center chest loadings in belt and passive interior systems provide a further basis for applying a two-inch deflection limit for those systems to assure they provide protection comparable to that provided by symmetrical systems.

Use of Acceleration Limits for Air Bag Systems

Two commenters raised questions about the use of an acceleration-based criterion for vehicles which use a combined air bag and lap/shoulder belt system. Mercedes-Benz said that acceleration-based criteria are not appropriate for systems that reduce the deflection of the ribs but increase chest acceleration values. Ford also questioned the use of acceleration-based criteria. Ford said that its tests and testing done by Mercedes-Benz have shown that using an air bag in combination with a lap/shoulder belt can result in increased chest acceleration readings. Ford said it knew of no data to indicate that combined air bag-lap/shoulder belt system loads are more injurious than shoulder belt loads alone. Ford recommended that manufacturers have the option of using either the chest acceleration or chest deflection criterion until use of the Hybrid III is mandatory.

As discussed previously, acceleration and deflection represent two separate types of injury mechanisms. Therefore, the agency believes that it is important to test for both criteria. Although the tests by Mercedes-Benz and Ford show higher chest accelerations, the tests also show that it is possible to develop air bag and lap/shoulder belt systems and meet both criteria. Therefore, the agency is retaining the use of the acceleration-based criterion.

Use of Additional Sensors

Mercedes-Benz said the deflection measuring instrumentation of the Hybrid III cannot adequately measure the interaction between the chest and a variety of vehicle components. Mercedes-Benz said that it is necessary to use either additional deflection sensors or strain gauges. Renault/Peugeot recommended that the agency account for the difference between symmetrical systems and asymmetrical systems by relocating the deflection sensor.

The agency recognizes that the use of additional sensors could be beneficial in the Hybrid III to measure chest deflection. However, such technology would require considerable further development before it could be used for compliance purposes. NHTSA believes that, given the current level of technology, use of a single sensor is sufficient for the assessment of deflection-caused injuries in frontal impacts.

Femurs

The April 1985 notice proposed to apply the femur injury reduction criterion used with the Part 572 test dummy to the Hybrid III. That criterion limits the femur loads to 2250 pounds to reduce the possibility of femur fractures. No commenter objected to the proposed femur limit and it is accordingly adopted.

Ford and Toyota questioned the need to conduct three pendulum impacts for the knee. They said that using one pendulum impact with the largest mass impactor (11 pounds) was sufficient. GM has informed the agency that the lower mass pendulum impactors were used primarily for the development of an appropriate knee design. Now that the knee design is settled and controlled by the technical drawings, the tests with the low mass impactors are not needed. Accordingly, the agency is adopting the suggestion from Ford and Toyota to reduce the number of knee calibration tests and will require only the use of the 11-pound pendulum impactor.

Hybrid III Positioning Procedure

The April notice proposed new positioning procedures for the Hybrid III, primarily because the curved lumbar spine of that test dummy requires a different positioning technique than those for the Part 572. Based on its testing experience, NHTSA proposed adopting a slightly different version of the positioning procedure used by GM. The difference was the proposed use of the Hybrid III, rather than the SAE J826 H-point machine, with slightly modified leg segments, to determine the H-point of the seat.

GM urged the agency to adopt its dummy positioning procedure. GM said that users can more consistently position the test dummy's H-point using the SAE H-point machine rather than using the Hybrid III. Ford, while explaining that it had insufficient experience with the Hybrid III to develop data on positioning procedures, also urged the agency to adopt GM's positioning procedure. Ford said that since GM has developed its repeatability data on the Hybrid III using its positioning procedure, the agency should use it as well. Ford also said that the use of GM's method to position the test dummy relative to the H-point should reduce variability.

Based on a new series of dummy positioning tests done by the agency's Vehicle Research and Test Center (VRTC), NHTSA agrees that use of the SAE H-point machine is the most consistent method to position the dummy's H-point on the vehicle seat.

Accordingly, the agency is adopting the use of the H-point machine.

In the new test series, VRTC also evaluated a revised method for positioning the Hybrid III test dummy. The testing was done after the results of a joint NHTSA-SAE test series conducted in November 1985 showed that the positioning procedure used for the current Part 572 test dummy and the one proposed in the April 1985 notice for the Hybrid III does not satisfactorily work in all cars. (See Docket 74-14, Notice 39, Entry 39.) The positioning problems are principally due to the curved lumbar spine of the Hybrid III test dummy. In its tests, VRTC positioned the Hybrid III by using the SAE H-point machine and a specification detailing the final position of the Hybrid III body segments prior to the crash test. The test results showed that the H-point of the test dummy could be consistently positioned but that the vertical location of the Hybrid III H-point is 1/4 inch below the SAE H-point machine on average. Based on these results, the agency is adopting the new positioning specification for the Hybrid III which requires the H-point of the dummy to be within a specified zone centered 1/4 inch below the H-point location of the SAE H-point machine.

GM also urged the agency to make another slight change in the test procedures. GM said that when it settles the test dummy in the seat it uses a thin sheet of plastic behind the dummy to reduce the friction between the fabric of the seat back and the dummy. The plastic is removed after the dummy has been positioned. GM said this technique allows the dummy to be more repeatably positioned. The agency agrees that use of the plastic sheet can reduce friction between the test dummy and the seat. However, the use of the plastic can also create problems, such as dislocating the test dummy during removal of the plastic. Since the agency has successfully conducted its positioning tests without using a sheet of plastic, the agency does not believe there is a need to require its use.

Ford noted that the test procedure calls for testing vertically adjustable seats in their lowest position. It said such a requirement was reasonable for vertically adjustable seats that could not be adjusted higher than seats that are not vertically adjustable. However, Ford said that new power seats can be adjusted to positions above and below the manually adjustable seat position. It said that testing power seats at a different position would increase testing variability. Ford recommended adjusting vertically adjustable seats so that the dummy's hip point is as close as possible to the manufacturer's design H-point with the seat at the design mid-point of its travel.

The agency recognizes that the seat adjustment issue raised by Ford may lead to test variability. However, the agency does not have any data on the effect of Ford's suggested solution on the design of other manufacturer's power seats. The agency will solicit comments on Ford's proposal in the NPRM addressing additional Hybrid III injury criteria.

Volvo said that the lumbar supports of its seats influence the positioning of the Hybrid III. It requested that the test procedure specify that adjustable lumbar supports should be positioned in their rearmost position. Ford made a similar request. GM, however, indicated that it has not had any problems positioning the Hybrid III in seats with lumbar supports. To reduce positioning problems resulting from the lumbar supports in some vehicles, the agency is adopting Ford's and Volvo's suggestion.

Test Data Analysis

The Chairman of the Society of Automotive Engineers Safety Test Instrumentation Committee noted that the agency proposed to reference an earlier version of the SAE Recommended Practice on Instrumentation (SAE J211a, 1971). He suggested that the agency reference the most recent version (SAE J211, 1980), saying that better data correlation between different testing organizations would result. The agency agrees with SAE and is adopting the SAE J211, 1980 version of the instrumentation Recommended Practice.

Ford and GM recommended that the figures 25 and 26, which proposed a standardized coordinate system for major body segments of the test dummy, be revised to reflect the latest industry practice on coordinate signs. Since those revisions will help ensure uniformity in data analysis by different test facilities, the agency is making the changes for the test measurements adopted in this rulemaking.

Both GM and Ford also recommended changes in the filter used to process electronically measured crash data. GM suggested that a class 180 filter be used for the neck force transducer rather than the proposed class 60 filter. Ford recommended the use of a class 1,000 filter, which is the filter used for the head accelerometer.

NHTSA has conducted all of the testing used to develop the calibration test requirement for the neck using a class 60 filter. The agency does not have any data showing the effects of using either the class 180 filter proposed by GM or the class 1,000 filter proposed by Ford. Therefore the agency has adopted the use of a class 60 filter for the neck transducer during the calibration test. The agency also used a class 60 filter for the accelerometer mounted on the neck pendulum and is therefore adopting the use of that filter to ensure uniformity in measuring pendulum acceleration.

Optional and Mandatory Use of Hybrid III

AMC, Chrysler, Ford, Jaguar and Subaru all urged the agency to defer a decision on permitting the optional use of the Hybrid III test dummy until manufacturers have had more experience with using that test dummy. AMC said it has essentially no experience with the Hybrid III and urged the agency to postpone a decision on allowing the optional use of that test dummy. AMC said this would give small manufacturers time to gain experience with the Hybrid III.

Chrysler also said that it has no experience with the Hybrid III test dummy and would need to conduct two years of testing to be able to develop sufficient information to address the issues raised in the notice. Chrysler said that it was currently developing its 1991 and 1992 models and has no data from Hybrid III test dummies on which to base its design decisions. It said that allowing the optional use of the Hybrid III before that time would give a competitive advantage to manufacturers with more experience with the test device and suggested indefinitely postponing the mandatory effective date.

Ford said that the effective date proposed for optional use of the Hybrid III should be deferred to allow time to resolve the problems Ford raised in its comments and to allow manufacturers time to acquire Hybrid III test dummies. It suggested deferring the proposed optional use until at least September 1, 1989. Ford also recommended that the mandatory use be deferred. Jaguar also said it has not had experience with the Hybrid III and asked that manufacturers have until September 1, 1987, to accumulate information on the performance of the test dummy. Subaru said that it has exclusively used the Part 572 test dummy and does not have any experience with the Hybrid III. It asked the agency to provide time for all manufacturers to gain experience with the Hybrid III, which in its case would be two years, before allowing the Hybrid III as an alternative.

A number of manufacturers, such as GM, Honda, Mercedes-Benz, Volkswagen, and Volvo, that supported optional use of the Hybrid III, urged the agency not to mandate its use at this time. GM asked the agency to permit the immediate optional use of the Hybrid III, but urged NHTSA to provide more time for all interested parties to become familiar with the test dummy before mandating its use. Honda said that while it supported optional use, it was just beginning to assess the performance of the Hybrid III and needed more time before the use of the Hybrid III is mandated. Mercedes-Benz also supported the use of the Hybrid III as an alternative test device because of its capacity to measure more types of injuries and because of its improved biofidelity for the neck and thorax. However, Mercedes recommended against mandatory use until issues concerning the Hybrid III's use in side impact, the biofidelity of its leg, durability and chest deflection measurements are resolved. Nissan opposed the mandatory us of the Hybrid III saying there is a need to further investigate the differences between the Hybrid III and the Part 572. Toyota said that it was premature to set a mandatory effective date until the test procedure and injury criteria questions are resolved. Volkswagen supported the adoption of the Hybrid III as an alternative test device, but it opposed mandating its use. Volvo supported the optional use of the Hybrid III. It noted that since NHTSA is developing an advanced test dummy, there might not be a need to require the use of the Hybrid III in the interim.

The agency recognizes that manufacturers are concerned about obtaining the Hybrid III test dummy and gaining experience with its use prior to the proposed September 1, 1991, date for mandatory use of that test dummy. However, information provided by the manufacturers of the Hybrid III shows that it will take no longer than approximately one year to supply all manufacturers with sufficient quantities of Hybrid III's. This means that manufacturers will have, at a minimum, more than four years to gain experience in using the Hybrid III. In addition, to assist manufacturers in becoming familiar with the Hybrid III, NHTSA has been placing in the rulemaking docket complete information on the agency's research programs using the Hybrid III test dummy in crash and calibration tests. Since manufacturers will have sufficient time to obtain and gain experience with the Hybrid III by September 1, 1991, the agency has decided to mandate use of the Hybrid III as of that date.

As discussed earlier in this notice, the evidence shows that the Hybrid III is more human-like in its responses to impacts than the existing Part 572 test dummy. In addition, the Hybrid III has the capability to measure far more potential injuries than the current test dummy. The agency is taking advantage of that capability by adopting a limitation on chest deflection which will enable NHTSA to measure a significant source of injury that cannot be measured on the current test dummy. The combination of the better biofidelity and increased injury-measuring capability available with the Hybrid III will enhance vehicle safety.

Adoption of the Hybrid III will not give a competitive advantage to GM, as claimed by some of the commenters, such as Chrysler and Ford. As the developer of the Hybrid III, GM obviously has had more experience with that test dummy than other manufacturers. However, as discussed above, the agency has provided sufficient leadtime to allow all manufacturers to develop sufficient experience with the Hybrid III test dummy. In addition, as discussed in the equivalency section of this notice, there are no data to suggest that it will be easier for GM or other manufacturers to meet the performance requirements of Standard No. 208 with the Hybrid III. Thus GM and other manufacturers using Hybrid III during the phase-in period will not have a competitive advantage over manufacturers using the existing Part 572 test dummy.

Finally, in its comments GM suggested that the agency consider providing manufacturers with an incentive to use the Hybrid III test dummy. GM said that the agency should consider providing manufacturers with extra vehicle credits during the automatic restraint phase-in period for using the Hybrid III. The agency does not believe it is necessary to provide any additional incentive to use the Hybrid III. The mandatory effective date for use of the Hybrid III provides sufficient incentive, since manufacturers will want to begin using the Hybrid III as soon as possible to gain experience with the test dummy before that date.

Optional use of the Hybrid III may begin October 23, 1986. The agency is setting an effective date of less than 180 days to facilitate the efforts of those manufacturers wishing to use the Hybrid III in certifying compliance with the automatic restraint requirements.

Use of Non-instrumented Test Dummies

Ford raised a question about whether the Hybrid III may or must be used for the non-crash performance requirements of Standard No. 208, such as the comfort and convenience requirements of S7.4.3, 7.4.4, and 7.4.5 of the standard. Ford said that manufacturers should be given the option of using either the Part 572 or Hybrid III test dummy to meet the comfort and convenience requirements. The agency agrees that until September 1, 1991, manufacturers should have the option of using either the Part 572 or Hybrid III test dummy. However, since it is important the crash performance requirements and comfort and convenience requirements be linked together through the use of a single test dummy to measure a vehicle's ability to meet both sets of requirements. Therefore, beginning on September 1, 1991, use of the Hybrid III will be mandatory in determining a vehicle's compliance with any of the requirements of Standard No. 208.

In addition, Ford asked the agency to clarify whether manufacturers can continue to use Part 572 test dummies in the crash tests for Standard Nos. 212, 219, and 301, which only use non-instrumented test dummies to simulate the weight of an occupant. Ford said that the small weight difference and the small difference in seated posture between the two test dummies should have no effect on the results of the testing for Standard Nos. 212, 219, and 301. The agency agrees that use of either test dummy should not affect the test results for those standards. Thus, even after the September 1, 1991, effective date for use of the Hybrid III in the crash and non-crash testing required by Standard No. 208, manufacturers can continue to use, at their option, either the Part 572 or the Hybrid III test dummy in tests conducted in accordance with Standard Nos. 212, 219, and 301.

Economic and Other Impacts

NHTSA has examined the impact of this rulemaking action and determined that it is not major within the meaning of Executive Order 12291 or significant within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has also determined that the economic and other impacts of this rulemaking action are not significant. A final regulatory evaluation describing those effects has been placed in the docket.

In preparing the regulatory evaluation, the agency has considered the comments from several manufacturers that the agency had underestimated the costs associated with using the Hybrid III. Ford said that the cost estimates contained in the April 1985 notice did not take into account the need to conduct sled tests during development work. Ford said that for 1985, it estimated it will conduct 500 sled tests requiring 1000 test dummy applications. Ford also said that NHTSA's estimate of the test dummy inventory needed by a manufacturer is low. It said that it currently has an inventory of 31 Part 572 test dummies and would expect to need a similar inventory of Hybrid III's. In addition, Ford said that NHTSA's incremental cost estimate of $3,000 per test dummy was low. It said that the cost for monitoring the extra data generated by the Hybrid III is $2,700. Ford said that it also would have to incur costs due to upgrading its data acquisition and data processing equipment.

GM said that NHTSA's estimate of a 30-test useful life for the test dummy substantially underestimates its actual useful life, assuming the test dummy is repaired periodically. It said that some of its dummies have been used in more than 150 tests. GM also said that the agency's assumption that a large manufacturer conducts testing requiring approximately 600 dummy applications each year underestimates the actual number of tests conducted. In 1984, GM said it conducted sled and barrier tests requiring 1179 dummy applications. GM said that the two underestimates, in effect, cancel each other out, since the dummies are usable for at least five times as many tests, but they are used four times as often.

Mitsubishi said that its incremental cost per vehicle is $7 rather than 40 cent as estimated by the agency. Mitsubishi explained the reason for this difference is that the price of an imported Hybrid III is approximately two times the agency estimate and its annual production is about one-tenth of the amount used in the agency estimate. Volvo also said the agency had underestimated the incremental cost per vehicle. Volvo said it conducts approximately 500–600 test dummy applications per year in sled and crash testing, making the incremental cost in the range of $15–18 per vehicle based on its export volume to the United States.

NHTSA has re-examined the costs associated with the Hybrid III test dummy. The basic Hybrid III dummy with the instrumentation required by this final rule costs $35,000 or approximately $16,000 more than the existing 572 test dummy. Assuming a useful life for the test dummy of 150 tests, the total estimated incremental capital cost is approximately $107 per dummy test.

To determine the incremental capital cost per test, the agency had to estimate the useful life of the Hybrid III. Based on NHTSA's test experience, the durability of the existing Part 572 test dummy and the Hybrid III test dummy is essentially identical with the exception of the Hybrid III ribs. Because the Hybrid III dummy chest was developed to simulate human chest deflection, the ribs had to be designed with much more precision to reflect human impact response. This redesign uses less metal and consequently they are more susceptible to damage during testing than the Part 572 dummy.

As discussed previously, GM estimates that the Hybrid III ribs can be used in severe unrestrained testing approximately 17 times before the ribs or the damping material needs replacement. In addition, GM's experience shows that the Hybrid III can withstand as many as 150 test applications as long as occasional repairs are made. Ford reported at the previously cited MVMA meeting that one of its belt-restrained Hybrid III test dummies underwent 35 crash tests without any degradation. Clearly, the estimated useful life of the test dummy is highly dependent on the type of testing, restrained or unrestrained, it is used for. Based on its own test experience and the experience of Ford and GM cited above, the agency has decided to use 30 applications as a conservative estimate of the useful life of the ribs. Assuming a life of 30 tests before a set of ribs must be replaced at a cost of approximately $2,000, the incremental per test cost is approximately $70.

The calibration tests for the Hybrid III test dummy have been simplified from the original specification proposed in the April 1985 notice. The Transportation Research Center of Ohio, which does calibration testing of the Hybrid III for the agency, vehicle manufacturers and others estimates the cost of the revised calibration tests is $1528. This is $167 less than the calibration cost for the existing Part 572 test dummy.

Numerous unknown variables will contribute to the manufacturers' operating expense, such as the cost of new or modified test facilities or equipment to maintain the more stringent temperature range of 69° F to 72° F for test dummies, and capital expenditures for lab calibration equipment, signal conditioning equipment, data processing techniques and capabilities, and additional personnel. Obviously, any incremental cost for a particular manufacturer to certify compliance with the automatic restraint requirements of Standard No. 208 will also depend on the extent and nature of its current test facilities and the size of its developmental and new vehicle test programs.

In addition to the costs discussed above, Peugeot raised the issue of a manufacturer's costs increasing because the proposed number of injury measurements made on the Hybrid III will increase the number of tests that must be repeated because of lost data. Since the agency is only adding one additional measurement, chest deflection, for the Hybrid III the number of tests that will have to be repeated due to lost data should not be substantially greater for the Hybrid III than for the Part 572.

Effective Date

NHTSA has determined that it is in the public interest to make the optional use of the Hybrid III test dummy effective in 90 days. This will allow manufacturers time to order the new test dummy to use in their new vehicle development work. Mandatory use of the Hybrid III does not begin until September 1, 1991.

In consideration of the foregoing, Part 572, *Anthropomorphic Test Dummies*, and Part 571.208, *Occupant Crash Protection*, of Title 49 of the Code of Federal Regulations is amended as follows:

Part 572–[AMENDED]

1. The authority citation for Part 572 is amended to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, and 1407; delegation of authority at 49 CFR 1.50.

2. A new Subpart E is added to Part 572 to read as follows:

Subpart E—Hybrid III Test Dummy

§ 572.30 *Incorporated materials*
§ 572.31 *General description*
§ 572.32 *Head*
§ 572.33 *Neck*
§ 572.34 *Thorax*
§ 572.35 *Limbs*
§ 572.36 *Test conditions and instrumentation*

§ 572.30 *Incorporated Materials*

(a) The drawings and specifications referred to in this regulation that are not set forth in full are hereby incorporated in this part by reference. The Director of the Federal Register has approved the materials incorporated by reference. For materials subject to change, only the specific version approved by the Director of the Federal Register and specified in the regulation are incorporated. A notice of any change will be published in the *Federal Register*. As a convenience to the reader, the materials incorporated by reference are listed in the Finding Aid Table found at the end of this volume of the Code of Federal Regulations.

(b) The materials incorporated by reference are available for examination in the general reference section of Docket 74-14, Docket Section, National Highway Traffic Safety Administration, Room 5109, 400 Seventh Street, S.W., Washington, DC 20590. Copies may be obtained from Rowley-Scher Reprographics, Inc., 1216 K Street, N.W., Washington, DC 20005 ((202) 628-6667). The drawings and specifications are also on file in the reference library of the Office of the Federal Register, National Archives and Records Administration, Washington, D.C.

§ 572.31 *General description*

(a) The Hybrid III 50th percentile size dummy consists of components and assemblies specified in the Anthropomorphic Test Dummy drawing and specifications package which consists of the following six items:

(1) The Anthropomorphic Test Dummy Parts List, dated July 15, 1986, and containing 13 pages, and a Parts List Index, dated April 26, 1986, containing 6 pages,

(2) A listing of Optional Hybrid III Dummy Transducers, dated April 22, 1986, containing 4 pages,

(3) A General Motors Drawing Package identified by GM drawing No. 78051-218, revision P and subordinate drawings,

(4) Disassembly, Inspection, Assembly and Limbs Adjustment Procedures for the Hybrid III dummy, dated July 15, 1986,

(5) Sign Convention for the signal outputs of Hybrid II dummy transducers, dated July 15, 1986,

(6) Exterior Dimensions of the Hybrid III dummy, dated July 15, 1986.

(b) The dummy is made up of the following component assemblies:

Drawing Number	*Remarks*
78051-61 Head Assembly—Complete—	(T)
78051-90 Neck Assembly—Complete—	(A)
78051-89 Upper Torso Assembly—Complete—	(I)
78051-70 Lower Torso Assembly—Without Pelvic Instrumentation Assembly, Drawing No. 78051-59	(C)
86-5001-001 Leg Assembly—Complete (LH)—	
86-5001-002 Leg Assembly—Complete (RH)—	
78051-123 Arm Assembly—Complete (LH)—	(D)
78051-124 Arm Assembly—Complete (RH)—	(D)

(c) Any specifications and requirements set forth in this part supercede those contained in General Motors Drawing No. 78051-218, revision P.

(d) Adjacent segments are joined in a manner such that throughout the range of motion and also under crash-impact conditions, there is no contact between metallic elements except for contacts that exist under static conditions.

(e) The weights, inertial properties and centers of gravity location of component assemblies shall conform to those listed in drawing 78051-338, revision S.

(f) The structural properties of the dummy are such that the dummy conforms to this part in every respect both before and after being used in vehicle test specified in Standard No. 208 of this Chapter (§ 571.208).

§ 572.32 *Head*

(a) The head consists of the assembly shown in the drawing 78051-61, revision T, and shall conform to each of the drawings subtended therein.

(b) When the head (drawing 78051-61, revision T) with neck transducer structural replacement (drawing 78051-383, revision F) is dropped from a height of 14.8 inches in accordance with paragraph (c) of this section, the peak resultant accelerations at the location of the accelerometers mounted in the head in accordance with 572.36(c) shall not be less than 225g, and not more than 275g. The acceleration/time curve for the test shall be unimodal to the extent that oscillations occurring after the main acceleration pulse are less than ten percent (zero to peak) of the main pulse. The lateral acceleration vector shall not exceed 15g (zero to peak).

(c) *Test Procedure.* (1) Soak the head assembly in a test environment at any temperature between 66° F to 78° F and at a relative humidity from 10% to 70% for a period of at least four hours prior to its application in a test.

(2) Clean the head's skin surface and the surface of the impact plate with 1,1,1 Trichlorethane or equivalent.

(3) Suspend the head, as shown in Figure 19, so that the lowest point on the forehead is 0.5 inches below the lowest point on the dummy's nose when the midsagittal plane is vertical.

(4) Drop the head from the specified height by means that ensure instant release onto a rigidly supported flat horizontal steel plate, which is 2 inches thick and 2 feet square. The plate shall have a clean, dry surface and any microfinish of not less than 8 microinches (rms) and not more than 80 microinches (rms).

(5) Allow at least 2 hours between successive tests on the same head.

§ 572.33 *Neck*

(a) The neck consists of the assembly shown in drawing 78051-90, revision A and conforms to each of the drawings subtended therein.

(b) When the neck and head assembly (consisting of the parts 78051-61, revision T; -84; -90, revision A; -96; -98; -303, revision E; -305; -306; -307, revision X, which has a neck transducer (drawing 83-5001-008) installed in conformance with 572.36(d), is tested in accordance with paragraph (c) of this section, it shall have the following characteristics:

(1) *Flexion* (i) Plane D, referenced in Figure 20, shall rotate, between 64 degrees and 78 degrees, which shall occur between 57 milliseconds (ms) and 64 ms from time zero. In first rebound, the rotation of plane D shall cross 0 degree between 113 ms and 128 ms.

(ii) The moment measured by the neck transducer (drawing 83-5001-008) about the occipital condyles, referenced in Figure 20, shall be calculated by the following formula: Moment (lbs-ft) = $M_y + 0.02875 \times F_x$ where M_y is the moment measured in lbs-ft by the moment sensor of the neck transducer and F_x is the force measure measured in lbs by the x axis force sensor of the neck transducer. The moment shall have a maximum value between 65 lbs-ft and 80 lbs-ft occurring between 47 ms and 58 ms, and the positive moment shall decay for the first time to 0 lb-ft between 97 ms and 107 ms.

(2) *Extension* (i) Plane D, referenced in Figure 21, shall rotate between 81 degrees and 106 degrees, which shall occur between 72 and 82 ms from time zero. In first rebound, the rotation of plane D shall cross 0 degree between 147 and 174 ms.

(ii) The moment measured by the neck transducer (drawing 83-5001-008) about the occipital condyles, referenced in Figure 21, shall be calculated by the following formula: Moment (lbs-ft) = $M_y + 0.02875 \times F_x$ where M_y is the moment measured in lbs-ft by the moment sensor of the neck transducer and F_x is the force measure measured in lbs by the x axis force sensor of the neck transducer. The moment shall have a minimum value between −39 lbs-ft and −59 lbs-ft, which shall occur between 65 ms and 79 ms., and the negative moment shall decay for the first time to 0 lb-ft between 120 ms and 148 ms.

(3) Time zero is defined as the time of contact between the pendulum striker plate and the aluminum honeycomb material.

(c) *Test Procedure.* (1) Soak the test material in a test environment at any temperature between 69 degrees F to 72 degrees F and at a relative humidity from 10% to 70% for a period of at least four hours prior to its application in a test.

(2) Torque the jamnut (78051-64) on the neck cable (78051-301, revision E) to 1.0 lbs-ft ± .2 lbs-ft.

(3) Mount the head-neck assembly, defined in paragraph (b) of this section, on a rigid pendulum as shown in Figure 22 so that the head's midsagittal plane is vertical and coincides with the plane of motion of the pendulum's longitudinal axis.

(4) Release the pendulum and allow it to fall freely from a height such that the tangential velocity at the pendulum accelerometer centerline at the instance of contact with the honeycomb is 23.0 ft/sec ± 0.4 ft/sec. for flexion testing and 19.9 ft/sec ± 0.4 ft/sec. for extension testing. The pendulum deceleration vs. time pulse for flexion testing shall

conform to the characteristics shown in Table A and the decaying deceleration-time curve shall first cross 5g between 34 ms and 42 ms. The pendulum deceleration vs. time pulse for extension testing shall conform to the characteristics shown in Table B and the decaying deceleration-time curve shall cross 5g between 38 ms and 46 ms.

Table A
Flexion Pendulum Deceleration vs. Time Pulse

Time (ms)	*Flexion deceleration level (g)*
10	22.50-27.50
20	17.60-22.60
30	12.50-18.50
Any other time above 30 ms	29 maximum

Table B
Extension Pendulum Deceleration vs. Time Pulse

Time (ms)	*Extension deceleration level (g)*
10	17.20-21.20
20	14.00-19.00
30	11.00-16.00
Any other time above 30 ms	22 maximum

(5) Allow the neck to flex without impact of the head or neck with any object during the test.

§ 572.34 *Thorax*

(a) The thorax consists of the upper torso assembly in drawing 78051-89, revision I and shall conform to each of the drawings subtended therein.

(b) When impacted by a test probe conforming to S572.36(a) at 22 fps ± .40 fps in accordance with paragraph (c) of this section, the thorax of a complete dummy assembly (78051-218, revision P) with left and right shoes (78051-294 and -295) removed, shall resist with the force measured by the test probe from time zero of 1162.5 pounds ± 82.5 pounds and shall have a sternum displacement measured relative to spine of 2.68 inches ± .18 inches. The internal hysteresis in each impact shall be more than 69% but less than 85%. The force measured is the product of pendulum mass and deceleration. Time zero is defined as the time of first contact between the upper thorax and pendulum face.

(c) *Test procedure.* (1) Soak the test dummy in an environment with a relative humidity from 10% to 70% until the temperature of the ribs of the test dummy have stabilized at a temperature between 69° F and 72° F.

(2) Seat the dummy without back and arm supports on a surface as shown in Figure 23.

(3) Place the longitudinal centerline of the test probe so that it is .5 ± .04 in. below the horizontal centerline of the No. 3 Rib (reference drawing number 79051-64, revision A-M) as shown in Figure 23.

(4) Align the test probe specified in S572.36(a) so that at impact its longitudinal centerline coincides within .5 degree of a horizontal line in the dummy's midsagittal plane.

(5) Impact the thorax with the test probe so that the longitudinal centerline of the test probe falls within 2 degrees of a horizontal line in the dummy midsagittal plane at the moment of impact.

(6) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

(7) Measure the horizontal deflection of the sternum relative to the thoracic spine along the line established by the longitudinal centerline of the probe at the moment of impact, using a potentiometer (ref. drawing 78051-317, revision A) mounted inside the sternum as shown in drawing 78051-89, revision I.

(8) Measure hysteresis by determining the ratio of the area between the loading and unloading portions of the force deflection curve to the area under the loading portion of the curve.

§572.35 *Limbs*

(a) The limbs consist of the following assemblies: leg assemblies 86-5001-001 and -002 and arm assemblies 78051-123, revision D, and -124, revision D, and shall conform to the drawings subtended therein.

(b) When each knee of the leg assemblies is impacted by the pendulum defined in S572.36(b) in accordance with paragraph (c) of this section at 6.9 ft/sec ± .10 ft/sec., the peak knee impact force, which is a product of pendulum mass and acceleration, shall have a minimum value of not less than 996 pounds and a maximum value of not greater than 1566 pounds.

(c) *Test Procedure.* (1) The test material consists of leg assemblies (86-5001-001) left and (-002) right with upper leg assemblies (78051-46) left and

(78051-47) right removed. The load cell simulator (78051-319, revision A) is used to secure the knee cap assemblies (79051-16, revision B) as shown in Figure 24.

(2) Soak the test material in a test environment at any temperature between 66° F to 78° F and at a relative humidity from 10% to 70% for a period of at least four hours prior to its application in a test.

(3) Mount the test material with the leg assembly secured through the load cell simulator to a rigid surface as shown in Figure 24. No contact is permitted between the foot and any other exterior surfaces.

(4) Place the longitudinal centerline of the test probe so that at contact with the knee it is colinear within 2 degrees with the longitudinal centerline of the femur load cell simulator.

(5) Guide the pendulum so that there is no significant lateral, vertical or rotational movement at time zero.

(6) Impact the knee with the test probe so that the longitudinal centerline of the test probe at the instant of impact falls within .5 degrees of a horizontal line parallel to the femur load cell simulator at time zero.

(7) Time zero is defined as the time of contact between the test probe and the knee.

§ 572.36 *Test conditions and instrumentation*

(a) The test probe used for thoracic impact tests is a 6 inch diameter cylinder that weighs 51.5 pounds including instrumentation. Its impacting end has a flat right angle face that is rigid and has an edge radius of 0.5 inches. The test probe has an accelerometer mounted on the end opposite from impact with its sensitive axis colinear to the longitudinal centerline of the cylinder.

(b) The test probe used for the knee impact tests is a 3 inch diameter cylinder that weighs 11 pounds including instrumentation. Its impacting end has a flat right angle face that is rigid and has an edge radius of 0.2 inches. The test probe has an accelerometer mounted on the end opposite from impact with its sensitive axis colinear to the longitudinal centerline of the cylinder.

(c) Head accelerometers shall have dimensions, response characteristics and sensitive mass locations specified in drawing 78051-136, revision A or its equivalent and be mounted in the head as shown in drawing 78051-61, revision T, and in the assembly shown in drawing 78051-218, revision D.

(d) The neck transducer shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing 83-5001-008 or its equivalent and be mounted for testing as shown in drawing 79051-63, revision W, and in the assembly shown in drawing 78051-218, revision P.

(e) The chest accelerometers shall have the dimensions, response characteristics, and sensitive mass locations specified in drawing 78051-136, revision A or its equivalent and be mounted as shown with adaptor assembly 78051-116, revision D, for assembly into 78051-218, revision L.

(f) The chest deflection transducer shall have the dimensions and response characteristics specified in drawing 78051-342, revision A or equivalent, and be mounted in the chest deflection transducer assembly 87051-317, revision A, for assembly into 78051-218, revision L.

(g) The thorax and knee impactor accelerometers shall have the dimensions and characteristics of Endevco Model 7231c or equivalent. Each accelerometer shall be mounted with its sensitive axis colinear with the pendulum's longitudinal centerline.

(h) The femur load cell shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing 78051-265 or its equivalent and be mounted in assemblies 78051-46 and -47 for assembly into 78051-218, revision L.

(i) The outputs of acceleration and force-sensing devices installed in the dummy and in the test apparatus specified by this part are recorded in individual data channels that conform to the requirements of SAE Recommended Practice J211, JUNE 1980, "Instrumentation for Impact Tests," with channel classes as follows:

(1) Head acceleration—Class 1000
(2) Neck force—Class 60
(3) Neck pendulum acceleration—Class 60
(4) Thorax and thorax pendulum acceleration—Class 180
(5) Thorax deflection—Class 180
(6) Knee pendulum acceleration—Class 600
(7) Femur force—Class 600

(j) Coordinate signs for instrumentation polarity conform to the sign convention shown in the document incorporated by § 572.31(a)(5).

(k) The mountings for sensing devices shall have no resonance frequency within range of 3 times the frequency range of the applicable channel class.

(l) Limb joints are set at lg, barely restraining the weight of the limb when it is extended horizontally. The force required to move a limb segment shall not exceed 2g throughout the range of limb motion.

(m) Performance tests of the same component, segment, assembly, or fully assembled dummy are separated in time by a period of not less than 30 minutes unless otherwise noted.

(n) Surfaces of dummy components are not painted except as specified in this part or in drawings subtended by this part. PART 571 [Amended]

2. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

3. Section S5 of Standard No. 208 (49 CFR 571.208) is amended by revising S5.1 to read as follows:

§ 571.208 [Amended]

S5. *Occupant crash protection requirements.*

S5.1 Vehicles subject to S5.1 and manufactured before September 1, 1991, shall comply with either, at the manufacturer's option, 5.1(a) or (b). Vehicles subject to S5.1 and manufactured on or after September 1, 1991, shall comply with 5.1(b).

(a) Impact a vehicle traveling longitudinally forward at any speed, up to and including 30 mph, into a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle under the applicable conditions of S8. The test dummy specified in S8.1.8.1 placed at each front outboard designated seating position shall meet the injury criteria of S6.1.1, 6.1.2, 6.1.3, and 6.1.4.

(b) Impact a vehicle traveling longitudinally forward at any speed, up to and including 30 mph, into a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle, under the applicable conditions of S8. The test dummy specified in S8.1.8.2 placed at each front outboard designated seating position shall meet the injury criteria of S6.2.1, 6.2.2, 6.2.3, 6.2.4, and 6.2.5.

3. Section S5.2 of Standard No. 208 is revised to read as follows:

S5.2 Lateral moving barrier crash.

S5.2.1 Vehicles subject to S5.2 and manufactured before September 1, 1991, shall comply with either, at the manufacturer's option, 5.2.1(a) or (b). Vehicles subject to S5.2 and manufactured on or after September 1, 1991, shall comply with 5.2.1(b).

(a) Impact a vehicle laterally on either side by a barrier moving at 20 mph under the applicable conditions of S8. The test dummy specified in S8.1.8.1 placed at the front outboard designated seating position adjacent to the impacted side shall meet the injury criteria of S6.1.2 and S6.1.3.

(b) When the vehicle is impacted laterally under the applicable conditions of S8, on either side by a barrier moving at 20 mph, with a test device specified in S8.1.8.2, which is seated at the front outboard designated seating position adjacent to the impacted side, it shall meet the injury criteria of S6.2.2, and S6.2.3.

4. Section S5.3 of Standard No. 208 is revised to read as follows:

S5.3 *Rollover* Subject a vehicle to a rollover test under the applicable condition of S8 in either lateral direction at 30 mph with either, at the manufacturer's option, a test dummy specified in S8.1.8.1 or S8.1.8.2, placed in the front outboard designated seating position on the vehicle's lower side as mounted on the test platform. The test dummy shall meet the injury criteria of either S6.1.1 or S6.2.1.

5. Section S6 of Standard No. 208 is revised to read as follows:

S6. *Injury Criteria*

S6.1 Injury criteria for the Part 572, Subpart B, 50th percentile Male Dummy.

S6.1.1 All portions of the test dummy shall be contained within the outer surfaces of the vehicle passenger compartment throughout the test.

S6.1.2 The resultant acceleration at the center of gravity of the head shall be such that the expression:

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a\,dt \right]^{2.5} t_2 - t_1$$

shall not exceed 1,000, where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2 are any two points during the crash.

S6.1.3 The resultant acceleration at the center of gravity of the upper thorax shall not exceed 60 g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S6.1.4 The compressive force transmitted axially through each upper leg shall not exceed 2250 pounds.

S6.2 *Injury criteria for the Part 572, Subpart E, Hybrid III Dummy*

S6.2.1 All portions of the test dummy shall be contained within the outer surfaces of the vehicle passenger compartment throughout the test.

S6.2.2 The resultant acceleration at the center of gravity of the head shall be such that the expression:

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a dt \right]^{2.5} t_2 - t_1$$

shall not exceed 1,000, where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2 are any two point during the crash.

S6.2.3 The resultant acceleration calculated from the thoracic instrumentation shown in drawing 78051-218, revision L, incorporated by reference in Part 572, Subpart E of this Chapter, shall not exceed 60g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S6.2.4 Compression deflection of the sternum relative to spine, as determined by instrumentation shown in drawing 78051-317, revision A, incorporated by reference in Part 572, Subpart E of this Chapter, shall not exceed 2 inches for loadings applied through any impact surfaces except for those systems which are gas inflated and provide distributed loading to the torso during a crash. For gas-inflated systems which provide distributive loading to the torso, the thoracic deflection shall not exceed 3 inches.

S6.2.5 The force transmitted axially through each upper leg shall not exceed 2250 pounds.

6. Section S8.1.8 of Standard No. 208 is revised to read as follows:

S8.1.8 *Anthropomorphic test dummies*

S8.1 8.1 The anthropomorphic test dummies used for evaluation of occupant protection systems manufactured pursuant to applicable portions of paragraphs S4.1.2, 4.1.3, and S4.1.4 shall conform to the requirements of Subpart B of Part 572 of this Chapter.

S8.1.8.2 Anthropomorphic test devices used for the evaluation of occupant protection systems manufactured pursuant to applicable portions of paragraphs S4.1.2, S4.1.3, and S4.1.4 shall conform to the requirements of Subpart E of Part 572 of this Chapter.

7. Section S8.1.9 of Standard No. 208 is revised to read as follows:

S8.1.9.1 Each Part 572, Subpart B, test dummy specified in S8.1.8.1 is clothed in formfitting cotton stretch garments with short sleeves and midcalf length pants. Each foot of the test dummy is equipped with a size 11EE shoe which meets the configuration size, sole, and heel thickness specifications of MIL-S-131192 and weighs 1.25 ± 0.2 pounds.

S8.1.9.2 Each Part 572, Subpart E, test dummy specified in S8.1.8.2 is clothed in formfitting cotton stretch garments with short sleeves and midcalf length pants specified in drawings 78051-292 and -293 incorporated by reference in Part 572, Subpart E, of this Chapter, respectively or their equivalents. A size 11EE shoe specified in drawings 78051-294 (left) and 78051-295 (right) or their equivalents is placed on each foot of the test dummy.

8. Section S8.1.13 of Standard No. 208 is revised to read as follows:

S8.1.13 *Temperature of the test dummy*

S8.1.13.1 The stabilized temperature of the test dummy specified by S8.1.8.1 is at any level between 66 degrees F and 78 degrees F.

S8.1.13.2 The stabilized temperature of the test dummy specified by S8.1.8.2 is at any level between 69 degrees F and 72 degrees F.

9. A new fourth sentence is added to section S8.1.3 to read as follows:

Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position.

10. A new section S11 is added to read as follows:

S11. *Positioning Procedure for the Part 572 Subpart E Test Dummy*

Position a test dummy, conforming to Subpart E of Part 572 of this Chapter, in each front outboard seating position of a vehicle as specified in S11.1 through S11.6. Each test dummy is restrained in accordance with the applicable requirements of S4.1.2.1, 4.1.2.2 or S4.6.

S11.1 *Head.* The transverse instrumentation platform of the head shall be horizontal within ½ degree.

S11.2 *Arms*

S11.2.1 The driver's upper arms shall be adjacent to the torso with the centerlines as close to a vertical plane as possible.

S11.2.2 The passenger's upper arms shall be in contact with the seat back and the sides of torso.

S11.3 *Hands*

S11.3.1 The palms of the driver test dummy shall be in contact with the outer part of the steering wheel rim at the rim's horizontal centerline. The thumbs shall be over the steering wheel rim and attached with adhesive tape to provide a breakaway force of between 2 to 5 pounds.

S11.3.2 The palms of the passenger test dummy shall be in contact with outside of thigh. The little finger shall be in contact with the seat cushion.

S11.4 *Torso*

S11.4.1 In vehicles equipped with bench seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver dummy shall be vertical and parallel to the vehicle's longitudinal centerline, and pass through the center of the steering wheel rim. The midsagittal plane of the passenger dummy shall be vertical and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the driver dummy.

S11.4.2 In vehicles equipped with bucket seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver and the passenger dummy shall be vertical and shall coincide with the longitudinal centerline of the bucket seat.

S11.4.3 *Lower torso*

S11.4.3.1 *H-point.* The H-point of the driver and passenger test dummies shall coincide within 1/2 inch in the vertical dimension and 1/2 inch in the horizontal dimension of a point 1/4 inch below the position of the H-point determined by using the equipment and procedures specified in SAE J826 (Apr 80) except that the length of the lower leg and thigh segments of the H-point machine shall be adjusted to 16.3 and 15.8 inches, respectively, instead of the 50th percentile values specified in Table 1 of SAE J826.

S11.4.3.2 *Pelvic angle.* As determined using the pelvic angle gage (GM drawing 78051-532 incorporated by reference in Part 572, Subpart E, of this chapter) which is inserted into the H-point gaging hole of the dummy, the angle measured from the horizontal on the 3 inch flat surface of the gage shall be 22 1/2 degrees plus or minus 2 1/2 degrees.

S11.5 *Legs.* The upper legs of the driver and passenger test dummies shall rest against the seat cushion to the extent permitted by placement of the feet. The initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches. To the extent practicable, the left leg of the driver dummy and both legs of the passenger dummy shall be in vertical longitudinal planes. Final adjustment to accommodate placement of feet in accordance with S11.6 for various passenger compartment configurations is permitted.

S11.6 *Feet*

S11.6.1 The right foot of the driver test dummy shall rest on the undepressed accelerator with the rearmost point of the heel on the floor surface in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, it shall be positioned perpendicular to the tibia and placed as far forward as possible in the direction of the centerline of the pedal with the rearmost point of the heel resting on the floor surface. The heel of the left foot shall be placed as far forward as possible and shall rest on the floor surface. The left foot shall be positioned as flat as possible on the floor surface. The longitudinal centerline of the left foot shall be placed as parallel as possible to the longitudinal centerline of the vehicle.

S11.6.2 The heels of both feet of the passenger test dummy shall be placed as far forward as possible and shall rest on the floor surface. Both feet shall be positioned as flat as possible on the floor surface. The longitudinal centerline of the feet shall be placed as parallel as possible to the longitudinal centerline of the vehicle.

S11.7 *Test dummy positioning for latchplate access.* The reach envelopes specified in S7.4.4 are obtained by positioning a test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

S11.8 *Test dummy positioning for belt contact force.* To determine compliance with S7.4.3 of this standard, position the test dummy in the vehicle in accordance with the requirements specified in S11.1 through S11.6 and under the conditions of S8.1.2 and S8.1.3. Pull the belt webbing three inches from the test dummy's chest and release until the webbing is within 1 inch of the test dummy's chest and measure the belt contact force.

S11.9 *Manual belt adjustment for dynamic testing.* With the test dummy at its designated seating position as specified by the appropriate requirements of S8.1.2, S8.1.3 and S11.1 through S11.6, place the Type 2 manual belt around the test dummy and fasten the latch. Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 2 to 4 pound tension load to the lap belt. If the belt system is equipped with a tension-relieving device introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer for normal use in the owner's manual for the vehicle. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor.

Issued on July 21,1986

Diane K. Steed
Administrator

51 F.R. 26688
July 25,1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection and Seat Belt Assemblies
(Docket No. 74-14; Notice 46)

ACTION: Final Rule; Response to petitions for reconsideration.

SUMMARY: This notice responds to eight petitions for reconsideration of several of the amendments to Standard No. 208, *Occupant Crash Protection,* that appeared in the *Federal Register* of Friday, March 21, 1986. In response to the petitions, the agency is modifying the test dummy positioning procedures. However, so as not to affect compliance testing done using the old procedures, the agency is permitting manufacturers to use either the old or new procedures for a one-year period. Beginning September 1, 1987, the new procedures would be mandatory. This notice denies a request to extend the September 1, 1989, effective date for dynamic testing of manual lap/shoulder belts in the front seat of passenger cars. (The dynamic test requirement would go into effect on that date only if the automatic restraint requirement is rescinded.) A response to four petitions asking the agency to reinstate certain of the test requirements of Standard No. 209, *Seat Belt Assemblies,* for dynamically-tested manual lap/shoulder belts, and to revise the current exemption for automatic belts, will be addressed separately at a later date.

DATES: The amendments made by this notice are effective on September 5, 1986.

SUPPLEMENTARY INFORMATION: On March 21, 1986 (51 FR 9800), NHTSA published a final rule amending Standard No. 208, *Occupant Crash Protection.* Subsequent to publication of the amendments, eight interested parties timely filed petitions asking the agency to reconsider some of the amendments adopted in that final rule. This notice responds to those petitions.

Test Procedures

The March notice adopted several changes to the test dummy positioning procedures of the standard. Ford Motor Company (Ford) said that the revised test procedures were not objective because of what it termed ambiguities, inconsistencies, and subjective elements in the test procedure provisions. Each of Ford's specific objections are discussed below, in the order that Ford raised them.

Positioning of Manual Belts for Dynamic Testing

Ford noted that the standard provides that in the dynamic test for manual belts, the lap/shoulder belt is to be placed around the test dummy after the dummy's arms and hands have been positioned. Ford said it is impracticable to position properly a lap/shoulder belt on a driver test dummy whose hands are on the steering wheel or on a passenger test dummy whose palms are in contact with its thighs. Ford noted that the agency's New Car Assessment Program (NCAP) test procedures provide for positioning the arms and hands after the safety belt has been positioned.

Ford is correct that the NCAP test procedure provides that the safety belts are to be placed on the test dummy before the arms and hands are placed in their final positions. To eliminate possible safety belt positioning problems, NHTSA is amending the Standard No. 208 positioning requirements to adopt the NCAP requirement.

Positioning of Automatic Belt for Dynamic Testing

Ford also noted that the safety belt positioning procedure applies only to manual belts and asked the agency to specify at what stage during the positioning of the test dummy automatic belts are to be deployed. Ford also asked what adjustment procedures the agency would use with automatic belts.

In NCAP testing, NHTSA has finally positioned both automatic and manual safety belts after the test dummy has been settled in its specified position and before the hands are placed in their final position. The agency has used this procedure because it is simpler than having to position the hands first and then move them in order to place the safety belt on the test dummy. NHTSA is therefore modifying the title of the safety belt positioning procedure to indicate that it applies to the positioning of both manual and automatic safety belts.

In the agency's NCAP testing, the only adjustment NHTSA has made to an automatic belt once it has been deployed on the test dummy is to ensure that the belt is lying flat on the test dummy's shoulder when the belt is in its final position. The agency is adopting the same procedure for the Standard No. 208 compliance test. In addition, as discussed immediately below, the agency will also adjust an automatic belt with a tension-relieving device that can be used to introduce slack in the belt system in accordance with the manufacturer's instructions provided in the vehicle owner's manual. For automatic belts that do not have devices that can be used to introduce slack in the belt system, it should not be necessary to make any further adjustments, other than ensuring the belt is flat on the test dummy's shoulder.

Adjusting Belt Slack

Ford noted that S7.4.2 of the standard requires automatic belts and dynamically-tested manual lap/shoulder belts to be tested with the maximum amount of slack recommended by the manufacturer. It said that the standard does not, however, prescribe a procedure for adjusting the slack of automatic belts with tension-relieving devices.

The purpose of S7.4.2 of the standard is to ensure that automatic and dynamically-tested manual belt systems will perform adequately when they are adjusted to the maximum amount of belt slack recommended by the vehicle manufacturer. S7.4.2(b) of the standard specifically requires manufacturers that use tension-relieving devices to provide information in their owner's manual describing how the tension-reliever works. In addition, the owner's manual must inform vehicle owners of the maximum amount of safety belt slack recommended by the vehicle manufacturer. In conducting its crash tests, the agency will adjust any safety belt tension-relieving devices in accordance with the instructions provided by the vehicle manufacturer in the owner's manual.

Belt Tension Loading

Ford noted that the safety belt positioning procedure specifies applying a 2-to-4 pound tension load to the lap belt of a lap/shoulder belt, but does not specify how the load is to be applied or how the tension is to be measured. Ford asked the agency to clarify the procedure, particularly with regard to whether the load is to be applied to the lap portion of the belt or whether an increasing load is to be placed on the shoulder portion of the belt until the required amount of tension has been reached in the lap portion of the belt.

NHTSA does not believe that the area of application of the belt tension load should have a significant effect on the subsequent performance of the belt in a dynamic test. However, to promote uniformity in application of the load, the agency is amending the standard to provide that the load will be applied to the shoulder portion of the belt adjacent to the latchplate of the belt. If the safety belt system is equipped with two retractors (one for the lap belt and one for the upper torso belt), then the tension load will be applied at the point the lap belt enters the retractor, since the separate lap belt retractor effectively controls the tension in the lap portion of a lap/shoulder belt. The amount of tension will also be measured at the location where the load is applied. Finally, the agency is amending the standard to provide that after the tension load has been applied, the shoulder belt will be positioned flat on the test dummy's shoulder. This will ensure that if the belt is twisted during the application of the tension load, it will be correctly positioned prior to the crash test.

Test Dummy Settling and Leg Positioning

Ford said that it was particularly concerned about the repeatability of the leg placement obtained using the new test procedures. Ford said that the positioning procedures provide for the placement of the test dummy's legs before the test dummy is settled. Ford said that the settling procedure usually results in movement of the test dummy's legs, but the new procedure does not call for readjustment of the leg positions after the test dummy has been settled. Ford requested that the procedure be changed by providing that after test dummy settling and placement of the arms and hands, the test dummy's feet and knees should be repositioned, if necessary. As an alternative approach, Ford suggested that the procedure provide that the test dummy settling be performed prior to adjustment of the legs.

NHTSA agrees that the procedures should be changed to minimize the possibility of inadvertent leg movement during the settling procedure. The agency is therefore adopting Ford's suggestion that the test dummy's feet and legs should be repositioned, if necessary, after the test dummy has been settled and its hands and arms have been positioned.

Initial Knee Spacing for the Driver

Ford and Nissan Motor Company, Ltd., (Nissan) expressed concern that NHTSA had misinterpreted comments made by General Motors Corporation (GM) and Honda Motor Company, Ltd., (Honda) concerning one of the proposed changes to the test dummy positioning procedures in the April 1985 NPRM. In that notice, NHTSA proposed a test dummy initial knee spacing of 14.5 inches for both the driver and passenger test dummies. In their comments on the April 1985 notice, GM and Honda requested that the proposed initial spacing of the passenger test dummy knees be changed from 14.5 inches to 11.75 inches, which would mean that the passenger test dummy legs would be parallel. In the March 1986 final rule, NHTSA adopted the 11.75 inch initial knee spacing change for both the driver and the passenger test dummy.

In their petitions for reconsideration, Ford and Nissan said that they support the change sought by GM and Honda for the initial placement of the passenger's knees. Thus, they requested the agency to apply the 11.75 inch requirement only to the spacing of the passenger's knees and retain the former 14.5 inch requirement for the driver's knees. Ford noted that an 11.75 inch initial knee spacing for the driver is not compatible with the requirement to position the driver's right foot on the accelerator pedal and keep the leg in a vertical plane.

NHTSA misinterpreted GM and Honda's suggested change and therefore believed that the commenters were seeking a change to the initial knee spacing requirement for both the driver and the passenger. NHTSA agrees that a change should not have been made to the initial knee spacing for the driver's knees, since the smaller initial knee spacing requirement is not compatible with the positioning requirement for the driver's right foot. The agency is therefore reinstating the 14.5 inch initial spacing requirement for the driver.

NHTSA emphasizes that, as it stated in the notice adopting the test dummy positioning procedures on July 5, 1977 (42 FR 34301), the knee spacing requirements apply only to the *initial* placement of the knees. The final spacing of the knees depends on the specific configuration of the vehicle's occupant compartment and may vary due to the positioning of the test dummy's feet to accommodate such differing design features as protruding wheelwells, foot rests, and ventilating system ducts. Thus, the agency recognizes that the initial spacing may have to be modified to ensure that the legs and feet are correctly positioned.

Driver Right Leg Positioning

Ford objected to the requirement in S10.1.1(b) that the driver's right leg be placed so that the upper and lower leg centerlines fall, as close as possible, in a vertical longitudinal plane. Ford said the requirement that the legs be in a vertical longitudinal plane is not compatible with the requirement that the driver's foot be placed on the accelerator pedal. Ford said that "in many passenger cars the accelerator pedal is further inboard than the pivot point of the driver's right femur and therefore not in the same longitudinal plane as the dummy's upper leg." Ford further said that requiring the leg to remain in a vertical plane is incompatible with the knee spacing requirement. Ford suggested that a leg position specification is unnecessary since specifying the positions of the foot and knee would adequately define the position of the right leg.

NHTSA recognizes that the initial knee spacing requirement and the requirements on foot placement help to maintain the right leg in a consistent position. However, because of the numerous variations in passenger car interior designs, it may not be possible to maintain the initial knee position and thus a further control is needed to maintain proper placement of the right leg. NHTSA recognizes it may be particularly difficult to place the right leg so that it is in a longitudinal plane, since as Ford pointed out, the right leg may have to be moved to place the foot on the accelerator. On reconsideration, the agency believes that simply requiring the leg to remain in a vertical plane after the right foot has been positioned (instead of a vertical longitudinal plane) should be sufficient to ensure consistent placement of the right leg.

Foot Placement on the Accelerator Pedal

Ford noted that S10.1.1(b) provides that if the driver's right foot can not be placed on the accelerator pedal, it is to be placed as far forward as possible in the direction of the "geometric center" of the pedal. Ford said that a formula is needed to guide technicians in determining the geometric center of an asymmetrically shaped accelerator pedal.

The agency agrees with Ford's underlying point that it is unnecessary to place the foot in the "geometric center" of the accelerator pedal to ensure proper foot placement. The intent of the requirement, which is to provide for consistent placement by different testing organizations, can be achieved by simplifying the requirement by providing that the centerline of the foot is to be placed, as close as possible, in the same plane as the centerline of the pedal.

Driver Left Foot Placement

Ford said it was concerned about the requirements of S10.1.1 for the placement of the driver's left foot in vehicles which have wheelwells that project into the passenger compartment. Ford agreed that in the case of the passenger test dummy, it "may be desirable to avoid placing the passenger dummy's right foot on the wheelwell because such placement can result in head contact with the dummy's knee, but head-to-knee contact is virtually impossible on the driver's side of the vehicle because the steering wheel would block any potential contact. In addition, placement of the driver's left foot is complicated by the presence of brake and clutch pedals, and therefore placement of the driver's left leg to avoid the brake and clutch pedals may have to take precedence over avoiding the wheelhouse projections."

Ford also said that it is not clear from the text of the standard whether the driver's left foot is to be placed inboard of a wheelwell projection. In addition, Ford said that S10.1.1(c) does not clearly specify where the driver's left leg should be positioned in such cases. Ford said "it is unclear whether the foot should be placed perpendicular to the tibia with the heel resting on the floor pan and the sole resting on one end of the brake pedal, or whether the foot may be pivoted around the axis of the tibia to eliminate contact with a brake pedal. It is also unclear whether the entire foot (and leg) may be moved laterally to miss the brake and clutch pedals."

NHTSA agrees with Ford that avoiding the positioning of the passenger's right foot on the wheelwell is more of a concern, since if there is floor buckling, the passenger's right knee can be pushed upward and strike the head. Although the agency has not seen as much floor buckling on the driver's side of the car in its NCAP tests, such buckling can happen. Although the positioning procedures for the driver's left foot and leg and the passenger's right foot and leg are the same as far as the final positioning of those parts is concerned, Ford is correct that the standard does not specifically state that the driver's left foot should not be placed on the wheelwell. To correct this, the agency has amended the standard to specifically provide that the driver's left foot is not to be placed on the wheelwell.

NHTSA has not experienced in its NCAP testing the difficulty mentioned by Ford in placing the driver test dummy's left foot in the vicinity of the clutch or brake pedals. However, to provide for a consistent positioning if there is pedal interference, the agency is making a minor amendment to the foot positioning procedure. The amendment provides that if there is pedal interference, the driver's left foot should be rotated about the tibia to avoid contact with the pedal. This simple action should avoid most problems. If that is not sufficient, the procedure provides that the left leg should be rotated about the hip in the outboard direction.

Driver Left Leg Placement

Ford noted that the agency did not adopt the requirement proposed in the April 1985 notice that the driver test dummy's left leg be placed in a vertical and longitudinal plane. Instead, in the March 1986 final rule, the agency provided that the driver's left leg need only be placed in a vertical plane. Ford said that if the leg is placed in a vertical plane with the knee 5.9 inches from the midsagittal plane, as called for in the initial knee spacing requirement for the driver, the leg will still be in a vertical longitudinal plane. Ford said it was unclear whether the agency intended the leg to remain in a vertical longitudinal plane or whether the 5.9 inch dimension is no longer appropriate.

The requirements are not inconsistent. As emphasized earlier in this notice, the requirement for the knee spacing is an *initial* setting. The agency recognizes that this initial placement will result in the driver's left leg being in a vertical longitudinal plane. However, to accommodate differences in vehicle designs, that spacing can be modified to achieve the other leg and foot placement requirements. The agency is retaining the requirement adopted in the March 1986 final rule that when the driver's left leg is in its final position it must be in a vertical plane.

Foot Rests

Ford said that its new Taurus/Sable models have a driver's foot rest, which is a flat area located low on the wheelwell projection. Ford said that placing the driver test dummy's left foot on the foot rest would mean that the dummy's left heel would be no higher than its right heel. Thus, Ford said that its foot rest is apparently different from the Honda foot rest discussed by NHTSA in the March 1986 notice. Ford asked the agency to clarify whether S10.1.1 of the standard would result in the driver test dummy's foot being placed on the Ford-type foot rest or whether the knee spacing and leg positioning requirements specified elsewhere in S10.1.1 would be controlling.

The foot rest positioning requirement adopted in the March 1986 final rule states that if the foot rest "does not elevate the left foot above the level of the right foot," then the left foot should be placed on the foot rest. If as it appears, the Ford foot rest does not elevate the left foot above the right foot, then the left foot should be placed on the foot rest.

Restraint Use During Testing

Ford said that the provisions of S10 regarding the restraint of the test dummy are inconsistent with the provisions of S4.1.2.1 for the testing of vehicles equipped both with automatic restraints and with manual Type 2 safety belts. The agency has modified S10 to make it consistent with S4.1.2.1. In brief, the new language provides that if a seating position in a vehicle is equipped with an automatic restraint to meet the frontal crash requirement and a manual safety belt to meet the lateral and rollover protection requirements, then the vehicle is subjected to two tests. First, the vehicle must pass a test in which the test dummy is restrained solely by the automatic restraint. In addition, the vehicle must pass a second test in which the test dummy is restrained by the automatic restraint and the manual safety belt as well. To reduce unnecessary testing costs for vehicles equipped with driver-only, non-belt automatic restraint systems, the agency is providing manufacturers with the option of using a passenger test dummy during the Standard No. 208 compliance test.

Placement of the Test Dummy on the Seat

Ford said that the wording of S10.1 is unclear regarding the placement of a test dummy in a seat whose centerline is not positioned in the vertical longitudinal plane of the vehicle. Ford said that in its Econoline van-type vehicles, the centerline of the front passenger's seat is "oriented a few degrees outboard to comfortably accommodate occupants by avoiding the intrusion of the engine cover on foot placement space. It is unclear whether, in compliance testing, the dummy would be placed in the vertical longitudinal plane passing through the center of the seat cushion, as implied by the wording of S10.1 This would place the dummy's torso out of alignment with the seat back, and such a position may be unstable. Alternatively, it is unclear whether the dummy would be placed in the vertical longitudinal plane passing through the seating reference point. Or would the dummy's torso be centered in the seat and only the legs placed in vertical longitudinal planes."

The positioning procedures have two purposes; to ensure consistency in dummy placement and to have the test dummy reasonably simulate the posture of a human in the seat. As Ford noted, the seats in its Econoline vehicles are oriented only a few degrees outboard of the vehicle's centerline. Thus, regardless of how the test dummy is positioned, the few degrees difference in orientation should not make a significant difference. It appears unlikely that many persons would even notice a few degrees difference in the seat orientation and it thus would be natural for a person to sit so they are centered in the seat. The agency is modifying the positioning requirements to provide that the test dummy is centered with the centerline of the seat cushion.

Subjective Phrases

Ford said that many of the test dummy positioning requirements contained subjective phrases, such as "to the extent permitted," and "except as prevented." Ford said that these phrases make the procedures ambiguous and can lead to varying interpretations by different testers.

As discussed previously, manufacturers use a wide variety of interior design configurations and the agency has established a positioning procedure that attempts to accommodate those differing configurations. The purpose of such phrases as "to the extent permitted" is to permit reasonable, minor adjustments in the positioning requirements so that a test dummy can be positioned in a vehicle with design features which may make it impossible to position the test dummy in absolute conformance to the test procedure. By allowing for minor, necessary adjustments, the test procedure can be used in all vehicles, regardless of their differing design features.

Test Dummy Upper Torso Rocking

Ford said that the provisions of S10.44 are unclear as to how much force is to be applied to the test dummy's lower torso while the test dummy is being positioned in a seat. Ford asked whether the initial force application of 50 pounds is to be reduced only long enough to allow the test dummy to slide down the seat back into contact with the seat cushion and whether that force is to be maintained until the test dummy's arms and hands are positioned. Ford recommended that the agency specify one specific force and provide that this force should be maintained during the upper torso force application.

The purpose of permitting testers to reduce the horizontal force on the test dummy during the settling procedure is to accommodate seats with differing frictional properties. In a vehicle with "slick" material, the test dummy may easily slide down the seat back without reducing the horizontal force much, if at all. If the seat has high friction material, the horizontal force must be reduced considerably to allow the test dummy to slide down the seat back. NHTSA, however, agrees with Ford that providing for use of a specific force should eliminate another possible source of test variability. NHTSA is thus modifying the settling procedure to provide that a force of 10 to 15 pounds of horizontal rearward force will be applied to the test dummy during the final upper torso positioning procedures (S10.4.4 and S10.4.5).

Test Dummy Position Fixture

Ford also asked the agency to specify the test dummy positioning fixture that will be used in accordance with the requirements of S10.4.2 to position the test dummy. Although the NCAP test procedures specify the use of a specific test positioning fixture, the agency does not believe it is necessary to specify such a device here. NHTSA believes that manufacturers should be permitted the option of devising their own positioning fixtures. This results in a more performance-oriented standard. Thus, the agency is not adopting Ford's recommendation for a specific test procedure but is making a minor change to S10.4.2 to delete any reference to a "dummy positioning fixture."

Arm and Hand Placement

Ford noted that S10.5 calls for placement of the test dummy's arms and hands prior to settling and asked that the requirements be changed to provide for arm and hand placement after settling. Ford also noted that the reference in S10.5 to the arm and hand placement requirements is incorrect.

NHTSA agrees with Ford that the procedure should be changed to provide for arm and hand placement after the test dummy has been settled. The agency has made the necessary change and has also corrected the references in the positioning procedure.

Vehicle Test Attitude

Ford said that the requirements of S8.1.1(d) require the cargo load to be centered over the longitudinal centerline of the vehicle. Ford said that the "longitudinal centerline of the vehicle marks the lateral center of the vehicle, and centering of the cargo on the longitudinal centerline of the vehicle only determines its lateral (side-to-side) position, but not its fore-and-aft position." Ford asked the agency to specify that the cargo be centered over the longitudinal centerline of the vehicle and at the longitudinal center of the cargo area.

Ford also asked the agency to clarify how to determine the longitudinal center of the cargo area in a station wagon or hatchback with a second seat that can be folded down to form a cargo area or in a multipurpose passenger vehicle with readily removable rear seats.

NHTSA agrees with Ford that cargo should be centered on the vertical longitudinal centerline of the vehicle and in the center of the cargo area. In the case of vehicles with a folddown seat or with a readily removable seat, the agency will consider the cargo area as the area that is available with a folddown seat in its upright position and a readily removable seat anchored at its position. The agency will then determine the center of that position and place the cargo there.

Effective Date for New Test Procedures

Ford and the Automobile Importers of America (AIA), asked the agency to reconsider its decision to implement the test dummy positioning procedure changes prior to September 1, 1986. AIA said that while some manufacturers wanted the new procedures to go into effect as soon as possible, the 45-day effective date placed an unreasonable burden on other manufacturers that are currently producing automatic restraints. AIA said that the short effective date did not provide enough time for a manufacturer to determine whether the test procedure changes affect the compliance of its current vehicles. AIA asked the agency to allow the optional use of the test procedures now and set a later mandatory effective date.

By adopting a 45-day effective date, the agency did not intend to jeopardize the compliance testing that has already been done by manufacturers. NHTSA is adopting AIA's suggestion to allow the use, at the manufacturer's option, of either the old or new test procedure during the first year of the phase-in. Beginning September 1, 1987, the use of the new test procedure will become mandatory.

Revisions to Standard No. 210

Ford asked the agency to clarify the revision made to the safety belt anchorage location requirements of S4.3 of Standard No. 210, *Seat Belt Assembly Anchorages.* The March 1986 notice exempted anchorages for automatic belts and dynamically-tested manual belts from the anchorage location requirements of Standard No. 210. Ford asked whether a manufacturer must provide two sets of anchorages in vehicles with dynamically-tested manual lap/shoulder belts that have the anchorages located outside the zone specified in S4.3—one set of anchorages for Type 2 manual belt systems located within the anchorage zone set out in S4.3 of the standard, and the other set of anchorages for the dynamically-tested Type 2 manual belt systems.

NHTSA has recently responded to a petition from GM raising the same issue. In a letter of April 14, 1986, the agency explained that anchorages for Type 2 manual belt systems must be included for vehicles that have automatic or dynamically-tested manual belts located outside of the zone. (The agency's letter is available in the Standard No. 210 interpretation file in the NHTSA docket section.) The agency did, however, grant GM's petition to amend the requirement, saying that GM had raised a number of reasons why the requirements of Standard No. 210 should be changed. NHTSA will shortly issue a notice of proposed rulemaking on this subject.

Labeling of Dynamically-Tested Safety Belts

Ford objected to the adoption, in Standard No. 209, *Seat Belt Assemblies,* of a requirement that dynamically-tested belts have a label identifying the vehicles in which they can be used. Ford said that the required label does not specifically identify the safety belt as a dynamically-tested belt and the label does not suggest that the belt may be safely used only in specific vehicles at specific seats. Ford asked the agency to rescind the labeling requirement.

Ford suggested that the intent of S4.6(b) could be accomplished by requiring the safety belt installation instruction required by S4.1(k) of the standard to specify both the vehicles for which the belt system is to be used and the specific type of seating position for which it is intended.

NHTSA still believes that it is important that a dynamically-tested safety belt be labeled to ensure that it is installed only in the type of vehicle for which it is intended. NHTSA agrees with Ford that providing the information in the installation instructions would address most of the problem of possible misuse. However, there still may be instances where the instruction would be lost. In addition, the installation instruction requirements apply only to aftermarket belts. There can be situations where a safety belt may be taken from one vehicle and transferred to another. Given these considerations and the importance of alerting motorists that a safety belt may have been designed for use in one particular make and model vehicle, the agency has decided to retain the labeling requirement.

In response to Ford's comment, NHTSA believes that the statement appearing on the label should be changed to require a manufacturer to specify the specific vehicles for which the safety belt is intended and the specific seating position (e.g., "right front") in which it can be used.

Exemption of Dynamically-Tested Safety Belts

The March 1986 rule adopted a requirement that the manual lap/shoulder belts in the front seats of passenger cars must meet a dynamic crash test. The requirement would go into effect for those manual belts on September 1, 1989, if the automatic restraint requirements of the standard are rescinded. Three petitioners, the American Seat Belt Council (ASBC), the Narrow Fabrics Institute (NFI), and Phoenix Trimming Company, asked the agency to reconsider its decision to exempt dynamically-tested manual safety belts from the webbing width and breaking strength requirements of Standard No. 209, *Seat Belt Assemblies.* On August 4, 1986, ASBC petitioned the agency to rescind the current Standard No. 209 exemption for automatic safety belts. The three petitions for reconsideration on dynamically-tested manual safety belts and the new petition for rulemaking on automatic safety belts raise similar issues, which the agency is currently reviewing. The agency will respond to those petitions at a later date.

Effective Date for Dynamic Testing of Manual Lap/Shoulder Belts

Nissan asked the agency for a two-year postponement, from September 1, 1989, to September 1, 1991, of the effective date of the dynamic test requirement for front seat manual lap/shoulder belts in passenger cars. The dynamic test requirement for passenger car manual belts will go into effect only if the automatic restraint requirement for passenger cars is rescinded. Nissan said that if a decision to rescind the automatic restraint requirements is not made until the end of March 1989, it will have only six months in which to develop a manual belt which can meet the dynamic test requirement. Nissan also said that having to develop a dynamically-tested manual safety belt prior to March 1989 places an unreasonable burden on manufacturers since they would have to be simultaneously developing both automatic restraints and dynamically-tested manual belts.

The agency has previously denied, in the March 21, 1986, final rule, a similar request from American Motors Corporation (AMC) for such an extension. In denying AMC's request, the agency noted that most of the vehicle components in passenger cars necessary for injury reduction are the same for automatic restraint vehicles and dynamically-tested manual belt vehicles. In addition, the agency noted that the New Car Assessment Program results show that approximately 40 percent of current model passenger cars can meet the injury criteria of Standard No. 208 in 35-mph crash tests, which involve 36 percent more crash energy than the 30-mph crash test used in Standard No. 208. Nissan has not provided any new data that would justify changing the agency's prior decision and therefore, Nissan's request for an extension of the effective date is denied.

Due Care Defense

The Center for Auto Safety (CFAS) and Ford petitioned the agency to reconsider its decision to adopt a due care defense in Standard No. 208. CFAS said that adoption of the defense contravenes the noncompliance notification and remedy requirements of the National Traffic and Motor Vehicle Safety Act. In addition, CFAS said that the due care defense is not a standard for motor vehicle performance as required by the Vehicle Safety Act and is too broad to accomplish its intended purpose. Ford said that adoption of the due care defense does not sufficiently address its concerns about the objectivity and practicability of the standard's requirements. It urged the agency to adopt a design to conform to the requirement in the standard.

The agency is still reviewing the issues raised by CFAS and Ford about the due care defense. Because the automatic restraint phase-in requirement is imminent, NHTSA has decided to retain the due care provision for the first year of the phase-in, pending the agency's final decision on this issue. The agency will expedite its review of these issues.

To clarify its interpretation of the due care defense, the agency does want to address one issue raised by the CFAS. In its comments, CFAS offered an example of what it believed was a problem with the due care defense. The CFAS said:

> Consider, for example, a scenario in which the agency's compliance test reveals a very high HIC score. The manufacturer's tests show complying results. It turns out that the manufacturer received from a supplier a shipment of poor quality restraint system components that resulted in the poor figure in the agency's test and would cause similarly poor results for most vehicles containing the components from that shipment. The poor quality components were not caught in the manufacturer's quality control program. Perhaps this failure to catch the poor quality component is because their problems only show up in dynamic crash testing. (The due care defense surely will not require manufacturers to crash test a vehicle containing components from each shipment.) Or perhaps the manufacturer's quality control by chance checked only some of the few units in the shipment that were of good quality. Under the due care exemption these vehicles could not be recalled for noncompliance despite clear evidence of a specific problem that will cause high HIC levels.

As stated in the preamble to the March 21, 1986, final rule, the due care defense is meant to address an instance where there is an isolated apparent failure and the manufacturer can demonstrate that it made a good faith effort in designing its vehicles and instituted adequate quality control measures. NHTSA considers the example used by CFAS as an instance in which the agency would *not* accept a due care defense and the vehicles would be subject to the noncompliance notification and remedy provisions of the Vehicle Safety Act. Clearly, the CFAS's example shows there is a significant flaw in the manufacturer's quality control process which affects a widespread number of vehicles. Manufacturers are capable of instituting quality control measures that will adequately test the performance of individual components without having to subject a vehicle containing that component to a crash test. Likewise, quality control measures are available so that manufacturers can statistically check a sufficient number of components to ensure that nearly all of the components of a particular shipment are of the required quality. For these reasons, the agency would *not* accept a due care defense in the example posed by CFAS.

Belt Contact Force Test Procedure

The March 21, 1986, notice renumbered the test dummy positioning procedure for the belt contact force test of the safety belt comfort and convenience requirements. In making that amendment, the following sentence was inadvertently left out: "Close the vehicle's adjacent door, pull 12 inches of belt webbing from the retractor and then release it, allowing the belt webbing to return to the dummy's chest."

Nissan has recently written the agency containing the deletion of the sentence. Nissan said that if the deletion was inadvertent and the requirement was reinstated, then the agency should slightly modify the requirement. Nissan said that in systems where it is not possible to pull out 12 inches of belt webbing, the requirement should provide for pulling out the maximum available length of the belt webbing.

Nissan pointed out that, as stated by the agency in the April 12, 1985, notice proposing amendments to the comfort and convenience requirement, one purpose of pulling out the webbing is to reduce belt drag in the the belt guide components prior to measuring the belt contact force. It further said that maintaining the 12-inch requirement would necessitate a complete redesign of some of the belt systems for its vehicles.

NHTSA agrees that the purpose of the belt webbing pull requirement can be adequately met by pulling out the maximum allowable amount of the belt, when the belt has less than 12 inches of available additional webbing. Pulling the belt in this way will ensure that the belt retractor is working and webbing drag is reduced. Thus, the agency is changing the requirement to provide that prior to measuring the belt contact force the agency will pull out 12 inches of webbing or the maximum amount of webbing available when the maximum amount is less than 12 inches.

The agency recognizes that manufacturers may have relied, in good faith, on the version of the belt contact force test procedure and based their certification of compliance on tests conducted according to that procedure. So as not to invalidate those compliance tests, the agency is amending the standard to allow the manufacturers to conduct the belt contact force test either with or without first pulling the webbing. Beginning September 1, 1987, the old test procedure will become mandatory.

Typographical Errors

The amendments made on March 21, 1986, contained a typographical error which is being corrected in this notice. In S4.1.3.2.2(b), the word "car" is corrected to read "cars."

Costs and Benefits

NHTSA has examined the impact of this rulemaking action and determined that it is not major within the meaning of Executive Order 12291 or significant within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has also determined that the economic and other impacts of this rulemaking action are so minimal that a full regulatory evaluation is not required.

The amendments adopted by this notice make some minor clarifying changes to the test dummy positioning procedures. In addition, the agency is providing increased flexibility to manufacturers by allowing them to use one of two sets of test procedures for a one-year period. Use of either set of test procedures should have only minimal impact on a manufacturer's testing costs.

Regulatory Flexibility Act

NHTSA has also considered the impacts of this rulemaking action under the Regulatory Flexibility Act. I hereby certify that it would not have a significant economic impact on a substantial number of small entities. Accordingly, the agency has not prepared a full regulatory flexibility analysis.

Few, if any, passenger car manufacturers would qualify as small entities and the test procedure changes made by this notice are minimal. Small organizations and governmental units should not be significantly affected since the costs, if any, associated with the test procedure changes should be minimal.

Environmental Effects

NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action will not have any significant impact on the quality of the human environment.

Paperwork Reduction

The information collection requirements of this notice are being submitted to the Office of Management and Budget pursuant to the requirements of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*).

Effective Date

NHTSA has determined that it is in the public interest to amend, upon publication of this final rule, the requirement of Standard No. 208 since the test dummy positioning options adopted by this notice affect manufacturer's plans for the 1987 model year.

In consideration of the foregoing, Part 571.208 of Title 49 of the Code of Federal Regulations is amended as follows:

1. In S4.1.3.2.2(b), the word "car" is amended to read "cars."

2. S10 through S10.9 is revised to read as follows:

S10 *Test dummy positioning procedures.* For vehicles manufactured before September 1, 1987, position a test dummy, conforming to Subpart B of Part 572 (49 CFR Part 572), in each front outboard seating position of a vehicle as specified in S10 through S10.9 or, at the manufacturer's option, as specified in S12 through S12.2.3.2. For vehicles manufactured on or after September 1, 1987, position a test dummy, conforming to Subpart B of Part 572 (49 CFR Part 572), in each front outboard seating position of a vehicle as set forth below in S10 through S10.9. Regardless of which positioning procedure is used, each test dummy is restrained during the crash tests of S5 as follows:

(a) In a vehicle equipped with automatic restraints at each front outboard designated seating position that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(1), each test dummy is not restrained during the frontal test of S5.1, the lateral test of S5.2 and the rollover test of S5.3 by any means that require occupant action.

(b)(i) In a vehicle equipped with an automatic restraint at each front outboard seating position that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(2), each test dummy is not restrained during one frontal test of S5.1 by any means that require occupant action. If the vehicle has a manual seat belt provided by the manufacturer to comply with the requirements of S4.1.2.1(c), then a second frontal test is conducted in accordance with S5.1 and each test dummy is restrained both by the automatic restraint system and the manual seat belt, adjusted in accordance with S10.9.

(ii) In a vehicle equipped with an automatic restraint only at the driver's designated seating position, pursuant to S4.1.3.4(a)(2), that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(2), the driver test dummy is not restrained during one frontal test of S5.1 by any means that require occupant action. If the vehicle also has a manual seat belt provided by the manufacturer to comply with the requirements of S4.1.2.1(c), then a second frontal test is conducted in accordance with S5.1 and the driver test dummy is restrained both by the automatic restraint system and the manual seat belt, adjusted in accordance with S10.9. At the option of the manufacturer, a passenger test dummy can be placed in the right front outboard designated seating position during the testing required by this section. If a passenger test dummy is present, it shall be restrained by a manual seat belt, adjusted in accordance with S10.9.

(c) In a vehicle equipped with a manual safety belt at the front outboard designated seating position that is certified by its manufacturer to meet the requirements of S4.6, each test dummy is restrained by the manual safety belts, adjusted in accordance with S10.9, installed at each front outboard seating position.

S10.1 *Vehicle equipped with front bucket seats.* Place the test dummy's torso against the seat back and its upper legs against the seat cushion to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10. Center the test dummy on the seat cushion of the bucket seat and set its midsagittal plane so that it is vertical and parallel to the centerline of the seat cushion.

S10.1.1 *Driver position placement.*

(a) Initially set the knees of the test dummy 14.5 inches apart, measured between the outer surfaces of the knee pivot bolt heads, with the left outer surface 5.9 inches from the midsagittal plane of the test dummy.

(b) Rest the right foot of the test dummy on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, set it initially perpendicular to the lower leg and place it as far forward as possible in the direction of the pedal centerline with the rearmost point of the heel resting on the floor pan. Except as prevented by contact with a vehicle surface, place the right leg so that the upper and lower leg centerlines fall, as closely as possible, in a vertical plane without inducing torso movement.

(c) Place the left foot on the toeboard with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toeboard and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toeboard, set it initially perpendicular to the lower leg and place it as far forward as possible with the heel resting on the floor pan. If necessary to avoid contact with the vehicle's brake or clutch pedal, rotate the test dummy's left foot about the lower leg. If there is still pedal interference, rotate the left leg outboard about the hip the minimum distance necessary to avoid the pedal interference. Except as prevented by contact with a vehicle surface, place the left leg so that the upper and lower leg centerlines fall, as closely as possible, in a vertical plane. For vehicles with a foot rest that does not elevate the left foot above the level of the right foot, place the left foot on the foot rest so that the upper and lower leg centerlines fall in a vertical plane.

S10.1.2 *Passenger position placement.*

S10.1.2.1 *Vehicles with a flat floor pan/toeboard.*

(a) Initially set the knees 11.75 inches apart, measured between the outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet on the vehicle's toeboard with the heels resting on the floor pan as close as possible to the intersection point of the toeboard. If the feet cannot be placed flat on the toeboard, set them perpendicular to the lower leg centerlines and place them as far forward as possible with the heels resting on the floor pan.

(c) Place the right and left legs so that the upper and lower leg centerlines fall in vertical longitudinal planes.

S10.1.2.2 *Vehicles with wheelhouse projections in passenger compartment.*

(a) Initially set the knees 11.75 inches apart, measured between the outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet in the well of the floor pan/toeboard and not on the wheelhouse projection. If the feet cannot be placed flat on the toeboard, initially set them perpendicular to the lower leg centerlines and then place them as far forward as possible with the heels resting on the floor pan.

(c) If it is not possible to maintain vertical and longitudinal planes through the upper and lower leg centerlines for each leg, then place the left leg so that its upper and lower centerlines fall, as closely as possible, in a vertical longitudinal plane and place the right leg so that its upper and lower leg centerlines fall, as closely as possible, in a vertical plane.

S10.2 *Vehicle equipped with bench seating.* Place the test dummy's torso against the seat back and its upper legs against the seat cushion, to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10.1.

S10.2.1 *Driver position placement.* Place the test dummy at the left front outboard designated seating position so that its midsagittal plane is vertical and parallel to the centerline of the vehicle and so that the midsagittal plane of the test dummy passes through the center of the steering wheel rim. Place the legs, knees, and feet of the test dummy as specified in S10.1.1.

S10.2.2 *Passenger position placement.* Place the test dummy at the right front outboard designated seating position so that the midsagittal plane of the test dummy is vertical and longitudinal, and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the test dummy at the driver's position. Place the legs, knees, and feet of the test dummy as specified in S10.1.2.

S10.3 *Initial test dummy hand and arm placement.* With the test dummy at its designated seating position as specified by the appropriate requirements of S10.1 or S10.2, place the upper arms against the seat back and tangent to the side of the upper torso. Place the lower arms and palms against the outside of the upper leg.

S10.4 *Test dummy settling.*

S10.4.1 *Test dummy vertical upward displacement.* Slowly lift the test dummy parallel to the seat back plane until the test dummy's buttocks no longer contact the seat cushion or until there is test dummy head contact with the vehicle's headlining.

S10.4.2 *Lower torso force application.* Apply a rearward force of 50 pounds against the center of the test dummy's lower torso in a horizontal direction. The line of force application shall be 6.5 inches above the bottom surface of the test dummy's buttocks.

S10.4.3 *Test dummy vertical downward displacement.* Remove as much of the 50-pound force as necessary to allow the test dummy to return downward to the seat cushion by its own weight.

S10.4.4 *Test dummy upper torso rocking.* Apply a 10-to-15-pound horizontal rearward force to the test dummy's lower torso. Then apply a horizontal forward force to the test dummy's shoulders sufficient to flex the upper torso forward until its back no longer contacts the seat back. Rock the test dummy from side to side 3 or 4 times so that the test dummy's spine is at any angle from the vertical in the 14-to-16-degree range at the extremes of each rocking movement.

S10.4.5 *Test dummy upper torso force application.* While maintaining the 10-to-15-pound horizontal rearward force applied in S10.4.4 and with the test dummy's midsagittal plane vertical, push the upper torso back against the seat back with a force of 50 pounds applied in a horizontal rearward direction along a line that is coincident with the test dummy's midsagittal plane and 18 inches above the bottom surface of the test dummy's buttocks.

S10.5 *Belt adjustment for dynamic testing.* With the test dummy at its designated seating position as specified by the appropriate requirements of S8.1.2, S8.1.3, and S10.1 through S10.4, place and adjust the safety belt as specified below.

S10.5.1 *Manual safety belts.* Place the Type 1 or Type 2 manual belt around the test dummy and fasten the latch. Pull the Type 1 belt webbing out of the retractor and allow it to retract; repeat this operation four times. Remove all slack from the lap belt portion of a Type 2 belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times so that the excess webbing in the shoulder belt is removed by the retractive force of the retractor. Apply a 2-to-4-pound tension load to the lap belt of a single retractor system by pulling the upper torso belt adjacent to the latchplate. In the case of a dual retractor system, apply a 2-to-4-pound tension load by pulling the lap belt adjacent to its retractor. Measure the tension load as close as possible to the same location where the force was applied. After the tension load has been applied, ensure that the upper torso belt lies flat on the test dummy's shoulder.

S10.5.2 *Automatic safety belts.* Ensure that the upper torso belt lies flat on the test dummy's shoulder after the automatic belt has been placed on the test dummy.

S10.5.3 *Belts with tension-relieving devices.* If the automatic or dynamically-tested manual safety belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer for normal use in the owner's manual for the vehicle.

S10.6 *Placement of test dummy arms and hands.* With the test dummy positioned as specified by S10.4 and without inducing torso movement, place the arms, elbows, and hands of the test dummy, as appropriate for each designated seating position in accordance with S10.6.1 or S10.6.2. Following placement of the arms, elbows, and hands, remove the force applied against the lower half of the torso.

S10.6.1 *Driver's position.* Move the upper and the lower arms of the test dummy at the driver's position to their fully outstretched position in the lowest possible orientation. Push each arm rearward permitting bending at the elbow, until the palm of each hand contacts the outer part of the rim of the steering wheel at its horizontal centerline. Place the test dummy's thumbs over the steering wheel rim and position the upper and lower arm centerlines as closely as possible in a vertical plane without inducing torso movement.

S10.6.2 *Passenger position.* Move the upper and the lower arms of the test dummy at the passenger position to the fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the upper arm contacts the seat back and is tangent to the upper part of the side of the torso, the palm contacts the outside of the thigh, and the little finger is barely in contact with the seat cushion.

S10.7 *Repositioning of feet and legs.* After the test dummy has been settled in accordance with S10.4, the safety belt system has been positioned, if necessary, in accordance with S10.5, and the arms and hands of the test dummy have been positioned in accordance with S10.6, reposition the feet and legs of the test dummy, if necessary, so that the feet and legs meet the applicable requirements of S10.1 or S10.2.

S10.8 *Test dummy positioning for latchplate access.* The reach envelopes specified in S7.4.4 are obtained by positioning a test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

S10.9 *Test dummy positioning for belt contact force.*

S10.9.1 *Vehicles manufactured before September 1, 1987.* To determine compliance with S7.4.3 of this standard, a manufacturer may use, at its option, either the test procedure of S10.9.1 or the test procedure of S10.9.2. Position the test dummy in the vehicle in accordance with the appropriate requirements specified in S10.1 or S10.2 and under the conditions of S8.1.2 and S8.1.3. Fasten the latch and pull the belt webbing three inches from the test dummy's chest and release until the webbing is within one inch of the test dummy's chest and measure the belt contact force.

S10.9.2 *Vehicles manufactured on or after September 1, 1987.* To determine compliance with S7.4.3 of this standard, position the test dummy in the vehicle in accordance with the appropriate requirements specified in S10.1 or S10.2 and under the conditions of S8.1.2 and S8.1.3. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Fasten the latch and pull the belt webbing three inches from the test dummy's chest and release until the webbing is within one inch of the test dummy's chest and measure the belt contact force.

3. A new section S12 is added to read as follows:

S12. *Optional position procedures for the Part 572, Subpart B test dummy.* The following test dummy positioning procedures for the Part 572, Subpart B test dummy may be used, at the option of a manufacturer, until September 1, 1987.

S12.1 *Dummy placement in vehicle.* Anthropomorphic test dummies are placed in the vehicle in accordance with S12.1.1 and S12.1.2.

S12.1.1 *Vehicle equipped with front bucket seats.* In the case of a vehicle equipped with front bucket seats, dummies are placed at the front outboard designated seating positions with the test device torso against the seat back, and the thighs against the seat cushion to the extent permitted by placement of the dummy's feet in accordance with the appropriate paragraph of S12.1. The dummy is centered on the seat cushion of the bucket seat and its midsagittal plane is vertical and longitudinal.

S12.1.1.1 *Driver position placement.* At the driver's position, the knees of the dummy are initially set 14.5 inches apart, measured between the outer surfaces of the knee pivot bolt heads, with the left outer surface 5.9 inches from the midsagittal plane of the dummy. The right foot of the dummy rests on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, it is set perpendicular to the tibia and placed as far forward as possible in the direction of the geometric center of the pedal with the rearmost point of the heel resting on the floor pan. The plane defined by the femur and tibia centerlines of the right leg is as close as possible to vertical without inducing torso movement and except as prevented by contact with a vehicle surface. The left foot is placed on the toeboard with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toeboard and the floor pan. If the foot cannot be positioned on the toeboard, it is set perpendicular to the tibia and placed as far forward as possible with the heel resting on the floor pan. The femur and tibia centerlines of the left leg are positioned in a vertical plane except as prevented by contact with a vehicle surface.

S12.1.1.2 *Passenger position placement.* At the right front designated seating position, the femur, tibia, and foot centerlines of each of the dummy's legs are positioned in a vertical longitudinal plane. The feet of the dummy are placed on the toeboard with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toeboard and the floorpan. If the feet cannot be positioned flat on the toeboard, they are set perpendicular to the tibia and are placed as far forward as possible with the heels resting on the floor pan.

S12.1.2 *Vehicle equipped with bench seating.* In the case of a vehicle which is equipped with a front bench seat, a dummy is placed at each of the front outboard designated seating positions with the dummy torso against the seat back and the thighs against the seat cushion to the extent permitted by placement of the dummy's feet in accordance with the appropriate paragraph of S12.1.1.

S12.1.2.1 *Driver position placement.* The dummy is placed at the left front outboard designated seating position so that its midsagittal plane is vertical and longitudinal, and passes through the center point of the plane described by the steering wheel rim. The legs, knees, and feet of the dummy are placed as specified in S12.1.1.1.

S12.1.2.2 *Passenger position placement.* The dummy is placed at the right front outboard designated seating position as specified in S.12.1.1.2, except that the midsagittal plane of the dummy is vertical, longitudinal, and the same distance from the longitudinal centerline as the midsagittal plane of the dummy at the driver's position.

S12.2 *Dummy positioning procedures.* The dummy is positioned on a seat as specified in S12.2.1 through S12.2.3.2 to achieve the conditions of S12.1.

S12.2.1 *Initial dummy placement.* With the dummy at its designated seating position as described in S12.1 place the upper arms against the seat back and tangent to the side of the upper torso and the lower arms and palms against the outside of the thighs.

S12.2.2 *Dummy settling.* With the dummy positioned as specified in S10.1, slowly lift the dummy in the direction parallel to the plane of the seat back until its buttocks no longer contact the seat cushion or until its head contacts the vehicle roof. Using a flat, square, rigid surface with an area of 9 square inches and oriented so that its edges fall in longitudinal or horizontal planes, apply a force of 50 pounds through the center of the rigid surface against the dummy's torso in the horizontal rearward direction along a line that is coincident with the midsagittal plane of the dummy and 5.5 inches above the bottom surface of its buttocks. Slowly remove the lifting force.

S12.2.2.1 While maintaining the contact of the force application plate with the torso, remove as much force as is necessary from the dummy's torso to allow the dummy to return to the seat cushion by its own weight.

S12.2.2.2 Without removing the force applied to the lower torso, apply additional force in the horizontal, forward direction, longitudinally against the upper shoulders of the dummy sufficient to flex the torso forward until the dummy's back above the lumbar spine no longer contacts the seatback. Rock the dummy from side to side three or four times, so that the dummy's spine is at an angle from the vertical of not less than 14 degrees and not more than 16 degrees at the extreme of each movement. With the midsagittal plane vertical, push the upper half of the torso back against the seat back with a force of 50 pounds applied in the horizontal rearward direction along a line that is coincident with the midsagittal plane of the dummy and 18 inches above the bottom surface of its buttocks. Slowly remove the horizontal force.

S12.2.3 *Placement of dummy arms and hands.* With the dummy positioned as specified in S12.2.2 and without inducing torso movement, place the arms, elbows, and hands of the dummy, as appropriate for each designated seating position in accordance with S12.2.3.1 or S12.2.3.2. Following placement of the limbs, remove the force applied against the lower half of the torso.

S12.2.3.1 *Driver's position.* Move the upper and the lower arms of the dummy at the driver's position to the fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the palm of each hand contacts the outer part of the rim of the steering wheel at its horizontal centerline. Place the dummy's thumbs over the steering wheel rim, positioning the upper and lower arm centerlines as close as possible in a vertical plane without including torso movement.

S12.2.3.2 *Passenger position.* Move the upper and the lower arms of the dummy at the passenger position to the fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the upper arm contacts the seat back and is tangent to the upper part of the side of the torso, the palm contacts the outside of the thigh, and the little finger is barely in contact with the seat cushion.

§571.209 Standard No. 209, *Seat Belt Assemblies.*

1. S4.6(b) of §571.209 is revised to read as follows:

(b) A seat belt assembly that meets the requirements of 4.6.1 of Standard No. 208 of this part (§571.208) shall be permanently and legibly marked or labeled with the following statement:

"This dynamically-tested seat belt assembly is for use only in (insert specific seating position(s), e.g., 'front right') in (insert specific vehicle make(s), and model(s))."

Issued on August 29, 1986

Diane K. Steed
Administrator

51 F.R. 29552
August 19, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection and Automatic Restraint Phase-in Reporting

(Docket No. 74-14; Notice 47)

ACTION: Final Rule.

SUMMARY: On April 12, 1985, NHTSA published a notice proposing amendments to Standard No. 208, *Occupant Crash Protection.* On March 21, 1986, NHTSA published a final rule that addressed a number of the proposed requirements. This notice announces the agency's decisions on several of the remaining proposals. NHTSA has decided to adopt an exemption from the automatic restraint requirement for convertibles. The exemption would only apply during the phase-in period. In a subsequent rulemaking the agency will determine whether to apply the automatic restraint requirement to convertibles manufactured after September 1, 1989, or whether to apply a dynamic test requirement to the manual safety belts used in those vehicles. The agency is modifying the head injury criterion used in Standard No. 208 compliance testing by adopting a maximum time interval of 36 milliseconds for calculating the HIC values.

EFFECTIVE DATE: The amendments made by this notice will be effective on November 17, 1986.

SUPPLEMENTARY INFORMATION:

On April 12, 1985 (50 FR 14589), NHTSA published a notice, which is the basis for the final rule being issued today, proposing the following amendments to Standard No. 208, *Occupant Crash Protection:* reporting requirements for the phase-in of automatic restraints, deletion of the oblique crash test, use of the New Car Assessment Program (NCAP) test procedures, adoption of a due care defense, alternative calculations of the head injury criterion (HIC), and alternative occupant crash protection requirements for convertibles. The notice also proposed the dynamic testing of manual lap/shoulder belts for passenger cars, light trucks and light van-type vehicles.

On March 21, 1986 (51 FR 9800), NHTSA published a final rule amending Standard No. 208 that retained the oblique crash test for automatic restraint equipped cars, adopted some NCAP test procedures for use in the standard's crash tests, provided for a due care defense with respect to the automatic restraint requirement, and required the dynamic testing of manual lap/shoulder belts in passenger cars if the automatic restraint requirement is rescinded. The March 1986 notice also created a new Part 585 setting reporting requirements regarding compliance with the automatic restraint phase-in requirements of the standard. This notice announces the agency's decision on several of the other actions proposed in the April 1985 notice. NHTSA will soon publish a separate notice announcing its decision on dynamic testing of safety belts in light trucks, buses, and multipurpose passenger vehicles.

Convertibles

The April 1985 notice proposed alternative occupant crash protection requirements for convertibles, beginning with model year 1990. The agency proposed that manufacturers have the option of installing manual lap belts, subject to the belt strength requirements of Standard No. 209, *Seat Belt Assemblies*, and the anchorage strength requirements of Standard No. 210, *Seat Belt Assembly Anchorages*, instead of installing automatic restraints subject to the occupant crash protection criteria of Standard No. 208.

As a part of the notice, NHTSA requested data on several specific questions to assist the agency in making a decision. Those questions covered such issues as current and future production figures for convertibles and the cost and practicability of installing various types of automatic restraints. The answers provided by the commenters show that:

- Through 1989, convertibles will average slightly over one percent of annual passenger car production.
- Manufacturers uniformly said that automatic safety belts are not a practical alternative for convertibles. For example, General Motors estimated an automatic lap/shoulder belt would cost $600 for convertibles, with much of that cost needed for structural modifications to the car. It also said that while automatic lap belts may be technically possible, their actual performance could be below that of manual belts because of additional belt "slack" that would be inherent in such designs.

- Manufacturers' estimates of the costs of air bag systems, exclusively for use in convertibles, ranged from $1,200 to $3,500.
- Most manufacturers supported exemption of convertibles from the automatic restraint requirement, saying that the increased costs of automatic restraints would diminish convertible sales. Ford, Toyota, and Volkswagen said that if convertibles had to meet the automatic restraint requirement, they would probably have to discontinue their convertible lines.
- All manufacturers that provided information on the type of safety belt they are installing in their convertibles stated that they use lap/shoulder safety belts, even though the standard currently gives them the option of using only a lap belt. Volkswagen suggested requiring all convertibles to have lap/shoulder belts.
- The Center for Auto Safety (CFAS), Insurance Institute for Highway Safety (IIHS), and State Farm, all of which supported the use of automatic restraints in convertibles, argued that convertibles are "luxury" cars and thus any cost increase associated with automatic restraints would not affect the sales of convertibles. In support of its argument or requiring automatic restraints in convertibles, CFAS also noted that the agency's NCAP data show that, with two exceptions, crash test results in the convertible version of a vehicle were considerably worse than in the "parent" vehicle.
- The National Transportation Safety Board (NTSB) argued that the current provision in the standard allowing manufacturers the option of installing only lap belts in convertibles is inadequate and may not provide sufficient protection in a crash.

After reviewing the comments, NHTSA continues to believe that applying the automatic restraint requirement to convertibles is not reasonable, practicable or appropriate for that vehicle type, at least during the phase-in. The information provided by the commenters shows that use of automatic belts is not reasonable for some models because they would have to make substantial structural redesigns to incorporate a "pylon" or other structure for attaching the upper torso portion of the automatic belt. If manufacturers use air bag systems, then the cost of the system could be substantial enough to severely curtail sales of those models. However, as new types of air bag and other automatic restraint systems are developed, the cost could be reduced. The agency has therefore decided to limit the exemption for convertibles to the phase-in period. NHTSA will re-examine, at a later date, the issue of whether to apply an automatic restraint requirement to convertibles manufactured after September 1, 1989, or to require dynamic testing of the manual safety belts installed in those vehicles.

NHTSA believes that its decision is consistent with its duty, under section 103(f)(3) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392(f)(3)), to "consider whether any such proposed standard is reasonable, practicable and appropriate for the particular type of motor vehicle . . . for which it is prescribed." The legislative history of the Vehicle Safety Act makes clear that Congress recognized that it might not be appropriate to set the same standards for some vehicle types, such as convertibles, as other vehicle types. In discussing the purpose of section 103(f)(3), the Senate Report stated that:

> [T]he committee intends that the Secretary will consider the desirability of affording consumers continued wide range of choices in the selection of motor vehicles. Thus it is not intended that standards will be set which will eliminate or necessarily be the same for small cars *or such widely accepted models as convertibles* and sports cars, so long as all motor vehicles meet basic minimum standards. [Emphasis added.]

NHTSA's decision with regard to convertibles is also consistent with the guidance provided by the U.S. Court of Appeals for the Sixth Circuit in its decision in *Chrysler v. Department of Transportation,* 472 F.2d 659 (1972). In that decision, the court reviewed the legislative history of section 103(f)(3), discussed above, and concluded that the agency did not give sufficient attention to the issue of whether convertibles should be subject to the same occupant crash protection requirements as hard top vehicles. While the court's decision to send the rule back to the agency for further consideration was based primarily on the perceived inadequacy of the test dummy used in compliance tests, the decision was also based on the need for the agency to consider adequately the potential effects of the occupant crash protection rule on convertibles.

The substantial cost impact of requiring convertibles to have automatic restraints, would be true even if convertibles were considered "luxury" cars, since the cost would have to be spread over a very low production volume. For example, although the agency believes that the cost for low volume installation of air bag systems—10,000 to 100,000 cars or less annually—would be smaller than the estimates submitted by some manufacturers, the cost, which ranges from $600 to $1,500 per vehicle, would still be substantial. Although convertible models are priced higher than their sedan counterparts, they are not all "high priced" or "luxury" cars. For example, convertible versions of the Renault Alliance, Chevrolet Cavalier, Chrysler LeBaron, Dodge 600, Ford Mustang LX, and Pontiac Sunbird all sell from $11,000—$13,000.

It is possible that development of new technology may lead to new air bag systems with lower costs. The agency is currently conducting research with the Breed Corporation on an air bag system with an all-mechanical sensor, which has the potential of being produced at a lower cost than current systems with electronic sensors. The preliminary data from the sled and crash tests of the Breed system are promising. However, the system still must be field-tested before the agency will be able to evaluate its effectiveness. Thus, it is still too early to predict whether this research system or other systems can be successfully developed into an effective and low-cost air bag system that can be used in convertibles and other passenger cars.

In the case of "built-in" safety (i.e., use of padding and structural changes to provide protection to unrestrained occupants), the agency notes that only General Motors has done some preliminary work, and GM has not yet indicated that it could certify convertibles or any vehicles to the injury protection criteria of Standard No. 208. Thus, the practicability of this approach across the fleet of convertibles (i.e., for all manufacturers for each of their convertibles) is uncertain at this time. The agency will continue to monitor the development of new automatic belt, air bag and built-in safety systems and review the practicability and appropriateness of those systems for convertibles.

Definition of convertible

Toyota asked the agency to clarify what vehicles are considered to be convertibles; in particular, it asked whether a passenger car with a T-bar roof or a Targa top would be considered a convertible. In several letters of interpretation, the agency has said that a convertible is a vehicle whose A-pillar or windshield peripheral support is not joined at the top with the B-pillar or other rear roof support rearward of the B-pillar by a fixed rigid structural member. Thus, a vehicle with a Targa top would be considered a convertible since it does not have any fixed structural member connecting the tops of the A and B-pillars. However, a vehicle with a T-bar roof would not be considered a convertible since there is a fixed structural member in the vehicle's roof which connects the A and B-pillars.

Changes in reporting requirements

Part 585, Automatic Restraint Phase-in Reporting Requirements, requires manufacturers to provide NHTSA with a yearly report on their compliance with the automatic restraint phase-in requirements of Standard No. 208. Part 585 currently requires manufacturers to provide data on their entire production of passenger cars, including convertibles. Since NHTSA has decided to exempt convertibles from the requirement for mandatory installation of automatic restraints during the phase-in period, the agency is making a change to Part 585. The agency is amending the reporting requirement so that a manufacturer does not have to count convertibles as a part of its passenger car production volume when it is calculating its phase-in requirement. However, since a manufacturer may decide to install voluntarily automatic restraints in its convertibles, the changes made to the phase-in requirements of Standard No. 208 and the reporting requirements of Part 585 will allow a manufacturer the option to include automatic-restraint equipped convertibles in its passenger car production volume when it is determining its compliance with the automatic restraint phase-in requirement.

Modification of the head injury criterion

In response to a petition from the Committee on Common Market Automobile Constructors and comments from other vehicle manufacturers, the April 1985 notice set forth two proposed alternative methods of using the head injury criterion (HIC) in situations when there is no contact between the test dummy's head and the vehicle's interior during a crash. The agency said that, after considering the comments, it would decide whether to retain the current HIC requirement or to adopt one of the proposed alternatives. As discussed in detail below, the agency has decided to adopt the proposed alternative which will calculate a HIC in both contact and non-contact situations, but limit the calculation to a maximum time interval of 36 milliseconds.

I. First Proposed HIC Alternative.

A. Use HIC only when there is head contact

The first proposed alternative was to retain the current HIC calculation for contact situations, but limited to the actual times that contact occurs. However, in non-contact situations, the agency proposed that a HIC would not be calculated, but instead new neck injury criteria would be calculated. The agency proposed that neck criteria would be calculated differently depending upon whether the existing Part 572 test dummy or the Hybrid III test dummy was used in the crash test. The reason for the proposed difference was that the Hybrid III test dummy has instrumentation in its neck to measure directly shear and tension forces in the neck and the existing Part 572 test dummy does not. The agency proposed to use the Hybrid III's neck instrumentation and set limits on the shear and tension forces in the neck. Since neck forces cannot be measured directly by the existing Part 572 test dummy, the agency proposed to use a surrogate measure for neck forces through the use of head acceleration-based criteria, a calculation that is valid only when the head does not contact any object during a crash test.

The agency explained that a crucial element necessary for deciding whether to use the HIC calculation or the neck criteria was an objective technique for determining the occurrence and duration of head contact in the crash test. As discussed in detail in the April 1985 notice, there are several methods available for establishing the occurrence and/or duration of head contact, but there are questions about their levels of consistency and accuracy.

Almost all of the commenters opposed the use of the first proposed alternative. The commenters uniformly noted that there is no current technique that can accurately and reliably identify whether and exactly when head contact has or has not occurred during a crash test in all situations. The agency agrees that, in the absence of such a method to determine the occurrence and duration of head contact, the first alternative is not appropriate.

B. Apply neck criteria if there is no head contact

As discussed above, the agency proposed a new neck criteria to be used in non-contact situations; however, because of the problems involved in trying to identify when head contact occurs, the agency is not adopting the non-contact proposal. CFAS urged the agency to apply the neck injury criteria in both contact and non-contact situations. It also argued that because the neck has more soft tissue than the head, a lower acceleration threshold should be used. As noted above, with the Part 572 test dummy, the proposed neck injury criteria (based on head acceleration measurements) are valid only when the head does not contact another object, so they should not be used in situations when there is an impact to the head. Similarly, the impossibility of determining, in all situations, when head contact begins and ends precludes the agency from adopting the proposed non-contact neck injury criteria for the Part 572 test dummy. The agency has already indicated that it will consider the issue of neck injury criteria for the Hybrid III test dummy in the separate rulemaking on that test dummy.

II. Second HIC Alternative.

At present, a HIC is calculated for the entire crash duration. The second alternative proposed by the agency would calculate a HIC in both contact and non-contact situations, but it would limit the time duration during which a HIC is calculated. NHTSA proposed a limit on the maximum time duration of the HIC calculation because the current calculation can produce high HIC values for a crash which has a relatively low acceleration level, but a long time duration, and which in all likelihood will not result in brain injuries.

The agency proposed to limit the HIC calculation to a maximum of 36 milliseconds because it determined that the 36 millisecond limit together with a HIC of 1,000 limit will assure that the acceleration level of the head will not exceed 60 g's for any period greater than 36 milliseconds. The 60 g's acceleration limit was set as a reasonable head injury threshold by the originators of the Wayne State Tolerance Curve, which was used in the development of the HIC calculation. (Readers are referred to the April 12, 1985 notice of proposed rulemaking for information on the development of HIC.)

There was a marked division among the commenters on the second alternative. Manufacturers and their trade associations commenting on the issue uniformly supported the use of the second alternative, although nine of those commenters (AMC, Chrysler, Ford, GM, Motor Vehicle Manufacturers Association (MVMA), Peugeot, Renault, Volvo, and Volkswagen) argued that the HIC calculation should be limited to a time interval of approximately 15 to 17 milliseconds, which would limit average long time duration head accelerations to 80-85 g's. Other commenters (CFAS, IIHS, and State Farm) argued that the current HIC calculations should be retained; they said that the proposed alternative would lower HIC levels without ensuring that motorists were still receiving adequate head protection.

Those favoring the second alternative raised a number of arguments in support of its use. They said that using a time limit for the HIC calculation is appropriate because head contacts with hard surfaces generally have high accelerations, but a short time duration (10 to 15 milliseconds). In the case of head contacts with softer surfaces, such as an airbag system, they said that the time duration of the contact is longer, but the acceleration is much lower, and thus the potential for injury is reduced. Ford pointed to airbag system testing in which human volunteers "experienced average accelerations between 59 to 63 g's for HIC calculation durations of 24 to 30 ms, without any head or neck injury."

Those favoring use of a shorter time duration than 36 ms offered additional arguments. They said that the proposed 36 ms requirement is too stringent because it would not allow the average head acceleration levels during a crash to exceed 60 g's. For example, GM said that the the Wayne State cadaver test data show that the head can withstand acceleration levels of up to 80 g's without injury. GM also said that Wayne State and other test data show that brain injuries and skull fractures in cadavers occur at HIC durations of 15 ms or less and thus there is no basis for considering any time interval longer than 15 ms. Likewise, Volvo said that it does not believe that 60 g is a critical acceleration level. Volvo noted that Standard No. 201, *Occupant Protection in Interior Impact*, permits an acceleration level of up to 80 g's in 15 mile per hour impacts of the instrument panel with a headform.

Mercedes-Benz, which supported the second alternative, urged the agency to measure HIC only during the time interval when the acceleration level in the head exceeds 60 g's. It said that this method would more effectively differentiate results received in contacts with hard surfaces and results obtained from systems, such as airbags, which provide good distribution of the loads experienced during a crash.

Those opposing the proposed second alternative argued that a 36 millisecond time limit is too short and could result in lower HIC scores being calculated than are calculated by the current HIC formula. For example, IIHS noted that a 60 g impact with a time duration of 50 milliseconds would produce a HIC of greater than 1,000 using the calculation methods currently found in the standard. IIHS also said that since some brain injuries can occur at a HIC level of less than 1,000, the agency should not take any action that would, in effect, allow HIC levels of above 1,000. It also urged the agency not to adopt the 36 millisecond limit since there is evidence showing that even mild brain injuries can produce long-term disability and it is not known whether such injuries can be caused without head contact.

A. Rejection of 17 millisecond HIC limit

To evaluate the effect of the 17 millisecond limit suggested by many of the commenters, NHTSA reexamined the biomechanical studies cited by the commenters and looked at the effect of how the recommended time limits would affect the HIC values measured in a 30 mile per hour barrier crash test, which is the compliance test used in Standard No. 208 for different types of restraint systems and also with respect to the New Car Assessment Program (NCAP). After completing this review, NHTSA has concluded, as discussed below, that the use of a 17 millisecond limit is not appropriate in vehicle crash tests.

The agency reviewed the Wayne State laboratory test results cited by several of the commenters in support of adopting a 17 millisecond limit for the HIC calculation. In those tests, cadaver heads were dropped on various hard and padded surfaces. The results from those tests show that those impacts generally produce a single peak acceleration, which ranges from 4 to 13 ms in duration. While NHTSA agrees that a 17 millisecond limit would be appropriate for short duration, single impacts into a hard surface, head acceleration responses in crash tests are considerably different from laboratory drop tests. In a vehicle crash, the duration of head impacts is often considerably longer, the head impact can involve considerably higher forces, and the head can experience multiple impacts. Given these differences, NHTSA does not believe that a 17 millisecond limit, based on single, short duration laboratory tests, should be adopted.

NHTSA agrees with Ford that the test results from the human volunteer airbag test are important and demonstrate that the probability of injury in longer duration impacts (greater than 15 milliseconds) with moderate accelerations is low. However, NHTSA believes that the air bag tests are limited in their application. Those well-controlled tests using young healthy males do not necessarily represent the results that would be found using other segments of the population. Likewise, the recommendation by the Wayne State researchers regarding a head acceleration limit of 60 to 80 g's is deduced mostly from tests with healthy 19 to 45 year old male volunteers. As to Volvo's comments about the use of an 80 g criteria in Standard No. 201, the agency notes that the standard places a specific limit on the 80 g criteria by prohibiting the accelerations from exceeding 80 g's for more than 3 continuous milliseconds.

NHTSA believes that it should take a cautious approach in modifying the head injury tolerance level set by the HIC requirement. Any modifications should ensure that a wide range of the population is provided protection. Therefore, the agency believes that it should use a HIC calculation which will not exceed 60 g's during relatively long duration impacts, which is the lower end of the recommended range proposed by the Wayne State researchers for use with HIC.

A review of the effect of a 17 millisecond limit on 291 test results from the 35 mph NCAP test program and the test results from 30 mph barrier impact tests also support the agency's decision not to adopt that suggestion. This analysis yielded the following results:

1. Using the current HIC calculation, this agency noted that the average HIC for the 291 NCAP tests was 1,107 and the percentage of HIC's that exceeded 1,000 was 46 percent. Using a 17 millisecond limit, the average HIC in the 291 NCAP tests dropped to 881 and the percentage of HIC's that exceeded 1,000 fell to 35 percent.

2. The current HIC failure rate of approximately 16 percent for 30 mph belted occupants could be cut to approximately 8 percent.

3. For unrestrained occupants, the average HIC value would drop by 21 percent and their Standard No. 208 compliance failure rate would be reduced by 42 percent.

4. Airbag average HIC values would be reduced by 25 percent, however, this would not affect the Standard No. 208 failure rates, since air bags that function properly produce HIC values well below the 1,000 level.

B. Rejection of Mercedes-Benz HIC limitation

To evaluate the effect of the Mercedes-Benz suggestion to limit the calculation of HIC to instances when the acceleration exceeded 60 g's, the agency recalculated the HIC values for 30 mph 3-point belts (driver and passenger sides), 30 mph unrestrained (driver and passenger), air bag (only), and 35 mph NCAP barrier and barrier equivalent crash tests using the Mercedes-Benz method.

Compared to the 36 ms proposed by NHTSA and 15-17 ms. approach advocated by some commenters, the Mercedes-Benz method would bring about the most significant numerical reduction in HIC scores. At 30 mph, all lap shoulder belt passenger HIC scores would be reduced to zero (a 100 percent reduction). Using the current HIC calculation, the average HIC for the 291 NCAP tests was 1107 and the percentage of HIC's that exceeded 1,000 was 46 percent. Using a 60 g limit, the average HIC would drop to 808 and the percentage of HIC's that exceeded 1,000 would fall to 32 percent. 30 mph air bag HIC values would be cut by 47.9 percent and unrestrained occupants would experience a 31 to 66 percent reduction of the average HIC score. The data also indicates that failure rates on airbags would not be affected, while approximately 14 percent of the unrestrained passengers would be shifted from failing to passing the HIC 1,000 limit.

The use of a minimum head acceleration threshold or cut-off to define the maximum HIC time duration, as proposed by Mercedes-Benz, provides a means of differentiating between critical and non-critical acceleration peaks, if and when they exceed 60 g's. However, there are a number of problems which led the NHTSA to reject the proposed Mercedes-Benz method. The Mercedes-Benz method only takes into account head accelerations that are greater than 60 g's. Thus, the average head acceleration permitted by the Mercedes-Benz method must be, at a minimum, 60 g's and most likely the average head acceleration permitted by the Mercedes-Benz method would substantially exceed that limit. In contrast, the 36 millisecond alternative adopted by the agency will ensure that the average head acceleration does not exceed the 60 g acceleration limit. In addition, it is unclear from Mercedes-Benz's comments how their method would accommodate multiple non-continuous acceleration peaks in excess of 60 g's. Discriminating between injurious and non-injurious peaks is critical to picking the time duration. If all peaks are to be included, it is unclear from Mercedes' proposal how the time interval would be measured. Given all of these concerns, NHTSA believes that the Mercedes-Benz proposal should not be adopted.

C. Adoption of 36 millisecond HIC limit

As discussed earlier in this notice, the agency proposed a time limit for the HIC calculation because the current method can produce an artificially high HIC for a crash which has a relatively low acceleration level, but a long time duration. To evaluate the effects of the proposal, NHTSA took the NCAP results and recalculated the HIC using the proposed 36 millisecond limit. That analysis shows that the 36 millisecond limit would have only a minor effect on HIC scores recorded in the NCAP tests. As discussed above, using the current HIC calculation, the average HIC for the 291 tests was 1107 and the percentage of HIC's that exceeded 1,000 was 46 percent. Using a 36 millisecond limit, the average HIC dropped slightly to 1061, and the percentage of HIC values that exceeded 1,000 dropped to 41 percent. Thus, the results show that in the NCAP tests, which are conducted at 35 mph, the average HIC value would be only four percent lower when calculated with the 36 millisecond limit. In addition, the results showed that of the 291 NCAP tests, only 38 tests had both a HIC value which exceeded 1,000 *and* a HIC duration exceeding 36 milliseconds. Of this group of 38 tests, there are only 15 instances in which the 36 millisecond limit results in a new HIC value less than 1,000. Since the NCAP tests at 35 mph involve 36 percent greater energy than the 30 mph tests used in Standard No. 208 compliance testing, the number of HIC values possibly changing from above 1,000 to below 1,000 because of the 36 millisecond limit should be even less in the Standard No. 208 compliance tests.

The agency further examined these 15 instances of HIC's greater than 1,000 being recalculated to be less than 1,000. In 12 of these 15 cases, the original HIC (i.e., without a time limitation) was between 1,000 and 1,074. Again at 30 mph, with 36 percent, less energy involved, it is doubtful if any of these vehicles would have had occupant HIC's greater than 1,000. Thus, in only three cases (one percent of the total involved) would a "fail" have potentially become a "pass," using the 208 criteria. If this same value is associated with 30 mph barrier tests, the risks to safety associated with having a HIC calculation which is founded on a sounder basis than the current calculation are not significant.

To further evaluate the effects of a 36 millisecond limit, the agency specifically examined the potential impact of the new HIC calculation on whether a vehicle will pass or fail the HIC of 1,000 limit set in Standard No. 208. NHTSA recalculated the HICs recorded in a wide variety of 30 mph crash tests, which is the compliance test speed used in Standard No. 208. The tests included vehicles using the following different types of restraint systems: manual lap shoulder belts, automatic belts, air bags only, and air bag with lap and lap shoulder belts. In addition, the agency recalculated the HIC values recorded in 30 mph tests with unrestrained occupants, which would simulate the types of HIC values that could be recorded in vehicles with built-in safety features. (The results of those tests are discussed in Chapter III of the Final Regulatory Evaluation on HIC). The agency's analysis shows that in all the 30 mph tests, the 36 millisecond limit does not change a "failing" HIC into a "passing" HIC. Thus, a vehicle which currently does not comply with the HIC requirement of Standard No. 208 using the prior HIC calculation method also will not comply using the 36 millisecond limit.

Cost and Benefits

NHTSA has examined the impact of this rulemaking action and determined that it is not major within the meaning of Executive Order 12291 or significant within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has prepared a regulatory evaluation that examines the economic and other impacts of this rulemaking action.

The changes in the HIC calculation should not have a significant impact. As discussed in detail above, the agency's analysis of crash test data shows that the 36 millisecond limit does not have any significant effect on changing the HIC values currently recorded in 30 mile per hour compliance crash tests. The extent of the effect of this change on mild brain injuries is unknown. As IIHS noted, there is insufficient data on how such injuries are caused. Thus, the agency cannot assess the role of the current or changed HIC calculation in preventing or reducing such injuries. However, since the agency's crash test analysis shows that a vehicle that currently exceeds a HIC of 1000 in Standard No. 208's 30 mile per hour compliance test will still exceed 1000 using the new 36 millisecond limit, the agency believes that the effect of the 36 millisecond limit on mild brain injuries should be no different than the effect of the current calculation. In addition, NHTSA does not believe that manufacturers will change their vehicle designs because of the slight change in the HIC calculation. Thus, the 36 millisecond limit should not adversely affect safety or a manufacturer's compliance costs.

Likewise, the decision to exempt convertibles during the phase-in period should not have a significant effect. Because convertibles represent a small portion of most manufacturers' production, they do not need to install automatic restraints in their convertibles in order to meet the production requirements during the phase-in. The problems associated with installing automatic restraints in convertibles also make it unlikely that manufacturers would equip their convertibles with such restraints during the phase-in. Thus, the exemption adopted in this notice should have little effect on the type of restraint system that will be used in convertibles during the phase-in.

Effective Date

NHTSA has determined that it is in the public interest to make the amendments, adopted in today's notice, effective immediately. The change in the HIC calculation can affect manufacturer's plans for the model year beginning September 1, 1986.

49 CFR PART 585—Reporting and recordkeeping requirements.

In consideration of the foregoing, Part 571.208 of Title 49 of the Code of Federal Regulations is amended as follows:

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

2. A new S4.1.3.1.3 is added to Part 571.208 to read as follows:

S4.1.3.1.3 A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.1.2(a) or its annual production under S4.1.3.1.2(b).

3. A new S4.1.3.2.3 is added to Part 571.208 to read as follows:

S4.1.3.2.3 A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.2.2(a) or its annual production under S4.1.3.2.2(b).

4. A new S4.1.3.3.3 is added to Part 571.208 to read as follows:

S4.1.3.3.3 A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.3.2(a) or its annual production under S4.1.3.3.2(b).

5. S6.2 of Part 571.208 is revised to read as follows:

S6.2 The resultant acceleration at the center of gravity of the head shall be such that the expression:

$$\left[\frac{1}{t_2 - t_1}\int_{t_1}^{t_2} a\,dt\right]^{2.5} (t_2 - t_1)$$

shall not exceed 1,000 where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2 are any two points in time during the crash of the vehicle which are separated by not more than a 36 millisecond time interval.

Part 585, *Automatic Restraint Phase-In Reporting*

1. Part 585.4 is revised to read as follows:

§ 585.4 Definitions.

(a) All terms defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used in their statutory meaning.

(b) "Passenger car" means a motor vehicle with motive power, except a multipurpose passenger vehicle, motorcycle, or trailer, designed for carrying 10 persons or less.

(c) "Production year" means the 12-month period between September 1 of one year and August 31 of the following year, inclusive.

2. Part 585(b)(1) is revised to read a follows:

(b) *Report content*—(1) *Basis for phase-in production goals.* Each manufacturer shall provide the number of passenger cars manufactured for sale in the United States for each of the 3 previous production years, or, at the manufacturer's option, for the current production year. A new manufacturer that is, for the first time, manufacturing passenger cars for sale in the United States must report the number of passenger cars manufactured during the current production year. For the purpose of the reporting requirements of this Part, a manufacturer may exclude its production of convertibles, which do not comply with the requirments of S4.1.2.1 of Part 571.208 of this Chapter, from the report of its production volume of passenger cars manufactured for sale in the United States.

Issued on October 10, 1986.

Diane K. Steed
Administrator

51 F.R. 37028
October 10, 1986

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
[Docket No. 74-14; Notice 50]

ACTION: Final Rule.

SUMMARY: Standard No. 208, *Occupant Crash Protection*, provides for the phased-in implementation of an automatic restraint requirement for the front outboard seats in passenger cars, beginning on September 1, 1986, with full implementation to take place on September 1, 1989. To encourage the development of a variety of automatic restraint systems, the standard provides that a manufacturer that installs a non-belt automatic restraint system, such as an air bag system, at the driver's seating position and a manual lap/shoulder belt at the front right passenger seating position will receive credit for producing one automatic restraint-equipped passenger car ("one car credit") during the phase-in period.

In response to a petition from the Ford Motor Company, NHTSA proposed amending Standard No. 208, *Occupant Crash Protection*, to extend the current one car credit beyond the phase-in period. Today's final rule amends Standard No. 208 to provide, until September 1, 1993, a one car credit to a manufacturer that produces a car with a non-belt automatic restraint system for the driver and a dynamically tested manual lap/shoulder belt for the right front passenger.

The limited extension adopted in today's final rule will not affect the requirement that all cars have automatic restraints beginning September 1, 1989. It only means that manufacturers can meet that requirement by installing a non-belt system for the driver position, where almost three-quarters of the front seat fatalities occur, and a dynamically-tested manual lap/shoulder belt for the right front passenger in vehicles that receive a one car credit beyond September 1, 1989.

The agency believes that a several year extension is warranted by the various technical, engineering and supplier resource problems, identified by Ford and other vehicle manufacturers and automatic restraint system suppliers, that currently hinder the widespread installation of full-front (driver and passenger) air bag systems. Today's final rule will encourage the orderly development and production of passenger cars with full-front air bag systems. The agency decided that the availability of the one car credit should be limited to the time necessary to complete the development and installation of passenger side air bag systems, which the agency believes should be September 1, 1993.

EFFECTIVE DATES: March 30, 1987. This rule affects vehicles manufactured on or after September 1, 1989, and until September 1, 1993.

SUPPLEMENTARY INFORMATION:

Background

On July 11, 1984 (49 FR 28962), the Department of Transportation announced its decision on occupant crash protection. The decision provided for the phased-in implementation of an automatic restraint requirement for the front outboard seats in passenger cars, beginning on September 1, 1986, with full implementation to take place on September 1, 1989. To encourage the development of innovative automatic restraint systems, the July 1984 decision also provided that manufacturers that installed a non-belt automatic restraint system, such as an air bag system, for the driver and any type of automatic restraint for the right front passenger during the phase-in period, would receive credit for producing 1.5 automatic restraint-equipped vehicles. The decision also provided that if two-thirds of the population of the United States were covered by effective safety belt use laws, which meet certain minimum requirements, by April 1, 1989, then the automatic restraint requirement would be rescinded. Subsequently, on August 30, 1985 (50 FR 35233), NHTSA adopted an amendment providing a new one car credit (versus a 1.5 car credit) for a driver-only, non-belt system to encourage the early introduction of those systems.

On November 25, 1986 (51 FR 42598), in response to a petition for rulemaking from Ford Motor Co., NHTSA proposed to amend Standard No. 208 to continue temporarily the one car credit for driver-only, non-belt automatic restraint systems after September 1, 1989. The notice also proposed that the manual lap/shoulder safety belt installed for the right front passenger seat in those vehicles would have to pass the requirements of Standard No. 208 in a 30 mph frontal barrier test.

After evaluating the issues raised by the commenters, NHTSA has decided to adopt the proposed amendments. The information provided by vehicle manufacturers and automatic restraint system suppliers, which is discussed in detail below, shows that adoption of a limited extension will promote the widespread introduction of non-belt automatic restraint systems, such as air bags, for both the driver and the passenger. That information provided by the commenters shows that there are a number of technical issues that still need to be resolved before widespread installation of passenger-side air bag systems will occur. In addition, there is a need for additional time for suppliers to increase their production capabilities for both driver and passenger air bag systems.

The limited extension adopted today will provide the additional time to resolve those technical and supply issues. NHTSA emphasizes that adoption of today's amendments does not change the fundamental requirement of Standard No. 208 that all passenger cars must have automatic restraints by September 1, 1989. Today's amendment means that manufacturers can meet that requirement by installing a non-belt system for the driver position, where almost three-quarters of the front seat fatalities occur. To provide safety belt-wearing passengers in the front seat of vehicles receiving a one car credit the same level of protection as a passenger in an automatic belt equipped car, the agency has also adopted a requirement that vehicles must pass a 30 mph barrier test in which a test dummy seated at the right front passenger is restrained by a lap/shoulder belt.

Comments on the Proposed Extension

There was widespread support among the commenters for the proposed extension of the one car credit. The commenters favoring the extension represented a wide range of interests that consisted of:

- restraint systems suppliers (Bendix Safety Restraint Division of Allied/Automotive, Breed Corp., Romeo-Kojyo, Talley Industries, and the TRW Vehicle Safety Division),
- insurance companies and their trade associations (Aetna, American Insurance Association, National Association of Independent Insurers, Nationwide Insurance, State Farm Mutual Automobile Insurance Co. and its outside legal counsel, The Travelers, and United Services Automobile Association),
- research and other organizations and individuals, (Insurance Institute for Highway Safety, National Association of Governors' Highway Safety Representatives, Motor Voters, National Safety Council, New Jersey's Insurance Commissioner, and Professor Susan Baker of the School of Hygiene and Public Health of The Johns Hopkins University),
- vehicle manufacturers and their trade associations (American Motors, Automobile Importers of America, Chrysler, Ford, General Motors, Honda, Jaguar, Mercedes-Benz, Motor Vehicle Manufacturers Association, Nissan, Porsche, SAAB, Volkswagen, and Volvo).

The proposed extension was opposed by the Center for Auto Safety and Robert Phelps, a private citizen. The Pennsylvania Department of Transportation's Center for Highway Safety expressed concern about providing protection to passengers in cars equipped with driver-only air bags and urged adoption of a requirement that cars produced beyond September 1, 1989, have automatic safety belts for the right front passenger. Finally, the Massachusetts-based Committee to Repeal the Mandatory Seatbelt Law filed comments asking the agency to reconsider the provision in Standard No. 208 that the automatic restraint requirements will be rescinded if two-thirds of the U.S. population is covered by effective safety belt laws. The issues raised by all of the commenters are discussed below.

Availability of Information

In its comments, the Center for Auto Safety (CFAS) raised questions about whether the public had adequate information about the Ford petition to be able to file meaningful comments. CFAS said that commenters could not analyze the leadtime issue raised by Ford because NHTSA "has refused to release the bulk of information filed by Ford in support of its petition." CFAS's statement is not correct. After Ford filed its original petition, NHTSA identified a number of issues that needed further clarification, including the technical problems faced by Ford and the leadtime necessary to provide passenger-side non-belt automatic restraints. As explained in the NPRM for this rule, the agency questioned Ford about these issues and Ford provided the agency with additional information. The "bulk" of all the information provided by Ford in its original petition and its subsequent filings is in the public record. Of the more than 20 pages of information filed by Ford in all of its submissions to the agency on this rulemaking action, only the equivalent of a few short paragraphs have been withheld by the agency as confidential information.

The limited information withheld from the record concerns the specific production volumes and models on which Ford plans to introduce driver-side non-belt automatic restraints. Since this information concerns Ford's future product plans, it is entitled to confidential treatment. The other material in the public docket adequately describes the basis for Ford's petition to allow the public to comment. The agency notes that none of the other commenters to this notice raised any objection about the adequacy of the information available to the public.

CFAS also urged the agency to seek additional information from automatic restraint system suppliers about leadtime and engineering problems. CFAS said that NHTSA should act as the Environmental Protection Agency did in 1975 when EPA obtained additional information from catalytic converter suppliers about efforts by vehicle manufacturers to meet the air pollution standard. According to CFAS, EPA did not grant any claim for confidentiality and required the sworn testimony of suppliers. NHTSA does not believe that such action is necessary. In this case, suppliers of automatic restraint systems representing the majority of the restraint system market have already voluntarily filed comments with the agency on the Ford petition. It is in the economic interest of those suppliers to ensure that passenger-side air bag systems are installed as soon as possible. All of the suppliers supported grant of the Ford petition, saying that providing additional leadtime will ensure the orderly introduction of passenger-side, non-belt automatic restraint systems. NHTSA also notes that Ford, in its latest comments, has provided additional information on its contractual arrangements with its air bag suppliers. Ford said that it "has committed to purchase its planned 1989 and 1990 model year restraint needs from its suppliers, and has authorized expenditures for long lead tooling." Based on the information that is already in the public record, NHTSA does not believe there is any need to take the action suggested by CFAS.

Credit Promotes Orderly Introduction of Air Bags

The commenters supporting adoption of the proposed amendment repeatedly cited the value of the one car credit in promoting the orderly introduction of air bag systems. Commenters noted that the amendment would encourage the installation of air bags for both the driver and the passenger. For example, in addressing the beneficial effect of the proposed amendment on increasing driver-side air bags, GM said that, "Currently, a manufacturer contemplating airbag technology in the near term must concurrently develop other passenger passive restraint technology if he is to avoid the risk that passenger airbag technology may not be available by the end of the passive restraint phase-in period. With the proposed extension, manufacturers can move forward with the development of driver airbags even though there might be uncertainty regarding the availability of a passenger airbag design by September of 1989." GM also addressed the effect of the proposal on development and installation of passenger-side air bags. It said, as did many of the other commenters, that "(a)dditional development time will greatly increase the potential for an orderly phase-in of passenger airbags. The additional time will enable manufacturers to use technical resources efficiently in addressing passenger airbag performance issues. With this incentive, the prospects for the wider use of passenger airbags in the 1994 time frame will be increased significantly."

In the November 1986 notice, NHTSA noted Ford's plans to install driver-side air bag systems "in the majority of its North American-designed car production" if the proposed extension is adopted. The agency asked manufacturers to provide information on their plans for adopting non-belt systems if the proposed extension of the one car credit was adopted. Two domestic and six foreign manufacturers provided such information in their comments.

Chrysler said that it has re-evaluated its automatic restraint plans, in part because of the agency's proposed extension of the one car credit, and now plans to "install driver air bags in most of our car lines by the 1990 model year." Chrysler emphasized that to meet that goal it is "making the largest commitment of manpower and resources that we have ever made to a single safety program." GM explained that it was engaged in "an on-going review of current and future marketing strategies" and has "every expectation that our review will lead to a significant increase in the use of inflatable restraint technology," if the agency adopts the proposed extension. In its comments, GM said it has two current air bag programs; one to develop an optional air bag for the 1988 model Oldsmobile 88 and another program, the details of which are confidential. GM subsequently filed supplemental information with the agency concerning its automatic restraint plans. GM said that it now plans to produce more than

500,000 driver air bag systems during the 1990 model year. GM also said that it is conducting engineering and resource studies on the feasibility of installing driver-only air bag systems in additional models. It said that, "If these additional programs prove to be feasible and are eventually approved, General Motors' production of driver-air bag equipped vehicles during the 1992 model year could approach 3,000,000."

In its comments, Honda said it planned to introduce driver-side air bags on some models if the credit is extended. Honda has subsequently announced that it will offer a driver-side air bag as an option on one of its Acura models beginning in June 1987. In its comments, Honda also said that it intended to introduce passenger-side air bag systems as soon as the technical problems are solved. Jaguar said that the proposed amendment would allow it to place more effort on its driver and passenger side air bag programs. In response to an inquiry from the agency, both Mercedes-Benz and Porsche indicated that they were proceeding with their passenger-side air bag programs. Saab said that it had a program underway to develop a driver-side air bag in one version of its 900 line and plans to develop driver and passenger air bag systems for both of its car lines. Volvo said that it plans to install a driver-side air bag plus a lap/shoulder belt for the right front passenger side on all its cars sold in the U.S. after September 1, 1989, if the one car credit extension is adopted.

In the November 1986 notice, NHTSA also asked manufacturers to comment on whether adoption of the proposed extension would delay the introduction of passenger-side systems. No vehicle manufacturer or restraint system supplier indicated that adoption of the proposal would slow the development of the passenger system. Instead, manufacturers indicated they were moving forward with passenger-side programs and extension of the one car credit would assist their efforts. CFAS, however, asserted that adoption of the extension would discourage efforts by Mercedes, Porsche and Jaguar to provide full-front systems. CFAS asked the agency to provide an incentive to the adoption of passenger-side systems by phasing-in an automatic restraint requirement for the passenger side. CFAS's claim that adoption of the proposal would discourage efforts by Mercedes, Porsche, and Jaguar to offer full-front air bag systems is contradicted by the comments filed by those companies. All of them supported adoption of the proposal and indicated they were proceeding with their passenger-side air bag programs. Porsche is already offering a full-front air bag system on its 1987 model of the 944 Turbo.

Volkswagen urged the agency to base its decision on a policy of promoting a variety of restraint systems. Volkswagen expressed concern that a decision to extend the one car credit should not be seen as the agency favoring a specific restraint system design. Such a position would work to discourage development of innovations in other passive restraint devices, Volkswagen said.

The purpose of today's amendment is not to favor one restraint system design over another. As discussed in the July 1984 final rule adopting the automatic restraint requirement, the purpose of the original 1.5 car credit and the subsequently adopted one car credit is, as Volkswagen suggested, to promote the installation of a variety of automatic restraint systems. The incentive provided by those credits will mean that a range of different automatic restraint systems such as detachable and non-detachable automatic safety belts, air bags, and potentially, built-in safety or other new technologies, will be available to the consumer. The agency emphasizes that the one car credit extended today is available to any non-belt technology that can meet the performance requirements of the standard. The temporary extension of this credit should further serve to encourage the development of a variety of automatic restraint systems. Ultimately, the type or types of automatic restraints that prevail in the marketplace will be determined by the choices made by consumers.

Technical Issues

The November 1986 notice requested manufacturers to comment on a number of technical issues concerning passenger air bag systems that Ford said needed further study. In their comments, vehicle manufacturers and restraint system suppliers agreed that there are a number of technical issues that need to be resolved. They also said that extension of the one car credit will assist them in solving those technical issues. For example, Breed, GM, Honda, Nissan, and Volvo said that the inflation of an air bag system, particularly for one passenger, must be carefully controlled so as not to create any undue hazard to out-of-position occupants. GM said that it is "hopeful that inflation risks to out-of-position occupants will be solvable given the opportunity to proceed in an orderly manner to gain experience with passenger side airbag technology."

In its comments, Breed, which is an air bag component supplier, said that it did not anticipate technical problems associated with the sensors used to trigger the inflation of a passenger-side air bag. Breed did, however, point out the difficulties associated with developing and producing an inflator for a passenger-side air bag. Breed said "there are no existing passenger side inflators in production at this time. In general, driver side inflators will be almost identical regardless of car models. However, passenger side inflators will have to have substantially different capacities depending on particular car model." Breed also said that the design of the fabric and cover for the air bag are also important technical issues since the proper design of those components can reduce risks to out-of-position occupants.

Volvo and Honda said that additional time is needed to address the noise level associated with a full-front air bag system. The level that occurs when two air bags are inflated is higher than that for one air bag. In addition, the passenger-side bag is larger and thus more gas must be generated to inflate the bag.

Finally, a number of the manufacturers said that installation of passenger-side air bag systems will bring about a number of instrument panel changes that will require additional leadtime to complete. Volvo said that installation of an air bag system in the instrument panel may mean that the glove compartment will have to be relocated. Honda referred to the need to optimize the design of the knee bolster and match the design and material of the deployment door and instrument panel.

NHTSA emphasizes that, as noted by the commenters, the technical issues identified by Ford and others are solvable, if manufacturers have sufficient time to design and develop approaches to each of the issues. As the commenters also noted, the additional leadtime provided by an extension of the one car credit will assist them in addressing those issues.

Safety Effects

The November 1986 notice and the accompanying preliminary regulatory evaluation contained a detailed discussion of the safety effects of the proposal. The notice discussed three independent analyses, one by NHTSA, and the others by Ford and IIHS, all of which demonstrated that a driver-side, non-belt automatic restraint system combined with a manual lap/shoulder belt for the passenger provides substantial safety benefits. No commenter disagreed with the methodology or conclusions of the different analyses. In supporting the analyses, Volvo noted that the analyses showed that the usage rate for automatic safety belts would have to be at least 60–70 percent to exceed the benefits of a driver-only air bag system. Volvo said that "(i)t appears unlikely that such high usage rates will be achieved for detachable automatic belts, at least initially. Consequently, a continuing 'one car credit' appears to present no negative societal safety effects," Volvo concluded. Since there was no objection to the methodology or conclusions of the agency's analysis, NHTSA has adopted the results of that analysis in its final regulatory evaluation.

Although it did not address the agency's safety analysis, the Pennsylvania Department of Transportation's Center for Highway Safety (CHS) expressed concern about providing protection to passengers in cars equipped with driver-only air bags. It urged adoption of a requirement that cars produced beyond September 1, 1989, have automatic safety belts for the right front passenger. Thus, in effect, CHS urged rejection of the Ford petition since CHS wants automatic protection for both the driver and the passenger after September 1, 1989.

NHTSA shares CHS's concern about protecting both the driver and right front passenger. Before proposing an extension of the one car credit, NHTSA carefully examined the safety effects of the proposal, including the effect on front seat passengers. Both the agency's preliminary and now the final regulatory evaluation show that a driver-only air bag system can have substantial safety benefits. In fact, safety belt usage in cars equipped with automatic safety belts for the driver and the passenger must exceed 60 percent before the benefits of that system equal the benefits of a driver-only air bag and a manual lap/shoulder belt for the right front passenger.

As discussed in more detail in the section of this preamble on leadtime, the information provided by the manufacturers shows conducting simultaneous engineering programs to develop two different types of automatic restraints for the same seating position is difficult to do with their available restraint system engineering resources. The agency believes that the limited extension adopted today will allow the industry to concentrate its resources on designing and developing full front air bag systems, which when used with lap/shoulder belts have the greatest estimated effectiveness of any of the automatic restraint systems studied by the agency. Thus, because a driver-only non-belt automatic restraint system will provide a substantial level of safety benefits during the limited extension, and because the extension will promote the development of even more effective full front automatic restraint systems, the agency believes that the overall safety benefits justify a limited extension. Thus, CHS's request to require automatic safety belts for the passenger during the extension is denied.

NHTSA does not, however, agree with Volvo that the agency's safety analysis justifies an indefinite extension. The primary purpose of the limited extension is to provide manufacturers with more time to design, develop, and produce passenger side air bag systems. The agency's analysis shows that a full-front air bag system provides additional benefits than does a driver-only system. Thus, the agency wants to limit the extension of the one car credit to the shortest time necessary to produce those systems.

Consumer Acceptance of Dual Systems.

One issue raised in the November 1986 notice was whether it was a viable option for manufacturers to provide driver-side air bags and passenger-side automatic belts. As discussed in that notice, Ford said that such an option is not viable for two reasons. First, it does not have the engineering resources to conduct parallel air bag and automatic belt programs for the same seating position. In addition, Ford raised the issue of possible market resistance to such a combination. The notice requested other commenters to address this issue.

As discussed in more detail in the section of this notice on leadtime issues, the manufacturers addressing the engineering resource problem all expressed concerns similar to Ford's. The commenters also provided additional information on potential consumer resistance problems to dual automatic restraint systems in a car. Only Chrysler said that it was planning to install driver air bags and passenger automatic safety belts. Chrysler said that although it believes such "mixed systems will be acceptable in the marketplace," it is "concerned that some prospective vehicle purchasers may not like having two different types of restraints for the front seat." GM said that while it has not conducted any market research on the public acceptability of dual restraint systems, it believes that "where the non-symmetry is obvious or intrusive," consumers will not respond favorably. AMC also agreed that for esthetic, styling, and other reasons a manufacturer would not offer a dual system. Honda said it is not considering a dual system since the optimum vehicle body structure for each type of restraint system is different.

Leadtime Issues

A. **Establishing a Supplier Base**

In the November 1986 notice, NHTSA noted Ford's concerns about the need for suppliers to increase their production capacities and to gain additional experience with the mass production of air bags. In their comments, vehicle manufacturers and equipment suppliers expressed the same concern. As mentioned in the November notice, Talley Industries, which has been involved in developing and producing air bag inflators, expressed support for the proposed extension. Allied Automotive also supported the proposal commenting that a prompt decision on whether to adopt the proposal "will greatly facilitate engineering and manufacturing capacity planning for future passive restraint systems beyond the scheduled phase-in period since significant differences exist between belt and non-belt occupant restraint systems technology." Volvo commented that there will be only three or possibly four suppliers of air bag inflators that have the capacity to produce large scale production before 1989. Volvo said that, "There are indications that even these suppliers will not have enough production capacity to supply inflators for more than a minor part of the total number of cars produced for the U.S. market."

B. **Engineering Resource Problems**

The November 1986 notice discussed Ford's concerns about the engineering resource problems it faces in having to conduct parallel programs to develop passenger-side air bag systems and automatic safety belts. In its comment, Ford provided new information on the issue of its engineering resources. Ford explained that since filing its petition, it has been conducting parallel restraint system programs. Ford further explained that "because of the acute shortage of knowledgeable and experienced engineers and test and development facilities available to Ford and its suppliers, and because Ford wants to be able to provide properly designed driver-side supplemental air bags if the extension is granted, Ford has now discontinued any further work on non-air bag passive restraint alternatives for those cars which would be equipped with driver-side supplemental air bag systems if the agency were to grant the extension."

Other manufacturers commenting on this issue cited similar engineering resource problems. AMC said that it could not divide its engineering resources between two simultaneous restraint system development programs. Chrysler said that while it has currently been engaged in a dual development program—driver air bags and passenger automatic belts—the program "is taxing our resources beyond our capability." Chrysler said that there is a shortage of trained design/development people and it has had to use an outside contractor to meet its crash testing needs. In its comments, IIHS said that it has "for months been in contact with suppliers of air bag components across the country, and they confirm that the capacity is not enough at present to provide large numbers of air bags (especially for the passenger side) to meet a 1991 deadline."

Among the foreign manufacturers, Jaguar said that because of the difficulty in allocating its engineering resources, it will have to concentrate its efforts on developing automatic safety belts. It said that adoption of the proposed extension would enable Jaguar to place more efforts on its driver and passenger air bag systems. SAAB said that it does not have the resources to develop driver and passenger air bags simultaneously. Citing the need to develop different systems for its two models, SAAB also said that it is unlikely that it can introduce passenger air bags by the 1990 model year. Finally, Volvo said that it agreed with Ford about the difficulties of concurrently carrying out parallel restraint system development programs. Volvo observed that the development of a driver side air bag system and a motorized automatic belt could require more development resources than developing a full-front air bag system.

C. **Length of the Extension**

1. *Support for Extension Until September 1, 1993*

There was widespread support for the proposal to extend the one car credit until September 1, 1993. The commenters supporting the proposed four-year extension were: the American Insurance Association, Automobile Importers of America, American Motors, Breed, Honda, IIHS, Mercedes-Benz, Motor Vehicle Manufacturers Association, National Association of Independent Insurers, National Association of Governors' Highway Safety Representatives, Nationwide Insurance, National Safety Council, Nissan, Romeo-Kojyo, SAAB, State Farm Mutual Automobile Insurance Company, The Travelers, United Services Automobile Association, Volvo, and Volkswagen.

Although it supported the four year leadtime proposal, the Automobile Importers of America urged the agency "to monitor the development of passenger air bags closely and be prepared to give additional leadtime, if some unforeseen problems arise." Likewise, Honda said it supported the proposal, but said that it could not presently estimate whether a four year period is sufficient to complete the development and installation of passenger-side air bags. Honda said, however, that it "will make every effort to accomplish this goal." Volvo, while supporting the proposed extension, said that the one car credit should be retained beyond 1993.

Several of the commenters provided information supporting the need for an additional four year period to develop and mass produce passenger-side air bag systems. In its comments, Breed identified what it views as the two major lead time issues associated with passenger-side air bag systems. Breed said that the first issue is the redesign of the instrument panel to accommodate an air bag. Breed said that it "may be impractical to attempt modification of at least some existing car models to accept passenger side air bags. As a consequence, we believe the installation of a passenger side airbag may have to coincide with the coming out of new car models." The second issue is the time to design and mass produce passenger-side systems. Breed said that it needed approximately one to two years to design an air bag system and needed another two years to tool and prepare production components.

GM repeated its prior estimate that it would take at least 36 months to incorporate either a driver-only or full-front (driver and right front passenger) air bag system into existing or new vehicle lines that could accommodate an existing air bag design. GM said that its 36 month estimate did not include the time necessary to develop the design. GM further noted that the bulk of its restraint system developers are currently working on automatic safety belt designs and the remainder are working on its driver air bag program. GM said because of this commitment of resources, "no significant development of a passenger airbag could be implemented prior to 1990."

IIHS also addressed the design and development issue involved in determining leadtime. IIHS said that "Air bags aren't modular components that can simply be tacked on a wide range of car models. Each individual model with an air bag system requires a separate engineering development and crash testing program. It wouldn't be responsible to place the phase-in of air bags ahead of these constraints."

Finally, State Farm addressed the concern that the extension represents a "delay" in the phase-in. Referring to what it termed "false starts" in the implementation of automatic restraints, State Farm said "it is understandable that the contemplated modification of the passive restraint standard may be viewed as the forerunner of yet another delay in full implementation of the standard. Although we share that concern, we believe that we are in a new era of awareness, by the public and the manufacturers, of the importance of safety generally and the desirability and utility of airbags specifically. This has led the management of a number of manufacturers, and we believe will lead the management of other manufacturers to conclude that airbags will meet with public approval and thus lead to widespread use at quite reasonable unit costs."

2. *Requests for Indefinite Extension*

Several vehicle manufacturers urged the agency not to place a time limit on the extension of the one car credit. Ford said that, in conjunction with its supplier, it had "recently defined in concept an innovative design approach to passenger-side supplemental air bags," but it added it has "no basis now for saying with any certainty that all design and supply system issues will be resolved by the fall of 1993." Thus, Ford requested an indefinite extension of the one car credit.

Ford said that if NHTSA decided to adopt the proposed 1993 effective date, the agency should "also provide for a review of the 1993 passive restraint requirement to take place during the 1990 calendar year. A review during 1990 would permit inclusion of real world passenger-side air bag experience, yet allow time to complete design work, and permit the construction of facilities and tooling necessary to produce passenger-side supplemental air bags in high volume by September 1993." In its comments, Chrysler also supported adopting an indefinite delay at this time and urged NHTSA to re-examine the termination date issue "in the 1990 time frame."

NHTSA does not believe that Ford and Chrysler have provided a sufficient justification to adopt an indefinite extension of the one car credit. NHTSA believes that there are sufficient technical issues, engineering resource, and supplier capacity problems to justify a *limited* extension of the one car credit. However, all of those issues are potentially solvable by September 1993, and manufacturers and suppliers uniformly have committed themselves to making their best efforts to introduce full front air bag systems by that date. The agency will continue to monitor the progress of vehicle manufacturers and suppliers in designing, developing, and mass producing full front air bag systems. As new issues and concerns arise, NHTSA fully expects that manufacturers and suppliers will bring them to the agency's attention. At that point, if there is additional information available about the nature and extent of any problems and their solutions, the agency can determine whether additional action is appropriate.

3. *Request for Earlier Effective Date*

New Jersey's Insurance Commissioner supported the proposed extension of the one car credit. He did, however, express concern about the proposed September 1993 effective date and suggested adopting a shorter leadtime. He also suggested the agency phase-in a passenger-side air bag requirement to ensure that vehicle manufacturers steadily increase the production of those systems. Motor Voters made a similar request. It urged that manufacturers receiving a one car credit be required to provide full-front air bag systems for vehicles manufactured after September 1, 1991. Robert Phelps, a private citizen, urged the agency not to adopt the proposed extension, arguing that manufacturers have the technology to install automatic safety belt or air bag systems by September 1, 1989.

CFAS raised a number of issues related to the leadtime necessary for producing passenger-side automatic restraint systems. CFAS first said that the Department's July 1984 decision provided sufficient leadtime to produce non-belt automatic restraint systems, such as air bags. In addition, CFAS said that historically passenger-side systems have been developed before driver-side air bag systems and thus an extension is not needed. In support of its position that passenger-side systems are available now, CFAS cited early 1970's research into passenger-side air bag systems and noted that the first GM and Ford air bag fleet vehicles had full-front air bag systems. CFAS said that the supplier problems result from a prior lack of commitment to air bags by the industry and government. It specifically cited the decisions by Allied Chemical and Eaton to leave the air bag market in the 1970's as examples of how government and industry indecision has resulted in supplier problems. CFAS also said that because of marketplace pressures, Ford will proceed with its air bag program, regardless of whether an extension is granted. Finally, CFAS said that if an extension is adopted, NHTSA should phase-in the requirement for a passenger-side air bag.

NHTSA agrees with CFAS that the requirement that all cars have automatic restraints by September 1989 provides manufacturers sufficient time to install some types of automatic restraints, such as automatic safety belts. NHTSA believes, as discussed in detail earlier in this notice, that manufacturers and suppliers have raised valid issues concerning their ability to provide for the widespread introduction of passenger-side air bags by September 1989. There is a substantial difference between the supplier base and engineering resources needed for the limited introduction of full-front air bags on full size cars in the 1970's and the planned widespread introduction of full-front air bags on a wide variety of car sizes. Whatever the historical reasons for the lack of a supplier base, the issue that faces the agency is that the supplier capacity does not currently exist. The agency has been presented with good faith assurances from manufacturers and suppliers that they have begun to develop the necessary production capabilities. For example, Ford in its latest comments indicated that it has already made commitments for its suppliers to begin expending funds on long leadtime tooling. NHTSA does not believe that these commitments would be made unless the agency had proposed extending the one car credit. The limited extension adopted today will further promote the widespread introduction of both driver and passenger-side air bag systems and other non-belt systems.

NHTSA does not believe it is necessary to adopt a new phase-in requirement for passenger-side non-belt systems and, as discussed in detail below, does not believe the one car credit should be limited to cars equipped with air bags. The information provided by the vehicle manufacturers and suppliers indicates that those manufacturers that plan to introduce passenger-side non-belt systems have already begun the initial stages of the design work. The committment of the financial and engineering resources to the necessary design and development work and the production of manufacturing facilities will serve as a sufficient incentive for manufacturers to ensure that the final products resulting from those efforts will be placed in cars as quickly as possible.

Limit Extension to Air Bags Only

CFAS urged the agency to limit the one vehicle credit to cars that meet the automatic restraint requirements with an air bag system. In particular, CFAS said the one vehicle credit should not be available to passive interiors, which CFAS labeled as "unproven." (Passive interiors or built-in safety is an occupant restraint approach that GM is examining. The approach uses structural changes in the vehicles and increased padding as a means to reduce occupant injury.) Motor Voters also requested the agency to limit the one car credit to cars that have driver-side air bags.

NHTSA agrees with CFAS and Motor Voters that air bag systems, when used in conjunction with manual lap/shoulder belts, are an effective restraint system. However, Standard No. 208 sets performance requirements which can be met by a variety of different technologies, including automatic safety belts, air bags and built-in safety. If built-in safety or other types of non-belt systems can meet the performance requirements of the standard, then manufacturers can use those systems at the driver's position to obtain a one vehicle credit. The agency believes there is no reason to limit the ability of manufacturers to pursue alternative automatic restraint systems, such as built-in safety, that can meet the performance requirements of the standard. Thus, NHTSA is not adopting the limitation suggested by CFAS and Motor Voters.

The agency notes that as a practical matter, air bags appear to be the only non-belt system that presently meets the performance requirements of the standard. In its comments, GM said that "built-in" safety "is not practicable for certifying a vehicle or any seat position to the current FMVSS 208 passive restraint requirements." GM said, however, it will "continue to implement this important safety concept in its vehicle design program."

Dynamic Testing of Manual Lap/Shoulder Belts

As a part of the November 1986 notice, NHTSA proposed that manual lap/shoulder safety belts installed at the front right passenger's seat after September 1, 1989, must be dynamically tested. Only a few commenters specifically addressed this proposed requirement. Noting its prior support for dynamic testing of manual lap/shoulder belts, GM urged the agency to adopt the proposed requirement. GM said that, "While uncertainties exist regarding the correlation of the laboratory dynamic test with the real world, with such testing the consumer will have the assurance that his or her manual belt system will have met the same level of laboratory performance as an automatic belt which might otherwise have been provided in the vehicle." CFAS, Chrysler, and Motor Voters also supported the proposed dynamic test requirement.

In its comments, Ford urged the agency not to adopt a dynamic test requirement for cars equipped with manual lap-shoulder belts. Ford said that the agency has relied primarily on New Car Assessment Program (NCAP) data to justify the need for dynamic testing. Although Ford agreed that a dynamic test requirement might compel manufacturers to design their safety belt systems to obtain better results in the NCAP test, Ford said that NHTSA has not shown that safer vehicles would result from the requirement.

NHTSA believes that the proposed test has the obvious safety benefit, cited by GM, of ensuring that a passenger in a manual belt equipped car will receive the same level of protection, when he or she wears the safety belt, as a passenger in an automatic belt equipped car. The agency recognizes that there are disagreements about the precise correlation of the results obtained in NCAP and other laboratory tests to real world crashes. One of the reasons it is difficult to correlate the results is the relative lack of data on real world crashes at 35 mph involving drivers and passengers wearing safety belts. As usage increases due to safety belt use laws, data on that type of crash should become more available. In addition, because of the wide variety of differing crashes in which a vehicle can be involved in the real world, the agency always cautions users of NCAP test results that those results cannot be used to predict the results in an actual crash. At the same time, the NCAP tests do measure the ability of vehicles to provide important head, chest, and leg protection in a standardized frontal crash test. The types of changes made to safety belt systems and vehicle structure to meet the proposed 30 mph barrier test, such as using energy-absorbing safety belt webbing and ensuring that safety belt retractors lock quickly to hold an occupant in place, should also help reduce injuries in the real world. The agency is thus adopting the proposed dynamic test requirement.

Denial of Two Car Credit

As a part of the November 1986 notice, NHTSA announced its decision to deny separate petitions filed by Porsche and IIHS that asked the agency to provide a two car credit to manufacturers that install driver- and passenger-side air bag systems during the phase-in period. In denying the petitions, NHTSA requested manufacturers to provide additional information to the agency indicating how they would make use of a two car credit. The agency said that if manufacturers provided sufficient information to refute NHTSA's reasons for denying the petition, the agency would reconsider its denial.

Only two manufacturers specifically addressed the two car credit issue. Chrysler said that it had no plans to install passenger-side air bags during the phase-in period and the grant of the Porsche/IIHS petition would not cause Chrysler to change its plans. Ford was the only other manufacturer to comment on this issue. Ford said that it plans to offer a passenger-side air bag on one car line during the 1989 model year. Ford said that its plans "are independent of whether such cars would receive a 1.5 or 2.0 credit." Since there is no new information indicating that a two car credit would promote the introduction of full-front air bag systems, NHTSA stands by its denial of the Porsche/IIHS petition.

Public Information

In its comments, the National Association of Governors' Highway Safety Representatives urged the vehicle industry and the Department of Transportation to market aggressively the availability and benefit of air bag protection. In addition, NAGHSR urged manufacturers, dealers, and the Department to disseminate information to the public about automatic restraint systems.

NHTSA recognizes the importance of providing consumers with information about the wide range of available automatic restraint systems. To that end, NHTSA has prepared and made available to the public, brochures and other information describing the benefits of different types of automatic restraint systems and explaining how they work. For example, NHTSA has already distributed more than 150,000 copies of two new pamphlets on automatic restraints and 350,000 copies of a pamphlet showing parents how to use child safety seats with the new restraints.

NHTSA is also aware of manufacturer and dealer programs to promote awareness of automatic restraints. For example, Ford has been sponsoring "safety days" at dealerships around the country to publicize the availability of air bags and their new automatic belts. These events have resulted in dealer orders for thousands of air bag-equipped cars. The agency encourages manufacturers and dealers to continue with these activities during the automatic restraint phase-in period.

Rescind Safety Belt Use Law Provision

The Massachusetts-based Committee to Repeal the Mandatory Seatbelt Law filed comments asking the agency to reconsider the provision in Standard No. 208 that the automatic restraint requirements will be rescinded if two-thirds of the U.S. population is covered by effective safety belt laws. In essence, the Committee said that safety belt use laws are unpopular because they place a burden on the freedom of private citizens and thus the agency should not encourage the adoption of those laws. The agency, on August 30, 1985 (50 FR 35233), has already reviewed and rejected requests such as the Committee's. For the reasons stated in that notice, the agency is rejecting this request as well.

Regulatory Impacts

NHTSA has examined the impact of this rulemaking action and determined that it is not major within the meaning of Executive Order 12291, but is significant within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has prepared a final regulatory evaluation describing the economic and other effects of this rulemaking action, which is available in the docket.

As mentioned earlier in this notice, the preliminary and now the final regulatory evaluation shows that a driver-only air bag system with a manual lap/shoulder belt for the right front passenger can have substantial safety benefits. In fact, safety belt usage in cars equipped with automatic safety belts for the driver and the passenger must exceed 60 percent, before the benefits of that system equal the benefits of a driver-only air bag.

NHTSA's analysis further shows that automatic belt usage would have to be greater than 75 percent to exceed the benefits of a driver- and passenger-side air bag system. Thus, the agency believes that a temporary extension of the one car credit for driver-only systems will not have an adverse safety effect and will provide additional time for the orderly development and installation of driver and passenger air bag systems. Furthermore, the agency believes that the amendments adopted today can result in higher levels of safety. The agency notes that vehicle manufacturers that are currently offering driver-only air bag systems are voluntarily installing lap/shoulder safety belts for the driver, even though they could install only a lap safety belt. The Final Regulatory Impact Analysis done for the Department's July 1984 occupant protection decision estimated that the combination of a lap/shoulder safety belt and an air bag system would provide the highest level of effectiveness in reducing fatal and moderate-to-critical injuries of all the restraint systems studied.

Regulatory Flexibility Act

NHTSA has also considered the impacts of this rulemaking action under the Regulatory Flexibility Act. I hereby certify that it would not have a significant economic impact on a substantial number of small entities. Accordingly, the agency has not prepared a full regulatory flexibility analysis.

Few, if any, passenger car manufacturers would qualify as small entities and the proposed change in the credit provision should not have a substantial effect on small manufacturers. The changes adopted today will provide vehicle manufacturers and restraint system suppliers with additional leadtime to develop passenger-side non-belt systems. The additional leadtime should have the effect of reducing a manufacturer's costs. Small organizations and governmental units that purchase cars with non-belt automatic restraint systems would be affected by this final rule. However, the cost effect of this final rule should not significantly affect them, since the potential cost reductions associated with the changes adopted today should not be significant.

In consideration of the foregoing, Part 571.208 of Title 49 of the Code of Federal Regulations is amended as follows:

S4.1.4 *Passenger cars manufactured on or after September 1, 1989.* Except as provided in S4.1.5, each passenger car manufactured on or after September 1, 1989, shall comply with the requirements of S4.1.2.1. Until September 1, 1993, each car whose driver's designated seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front designated seating position is equipped with a manual Type 2 seat belt that meets the requirements of S5.1, with the Type 2 seat belt assembly adjusted in accordance with S7.4.2, shall be counted as a vehicle complying with S4.1.2.1. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

Issued on March 25, 1987

Diane K. Sneed
Administrator

52 F.R. 10096
March 30, 1987

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
[Docket No. 74-14; Notice 51]

ACTION: Termination of Rulemaking.

SUMMARY: This notice announces the agency's decision to retain the automatic restraint requirement for convertibles manufactured after September 1, 1989. NHTSA has concluded that it is reasonable and practicable for manufacturers to install driver-only air bag systems or automatic safety belts in convertibles. One of the primary reasons for the agency's decision is the anticipated widespread availability of driver-side air bag systems for passenger cars, including convertibles. The increased availability of air bag systems will be a result of a final rule, published elsewhere in today's *Federal Register,* which amends Standard No. 208, *Occupant Crash Protection,* to provide, until September 1, 1993, that a car meeting the performance requirements in the standard with a non-belt automatic restraint, such as an air bag, for the driver and a manual lap/shoulder belt at the right front passenger seating position will be considered in compliance with Standard No. 208. The increased production of driver-side systems which will result from that rulemaking action will decrease the cost of those systems, thus making it financially easier for manufacturers to install those systems in cars that are produced in low volumes, such as convertibles.

EFFECTIVE DATE: Convertibles manufactured on or after September 1, 1989, must comply with the automatic restraint requirement of S4.1.4 of the standard.

SUPPLEMENTARY INFORMATION:

Background

On July 11, 1984 (49 FR 28962), the Department of Transportation announced its decision on occupant crash protection. The decision provided for the phased-in implementation of an automatic restraint requirement for the front outboard seats in passenger cars, including convertibles, beginning on September 1, 1986, with full implementation to take place on September 1, 1989. The decision also announced that the agency was considering whether to rescind the automatic restraint requirement for convertibles and would specifically address that issue in a subsequent rulemaking action.

On April 12, 1985 (50 FR 14589), NHTSA published a notice that proposed, among other things, alternative occupant crash protection requirements for convertibles. On October 17, 1986 (51 FR 37028), NHTSA published a final rule that amended Standard No. 208 to provide manufacturers with the option of excluding convertibles from the automatic restraint requirements during the phase-in period. The agency also announced that it would determine, in a separate rulemaking action, whether to retain the automatic restraint requirements for convertibles manufactured on or after September 1, 1989, or whether the agency should apply a dynamic test requirement to the manual safety belts installed in those vehicles. Subsequent to publication of the October 1986 final rule, seven interested parties filed timely petitions for reconsideration. After reviewing the issues raised by the petitioners, NHTSA has decided to retain the automatic restraint requirement for convertibles manufactured on or after September 1, 1989. The issues raised by the petitioners and the reasons for the agency's decision are discussed below.

Adopt Permanent Exclusion for Convertibles

Six of the petitioners (Chrysler, Ford, Mazda, Rolls-Royce, Toyota, and Volkswagen) requested NHTSA to adopt a permanent exclusion for convertibles from the automatic restraint requirement. In addition, those six petitioners urged the agency to make its decision promptly, saying that vehicle manufacturers need to know the final requirements for convertibles since they are currently making their design decisions for convertibles that will be manufactured after September 1, 1989.

The petitioners raised a number of reasons why the automatic restraint requirement should not be retained for convertibles. Chrysler said that while "an air bag might provide a technical solution for the driver's side, we know of no passive system which can be employed on the passenger side and still retain the open character of the convertible." Ford and Volkswagen said that, based on the information relied on by the agency in the October 1986 final rule, a requirement for automatic restraints in convertibles manufactured after September 1, 1989, would be unreasonable, impracticable, and inappropriate. They referred to the agency's comment in the October 1986 final rule that automatic belts are not reasonable for some models because of the structural changes that would have to be made to attach the upper torso portion of the belt. They also referred to the agency's comment in the same final rule that further research and development work must be accomplished before an effective, low-cost air bag system is available for convertibles. Finally, they also pointed out that the practicability of using "built-in" safety (i.e., the use of interior padding and structural changes to provide protection to unrestrained occupants) in convertibles is uncertain at this time. Ford repeated its prior comment that failure to rescind the September 1, 1989, automatic restraint requirement for convertibles "would likely prevent Ford from offering convertibles in the 1990 model year." Volkswagen also said it might have to discontinue its convertible models if the automatic restraint requirement is retained for those vehicles.

Ford also said that, even if a practicable automatic belt system were available, it could not design and tool an automatic belt system in time for the 1990 model year. Ford also said that "to introduce a driver air bag into convertibles built after August 31, 1989, Ford would have to initiate immediately a unique engineering program with engineering resources that do not currently exist within Ford or at key suppliers." Further, Ford said that if it had to divert its limited engineering resources to an accelerated design and development program for convertibles, it would have to delay its long term program to develop passenger-side air bags.

Rolls-Royce said that its convertible is a separate vehicle model and is not a convertible version of its four door sedan. It said that the current exclusion of convertibles from the automatic restraint requirement during the phase-in allows Rolls-Royce to "devote our limited resources to the development and installation of passive restraints in our four door sedan in the short term." Rolls-Royce said it plans to install an air bag system in its convertible models in the future, but it may not be able to develop a driver and passenger-side air bag system for the 1990 model.

Apply Requirement to Convertibles

The Insurance Institute for Highway Safety strongly opposed excluding convertibles manufactured after September 1, 1989, from the automatic restraint requirement. IIHS referred to its prior comments on the convertible issue and said that air bags can be installed in those vehicles. IIHS further said that the use of air bags will not "significantly affect car prices because, by the 1990 model year, they will be produced in large enough quantities to keep their cost reasonable."

Agency Decision

After considering the information provided by the commenters, the agency has decided to retain the automatic restraint requirement for convertibles manufactured on or after September 1, 1989. One primary reason for NHTSA's decision is the anticipated widespread availability of driver-side air bag systems for use in convertibles and other passenger cars that will result from another rulemaking action taken today by the agency. To encourage the development of a variety of automatic restraint systems, Standard No. 208 currently provides that a manufacturer that installs a non-belt automatic restraint system, such as an air bag system, at the driver's seating position and a manual lap/shoulder belt at the front right passenger seating position will receive credit for producing one automatic restraint-equipped passenger car ("one car credit") during the phase-in period. In a final rule published elsewhere in today's *Federal Register,* the agency has decided, in response to a petition from the Ford Motor Company, to extend this provision temporarily beyond the phase-in period. That final rule amends Standard No. 208 to provide, until September 1, 1993, that a car meeting the performance requirements in the standard with a non-belt automatic restraint system for the driver and a dynamically tested manual lap/shoulder belt for the right front passenger will be considered in compliance with Standard No. 208.

At the time of the October 1986 final rule that excluded convertibles from the automatic restraint phase-in requirement, the agency expressed concern about the availability of low cost air bag systems for convertibles. NHTSA said that the cost of air bag systems, particularly when used in low volume installations such as convertibles, could be substantial and thus result in significant increases in the price of convertibles. However, information provided by vehicle manufacturers and suppliers in response to the notice of proposed rulemaking on the one car credit indicates that the prospects for the widespread availability of driver-side air bag systems by September 1, 1989, are now substantially greater. With the anticipated increase in production of driver-only systems, the costs of those systems will decrease. Thus, it will be possible for manufacturers to install driver-side air bag systems in their convertibles without having to substantially raise the price of those vehicles.

The agency also believes that manufacturers have sufficient time to allocate their resources to provide driver air bag systems for convertibles, if they do not wish to use an automatic safety belt. The basic components used in an air bag system, such as the inflators and crash sensors, are fundamentally the same regardless of whether the components are used in sedans or in convertibles. For example, according to information obtained by the agency, the air bag components used by Mercedes-Benz in its convertibles and sedans are generally interchangeable. Thus, manufacturers should be able to use driver air bag design and development work done for a line of sedan vehicles and be able to apply it in preparing similar installations in its convertible lines.

The agency also has additional information indicating that it is possible to install automatic safety belts in some types of convertibles without having to make significant structural changes, such as the addition of pylons or other vehicle structures, to allow the safety belt to be anchored to the vehicle. Alfa Romeo has presented information to the agency concerning an automatic safety belt system it has developed for its two-seat convertible model. The Alfa Romeo system uses a motorized automatic belt in which the belt is anchored, at the one end in a motorized track that is located in the vehicle's side door sill. It is anchored at the other end in the center of the floor behind the front seats. The belt runs from those anchorage points through a guide located on the inboard, top side of the front seat. Although it is possible that this system might not be suitable for at least some convertibles with rear seats, it is available for use in other convertibles.

Based on information presented by General Motors in its comments on the proposed one-car credit rule, it appears that "built-in" safety is still not practicable for convertibles or other passenger cars. Although manufacturers may not have the choice of using "built-in" safety at this time, they can use driver-only air bags and automatic belt designs, such as Alfa's. Because of the availability of these automatic restraint alternatives, the agency believes it is appropriate to retain the automatic restraint requirement for those vehicles.

Competition Among Air Bag Suppliers

In commenting on the agency's decision to exclude convertibles from the automatic restraint requirement during the phase-in, Mazda noted that the agency referred to the Breed Corporation's air bag system as one possible system that would reduce the cost of air bags. Mazda criticized the agency for what it termed the "creation and approval of the NHTSA of a monopoly of the air bag market by the Breed Corporation." As discussed below, the Mazda criticism is not accurate.

NHTSA has been engaged in a research effort with the Breed Corporation to explore the use of one type of technology—the use of a mechanical as opposed to an electronic sensor—in air bag systems. NHTSA entered into this research effort since it holds the promise of resulting in an air bag system that is potentially simpler and less costly than current systems. That research, if successful, will not create a monopoly for the Breed Corporation. As shown by a review of the companies that commented on the agency's November 25, 1986 (51 FR 42598), notice of proposed rulemaking on the Ford petition, there are a number of restraint system suppliers, other than Breed, that have been involved in past air bag development programs and are currently involved in new programs to develop new air bag systems. The future availability of those systems, and availability of systems currently being produced by other companies will ensure that there is a competitive market for air bag systems.

Definition of Convertible

In the October 1986 final rule, NHTSA set out the criterion it has used in determining whether a vehicle is a convertible. The agency said that a convertible is a vehicle whose A-pillar or windshield peripheral support is not joined at the top with the B-pillar or another rear roof support rearward of the B-pillar by a fixed rigid structural member. Applying this criterion, the agency said that a vehicle with a so-called "targa" roof—a roof in which an entire section of the structure over the driver and front seat passenger can be easily removed and replaced by a vehicle owner—would be considered a convertible since it does not have any fixed structural member connecting the tops of the A- and B-pillars when the targa roof is removed. However, a vehicle with a T-bar roof—a roof which can be only partially removed by the vehicle's owner—would *not* be considered a convertible since there is a fixed structural member in the vehicle's roof which connects the A- and B-pillars when the partial sections of the roof are removed.

In its petition for reconsideration, Toyota requested the agency to exclude T-bar roof vehicles from the automatic restraint requirement. Toyota said that "due to the lack of a door frame or a roof side rail structure, it is impossible to install an automatic belt that is acceptable to customers to the T-bar roof vehicles in view of current technology." Toyota said it will have to discontinue T-bar roof vehicles after September 1, 1989, unless those vehicles are excluded from the automatic restraint requirement.

NHTSA has decided to retain its current interpretation of the term convertible and thus, is not adopting the proposed revision requested by Toyota. As discussed earlier in this notice, driver-side air bags and automatic safety belg systems will be available for use in convertibles. Since those systems are available for convertibles, Toyota and other manufacturers of cars with T-bar roofs can use those same systems to comply with the performance requirements of the standard.

Cost and Benefits

NHTSA has examined the impacts of this rulemaking action and determined that the action is not major within the meaning of Executive Order 12291 or significant within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has prepared a regulatory evaluation that examines the economic and other impacts of this rulemaking action.

The agency anticipates that most manufacturers initially will choose to install driver-only air bag systems in their convertible models. As discussed earlier in this notice, NHTSA believes that because of the agency's decision to extend temporarily the provision that a car meeting the performance requirements in the standard with a non-belt automatic restraint system for the driver, air bag systems will become readily available in large numbers by the September 1, 1989, effective date. With the increase in air bag production, the cost of the system should decrease significantly. NHTSA estimated that, assuming high volume production, a driver-only air bag system will cost from $250 to $350. Thus, installing them in convertibles should not have a significant effect on vehicle prices. As discussed in the agency's regulatory evaluation, the long-term benefits of driver-only air bag systems in convertibles range from 19 to 38 fatalities prevented and from 295 to 533 moderate to serious injuries prevented annually. The agency has also examined the costs and benefits for automatic belt systems. NHTSA estimates that motorized automatic safety belts would have a lifetime cost of from approximately $290 to $490. The agency also examined the effectiveness of automatic safety using a range of assumed usage rates. At 40 percent usage, automatic safety belts would prevent up to 5 fatalities and 71 moderate to serious injuries. At 70 percent usage, automatic safety belts would save from 21 to 36 lives and prevent from 337 to 562 moderate to serious injuries.

Regulatory Flexibility Act

NHTSA has also considered the impacts of this rulemaking action under the Regulatory Flexibility Act. I hereby certify that it will not have a significant economic impact on a substantial number of small entities. Accordingly, the agency has not prepared a full regulatory flexibility analysis.

Few, if any, passenger car manufacturers qualify as small entities. Small organizations and government units should not be affected since the number of convertibles purchased by those entities should be small. As discussed below, persons engaged in the business of converting passenger cars from sedans to convertibles may be affected.

Under the agency's certification regulation, a person that alters a previously certified new vehicle must certify that the vehicle, as altered, conforms with all applicable safety standards. The agency has said that when a vehicle is altered from one vehicle type to another, the alterer must certify that the vehicle conforms to the safety standards that apply to the new vehicle type, in this case a convertible. Since the agency has decided to retain the automatic restraint requirement for convertibles, a person converting a new hard-top car into a convertible would have to ensure that the altered car complied with the automatic restraint requirement. If a hard-top vehicle were equipped with automatic safety belts, a converter would have to either find a way to re-install the automatic safety belts or install an air bag or other type of automatic restraint system.

The information NHTSA has obtained about the passenger car conversion industry indicates that, at present, there are only a few businesses engaged in large-scale conversions of passenger cars for manufacturers and dealers and the businesses that the agency has identified would not qualify as small businesses. In addition, there may be a number of small businesses that do a few conversions each year. The effect on those businesses will depend on the automatic restraint system installed in the vehicles that they are converting. If the car is equipped with an air bag system, the converter may not have to make any significant changes to the car to ensure that it still complies with the standard. However, if the car has an automatic belt, the converter may have to make more significant structural changes to either re-install the automatic belt or install an air bag system. The converter would also have to do testing or prepare an engineering analysis to show that the converted vehicle complied with the requirements of the standard.

Issued on: Mar 25, 1987

Diane K. Steed
Administrator

52 F.R. 10122
March 30, 1987

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection and Automatic Restraint Phase-in Reporting (Docket No. 74-14; Notice 47)

ACTION: Final rule; correction.

SUMMARY: This document corrects a citation contained in a final rule amending Standard No. 208, Occupant Crash Protection. This rule was intended to modify the head injury criteria set forth in sections S6.1.2 and S6.2.2 of Standard No. 208 by limiting the calculation to a maximum time interval of 36 milliseconds. However, as published on October 17, 1986 (51 FR 37028, at 37033), the rule amended section S6.2 of Standard No. 208. This notice corrects that error.

Accordingly, the following correction is made to page 37033 of Volume 51 of the *Federal Register*, in the issue of October 17, 1986:

In the second column, the lead in to the sixth amendment is corrected to read as follows:

S6.1.2 and S6.2.2 are revised to read as follows:

Issued on September 24, 1987

Diane K. Steed
Administrator

52 F.R. 36423
September 29, 1987

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 74-14; Notice 53)

ACTION: Final rule.

SUMMARY: This final rule requires light trucks and light multipurpose passenger vehicles (e.g., utility vehicles capable of off-road use and van-type passenger vehicles) equipped with manual lap/shoulder safety belts for the front outboard seats to comply with the injury reduction criteria of Standard No. 208, *Occupant Crash Protection*, in a 30 mile per hour barrier crash test. This rule also responds to dummy positioning issues raised in petitions for reconsideration of the final rule adopting the use of the Hybrid III dummy.

The vehicles subject to this final rule are those with a gross vehicle weight rating (GVWR) of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. Thus, this final rule will require the vast majority of multipurpose passenger vehicles and light trucks to meet the new manual belt performance requirements of the standard.

The GVWR and unloaded weight limits adopted in today's final rule will avoid imposing a testing and paperwork burden on most small businesses that either install a body on a chassis manufactured by another company or alter vehicles previously certified by other manufacturers. NHTSA is limiting the effects of this rule on small businesses to the extent possible, because most small businesses do not have the technical and financial resources necessary to do the testing or engineering analysis needed to determine whether their completed vehicles will meet the requirements of the new dynamic test for safety belts.

The dynamic test requirement will go into effect for multipurpose passenger vehicles and trucks with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less beginning on September 1, 1991. Unlike the dynamic test requirement for manual safety belts in passenger cars, the rule adopted today is not conditional. The requirement for cars with manual safety belts is conditional in that it becomes effective only if the automatic restraint requirement for cars is rescinded as a result of the enactment of State safety belt use laws covering two-thirds of the U.S. population and meeting criteria set forth in Standard No. 208.

DATES: The amendments made by this final rule are effective on May 23, 1988. Multipurpose passenger vehicles and trucks with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.

SUPPLEMENTARY INFORMATION: On April 12, 1985 (50 FR 14589), NHTSA published a notice, which is the basis for the final rule being issued today, proposing a number of amendments to Standard No. 208, *Occupant Crash Protection*. Among the proposals was one that manual lap/shoulder belts installed at the front outboard seating positions of four different vehicle types comply with the dynamic testing requirements of Standard No. 208. That notice proposed to use test dummies in 30 mile per hour barrier crash tests to measure the level of protection offered by the vehicle's manual lap/shoulder safety belts. (The same test conditions and procedures are used for testing the protection provided by automatic restraint systems, such as automatic safety belts and air bags, in passenger cars.) The four vehicle types subject to this proposal were passenger cars and light trucks, buses, and multipurpose passenger vehicles, i.e., trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. On March 21, 1986 (51 FR 9800), NHTSA adopted a dynamic test requirement for manual lap/shoulder safety belts in the front outboard seats in passenger cars. The dynamic test requirement for manual lap/shoulder belts in passenger cars will go into effect on September 1, 1989, if the automatic restraint requirement is rescinded as a result of the enactment of State safety belt use laws covering two-thirds of the U.S. population and meeting criteria set forth in Standard No. 208.

This final rule adopts a dynamic test requirement for the lap/shoulder safety belts installed in the front outboard seating positions of light trucks and multipurpose passenger vehicles. Several of the issues discussed with respect to those vehicle types in this final rule, such as the adjustment that will be made to safety belt tension-relieving devices prior to the crash test, have already been discussed with respect to passenger cars in prior agency final rules. To assist readers in understanding all of the effects of the new dynamic test requirement for safety belts in light trucks and multipurpose passenger vehicles, those discussions have been repeated in this final rule.

Dynamic testing of manual safety belts

Most of the commenters favored adopting a dynamic test requirement for manual belts, at least as to passenger cars, although many of those commenters raised questions about the leadtime needed to comply with the requirement. Those opposing the requirement argued that the field experience has shown that current manual safety belts provide substantial protection and thus a dynamic test requirement is not necessary. In addition, they argued that dynamic testing would substantially increase a manufacturer's testing costs and workload and could pose problems for final-stage manufacturers and vehicle alterers.

As discussed in detail below, the agency has now decided to adopt a dynamic test requirement for manual lap/shoulder belts in the front outboard seats of light trucks and light multipurpose passenger vehicles, which include such vehicles as light vans and light utility vehicles. To reduce potential problems for final-stage vehicle manufacturers and vehicle alterers, the agency is limiting the dynamic test requirement to vehicles which have a gross vehicle weight rating (GVWR) of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. The requirement will go into effect for light trucks and light multipurpose passenger vehicles on September 1, 1991.

The agency has decided not to apply a dynamic test requirement to buses at this time. Standard No. 208 only requires the installation of a safety belt for the driver of a bus and gives manufacturers the option of installing either a lap safety belt or a lap/shoulder safety belt for the driver. The agency is concerned that applying a dynamic test requirement to a lap/shoulder belt that is voluntarily installed in a bus might encourage manufacturers to replace the lap/shoulder belt with a less costly lap belt, which would not be subject to a dynamic test requirement. Today's final rule should, however, also work to improve the safety of van-type buses since many of those vehicles are based on a chassis that is the same as or similar to the chassis used in light van-type multipurpose passenger vehicles that will be covered by the dynamic test requirement. (Under the agency's regulations, a bus is a vehicle that carries more than 10 persons. Thus, a van-type vehicle with four rows of seats that carries 12-15 people would be classified as a bus. Under the agency's regulations, a multipurpose passenger vehicle is a vehicle that is designed to carry 10 or less persons and is either built on a truck chassis or has features for occasional off-road use. Thus, a passenger van-type vehicle that is designed to carry 9 or fewer persons would be considered a multipurpose passenger vehicle.)

The issues raised by the commenters and the reasons for the agency's decisions are discussed below.

Safety need

As mentioned previously, most of the commenters favored the adoption of a dynamic test requirement for manual safety belt systems. The commenters favoring adoption of the requirement were the American Seat Belt Council, Center for Auto Safety, General Motors, Insurance Institute for Highway Safety, Mercedes-Benz, National Transportation Safety Board, Porsche, State Farm Mutual Insurance Co., and Volkswagen. In expressing their support for dynamic testing, the commenters generally did not distinguish between dynamic testing of safety belts in passenger cars and dynamic testing of safety belts in light trucks, buses and multipurpose passenger vehicles. The Insurance Institute for Highway Safety, however, did specifically address the dynamic testing of safety belts in vehicles other than passenger cars. It said that "requiring the dynamic testing of manual belts would result in the upgrading of the crash performance of many vehicles, including light trucks, vans, and utility vehicles, for which automatic restraint requirements have not yet been proposed."

The proposed dynamic test requirement was opposed by American Motors Corporation (AMC), Chrysler, Fiat, Ford, the Motor Vehicle Manufacturers Association (MVMA), and Toyota. In addition, Peugeot and Renault requested the agency to adopt a laboratory test procedure used by the Economic Commission for Europe rather than use a vehicle crash test to measure the dynamic performance of safety belts.

In questioning the safety need for dynamic testing, AMC, Chrysler, Ford, and MVMA said that current field data do not show a need for dynamic testing. Ford said that available crash data indicate "occupants of full-size light trucks are exposed to less risk of collision injuries than occupants of either passenger cars or compact trucks. Moreover, full-size light trucks are far more likely to collide with smaller, lighter vehicles than with vehicles whose mass is comparable to or greater than that of such trucks." (In its comments, Ford explained that it used the term "full-size light truck" to mean trucks, such as its F-Series/Bronco and Econoline vehicles, that have derivatives with GVWR's greater than 8,500 pounds.) In addition, Ford said that a "30 mph fixed barrier test requirement represents an unrealistically severe test for many full-size light trucks because they weigh much more than typical passenger cars" and full-size light trucks "are not likely to experience an impact of 30 mph barrier equivalent velocity on the highway."

The agency strongly agrees with the commenters that current manual safety belts provide very substantial protection in a crash. The Department's 1984 occupant protection decision concluded that current manual safety belts, when worn, are at least as effective, and in some cases, more effective than current automatic belt designs. That conclusion was based on current manual safety belts, which are not certified to dynamic tests. However, as discussed in the April 1985 notice, the agency is concerned that as more tension-relieving devices are used on manual belts and as an increasing number of vehicles are reduced in size, the potential for occupant injury may increase. The agency is particularly concerned about ensuring the safety performance of belt systems used in the popular series of new compact trucks, utility vehicles, and minivans. The agency's concerns about ensuring adequate safety performance are substantiated by laboratory crash tests of current light trucks and multipurpose passenger vehicles. Each of these issues is addressed in more detail below.

Crash test performance of current vehicles

To evaluate the safety performance of current light trucks, buses, and multipurpose passenger vehicles, the agency has examined the results of 20 crash tests at 30 mph. In the 30 mph tests, only five of the 20 vehicles tested met both Standard No. 208's head injury criterion (HIC) and chest acceleration criterion at the driver and front right seat passenger positions. (In four other tests, at least one of the test dummies met both the HIC and chest acceleration criteria.) These test results suggest that the agency's concerns about ensuring adequate safety performance of these vehicles are not unfounded.

In addition, the agency has conducted 16 additional tests of those vehicles at 35 mph as a part of its experimental New Car Assessment Program (NCAP). The agency is aware of the fact that NCAP testing exposes vehicles to 36 percent greater crash forces than the 30 mph test. Because of these significantly higher crash forces, the agency has repeatedly stated that the fact that a vehicle did not comply with the Standard No. 208 criteria in an NCAP test should *not* be interpreted as implying that the vehicle would not comply with Standard No. 208 if it were tested in accordance with that Standard; i.e., subjected to a 30 mph frontal barrier crash. Although NCAP data alone would not indicate a basis for the agency's concern, they do, in this case, correlate reasonably well with the 30 mph test data. In the 35 mph tests, only three of the 16 vehicles tested met Standard No. 208's HIC and chest acceleration criteria at both front seating positions. (In four other tests, at least one of the test dummies met both the HIC and chest acceleration criteria.)

In addition to these test results, an analysis of fatalities in crashes of the various vehicle types in frontal impacts supports the agency's concerns about extending dynamic testing requirements to these additional groups of vehicles. Even though the analysis of fatalities shows that the fatality rates per million registered vehicles were nearly identical in 1985 for passenger cars and light trucks, at 86.9 and 80.4 respectively (see Table 6 of NHTSA's May, 1987 Report to Congress entitled "Light Truck and Van Safety"), some types of light trucks, especially compact pick-up trucks, had higher fatality rates. This rule will ensure adequate safety performance for *all* types of light trucks and multipurpose passenger vehicles, in the same way that Standard No. 208 now ensures adequate safety performance for all types of passenger cars.

Downsizing

Ford agreed with the agency that downsizing "is certainly evident in the new smaller pickup trucks, utility vehicles and minivans," but said that downsizing is "not evident in full-size pickups, MPV's, vans or buses. We do not expect any significant reduction in the size of full-size trucks, buses or MPV's in the foreseeable future." Ford also said that "downsizing has not affected interior geometry and thus, is not a valid rationale for requiring dynamic testing of belts."

The agency agrees with Ford that in their downsizing efforts, manufacturers have attempted to preserve the interior space of their vehicles, while reducing their exterior dimensions. Preserving the interior dimensions of the passenger compartment means that occupants will not be placed closer to instrument panels and other vehicle structures which they could strike in a crash. However, the reduction in *exterior* dimensions in the new lines of compact trucks, utility and van-like vehicles can result in a lessening of the protective crush distance available in those vehicles. The reduction in crush space may mean that occupants may be subject to a higher degree of risk in downsized vehicles, even if the interior dimensions of the vehicle are the same as or similar to the dimensions of the older, full-size vehicle. Thus, the agency believes it is important to require dynamic testing to ensure that safety belts in downsized vehicles will perform adequately.

Ford raised another issue associated, in part, with downsizing. Ford said that because of the differences in vehicle weights, when light trucks and van-like vehicles strike passenger cars, the heavier truck or van-like vehicle will experience lower changes in velocity and thus will likely expose their occupants to less violent crash conditions. NHTSA agrees that this will be particularly true for the heavier vehicles excluded from the dynamic test requirement, which will experience a far lower change in velocity in an impact with a lighter passenger car. However, the change in velocity in impacts between a passenger car and a compact truck or multipurpose passenger vehicle, which represent most of the vehicles covered by today's final rule, will be similar. Thus, the crash test does not represent an overly severe test for lighter trucks and multipurpose passenger vehicles. In addition, the light trucks and van-like vehicles covered by today's rule also are involved in crashes with heavier vehicles and solid objects, such as trees and bridge abutments, which will result in high crash forces for these light vehicles. NHTSA believes that occupants of these light trucks and multipurpose passenger vehicles should be assured of the same level of protection as passenger car occupants in those crashes.

Webbing tension-relieving devices

The April 1985 notice explained that the agency was also concerned about the possible misuse of tension-relieving devices on manual belts. Tension-relieving devices are used to introduce slack in the shoulder portion of a lap/shoulder belt to reduce the pressure of the belt on an occupant or to effect a more comfortable "fit" of the belt to an occupant. The agency believed that the trend toward use of tension-relieving devices was another reason for requiring dynamic tests of safety belts. While recognizing that such devices could make belts more comfortable, thus increasing usage, the agency was also concerned that vehicle occupants may use the tension-relieving device to introduce too much slack in the safety belt and thus reduce its protection capability.

The notice proposed that manufacturers be required to specify in the owner's manuals for their vehicles the maximum amount of slack they recommend introducing into the belt under normal use conditions. Further, the owner's manual would be required to warn that introducing slack beyond the maximum amount specified by the manufacturer could significantly reduce the effectiveness of the belt in a crash. During the agency's dynamic testing of manual belts, the tension-relieving devices would be adjusted so as to introduce the maximum amount of slack specified in the owner's manual.

With the exception of Ford, those manufacturers who commented on the proposal concerning tension-relieving devices supported testing safety belts adjusted so that they have the amount of slack recommended by the manufacturer in the owner's manual. Ford said that requiring any slack to be introduced into the belt system would increase the variability of the dynamic test procedure, and thus reduce the objectivity of the test. Ford said that it might have to eliminate all tension-relieving devices for its safety belts.

The agency's proposed test procedure was intended to accommodate tension-relieving devices since, as noted above, they can increase the comfort of lap/shoulder safety belts, which in turn, should increase usage. At the same time, the proposal would limit the potential reduction in effectiveness for safety belts systems with excessive slack. The agency does not agree that this test procedure need result in the elimination of tension-relieving devices from the marketplace. As mentioned earlier, all the other manufacturers addressing this proposal supported it and did not indicate they would have to remove tension-relieving devices from their belt systems.

In addition, Ford did not provide any data showing that the variability of the tests will increase because of the new requirement. In particular, Ford did not show that injury levels cannot be controlled within the specified injury criteria by testing with the recommended amount of slack, as determined by the manufacturer. A manufacturer has the option of recommending that a very limited amount of slack be introduced into its safety belts to ensure that the injury reduction criteria of Standard No. 208 would be met with the slackened safety belt. The agency notes that as a practical matter, most tension relievers automatically introduce some slack into the belt for all occupants.

Testing without such slack would be unrealistic, since it would not represent how vehicle occupants will wear the safety belt in their vehicles.

CFAS and NTSB raised another objection about the proposed requirement. They objected to the proposal that manual belt systems using tension-relieving devices meet the injury criteria with only the specified amount of slack recommended in the owner's manual. They stated that most owners would not read the instructions in the owner's manual regarding the proper use of the tension-relieving device. They said an occupant could have a false sense of adequate restraint when wearing a belt system adjusted beyond the recommended limit.

The agency's views on allowing the use of tension-relievers in safety belts were detailed in the April 1985 notice. The agency specifically noted the effectiveness of a safety belt system could be compromised if excessive slack were introduced into the belt. However, the agency recognizes that a belt system must be used to be effective at all. Allowing manufacturers to install tension-relieving devices makes it possible for an occupant to introduce a small amount of slack to relieve shoulder belt pressure or to divert the belt away from the neck. As a result, safety belt use is promoted. This factor should outweigh any loss in effectiveness due to the introduction of a recommended amount of slack in normal use. This is particularly likely in view of the requirement that the belt system, as adjusted, must meet the injury criteria of Standard No. 208 under 30 mph test conditions. Further, the agency believes that the inadvertent introduction of slack into a belt system, which is beyond that for normal use, is unlikely in most current systems.

Feasibility

In questioning the feasibility of meeting the requirements in full-size vehicles, Ford said it knew of no test data indicating that any vehicle in the full-size bus/multipurpose passenger vehicle class can meet the proposed requirements. Ford also said it was unsure whether modifying its vehicles to meet the dynamic test requirement might require it to stiffen the front end of the vehicles or develop a less stiff front end that "could preclude concurrent compliance to the 212/219 standards." Finally, Ford said that the dynamic test requirement "would be complicated by the broad range of vehicles produced with a variety of interchangeable parts." In particular, it said that high GVWR vehicles have different vehicle and dummy movement than the lower GVWR models from which the high GVWR vehicles are derived. Ford said that these "differences argue against requiring lower GVWR derivatives to meet the injury criteria, because such a requirement may jeopardize the commonality of body components across the truck line and the truck's function and may even adversely affect the occupant protection offered in higher GVWR trucks." Fiat and Toyota also said that it is more difficult to design light trucks and van-like vehicles to conform to a dynamic test requirement and asked the agency to exclude those vehicles from the proposed requirement.

As discussed in the regulatory evaluation for this rulemaking action, the agency has examined test results of light trucks, buses, and multipurpose passenger vehicles at both 30 and 35 mph. Those results show that it is possible for the heavier light trucks and vans to meet the HIC, femur load, and chest acceleration criteria. The test results from the agency's 30 mph tests show that the Ford F-250 pickup truck, with a test weight of 4,866 pounds, and a Ford R-100 pickup truck, with a test weight of 3,163 pounds, met the HIC and chest acceleration requirements. The heaviest vehicle tested in the 30 mph crashes, a Ford P-500 van with a test weight of 5,796 pounds, met the HIC and chest acceleration criteria for the driver; the data for the passenger are not available. The results also show that a Chevrolet K-10 pickup truck with a test weight of 5,401 pounds, met the head injury criterion, and met the chest acceleration criterion for the passenger; the data on the chest acceleration criterion for the driver are not available.

Even at higher speeds, heavier vehicles can meet the dynamic test. For example, NHTSA has examined its NCAP test results and identified two heavier vehicles that met the proposed requirements in 35 mph tests, which involve 36 percent more energy than the 30 mph crash test that will be used in dynamic testing of safety belts. Those vehicles are a Chevrolet C-10 pickup truck, with a test weight of 4,830 pounds, and a Toyota Van-Wagon, with a test weight of 3,616 pounds. Those vehicles were also tested and found to meet Standard No. 212, *Windshield Retention*. Although these results indicate that the requirements are feasible, the agency recognizes that manufacturers will need additional leadtime to develop and produce the necessary design changes that must be made to bring the rest of their vehicles into compliance.

Aggressivity

Ford and MVMA argued that the aggressivity of these vehicles may increase because of design changes required to meet the proposed standard (aggressivity refers to the possibility of increasing the stiffness of a vehicle so that when it strikes another vehicle, the stiffened vehicle inflicts greater damage on the struck vehicle than it would otherwise have done.) However, neither commenter provided data showing that these vehicles would necessarily become more aggressive. NHTSA analysis of existing NCAP data shows that softening rather than stiffening the front structure of a vehicle can improve its crash performance without increasing its aggressivity. (See the results presented in "A Review of the Effects of Belt Systems, Steering Assemblies, and Structural Design on the Safety Performance of Vehicles in the New Car Assessment Program." Hackney and Ellyson, Tenth International Technical Conference on Experimental Safety Vehicles, 1985.)

Effect on final-stage manufacturers and alterers

Ford and MVMA also raised questions about the effect of dynamic testing of full-size light trucks on final-stage manufacturers and vehicle alterers. Ford said that final-stage manufacturers, such as van converters, who install their own seats in a vehicle could not rely on the incomplete vehicle manufacturer's testing to certify compliance because changes in the seat or belt mounting could invalidate the results of the prior dynamic testing. Likewise, Ford said final-stage manufacturers that add additional equipment to a vehicle could be affected since Ford "would most likely have to recommend stringent limitations on vehicle weight distribution and center of gravity height in order that our crash test results might be approximately representative of the results obtained in tests of the vehicles as completed or altered."

After examining this issue, the agency agrees that dynamic testing of safety belts can pose a problem for final-stage manufacturers and vehicle alterers. NHTSA believes that these parties do not generally have the necessary technical and financial resources to do the vehicle testing or engineering analysis necessary to determine if the safety belts in their altered vehicles meet the dynamic test requirements. Accordingly, this rule limits the effects on these small businesses to the extent possible. NHTSA has obtained information from the Truck Body and Equipment Association which indicates that 90-95 percent of multi-stage manufacturers among its members use vehicles with a GVWR of greater than 8,500 pounds. To reduce the potential problem for final-stage manufacturers and alterers, the agency has decided to limit the applicability of the dynamic test requirement to vehicles with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less.

As another approach to limiting the effect of the rule on final-stage manufacturers, the agency had proposed to exclude motor homes. Most, if not all, motor homes, with a GVWR of 10,000 pounds or less, are built on a van cutaway chassis, which consists of the front end and chassis of a van. The number of such vehicles is limited. For example, in 1985, approximately 28,000 van cutaway chassis were used for motor homes. No commenter opposed the proposed exclusion of motor homes and it is thus adopted in the final rule. The agency also proposed to exclude open-body type vehicles, walk-in van-type trucks, vehicles designed exclusively to be sold to the U.S. Postal Service and vehicles carrying chassis-mount campers. These exclusions were also not opposed and are therefore adopted in today's final rule.

Applying the dynamic test requirement to vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less will cover the vast majority of light trucks and multipurpose passenger vehicles. The agency projects that for model year 1992, there will be sales of 4.4 million vehicles, other than passenger cars, with a GVWR of up to 10,000 pounds. Of those vehicles, approximately 3.8 million will have a GVWR of 8,500 pounds or less. The remaining 0.6 million, which represent approximately 14 percent of the total, will have a GVWR in the 8,501 to 10,000 pound range. The dynamic test requirement adopted today should also have a safety benefit for the vehicles in the 8,501 to 10,000 pound GVWR range. Many of these vehicles are derived from vehicles with a GVWR of 8,500 pounds or less. The type of structural and safety belt system changes made to the vehicles covered by today's final rule should also benefit occupants in the derivative vehicles.

Forward control vehicles

GM said that it had limited data on the ability of forward control vehicles to meet a dynamic performance test. GM said that, based on engineering studies, it believes that the limited crush space in those vehicles may not make it possible to meet the proposed requirements, at least not by the proposed September 1, 1989 effective date.

In supplemental comments filed with the agency, GM said it was also concerned about the ability of some forward control-type vehicles to meet the proposed requirements. GM explained that those forward control-type vehicles do not meet the agency's definition of forward control, but do have the same or similar limited crush space. (Part 571.3 of the agency's regulations define a forward control vehicle as a vehicle in which at least half the engine is located rearward of the windshield and the steering wheel is located in the front quarter of the vehicle.) GM further explained that two of its three series of light trucks and multipurpose passenger vehicles are forward control vehicles that meet the agency's definition of that term. Those two forward control vehicle series are the G series vans, which are full-size vans, and the P series vehicles, which consist of either a completed walk-in van-type vehicle or a chassis that is completed by final-stage manufacturers into walk-in van-type vehicles, such as parcel delivery trucks. In the case of its M series vehicles, which are minivans, GM said that while those vehicles do not meet the agency's definition of forward control, they are forward control *type* vehicles.

GM's submission contained data from two 30 mph crash tests of the M series vehicles using Hybrid III test dummies, in which some of the HIC, chest acceleration and chest deflection readings exceeded the values set in Standard No. 208. GM said that "These type of test results are to be anticipated from vehicle decelerations which do not benefit significantly from energy dissipation due to frontal crush. Further, a greater amount of passenger compartment deformation would be expected in barrier tests of forward control type vehicles, another factor that probably contributed to the observed injury criteria values." GM also noted that the agency's NCAP test results for the M series van also showed the difficulty of meeting Standard No. 208's test requirements in those vehicles. GM suggested that the agency consider establishing other injury criteria levels for forward control type vehicles or excluding those vehicles from the dynamic test requirement. GM also requested NHTSA to consider revising the agency's definition of forward control vehicle.

The agency recognizes that because of the smaller amount of frontal crush space available in forward control and forward control type vehicles, it is more difficult to provide occupant crash protection in frontal crashes of those vehicles. However, there is information showing that those vehicles can be designed to meet the performance requirements of Standard No. 208. In its NCAP program, the agency has tested a 1984 Toyota Van, which is a forward control vehicle, in a 35 mph barrier impact test. In that test, which is a more severe test than the 30 mph barrier impact used in Standard No. 208, both the driver and passenger test dummies did not exceed the HIC and chest acceleration limits set in the standard. The femur loads for the driver did exceed the limit in Standard No. 208, but the passenger's femur loads were well below the limit. NHTSA believes that with the longer leadtime provided by this notice, manufacturers can adopt appropriate changes to enable forward control and forward control type vehicles to meet the performance requirement of Standard No. 208. Therefore, the agency has decided not to exempt forward control or forward control type vehicles from the dynamic test requirement.

Dummy positioning in light trucks

In its comments, Ford expressed concern about whether the test dummy positioning procedure used in passenger cars can be used in light trucks. In particular, Ford said that the more upright seat backs found in some light trucks might prevent use of the current positioning procedure.

To address Ford's concern, the agency recently conducted a test series at its Vehicle Research and Test Center in which the agency examined twenty-four different light trucks, vans, and utility vehicles to identify any problems in positioning a SAE H-point machine, which is a manikin representing the weight and dimensions of a 50th percentile male, and a Hybrid III test dummy in those vehicles. The vehicles chosen represented five different vehicle categories: compact and full-size light trucks, compact multipurpose passenger vehicles, minivans, and full-size vans.

Based on its examination and testing of the vehicles, the agency concluded that the SAE H-point machine could be positioned in 15 of the vehicles without any actual or expected difficulty. In the remaining 9 vehicles, the agency did experience some difficulty in positioning the left leg of the H-point machine. However, NHTSA was successful in ultimately positioning the H-point machine in each of the vehicles. The difficulty was caused by the presence of large engine covers in van-type vehicles and a large transmission tunnel in a full-size truck. In those vehicles, the engine cover or transmission tunnel protruded into the passenger's footspace and reduced the space available for placement of the left leg of the H-point machine. In three vehicles the agency had to remove the left leg of the H-point machine in order to be able to position the manikin in the passenger's seat. As long as the weight represented by the left leg is added to the manikin, the agency does not believe that removal of the left leg will affect the determination of the H-point.

Based on its examination and testing, the agency concluded that the Hybrid III test dummy could be positioned in 15 of the vehicles without any actual or expected difficulty. In nine of the vehicles in which the agency identified potential problems, the agency was able to position a Hybrid III test dummy in each of those vehicles using the existing positioning procedure. In each of those vehicles, the agency was able to meet the H-point orientation, pelvic angle and head orientation specifications set for the Hybrid III in Standard No. 208. (A copy of the results for the VRTC testing has been placed in the General Reference section of Docket 74-14.)

As a result of the test series, the agency is adopting one change in the positioning procedure for the Hybrid III. During the tests, NHTSA experienced a problem in placing the Hybrid III in vehicles that had very upright seats with non-adjustable seatbacks. In those vehicles, it was necessary to level the head of the test dummy by adjusting the lower neck bracket of the test dummy. The effect of adjusting the neck bracket is to move the head slightly rearward.

To ensure consistency in the placement of the head when positioning the test dummy in an upright seat with a non-adjustable back, the agency is adopting a sequence of positioning procedures it will follow in adjusting a test dummy in such a seat to level its head. The agency will first adjust the position of the H-point within the limits set forth in the standard in an effort to level the head of the test dummy. If that approach is not successful, the agency will then adjust the pelvic angle of the test dummy, again within the limits provided in the standard. If the head is still not level, the agency will then adjust the neck bracket the minimum amount necessary to level the head. By setting out this sequence, the agency expects to reduce the possibility that different testing organizations will position the test dummy in substantially different ways in an effort to level the head of the test dummy.

Petitions for reconsideration regarding Hybrid III positioning

Subsequent to issuance of the July 25, 1986 (51 FR 26688) final rule adopting the use of the Hybrid III test dummy, a number of manufacturers filed petitions for reconsideration. A number of the issues raised in those petitions for reconsideration involved the positioning of the Hybrid III test dummy. NHTSA has decided to address the positioning issues in this notice, since they affect the positioning procedures that can be used in testing light trucks. At a later date, the agency will address the remaining petitions for reconsideration of the final rule on the Hybrid III test dummy.

Use of different test dummies in different tests

In its petition for reconsideration, the Motor Vehicle Manufacturers Association (MVMA) asked NHTSA to clarify a statement the agency made on the use of the Hybrid III in non-instrumented testing, such as the comfort and convenience testing. MVMA said that it was unclear from the agency's statement in the preamble to the July 25, 1986 final rule whether either test dummy can be used, at the manufacturer's option, to test for compliance with the comfort and convenience requirements, regardless of which test dummy is used in the barrier crash test.

NHTSA's intention was to allow manufacturers, at their option, to specify the use of either test dummy in the instrumented tests and also to permit manufacturers to specify the use of either test dummy in the non-instrumented tests of the standard. Thus, a manufacturer can specify the use of a Hybrid III in the crash test and a Part 572 Subpart B test dummy in the comfort and convenience tests. The July 1986 rule did, however, make clear that manufacturers will only have the option of using either test dummy until September 1, 1991. At that time, the use of the Hybrid III is mandatory for testing passenger cars to the instrumented and non-instrumented testing requirements of Standard No. 208. (Throughout this preamble, the agency refers to the currently specified September 1, 1991 date for mandatory use of the Hybrid III test dummy for compliance testing of passenger cars. The agency would like to note that this mandatory use date was the subject of numerous petitions for reconsideration. The agency is evaluating those petitions at this time, and will announce its decision on any change to that mandatory use date when it responds to those petitions).

In its petition, MVMA also noted that the latchplate access portion of the comfort and convenience requirement needs to be modified to accommodate the use of the Hybrid III test dummy in that test. To determine whether a car complies with that requirement, the standard uses two reach strings attached to the test dummy. To demonstrate compliance, a manufacturer must show that a stowed latchplate is located within the arcs generated by moving the ends of the strings attached to the test dummy. MVMA said that its "comparison of the physical characteristics of the two dummies indicates that there is a significant difference in the seated attitude of the two dummies and in the respective positions of the two dummies' heads." These differences mean that arcs generated by using the two test dummies are different.

MVMA is correct that the requirements of the standard need to be amended. The positioning of the reach strings shown in Figure 3 of the standard is based on the seated position of a Part 572 Subpart B test dummy. Since the Hybrid III has a slightly different seated position, it is necessary to specify different locations for attaching the reach strings on a Hybrid III test dummy. NHTSA has amended the standard to set out the attachment locations for the latchplate access test strings on a Part 572 Subpart B test dummy in Figure 3 A and the attachment locations on a Hybrid III test dummy in Figure 3 B.

Use of different test dummies in the same test

In its petition for reconsideration, Renault asked the agency to permit manufacturers to specify the use of different test dummies at different seating positions in the same crash test. As discussed above, NHTSA believes that prior to September 1, 1991, manufacturers should have the option of choosing which of the test dummies they will use to certify that their vehicles meet the requirements of Standard No. 208. Thus, prior to September 1, 1991, a manufacturer may choose to use, for example, a Hybrid III at the driver's seating position and a Part 572 Subpart B test dummy at the passenger's seating position. On or after September 1, 1991, manufacturers' certifications must be based on the use of the Hybrid III in the driver's and front right outboard seating position is mandatory in passenger car testing. As discussed below, the agency has decided to permit the use of either the Part 572 Subpart B test dummy or the Hybrid III test dummy for testing in vehicles other than passenger cars after 1991.

Indefinite use of Part 572 Subpart B dummy in non-passenger car testing

Today's final rule marks the first time that NHTSA will check compliance with Standard No. 208 for light trucks and multipurpose passenger vehicles by conducting crash tests of those vehicles using instrumented test dummies positioned in accordance with the detailed requirements of Standard No. 208. Although the agency has placed uninstrumented test dummies in those vehicles for compliance testing under other standards, such as Standard Nos. 212 and 219, those standards do not contain detailed test dummy positioning requirements. NHTSA recognizes that while manufacturers have conducted numerous crash tests of passenger cars in accordance with Standard No. 208 to certify compliance with the automatic restraint requirements, manufacturers have not conducted as many similar tests with light trucks and multipurpose passenger vehicles to measure the performance of the safety belt systems in those vehicles. In particular, the agency recognizes that manufacturers have had only limited experience in positioning and using Hybrid III test dummies in light trucks and multipurpose passenger vehicles. As discussed in more detail below, the agency recognizes that it can be difficult to position the Hybrid III test dummy in some light trucks and multipurpose passenger vehicles.

To allow manufacturers to gain more experience with the Hybrid III test dummy, NHTSA has decided to permit temporarily the use of either the Part 572 Subpart B or Hybrid III test dummy in Standard No. 208 compliance testing for light trucks and multipurpose passenger vehicles after September 1, 1991. The agency will continue to monitor its own testing experiences and the manufacturers' experiences in using the Hybrid III test dummy in light trucks and multipurpose passenger vehicles. After evaluating experiences with the Hybrid III test dummy, NHTSA will announce in a subsequent rulemaking when the use of that test dummy will become mandatory for compliance testing for light trucks and multipurpose passenger vehicles.

Foot positioning

Ford said the positioning specification adopted for placement of the driver's left foot and for placement of the passenger test dummy's feet were not clear. In particular, Ford said that the agency should clarify the term "floor surface" to indicate whether the agency is referring to the floor pan or the toeboard. Ford also recommended adopting the same foot positioning requirements for the Hybrid III as are used for the older Part 572 Subpart B test dummy.

Toyota raised a similar issue concerning the placement of the Hybrid III's feet and also recommended that NHTSA use the same foot positioning procedures for the Hybrid III as are used for the Part 572 Subpart B test dummy. In particular, Toyota said that the same procedures should be used for such things as the Hybrid III's foot location when there is a footrest or wheelwell in the passenger compartment. Toyota noted that because of structural differences between the two test dummies, each dummy should continue to have different initial spacing requirements for the knees.

The agency adopted the positioning procedures for the Hybrid III's feet before it had issued the revisions to the feet positioning procedures for the Part 572 Subpart B test dummy. NHTSA agrees with Ford and Toyota that the foot positioning procedures for the two test dummies should be the same. NHTSA has made the necessary changes to the Hybrid III foot positioning procedures to conform them with the procedures used with the Part 572 Subpart B test dummy. So as not to invalidate any design and development work that manufacturers have done using the foot positioning procedures adopted in July 1986, NHTSA is providing that manufacturers have the option of using either positioning procedure until September 1, 1991. In response to Ford's request, NHTSA has also clarified the use of the term "floor surface" in the July 1985 foot positioning procedures to distinguish between the floor pan and the toeboard.

Leg positioning

In its petition for reconsideration, Toyota noted that there were several slight differences between the leg positioning procedure for the Hybrid III and the Part 572 Subpart B test dummies and requested the agency to resolve those differences. Toyota noted that there is no requirement specifying the initial knee position of the driver's left leg for the Hybrid III. In addition, Toyota noted that there is no requirement that the upper and lower leg centerlines of the driver's right leg fall as nearly as possible in a vertical plane.

The positioning specifications for the Hybrid III currently contain a requirement concerning the initial distance between the knees of the Hybrid III test dummy. Since this specification concerns only the initial placement of the knee, the agency does not believe it is necessary to further define the specific initial placement of the driver's right knee. As emphasized in the July 1986 final rule, the knee spacing requirement for the Hybrid III and the part 572 Subpart B test dummies are merely initial settings. The agency recognizes that the spacing can change as the test dummy is adjusted to meet the other positioning requirements. Therefore, the agency does not believe it is necessary to further specify the initial placement of the driver's right knee for the Hybrid III test dummy.

NHTSA does, however, agree with Toyota that the requirements for the positioning of the leg centerlines for the driver's right leg should be the same for both test dummies. The agency has therefore modified the Hybrid III positioning procedures to provide that the centerlines of the driver's upper and lower leg should fall as nearly as possible in a vertical plane.

Hip point placement

The July 1986 final rule provided for positioning the lower torso of the hybrid III with reference to several dimensions established by positioning the Society of Automotive Engineers (SAE) H-point machine on the vehicle's seat. (The H-point machine used in positioning the Hybrid III is a three-dimensional manikin that represents the weight and dimensions of a 50th percentile male.) In particular, the procedure calls for locating the hip point of the Hybrid III test dummy so that it is within 1/2 inch vertically and 1/2 inch longitudinally of a point determined by use of the H-point machine. Ford recommended that the tolerances for the longitudinal location of the dummy's hip point be reduced to 1/4 inch to reduce the possibility of test variability. Ford did not, however, provide any evidence indicating that reducing the tolerances would significantly reduce test variability. In the absence of such data, the agency has decided to deny Ford's request.

Pelvic angle

The July 1986 final rule provided for positioning the pelvic angle of the Hybrid III so that the angle is 22 1/2 degrees plus or minus 2 1/2 degrees. Ford said that the permitted five degree tolerance band is "unnecessarily broad." Ford recommended that the tolerance be reduced to 22 degrees plus or minus one degree.

NHTSA is not adopting Ford's recommended change. The current range of permissible pelvic angles is needed to make it easier to adjust the leg placement of the test dummy. In addition, the current range of permissible angles also makes it easier to rotate the torso of the test dummy to level its head once the tet dummy has been placed on the vehicle seat.

Head positioning

The July 1986 final rule provided that the head shall be positioned so that the head accelerometer mounting platform is horizontal within 1/2 degree. Ford recommended that the test dummy's head "be positioned 5 inches plus or minus 1/4 inch rearward of its hip position to minimize variations in fore-and-aft head positioning." Ford also said that positioning the head in this manner is "consistent with the typical seat back angle in cars and the 22 degree pelvic angle, and will keep the head accelerometer mounting platform essentially horizontal."

The agency has successfully used the current head positioning procedures to obtain a consistent positioning of the Hybrid III's head relative to different vehicle interiors. As discussed earlier in this notice, the agency has decided to adopt a minor change in the positioning requirements to address the minor difficulty the agency has experienced in positioning the Hybrid III in an upright vehicle seat with a non-adjustable seat back. Since the current procedure, with the minor change adopted in this notice, has proved to consistently position the head, the agency is not adopting Ford's suggested alternative.

Torso positioning

The July 1986 final rule provided for positioning the upper torso of the Hybrid III so that it rests against the seat back. Toyota said that it has attempted to position a Hybrid III test dummy using this procedure and "found that the head position of the dummy is not consistent and is significantly influenced by the force applied to the upper torso when positioning the dummy." Toyota requested the agency to set a specific load to be applied to the upper torso of the Hybrid III while positioning the test dummy.

When NHTSA adopted the final rule on the Hybrid III test dummy, the agency consciously decided not to specify the step-by-step procedure that must be used to reach the prescribed final position. Instead, the Hybrid III dummy positioning specifications set forth the final position in which the test dummy should be before the crash test is conducted, such as having the head level and the pelvic angle adjusted within a specified range. The agency believes that the test dummy will be properly positioned when these procedures are followed. Consequently, there is no need for this rule to establish a specific load to be used in positioning the upper torso of the Hybrid III.

Hand placement

The July 1986 final rule called for positioning the hands of the Hybrid III test dummy so that they are in contact with the steering wheel and attaching the thumbs to the steering wheel with adhesive tape with a breakaway force of between 2 to 5 pounds. Toyota said that the standard does not provide a procedure for measuring the breakaway force. In addition, Toyota said that the positioning procedure for the existing Part 572 Subpart B test dummy does not call for taping the thumbs to the steering wheel rim. It suggested the agency to drop the taping requirement for the Hybrid III. Ford requested using the term "masking tape" rather than "adhesive tape." Ford said that the term "adhesive tape" is "commonly used to mean medical cloth or plastic tape that would not meet the 2 to 5 pound breakaway force specification."

NHTSA has used a procedure of lightly taping the thumbs of the Hybrid III to the steering wheel in its crash tests. The agency has found that this practice is helpful in maintaining the test dummy's hands in place on the steering wheel as technicians make adjustments to the position of the test dummy. The tape is also helpful in keeping the test dummy's hands on the steering wheel as the vehicle is accelerated toward the barrier in a crash test.

The agency has not previously specified a test to measure breakaway force of the tape since the tape is used as a convenience feature to reduce the number of times a technician must reposition the hands as he or she makes final minor adjustments to the test dummies' positions prior to a crash test. NHTSA believes that a simple means of determining whether the tape meets the 2 to 5 pound breakaway force requirement is simply to provide that when the test dummy's hand is moved upward with a force of not less than 2 pounds and not more than 5 pounds, the tape must break away. The agency does not believe it is necessary to specify whether the tape should be masking or adhesive tape, as long as the tape can meet the breakaway requirement. Thus, the agency has deleted the word "adhesive".

Leadtime

In commenting on the leadtime needed to meet the proposed requirements, Ford said that it would need to conduct pre-program design studies lasting up to 12 months on each of its four basic truck lines. It said the studies would be needed to determine how to comply with the proposed requirements without "jeopardizing the intended functions of these trucks, increasing their aggressivity, or threatening the existence of the many small final-stage manufacturers that use our trucks as the base for their products." Ford said that these pre-program studies would have to be completed before it could begin normal programs, taking up to 54 months, to make the necessary changes, which could involve changes to the front end structure, steering system, chassis, instrument panel, engine mounting and seating systems. Ford also said it "does not have the personnel or engineering facilities to make major changes in all of its truck lines at the same time. We can accomplish only one major change truck program in any year." Ford recommended indefinite deferral of a dynamic test requirement for full-size light trucks until the practicability and safety need is established. In the case of compact light trucks, Ford requested that the effective date be delayed until September 1, 1991.

The agency finds good cause for providing additional leadtime. As discussed previously, the agency's test data show that while it is practicable for light trucks and multipurpose passenger vehicles to meet a dynamic test requirement, even in 35 mph barrier impacts, there are a large number of vehicles that must be modified to meet the requirement. Some vehicles, in particular van-type vehicles, may need more extensive structural modifications to meet the dynamic test requirement. Based on the agency's review of the test data, NHTSA believes that in some cases, extensive vehicle modifications may not be necessary. The addition of pre-tensioners to the safety belts (devices that sense a crash and remove slack from the belt system) and additional vehicle padding may enable those vehicles to meet the dynamic test requirement at 30 mph. To address the redesign and manpower issues Ford raised, the agency has decided to adopt a September 1, 1991 effective date. The agency recognizes that some vehicles will be able to comply before that date. However, the additional leadtime is necessary to ensure that all vehicles can be modified by the September 1, 1991 date.

Other Issues Raised by the Commenters

Exclusions from Standard Nos. 203 and 204

Volkswagen suggested that vehicles equipped with dynamically tested manual belts be excluded from Standard Nos. 203, *Impact Protection for the Driver from the Steering Control Systems*, and 204, *Steering Control Rearward Displacement*. The agency does not believe such an exclusion would be appropriate because both those standards have been shown to provide substantial protection to unbelted and belted drivers.

Latching procedure in Standard No. 208

Mercedes-Benz asked that Standard No. 208 be modified to include a test procedure for latching and adjusting a manual safety belt prior to the belt being dynamically tested. NHTSA agrees that Standard No. 208 should include such a procedure and has already adopted such a procedure for dynamically tested manual belts in passenger cars. Subsequent to issuance of that rule, Ford petitioned for reconsideration of the belt latching test procedure. Ford noted that the safety belt positioning procedure specifies applying a 2 to 4 pound tension load to the lap belt of a lap/shoulder belt, but does not specify how the load is to be applied or how the tension is to be measured. Ford asked the agency to clarify the procedure, particularly with regard to whether the load is to be applied to the lap portion of the belt or whether an increasing load is to be placed on the shoulder portion of the belt until the required amount of tension has been reached in the lap portion of the belt.

NHTSA does not believe that the area of application of the belt tension load should have a significant effect on the subsequent performance of the belt in a dynamic test. However, to promote uniformity in application of the load, the agency, on September 5, 1986 (51 FR 31765), amended the standard to provide that the load will be applied to the shoulder portion of the belt adjacent to the latchplate of the belt. If the safety belt system is equipped with two retractors (one for the lap belt and one for the upper torso belt), then the tension load will be applied at the point the lap belt enters the retractor, since the separate lap belt retractor effectively controls the tension in the lap portion of a lap/shoulder belt. The amount of tension will also be measured at the location where the load is applied. Finally, the agency has amended the standard to provide that after the tension load has been applied, the shoulder belt will be positioned flat on the test dummy's shoulder. This will ensure that if the belt is twisted during the application of the tension load, it will be correctly positioned prior to the crash test. This final rule incorporates the same latching procedure for safety belts in light trucks and van-like vehicles.

Revisions to Standard No. 209

The notice proposed to exclude dynamically tested belts from the static laboratory strength tests for safety belt assemblies set forth in S4.4 of Standard No. 209. Ford asked that such belts be excluded from the remaining requirements of Standard No. 209 as well.

In adopting the dynamic test requirement for lap/shoulder belts in passenger cars, NHTSA agreed that an additional exclusion from some performance requirements of Standard No. 209 is appropriate. The agency noted that the webbing of automatic belts is currently excluded from the elongation and other belt webbing and attachment hardware requirements of Standard No. 209, since those belts have to meet the injury protection criteria of Standard No. 208 during a crash. For dynamically tested manual belts in passenger cars, NHTSA believed that an exclusion from the webbing width, strength and elongation requirements (sections 4.2(a)-(c)) is also appropriate, since these belts will also have to meet the injury protection requirements of Standard No. 208. The agency believes that for those same reasons, dynamically tested safety belts in light trucks and multipurpose passenger vehicles should also be excluded from those requirements of Standard No. 209.

The agency does not believe that manual belts should be excluded from the other requirements in Standard No. 209. For example, the requirements on buckle release force should continue to apply, since manual safety belts, unlike automatic belts, must be buckled every time they are used. As with retractors in automatic belts, retractors in dynamically tested manual belts will still have to meet Standard No. 209's performance requirements.

Subsequent to issuance of the final rule on the dynamic testing of manual safety belts in passenger cars, several organizations petitioned for reconsideration of the exclusion of dynamically tested safety belts in passenger cars from the requirements of Standard No. 209. The agency is still in the process of reviewing those petitions and will respond to them in a later notice. Any changes made for dynamically tested belts in passenger cars will also be made for dynamically tested belts in light trucks and multipurpose passenger vehicles.

Revisions to Standard No. 210

The April 1985 notice proposed that dynamically tested manual belts would not have to meet the location requirements set forth in Standard No., 210, *Seat Belt Assembly Anchorages*. Volkswagen suggested that dynamically tested belts be completely excluded from Standard No. 210; it also recommended that Standard No. 210 be harmonized with Economic Commission for Europe (ECE) Regulation No. 14. AMC and Renault suggested using the "out-of-vehicle" dynamic test procedure for manual belts contained in ECE Regulation No. 16, instead of the proposed barrier crash test in Standard No. 208.

As explained in the final rule adopting the dynamic test requirement for manual safety belts in passenger cars, the agency does not believe that the "out-of-vehicle" laboratory bench test of ECE Regulation No. 16 should be allowed as a substitute for a dynamic vehicle crash test. The protection provided by safety belts depends on the performance of the safety belts themselves, in conjunction with the structural characteristics and interior design of the vehicle. the best way to measure the performance of the safety belt/vehicle combination is through a vehicle crash test.

The agency has recently proposed revisions to Standard No. 210 to harmonize it with ECE Regulation No. 14; therefore the commenters' suggestions concerning harmonization and exclusion of dynamically tested safety belts from the other requirements of Standard No. 210 will be considered during that rulemaking. At the present time, the agency is adopting only the proposed exclusion of anchorages for dynamically tested safety belts from the location requirements, which was not opposed by any commenter.

Belt labeling

Ford objected to the proposal that dynamically tested belts have a label indicating that they may be installed only at the front outboard seating positions of certain vehicles. Ford said that it is unlikely that anyone would attempt to install a lap/shoulder belt in any vehicle other than the model for which it was designed. The agency does not agree and has already adopted a belt labeling requirement for dynamically tested safety belts in passenger cars.

In the final rule on dynamically testing manual safety belts in passenger cars, the agency explained that it believes that care must be taken to distinguish dynamically tested belt systems from other systems, since misapplication of a belt in a vehicle designed for use with a specific dynamically tested belt could pose a risk of injury. If there is a label on the belt itself, a person making the installation will be aware that the belt should be installed only in certain vehicles.

Subsequent to issuance of the passenger car final rule, Ford petitioned for reconsideration of the belt labeling requirement. Ford said that the required label does not specifically identify the safety belt as a dynamically tested belt and the label does not suggest that the belt may be safely used only in specific vehicles at specific seats. Ford asked the agency to rescind the labeling requirement. Ford also suggested that the intent of S4.6(b) could be accomplished by requiring the safety belt installation instruction required by S4.1(k) of the standard to specify both the vehicles for which the belt system is to be used and the specific type of seating position for which it is intended.

As explained in the September 5, 1986 notice responding to Ford's petition for reconsideration, NHTSA believes that it is important that a dynamically tested safety belt be labeled to ensure that it is installed only in the type of vehicle for which it is intended. NHTSA agreed with Ford that providing the information in the installation instructions would address most of the problem of possible misuse. However, there still may be instances where the instruction would be lost. In addition, the installation instruction requirements apply only to aftermarket belts. There can be situations where a safety belt may be taken from one vehicle and transferred to another. Given these considerations and the importance of alerting motorists that a safety belt may have been designed for use in one particular make and model vehicle, the agency decided to retain the labeling requirement.

In response to Ford's comment, NHTSA believes that the statement appearing on the label should be changed to require a manufacturer to specify the specific vehicles for which the safety belt is intended and the specific seating position (e.g., "right front") in which it can be used. In today's final rule, NHTSA is adopting the same belt labeling requirements for light trucks and multipurpose passenger vehicles that it has previously applied to passenger car safety belts.

Cost and benefits

NHTSA has examined the impacts of this rulemaking action and determined that the action is not major within the meaning of Executive Order 12291. It is, however, significant within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has prepared a final regulatory evaluation, which analyzes in detail the economic and other impacts of this rulemaking action. This regulatory evaluation has been placed in Docket No. 74-14; Notice 53. Any interested person may obtain a copy of this regulatory evaluation by writing to: NHTSA Docket Section, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590, or by calling the Docket Section at (202) 366-4949.

To briefly summarize the regulatory evaluation, the agency estimates that the dynamic test requirement for manual safety belts will increase testing costs by about $8,500 per test. This cost estimate assumes that manufacturers can conduct the new test as a part of its current crash testing to meet other standards. The additional costs are associated with instrumentation of the dummies. Ford said these tests cannot be "piggy-backed" with those done for FMVSS 212, 219, and 301. Ford stated, "we try to test 'worst case' conditions so that when we pass, we have confidence that all vehicles will pass. But the 'worst case' conditions for one standard may be the 'best case' for another standard." The agency recognizes that it is possible that a worst case test for one standard may not be the same for another standard for a particular vehicle. However, it is also unlikely that for each of the vehicle types covered by this standard it will not be possible to conduct testing to multiple standards, including Standard No. 208, in one crash test.

The agency cannot estimate the design costs associated with meeting the performance requirements adopted in this final rule. As discussed earlier in this notice, some existing vehicle designs currently meet the requirements adopted today. In addition, other vehicles may be able to meet the requirements by adopting different safety belt webbing or retractors, which are relatively minor changes. In other cases, it may be necessary to make structural changes to the vehicle as well to enable the vehicle to meet the performance requirements of the standard.

The agency believes that the rule's requirements will improve the overall level of safety performance provided by light trucks and multipurpose passenger vehicles. As discussed earlier, agency crash testing has shown that the instrumented test dummies in some of these vehicles record comparatively high injury readings in 30 and 35 mph crashes. Today's final rule will ensure that the belt systems and vehicle structure are designed to work together to reduce potential injuries.

Regulatory Flexibility Act

NHTSA has also considered the impacts of this rulemaking action under the Regulatory Flexibility Act. Today's final rule will have an impact on a large number of small businesses. The potential significance of that impact will differ depending on the type of vehicles currently being used by those businesses and on what actions those manufacturers take in response to today's final rule. The agency has tried to minimize the impact on small businesses, while still improving the safety of the vehicles covered by the amendments adopted today. The impacts on small businesses are discussed briefly below and in more detail in the agency's final regulatory evaluation, which includes a full regulatory flexibility analysis. Persons interested in the regulatory flexibility analysis are urged to review the regulatory evaluation that has been placed in the docket for this final rule.

Few, if any, light truck and multipurpose passenger vehicle manufacturers would qualify as small entities. there is, however, a specialized class of businesses involved in the final stage manufacturing of a vehicle manufactured in two or more stages or involved in the conversion or alteration of new vehicles that would be affected by the restraint system requirements adopted today. Under NHTSA's regulations, a final stage manufacturer must certify that the completed vehicle conforms to all applicable safety standards. In addition, a business that modifies or converts a new vehicle prior to its first sale to a consumer is considered a vehicle alterer under the agency's regulations. As an alterer, the business is required to certify that the vehicle, as altered, continues to comply with all applicable Federal motor vehicle safety standards. For example, a business that installs a body on a new truck chassis or places new seats and other equipment in a van must certify that the vehicle, as altered, continues to comply with all the agency's safety standards.

As discussed earlier in this notice, the agency has reduced the potential impact on those small businesses by limiting the application of today's final rule. In many instances, businesses involved in the final stage manufacturing of a vehicle are adding substantial items of heavy work-performing equipment to a truck chassis. According to the Truck Body and Equipment Association, which represents many final stage manufacturers and vehicle alterers, approximately 90-95 percent of the chassis used by their members involved in final stage manufacturing have a GVWR greater than 8,500 pounds and, in addition, would have an unloaded vehicle weight greater than 5,500 pounds when they are completed. Thus, they would not be covered by the requirement adopted today.

In the case of vehicles that will be covered by the dynamic test requirement, converters and final-stage manufacturers have a number of different alternatives. The manufacturers of the truck or van chassis used by final-stage manufacturers are required to provide information on what center of gravity, weight, and other limitations must be followed for the vehicle to remain in compliance with all the agency's safety standards. Final-stage manufacturers and converters can stay within the limitations prescribed by the original chassis manufacturer and thus the final vehicle will continue to comply. They may also choose to finish the vehicle outside of the limits imposed by the original manufacturer and do the necessary testing or engineering analysis to show that the vehicle still complies with the dynamic test requirement. Finally, in those instances where alterers or final-stage manufacturers have used a vehicle with a GVWR of 8,500 pounds or less or a vehicle with an unloaded vehicle weight of 5,500 pounds or less, they may now choose to switch to vehicles with a greater GVWR or to add more weight to the vehicle so that it is not covered by the requirements adopted today.

Small organizations and governmental units should not be significantly affected. Those entities may be purchasing some altered or multi-stage manufactured vehicles. However, as discussed above, the agency's decision to limit the applicability of the final rule will minimize the cost impact on those vehicles.

In consideration of the foregoing, sections 571.208 and 571.209 of Title 49 of the Code of Federal Regulations are amended as follows:

S4.2 is revised to read as follows:

S4.2 *Trucks and multipurpose passenger vehicles with GVWR of 10,000 pounds or less.*

S4.2.1 *Trucks and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less, manufactured on or after January 1, 1976 and before September 1, 1991.* Each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of 10,000 pounds or less, manufactured before September 1, 1991, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that forward control vehicles manufactured prior to September 1, 1981, convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2.

S4.2.1.1 *First option—complete automatic protection system.* The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.2.1.2 *Second option—belt system.* The vehicle shall have seat belt assemblies that conform to Standard 209 installed as follows:

(1) A Type 1 or Type 2 seat belt assembly shall be installed for each designated seating position in convertibles, open-body type vehicles, and walk-in van-type trucks.

(b) In all vehicles except those for which requirements are specified in S4.2.1.2(a), a Type 2 seat belt assembly shall be installed for each outboard designated seating position that includes the windshield header within the head impact area, and a Type 1 or Type 2 seat belt assembly shall be installed for each other designated seating position.

S4.2.2 *Trucks and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991.* Each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2. Each Type 2 seat belt assembly installed in a front outboard designated seating position in accordance with S4.1.2.3 shall meet the requirements of S4.6.

S4.2.3 *Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with either a GVWR of more than 8,500 pounds but not greater than 10,000 pounds or with an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less.* Each truck and multipurpose passenger vehicle manufactured on or after September 1, 1991, that has either a gross vehicle weight rating which is greater than 8,500 pounds, but not greater than 10,000 pounds, or has an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2.

3. S4.6 is amended by revising S4.6.2 and adding S4.6.3 to read as follows:

S4.6 *Dynamic testing of manual belt systems.*

S4.6.1 * * *

S4.6.2 Each truck and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded weight of less than 5,500 pounds that is manufactured on or after September 1, 1991, and is equipped with a Type 2 seat belt assembly at a front outboard designated seating position pursuant to S4.1.2.3 shall meet the frontal crash protection requirements of S5.1 at those designated seating positions with a test dummy restrained by a Type 2 seat belt assembly that has been adjusted in accordance with S7.4.2. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.6.3 A Type 2 seat belt assembly subject to the requirements of S4.6.1 or S4.6.2 of this standard does not have to meet the requirements of S4.2(a)-(c) and S4.4 of Standard No. 209 (49 CFR 571.209) of this Part.

4. S5.1 is revised to read as follows:

S5. *Occupant crash protection requirements.*

S5.1 Passenger cars manufactured before September 1, 1991, and all other vehicles subject to S5.1 shall comply with either S5.1(a) or S5.1(b), at the manufacturer's option. Passenger cars manufactured on or after September 1, 1991, shall comply with S5.1(b). * * * * *

5. S7.4.4 is revised to read as follows:

S7.4 *Seat belt comfort and convenience* * * * *

S7.4.4 *Latchplate access.* Any seat belt assembly latchplate that is located outboard of a front outboard seating position in accordance with S4.1.2 shall also be located within the outboard reach envelope of either the outboard arm or the inboard arm described in S10.6 of this standard and, in the case of a Part 572 Subpart B test dummy, Figure 3A of this standard, or, in the case of a Part 572 Subpart E test dummy, Figure 3B of this standard, when the latchplate is in its normal stowed position. There shall be sufficient clearance between the vehicle seat and the side of the vehicle interior to allow the test block defined in Figure 4 of this standard unhindered transit to the latchplate or buckle. * * * * *

6. S10.6.1 is revised to read as follows:

S10.6 * * *

S10.6.1 *Driver's position.* Move the upper and the lower arms of the test dummy at the driver's position to their fully outstretched position in the lowest possible orientation. Push each arm rearward permitting bending at the elbow, until the palm of each hand contacts the outer part of the rim of the steering wheel at its horizontal centerline. Place the test dummy's thumbs over the steering wheel rim and position the upper and lower arm centerlines as close as possible in a vertical plane without inducing torso movement. The thumbs shall be over the steering wheel rim and lightly taped to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 2 pounds and not more than 5 pounds, the tape shall release the hand from the steering wheel rim. * * * * *

7. S11 is amended by revising S11.1, S11.3.1, S11.5, and S11.6, to read as follows:

S11 *Positioning procedure for the Part 572 Subpart E Test Dummy.* * * *

S11.1 *Head.* The transverse instrumentation platform of the head shall be horizontal within 1/2 degree. To level the head of the test dummy in vehicles with upright seats with non-adjustable backs, the following sequences must be followed. First adjust the position of the H-point within the limits set forth in S11.4.3.1 to level the transverse instrumentation platform of the head of the test dummy. If the transverse instrumentation platform of the head is still not level, then adjust the pelvic angle of the test dummy within the limits provided in S11.4.3.2 of the standard. If the transverse instrumentation platform of the head is still not level, then adjust the neck bracket of the test dummy the minimum amount necessary to ensure that the transverse instrumentation platform of the head is horizontal within 1/2 degree. * * * * *

S11.3 *Hands.*

S11.3.1 The palms of the driver test dummy shall be in contact with the outer part of the steering wheel rim at the rim's horizontal centerline. The thumbs shall be over the steering wheel rim and shall be lightly taped to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 2 pounds and not more than 5 pounds, the tape shall release the hand from the steering wheel rim. * * * * *

S11.5 *Legs.*

S11.5.1 The legs of the driver and passenger dummy shall be plasced as provided in S11.5.2 or, at the option of the vehicle manufacturer until September 1, 1991, as provided in S10.1.1 for the driver and S10.1.2 for the passenger, except that the initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches for both the driver and the passenger rather than 14 1/2 inches as specified in S10.1.1 (a) for the driver and 11 3/4 inches as specified in S10.1.2.1(a) and S10.1.2.2(a) for the passenger.

S11.5.2 The upper legs of the driver and passenger test dummies shall rest against the seat cushion to the extent permitted by placement of the feet. The initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches. To the extent practicable, the left leg of the driver dummy and both legs of the passenger dummy shall be in vertical longitudinal planes. To the extent practicable, the right leg of the driver dummy shall be in a vertical plane. Final adjustment to accommodate placement of feet in accordance with S11.6 for various passenger compartment configurations is permitted.

S11.6 *Feet.*

S11.6.1 The feet of the driver test dummy shall be placed as required by S11.6.2 or, at the option of the vehicle manufacturer until September 1, 1991, as provided in S10.1.1. The feet of the passenger test dummy shall be placed as required by S11.6.3 or, at the option of the vehicle manufacturer until September 1, 1991, as provided in S10.1.2.

S11.6.2 The right foot of the driver test dummy shall rest on the undepressed accelerator with the rearmost point of the heel on the floor surface in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, it shall be positioned perpendicular to the tibia and placed as far forward as possible in the direction of the centerline of the pedal with the rearmost point of the heel resting on the floor surface. The heel of the left foot shall be placed as far forward as possible and shall rest on the floor pan. The left foot shall be positioned as flat as possible on the toeboard. The longitudinal centerline of the left foot shall be placed as parallel as possible to the longitudinal centerline of the vehicle.

S11.6.3 The heels of both feet of the passenger test dummy shall be placed as far forward as possible and shall rest on the floor pan. Both feet shall be positioned as flat as possible on the toeboard. The longitudinal centerline of the feet shall be placed as parallel as possible to the longitudinal centerline of the vehicle. * * * * *

8. Figure 3 following the test of §571.208 is removed and new Figures 3A and 3B are inserted in its place, appearing as follows:

§571.209 [AMENDED]

9. S4.6 of §571.209 is revised to read as follows:

S4.6 *Manual belts subject to crash protection requirements of Standard No. 208.*

(a) A seat belt assembly subject to the requirements of S4.6 of Standard No. 208 (49 CFR §571.208) does not have to meet the requirements of S4.2(a)-(c) and S4.4 of this standard.

(b) A seat belt assembly that meets the requirements of S4.6 of Standard No. 208 (49 CFR §571.208) shall be permanently and legibly marked or labeled with the following statement:

The dynamically-tested seat belt assembly is for use only in (insert specific seating position(s)), e.g., "front right") n (insert specific vehicle make(s) and model(s)).

Issued on: November 18, 1987

Diane K. Steed
Administrator

52 F.R. 44898
November 23, 1987

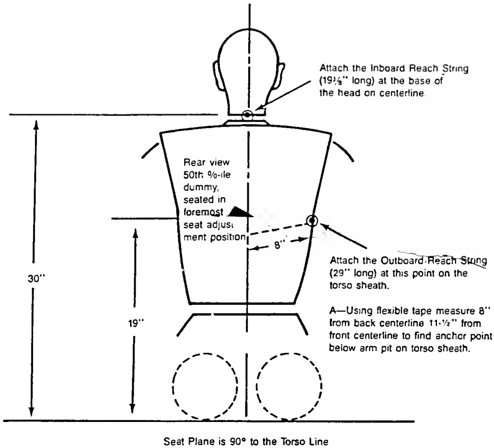

Figure 3a. Location of Anchoring Points for Latchplate Reach Limiting Chains or Strings to Test for Latchplate Accessibility [Using Subpart B Test Device (52 F.R. 44910—November 13, 1987. Effective: January 7, 1988)]

(Rev. 11/23/87)

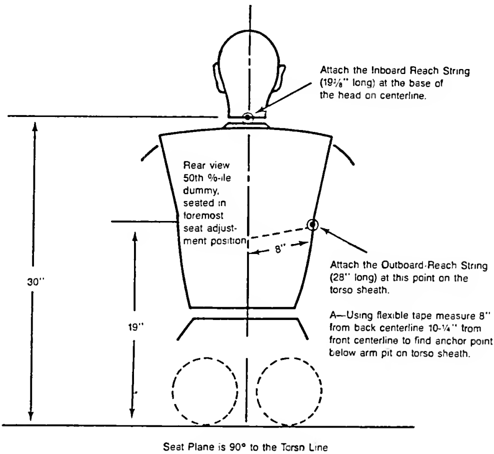

Figure 3b. Location of Anchoring Points for Latchplate Reach Limiting Chains or Strings to Test for Latchplate Accessibility Using Subpart E Test Device

(Added (11/23/87)

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 74-14; Notice 54)

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: In July 1986, this agency published a final rule mandating the use of the Hybrid III test dummy in compliance testing under Standard No. 208 beginning September 1, 1991. That same rule permitted the optional use of the Hybrid III test dummy for compliance testing beginning October 23, 1986. Eleven organizations filed petitions for reconsideration of this rule.

In response to these petitions, the agency is making three significant and several other changes to the final rule published in July 1986. The first of the significant changes is the suspension of the September 1, 1991, date for mandatory use of the Hybrid III test dummy in compliance testing. The mandatory use date is being suspended because, inadvertently, insufficient time was permitted to address the technical questions that may arise through the use of this new test dummy.

The second significant change is the amendment of the thorax deflection requirement to increase the permissible deflection of the Hybrid III thorax (chest) during compliance testing from two to three inches. The thorax deflection limit is being increased because it appears that most 2-point automatic belt designs used in current vehicles would not comply with the previously established two inch thorax deflection limit. The available accident data do not show an increased risk of thorax injuries to occupants of 2-point belt systems, as compared with occupants of 3-point belt systems or air bags. On the other hand, some limited biomechanical data appear to suggest that 2-point belted occupants may suffer chest injuries more frequently than their 3-point belted or air bag restrained counterparts. These inconsistencies between the different data cannot be resolved at the present time. The agency intends to take the necessary steps to obtain sufficient data in this area to arrive at a satisfactory resolution of the inconsistencies. Given the current uncertainties, however, this rule establishes a three inch chest deflection limit for the Hybrid III test dummy. The available data for 2-point and 3-point belt systems and for air bags indicate that this three inch limit is practicable and meets the need for safety.

The third significant change is a delay until September 1, 1990, in the use of the Hybrid III dummy for compliance testing of vehicles that do not use any restraint system to provide automatic occupant protection. Such restraint systems have generally been called "passive interiors." Up to this point, the agency has established the same chest deflection limit for Hybrid III dummies restrained by safety belts and those that are unrestrained. However, the agency wants to further investigate whether it is appropriate to establish separate chest deflection limits for unrestrained and safety-belt restrained Hybrid III dummies. Additionally, the agency wants to determine if the Hybrid III dummy with a three inch chest deflection limit is equivalent to the older type of test dummy when both are unrestrained. The temporary delay in the use of the Hybrid III test dummy for certain vehicles will provide the agency with sufficient time to determine whether a chest deflection limit lower than three inches should be proposed for unrestrained Hybrid III dummies, and, if so, which lower limit should be proposed.

This notice also makes several other changes to the July 1986 rule in response to the petitions for reconsideration. These are:

1. This notice adjusts the required calibration responses for the dummy's thorax and femur. The thorax force response adjustment is necessary to reflect the characteristics of the dummy's rib cage structure when the ribs are manufactured with new rib damping material. The femur force adjustment narrows the acceptable force response range during calibration. Both of these adjustments will result in more consistently repeatable dummy impact responses during crash testing. NHTSA has made the appropriate adjustments to the drawing and specifications package for the Hybrid III dummy to reflect these changes.

2. This notice makes certain clarifying amendments to Standard No. 208 to permit the use of the Hybrid III test dummy for compliance testing with all the requirements of Standard No. 208 and to permit the use of both types of test dummies in

any Standard No. 208 testing conducted before the use of the Hybrid III becomes mandatory.

EFFECTIVE DATE: The regulatory changes made in response to the petitions for reconsideration are effective on March 17, 1988.

SUPPLEMENTARY INFORMATION:

Background

In December 1983, General Motors (GM) petitioned the agency to amend 49 CFR Part 572, *Anthropomorphic Test Dummies*, to include specifications for the Hybrid III test dummy that GM had developed. GM stated in its petition that the Hybrid III test dummy provides more meaningful information about the occupant protection potential of a vehicle than does the test dummy specified in Subpart B of Part 572. GM also argued that the Hybrid III test dummy's impact responses during a crash are more representative of human responses. Additionally, GM stated that the Hybrid III allows the assessment of more types of potential injuries, with 31 total measurements as opposed to eight measurements with the Part 572 Subpart B test dummy. GM also claimed that the repeatability and reproducibility of the Hybrid III are as good as those of the Subpart B test dummy. In support of these claims, GM submitted numerous documents to the agency.

After evaluating the petition and the supporting documents, NHTSA published a proposal on April 12, 1985 (50 FR 14602). That notice proposed to adopt the Hybrid III test dummy as an alternative to the Part 572 Subpart B test dummy for compliance testing under Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208) until September 1, 1991. After that date, the agency proposed to use only the Hybrid III test dummy for compliance testing under Standard No. 208.

The agency proposed that action because it tentatively concluded that the Hybrid III test dummy appeared to represent an appreciable advance in the state-of-the-art of human simulation. NHTSA was particularly interested in the Hybrid III test dummy because of its apparently superior biofidelity and updated anthropometry, as compared with the Part 572 Subpart B test dummy. Further, because the Hybrid III test dummy has the capability of monitoring almost four times as many injury indicating parameters as the Subpart B test dummy, it can be used to measure injury producing forces, accelerations, deflections, moments, etc., for areas of the body that are not instrumented in the Subpart B test dummy. For instance, the Hybrid III test dummy has instrumentation capable of measuring injury producing forces experienced by the neck and lower legs. Although these body areas show a high incidence of serious and/or disabling injuries in crashes, the agency cannot make use of the Subpart B test dummy to evaluate the extent of the protection afforded to these body areas by vehicle safety systems. Because of these attributes of the Hybrid III test dummy, NHTSA believed that it should eventually replace the Subpart B test dummy as the tool used to evaluate the protection that vehicles afford occupants during frontal crashes.

The Final Rule

After evaluating the comments on the April 1985 proposal, NHTSA published a final rule adopting the Hybrid III test dummy on July 25, 1986 (51 FR 26688). This final rule made some adjustments to the calibration procedures proposed to be used with the Hybrid III test dummy. The calibration procedures involve a series of static and dynamic tests of the test dummy components to determine whether the responses of the dummy fall within specified ranges. These calibration procedures help ensure that the test dummy has been properly assembled and that the assembled test dummy will give repeatable and reproducible results during crash testing. (Repeatability refers to the ability of the same test dummy to produce the same results when subjected to identical tests. Reproducibility refers to the ability of one test dummy to provide the same results as another test dummy built to the same specifications.)

The preamble to the final rule also stated that the agency had concluded that the two types of test dummies were equivalent; i.e., when both test dummies were restrained by lap/shoulder belts or with air bags, only minimal differences in test results were shown by the two types of dummies. The importance of equivalence is that vehicles, which will pass or fail Standard No. 208 using one type of dummy, will achieve essentially the same result using the other dummy.

The exception to the finding of equivalence occurred for chest acceleration measurements for unrestrained Hybrid III test dummies. The chest acceleration measurements for unrestrained

Hybrid III dummies were consistently lower than the chest acceleration measurements for unrestrained Part 572 Subpart B dummies. If the two test dummies were to be equivalent, some additional measurement of injury producing forces to the chest of the Hybrid III test dummy would have to be recorded to compensate for the lower chest acceleration measurements with this test dummy. Chest injuries generally are caused by excessive loading on the chest, when the chest contacts the restraint system and possibly the steering system, if the occupant is restrained, or the steering system or other passenger compartment components, if the occupant is unrestrained. The agency concluded that a measurement of chest deflection in testing with the Hybrid III test dummy would appropriately compensate for that dummy's lower chest acceleration measurements when it was unrestrained. Therefore, the July 1986 final rule specified a limit on the amount of thorax deflection that could occur with the Hybrid III test dummy, as the means of ensuring equivalence of the two types of test dummies. See 51 FR at 26693-26694.

Having determined that a thorax deflection limit was necessary to ensure equivalence of the two types of test dummies, the obvious question was what that limit should be. The agency began by examining biomedical data on thorax deflection. Excessive chest deflection can produce rib fractures which can impair breathing and inflict serious damage to the internal organs within the perimeter of the chest structure. The agency began by examining test results to compare the measured responses of Hybrid III test dummies and the injuries induced in cadavers under identical impact conditions. Injuries induced in the cadavers were rated on the Abbreviated Injury Scale (AIS). An AIS rating of 1 is a minor injury, while an AIS of 3 is a serious injury. The rated cadaver injuries were then compared with the chest deflection experienced by a Hybrid III test dummy under identical impact conditions.

In tests using a relatively stiff air bag, which was preinflated and not vented, the cadaver sustained an average injury level of AIS 1.5 (minor to moderate), while the Hybrid III test dummy experienced a 2.7 inch chest deflection under the same conditions. NHTSA concluded that these results demonstrated that a system that symmetrically and uniformly distributes impact loads over the entire chest can produce approximately three inches of chest deflection, as measured on the Hybrid III dummy, and still adequately protect an occupant from serious injury.

However, the testing with belt restraints that did not uniformly or symmetrically spread loads over the entire chest and with other protective systems where the impact loads were highly concentrated over a relatively small area suggested that chest deflection in other portions of the chest could be significantly greater than was shown by the centrally mounted chest deflection gauge on the Hybrid III dummy. Accordingly, it appeared reasonable to establish a chest deflection limit of less than three inches to ensure that those restraint systems would provide a level of chest protection comparable to that provided by restraint systems that symmetrically spread the load over the entire chest surface. When evaluating lap/-shoulder belts in a laboratory environment, the cadavers had moderate to serious injuries (AIS of 2.6) induced under the same conditions that the Hybrid III experienced chest deflection of 1.6 inches. Additionally, some pendulum tests were conducted for GM. In these tests, blunt, concentrated loads are intended to stimulate unrestrained vehicle occupant impacts into the steering wheel or other interior components. This testing showed that the cadavers had serious chest injuries induced (average AIS of 2.8) under the same impact conditions in which the Hybrid III dummy measured 2.63 inches of chest deflection.

The available biomechanical data on this subject are based on a limited number of cadaver tests that are not large enough to make statistically significant injury projections. While the agency could not and did not rely on these limited biomechanical data *alone* to justify a decision to establish any particular limit for chest deflection, these data did suggest that a limit as low as 1.6 inches of chest deflection should be considered for the Hybrid III test dummy.

In addition to the indications from the biomechanical data that a chest deflection limit of less than three inches should be adopted for impact exposures that provide concentrated loadings over a limited area of the chest, the agency was also concerned that the Hybrid III test dummy could, in many instances, underestimate actual chest deflection. The Hybrid III measures chest deflection by a deflection sensor located near the third rib of the test dummy, on the midsternum of the dummy's chest. NHTSA testing has shown that the Hybrid III's deflection sensor underestimates chest displacement when a load is applied to an area away from the deflection sensor.

The agency recognized the limitations of the biomechanical data when it was considering what chest deflection limit should be established for restraint systems that can provide concentrated loadings over a limited area of the chest. Given these limitations, NHTSA examined the chest deflection levels that occur with current vehicle restraint systems. To do this, NHTSA examined the crash performance of existing restraint systems in available accident files, such as National Accident Sampling System (NASS) and Fatal Accident Reporting System (FARS). These data showed that existing 2- and 3-point safety belts, when used, offer vehicle occupants a high level of safety protection, including protection against the risk of serious chest injuries. Therefore, the agency determined that the chest deflection limit could safely be set at a level that was compatible with the level of chest deflection that would be experienced in 30 mph tests with existing 2- and 3-point belt designs.

Test data available to the agency at the time of the final rule indicated that the two inch limit could be satisfied by existing designs of 3-point manual belts, 2-point automatic belts, and 3-point manual belts with air bags. For instance, the data available on 3-point manual safety belts in 30 mph frontal impacts with the Hybrid III test dummy showed chest deflections ranging from an average of 0.67 inch in NHTSA car-to-car testing to 1.89 inches in GM sled testing. For the Volkswagen 2-point automatic belts, the data showed chest deflections ranging from 0.79 inch to 1.09 inches in NHTSA testing. Bases on these data, the agency concluded that a two inch chest deflection limit was an achievable level for existing restraint system designs.

Thus, the decision to adopt a two inch chest deflection limit for restraint systems that did not generally distribute the load over the entire chest area was based on the following factors:

1. The limited biomechanical data that were available suggested that there was a safety need for a chest deflection limit at a level below three inches;
2. A chest deflection limit below three inches would compensate for the Hybrid III's tendency to underestimate chest deflection when a load is applied to a small area away from the deflection sensor; and
3. Existing 2- and 3-point belt systems could comply with a two inch chest deflection limit, based on the limited testing data available to the agency.

Petitions for Reconsideration

The agency received petitions for reconsideration of this final rule from nine different organizations. Many of the petitions for reconsideration raised issues involving the positioning of the Hybrid III dummy during compliance testing. In its November 23, 1987, final rule establishing dynamic testing requirements for light trucks and light multipurpose passenger vehicles (MPV's) (52 FR 44898), NHTSA permitted the use of Hybrid III test dummies for compliance testing of those vehicle types. The dummy positioning issues that were raised in the petitions for reconsideration of the Hybrid III dummy had to be resolved in that rule, to allow the Hybrid III dummies to be properly positioned during compliance testing. Although that rule addressed only light trucks and MPV's, the positioning problems in those vehicle types are similar to the positioning problems for passenger cars. Accordingly, the dummy positioning procedures set forth therein are applicable to positioning the Hybrid III test dummy in any type of vehicle, including passenger cars. Persons interested in reviewing the agency's response to the Hybrid III test dummy positioning issues raised in the petitions for reconsideration should consult that document. This notice addresses all other issues raised in the petitions for reconsideration of the final rule establishing requirements for the Hybrid III test dummy.

Chest Deflection Limits

The chest deflection limits generated the most requests for reconsideration. Chrysler, Ford, GM, Honda, the Motor Vehicle Manufacturers Association (MVMA), Nissan, Renault, Toyota, Volkswagen, and Volvo all asked for some changes to these requirements. GM stated that it uses a two inch deflection limit as an internal design and performance guide in its development of belt restraint systems. However, GM stated that there is no biomedical basis for such a limit. GM concluded by stating that it believed a two inch chest deflection limit was overly conservative as a mandatory requirement and that a three inch limit would be a more appropriate regulatory requirement.

Toyota stated that the two inch limit was unreasonable. Toyota stated that it has no knowledge of any accidents in which occupants of a Cressida equipped with this automatic belt system have suffered serious chest injuries. Yet, according to this petitioner, in 30 miles per hour (mph) barrier impact tests using the Hybrid III test dummy, the 2-point automatic belt system installed in its Cressida model causes chest deflections that average 2.3 inches, with a maximum of 2.9 inches. Thus, these vehicles would not comply with the two inch chest deflection limit. Toyota asserted that retention of the two inch chest deflection limit would force it to discontinue offering this 2-point automatic belt system, even though accident data indicate that the system offers effective occupant protection. Toyota urged the agency to increase the chest deflection limit to three inches for all restraint systems. Volkswagen made a similar point with respect to the 2-point automatic belt system installed in its Golf models, as did Chrysler for the 2-point automatic belt systems installed in some of its models.

Volvo stated that the data on which NHTSA had based the two inch deflection limit were inadequate to provide conclusive evidence of biomechanical tolerance levels. Renault requested the agency to amend the chest deflection limit to 2.5 inches until the uncertainties associated with the test data, which were the basis for the two inch limit, are fully resolved. MVMA asked that the two inch limit be suspended until the agency had resolved the issues surrounding this aspect of occupant protection.

Restrained Hybrid III dummies. In response to these petitions, NHTSA has thoroughly reexamined this subject. The agency has no basis for questioning its previous statements that the Hybrid III can underestimate actual chest deflections in certain circumstances. Further, after again reviewing the available biomechanical data, the agency continues to believe those data suggest the need to establish a chest deflection limit for restraint systems that do not evenly distribute the load over the entire thorax surface at some level below three inches.

If the biomechanical data were complete and reliable, the agency could rely on these data alone as the primary support for a particular chest deflection limit somewhere below three inches. However, the currently available biomechanical data are limited. NHTSA believes that it should not rely on these biomechanical data *alone* to support a particular chest deflection limit. Even when the agency's concern about the Hybrid III dummy's propensity to underestimate actual chest deflection in certain situations is combined with the available biomechanical data, the agency cannot demonstrate at this time that a two inch chest deflection limit is necessary to meet the need for safety.

The most broad-based data source available for examination when establishing a new chest deflection limit is the accident files for the restraint systems currently in production. As noted above, those accident files show that current 2- and 3-point safety belts, when used, afford a high level of protection against serious thorax injuries. When the agency adopted the two inch chest deflection limit, the data available to the agency indicated that existing 2- and 3-point safety belt systems would not have to be redesigned to comply with this requirement. In the case of 2-point automatic belts, the available data consisted of 1982 and 1984 Volkswagen Rabbit tests. This testing showed chest deflections of 1.09 and 1.06 for the Hybrid III dummy at the driver's position, and chest deflections of 0.79 and 0.86 inch for the Hybrid III dummy at the passenger's position. Based on these test results, the agency had no reason to believe that existing 2-point automatic belt systems would have to be redesigned to comply with the two inch chest deflection limit.

However, manufacturers of vehicles with 2-point automatic belt systems submitted new test results as part of their petitions for reconsideration, showing that their existing belt systems do not comply with a two inch chest deflection limit. As noted above, Toyota and Chrysler submitted test results showing that their models with 2-point automatic belt systems would not comply with a two inch chest deflection limit. Most significantly, Volkswagen submitted test data for its 1987 Golf model. This vehicle uses a very similar design of 2-point automatic belts to that which was present in the 1982 and 1984 Rabbit models that were tested by the agency. Volkswagen's testing of this 1987 Golf showed that the Hybrid III test dummies at both the driver and the passenger positions experienced chest deflections of 2.3 inches. These chest deflections are significantly higher than those measured in the NHTSA testing. Both Volkswagen and MVMA alleged in their petitions for reconsideration that a scaling error may account for the large differences in test results for what is essentially the same restraint system. Both petitioners stated that the agency may have improperly converted centimeters to inches. Volkswagen showed that when the NHTSA results were multiplied by 2.54 (the number of centimeters in one inch), the NHTSA and Volkswagen data show very good agreement.

In response to these allegations, NHTSA has begun an investigation of its previous test results. The preliminary conclusion from that investigation is that the discrepancy between the NHTSA and Volkswagen test results cannot be definitely attributed to a data processing scaling error in the NHTSA data. However, it concluded that those previous test results must be regarded as highly suspect.

Subsequent sled tests by NHTSA using Volkswagen Golf interiors produced chest deflections substantially greater than the results of the previous NHTSA crash testing of Volkswagen Rabbits. For example, this subsequent sled testing of a Golf showed a chest deflection of 2.8 inches for the current design of the Golf interior and restraint system. The agency then made several modifications to the Golf interior and restraint system to explore the sensitivity of the parameters that influence the magnitude of measured chest deflection. One of these modifications resulted in a chest deflection of 1.9 inches. However, this modification increased the HIC level to 2362. None of the chest deflections measured in these 11 tests of the Golf were near the level of 1.09 inches measured in the previous NHTSA testing of the Rabbit, and all but the one modification discussed above had chest deflections above two inches.

Additionally, the agency has also conducted several 30 mph frontal impact tests of vehicles equipped with 2-point automatic belts. The Chrysler LeBaron had a chest deflection of 2.35 inches at the driver's position and 2.56 inches at the passenger's position. The Subaru XT had a chest deflection of 2.48 inches at the driver's position and 2.61 inches at the passenger's position. The Toyota Camry had a chest deflection of 1.66 inches at the driver's position and 2.15 inches at the passenger's position. These results likewise are substantially greater than the chest deflection of 1.09 inches measured for the Volkswagen Rabbit in the agency's previous testing.

The subsequent testing by NHTSA and by the manufacturers has not been able to replicate the results of NHTSA's previous testing of 2-point automatic belts. To date, the agency has not been able to identify the source(s) of the discrepancies between current and previous test results. Accordingly, the agency believes that it cannot rely on the chest deflection measurements obtained in that previous round of testing for any purpose until such time as the agency can explain or replicate those results.

Data available to the agency indicate that most of the two point belt systems currently offered and some three point belt systems could not comply with the two inch chest deflection limit. Moreover, the accident data for vehicles equipped with restraint systems that do not comply with the two inch chest deflection limit do *not show* that persons restrained by these belt systems experience a higher level of chest injuries in crashes than those restrained by belt systems that comply with the two inch chest deflection limit. Given these accident data and the acknowledged limitations of the available biomechanical data, the agency has concluded that it does not have an adequate basis for imposing a two inch chest deflection limit at this time. Accordingly, this notice amends the chest deflection level upward.

The remaining question is what level should be established as the limit for permissible chest deflection. As noted above, agency sled tests have measured a 2.8 inch chest deflection for the Volkswagen Golf. NHTSA vehicle tests measured chest deflections of 2.56 inches in the Chrysler LeBaron and 2.61 inches in the Subaru XT. In one of Toyota's tests, a chest deflection of 2.9 inches was measured in its Cressida model. The agency currently has no field evidence that persons restrained by the restraint systems in these vehicles are exposed to an unacceptable risk of serious chest injuries. Therefore, this notice amends the chest deflection limit for Hybrid III test dummies to specify that the chest deflection shall not exceed three inches for any occupant protection system.

Unrestrained Hybrid III dummies. As noted above, the available accident data suggest that, when the impact forces that produce 2.9 inches of chest deflection in the Hybrid III test dummy are imposed on the human chest by 2-point belts, those forces appear not to expose vehicle occupants to a significant risk of serious chest injury. Similarly, NHTSA has test data showing that, when the forces that produce 2.7 inches of chest deflection in the Hybrid III test dummy are imposed on the human chest by air bags, those forces appear not to expose vehicle occupants to a significant risk of serious chest injury. Accordingly, the agency believes that a three inch chest deflection limit for the Hybrid III test dummy when restrained by safety belts or air bags appears to meet the need for motor vehicle safety.

In both the NPRM and the final rule adopting the Hybrid III test dummy, the agency treated all occupant protection systems other than those that were "gas inflated and provide distributed loading to the torso during a crash" as a single category. This treatment had the effect of establishing the same chest deflection limit for Hybrid III dummies that were restrained by safety belts and those that were unrestrained. Following this same reasoning, one would infer that since the three inches of chest deflection in the Hybrid III dummy can safely be tolerated by vehicle occupants when those forces are imposed by safety belts, that same level of chest deflection could be safely tolerated when it is imposed on unrestrained vehicle occupants.

However, the accident data and the limited biomechanical data that are currently available for unrestrained occupants raise concerns about the decision to assign the same chest deflection limit to unrestrained and belt-restrained occupants. To respond to these concerns, NHTSA believes that it should reexamine the basis for its decision to establish the same chest deflection limit for belt-restrained and unrestrained Hybrid III test dummies.

Moreover, the preamble to the final rule establishing the Hybrid III test dummy expressed the agency's concerns about the equivalence of the Hybrid III test dummy and the Part 572 Subpart B test dummy, relying solely on data gathered when both types of test dummies were *unrestrained*. The equivalence of the two test dummies is essential if the agency is to ensure that permitting a choice of test dummies will not lead to a degradation in vehicle safety performance. That is, both test dummies must reach similar conclusions in identifying vehicle designs that could cause or increase occupant injury. Based on a review of all available data comparing the test responses of the two dummies, the agency concluded that there was no consistent trend for either test dummy to measure higher or lower Head Injury Criterion (HIC) or femur measurements than the other. With respect to chest acceleration responses, however, the preamble explained the following:

> In the case of chest acceleration measurements, the data again do not show higher or lower measurements for either test dummy, except in the case of unrestrained tests. In unrestrained tests, the data show that the Hybrid III generally measures lower chest g's than the existing Part 572 test dummy. This difference in chest g's measurement is one reason why the agency is adopting the additional chest deflection measurement for the Hybrid III, as discussed further below. 51 FR 26688, at 26694; July 25, 1986.

Later, the preamble said:

> In summary, the test data indicate the chest acceleration responses between the Hybrid III and the existing Part 572 test dummy are about the same for restrained occupants, but differ for some cases of unrestrained occupants. This is to be expected since a restraint system would tend to make the two dummies react similarly even though they have different seating postures. The different seating postures, however, would allow unrestrained dummies to impact different vehicle surfaces, which would in most instances produce different responses. Since the Hybrid III dummy is more human-like, it should experience loading conditions that are more human-like than would the existing Part 572 test dummy.
>
> One reason that the agency is adding chest deflection criteria [*sic*] for the Hybrid III is that the unrestrained dummy's chest may experience more severe impacts with vehicle structures than would be experienced in an automatic belt or air bag collision. Chest deflection provides an additional measurement of potential injury that may not be detected by the chest acceleration measurement. *Id.*, at 26694-95.

NHTSA's 1986 determination that the Hybrid III and the Part 572 Subpart B test dummies were nevertheless equivalent test devices for unrestrained occupants was based on the addition of a chest deflection limit for unrestrained Hybrid III test dummies. The chest deflection limit was established at two inches, based primarily upon data that had been gathered for *belt-restrained* occupants. However, today's notice has amended the chest deflection limit for Hybrid III test dummies to three inches, based in part on the inadequate support for the two inch value. Despite our acknowledgement of the limitations in the support for the two inch value, NHTSA is also concerned that none of the limited available data indicate that a three inch chest deflection limit for *unrestrained* Hybrid III test dummies is the correct value to make the Hybrid III test dummy equivalent to the Part 572 Subpart B test dummy.

Given the limitations of the available data to support any particular chest deflection value for unrestrained occupants and the concerns about the equivalence of the Hybrid III and Subpart B test dummies without a two inch chest deflection limit, the agency has concluded that it should not permit the Hybrid III dummy to be used until September 1, 1990, to test vehicles that do not use any restraint systems (such as automatic safety belts or air bags) to provide automatic occupant protection. This period of time will allow the agency to gather and analyze additional data, so that it can determine whether a chest deflection limit of less than three inches is necessary for unrestrained Hybrid III test dummies, and, if so, what specific limit should be proposed.

Furthermore, the agency has already determined that the injury criteria applicable to unrestrained Subpart B test dummies are reasonably correlated to the tolerance limits of unrestrained vehicle occupants. Accordingly, mandating the use of the Subpart B test dummy until September 1, 1990, for compliance testing of vehicles that do not use restraints to provide occupant protection will ensure that any such vehicles afford a level of occupant protection equivalent to that afforded by vehicles that use restraint systems.

The agency would like to make clear that the available data do *not* establish that the three inch chest deflection limit for unrestrained Hybrid III test dummies fails to meet the need for safety or fails to ensure equivalence with the Subpart B test dummy. To repeat, the agency has always treated unrestrained and belt-restrained Hybrid III dummies as a single category for the purposes of chest deflection throughout this rulemaking. If the agency were to continue following this course, there would be no reason for the temporary delay in the use of the Hybrid III for certain types of vehicles. However, the accident data and the limited biomechanical data that are available suggest that it would not be appropriate to continue to treat belt-restrained and unrestrained Hybrid III test dummies in a single category for purposes of the chest deflection limit. The agency wants to investigate this subject further, to ensure that the chest deflection limit that is established for unrestrained Hybrid III dummies both meets the need for safety and ensures that these dummies are equivalent to the Subpart B test dummy in similar conditions.

If the agency cannot substantiate its concerns with data by the time this temporary delay in the use of the Hybrid III dummy for some vehicles expires, NHTSA will assume that it is reasonable to continue imposing a single chest deflection limit for belt-restrained and unrestrained Hybrid III dummies. Accordingly, *unless* there is some future rulemaking action in this area, this rule provides that vehicles that do not use any restraint systems to provide occupant protection and that are manufactured on or after September 1, 1990, *may* use the Hybrid III test dummy with the three inch chest deflection limit in Standard No. 208 compliance testing.

The agency is not aware of any manufacturer's plans to certify a vehicle design as complying with Standard No. 208 without including any automatic restraint system before September 1, 1990. Hence, this temporary delay in the use of the Hybrid III for testing vehicles without any automatic restraint systems should not adversely affect any manufacturer. After this temporary delay has expired, the Hybrid III dummy will be available for compliance testing for any type of occupant protection system a manufacturer may certify as complying with Standard No. 208. This reflects the agency's continuing belief that the Hybrid III test dummy should eventually replace the older Subpart B test dummy as the tool used to evaluate the protection that *all* vehicles afford occupants during frontal crashes, including vehicles that do not use any restraint systems to protect the occupants, because of the Hybrid III's enhanced biofidelity and capability of measuring injury producing forces for areas of the body that are not measured by the Subpart B test dummy.

Mandatory Use Date for Hybrid III

There are a number of questions that are currently unresolved regarding the injury criteria that should be established for the Hybrid III dummy. The following are some of the issues that need to be addressed to develop sound injury criteria for that test dummy:

1. What is the extent of the occupant chest injury problem in real world motor vehicle crashes? How does the problem vary by restraint system type?
2. Is chest deflection a relevant chest injury measure, in addition to chest acceleration, when using the Hybrid III test dummy?
3. What process should be used to correlate laboratory-based test data about chest injuries with the actual accident data for chest injuries?
4. How accurate and valid are the current chest deflection measurement technology and any current technological alternatives for assessing chest injury potential (such as measurements of shoulder belt loading)?
5. To what extent should the performance requirement limiting chest deflection differentiate among the various types of restraint systems?
6. Are the responses of the Hybrid III test dummy adequately repeatable when used to measure the chest deflection of various types of restraint systems?

The available data are inadequate to permit the agency to resolve these questions with a reasonable degree of confidence. Until the agency has a reasonable confidence in its answers to these types of questions, NHTSA believes it would premature to mandate the use of only this test dummy for compliance testing under Standard No. 208. Accordingly, this notice suspends the mandatory use date for the Hybrid III test dummy. The July 1986 final rule had established September 1, 1991, as the date after which NHTSA would use only the Hybrid III test dummy for its passenger car compliance testing under Standard No. 208.

NHTSA has already initiated further testing of current restraint systems with the Hybrid III test dummy. In addition, the agency intends to broaden its biomechanical data base to fill in the gaps in the existing data regarding the appropriateness of limits on permissible chest deflection. NHTSA will also attempt to correlate the biomechanical data, Hybrid III chest deflections and/or related injury assessments, and injuries observed in vehicle crashes. Finally, the agency will gather more chest deflection and injury data from vehicle test crashes. After the agency has performed this additional research, it will propose a new mandatory use date for the Hybrid III dummy in Standard No. 208 compliance testing.

In connection with this suspension of the mandatory use date for the Hybrid III dummy in NHTSA's compliance testing, the agency emphasizes that it is aware of the need to allow all manufacturers to obtain and gain experience with using the Hybrid III dummy *before* that test dummy is used for passenger car compliance testing. NHTSA previously determined that at least four years should be allowed for manufacturers to gain experience with the Hybrid III, after those test dummies were commercially available in sufficient quantities; 51 FR 26688, at 26699, July 25, 1986. When proposing a new mandatory use date for the Hybrid III, NHTSA will again specify a leadtime that is adequate to allow all manufacturers to gain experience with the Hybrid III test dummy. Because of the problems that have arisen vis-a-vis chest deflection, NHTSA will not include the time that has elapsed since the July 25, 1986, final rule in its leadtime estimate.

Other Issues Raised in Petitions for Reconsideration

As noted above, all issues related to the Hybrid III positioning procedures that were raised in these petitions for reconsideration were addressed in the November 23, 1987, final rule establishing dynamic testing requirements for light trucks and light multipurpose passenger vehicles (52 FR 44898). Interested persons are referred to that rule if they wish to review the agency's response to those issues. Besides the issues of the appropriate chest deflection limits, the mandatory use date for the Hybrid III test dummy, and the positioning procedures, the following issues were raised in petitions for reconsideration.

1. *Acceptability of the Hybrid III's Design and Performance Specifications.*

Ford commented that the performance requirements for Hybrid III test dummies that were specified in the final rule were based on versions of the Hybrid III that reflected the proposed requirements. However, the version of the Hybrid III mandated in the final rule includes new rib damping material, knee sliders, ball-joint ankles, and so forth. Ford asserted that the performance requirements in the final rule may not have taken these changes into account. In addition to the changes noted by Ford, the requirements for the Hybrid III dummy specified in the final rule differed from those proposed with respect to the calibration procedures to be followed.

Ford's assertion that the agency failed to account for the changes made to the test dummy between the proposal and the final rule is not correct. In the case of the new rib damping material, data submitted by GM (Docket No. 74-14-N 45-027) and testing conducted for NHTSA show that the new rib damping material shifts the impact force response calibration limits upward by about six percent, but has little or no effect on the chest deflection characteristics.

The design changes to the knee, lower leg, and ankle were made to reduce the dummy's design complexity which, in turn, should enhance the dummy's reproducibility. The size, mass, mass distribution, and rigidity of the knee, lower leg, and ankle are identical to those which were proposed. Additionally, NHTSA conducted its testing of the Hybrid III dummy's knees with the proposed knees, that is, *without* a shear module. GM conducted its testing of the dummy's knees with the knees adopted in the final rule, that is, *with* the shear module. The agency and GM test results for the knees were nearly identical. These test results show that the addition of the knee shear module did not significantly affect the performance of the knees in testing.

Ford did not offer any explanation of why it believes the changes to the knee, lower leg, and ankle would affect the performance of the Hybrid III dummy during testing. The dummy calibration modifications that were made between the proposal and the final rule simply reduced the complexity and redundancy of the calibration procedures. The available evidence indicates that the only effect on the performance of the Hybrid III as a result of the calibration modifications was to ensure that the test dummy produces more consistent impact responses. Accordingly, NHTSA has not amended the rule in response to Ford's concern.

2. *Calibration Requirements.*

The calibration procedures involve a series of static and dynamic tests of the test dummy components to determine whether the responses of the dummy fall within specified ranges. These calibration procedures help ensure that the test dummy has been properly assembled and that the assembled test dummy will give repeatable and reproducible results during crash testing.

a. *Thorax calibration response requirements.* In its petition, Ford asked NHTSA to revise the thorax calibration specifications to reflect the characteristics of the rib cage structure with the new United McGill rib damping material. NHTSA changed to this new rib damping material after proposing to use a different rib damping material. Ford also indicated that it has experienced some intermittent difficulties in getting its Hybrid III dummies to comply with the thorax calibration requirements. Honda, Volkswagen, and Toyota also indicated they had experienced problems with getting Hybrid III dummies to meet the thorax calibration requirements. These three manufacturers also indicated that they had difficulties obtaining consistent thorax impact responses. GM urged the agency to revise the midpoint of the thorax resistive forces specified in the calibration requirements upwards by 47.5 pounds. GM stated that this increase would more appropriately reflect the range of acceptable responses for newly manufactured Hybrid III test dummies incorporating the new rib damping material.

The agency believes that these petitions raise a legitimate point. NHTSA confirmed in its own testing and testing conducted by the Hybrid III dummy manufacturers that the rib design specification set forth in the final rule is too broad. The dimensional extremes permissible under that specification result in the test dummy's thorax exhibiting excessive impact response variations. During the months of November and December 1986, a series of round robin tests were conducted by the two dummy manufacturers and GM to determine what rib steel and damping material combinations would produce the most consistent impact responses, while ensuring biofidelity with the human rib cage. Those tests indicated that a rib steel thickness of 0.080 inch and 0.53 inch thickness of the new rib damping material would yield the most consistent responses and retain biofidelity (NHTSA Docket No. 74-14-N45-027). However, this report also concluded that the calibration force requirements should be adjusted upwards by 80 pounds.

Subsequently, the agency performed a similar series of tests of the rib cages made by both dummy manufacturers to ensure that rib cages that comply with these new specifications could be calibrated within the higher force levels and that rib cages that comply with these new specifications and that are calibrated at the higher force levels yield consistent impact responses. These tests showed that both dummy manufacturers can produce Hybrid III rib cages well within these new specifications and that both manufacturers' rib cages built to these new specifications gave repeatable and reproducible impact responses. (NHTSA Docket No. 74-14-N45-038).

Therefore, in response to the petitions and these test results, §572.34(b) is revised to specify that the thorax shall resist a force of 1242.5 ± 82.5 pounds. This is an increase of the midpoint force level by 80 pounds, or about six percent, over the previously specified level. The specifications for rib steel thickness have been narrowed from 0.078 ± 0.002 inch to 0.080 ± 0.001 inch. The specifications for rib damping material thickness are revised from a range of 0.250-0.625 inch to a range of 0.53 ± 0.03 inch. These changes should ensure that the Hybrid III thorax will yield more consistent impact responses.

b. *Knee impact calibration responses.* Ford stated in its petition for reconsideration that the knee impact calibration should be conducted without the lower leg attached. In support of this request, Ford stated that it is hard to accurately measure the required angle specified for the lower leg, using the new lower leg. Additionally, Ford noted that §572.35(c) requires the use of the new lower leg for knee impact testing, while Figure 24 shows the lower leg that was proposed, but not adopted in the final rule.

The agency was not persuaded by this argument. First, the agency has not encountered any problems in its testing with rotating the leg to the specified angle and maintaining it in the correct orientation. Ford did not explain what specific difficulties it has encountered. Second, removal of the lower leg would require the dummy to be disassembled during the calibration procedures. This would add time and effort to the calibration process with no corresponding benefit. Hence, this suggested change has not been adopted.

Additionally, Ford's suggestion that Figure 24 needs to be revised to show the version of the lower leg adopted in the final rule is not persuasive. The proposed lower leg included instrumentation on the tibia, while the final rule specified a non-instrumented tibia. There were no other differences in the lower leg. Figure 24 merely shows a lower leg, without identifying any particular lower leg by a part number or the like. The identification of the lower leg in §572.35 correctly identifies the leg assembly with a non-instrumented tibia. Hence, no clarifying amendments are necessary.

Both Ford and GM stated that the knee impact calibration tolerances were overly broad in the final rule. That rule specified a tolerance of ± 22 percent, with an acceptable variation of 44 percent (not less than 996 pounds nor more than 1566, with a midpoint of 1281 pounds),. Ford stated that potential test variability would be significantly reduced if the range were narrowed to ± 10 percent (not less than 1153 pounds nor more than 1409 pounds, with the midpoint remaining at 1281 pounds).

Based on a series of round robin tests between NHTSA and itself, GM also stated that the range of acceptable knee impact force requirements is too broad, especially when compared with the typical knee impact responses of newly manufactured Hybrid III dummies. GM recommended, based on the round robin testing, that the calibration performance requirements be modified to be not less than 1060 pounds nor more than 1300 pounds. This would lower the midpoint of the acceptable range to 1180 pounds, and would fall within the ± 10 percent tolerance limit suggested by Ford.

After reconsidering this issue, NHTSA agrees with Ford and GM that the knee impact response range specified in the final rule is too broad. The knee response is governed primarily by the flesh covering the knee. It is relatively simple to control the consistency of this flesh when manufacturing new dummies, and relatively simple to replace the flesh on used dummies, when the response falls out of the acceptable calibration range. Based on the round robin testing, this notice adopts GM's suggested calibration range of 1060-1300 pounds. NHTSA and GM testing showed that this range is practicable and relatively simple to attain. This narrower range should also yield more repeatable impact responses from the Hybrid III dummies in crashes.

c. *Conforming changes to the drawings and specifications package for the Hybrid III test dummy.* As a part of the amendments to the calibration specifications and to correct errors in the previous package, NHTSA is making some changes to the drawings and specifications package for the Hybrid III test dummy. These changes consist of the following:

i) a revised rib thickness specification;

ii) a revised rib damping material specification;

iii) a revised rib cage assembly specification (to reflect the changes in i) and ii));

iv) a new abdominal insert specification (to eliminate possible interference by the insert with the lever arm of the chest deflection potentiometer);

v) a new specification for the pelvis angle during thorax calibration tests; and

vi) an update of the dummy assembly drawing to reflect these changes.

3. *Chest Temperature Sensitivity.*

The final rule provided that the stabilized temperature of the Hybrid III test dummy is to be between 69° and 72° F for the Standard No. 208 compliance testing. This narrow temperature range is necessary, because testing has shown that the Hybrid III test dummy's measurements of chest deflection and chest acceleration are temperature sensitive. The agency stated that it believed this temperature range was practicable.

Ford stated that its barrier crash facility cannot maintain the specified temperature range. However, Ford recommended that the temperature range could be broadened because "the new rib damping material will probably exhibit somewhat different temperature sensitivity." Based on this assumption, Ford suggested that the temperature range be broadened by 2° to 5° F. As an alternative to broadening the temperature range, Ford suggested that this narrow temperature range be applied only to the dummy components that have shown great temperature sensitivity, and that the dummy components that do not exhibit temperature sensitivity should not be subject to tight temperature controls.

According to Mazda's petition for reconsideration, the specified temperature range can only be maintained with separate on-board air conditioning, and such an arrangement would limit the number and variety of tests that were possible. Like Ford, Mazda asserted that the reduced temperature sensitivity of the new rib damping material would permit the agency to expand the permissible temperature range, which Mazda suggested be set at 68° to 76° F. Honda stated that its test facility could control the temperature within 8° F and urged that the permissible temperature range be expanded to an 8° F limit. Volvo stated that the permissible temperature range is practicable, but that it is excessively time consuming and complicated, especially because the test cycle has to be interrupted frequently for various technical reasons unrelated to temperature.

Contrary to the assertions by some of these petitioners, test data available in the public docket (NHTSA Docket No. 74-14-N39-049) show that the new rib damping material has nearly the identical temperature sensitivity as the damping material it replaces. If the agency were to establish a broader temperature range for the testing, it would introduce excessive variability into the compliance test results. The preamble to the final rule discussed at length the several means that the agency and its contractors have used to maintain the temperature within the specified range (51 FR 26692). In addition, in a submission to the docket, General Motors indicated successful use of temperature normalization factors which a manufacturer may want to use to predict response values at the exact specified mean temperature. NHTSA has concluded that the specified temperature range is practicable and necessary to reduce variability of the test results, so this provision has not been changed in this notice.

4. *Dummy Durability.*

Nissan stated that in 35 mph sled tests, its Hybrid III test dummy had experienced damage to the neck, rib cage, and wrists. Similarly, Volvo stated in its petition for reconsideration that the Hybrid III dummy is less durable in 35 mph impacts than the currently specified test dummy. Additionally, Volvo stated that the thorax needs more frequent replacement in 35 mph impacts than was stated by the agency. In the preamble to the final rule, the agency said that testing had shown that Hybrid III dummies could be used for about 17 crash tests before the ribs must be replaced, and concluded that this level of durability was reasonable. Volvo did not provide any data to support its assertions.

The agency has not examined the durability of the Hybrid III test dummy in 35 mph impact tests. However, the agency does not believe this issue is relevant to the announced use of the Hybrid III test dummy. The final rule specified that the Hybrid III dummy would be used in compliance testing for Standard No. 208, which requires 30 mph impacts. If and when the agency decides to use the Hybrid III dummy in testing for the New Car Assessment Program, which involves 35 mph frontal impacts, the agency will examine the durability of the dummy in 35 mph frontal impacts. Until such a decision is made, NHTSA believes that its resources can be better spent examining other issues related to the Hybrid III test dummy.

During extensive testing in 30 mph impacts conducted for NHTSA and manufacturers, the Hybrid III dummy has demonstrated adequate durability under those conditions (NHTSA Docket No. 74-14-GR-602). To the extent that the durability of the Hybrid III thorax may have been in question, agency testing has shown that Hybrid III test dummies with the new ribs and new rib damping material show minimal changes in force and deflection responses of the thorax after 20 consecutive pendulum impacts. After the 20th impact, the rib cage force and deflection response levels had changed less than 3 percent from the mean responses of the first four impacts. (NHTSA Docket No. 74-14-N45-038). Based on these test results, NHTSA concludes that the Hybrid III test dummy has adequate durability in 30 mph impacts.

5. *Changes to the Text of Standard No. 208 and Part 572.*

Chrysler, Ford, and MVMA all requested the addition of text to sections S7.4.3-S7.4.5 to permit use of the Hybrid III test dummy to test compliance with the comfort and convenience requirements of S7.4. The final rule establishing dynamic testing requirements for light trucks and multipurpose passenger vehicles has already amended section S7.4.4 to permit the use of either type of test dummy for such testing. This notice makes similar changes to sections S7.4.3 and S7.4.5.

Renault asked that Standard No. 208 be clarified as to the question of whether the two dummy types may be used interchangeably in the driver and/or passenger positions. NHTSA has previously concluded that both dummy types yield equivalent safety assessments of vehicles. Therefore, until the time when only the Hybrid III test dummy is used for compliance testing, NHTSA believes manufacturers should be allowed to base their certifications of compliance on the use of either type of test dummy in any combination and in any of the designated seating positions. Language to this effect has been added to Standard No. 208.

Ford also suggested some technical changes to clarify certain parts of Standard No. 208 and Part 572. Ford stated that section S6.2.3 of Standard No. 208 currently provides that, "The resultant acceleration calculated from the thoracic instrumentation . . . ." Ford stated that the acceleration is calculated from the output signal of the instrumentation, not from the instrumentation itself, and asked that the language be amended to state that. The agency agrees, and has made this change.

Ford stated that the positive and negative signs had been reversed in section 572.33(b)(1)(ii) and (b)(2)(ii). This statement is incorrect. According to the sign convention for the output of the Hybrid III transducers referenced in §572.31(a)(5) and sign conventions adopted by the Society for Automotive Engineers (SAE) Instrumentation Subcommittee, the positive and negative signs were correctly used in the sections questioned by Ford.

Ford also asked that the definition of and references to "time zero" be deleted from §572.34(b), because the agency had deleted the proposed specifications that thorax load be measured 19 milliseconds after impact and that thorax displacement be measured 25 milliseconds after impact. Because of these deletions, Ford asserted that the references and definition of time zero were unnecessary and potentially misleading. NHTSA agrees with this point, and this rule has amended §572.34 to delete the reference to "time zero."

Impact Assessments

1. *Economic and Other Impacts.* NHTSA has considered the impacts of this response to the petitions for reconsideration of the final rule on the Hybrid III test dummy and determined that it is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation's regulatory policies and procedures. The several technical corrections made by this notice should not significantly affect the cost estimates set forth in the final regulatory evaluation that was prepared in connection with the final rule on the Hybrid III test dummy. Interested persons are referred to that document, which is available in NHTSA Docket No. 74-14, Notice 45. Copies of that regulatory evaluation may be obtained by writing to: NHTSA Docket Section, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590, or by calling the Docket Section at (202) 366-2992.

The most important changes made in this response to the petitions are the amendment of the chest deflection limit, the delay until September 1, 1990, in using the Hybrid III dummy for compliance testing of vehicles that don't use restraint systems to provide automatic occupant protection, and the suspension of the mandatory effective date for use of the Hybrid III dummy. The amendment of the chest deflection limit for the Hybrid III dummy is necessary to ensure that the adoption of a new compliance test device does not require the redesign of most existing designs of 2-point automatic belt systems. Amending the chest deflection limit to three inches both recognizes the effectiveness of existing 2-point automatic belt systems and avoids unnecessary adverse impacts on any party.

The temporary delay in the use of the Hybrid III test dummy for compliance testing of vehicles that provide automatic occupant protection without using any restraint systems is necessary to allow the agency to further examine its decision to establish the same chest deflection limits for those systems and systems that use either safety belts or air bags. No manufacturer currently certifies any such vehicle design, nor is the agency aware of any plans to certify such a vehicle design before September 1, 1990. Hence, this temporary delay should not adversely affect any person.

The suspension of the effective date for mandatory use of the Hybrid III test dummy is necessary to permit the agency to resolve some remaining technical issues, principally related to chest deflection. The agency does not believe that postponing the mandatory use date for the Hybrid III test will have any adverse impact on any person. Those manufacturers that wish to certify their vehicles on the basis of testing with the Hybrid III test dummy are permitted to do so. Those manufacturers that wish to certify their vehicles on the basis of testing with the Part 572 Subpart B dummy are also permitted to do so. Once the agency has resolved the outstanding technical issues associated with the Hybrid III test dummy, a new date for the mandatory use of that test dummy in NHTSA's compliance testing will be proposed through the rulemaking process. That rulemaking will consider all the impacts associated with a new mandatory use date.

In consideration of the foregoing, 49 CFR §571.208, *Occupant Crash Protection*, and 49 CFR Part 572, *Anthropomorphic Test Dummies*, are amended as follows:

PART 571 — [AMENDED]

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§571.208 [Amended]

2. S5 of Standard No. 208 is amended by revising S5.1 and S5.2.1 to read as follows:

S5. *Occupant crash protection requirements.*

S5.1 Vehicles subject to S5.1 shall comply with either S5.1(a) or S5.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1990, that comply with the requirements of S4.1.2.1(a) by means not including any type of seat belt or inflatable restraint shall comply with S.5.1(a).

(a) * * *

(b) * * *

S5.2. *Lateral moving barrier crash test.*

S5.2.1 Vehicles subject to S5.2 shall comply with either S5.2.1(a) or S5.2.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1990, that comply with the requirements of S4.1.2.1(c) by means not including any type of seat belt or inflatable restraint shall comply with S5.2.1(a). * * * * *

3. S6.2 of Standard No. 208 is amended by revising S6.2.3a and S6.2.4 to read as follows:

S6.2 *Injury Criteria for the Part 572, Subpart E, Hybrid III Test Dummy.* * * * * *

S6.2.3 The resultant acceleration calculated from the output of the thoracic instrumentation shown in drawing 78051-218, revision R incorporated by reference in Part 572, Subpart E, of this Chapter shall not exceed 60 g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S6.2.4 Compression deflection of the sternum relative to the spine, as determined by instrumentation shown in drawing 78051-317, revision A incorporated by reference in Part 572, Subpart E of this Chapter, shall not exceed 3 inches. *****

4. S7.4 of Standard No. 208 is amended by revising S7.4.3 and the first sentence of S7.4.5 to read as follows:

S7.4 *Seat belt comfort and convenience.* * * * * *

S7.4.3 *Belt contact force.* Except for manual or automatic seat belt assemblies that incorporate a webbing tension-relieving device, the upper torso webbing of any seat belt assembly shall not exert more than 0.7 pound of contact force when measured normal to and one inch from the chest of an anthropomorphic test dummy, positioned in accordance with either S10 or S11 of this standard in the seating position for which that seat belt assembly is provided, at the point where the centerline of the torso belt crosses the midsagittal line on the dummy's chest. * * * * *

S7.4.5 *Retraction.* When tested under the conditions of S8.1.2 and S8.1.3, with anthropomorphic test dummies whose arms have been removed and which are positioned in accordance with either S10 or S11, or any combination thereof, in the front outboard designated seating positions and restrained by the belt systems for those positions, the torso and lap belt webbing of any of those seat belt systems shall automatically retract to a stowed position either when the adjacent vehicle door is in the open position and the seat belt latchplate is released, or, at the option of the manufacturer, when the latchplate is released. * * * * *

PART 572 — [AMENDED]

5. The authority citation for Part 572 continues to read as follows:

AUTHORITY: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

6. Section 572.31 is amended by revising paragraphs (a)(1), (a)(3), and (b) to read as follows:

§572.31 *General description.*

(a) The Hybrid III 50th percentile size dummy consists of components and assemblies specified in the Anthropomorphic Test Dummy drawing and specifications package which consists of the following six items:

(1) The Anthropomorphic Test Dummy Parts List, dated December 15, 1987, and containing 13 pages, and a Parts List Index, dated December 15, 1987, containing 8 pages.

* * *

(3) A General Motors Drawing Package identified by GM Drawing No. 78051-218, revision R, and subordinate drawings. * * * * *

(b) The dummy is made up of the following component assemblies:

Drawing No.	Revision
78051-61 Head Assembly — Complete	(T)
78051-90 Neck Assembly — Complete	(A)
78051-89 Upper Torso Assembly — Complete	(K)
78051-90 Lower Torso Assembly — Without Pelvic Instrumentation Assembly, Drawing No. 78051-59	(D)
86-5001-001 Leg Assembly — Complete (LH)	(E)
86-5001-002 Leg Assembly — Complete (RH)	(E)
78051-123 Arm Assembly — Complete (LH)	(D)
78051-124 Arm Assembly — Complete (RH)	(D)

7. Section 572.33 is amended by revising paragraph (b)(1)(i) to read as follows:

§572.33 *Neck.* * * * * *

(b) * * *

(1) *Flexion* (i) Plane D, referenced in Figure 20, shall rotate between 64 degrees and 78 degrees, which shall occur between 57 milliseconds (ms) and 64 ms from time zero. In first rebound, the rotation of Plane D shall cross 0 degrees between 113 ms and 128 ms. * * * * *

8. Section 572.34 is amended by revising paragraphs (a), (b), and (c)(2) to read as follows:

§572.34 *Thorax.*

(a) The thorax consists of the upper torso assembly in drawing 78051-89, revision K, and shall conform to each of the drawings subtended therein.

(b) When impacted by a test probe conforming to §572.36(a) at 22 fps ± 0.40 fps in accordance with paragraph (c) of this section, the thorax of a complete dummy assembly (78051-218, revision R) with left and right shoes (78051-294 and -295) removed, shall resist with a force of 1242.5 pounds ± 82.5 pounds measured by the test probe and shall have a sternum displacement measured relative to spine of 2.68 inches ± 0.18 inches. The internal hysteresis in each impact shall be more than 69 percent but less than 85 percent. The force measured is the product of pendulum mass and deceleration.

(c) *Test procedure.* (1) * * *

(2) Seat the dummy without back and arm supports on a surface as shown in Figure 23, and set the angle of the pelvic bone at 13 degrees plus or minus 2 degrees, using the procedure described in S11.4.3.2 of Standard No. 208 (§571.208 of this Chapter). * * * * *

9. Section 572.35(b) is revised to read as follows:

§572.35 *Limbs.*

(a) * * *

(b) When each knee of the leg assemblies is impacted, in accordance with paragraph (c) of this section, at 6.9 ft/sec ± 0.10 ft/sec by the pendulum defined in §572.36(b), the peak knee impact force, which is a product of pendulum mass and acceleration, shall have a minimum value of not less than 1060 pounds and a maximum value of not more than 1300 pounds. * * * * *

10. Section 572.36 is amended by revising paragraphs (b), (c), (d), (e), (f), and (h) to read as follows:

§572.36 *Test conditions and instrumentation.*

* * * * * * * *

(b) The test probe used for the knee impact tests is a 3 inch diameter cylinder that weighs 11 pounds including instrumentation. Its impacting end has a flat right angle face that is rigid and has an edge radius of 0.02 inches. The test probe has an accelerometer mounted on the end opposite from impact with its sensitive axis colinear to the longitudinal centerline of the cylinder.

(c) Head accelerometers shall have dimensions, response characteristics, and sensitive mass locations specified in drawing 78051-136, revision A, or its equivalent, and be mounted in the head as shown in drawing 78051-61, revision T, and in the assembly shown in drawing 78051-218, revision R.

(d) The neck transducer shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing 83-5001-008 or its equivalent and be mounted for testing as shown in drawing 79051-63, revision W, and in the assembly shown in drawing 78051-218, revision R.

(e) The chest accelerometers shall have the dimensions, response characteristics, and sensitive mass locations specified in drawing 78051-136, revision A, or its equivalent, and be mounted as shown with adaptor assembly 78051-116, revision D, for assembly into 78051-218, revision R.

(f) The chest deflection transducer shall have the dimensions and response characteristics specified in drawing 78051-342, revision A, or equivalent, and be mounted in the chest deflection transducer assembly 78051-317, revision A, for assembly into 78051-218, revision R. * * * * *

(h) The femur load cell shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing 78051-265 or its equivalent and be mounted in assemblies 78051-46 and -47 for assembly into 78051-218, revision R.

* * * * * * * *

Issued on March 11, 1988

Diane K. Steed
Administrator

53 F.R. 8755
March 17, 1988

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection (Docket No. 85-08; Notice 2)

ACTION: Final rule.

SUMMARY: This rule upgrades the safety belt requirements for new trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds. Specifically, this rule:

1. Standardizes the buckle release mechanism for safety belts used in those vehicles;
2. Requires that the safety belts in these vehicles must be equipped either with an emergency locking retractor or with an automatic locking retractor that has certain features to prevent it from progressively tightening the belt around the wearer; and
3. Requires that retractors in these vehicles must be attached to the seat structure that moves, if the retractor is an automatic locking retractor and if the seat at which the safety belt system is installed has some type of suspension system for the seat.

These changes will make the safety belt systems in heavy vehicles more comfortable and convenient to use, which in turn should promote the use of safety belts in those vehicles. This rule will also assist drivers of those vehicles in complying with the Office of Motor Carrier Standards' regulation requiring safety belt use in trucks and buses engaged in interstate commerce and with the mandatory safety belt use laws being adopted by the States.

DATES: *Effective date:* The changes made in this rule become effective January 3, 1989. Vehicles manufactured on or after September 1, 1990, must be certified as complying with these changes.

Background

Since January 1, 1972, Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208) has required vehicle manufacturers to install safety belt systems in heavy vehicles (i.e., trucks, buses, and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating of more than 10,000 pounds). The safety belts required in those vehicles have had to meet all of the strength requirements set for belt systems in passenger cars and light trucks, buses, and MPV's (those with a gross vehicle weight rating of 10,000 pounds or less). However, the safety belts required in heavy vehicles have not had to meet several requirements for lighter vehicle safety belt systems that make the safety belts easier to use.

There are substantial data showing that occupants of heavy vehicles, particularly heavy trucks, face a significant risk of death and injury in vehicle crashes. For instance, there are approximately 1,000 deaths annually of heavy vehicle occupants (*Heavy Truck Safety Study*, DOT HS 807 109). Total or partial ejections, which could be substantially reduced by increased safety belt usage, accounted for about 30 percent of all the heavy vehicle fatalities. The agency estimates that about 43,000 injuries occur in heavy vehicles annually (*Heavy Truck Safety Study*, DOT HS 807 109).

A study entitled "Heavy Truck Occupant Protection" (DOT-HS-806-368) has found that impacts with the steering wheel assembly, as well as ejection and entrapment, are the primary sources of injuries and fatalities to drivers of heavy trucks. This study concluded that safety belts could have reduced the severity of the injuries in as many as 40 to 60 percent of the crashes. Other research studies of heavy vehicle crashes, such as "Study of Heavy Truck Occupant Protection: Accident Data Analyses" (DOT-HS-806-426), have also recommended developing ways of improving safety belt usage in heavy vehicles as a means of improving occupant safety in those vehicles.

Surveys of belt usage among heavy truck drivers have found usage to be as low as 6.2 percent, which is substantially below the national average for passenger car drivers. Surveys of heavy vehicle drivers have noted several behavioral and vehicle design-related reasons for low belt use among heavy truck drivers. Results of an analysis by the Transportation System Center in 1983 of surveys conducted by the Private Truck Council of America and the International Brotherhood of Teamsters revealed that drivers were concerned about the cleanliness of safety belts as well as the design of the belt system. About 25 percent of those who reported that they did not use the safety belts cited dirty belts as the most important reason for non-use of the belts.

Belts in heavy vehicles were often too dirty to wear because most safety belts in heavy vehicles on the road today are not equipped with retractors. Absent a retractor, the belts can dangle from the seat, become tangled in the seat structure, and become soiled with dirt and grease on the vehicle's floor. Properly working retractors would eliminate these problems.

By way of contrast, a survey by ADTECH (Contract DTNH 22-81-C-07075) found that 75 percent of the United Parcel Service (UPS) drivers who were observed for the survey were wearing their safety belts. UPS has a company policy requiring drivers to wear their belts, under penalty of company-imposed sanctions for failure to do so. UPS also equips its trucks with an upgraded safety belt system that includes retractors mounted on the seat pan and stand-up buckles for easy one-handed operation. The combination of company policy and improved belt systems resulted in very high belt usage.

Notice of Proposed Rulemaking

The agency proposed several changes to the requirements for belt systems in heavy vehicles in a notice of proposed rulemaking (NPRM) published on May 30, 1985 (50 FR 23041). First, that notice proposed that emergency locking retractors (ELR's) be at each outboard seating position in heavy trucks and MPV's and at the driver's seat in heavy buses. Retractors ensure that the belts will not experience cleanliness problems and help ensure that the belts will be readily accessible to vehicle occupants. With respect to the type of retractor, the notice proposed to require ELR's, because they are already required in passenger cars (*see* 46 FR 2064; January 8, 1981). This requirement was specified primarily because ELR's permit more freedom of movement than do automatic locking retractors (ALR's). NHTSA tentatively concluded that the proposed requirement for ELR's in heavy vehicles would avoid the typical problems posed for belt occupants by ALR's. With current designs of ALR's, the safety belt "cinches down" (becomes progressively tighter) around an occupant as the vehicle travels over potholes or other jarring surfaces of the road. This "cinching down" effect can discourage continued belt use. To provide the maximum benefits, the notice proposed to also require that ELR's be mounted to the seat frame above any air suspension mechanism used in the vehicle seat.

Second, the notice proposed to require that heavy vehicles' belts have a standardized push button release, just as all safety belt systems in light vehicles are required to have a standardized push button release. Many heavy vehicles currently have flap-type releases such as are found on airplane safety belts. The NPRM explained that the flap-type releases are more susceptible to accidental opening during a crash or rollover, for example, by being caught in a sleeve. Additionally, if there is a need to extricate a belted driver from a vehicle after a crash, a standardized release mechanism would eliminate any potential confusion about how to release the safety belt. Accordingly, NHTSA tentatively concluded that safety belt use in heavy vehicles could be increased if the safety belt release mechanisms in heavy vehicles were the same as those in lighter vehicles.

Finally, the NPRM sought data from commenters to help the agency make a determination of whether to propose amending the anchorage strength requirements for heavy vehicles. Presently, safety belt anchorages in heavy vehicles are required to withstand a 5,000-pound load. However, the European Economic Community has amended its safety belt anchorage requirements downward, lowering them to a 1,517-pound load for lap/shoulder belts and 2,495 pounds for lap belts. The NPRM asked for data from all interested parties on the effects of such a change in the United States driving environment.

The Comments and the Agency Response

The agency received 23 comments in response to this NPRM, all of which were considered in developing this final rule. The most significant points raised in the comments are addressed below, along with the agency's response to the comments. For the convenience of the reader, these issues are set forth in the same order they were presented in the NPRM.

1. *Retractors.*

Five commenters supported the proposal to require ELR's on heavy vehicle safety belts. These commenters were the International Brotherhood of Teamsters (Teamsters), the American Petroleum Institute (API), the California Highway Patrol, the Insurance Institute for Highway Safety (IIHS), and Chrysler Corporation (Chrysler). Chrysler stated that it already equips all of its heavy vehicles with ELR's only.

On the other hand, 11 commenters objected to the proposal to require ELR's in heavy vehicles. Navistar, formerly called International Harvester, stated that it agreed with the agency's proposal to increase belt usage in heavy vehicles by requiring that safety belts in those vehicles be equipped with retractors. However, Navistar stated its opinion that ELR's would not be acceptable for all heavy truck applications and stated that it installs primarily non-locking retractors (NLR's) in its heavy vehicles. Mack Trucks, Inc., Freightliner, and Volvo White offered comments that raised essentially the same points as Navistar's. Ford, the American Seat Belt Council (ASBC), and the Motor Vehicle Manufacturers Association (MVMA) commented that they agreed with the proposal to require retractors on heavy vehicle safety belts, but they did not support the proposal to specify ELR's. Ford, ASBC, and MVMA alleged that such a requirement would be unnecessarily design restrictive, especially when there are questions about the comfort of webbing-sensitive ELR's in some heavy truck applications. PACCAR also questioned the acceptability of ELR's in all heavy truck applications, and asserted that new designs of ALR's would alleviate the occupant comfort problems associated with older designs of ALR's.

Indiana Mills & Manufacturing, Inc. (IMMI) commented that the proposed requirement for ELR's in heavy vehicles would present problems for the safety belts at the driver's seat in large school buses. Specifically, IMMI stated that two States (Washington and Illinois) currently require that *only* ALR's be installed on the safety belts for the driver's seat in school buses. These State requirements would be preempted if NHTSA were to require only ELR's in heavy vehicles. The National School Transportation Association (NSTA) stated that the May 1985 National Conference on School Transportation adopted a resolution supporting only ALR's for the safety belts installed at the driver's seat of large school buses. According to NSTA, the reasoning behind this action was that it is believed to be more important to keep the school bus driver in his or her seat at all times, to permit the driver to retain control of the vehicle, than to ensure the driver's comfort. Hence, NSTA opposed the proposal for ELR's to the extent that it would mandate ELR's for the driver's seat in school buses. The Blue Bird Body Company (Blue Bird), a school bus manufacturer, also opposed the proposed ELR requirement. Blue Bird stated that it currently provides NLR's as standard equipment and ALR's as optional equipment on the safety belts at the driver's position in large school buses. Blue Bird alleged that the primary function of the safety belts for the driver of school buses is to keep the driver in position at all times, and that ELR's might fail to achieve this purpose.

In response to these comments, NHTSA has thoroughly reexamined its proposed requirement for ELR's in heavy vehicles. The agency concludes that a requirement for safety belt retractors in these vehicles would be likely to increase safety belt usage, by keeping the belts clean and reasonably accessible. Therefore, this rule adds a requirement that the safety belts in such vehicles be equipped with retractors.

With respect to the issue of requiring a particular type of retractor, NHTSA had proposed that ELR's be required because those retractors are generally the most comfortable for belt occupants. In proposing that ELR's be required, the agency in effect proposed eliminating the NLR's that several commenters stated were standard equipment on their heavy vehicle safety belts. This proposal was based on the fact that NLR's must be snugly adjusted to provide adequate crash protection. Drivers of heavy trucks who are familiar with the ELR's in their family cars might not snugly adjust the belt in their heavy trucks, because that step is not necessary if the belt has an ELR. If this were to occur, any excess slack in the NLR belt would play out in a crash, potentially allowing the driver to move out of his or her seat and subjecting the driver to an increased risk of injury. To preclude such results, this final rule adopts the proposed prohibition of NLR's for the safety belts in heavy trucks.

On the other hand, the agency explained the proposed prohibition of ALR's was based on the tendency of those retractors to become uncomfortable because of progressive tightening or "cinching down." The agency had no additional reasons for proposing to prohibit ALR's on heavy vehicle belts. At the time the agency proposed to require ELR's only, however, it was not aware of either a requirement by some States that the driver's seat in heavy school buses be equipped with an ALR or the existence of newer ALR designs with anti-cinch capability. Since NHTSA was unaware of the States' requirement for an ALR on the driver's seat of a school bus, the agency did not consider whether it was necessary or desirable to preempt those State regulations by issuing a Federal regulation. Executive Order 12612 compels NHTSA to consider the federalism implications of this final rule, now that the agency is aware of those State regulations. After considering the federalism implications, the agency has determined that it is not necessary to preempt these State requirements, for the reasons set forth below.

With respect to the issue of newer ALR designs with anti-cinch capability, NHTSA further investigated these newer designs by visiting three retractor manufacturers (IMMI, TRW, and Allied) to review their anti-cinch ALR programs. As a result of the information gained from reviewing these programs, NHTSA has concluded that the cinching problem may be solved for ALR's. Therefore, this rule has been expanded from the proposal, in order to permit ALR's with anti-cinch capability to be installed in heavy vehicles. For the purposes of this rule, anti-cinch capability for an ALR is determined by examining the working of the retractor after it has locked after the initial adjustment of the safety belt. After this initial adjustment and with the webbing extended to 75 percent of its maximum extension, an ALR with anti-cinch capability will *not* retract webbing to the next locking position until at least 3/4 of an inch of webbing has been retracted into the retractor.

These requirements were derived from existing requirements in Standard No. 209. Section S4.3(i) of Standard No. 209 currently specifies that the webbing of a seat belt assembly equipped with an ALR "shall not move more than 1 inch or 25 millimeters between locking positions of the retractor." This requirement ensures that occupants of seating positions with ALR's will not move forward more than one inch in a crash before the ALR locks. However, Standard No.

209 does not set forth any required minimum distance for the webbing to move between locking positions on an ALR. Absent a provision for a minimum distance of webbing travel between locking positions on ALR's, those retractors have exhibited the tendency to "cinch down" on occupants, as explained above and in the NPRM.

NHTSA believes that anti-cinch capability in ALR's can be defined by incorporating a minimum distance of webbing travel between locking positions on ALR's. The agency started from the premise that this minimum distance should not compromise the one-inch maximum distance of webbing travel that is needed for adequate occupant crash protection. NHTSA sought to establish a minimum distance requirement that was not too close to the one-inch maximum distance requirement, in recognition of the item-to-item variations inherent in mass-produced goods. Setting a minimum distance requirement too close to the one-inch maximum limit could result in manufacturers being forced to scrap a larger than normal percentage of their ALR's because those ALR's exceeded the one-inch maximum limit. On the other hand, NHTSA sought to establish a minimum distance requirement that was sufficiently close to the one-inch limit to minimize instances of "cinch down." The agency has concluded that the 3/4-inch minimum established by this rule represents the most appropriate balance of these competing interests.

The 75 percent extension specified for determining compliance with this requirement is identical to the 75 percent extension already specified in S5.2(i) of Standard No. 209 for determining whether ALR's comply with Standard No. 209. NHTSA believes that it is appropriate to measure compliance with this new 3/4-inch minimum webbing travel requirement for ALR's in Standard No. 208 under the same conditions currently specified for determining compliance with the existing 1-inch maximum webbing travel requirement for ALR's in Standard No. 209.

2. *Mounting Position of Retractors.*

The NPRM proposed that ELR's would have to be mounted to the seat frame above any air suspension mechanism used in the vehicle's seat. This proposed requirement was intended to ensure that the belt would not tighten around the wearer, and possibly discourage continued use, whenever the suspension seat moved.

The Teamsters supported this proposal because it would help increase belt comfort for the wearer. MVMA stated that it supported the intent of the proposal, but that it believed the proposed wording would result in unintended restrictions in retractor location for some suspension seat designs. MVMA suggested that the requirement be reworded to specify that the retractors be mounted on the seat structure that moves with the seat occupant as the suspension system functions. MVMA also stated that the proposed retractor location requirements did not appear to address the possible future installation of lap/shoulder belts in heavy vehicles. This point was echoed in the comments of IMMI and Volvo White, both of which stated that the proposed retractor location requirements would restrict designs of lap/shoulder belts for heavy vehicles. ASBC commented that advanced belt systems are being developed for heavy vehicles, and suggested that NHTSA not preclude installation of such belt systems by requiring retractors to be mounted on suspension seat frames. Freightliner commented that the EEC allows anchorages for lap/shoulder belts with ELR's that are installed in heavy vehicles to be mounted on the cab structure. Freightliner stated that the proposed retractor location requirements would conflict with the EEC requirement.

Bostrom Seating, Inc., (Bostrom) and Mack asked whether the agency intended to cover only seats with air suspension, as proposed in the NPRM, or whether the agency meant to address *all* types of suspension seats in heavy trucks, which could include seats that use steel or rubber spring suspensions. Volvo White also commented that the proposed location requirement was too restrictive. According to this commenter, not all heavy vehicle seats are pedestal designs, where it might be appropriate to locate retractors on the seat structure. Some heavy vehicle seats incorporate risers integral to the cab of the heavy truck. According to Volvo White, these types of seats would have different design requirements, and it might be inappropriate to locate the retractors on the seat structure.

In response to these comments, the agency has reevaluated its proposal. NHTSA agrees with the commenters that the proposed language was drafted to address lap belts only, and that it did not fully consider the possibility that some manufacturers would install lap/shoulder belts in heavy vehicles. To accommodate this possibility, this final rule imposes retractor location requirements only for:

1. lap belts that use ALR's; and
2. the pelvic portion of a dual retractor lap/shoulder belt assembly, if the retractor for the pelvic portion is an ALR.

This rule does *not* impose any retractor location requirements for lap belts that use ELR's or for ELR lap/shoulder belt assemblies. Hence, manufacturers that are developing these types of belt systems for heavy vehicles will not have to change the planned location of the retractor in response to this rule.

There are several reasons why this rule does not adopt the proposed location requirements for ELR's used at a seating position with an air suspension seat. First, such a requirement does not appear necessary in many instances. In general, ELR's do not cinch down on the belt wearer in most applications. Further, some new truck cab designs will have seat risers integral to the cab structure with the seat cantilevered from the riser. A requirement that the retractors for the belts of such seats be located on the seat structure would be unnecessary, because the belts would not cinch down on the wearer even if the retractors were on the riser or some other part of the cab structure. Additionally, there are now available some electrically activated ELR designs that would prevent the retractor from tightening, even if the retractor were located on the cab structure.

Second, a location requirement for ELR's could preclude manufacturers from exploring some innovative belt system designs that are now being considered for heavy vehicles. For instance, the agency has learned that lap/shoulder belts with ELR's are being evaluated for installation in heavy vehicles, some of which would require the lap belt retractor to be attached to the cab structure. The agency believes that these innovative designs could offer comfort and occupant protection that would be at least as good as that offered by systems that complied with the proposed retractor location requirements.

Accordingly, this rule specifies no location requirements for ELR's used on suspension seats in heavy trucks. NHTSA assumes that vehicle manufacturers will consider wearer comfort when determining the appropriate location of the ELR's, and that manufacturers will not position ELR's in locations that would make the safety belts uncomfortable for wearers. The agency will reexamine this question if these assumptions prove to be incorrect.

With respect to ALR's, the agency has decided that this final rule should include retractor location requirements. As noted in the NPRM, ALR's are not permitted at the front outboard seating positions in passenger cars, because of the wearer comfort problems that have been associated with those belts. If an ALR were used in a single retractor lap/shoulder belt, the retractor would lock when the belt was buckled, thereby preventing the user from leaning forward to reach vehicle controls, items in the glove box, and so forth. Although this rule permits only ALR's with anti-cinch capability to be installed in heavy trucks, NHTSA believes that retractor location requirements are still necessary for seats that have suspension mechanisms. If an ALR were located on the cab structure of a cab with suspension seats, the movement of the suspension seats, which can be different from the movement of the cab structure, would increase the likelihood of belts cinching down on the wearer. With cab-mounted ALR's for suspension seats, even the anti-cinch capability of the ALR's permitted by this rule would not completely eliminate the likelihood that belt wearers would experience some "cinch down" and discomfort because of the belt tightening around the wearer. To achieve this rule's goal of enhancing belt use in heavy vehicles, it is necessary to eliminate the likelihood of "cinch down" for belt users, by specifying location requirements for ALR's used on suspension seats.

Bostrom and Mack correctly pointed out in their comments that the problems that led the agency to propose retractor location requirements for seats with air suspension systems would occur in seats with other types of suspension systems, including rubber or steel spring suspension systems. Therefore, these retractor location requirements for ALR's apply to all vehicles where an ALR is installed at a subject seat that has its own suspension system.

The agency has also determined that the language suggested by MVMA in its comments effectuates the agency's intent in a less restrictive manner. The NPRM proposed that the retractors be mounted "on the seat assembly and above any adjustment or air-suspension mechanism." MVMA stated that on some designs of suspension seats, the retractor could be located so as to minimize the likelihood of "cinching down," but the retractor would be adjacent to any adjustment or air-suspension mechanism, not "above" it. Further, MVMA correctly noted that a retractor would function as intended by the NPRM if it were mounted below the seat's fore-and-aft track, but that this position also would be prohibited by the requirement that the retractor be mounted "above" any adjustment mechanisms. MVMA suggested that the language be revised to permit the locations described above, while achieving the agency's intent, by specifying that retractors be located "on the seat structure that moves with the seat occupant as the suspension system functions." This final rule adopts MVMA's suggested language.

3. *Standardize Buckle Release.*

The NPRM proposed to require that the belts in heavy vehicles be equipped with a push button release, which is required for all safety belt systems in light vehicles. This proposal was supported by Chrysler, Mack, Volvo White, ASBC, IIHS, Ford, the Teamsters, NSTA, Blue Bird, California Highway Patrol, and Freightliner. IMMI also supported the proposal, but stated that it assumed the "push button release" would permit the continued use of slide-button releases. Section S7.2(c) of Standard No. 208 requires that a seat belt assembly shall have a latch mechanism that "releases at a single point by a pushbutton action." This requirement has applied to passenger cars since 1972 and to most light trucks and multipurpose passenger vehicles since 1976. Some releases that comply with the requirements of S7.2(c) could be described as "slide-button releases." On the other hand, some designs that could be described as "slide-button releases" would not comply with S7.2(c), because they would not release by a "pushbutton action." If IMMI is uncertain whether the release mechanism that it called a "slide-button release" complies with the requirements of S7.2(c), it should request an interpretation of that section with respect to its release mechanism, and enclose pictures and diagrams of the release mechanism with the request for interpretation.

GM commented that it uses a push button release on all of its vehicles, so it would not be affected by the adoption of the proposed provision. However, GM stated its belief that such a requirement would be design-restrictive. To avoid this, GM suggested that other releases be permitted if they include a means to ensure against inadvertent release. Any standardization effort is necessarily design-restrictive. Accordingly, standardization efforts are undertaken only when the benefits of standardization outweigh the disadvantages of restricting alternative designs. In this instance, NHTSA has concluded that the benefits of having a standardized release mechanism in all types of vehicles, in terms of encouraging use and eliminating confusion about how to release the buckle in an emergency, are sufficiently compelling to justify the prohibition of other types of release mechanisms in heavy vehicles.

Beam's, a heavy vehicle safety belt manufacturer, commented that there would be no advantage to push button buckles, and that most of its customers prefer flap-type buckles, even though there is no price difference between push button and flap-type buckles. Similarly, API commented that there is insufficient information to prove that push button buckles are superior to flap-type buckles, and that flap-type buckles are preferred by some drivers. NHTSA does not question the assertion that some drivers prefer flap-type buckles. Further, while the NPRM explained NHTSA's reasons for believing that there may be safety advantages associated with pushbutton release buckles, the NPRM also explicitly acknowledged that there were insufficient data to show that push button release buckles have a marked safety advantage over flap-type buckles. However, this rulemaking was initiated to improve the extremely low belt use rate in heavy vehicles. The agency has concluded that a requirement that safety belts in heavy vehicles have the same type of release mechanism that is installed in the driver's personal vehicle will eliminate any confusion or uncertainty about how to release the belts. Eliminating any confusion or uncertainty should increase belt use in heavy vehicles, and increased belt use would enhance vehicle safety.

ATA commented that the standardized push button release was a good idea, but it was concerned that truck drivers wearing work gloves or mittens might find it difficult to release their belts. NHTSA knows of no test results to support this position, nor have any truck drivers raised this complaint. Some NHTSA personnel attempted to open several different buckles while wearing heavily padded ski gloves, and did not encounter any difficulties in releasing the buckles. Therefore, NHTSA has no reason to believe that truck drivers wearing gloves or mittens will encounter any problem releasing their safety belts.

After reconsidering its proposal and the comments received thereon, the agency has adopted in this rule the proposed requirement that the safety belts in heavy vehicles have a push button release mechanism.

4. *Safety Belt Loads.*

The NPRM referred to the EEC action lowering the anchorage strength requirements for safety belts in heavy vehicles, but explained that the agency had insufficient data on the effects of such a change in the U.S. driving environment. Accordingly, the notice requested data from all interested parties on this issue.

In response to this request, Chrysler and GM commented that they had no data on belt loads. Volvo White, Ford, ASBC, and the California Highway Patrol believed that a reduction in the anchorage strength requirements for these vehicles would be appropriate, but offered no data to support this belief. MVMA stated that it had no data on the subject, but recommended that this area be further investigated. ATA commented that a task force of the Society of Automotive Engineers (SAE) was examining the issue of the appropriate anchorage strength requirements for these vehicles. Until that task force completes its work, the ATA said, the appropriate anchorage strength requirements for heavy vehicles will not be known, so heavy vehicle manufacturers should continue to comply with the existing 5,000-pound load.

Navistar referred to one crash it conducted "some years ago" in which the belt load measured in a 27,000-pound straight truck was 533 pounds. Freightliner referred to some German crash tests of a truck moving at 21 kilometers per hour (kmh), which corresponds to about 12.6 miles per hour (mph), into various passenger cars moving at 42 kmh (about 24.2 mph). These crashes yielded a truck deceleration of about 5 g's, which Freightliner interprets as showing that the anchorage strength requirements for heavy vehicles could be lowered. The agency notes that the Navistar information consisted of a single crash, while the data referred to by Freightliner represented a single European-size truck crashing into European-size passenger cars at a single speed.

After evaluating these comments, NHTSA has concluded that it still lacks sufficient data to propose lowering heavy vehicle anchorage strength requirements. The agency will continue to gather data in this area. The agency will consider initiating rulemaking on this topic if and when there are sufficiently probative data on the effects of lowering anchorage strength requirements in heavy vehicles.

5. *Other Comments on Buckle Release Accessibility and Ease of Operation.*

In their comments, Duke Power Company and Mobil Oil asked that the final rule include a requirement that the buckle release mechanism be mounted on the inboard side of the vehicle. Duke Power commented that such a requirement would ensure the buckle could be released if the vehicle was in a crash where it was hit on the driver's side. IIHS commented that the preamble to the NPRM referred to UPS equipping all its trucks with stand-up buckles for easy one-hand operation, and asked that the final rule include a requirement for all heavy vehicles to be equipped with stand-up buckles that allow one hand operation.

The agency does not believe there is a safety need to adopt these requested amendments. NHTSA notes that this rule does not prohibit manufacturers from equipping heavy vehicles with stand-up buckles or buckles on the inboard side of the vehicle, if consumers prefer those features. However, NHTSA is not aware of any data that show that buckles on the inboard side of the vehicle are safer than buckles on the outboard side. In fact, one might argue that buckles on the outboard side could be released more quickly by rescue personnel in fire and other emergency situations, thus allowing a quicker rescue. Further, adoption of the requested amendments could serve to stifle innovative restraints system and seating system designs, at a time when the agency is seeking to increase safety belt use in heavy vehicles. Therefore, NHTSA has not adopted these requested amendments in this final rule.

6. *Leadtime.*

The NPRM proposed to give one year of leadtime between the publication of the final rule and the effective date of the amendments. Comments were requested on this leadtime. MVMA stated that one year was too short a leadtime, although it did not explain the basis for its assertion. Further, MVMA did not indicate what length of time would be sufficient. Navistar suggested an 18-month leadtime, since it did not install ELR's on any of its heavy vehicles. It asserted that it would need 18 months to evaluate the available ELR's and incorporate acceptable ones into its vehicle production. Ford suggested a two-year leadtime. Ford commented that it could probably change from ALR's to ELR's, as proposed, on its vehicles that included retractors in about 18 to 20 months. However, Ford stated that some of its vehicles did not currently offer any retractors. On those vehicles, Ford commented that it might have to modify seat cushions and trim to make room for retractors, or to move the anchorages. For such vehicles, Ford commented that it would need about two years to make and test all the required changes. Volvo White indicated that it would need a three-to-five-year leadtime. This was based on 1.5 to 2 years to redesign its seats to comply with the proposed retractor location requirements on suspension seats, another 1 to 1.5 years to redesign its vehicles to incorporate the redesigned seats, and then another 0.5 to 1 year to complete its certification testing of the redesigned vehicles. Volvo White also included a 0.5 to 1-year period to allow it to use up existing supplies of old seats.

After reconsidering this issue, NHTSA has concluded that the proposed one-year leadtime was too short, primarily because that length of time may be needed just to ensure that the vehicle manufacturers can evaluate retractors and obtain adequate supplies of those retractors. The vehicle manufacturers will also have to evaluate the seat designs in each of their heavy vehicle models and perhaps change some of the retractor locations. NHTSA believes this could be accomplished in approximately 18 months and that this evaluation could be undertaken simultaneously with the retractor evaluation. To account for the uncertainties in the agency estimates, this final rule provides a two-year leadtime for the vehicle manufacturers. This means that heavy vehicles manufactured on or after September 1, 1990, must comply with the requirements of this rule. The agency has concluded that the Volvo White estimate of three to five years is excessive, because it was premised upon that company scrapping all its existing seat designs and lap/shoulder belt restraint system designs. Since neither of those actions is required by this rulemaking, the estimate is not deemed reliable.

7. *Costs.*

The NPRM stated NHTSA's estimates that this rule would cost the consumer about $14 in 1982 dollars for ELR's at each seating position, based on a study of the belt system installed in a 1980 Citation. Since most heavy vehicles have two seating positions in the cab, the agency estimated incremental costs of installing ELR's would be about $30 per heavy vehicle, which would result in total annual costs of between $6 million and $7 million. Incremental consumer costs for push button releases were expected to be less than 10 cents per vehicle and total estimated annual cost for push button release was estimated at about $30,000. The NPRM asked for comments on these estimates.

Ford stated that the estimated costs were reasonable. Bostrom stated that the estimated costs were correct, if the intent was to have the retractor mounted on the seat support structure, not the seat cushion itself. Neither the proposal nor this rule requires the retractors to be mounted on the seat cushion, so the agency is treating Bostrom's comment as saying that the cost estimates in the proposal were accurate. Volvo White, on the other hand, stated that the cost estimates were too low. First, Volvo White did not believe the 1980 Citation was a good benchmark for estimating costs, because the sales volume for the 1980 Citation was more than two years' worth of heavy truck sales by all manufacturers. Second, Volvo White now equips some of its vehicles with NLR's, but consumers get a credit of $20 per seating position if they order the truck without a retractor. According to Volvo White, ELR's cost more than NLR's, so the cost estimate for ELR's should be more than $20 per seating position.

The agency has concluded that its estimate of costs was reasonable, and is not persuaded by Volvo White's assertions to the contrary. The difference in sales volume between the 1980 Citation and total heavy truck sales has no effect on NHTSA's cost estimate for ELR's. Retractor manufacturers use the identical parts for ELR's regardless of the vehicle type in which the ELR is ultimately installed. Thus, there is no inherent reason that an ELR to be installed in a heavy vehicle would cost any more or less than an ELR to be installed in a passenger car.

Volvo White's consumer credit of $20 per seating position ordered without a retractor also does not suggest that the agency's cost estimate was inaccurate. These "delete option" credits are not necessarily directly related to the manufacturer's costs to provide the option. Volvo White did not provide any estimates of the costs it would incur if it were to provide ELR's in its heavy vehicles. NHTSA derived its cost estimate from an actual study of an ELR, and two manufacturers (Ford and Bostrom) commented that the cost estimates based on that study were reasonable. Since Volvo White did not provide any cost estimates of its own, and did not establish that NHTSA had somehow erred in its own cost estimates, the agency concludes that its previous cost estimates for ELR's was reasonable.

The agency has no study on which to base a cost estimate for the anti-cinch ALR's permitted by this rule. However, if manufacturers of anti-cinch ALR's want to compete with manufacturers of ELR's for the heavy vehicle market, NHTSA anticipates that the anti-cinch ALR's would be comparably priced. Thus, for the purposes of this rule, NHTSA estimates that the incremental costs of installing anti-cinch ALR's will be about $30 per heavy vehicle, the same as ELR's.

Regulatory Impacts

NHTSA has examined the impacts of this rulemaking action and determined that this rule is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has also determined that the economic and other impacts of this rule are so minimal that a full regulatory evaluation is not required.

As noted in the NPRM, most new heavy vehicles manufactured today are equipped only with simple safety belt buckles with no retractors. As explained above, the incremental customer costs of requiring ELR's or anti-cinch ALR's will be about $14 per seating position, or about $30 per heavy vehicle. Total estimated annual costs of requiring these retractors would be between $6 million and $7 million. The incremental customer cost for requiring a push button release for the safety belts is expected to add less than 10 cents to total vehicle cost, and will result in estimated annual costs of about $30,000. These figures are far short of the $100 million costs that result in a rule being classified as a major rule.

Based on the experience of the United Parcel Service in substantially increasing safety belt use by its employees, NHTSA believes that the requirements for retractors and push button release buckles are likely to raise safety belt use up to 15 to 20 percent. An increase in belt use to the 15 to 20 percent range could eliminate 40-60 fatalities annually and reduce the severity of from 8,000 to 12,000 injuries annually for heavy truck occupants. Since the safety belt use rate is unknown for drivers of heavy MPV's and buses, the agency cannot quantify the potential fatality and injury reduction for those vehicles.

NHTSA has also considered the effects of this rule under the Regulatory Flexibility Act. I hereby certify that it will not have a significant economic impact on a substantial number of small entities. Few, if any, of the heavy vehicle manufacturers are small entities. To the extent that these manufacturers experience a cost increase as a result of this rule, that increase will be minimal, as explained above. Likewise, small organizations and small governmental entities will not be significantly affected by this rule. Although those groups do purchase heavy vehicles, the potential price increase resulting from this rule will be minimal.

The agency has also analyzed this rule for the purposes of the National Environmental Policy Act, and determined that the rule will not have any significant impact on the quality of the human environment.

Finally, NHTSA has considered the federalism implications of this final rule, as required by Executive Order 12612. NHTSA is unaware of any existing State requirements that would be preempted by this rule. After considering this rule in accordance with the principles and criteria contained in Executive Order 12612, NHTSA has determined that the rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles, Rubber and rubber products, Tires.

In consideration of the foregoing, 49 CFR §571.208 is amended as follows:

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§571.208 *Standard No. 208; Occupant crash protection* [Amended]

2. Section S4.3 of Standard No. 208 is revised to read as follows:

S4.3 *Trucks and multipurpose passenger vehicles, with GVWR of more than 10,000 pounds.*

S4.3.1 *Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds, manufactured on or after January 1, 1972, and before September 1, 1990.* Each truck and multipurpose passenger vehicle with a gross vehicle weight rating of more than 10,000 pounds, manufactured on or after January 1, 1972, and before September 1, 1990, shall meet the requirements of S4.3.1.1 or S4.3.1.2. A protection system that meets the requirements of S4.3.1.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.3.1.2.

S4.3.1.1 *First option—complete passenger protection system.* The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.3.1.2 *Second option—belt system.* The vehicle shall, at each designated seating position, have either a Type 1 or Type 2 seat belt assembly that conforms to §571.209.

S4.3.2. *Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds, manufactured on or after September 1, 1990.* Each truck and multipurpose passenger vehicle with a gross vehicle weight rating of more than 10,000 pounds, manufactured on or after September 1, 1990, shall meet the requirements of S4.3.2.1 or S4.3.2.2. A protection system that meets the requirements of S4.3.2.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.3.2.2.

S4.3.2.1 *First option—complete passenger protection system.* The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.3.2.2 *Second option—belt system.* The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at an outboard seating position shall include either an emergency locking retractor or an automatic locking retractor. An automatic locking retractor provided for one of these belt assemblies at an outboard seating position shall not retract webbing to the next locking position until at least 3/4 inch of webbing has moved into the retractor. In determining whether an automatic locking retractor complies with this requirement, the webbing is extended to 75 percent of its length and the retractor is locked after the initial adjustment. An automatic locking retractor that is used at an outboard seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

3. Section S4.4 of Standard No. 208 is revised to read as follows:

S4.4 *Buses.*

S4.4.1 *Buses manufactured on or after January 1, 1972, and before September 1, 1990.* Each bus manufactured on or after January 1, 1972, and before September 1, 1990, shall meet the requirements of S4.4.1.1 or S4.4.1.2

S4.4.1.1 *First option—complete passenger protection system—driver only.* The vehicle shall meet the crash protection requirements of S5, with respect to an anthropomorphic test dummy in the driver's designated seating position, by means that require no action by vehicle occupants.

S4.4.1.2 *Second option—belt system—driver only.* The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209.

S4.4.2 *Buses manufactured on or after September 1, 1990.* Each bus manufactured on or after September 1, 1990, shall meet the requirements of S4.4.2.1 or S4.4.2.2.

S4.4.2.1 *First option—complete passenger protection system—driver only.* The vehicle shall meet the crash protection requirements of S5, with respect to an anthropomorphic test dummy in the driver's designated seating position, by means that require no action by vehicle occupants.

S4.4.2.2 *Second option—belt system—driver only.* The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at the driver's seating position shall include either an emergency locking retractor or an automatic locking retractor. An automatic locking retractor provided for one of these belt assemblies at the driver's seating position shall not retract webbing to the next locking position until at least 3/4 inch of webbing has moved into the retractor. In determining whether an automatic locking retractor complies with this requirement, the webbing is extended to 75 percent of its length and the retractor is locked after the initial adjustment. An automatic locking retractor that is used at a driver's seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

4. The introductory phrase of section S7.2 is revised to read as follows:

S7.2 *Latch mechanism.* A seat belt assembly installed in any vehicle, except an automatic belt assembly, shall have a latch mechanism—

* * * * *

Issued on June 30, 1988.

Diane K. Steed
Administrator

53 F.R. 25337
July 6, 1988

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 74-14; Notice 60)
RIN 2127-AC01

ACTION: Final rule; grant of petitions for reconsideration.

SUMMARY: On November 23, 1987, NHTSA published a final rule which, among other things, responded to the dummy positioning issues raised in petitions for reconsideration of the 1986 final rule adopting the Hybrid III test dummy. Three of the petitions for reconsideration of that 1987 rule asked that the positioning procedures for the test dummy's head and feet be amended to make the procedures more specific. NHTSA agrees with these petitioners about the need for such changes, and so is amending the head and feet positioning procedures along the lines requested by the petitioners.

EFFECTIVE DATE: The changes to the Hybrid III test dummy positioning procedures are effective December 4, 1989.

SUPPLEMENTARY INFORMATION: On July 25, 1986 (51 FR 26688), NHTSA published a final rule adopting the Hybrid III test dummy as an alternative for use in determining compliance with the injury criteria in dynamic crash testing under Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208). This rule established the technical specifications and calibration requirements to be met by the new test dummy, an additional injury criterion to be met when the new test dummy was used, and the procedures to be used to position the new test dummy during Standard No. 208 compliance testing.

More than a dozen petitions for reconsideration of that rule were timely filed with NHTSA. The petitions addressed all facets of the final rule, but most focused on the additional injury criteria. The agency responded to all of the issues raised in these petitions, *except the dummy positioning issues*, in a notice published on March 17, 1988 (53 FR 8755).

While these petitions for reconsideration were pending, NHTSA was formulating a final rule requiring light trucks and light multipurpose passenger vehicles equipped with manual lap/shoulder belts at the front outboard seats to comply with the injury criteria of Standard No. 208. While formulating this rule, the agency decided that it ought to expedite its consideration of the dummy positioning issues raised in the petitions for reconsideration of the Hybrid III final rule. This decision to expedite was necessary because those dummy positioning procedures would also be used to position the Hybrid III test dummies in light trucks and multipurpose passenger vehicles. Absent an agency response to those petitions, only the older test dummy could be used in compliance testing for light trucks and multipurpose passenger vehicles. Accordingly, the final rule that established dynamic testing requirements for light trucks and light multipurpose passenger vehicles also responded to the petitions for reconsideration of the Hybrid III test dummy positioning procedures (52 FR 44898; November 23, 1987).

NHTSA received five petitions for reconsideration of the November 23, 1987, final rule. Three of those petitions sought some modifications of the dynamic testing requirements. NHTSA responded to those petitions on December 14, 1988 (53 FR 50221). In that notice, the agency indicated that it had not finished evaluating the petitions relating to the Hybrid III test dummy positioning procedures, and that a response to those petitions would be published at a later time. This notice responds to those petitions relating to the test dummy positioning procedures.

The petitioners in this case were Ford, Honda, and Toyota. The petitions focused on the positioning procedures for the head and feet of the Hybrid III test dummy. These petitions are granted, for the reasons explained below.

The head positioning procedures established for the Hybrid III test dummy in passenger cars specified that the head accelerometer mounting platform is horizontal within ½ degree. However, the final rule extending dynamic testing to light trucks and MPVs noted that NHTSA had encountered difficulties in properly leveling the Hybrid III test dummy's head in "vehicles that had very upright seats with non-adjustable seatbacks" (52 FR 44898 at 44903;

November 23, 1987). To address this problem, the final rule established a sequence of head positioning procedures to be followed when positioning the Hybrid III test dummy in "vehicles with upright seats with non-adjustable backs."

In its petition for reconsideration of the 1987 rule, Ford asserted that the problem of leveling the dummy's head does not arise from the fact that the seats are non-adjustable. Ford correctly noted that section S8.1.3 of Standard No. 208 requires that adjustable seat backs be placed at the manufacturer's nominal design riding position, and not be adjusted out of that position. Instead, Ford alleged that the problem of leveling the dummy's head arises when seats are "very upright" either because the seats are non-adjustable or because that is the manufacturer's nominal design riding position. Accordingly, Ford suggested that the reference to "non-adjustable seats" be deleted from the head positioning procedures. Toyota raised a similar point in its petition, asserting that Standard No. 208 specifies clearly the head positioning procedures to be followed for non-adjustable seatbacks but does not specify any head positioning procedures for adjustable seatbacks.

NHTSA has not encountered any difficulties in positioning Hybrid III test dummies in vehicles where the seats have adjustable backs. The manufacturer's nominal design riding position for vehicles with adjustable seats has to date always resulted in a seat position inclined to the rear of the vehicle. However, NHTSA agrees with the point that vehicles with adjustable seats could be produced with a very upright nominal design riding position, and that such vehicles would pose the same head positioning difficulties that have been encountered in vehicles with non-adjustable seats. To avoid any potential difficulties, this notice amends the head positioning procedures for the Hybrid III dummy to provide that those procedures should be followed in all vehicles, regardless of whether the seats are adjustable or non-adjustable. This notice also adds language to the head positioning procedures to clarify that before the neck bracket of the Hybrid III is adjusted, the neck bracket should be set at "0" (the non-adjusted position) and after the neck bracket of the Hybrid III is adjusted, the test dummy should remain within the limits for the H point and the pelvic angle.

The other dummy positioning issue raised in the petitions for reconsideration of the 1987 rule was the issue of foot positioning. As the foot positioning procedures for the Hybrid III dummy were being developed, both Ford and Toyota asserted that the agency should use the same foot positioning procedures for the Hybrid III dummy as it used for the older Part 572 Subpart B test dummy. In response to these assertions, the final rule stated:

NHTSA agrees with Ford and Toyota that the foot positioning procedures for the two test dummies should be the same. NHTSA has made the necessary changes to the Hybrid III foot positioning procedures to conform them with the procedures used with the Part 572 Subpart B test dummy. (52 FR 44904; November 23, 1987)

Ford, Toyota, and Honda stated in their petitions for reconsideration that NHTSA had not made the foot positioning procedures for the two test dummies the same, notwithstanding its stated intent to do so. Honda noted that the Hybrid III foot positioning procedures do not specify how to place the test dummy's feet for vehicles with a footrest or for vehicles with wheelhouse projections in the passenger compartment after September 1, 1991. Prior to that date, the rule permits the feet of the Hybrid III test dummy to be positioned according to the same procedures specified for the Part 572 Subpart B test dummy.

The agency has already expressly stated that the foot positioning procedures for the two test dummies should be the same. NHTSA agrees with the petitioners' assessment that the amendments made to the Hybrid III foot positioning procedures in the November 23, 1987, final rule did not achieve the goal of making the foot positioning procedures the same for the two test dummies. Therefore, this notice adopts as the foot positioning procedures for the Hybrid III test dummy the foot positioning procedures that have already been adopted for the Part 572 Subpart B test dummy.

This notice also removes section S12 from Standard No. 208, and the reference to that section in S10 of Standard No. 208. Section S12 set forth optional positioning procedures for the Part 572 Subpart B dummy that could be used until September 1, 1987. Since that date has now passed, there is no continuing need to refer to those optional positioning procedures in Standard No. 208.

Impact Assessments

NHTSA has considered the impacts of these changes to the Hybrid III test dummy positioning procedures in response to the petitions for reconsideration. The agency has determined that these impacts are neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation's regulatory policies and procedures. The changes to the test dummy positioning procedures do not affect the estimates of costs and other impacts set forth in the final regulatory evaluation that was prepared in connection with the final rule establishing the dynamic testing requirements for light trucks and MPVs. Interested persons are referred to that document, which is available in NHTSA Docket No.

74–14, Notice 53. Copies of that regulatory evaluation may be obtained by writing to: NHTSA Docket Section, Room 5109, 400 Seventh Street, SW., Washington, DC 20590, or by calling the Docket Section at (202) 366–4949.

As noted above, the only differences between the rule considered in that regulatory evaluation and this response to the petitions for reconsideration are the two modifications of the Hybrid III test dummy positioning procedures. These modifications do not impose any burdens on any party. Instead, the modifications to the positioning procedures will result in more consistent crash test results by more clearly specifying precisely how the Hybrid III test dummy is to be positioned in a vehicle prior to a crash test. Changes to the positioning procedures do not affect the cost of purchasing a Hybrid III test dummy or the cost of conducting a crash test. Because of these minimal impacts, a full regulatory evaluation has not been prepared for this response to the petitions for reconsideration.

NHTSA has also considered the effects of this action under the Regulatory Flexibility Act. I hereby certify that the modifications to the Hybrid III test dummy positioning procedures made in response to the petitions for reconsideration will not have a significant economic impact on a substantial number of small entities. These changes will only affect manufacturers that conduct their own crash testing, few of which are small entities. As described above, no adverse impacts will be associated with these modifications of the Hybrid III positioning procedures. Further, since no price increases will result from these modifications to the test dummy positioning procedures, small organizations and small governmental entities will not be affected by this action when they purchase new vehicles.

In consideration of the foregoing, 49 CFR 571.208 is amended as follows:

S10 is amended by revising the introductory text to read as follows:

S10. *Test dummy positioning procedures.* Position a test dummy, conforming to Subpart B of Part 572 of this chapter, in each front outboard seating position of a vehicle as set forth below in S10 through S10.9. Each test dummy is restrained during the crash tests of S5 as follows:

* * * * *

S11 is amended by revising S11.1 and S11.6 to read as follows:

S11. *Positioning Procedure for the Part 572 Subpart E Test Dummy.*

* * * * *

S11.1 *Head.* The transverse instrumentation platform of the head shall be horizontal within ½ degree. To level the head of the test dummy, the following sequences must be followed. First, adjust the position of the H point within the limits set forth in S11.4.3.1 to level the transverse instrumentation platform of the head of the test dummy. If the transverse instrumentation platform of the head is still not level, then adjust the pelvic angle of the test dummy within the limits specified in S11.4.3.2 of this standard. If the transverse instrumentation platform of the head is still not level, then adjust the neck bracket of the dummy the minimum amount necessary from the non-adjusted "0" setting to ensure that the transverse instrumentation platform of the head is horizontal within ½ degree. The test dummy shall remain within the limits specified in S11.4.3.1 and S11.4.3.2 after any adjustment of the neck bracket.

* * * * *

S11.6 *Feet.* The feet of the driver test dummy shall be positioned in accordance with S10.1.1 (b) and (c) of this standard. The feet of the passenger test dummy shall be positioned in accordance with S10.1.2.1 (b) and (c) or S10.1.2.2 (b) and (c) of this standard, as appropriate.

* * * * *

S12 is removed.

Issued on May 30, 1989.

Jeffrey R. Miller
Acting Administrator

54 F.R. 23986
June 5, 1989

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 87–08; Notice 3)
RIN 2127–AB 9

ACTION: Final rule.

SUMMARY: This rule establishes a new requirement for lap/shoulder safety belts to be installed at all forward-facing rear outboard seating positions in passenger cars. Rear-seat lap/shoulder belts are estimated to be even more effective than rear-seat lap-only belts in reducing fatalities and moderate-to-severe injuries. As safety belt use in the rear seat increases, the greater effectiveness of rear-seat lap/shoulder belts should yield progressively larger benefits in terms of reduced fatalities and moderate-to-severe injuries. NHTSA anticipates that this rule requiring rear-seat lap/shoulder belts will help increase safety belt use in the rear seats by providing rear-seat occupants with maximum safety protection when they buckle up.

DATES: This final rule takes effect on December 11, 1989. All passenger cars, other than convertibles, manufactured on or after that date must be equipped with rear-seat lap/shoulder belts that comply with this rule.

SUPPLEMENTARY INFORMATION: Standard No. 208, *Occupant Crash Protection* (49 CFR § 571.208) currently requires vehicle manufacturers to install a seat belt assembly that conforms to Standard No. 209, *Seat Belt Assemblies,* at every rear designated seating position in passenger cars, trucks, and multipurpose passenger vehicles. Manufacturers are permitted to choose between installing a Type 1 (lap-only) or Type 2 (lap/shoulder) safety belt system. Until recently, most manufacturers chose to comply with this requirement by installing lap-only safety belts at rear designated seating positions.

When the agency gave manufacturers the option of installing either a lap-only or lap/shoulder belt at each rear designated seating position, the available evidence showed that both types of belt systems were effective in reducing the risk of death and serious injury in a crash. A number of studies since that time have evaluated thousands of cases and repeatedly concluded that lap-only belts are, in fact, substantially effective in preventing deaths and reducing injuries. While there are individual cases where lap-only belts may have failed to prevent injury, NHTSA knows of no comprehensive study by any person or organization that concludes that rear-seat lap belts are anything less than effective in reducing overall crash risks for those occupants. The agency again strongly encourages rear seat occupants to use whatever type of safety belt is available, whether lap-only or lap/shoulder, just as front seat occupants should always buckle up.

Even so, NHTSA believes that lap/shoulder belts would be even more effective than lap-only belts in rear seating positions. In past years, however, rear-seat occupants infrequently used their safety belts, which were almost always the lap-only type, with usage rates far lower than for front-seat occupants. For example, approximately 2 percent of rear seat occupants wore their safety belts in 1981–82. With that very low rate of belt use, the safety benefits (in terms of reduced deaths and injuries) of lap/shoulder belts vs. lap-only belts at those rear seating positions would have been negligible, but would have imposed substantially greater costs. In 1984, NHTSA estimated the cost differential to be an additional $20 per rear seating position equipped with lap/shoulder belts. After considering these facts, and the far greater need for improved front seat occupant protection, the agency decided that it could not then justify a requirement for lap/shoulder belts at rear seating positions.

In August 1986, a petition was filed with the agency by the Los Angeles Area Child Passenger Safety Association. This petition asked NHTSA to require the installation of lap/shoulder belts in rear seating positions. The agency decided to grant this petition and reexamine the issue. Accordingly, on June 16, 1987, NHTSA published an advance notice of proposed rulemaking (ANPRM), requesting comments on the need for rulemaking to require lap/shoulder belts in rear seating positions (52 FR 22818). Thirty-four commenters responded to the ANPRM.

After considering these comments, NHTSA concluded that several factors had changed since the previous considerations of this subject. Among the changed factors were the following:

1. *Safety Belt Use in Rear Seating Positions Had Increased Substantially.* Safety belt use in rear seats had increased eightfold from the 2 percent use rate in 1981–82 to 16 percent use in 1987. The primary factors responsible for the dramatic increase in safety belt use were State safety belt use laws. As of April 1989, these laws were in place in 32 States and the District of Columbia. As the number of States with safety belt use laws continues to grow, along with expanded belt-use campaigns and greater public awareness of the benefits of wearing safety belts, there is every reason to believe that the rate of belt use by rear-seat occupants will continue to increase as well.

2. *The Greater Effectiveness of Rear-Seat Lap/Shoulder Belts Had Become a Significant Factor With the Increase in the Use of Rear-Seat Belts.* NHTSA estimates that rear-seat lap-only belts are 32 percent effective in reducing the risk of death, while rear-seat lap/shoulder belts would be 41 percent effective in reducing the risk of death. As more rear-seat occupants use their safety belts, the 9 percentage point greater effectiveness for lap/shoulder belts will result in progressively greater safety benefits.

3. *As Manufacturers Voluntarily Chose to Equip Their Vehicles With Rear-Seat Lap/Shoulder Belts, the Costs Associated With a Requirement for Rear-Seat Lap/Shoulder Belts Were Proportionally Diminished.* When the agency examined this issue on previous occasions, the vast majority of vehicles were equipped with lap-only safety belts at rear seating positions. The costs of adding lap/shoulder safety belts to the rear seating positions of nearly every new vehicle were substantial. In preparing the ANPRM on this subject, NHTSA assumed that rear outboard seat lap/shoulder belts would not otherwise be installed in passenger cars unless required by regulation, and estimated the total costs for equipping the new-car fleet to be approximately $140 million annually.

However, vehicle manufacturers have voluntarily chosen to equip more and more of their vehicles with rear-seat lap/shoulder belts. For example, nearly every 1990 model year passenger car would have been voluntarily equipped with rear outboard seat lap/shoulder belts. The incremental costs associated with a NHTSA requirement would reflect only the costs of installing rear-seat lap/shoulder belts in the small portion of the fleet that would not have those belts voluntarily installed, or approximately $790,000, a substantial decrease from the agency's previous estimates of such costs.

After analyzing the effects of these changed factors and the comments received on the ANPRM, NHTSA tentatively determined that a requirement for lap/shoulder belts in rear seating positions would now be justified. Accordingly, NHTSA published a notice of proposed rulemaking (NPRM) on November 29, 1988 (53 FR 47982). This NPRM was a comprehensive proposal. It proposed to require that all passenger cars, other than convertibles, manufactured on or after September 1, 1989, be equipped with lap/shoulder safety belts at all forward-facing rear outboard seating positions. It proposed further that convertible passenger cars and trucks, multipurpose passenger vehicles, and buses with a gross vehicle weight rating of 10,000 pounds or less manufactured on or after September 1, 1991, be equipped with lap/shoulder safety belts at all forward-facing rear outboard seating positions. The NPRM also proposed that rear-seat lap/shoulder belts be equipped with a particular type of retractor, that such belts be integral (i.e., the lap belt could not be detachable from the shoulder belt), that rear-seat lap/shoulder belts comply with some of the comfort and convenience requirements specified in section S7.4 of Standard No. 208, and that the anchorages for the rear-seat lap/shoulder belt assemblies comply with the requirements of Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR § 571.210).

The comment period for the NPRM closed on January 30, 1989. More than 70 comments were received on the NPRM. The commenters generally agreed with the proposal to require lap/shoulder belts at forward-facing rear outboard seating positions, at least in passenger cars other than convertibles. However, the commenters raised a number of concerns with and objections to specific details of the NPRM, including the vehicle types other than passenger cars that should be required to be equipped with rear-seat lap/shoulder belts, the retractors with which those lap/shoulder belts should be equipped, compatibility with child restraint systems, the definition of an "outboard seat," the details of the comfort and convenience requirements, and the requirements for tension-relieving devices on these belts.

NHTSA will need some additional time to properly analyze and evaluate each of these comments on the detailed aspects of the proposal, and to formulate the agency response and appropriate regulatory requirements for each of these aspects. If the agency were to take no final rulemaking action while it is preparing its position on each of these issues, the effect would be to delay the issuance and effective date of the basic requirement to install rear-seat lap/shoulder belts in all vehicles including passenger cars. Yet it is this basic requirement that will offer the public most of the safety benefits that were contemplated by the agency when it published the NPRM. While NHTSA believes that additional incremental safety benefits will result from requirements adopting detailed installation requirements, such as those proposed in the NPRM, it would appear unwise and inappropriate for the agency to deny the public the benefits of a basic requirement for rear-seat lap/shoulder belts until the agency can complete its work on those installation requirements.

To ensure the earliest possible implementation of a requirement for rear-seat lap/shoulder belts, NHTSA has decided to take final action on its proposal in two steps. The first step consists of this rule, which addresses only passenger cars other than convertibles with a general requirement for lap/shoulder belts at rear outboard seating positions. The second step will consist of NHTSA's decision regarding each of the detailed proposals for rear-seat lap/shoulder belts set forth in the NPRM. NHTSA will also treat the second step of this rulemaking as a high priority action, to ensure that the incremental benefits are available in a timely fashion.

With the exception of Ford Motor Company (Ford) and Subaru, the commenters were essentially unanimous in their support for the agency's proposal to require rear-seat lap/shoulder belts in all 1990 and subsequent model year passenger cars other than convertibles.

Ford commented that it had planned to voluntarily provide rear-seat lap/shoulder belts in most of its cars by September 1, 1989, regardless of any regulatory requirements. However, Ford stated that it had not planned to provide rear-seat lap/shoulder belts in one of its car lines by that date, because production of the current design of that line will be phased out during the 1990 model year. Accordingly, Ford commented that "a 1989 effective date might well compel Ford to stop production of that line," but that Ford could meet the proposed passenger car requirements for all its cars manufactured on or after September 1, 1990. NHTSA contacted Ford to obtain more detailed information about these assertions.

Ford explained that its asserted problem arose from the proposed requirement that rear-seat lap/shoulder belts be integral. However, Ford did plan to offer retrofit shoulder belt kits for the rear seats of the single line which it was not planning to equip with rear-seat lap/shoulder belts for the 1990 model year. These retrofit kits would consist of separate manually adjustable shoulder belt and buckle assemblies to supplement the lap-only belts already installed in the vehicle. The installation of these retrofit kits involves no change to the existing lap belts. Instead, the upper ends of the shoulder belts are attached to the upper anchorages required by Standard No. 210 to be in the car at all forward-facing rear outboard seating positions. The lower ends of the shoulder belts are attached to the inboard anchorages for the existing lap belts by loosening the bolt anchoring the lap belt, inserting the attachment hardware for both the lap belt and the shoulder belt on that bolt, and then retightening and properly torquing the bolt. After the retrofit, the installed safety belt system consists of a lap belt with its own buckle and retractor, and a shoulder belt with its own buckle and manual adjusting device. Such a design would not comply with the proposed requirement that the lap/shoulder belts be integral.

Ford asserted that it could not comply with a requirement for *integral* lap and shoulder belts for the rear outboard seating positions of this single line. According to Ford, it would not be acceptable simply to use an integral lap/shoulder belt assembly and attach the upper end of the shoulder belt assembly to the anchorages installed in the car in compliance with Standard No. 210. While such a system would comply with the applicable and proposed NHTSA regulatory requirements, Ford indicated that such a safety belt system would not necessarily be optimized for kinematic performance, belt comfort, restraint system integrity, and the like. Because of these concerns, Ford indicated that it was moving the anchorages for rear outboard seats in most of its car lines to optimally accommodate factory-installed integral lap/shoulder belts.

Ford also indicated that it was simply not possible for it to complete the necessary testing and design modifications and incorporate those changes into production for the current design of the line in question within the period proposed in the NPRM (i.e., by September 1, 1989). Ford asserted that it would need at least 42 weeks of leadtime to begin production of cars in this line with integral lap/shoulder belts in the rear. Additionally, Ford stated that the successor vehicle for this line would have integral lap/shoulder belts at the rear outboard seating positions. Thus, instead of making the investment in design, testing, and production changes for a car line that will not be produced after April 1990, Ford indicated that it might stop production of that line eight months earlier than is now planned.

When NHTSA issued the NPRM, the agency believed that Ford would voluntarily install rear-seat lap/shoulder belts on all of its 1990 car lines. Since that is not the case, and since Ford faces special difficulties in bringing one of its car lines into compliance, the agency must revise its tentative conclusion that a September 1, 1989, effective date was practicable for a requirement for *integral* rear-seat lap/shoulder belts. This final rule reflects a balancing of the need to ensure that any new requirements in the safety standards are "practicable" (as required by the Safety Act) with the public safety benefits from the earliest practicable effective date for these requirements. The agency is therefore adopting a schedule of effective dates that addresses both these needs, as described below.

Subaru's objection to the proposed requirement was based on the fact that one of its models (the Loyale station wagon) is already voluntarily equipped with rear-seat lap/shoulder belts, but the anchorage for the upper end of the shoulder belt is outside the anchorage location zones specified in Standard No. 210. Some background information on this situation may be helpful.

Subaru previously sought an interpretation from NHTSA as to whether the company would be permitted to use an anchorage location outside of the zones specified in Standard No. 210 for the upper anchorage of voluntarily installed rear-seat lap/shoulder belts. In an October 13, 1988, interpretation letter to Mr. Paul Utans of Subaru, NHTSA responded that components voluntarily installed in addition to required safety systems are not themselves required to comply with the safety standards, provided that the additional components do not diminish the ability of the required systems to comply with the safety standards. In this case, the shoulder belts were voluntarily installed by Subaru, so the shoulder-belt portions of the lap/shoulder belt systems were not required to comply with the anchorage location requirements in Standard No. 210 or any other of the requirements in the safety standards. Instead, the only limitation on the voluntarily installed shoulder belts was that they could not diminish the ability of the required lap belts to comply with the safety standards. This letter concluded by noting that this interpretation would no longer apply if NHTSA adopted a final rule requiring rear-seat lap/shoulder belts in passenger cars, because the interpretation was based upon the voluntary nature of the shoulder belt installation.

Because of this interpretation, Subaru correctly assumed in its comments that the upper anchorages for the rear-seat lap/shoulder belts in its Loyale station wagons would have to comply with all requirements of Standard No. 210, including the location requirements, if the proposed rule were adopted as a final rule and became effective. This would obligate Subaru to redesign the rear-seat lap/shoulder belt system in its Loyale station wagon, conduct testing of the redesign, and incorporate the redesign into production. In comments similar to those of Ford, Subaru asserted that the proposed leadtime until September 1989 was too short, but that vehicles manufactured after September 1990 could comply with the proposed requirements.

When NHTSA proposed that this rule become effective nine months after the NPRM was published, the agency recognized that this amount of leadtime was substantially less than is frequently proposed for other significant rulemakings. This foreshortened leadtime reflected NHTSA's belief that manufacturers would not need to make engineering or design changes to install lap/shoulder belts in the rear outboard seating positions of passenger cars other than convertibles, especially in view of the substantial commitments for voluntary installation of such belts. *See* the discussion under the heading, *9. Proposed Timing for Applying These Requirements to Vehicle Types*, in the preamble to the NPRM (53 FR 47991). The Ford and Subaru comments show instances where the agency's tentative conclusions about the sufficiency of the leadtime were inaccurate, because those manufacturers would need to make engineering and design changes to comply with the proposed requirements.

After reviewing the comments, NHTSA does not believe that a final rule would be "practicable" if it were effective in September 1989 and adopted all of the NPRM's proposed requirements for integral rear seat lap/shoulder belts using anchorages that comply with Standard No. 210. However, a final rule adopting a general requirement for rear-seat lap/shoulder belts effective six months after publication of this final rule would be practicable, if the requirements did not require integral belts or complying anchorages. This general requirement would ensure all cars had lap/shoulder belts installed as original equipment in the rear seat. Some production changes might still be needed, since Ford had not planned to install the shoulder belt retrofit kits as original equipment in the single line discussed above. However, these production changes would be practicable 180 days after publication of this rule.

Accordingly, NHTSA has decided to adopt a general requirement that passenger cars other than convertibles be equipped with rear-seat lap/shoulder belts, beginning 180 days after this rule is published. This general requirement specifically excludes these rear seat safety belts from the existing requirements that lap/shoulder belts be integral and that anchorages comply with all requirements of Standard No. 210. These exclusions will expire August 31, 1990. Hence, all passenger cars other than convertibles manufactured on or after September 1, 1990, must have *integral* rear-seat lap/shoulder belts and use shoulder belt anchorages that comply with all requirements of Standard No. 210.

As noted above, the second step of the agency's final action in this rulemaking will address all of the detailed proposals set forth in the NPRM for all the vehicle types. The issue of the retractor type that should be required for passenger car rear-seat lap/shoulder belts, and its compatibility with child restraint systems, will be addressed during that second step, not in this rule. This rule leaves the existing provisions of S7.1.1 of Standard No. 208 in place. Those provisions require that the lap belt adjust by means of *either* an automatic locking retractor (ALR) or an emergency locking retractor

(ELR), and the shoulder belt adjust by means of *either* an ELR or a manual adjusting device. That second rule will also address vehicles other than passenger cars, as well as the definition of an "outboard seat," details of the comfort and convenience requirements, special requirements for tension-relieving devices on these belts, and the other issues raised in comments on the NPRM.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

S4.1.4 is revised to read as follows:

S4.1.4 *Passenger cars manufactured on or after September 1, 1989.*

S4.1.4.1 Except as provided in S4.1.5 and S4.1.4.2, each passenger car manufactured on or after September 1, 1989, shall comply with the requirements of S4.1.2.1. Until September 1, 1993, each car whose driver's designated seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front designated seating position is equipped with a manual Type 2 seat belt that meets the requirements of S5.1, with the Type 2 seat belt assembly adjusted in accordance with S7.4.2, shall be counted as a vehicle complying with S4.1.2.1. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.1.4.2 (a) Each passenger car, other than a convertible, manufactured on or after December 4, 1989 and before September 1, 1990, shall be equipped with a Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR § 571.209) and with S7.1.1 of this standard.

(b) Each passenger car, other than a convertible, manufactured on or after September 1, 1990, shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR § 571.209) and with S7.1.1 and S7.2 of this standard.

* * * * *

The introductory text of S4.3 of Standard No. 210 is revised to read as follows:

S4.3 *Location.* As used in this section, "forward" means the direction in which the seat faces, and other directional references are to be interpreted accordingly. Anchorages for automatic seat belt assemblies and for dynamically tested seat belt assemblies that meet the frontal crash protection requirements of S5.1 of Standard No. 208 (49 CFR § 571.208) are exempt from the location requirements of this section. Anchorages are exempt from the requirements of S4.3.2 of this standard, if those anchorages are for the upper torso portion of a Type 2 seat belt assembly installed at a forward-facing rear outboard seating position of a passenger car, other than a convertible, that is manufactured on or after December 11, 1989 and before September 1, 1990.

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Issued on June 9, 1989

Jeffrey R. Miller
Acting Administrator

54 F.R. 25275
June 14, 1989

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 85-08; Notice 4)
RIN 2127-AB71

ACTION: Response to petition for reconsideration; final rule.

SUMMARY: The requirements for safety belt systems in trucks, buses and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds were recently expanded to include special provisions to make those safety belt systems more convenient to use. In its proposal, NHTSA indicated that these special provisions would apply to safety belt systems installed at *front* outboard seating positions. However, NHTSA inadvertently omitted the word "front" in the final rule, so that the special provisions for safety belt systems apply to all outboard seating positions, both front and rear. This rule corrects this inadvertent omission so that the special provisions for safety belt systems apply only to those systems installed at *front* outboard seating positions, as was proposed.

EFFECTIVE DATES: The changes made in this rule become effective January 8, 1990. Vehicles manufactured on or after September 1, 1990 must be certified as complying with these changes.

SUPPLEMENTARY INFORMATION: Since January 1, 1972, Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208) has required vehicle manufacturers to install safety belt systems in heavy vehicles (i.e., trucks, buses, and multipurpose passenger vehicles [MPV's] with a gross vehicle weight rating of more than 10,000 pounds). The safety belts required in those vehicles have had to meet all of the strength requirements set for belt systems in passenger cars and light trucks, buses, and MPV's (those with a gross vehicle weight rating of 10,000 pounds or less). However, the safety belts required in heavy vehicles have not had to meet several requirements for lighter vehicle safety belt systems that make the safety belts more comfortable to wear and easier to use.

The agency proposed several changes to the requirements for belt systems in heavy vehicles to make such belt systems more comfortable to wear and easier to use. The proposed changes were set forth in a notice of proposed rulemaking (NPRM) published on May 30, 1985 (50 FR 23041). That notice proposed that these changes would apply to safety belt systems installed at all *front* outboard seating positions in heavy trucks and MPV's and to the safety belt system installed at the driver's seat in heavy buses.

A final rule adopting new requirements for heavy vehicle safety belt systems was published on July 6, 1988 (53 FR 25337). No commenters suggested that the proposed changes should be extended to apply to seating positions other than front outboard ones, nor did the preamble to this final rule suggest that NHTSA intended to extend the proposed changes to apply to both front and rear outboard seating positions. However, the specific regulatory change adopted in Standard No. 208 inadvertently omitted the word "front" in referring to outboard seating positions in heavy trucks and MPV's, and instead referred simply to outboard seating positions in those vehicles as the seating positions subject to these changed requirements.

The Recreation Vehicle Industry Association (RVIA) filed a petition for reconsideration of the final rule, arguing that the agency's purpose could be achieved without imposing additional requirements on rear outboard seating positions in motor homes. NHTSA did not intend the final rule to impose any additional requirements on safety belt systems at seating positions other than front outboard seating positions. This notice corrects the omission from the final rule, and adopts the proposed approach of applying additional requirements to *front* outboard seating positions in heavy vehicles.

The regulatory language at the end of this rule simply inserts the word "front" in the appropriate places of the regulatory language published in the July 6, 1988 final rule on this subject. Today's rule should *not* be misinterpreted as a reaffirmation of the July 6, 1988 rule's approach of considering only the workings of the retractor to evaluate whether the safety belt system complies with some of the comfort requirements. A proposal to expand that approach to evaluate the workings of the entire belt system appears elsewhere in today's edition of the *Federal Register*.

In consideration of the foregoing, 49 CFR §571.208 is amended as follows:

S4.3.2.2. of Standard No. 208 is revised to read as follows:

S4.3.2.2 *Second option—belt system.* The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at a front outboard seating position shall include either an emergency locking retractor or an automatic locking retractor. An automatic locking retractor provided for one of these belt assemblies at a front outboard seating position shall not retract webbing to the next locking position until at least 3/4 inch of webbing has moved into the retractor. In determining whether an automatic locking retractor complies with this requirement, the webbing is extended to 75 percent of its length and the retractor is locked after the initial adjustment. An automatic locking retractor that is used at a front outboard seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

Issued on July 5, 1989.

Jeffrey R. Miller
Acting Administrator

54 F.R. 29041
July 11, 1989

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 74-14; Notice 61)
RIN 2127-AC 49

ACTION: Final rule.

SUMMARY: This final rule makes two relatively minor amendments to Standard No. 208 *Occupant Crash Protection*. The first amendment extends existing requirements for safety belt systems that incorporate tension-relieving devices to manual belt assemblies installed in conjunction with air bags. This amendment will ensure that the effectiveness of the belts in a crash situation is not reduced by misuse of the tension-relieving devices. This amendment will apply to cars manufactured on or after September 1, 1990.

The second amendment specifies that adjustable anchorages for belt assemblies shall be set at the vehicle manufacturer's nominal design position for a 50th percentile adult male. Adjustable anchorages permit the occupant of a seating position to move one of the belt system's anchorages within a limited range, to optimize the fit of the belt for the occupant. Standard No. 208 does not currently specify the adjustment position at which adjustable anchorages will be set during compliance testing. To avoid any difficulties or confusion that might result if the agency were to select an adjustment position other than the one selected by a vehicle's manufacturer, this rule specifies that vehicles with adjustable anchorages will be tested at the position appropriate for the size of the dummy used in compliance testing, the 50th percentile adult male. This amendment will apply to cars manufactured on or after September 1, 1989.

EFFECTIVE DATES The amendments made by this rule to the Code of Federal Regulations are effective on September 1, 1989. The provisions for vehicles with adjustable anchorages will apply to vehicles manufactured on or after September 1, 1989, and the provision for vehicles with tension-relieving devices at seating positions also equipped with air bags will apply to vehicles manufactured on or after September 1, 1990.

SUPPLEMENTARY INFORMATION: On July 6, 1988 (53 FR 25354), NHTSA proposed to make the two relatively minor amendments to Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208) that are the subject of this final rule. The first amendment proposed in that notice was to extend the existing provisions for safety belts at the front outboard seating positions to belt systems installed at those seating positions in conjunction with air bags.

Tension-relieving devices on safety belts are intended to relieve shoulder belt pressure and increase the comfort of the belt, thereby increasing the likelihood that the belt will be used to protect the occupant. However, if these tension-relieving devices are misused so as to introduce excessive slack in the belt webbing, the tension-relieving devices may reduce the effectiveness of the belt in a crash situation. To strike an appropriate balance between the need to increase belt use and the need to avoid belt misuse, section S7.4.2 of Standard No. 208 specifies additional requirements for some front outboard safety belts that incorporate tension-relieving devices. These additional requirements currently apply to automatic belts with tension-relieving devices installed at front outboard seating positions in passenger cars. These additional requirements are:

1. The vehicle owner's manual must include an explanation of how the tension-relieving device works and recommend a maximum amount of slack that should be introduced into the belt under normal circumstances;
2. The vehicle must comply with the injury criteria specified in S5.1 of Standard No. 208 with the shoulder belt webbing adjusted to introduce the maximum amount of slack recommended by the manufacturer; and
3. The vehicle must have an automatic means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device.

NHTSA tentatively concluded that the same factors that had led it to apply the requirements of S7.4.2 to automatic safety belts (the balancing of the need to encourage belt use with the need to minimize belt misuse) were equally applicable to manual belts installed in conjunction with air bags. Accordingly, the notice proposed to extend the requirements of S7.4.2 to manual belts installed in conjunction with an air bag at a front outboard seating position.

The second change proposed in the notice addressed adjustable anchorages on belt systems. Adjustable anchorages allow the occupant of a seating position to move the anchorage location within a limited range, so as to optimize the fit of the belt for the individual occupant. Some current vehicles already incorporate adjustable upper anchorages.

Standard No. 208 does not presently specify any positioning requirements for adjustable anchorages during compliance testing. Absent some guidance in the standard for positioning an adjustable feature, considerable difficulties could arise. The positioning of an anchorage for a belt system can affect the performance of the belt system during a crash. However, absent any positioning for adjustable anchorages in Standard No. 208, the various manufacturers of vehicles with adjustable anchorages might all select different anchorage adjustment positions to certify the vehicles' compliance with Standard No. 208. NHTSA, in turn, might select an anchorage adjustment position different from that chosen by any of the manufacturers for its compliance testing. The different anchorage adjustment positions could lead to unreasonable and unnecessary difficulties for both the agency and the manufacturers.

To avoid any difficulties, the notice proposed that adjustable anchorages be set to the vehicle manufacturer's nominal design position for a 50th percentile adult male occupant, which is the size of the test dummy used in NHTSA's compliance testing. This would ensure that compliance testing was conducted under realistic and representative conditions for adjustable anchorages. The notice also asked for comments on the appropriateness of requiring that vehicles that use adjustable anchorages comply with the requirements of Standard No. 208 with the anchorages in any adjustment position. Such an approach would ensure that adjustable anchorages afforded adequate protection even when they were not properly adjusted.

Eight parties responded to the request for comments on the proposal. All of these comments were considered in developing this final rule, and the most significant comments are discussed below.

Four of the commenters addressed the proposal to extend the existing requirements for belts equipped with tension-relieving devices to manual belts with tension-relieving devices installed in conjunction with air bags at a seating position. Chrysler supported the proposal for the reasons stated in the proposal. The Insurance Institute for Highway Safety (IIHS) opposed the proposal, asserting that tension-relieving devices are detrimental to occupant protection in crashes. Based on this assertion, IIHS urged the agency to initiate rulemaking to prohibit the installation of tension-relieving devices on any belt systems.

Contrary to the assertion by IIHS, NHTSA is unaware of any data showing that occupants of cars equipped with tension-relieving devices suffer a higher level of injuries in crashes. In fact, a recent examination of this subject by the National Transportation Safety Board concluded that "the cases as a whole do not demonstrate that occupants of window shade-equipped cars are injured more often or more seriously than occupants of nonwindow shade equipped cars." *Performance of Lap/Shoulder Belts in 167 Vehicle Crashes*, NTSB/SS-88/02. Because of the absence of any such data, NHTSA has repeatedly declined to adopt suggestions that tension-relieving devices be prohibited on belt systems. NHTSA believes that the possibility of misuse is not a sufficient justification for prohibiting devices that have the potential to increase safety belt use, particularly when there is no evidence that the public is misusing tension-relieving devices to any significant extent. Instead, the agency believes the more appropriate course of action is to take steps to minimize the likelihood of misuse, and has done so by means of the requirements in S7.4.2. IIHS has provided no additional information or data that would cause the agency to reexamine its previous decisions.

Ford questioned whether there was a safety need to extend the requirements for belts with tension-relieving devices to such belts installed in conjunction with air bags. According to Ford, excessive slack in a shoulder belt during a frontal crash would result in the occupant's head and chest being stopped primarily or solely by the air bag, a condition that would not pose any added safety risks to the occupant. Thus, Ford seemed to be asserting that since there are no adverse safety consequences associated with misuse of tension-relieving devices on belt systems installed in conjunction with air bags, there is no safety need for the agency to take regulatory steps to minimize the likelihood of misuse of tension-relieving devices on such belt systems.

NHTSA disagrees with this assertion. If excessive slack is introduced into the shoulder belt, the protection offered by the shoulder belt would be substantially reduced or even eliminated. Ford's assertion is correct that the absence of full protection from the shoulder belt might not result in lesser occupant protection in crashes similar to the dynamic test specified in Standard No. 208, because the air bag would protect the occupant's head and chest during the crash. However, many other types of real-world crashes (e.g., side impacts and rollovers) do *not* result in air bag deployment, and thus require effective restraint by the shoulder belt for maximum protection of the occupant. The agency recognizes that, under Standard No. 208, lap/shoulder belts are "optional" for seating positions equipped with air bags (only lap belts are required). Nevertheless, NHTSA has strongly encouraged manufacturers to provide the additional protection of lap/shoulder belts. When lap/shoulder belts are provided, NHTSA believes it is reasonable, a] propriate, and valuable from a safety perspective to minimize the likelihood that the shoulder-belt portion of the belt might be misused so as to substantially reduce its effectiveness. Those concerns apply to cars that are equipped with air bags as well as those that are not. This extension of the requirements for tension-relieving devices will help assure that all motor vehicle safety belt systems are effective systems, and minimize the likelihood that those belt systems will be misused.

Additionally, the agency believes that an extension of the requirements for tension-relieving devices will help induce use of lap/shoulder belt systems installed in conjunction with air bags. Specifically, if the requirements for automatic cancellation of slack do not apply to those belt systems, a belt user might inadvertently introduce excessive slack into the shoulder belt, especially when exiting the vehicle. If the owner's manual for this vehicle does not include an explanation of how the tension-relieving device works (another existing requirement for tension-relieving devices), the belt user might not realize how to cancel the excessive slack. This would result in a shoulder belt that could loosely dangle in front of the occupant. NHTSA believes that a lap/shoulder belt system in which the shoulder belt portion dangles in front of an occupant could actually discourage use of the belt system, by conveying to the occupant the idea that the belt system may not afford adequate crash protection. A belt system that discourages use will result in lesser occupant crash protection. Hence, NHTSA disagrees with Ford's assertion that there are no potential adverse safety consequences associated with the misuse of tension-relieving devices on safety belt systems installed in conjunction with air bags.

General Motors (GM) also questioned the agency's tentative determination that there is a safety need to extend the requirements of S7.4.2 to safety belt systems installed in conjunction with air bags. GM stated that it supported the extension of requirements to include a recommendation about the maximum amount of slack in the owner's manual and to test the vehicle with the recommended maximum amount of slack introduced into the belt systems. However, GM objected to the requirement for automatic tension-relief cancellation, on the grounds that this automatic cancellation is primarily a convenience feature. GM asserted that this convenience feature is unnecessary in this case, because the occupant entering the vehicle is, in many cases, the same person who left the vehicle from that position. When it is a different occupant, GM asserted that the excessive slack should be obvious to the occupant and that the occupant can remove the excessive slack by a slight adjustment to the shoulder belt.

NHTSA was not persuaded by this argument. The purpose of S7.4.2, including the requirement for automatic cancellation of any slack, is to minimize the likelihood that tension-relieving devices will be misused. As explained above in response to Ford's comments, NHTSA believes the need to minimize the likelihood of misuse could be as important for belt systems installed in conjunction with air bags as it is for those belt systems to which the requirement of S7.4.2 already apply. The automatic cancellation feature serves this purpose by ensuring that a new occupant entering a vehicle will encounter a belt system without any slack and will then make adjustments to that belt system that are appropriate for that occupant. NHTSA concludes that avoiding misuse of belts equipped with tension-relieving devices is a legitimate safety need and that the requirement for automatic slack cancellation is a reasonable and necessary means of achieving this end.

GM also argued that the proposed requirement was not as minor as NHTSA had suggested. According to GM's comments, the retractors for most belt systems that incorporate tension-relieving devices are mounted on either the door pillar or the rocker panel of the car body. For these retractors, vehicle manufacturers design the retractor to automatically retract webbing whenever the adjacent door is opened or the belt is unbuckled. The reason for this design is to prevent the belt webbing from being damaged by being closed in the door. This design feature fully complies with the automatic slack cancellation requirement in S7.4.2 of Standard No. 208. Hence, no design or production changes would be needed on vehicles equipped with these retractors that will be equipped with air bags.

However, some of GM's two door models are equipped with roof mounted retractors. These retractors are not, according to GM's comments, already designed to automatically retract webbing when the adjacent door is opened, because shoulder belt webbing extended from roof mounted retractors is not "subject to damage from an adjacent door closure." GM stated that it would need at least 18 months leadtime to make the necessary design and production changes to the vehicles on which it plans to introduce driver's side air bags that are equipped with roof mounted retractors.

NHTSA has reexamined its proposed requirement in light of this comment. The agency statements that this proposal was a minor change was based on the assumption that manufacturers of vehicles subject to the proposed requirement already complied voluntarily with the requirements of S7.4.2. Based on this assumption, the agency believed that a requirement for the manufacturers to follow a practice they already followed voluntarily would not require any design or manufacturing changes, and that any burdens associated with such a requirement would be minimal.

However, GM's comments indicate that this assumption by the agency was erroneous with respect to that manufacturer. Since GM was not voluntarily complying with the requirements of S7.4.2 for all of its cars equipped with tension-relieving devices, it will be required to make production and design changes to some of its vehicles to comply with this requirement. The agency agrees that some additional leadtime is necessary to permit GM to make these design and production changes. Therefore, this requirement will apply to cars manufactured on or after September 1, 1990.

The second proposed change was to specify that belt systems with adjustable anchorages would have those anchorages set to the manufacturer's nominal design position for a 50th percentile adult male for the purposes of Standard No. 208 compliance testing. This proposal was supported by Mitsubishi, Volkswagen, Chrysler, Toyota, Range Rover, GM, and Ford. Ford stated that it has been reluctant to offer adjustable anchorages because of its uncertainty about the adjustment position NHTSA would select in Standard No. 208 compliance testing, and that the proposed adjustment position would encourage manufacturers to provide adjustable anchorages on their vehicles.

These same commenters indicated that a requirement to test adjustable anchorages at any adjustment position should not be adopted. Mitsubishi, Chrysler, and Volkswagen commented that testing at the manufacturer's nominal design position would be more representative of real world crashes, since most 50th percentile adult males would adjust their anchorage properly to enhance belt fit and comfort. Volkswagen, Range Rover, and Ford argued that manufacturers would be obliged to conduct a number of repetitive crash tests before certifying that a vehicle with adjustable anchorages complied with Standard No. 208 with the anchorages adjusted to any position, and that the cost of these repetitive tests would discourage manufacturers from offering adjustable anchorages. Toyota argued that the effect of requiring compliance at any adjustment position would be to narrow the range of adjustment positions offered for anchorages. While this narrow range would ensure that the vehicle would comply with the anchorage in any adjustment position, it would also make the adjustable anchorage superfluous, since they would not adjust sufficiently to enhance belt fit and comfort for occupants who were not close to the size of a 50th percentile adult male.

The agency is persuaded by these comments. Adjustable anchorages allow occupants to adjust the belt fit to be more comfortable than is the case with fixed anchorages. This adjustment feature is particularly desirable for short adults and children, as well as tall adults. NHTSA has no reason for imposing a requirement that might discourage manufacturers from installing adjustable anchorages. Therefore, this final rule adopts the proposed requirement that adjustable anchorages will be adjusted to the manufactuers' nominal design position for a 50th percentile adult male prior to Standard No. 208 compliance testing.

Ford commented that the agency should also amend the provisions of S7.1 (relating to belt adjustment) and S7.4.4 (relating to latchplate access) to specify that adjustable anchorages will be adjusted to the manufacturer's nominal design position for a 50th percentile adult male occupant to determine compliance with those provisions of Standard No. 208. NHTSA agrees with this comment and this final rule makes the requested changes.

This rule becomes effective September 1, 1989. For those manufacturers that choose to equip their vehicles with adjustable anchorages, this rule will remove the existing uncertainties about the proper adjustment position for such anchorages during compliance testing. Removing these uncertainties is an advantage for those manufacturers, the agency, and the public. For those manufacturers whose vehicles are not equipped with adjustable anchorages, this rule will not impose any additional obligations. Since no party is adversely affected by this rule and some parties will be positively affected, the agency has concluded that there is good cause for specifying an effective date sooner than 180 days after publication of this rule.

The requirement in this rule to provide information in the owner's manual about the maximum amount of slack that should be introduced into safety belts installed in conjunction with air bags is an information collection requirement, as that term is defined in 5 CFR Part 1320. Pursuant to the requirements of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), this information collection requirement was submitted to and approved by the Office of Management and Budget. These requirements were assigned OMB # 2127-0541 and approved through March 31, 1992.

In consideration of the foregoing, 49 CF §571.208 is amended as follows:

2. S7.1.1 of Standard No. 208 is revised to read as follows:

S7.1.1 Except as specified in S7.1.1.1 and S7.1.1.2, the lap belt of any seat belt assembly furnished in accordance with S4.1.2 shall adjust by means of an emergency-locking or automatic-locking retractor that conforms to §571.209 to fit persons whose dimensions range from those of a 50th percentile 6-year-old child to those of a 95th percentile adult male and the upper torso restraint shall adjust by means of an emergency-locking retractor or a manual adjusting device that conforms to §571.209 to fit persons whose dimensions range from those of a 5th percentile adult female to those of a 95th percentile adult male, with the seat in any position, the seat back in the manufacturer's nominal design riding position, and any adjustable anchorages adjusted to the manufacturer's nominal design position for a 50th percentile adult male occupant. However, an upper torso restraint furnished in accordance with S4.1.2.3.1(a) shall adjust by means of an emergency-locking retractor that conforms to §571.209.

3. S7.4.2 of Standard No. 208 is amended by revising the introductory text to read as follows:

S7.4.2 *Webbing tension-relieving device.* Each vehicle with an automatic seat belt assembly or with a Type 2 manual seat belt assembly that must comply with S4.6 of this standard and each vehicle manufactured on or after September 1, 1990, with a manual seat belt assembly installed to comply with S4.1.2.1(c)(2) of this standard, which has such a seat belt assembly installed at a front outboard designated seating position and equipped with either manual or automatic tension-relieving devices permitting the introduction of slack in the webbing of the shoulder belt (e.g., "comfort clips" or "window-shade" devices), shall:

* * * * *

4. S7.4.4 of Standard No. 208 is revised to read as follows:

S7.4.4 *Latchplate access.* Any seat belt assembly latchplate that is located outboard of a front outboard seating position in accordance with S4.1.2 shall also be located within the outboard reach envelope of either the outboard arm or the inboard arm described in S10.6 of this standard and, in the case of a Part 572 Subpart B test dummy, Figure 3A of this standard, or, in the case of a Part 572 Subpart E test dummy, Figure 3B of this standard, when the latchplate is in its normal stowed position and any adjustable anchorages are adjusted to the manufacturer's nominal design position for a 50th percentile male occupant. There shall be sufficient clearance between the vehicle seat and the side of the vehicle interior to allow the test block defined in Figure 4 unhindered transit to the latchplate or buckle.

5. S8.1.3 is revised to read as follows:

S8.1.3 Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer. Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male occupant. Place each adjustable head restraint in its highest adjustment position. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position.

Issued on July 5, 1989

Jeffrey R. Miller
Acting Administrator

54 F.R. 29045
July 11, 1989

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 87-08; Notice 4)
RIN 2127-AB91

ACTION: Technical amendment.

SUMMARY: Lap/shoulder safety belts are required to be installed at all forward-facing rear outboard seating positions in passenger cars (other than convertibles) manufactured on or after December 11, 1989. Although NHTSA typically includes language in its regulations when necessary in order to permit manufacturers the option to begin complying with new requirements on vehicles manufactured before the date those new requirements take effect, the agency inadvertently omitted such language from the new rear seat lap/shoulder belt requirements. This notice adds language that will correct this oversight and clarify the new requirement for rear seat lap/shoulder belts in passenger cars other than convertibles.

DATE: The amendment made by this notice takes effect August 7, 1989.

SUPPLEMENTARY INFORMATION: On June 14, 1989, NHTSA published a final rule amending Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208). This amendment established a new requirement for lap/shoulder safety belts to be installed at all forward-facing rear outboard seating positions in passenger cars (other than convertibles) manufactured on or after December 11, 1989. In a letter dated June 28, 1989, Ford Motor Company (Ford) asked the agency whether it could begin installing lap/shoulder safety belts that comply with the requirements that take effect on December 11, 1989 in vehicles manufactured before that date.

In its rules establishing new requirements, NHTSA routinely discusses the issue of whether vehicles or equipment manufactured before the date the new requirements take effect may comply with those new requirements in lieu of complying with the existing requirements. However, the rear seat lap/shoulder belt rule inadvertently omitted any such discussion. To correct this oversight, this notice adds language to the newly established requirements to make clear that vehicles may comply with the requirements that take effect on December 11, 1989 in advance of that date without violating any other provisions in Standard No. 208.

Section S4.1.4.2(a) of Standard No. 208 is revised to read as follows:

S 4.1.4.2(a) Each passenger car, other than a convertible, manufactured before December 11, 1989 may be equipped with, and each passenger car, other than a convertible, manufactured on or after December 11, 1989 and before September 1, 1990 shall be equipped with a Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed pursuant to this provision shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1.1 of this standard.

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Issued on August 1, 1989

Jeffrey R. Miller
Acting Administrator

54 F.R. 32345
August 7, 1989

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 87-08; Notice 5)
RIN: 2127-AD12

ACTION: Final rule.

SUMMARY: This rule establishes a new requirement for lap/shoulder safety belts to be installed in all forward-facing rear outboard seating positions in convertible passenger cars, light trucks and multipurpose passenger vehicles (e.g., passenger vans and utility vehicles), and small buses. Rear-seat lap/shoulder belts are estimated to be even more effective than rear-seat lap-only belts in reducing fatalities and moderate-to-severe injuries. As safety belt use in the rear seat of these vehicle types increases, the greater effectiveness of rear-seat lap/shoulder belts should yield progressively greater safety benefits. NHTSA also anticipates that this rule will achieve benefits by helping to increase safety belt use in rear seating positions of these vehicle types, by providing rear-seat occupants with maximum safety protection when they buckle up.

This rule also establishes a requirement for lap/shoulder belts to be installed at the driver's seat and at any other front outboard seating position in small buses. NHTSA believes that lap/shoulder safety belts in these small buses will offer the same benefits as lap/shoulder belts in those positions offer to occupants of passenger cars, light trucks, and light multipurpose passenger vehicles.

EFFECTIVE DATE: The amendments of S7.1.1.3 and S7.1.1.5 are effective on September 1, 1991. All the other amendments made by this rule take effect on May 1, 1990. These requirements apply to convertible passenger cars, light trucks, light multipurpose passenger vehicles, and small buses manufactured on or after September 1, 1991. Convertible passenger cars, light trucks, light multipurpose passenger vehicles, and small buses manufactured before September 1, 1991 may also comply with these requirements.

SUPPLEMENTARY INFORMATION: ***Background.*** On January 1, 1968, the initial Federal Motor Vehicle Safety Standards took effect. One of those standards was Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), which required the installation of lap/shoulder safety belts at the driver's and right front passenger's seating positions of passenger cars, and either lap-only or lap/shoulder safety belts at every other designated seating position. Another of the initial safety standards that took effect on January 1, 1968 was Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR 571.210), which specified location and strength requirements for the anchorages used to hold the safety belts to the passenger car during a crash. Standard No. 210 required passenger car manufacturers to provide anchorages for lap/shoulder belts for each forward-facing front *and* rear outboard seating position in all cars other than convertibles. NHTSA subsequently amended both of these standards to extend their applicability to trucks, multipurpose passenger vehicles (MPVs), and buses. However, when Standard No. 210 was extended to these additional vehicle types, NHTSA did not require the manufacturers to provide upper torso (i.e., shoulder belt) anchorages for rear outboard seating positions in these other vehicle types or in convertible passenger cars.

Studies of occupant protection from 1968 forward show that the lap-only safety belts installed in rear seating positions are effective in reducing the risk of death and injury. See, for example, the studies cited in the ANPRM on this subject; 52 FR 22820, June 16, 1987. However, the agency believes that rear-seat lap/shoulder safety belts would be even more effective. NHTSA estimates that rear-seat lap-only belts reduce the risk of death by 24-40 percent, while rear-seat lap/shoulder belts reduce that risk by 32-50 percent. The somewhat greater effectiveness of lap/shoulder belts vs. lap-only belts in the rear seat results in progressively greater actual safety benefits for rear-seat occupants, to the extent that those safety belts are, in fact, used. As recently as 1981-82, only two percent of rear-seat occupants used their safety belts. At that level of belt use, there are very few safety benefits from requiring rear-seat lap/shoulder belts instead of lap-only belts. However, belt use in the rear seat has steadily risen, with 16 percent of rear seat occupants buckling up in 1987. As rear-seat belt use continues to rise, the incremental benefits of rear-seat lap/shoulder belts can be realized.

The increase in belt use in rear seats was one of the factors reflected in the agency's decision to grant a petition by the Los Angeles Area Child Passenger Safety Association asking NHTSA to establish a requirement for rear-seat lap/shoulder safety belts. After granting this petition, NHTSA published an advance notice of proposed rulemaking (ANPRM) on June 16, 1987 (52 FR 22818). Thirty-four commenters responded to the ANPRM's request for comments on the need for rulemaking action to require lap/shoulder safety belts in rear seating positions.

After considering these comments, NHTSA concluded that several factors had changed since the agency had previously examined this issue and determined that it was appropriate to give vehicle manufacturers the option of installing either lap-only belts or lap/shoulder belts in rear seats. Among the changed factors were the substantial increase in rear seat safety belt use and the substantial decrease in costs of a requirement for rear-seat lap/shoulder belts, because of manufacturers voluntarily equipping more and more of their vehicles with rear seat lap/shoulder belts. After analyzing the effects of these changed factors and the comments on the ANPRM, NHTSA tentatively determined that a requirement for lap/shoulder belts would now be appropriate. Accordingly, NHTSA published a notice of proposed rulemaking (NPRM) on November 29, 1988 (53 FR 47982).

This NPRM was a comprehensive proposal that proposed requirements for passenger cars and light trucks, MPVs, and small buses to be equipped with lap/shoulder safety belts at all forward-facing rear outboard seating positions. Additionally, the NPRM proposed that these lap/shoulder safety belts be equipped with a particular type of retractor, that such belts be integral (i.e., the shoulder belt could not be detachable from the lap belt), and that such belts comply with some of the comfort and convenience requirements specified in section S7.4 of Standard No. 208.

More than 70 comments were received on this NPRM. The issue of whether passenger cars other than convertibles would be equipped with rear seat lap/shoulder belts was straightforward and noncontroversial, with only two commenters suggesting some modifications of the agency's proposal to require all 1990 and subsequent model year passenger cars to be equipped with rear-seat lap/shoulder belts. To ensure the earliest possible implementation of a requirement for rear-seat lap/shoulder belts in passenger cars, on June 14, 1989, NHTSA published a final rule addressing only those vehicles (54 FR 25275). That rule requires rear-seat lap/shoulder belts in all passenger cars manufactured on or after December 11, 1989.

This rule addresses all of the other issues that were presented in the November, 1988 NPRM on this topic. For the convenience of the reader, this rule uses the same organization and format as the NPRM did.

Requirements of this Rule

1. Seating Positions Subject to These Requirements

The NPRM proposed that lap/shoulder belts be required in rear seats at outboard seating positions *only.* Some commenters suggested that technologies and designs are available to provide lap/shoulder belts at rear center seating positions, and that NHTSA should further examine this issue. The agency explained in the NPRM that there are more technical difficulties associated with any requirement for lap/shoulder belts at center rear seating positions, and that lap/shoulder belts at center rear seating positions would yield small safety benefits and substantially greater costs, given the lower center seat occupancy rate and the more difficult engineering task. Accordingly, this rulemaking excluded further consideration of a requirement for center rear seating positions. None of the commenters presented any new data that would cause the agency to change its tentative conclusion on this subject that was announced in the NPRM.

The NPRM also noted that seating positions adjacent to aisleways in some vans might not be "outboard designated seating positions" as defined at 49 CFR § 571.3, because those aisle seats could be more than 12 inches from the inside of the vehicle. General Motors (GM) stated its belief that this discussion showed the agency's intent to exclude seats that border aisleways from the lap/shoulder belt requirement. GM suggested that the reasons for excluding these seating positions from the lap/shoulder belt requirement were the costs and/or practical difficulties that would be presented if aisleway seating positions were required to be equipped with lap/shoulder belts. Specifically, GM stated that locating the anchorage for the upper end of the shoulder belt on the aisle side of the vehicle would stretch the shoulder belt across the aisleway and cause entry and exit problems for occupants of seating positions to the rear of the aisleway seating position. To avoid such difficulties, the anchorage for the upper end of the shoulder belt could be moved to the roof of the vehicle. However, roof structural modifications would have to be made to accommodate the anchorage, and these modifications would impose disproportionately high costs. GM stated in its comments that these reasons would apply with equal force to all seats adjacent to aisleways, regardless of whether such seats were more than or less than 12 inches from the inside of the vehicle.

NHTSA has determined that these comments have merit. The agency did not mean to suggest that shoulder belts should be required at seating positions where they would obstruct an aisle designed to give access to rear seating positions. Accordingly, this rule has been modified from the proposal to specify that these rear-seat lap/shoulder belt requirements apply to rear outboard seating positions *except* any outboard seating positions that are adjacent to a walkway located between the seat and the side of the vehicle to allow access to more rearward seating positions. Of course, in those cases where manufacturers are able to design and install lap/shoulder belts at seating positions adjacent to aisleways without interfering with the aisleway's purpose of allowing access to more rearward seating positions, NHTSA encourages the manufacturers to do so. It should also be noted that those rear seating positions at which lap/shoulder belts are not installed voluntarily or in response to a regulatory requirement *are required* by Standard No. 208 to be equipped with lap-only safety belts, which have been proven effective in reducing the risk of death and injury.

2. Types of Rear Seats Subject to These Requirements

The NPRM proposed limiting these requirements to *forward-facing* rear outboard seats, because the agency is unaware of any data showing that occupants of center-facing or rear-facing seating positions would be significantly better protected by lap/shoulder belts than by lap-only belts. The NPRM also referred to an April 8, 1988 letter to Mr. Ohdaira of Isuzu Motors, in which NHTSA stated that S7.1.1 of Standard No. 208 requires safety belts on swivel seats installed at *front* outboard seating positions to adjust to fit occupants "with the seat in any position." Because the same regulatory language would apply to swivel seats installed at *rear* outboard seating positions if the proposal were adopted as a final rule, the NPRM proposed to add express regulatory language to S7.1.1 to codify the interpretation.

Three commenters responded to this discussion in the NPRM. Ford, Nissan, and Toyota raised substantially the same points in their comments. These commenters all suggested that the agency ought to require swivel seats to provide lap/shoulder belts for occupants when the seats are forward-facing, but permit occupants to be restrained by lap-only belts when the swivel seats are adjusted to some position other than forward-facing. These manufacturers argued that the overall protection of upper torso restraints (i.e., shoulder belts) on occupants of center-facing seating positions is unclear. For example, in certain instances, the design standard in Australia *prohibits* manufacturers from providing upper torso restraints at center-facing seating positions. Further, these manufacturers stated that they knew of no crash data suggesting the need for such a requirement. According to these commenters, the absence of demonstrable safety benefits associated with such a requirement combined with the demonstrable technological problems and costs associated with such a requirement should lead the agency to require only lap belts when swivel seats are adjusted to a position other than forward-facing.

NHTSA was persuaded by these comments. Indeed, as Ford noted in its comments, just as the NPRM stated that no data show that occupants of center-facing or rear-facing seats would be significantly better protected by lap/shoulder belts instead of lap-only belts, no data show that occupants of swivel seats adjusted to the center-facing or rear-facing positions would be significantly better protected by lap/shoulder belts instead of lap-only belts. Accordingly, this final rule adds language to Standard No. 208 that requires swivel seats to provide lap/shoulder belts for occupants when the seat is adjusted to the forward-facing position and permits swivel seats to provide lap-only belts for occupants when the seat is adjusted to some position other than forward-facing. The Ohdaira interpretation is, therefore, overruled to the extent that it is inconsistent with this new language in Standard No. 208.

In its comments, Ford indicated that it would be appropriate for this preamble to discuss a type of seat Ford is considering installing in future vehicle models. This seat was described as a bench seat that converts from forward-facing to rear-facing. Under the language added to Standard No. 208 by this rule, all seats that can be adjusted to a forward-facing position and some other position, regardless of whether such seats are swivel seats, convertible seats of the sort described in Ford's comment, or any other such seat, must provide lap/shoulder belts when in the forward-facing position and may provide lap-only belts when adjusted to some position other than forward-facing.

3. Vehicle Types Subject to These Requirements

a. Passenger Cars

In the NPRM, the agency proposed to make the requirement for rear seat lap/shoulder belts apply to *all* passenger cars, including convertibles. As previously discussed, the requirements for passenger cars other than convertibles were published in a June 14, 1989 final rule (54 FR 25275). The NPRM proposed that rear seat lap/shoulder belts be required on convertible passenger cars manufactured on or after September 1, 1991.

In its comments, Volkswagen asked for an additional year of leadtime, until September 1, 1992, before rear seat lap/shoulder belts must be installed in convertible passenger cars. According to this commenter, the convertible version of its Golf model (the Cabriolet) is not currently equipped with rear seat lap/shoulder belts, was not originally designed to accommodate such belts, and will need substantial modifications to its current design if the car is to accommodate such belts.

No change has been made in response to this comment. The NPRM noted that it was more difficult to install rear seat lap/shoulder belts in convertibles than in other passenger cars, but that, in spite of these difficulties, at least three different manufacturers had rear-seat lap/shoulder belts in their 1988 model year convertibles. Accordingly, the agency proposed to require convertible passenger cars to be equipped with rear-seat lap/shoulder belts, but to allow two years more leadtime than was proposed for other passenger cars, in recognition of the greater technical difficulties. Volkswagen's comment appears to be that more than two years of additional leadtime is needed to overcome the greater technical difficulties associated with convertibles, although the comment does not include any explanation or analysis of why this is so. A manufacturer's unsubstantiated desire for additional leadtime is not a sufficient basis for the agency to postpone the proposed September 1, 1991 effective date for rear seat lap/shoulder belts in convertibles. Therefore, this rule adopts the proposed requirement.

b. Light Multipurpose Passenger Vehicles.

This vehicle type consists primarily of passenger vans with a seating capacity of 10 persons or less and utility vehicles and other off-road vehicles. None of the commenters suggested any particular problems that a requirement for rear-seat lap/shoulder belts would impose on MPVs in general. Toyota repeated its position that the voluntary installation of rear-seat lap/shoulder belts by manufacturers in all vehicle types made it unnecessary for NHTSA to proceed with this rulemaking. NHTSA responded at length to similar comments by the vehicle manufacturers in the preamble to the NPRM; *see* 53 FR 47984.

Ford did not object to the proposed general requirement for rear-seat lap/shoulder belts in light MPVs, but asked that open-body type MPVs be excluded from the requirement. Ford explained its comment by stating that its Bronco II utility vehicle has a removable roof over the rear passenger and cargo area. According to Ford's comments, "Because the removable roof on this vehicle extends below the shoulder reference point, it would be impossible to obtain a good shoulder belt fit if the shoulder belt anchorages were to be located on the non-removable side panels of the vehicle." For these reasons, Ford suggested that open-body type MPVs be exempted from these requirements or that the proposed requirements be revised to make clear that rear-seat lap/shoulder belts are not required in open-body type MPVs when the roof is removed.

NHTSA agrees with Ford's assertions that open-body type MPVs present greater technical difficulties for the installation of rear seat lap/shoulder belts than other MPVs or convertible passenger cars. For example, the rear seats are closer to the rear of the vehicle and the rear seats are higher in relation to the vehicle floor and sides in most open-body type MPVs than in most convertible passenger cars. The agency concurs with Ford's assertion that these factors tend to make the shoulder belt geometry more difficult in open-body type MPVs. However, the agency does not believe that these factors present insurmountable engineering difficulties. Instead, NHTSA believes that these problems can be solved in a relatively straightforward manner. While manufacturers cannot use the exact same designs used for convertible passenger cars on open-body type MPVs, the convertible passenger car designs can be modified for use in open-body type MPVs. NHTSA concludes that if it is practicable to offer the increased protection of shoulder belts at rear outboard seating positions, and the added costs are comparable to the costs for other MPVs and convertible passenger cars, there is no reason to exclude open-body type MPVs from the requirement for rear seat lap/shoulder belts in MPVs. Hence, no change has been made to the proposed requirements for MPVs in response to this comment by Ford.

The agency notes that this means that lap/shoulder belts will be required in the rear outboard seats of open-body type MPVs, while lap-only belts will be permitted in front outboard seats of those vehicles. (In practice, however, manufacturers have voluntarily provided front-seat lap/shoulder belts in these vehicles.) NHTSA is in the process of re-examining the occupant protection requirements for the front seating positions in open-body type MPVs and other light trucks and vans, with particular consideration of whether automatic occupant protection should be required in these vehicles. NHSTA will address the discrepancy between the regulatory requirements for front and rear seat occupant protection in open-body type MPVs in the course of that re-examination.

c. Light Trucks and Small Buses

All commenters that addressed the proposed requirements for rear-seat lap/shoulder belts in light trucks supported the proposal. Similarly, no commenters raised any objections to the proposed rear-seat lap/shoulder belt requirements in small buses *other than school buses.* Thus, those proposed requirements are adopted, for the reasons explained in the NPRM.

However, several commenters, primarily school bus manufacturers and operators, objected to the proposed requirements for rear-seat lap/shoulder belts in small school buses. Thomas Built, a school bus manufacturer, questioned the effectiveness of rear-seat lap/shoulder belts in certain small school buses ("body on chassis" buses). The Connecticut Operators of School Transportation Association (COSTA) also questioned the effectiveness of lap/shoulder belts in small school buses, by voicing concerns about how the additional stress on the side walls of a small school bus would affect its compliance with Standard No. 221, *School Bus Body Joint Strength* (49 CPR 571.221). Thomas Built also raised the issue of different levels of safety protection for passengers on small school buses, with lap/shoulder belts for outboard seating positions and lap-only belts for the the inboard seating positions. The National School Transportation Association (NSTA) likewise objected to the different levels of occupant protection that would result if some seating positions were equipped with lap/shoulder belts while others were equipped with lap-only belts. Blue Bird, another school bus manufacturer, raised similar objections, claiming that NHTSA occupant protection standards for school buses are "disorganized and confusing," and suggested that the agency undertake rulemaking to separate the occupant protection requirements for school buses from the occupant protection standards for passenger cars and light trucks. Additionally, Blue Bird argued that the requirements proposed in the NPRM would require too many varieties of occupant protection for small school buses.

NHTSA is concerned if Blue Bird or any other school bus manufacturer is having difficulty understanding the occupant protection requirements applicable to the different types of vehicles that can be used to transport school children. A brief summary of those requirements might be helpful. If school systems use a nine or fewer passenger vehicle to transport school children, that vehicle is not a "school bus" for the purposes of the Federal motor vehicle safety standards. Accordingly, that vehicle is not subject to any of the requirements in Standard No. 222, *School Bus Passenger Seating and Crash Protection* (49 CFR § 571.222). Instead, that vehicle would have to comply with the applicable requirements in Standard No. 208. As a result of this rule published today and the agency's previous rulemaking, all front and rear outboard seating positions in nine-passenger light vehicles must be equipped with lap/shoulder safety belts, *irrespective* of whether the nine-passenger light vehicle is classified as a passenger car, truck, or an MPV.

If the vehicle used to transport school children can accommodate 10 or more passengers, the vehicle is a "school bus" for the purposes of the Federal motor vehicle safety standards. Every vehicle that is a "school bus" must comply with the occupant protection requirements of Standard No. 222. In the case of school buses with a gross vehicle weight rating (GVWR) of more than 10,000 pounds, no safety belts are required at seating positions other than the driver's seat. Instead, Standard No. 222 sets forth requirements that protect occupants of rear seating positions in large school buses by means of a concept called "compartmentalization." Persons interested in learning more about the concept of compartmentalization and occupant protection in large school buses may wish to review the agency's notice terminating rulemaking to specify installation requirements for voluntarily installed safety belts on large school buses. This notice was published March 22, 1989 at 54 FR 11765.

In the case of school buses with a GVWR of 10,000 pounds or less, Standard No. 222 requires that occupants be protected *both* by safety belts at seating positions other than the driver's seat *and* by most of the features of compartmentalization. This double means of occupant protection reflects the more severe "crash pulse" or deceleration experienced by lighter vehicles as compared with heavier vehicles in similar collisions. Sections S5(b) of Standard No. 222 requires that small school buses meet the requirements of Standard No. 208 as those requirements apply to MPVs. The provisions of Standard No. 208 currently require MPVs (and small school buses, since the requirements for these two vehicle types are linked) to be equipped with lap/shoulder safety belts at front outboard seats and either lap/shoulder belts or lap-only belts at all other seating positions.

Upon further consideration, NHTSA has determined that the occupant protection requirements for small school buses should be considered separately, not as an aspect of the rulemaking action. In the past, NHTSA has recognized the special importance of issues related to school buses by examining many of those issues in rulemaking actions focused exclusively on school buses, instead of examining those issues as one part of a rulemaking addressing many types of vehicles. This policy has allowed both the agency and the public to consider fully the implications of any proposed action on school buses safety. NHTSA believes it is appropriate to continue following this policy. Accordingly, this rule continues to permit small school buses to be equipped with either lap-only or lap/shoulder safety belts at all rear seating positions, but small school buses must also comply with most of the compartmentalization requirements for large school buses. All other small buses will be required to be equipped with rear-seat lap/shoulder safety belts, but will not be required to comply with the compartmentalization requirements.

The NPRM acknowledged that small buses other than school buses are not currently required to have lap/shoulder safety belts at front outboard seating positions, even though front seats generally present a more hostile crash environment than rear seats. As noted above, small school buses are subject to the occupant protection requirements for MPVs, and small MPVs have long been required to have lap/shoulder safety belts at front outboard seating positions. No commenters suggested any reasons why front-seat lap/shoulder belts should not be required in small buses, just as they are required in small school buses. This rule adopts such a requirement.

4. Vehicle Types NOT Subject to These Requirements

a. Vehicles with a GVWR of More Than 10,000 Pounds

NHTSA has traditionally used GVWRs as dividing lines for the purposes of applying occupant crash protection standards. These groupings reflect the differences in the vehicles' functions and crash responses and exposure. The NPRM proposed to use such a dividing line by limiting the rear seat lap/shoulder belt requirements to vehicles with a GVWR of 10,000 pounds or less. No commenters addressed this issue, and this rule adopts the proposal.

b. Motor Homes

The NPRM proposed to exclude vehicles that are "motor homes" from the rear-seat lap/shoulder belt requirements, because lap/shoulder belts at rear seating positions might interfere with the residential purposes of those seats and because the agency had no evidence of significant potential benefits from lap/shoulder belts, instead of the currently permitted option for lap/shoulder or lap-only belts, at these seating positions. The NPRM also proposed a specific definition of "motor home." These proposed requirements are adopted in this rule.

5. Retractor Types Required for Rear Seat Lap/Shoulder Belts

Retractors at Driver's Seat in Small Buses.

The NPRM proposed to require that the lap/shoulder belt assembly installed at the driver's seating position of small buses include an anti-cinch automatic locking retractor (ALR) on the lap belt portion. Both Ford and Chrysler objected to this proposed requirement, stating that it would preclude the use of the continuous loop lap/shoulder belt system in small buses. The continuous loop system, currently used on most manual lap/shoulder belt systems in passenger cars, uses a single emergency locking retractor (ELR) on one end of the belt system and the other end of the belt system is fixed. The ELR then retracts both the lap and shoulder belt portions of the belt system. Ford and Chrysler each commented that they currently use a continuous loop system for the lap/shoulder belts that they voluntarily install at the front outboard seating positions of their small buses, and that they knew of no safety justification for a requirement that would prohibit the use of continuous loop system in small buses, as the proposed requirement for an ALR for the lap belt would have the effect of doing. NHTSA was persuaded by these comments. This rule has been amended to permit the belt systems at front outboard seating positions in small buses to be equipped with either an ELR or an anti-cinch ALR for the lap belt portion.

Retractors for Rear Seats and Child Safety Seats

The NPRM contained a detailed discussion of the agency's previous statements on this subject, and repeated the agency's previous conclusion that *only* ELRs should be permitted as the retractor for the lap belt portion of the lap/shoulder belt system. See 53 FR 47987-47989; November 29, 1988. The agency's conclusion was based on the fact that ELRs for the lap belt made the belt system more comfortable and convenient for adult occupants, thereby tending to increase use of the belt system. Although active children can make some child restraint systems unstable if the child restraint is secured by a lap belt that incorporates an ELR, NHTSA knew of no data to show that this potential instability would affect the safety performance of the child restraint in motor vehicle crashes. Those parents that wanted to eliminate the potential instability of child restraints, even if the instability did not have any demonstrable effect on safety, could purchase locking clips. These locking clips can prevent movement of belts equipped with an ELR.

NHTSA received many comments on this discussion and the accompanying proposal. Many pediatricians and other medical professionals, as well as advocates of child safety, associations representing the insurance industry, and manufacturers of child safety seats, commented that it was important that the belt system in the vehicle be capable of tightly securing a child seat, without resort to any additional hardware like locking clips. The commenters suggested differing means of achieving this end. Some of these commenters advocated that this rule should specify the use of only ALRs in the lap belt portion, because ALRs automatically tighten down to secure the child seat. Other of these commenters, such as the Los Angeles Area Child Passenger Safety Association, urged the agency to draft this rule to require the use of convertible retractors similar to those installed in some General Motors vehicles. These convertible retractors function as ELRs normally, to ensure comfort for adult occupants. When the belt webbing is fully extended, however, the retractors convert to ALRs, to tightly secure child seats. Other of these commenters suggested that the agency could ensure that these rear-seat lap/shoulder belt systems would tightly secure child seats by following the course of action being considered for recommendation by a Society of Automotive Engineers (SAE) Task Force. That task force may recommend that safety belts which incorporate ELRs in the lap belt or lap belt portion of a belt assembly shall include a means for locking the lap belt when it is used with a child seat. Instead of specifying the use of some specific technology, like ALRs or convertible retractors, this approach sets forth the desired goal and permits manufacturers to use any available technology to achieve that goal.

Some of the vehicle manufacturers, such as Nissan and Toyota, believe that there is no need for any further requirements. According to these commenters, and persons wishing to secure a child seat at a seating position whose lap belt is equipped with ELR can cause the retractor to perform like an ALR simply by using a locking clip. Volvo commented that the agency ought to permit the use of a continuous loop lap/shoulder belt. Volvo asserted that its design of the continuous loop system uses friction at the loop in the buckle to achieve an effect similar to that which would be obtained by using a locking clip. In Volvo's opinion, this lap/shoulder belt system is the best means of both securing child safety seats and ensuring comfort for other occupants of the belt system. Chrysler commented that it was considering modifications to the buckle latchplate as a means of accomplishing the same effect as would locking clips for its belt assemblies equipped with ELRs.

NHTSA has reached the following conclusions after reexamining the available information in light of these comments. Nothing in these comments or the available information shows that low-speed movement of child safety seats actually reduces to any significant extent the effectiveness of those seats in crashes. However, the low-speed movement of child safety seats held by lap belts that use an ELR seems to have given rise to questions and concerns about the safety and effectiveness of child seats when used with a belt that incorporates an ELR. Even if these questions and concerns have not been substantiated, the public may not be as likely to use child safety seats if there are perceived questions about the effectiveness of those seats. NHTSA has concluded that it is appropriate to take action to remove these perceived questions, so as to maintain public trust and confidence in the efficacy of child seats.

The agency was persuaded by the comments asserting that it would be unnecessarily restrictive to require the use of ALRs on the lap belt portion of rear seat lap/shoulder belts, because there are design features other than incorporating an ALR that are as effective in ensuring that the belt system can tightly secure a child safety seat and because such a feature could reduce safety belt use by adult occupants. NHTSA has devised an approach in this final rule that will ensure comfort for adult occupants and tight securing of child safety seats. First, this rule requires that any lap belt or lap belt portion of a lap/shoulder belt installed at an outboard designated seating position in compliance with Standard No. 208 shall be equipped with an ELR. This requirement will take effect on September 1, 1991 for passenger cars, as well as the vehicle types addressed in this rule.

Second, this final rule requires that safety belts that incorporate an ELR in the lap belt or lap belt portion of a lap/shoulder belt shall provide some means other than an external device that requires manual attachment or activation that will prevent any further webbing from spooling out until that means is released or deactivated. This requirement will also take effect on September 1, 1991 for passenger cars and vehicle types addressed in this rule. The purpose of this requirement is to ensure that child safety seats can be tightly secured. This requirement will *not* allow vehicle manufacturers to provide "locking clops" to comply with this requirement. However, any means that can function without additional manual actions can satisfy this requirement. For instance, the convertible retractors on some GM vehicles would comply with this requirement. Additionally, devises like Volvo's are acceptable if those devices do not require any further manual actions to prevent webbing spool out. This approach is intended to allow vehicle manufacturers the freedom to choose whatever approach they prefer to prevent webbing spool out for ELRs, while ensuring that whatever approach is chosen will be effective.

6. The Requirements With Which Rear Seat Lap/Shoulder Belts Must Comply

The NPRM did not propose to require any crash testing requirements for rear-seat lap/shoulder belts, for several reasons. First, neither dummy positioning procedures nor testing procedures for rear seat occupants have yet been developed. In fact, the rear seats are generally removed from vehicles when conducting compliance testing for occupant protection for the front seating positions, to allow the specified weight distribution to be more easily achieved and to permit the installation of additional instrumentation. Second, the rear seating positions offer a generally more benign crash environment than the front seating positions. Accordingly, the agency concluded that it could not justify delaying a proposal for rear-seat lap/shoulder belts until it was able to propose a requirement for dynamic testing of those safety belts. Several commenters stated that they agreed with the agency's decision not to delay this rulemaking, but suggested that the agency ought to move expeditiously to establish crash testing requirements for rear seat occupants. NHTSA will consider these comments when it establishes its priorities for future activities in the area of occupant protection.

As an adjunct to the decision not to require crash testing of rear-seat lap/shoulder belts, the agency proposed to require that rear-seat lap/shoulder belts be integral. Section S4.1.2.3.1 of Standard No. 208 specifies that manual safety belts installed at front outboard seating positions must be either (a) integral lap/shoulder belts or (b) crash-tested lap-only belts such that the car complies with the occupant protection requirements with test dummies restrained only by the lap belts. However, since the agency cannot at this time promulgate any crash testing requirements for rear-seat safety belts, NHTSA believes it is appropriate to require that rear-seat lap/shoulder belts installed in compliance with this rule be integral; i.e., the lap belt must not be detachable from the shoulder belt.

Several commenters suggested that the requirement for integral lap/shoulder belts should not apply to certain types of seats or vehicles, because of special difficulties posed for those seats or vehicles. In response to these comments, NHTSA has carefully reexamined it proposal to require that *all* rear seat lap/shoulder belts installed in compliance with this rule be integral. The agency prefers to retain the proposed requirement, for the same reasons that the requirement was proposed. That is, to the extent that the lap belt is detachable from the shoulder belt and the lap belt is used without the shoulder belt, the enhanced safety protection offered by lap/shoulder belts will not be achieved. The agency's responses to the comments suggesting that there are some seating positions or vehicles in which rear outboard lap/shoulder belts should not be required to be integral are as follows:

a. Convertible Passenger Cars. ASC, Inc., a company that converts hardtops into convertibles, commented that it did not believe that rear-seat lap/shoulder belts installed in convertibles should be required to be integral. According to ASC's comments, a detachable shoulder belt that is not buckled would still offer the occupant the protection of the lap-only belt. While this comment is true, the purpose of this rulemaking is to ensure that rear-seat occupants will enjoy even greater safety protection than is afforded by lap-only belts. Detachable shoulder belts would not serve this purpose.

ASC's comment then asserted that "the detachability feature is essential for ASC to continue to manufacture at a competitive price a majority of its present convertible production which is already equipped with three point lap-shoulder safety belts." Accordingly, ASC believed that a requirement for integral rear-seat lap/shoulder belts would have a "significant negative impact on its business." The agency has previously stated that it is typically more difficult to install rear-seat lap/shoulder belts in convertibles than in sedans or coupes. However, the 1988 convertible models produced by BMW, Mercedes-Benz, and Saab were all equipped with *integral* lap/shoulder belts at rear outboard seating positions. These voluntary actions by convertible manufacturers showed that the technical difficulties associated with integral rear seat lap/shoulder belts in convertibles can be overcome. It may well cost ASC, Inc. or other converters more to equip a convertible with integral rear-seat lap/shoulder belts than it would cost a high volume manufacturer. However, ASC provided no data or cost estimates that would permit the agency to estimate the cost differential for rear-seat lap/shoulder belts installed by high volume manufacturers and converters. Based on the available information, NHTSA concludes that it is unlikely that any such cost differential would have more than an insignificant effect on the demand for convertibles produced by converters.

NHTSA repeats it previous acknowledgements that it will cost manufacturers more to equip convertibles with integral rear seat lap/shoulder belts than it will cost to equip sedans and coupes with those safety belts. In its comments, Volkswagen stated that it would have to incur tooling costs of $1.2 million to install integral rear-seat lap/shoulder belts in its convertibles, with variable costs of an additional $60 per vehicle to install integral lap/shoulder belts instead of lap-only belts. NHTSA estimates that these costs would result in a consumer cost increase of $90 per vehicle. Even accepting these costs as accurate, NHTSA does not believe that a $90 cost increase for convertibles, which already cost substantially more than the hardtop version of the same vehicle, will have any *significant* negative impacts on the demand for convertibles, even those produced by converters.

To the extent that these costs result in some relatively minor economic impacts, the agency concludes that those costs and impacts are reasonable. The occupants of rear seating positions in convertibles are exposed to at least the same degree of risk of death and injury in a motor vehicle crash as occupants of rear seating positions in other light vehicles. In these circumstances, NHTSA has concluded it is appropriate to provide those occupants with the same amount of safety protection. Therefore, a requirement that convertible passenger cars manufactured on or after September 1, 1991 be equipped with integral lap/shoulder belts at rear outboard seating positions is adopted as proposed.

Fiat filed comments on behalf of Ferrari to the effect that it was possible to comply with the requirement for integral lap/shoulder belts for convertibles that were designed to include those safety belt systems. However, Fiat asserted that the steps needed to modify an existing convertible design to accept the upper anchorages for rear seat lap/shoulder belts "would be financially intolerable." Fiat asked that this final rule be structured to provide an exemption for at least two years for existing convertible designs "which cannot be made to comply without extreme economic and technical hardships." NHTSA has not done so. Section 123 of the Safety Act (15 U.S.C. 1410) and 49 CFR Part 555 set forth procedures for obtaining temporary exemptions from any of the generally applicable requirements set forth in the safety standards. If Fiat is statutorily eligible for such an exemption and can make the requisite showings, it can obtain the temporary exemption it seeks in accordance with those statutory and regulatory requirements.

b. Readily Removable Seats. In the NPRM for this rule, the agency summarized Ford's comment to the ANPRM asserting that lap/shoulder belts installed for readily removable seats should be permitted to be nonintegral, since that would be more convenient for persons using the vehicle especially with the seats removed. NHTSA concurred with this assertion, but noted that permitting detachable shoulder belts would result in lower usage of the shoulder belts and lower safety benefits for this rule. The agency suggested that manufacturers are capable of designing an integral lap/shoulder belt system that is nearly as convenient as safety belt systems with nonintegral shoulder belts. The NPRM suggested: "For instance, a shoulder belt that is readily detachable at the anchorage could be used for the outboard seating positions." 53 FR 47990, November 29, 1988.

Both Ford and GM suggested in their comments that permitting belts to be detachable at the upper anchorage would ease the problems of providing integral lap/shoulder belts at outboard seating positions of readily removable seats. However, both these commenters also stated that a March 1, 1985 interpretation letter from NHTSA's Chief Counsel to Mr. Hiroshi Shimizu of Tokai Rika Co. appeared to state that the provisions of Standard No. 208 forbid the use of a lap/shoulder safety belt that is detachable at the upper anchorage.

Mr. Shimizu provided a diagram with his letter that illustrated the safety belt design in question. This diagram showed two reasons why this design would not comply with the requirements of Standard No. 208. First, because of the location of the retractor and the separate buckles for the lap and shoulder belt portions of this belt system, an occupant could release the shoulder belt buckle and use this system soley as a lap belt with no dangling shoulder belt webbing to alert the occupant to the need to fasten the shoulder belt buckle. Alternatively, an occupant could release the lap belt buckle and use the system solely as a shoulder belt with no dangling webbing to alert the occupant to the need to fasten the lap belt buckle. NHTSA stated that this design would not satisfy the requirement in S4.1.2.3.1 and S4.2.2 of Standard No. 208 the *non-detachable* shoulder belts be provided on some belt assemblies.

Second, section S7.2 of Standard No. 208 requires that the latch mechanism of seat belt assemblies shall release both lap and shoulder belt simultaneously and release at a single point by a pushbutton action. When both the lap and shoulder belt portions of Mr. Shimizu's design were buckled, the occupant would have to release both buckles to get out of the belt system. Hence, this belt system could not comply with Standard No. 208 because the release from the lap and shoulder belt would not be simultaneous, nor would it be at a single point.

NHTSA does not believe that the Shimizu interpretation forecloses all safety belt system designs that detach at the upper anchorage. The language of section S7.2 plainly requires that any such safety belt system must use a single, pushbutton buckle that releases the occupant from the lap belt and shoulder belt simultaneously. There is nothing inherent in the design of a safety belt system detachable at the upper anchorage that makes it impossible to comply with these requirements. Similarly, a shoulder belt could be detachable at the upper anchorage without incorporating an additional point at which the belt could be released by the seat occupant, such as the buckle in Mr. Shimizu's design. For example, manufacturers could install some type of spring operated "dog leash" device that would not be equipped with a push button release mechanism. By a "dog leash" device, NHTSA is referring to a device that does not use any form of push button release. Such devices rely on other actions such as a slide button or slide collar to mechanically uncouple the belt system from the upper anchorage. Such a design would not be prohibited by Standard No. 208 nor anything in the Shimizu interpretation. To make this more clear, this rule adopts language in Standard No. 208 expressly stating that vehicles with readily removable rear seats may use a shoulder belt that detaches at the upper anchorage point to meet the requirements for an integral rear-seat lap/shoulder belt.

c. Swivel seats. As previously noted, swivel seats and other seats that can be adjusted to be forward-facing and to face some other direction will be required to provide lap/shoulder belts only when in the forward-facing position and may provide lap-only belts when adjusted to face other directions. The agency had to consider the question of what requirements should be specified for the detachable shoulder belt. NHTSA could have required those belts to be detachable at the upper anchorage point, by establishing requirements such as were established for readily removable seats. However, that would have left the occupant of the swivel seat with webbing in his or her lap every time the occupant adjusted the seat to some position other than forward-facing. The shoulder belt webbing could become soiled, so that the occupant of the swivel seat not use either the lap belt alone or the belt as a lap/shoulder belt.

To prevent this, NHTSA has decided that seats that adjust to be forward-facing and to face in some other direction are the only rear outboard seating positions that will *not* be required to be equipped with integral lap/shoulder belts. Instead, those seating positions may be equipped with a shoulder belt that is detachable at the latchplate.

However, this rule establishes an additional requirement that any such non-integral shoulder belt portion be equipped with an ELR, so that the shoulder belt portion will be available for use by all occupants of the seat in its retracted position, and will be less likely to become soiled. This will ensure that those occupants of adjustable seating positions that want the added protection of a lap/shoulder belt in these seating positions will have that protection.

The agency acknowledges that this requirement is likely to result in lower shoulder belt use at these seating positions than at other rear outboard seating positions. However, the agency concludes that belt use at these adjustable seating positions would be lower still if the agency were to require that the lap/shoulder belts be integral and the shoulder belt webbing were in the occupant's lap or on the floor of the vehicle. On balance, the agency concludes that the interests of occupants of adjustable rear seating positions will be best served by permitting the shoulder belt portion of the lap/shoulder belt system to be detachable at the buckle, i.e., non-integral, while including a requirement for a shoulder belt retractor so that a lap shoulder belt will always be available for those persons.

7. Comfort and Convenience

The NPRM stated that compliance with the provisions in S7.4.2(a), S7.4.3, S7.4.4, and S7.4.5 of Standard No. 208 is determined with reference to a test dummy for the front seating positions. As noted above, there are no dummy positioning procedures for the rear seating positions, so the agency cannot determine compliance with the comfort and convenience provisions with reference to a test dummy. Additionally, the NPRM announced that the agency has not yet developed any alternative surrogate measurements for comfort and convenience in rear seating positions. As was the case with crash testing requirements discussed above, NHTSA did not believe it would be appropriate to delay this rulemaking to allow the agency to develop a full set of comfort and convenience requirements.

NHTSA noted that the requirements in S7.4.6 for seat belt guides and hardware would apply to rear-seat lap/shoulder belts without proposing any changes to accomplish that. No commenters objected to this result, so safety belts installed in compliance with this rule are subject to those requirements.

The remaining issue in this area concerned tension-relieving devices on rear-seat lap/shoulder belts. In the NPRM, the agency expressed its tenative conclusion that the same considerations should apply to rear seating positions with tension-relieving devices on safety belts as already apply to front seating positions with tension-relieving devices on safety belts. That is, tension-relieving devices are permitted to be installed on front seat safety belts if vehicles that have tension-relieving devices at those seating positions comply with certain special conditions intended to reduce the likelihood of misuse of tension-relieving devices. Those special conditions are set forth in S7.4.2 as follows:

1. The vehicle owner's manual must include an explanation of how the tension-relieving device works and recommend a maximum amount of slack that should be introduced into the belt under normal circumstances (S7.4.2(b);

2. The vehicle must comply with the injury criteria specified in S5.1 of Standard No. 208 during a barrier crash test with the shoulder belt webbing adjusted to introduce the maximum amount of slack recommended by the manufacturer (S7.4.2(c);

3. The vehicle must have an automatic means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device (S7.4.2(c).

The NPRM explained that the second requirement listed above could not be applied to rear seat lap/shoulder belts, because the agency could not develop dynamic testing procedures for the rear seating positions at this time. However, the notice proposed to apply the other two requirements listed above to rear-seat lap/shoulder belts equipped with tension-relieving devices.

None of the commenters addressed the proposal to require the vehicle owner's manual to include an explanation of how the tension-relieving device works and a recommendation of the maximum amount of slack to be introduced into the safety belt. Hence, that requirement is adopted as proposed, for the reasons explained in the NPRM.

In its comments, GM objected to the proposed requirement for automatic cancellation of slack. GM indicated that automatic cancellation of slack in front-seat lap/shoulder belts is accomplished by either of two means. If the retractor is mounted on the floor or on the pillar near the adjacent door, the manufacturer generally uses a simple cable, which operates when the door is open to cancel the slack. If there are dual spool retractors on the safety belt system, a simple mechanical device triggered by retraction of the lap belt is used to cancel the slack in the shoulder belt. According to GM, "cable routing concerns" make it difficult to use a cable and the current size of dual spool retractors precludes the use of that technology in rear seating positions. This comment concluded by alleging that only "complex, expensive mechanisms" could be used for slack cancellation in rear seating positions. Ford also suggested in its comments that it would be very complex to develop an automatic means for slack cancellation. Ford stated that all of its slack cancellation mechanisms are activated by opening the adjacent door. Ford also stated that electric slack cancellation mechanisms would be impracticable for rear-seat lap/shoulder belts.

In response to these comments, NHTSA has re-examined its proposal. That proposal was that slack be automatically cancelled either when the belt is unbuckled *or* when the adjacent door is opened. Although not expressly stated by either GM or Ford, the manufacturers' concern appears to be that there is *no* adjacent door for rear seating positions in many of the vehicles that will be subject to these requirements. The effect of the proposal, then, would be to force manufacturers that chose to install tension-relieving devices in rear-seat lap/shoulder belts for passenger vans, extended cab pickups, and the like, to cancel the slack every time the latchplate is unbuckled, because there is no door adjacent to those seating positions.

The agency did not intend such a result. Instead, the agency's intent was to permit the slack to be cancelled either every time the latchplate was unbuckled or each time the door is opened that is designed to allow the occupant of the seating position in question entry and egress to and from the seat. Thus, if a passenger van has a sliding door on the right side of the vehicle that is designed as the means of entry and egress for all rear seat passengers, slack for rear seat lap/shoulder belts in that van must be cancelled either when that sliding door is opened or when the belt latchplate is unbuckled. Similarly, if a two-door convertible has tension-relieving devices for its rear- seat lap/shoulder belts, slack in the rear-seat lap/shoulder belts must be cancelled either when the latchplate is unbuckled or when the door is opened on the same side of the vehicle as the rear outboard seating position.

This approach will permit manufacturers to use, with appropriate modifications, the same slack cancellation mechanism that is activated by the opening of an adjacent door in seating positions that are not immediately adjacent to the door. The agency is not aware of any reasons why cable routing concerns would present any insuperable difficulties for slack cancellation for the rear- seat lap/shoulder belt systems that are not adjacent to a door. Accordingly, S7.4.2(c) of Standard No. 208 has been amended to provide that slack must be cancelled automatically either when the latchplate is unbuckled or when the door that is designed to provide entry and egress for that seating position is opened.

Both Ford and GM also commented that there was no safety need for automatic cancellation of slack in rear-seat lap/shoulder belts. GM stated that it was not aware of any data showing a safety need for automatic of slack cancellation. Ford commented that there was no possibility of safety belts getting tangled in the door when there was no door adjacent to the seating position at which the tension-relieving device is installed.

NHTSA has previously explained the safety need for automatic slack cancellation in belts equipped with tension-relieving devices. Persons interested in reviewing those discussions may examine 50 CFR 14580; April 12, 1985 and 54 FR 29047; July 11, 1989. Ford and GM did not raise any new arguments that have not already been considered and rejected by the agency. Accordingly, this rule incorporates a requirement for automatic slack cancellation. NHTSA notes that it is currently reviewing a petition that asks the agency to prohibit tension-relieving devices altogether.

8. Relationship of This Rule to Standard No. 210

As noted in the NPRM, section S4.1.1 of Standard No. 210 provides that seat belt anchorages for a Type 2 seat belt assembly (lap/shoulder belt) shall be installed for each forward-facing outboard designated seating position in passenger cars other than convertibles, and for each designated seating position for which a Type 2 seat belt assembly is required by Standard No. 208 in vehicles other than passenger cars. The NPRM proposed to delete Standard No. 210's exemption for convertibles, because the agency was proposing to amend Standard No. 208 to require rear-seat lap/shoulder belts in convertibles. Obviously, there would be lesser benefits from requiring rear-seat lap/shoulder belts in convertibles if those lap/shoulder belts are not required to be effectively anchored to the vehicle. No commenter objected to this proposal, so it is adopted as proposed.

No amendment is needed to ensure that the rear-seat lap/shoulder belts required in other vehicle types covered by this rule will be effectively anchored to the vehicle. As explained above, the existing language of S4.1.1 of Standard No. 210 automatically requires anchorages for lap/shoulder belts to be provided at seating positions required by Standard No. 208 to have lap/shoulder belts.

9. Timing for Applying These New Requirements

Some of the requirements specified in this rule apply to both the vehicle types addressed exclusively in this rule (convertible passenger cars, light trucks, MPVs, and small buses) and to the vehicle type previously addressed in NHTSA's June 14, 1989 final rule (passenger cars other than convertibles). These requirements include the types of retractors that can be installed on rear-seat lap/shoulder belts and special performance requirements for tension-relieving devices installed on rear seat-lap/shoulder belts.

The NPRM proposed that these general requirements, as well as the new requirement that rear-seat lap/shoulder belts be installed, apply to the vehicle types addressed exclusively in this rule for all such vehicles manufactured on or after September 1, 1991. None of the commenters has provided any evidence demonstrating that the amount of leadtime would be inadequate. Accordingly, the requirements in this rule will apply to convertible passenger cars, light trucks, MPVs and small buses as of September 1, 1991, as was proposed. Earlier compliance is also permitted and encouraged.

With respect to passenger cars, the June 14, 1989 final rule established certain general requirements applicable to cars manufactured on or after September 1, 1990. These general requirements included a requirement that rear-seat lap/shoulder belts be integral and that the upper anchorage for the rear-seat lap/shoulder belt comply with the location requirements of Standard No. 210. The general requirements of this rule for rear-seat lap/shoulder belts (retractor type and special requirements for tension-relieving devices) will apply on or after September 1, 1991, the same data as the other requirements mandated by this rule take effect. The general requirements of this rule will require greater changes, and thus longer leadtime, than the general requirements announced in the June 14, 1989 rule. Accordingly, passenger cars manufactured on or after September 1, 1991 must comply with the retractor type and tension-relieving device requirements set forth in this rule.

In consideration of the foregoing, 49 CFR Part 571.208 is amended as follows:

S4.1.4 of Standard No. 208 is revised to read as follows:

S4.1.4 *Passenger cars manufactured on or after September 1, 1989.*

S4.1.4.1 Except as provided in S4.1.4.2, each passenger car manufactured on or after September 1, 1989 shall comply with the requirements of S4.1.2.1. Any passenger car manufactured on or after September 1, 1989 and before September 1, 1993 whose driver's designated seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front designated seating position is equipped with a manual Type 2 seat belt so that the seating position complies with the occupant crash protection requirements of S5.1, with the Type 2 seat belt assembly adjusted in accordance with S7.4.2, shall be counted as a vehicle complying with S4.1.2.1. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not know in the exercise of due care that such vehicle is not in conformity with this standard.

S4.1.4.2 (a) Each passenger car, other than a convertible, manufactured before December 11, 1989 may be equipped with, and each passenger car, other than a convertible, manufactured on or after December 11, 1989 and before September 1, 1990 shall be equipped with a Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed pursuant to this provision shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1.1 of this standard.

(b) Except as provided in S4.1.4.2.1, each passenger car other than a convertible manufactured on or after September 1, 1990 and each convertible passenger car manufactured on or after September 1, 1991 shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.2 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

S4.1.4.2.1 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either:

(i) meet the requirements of S4.1.4.2 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) when the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle, and, when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of a Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.1.4.2.2 Any rear outboard designated seating position with a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) shall meet the requirements of S4.1.4.2, and may use an upper torso belt that detaches at the upper anchorage point to meet those requirements.

3. A new S4.2.4 is added to Standard No. 208, to read as follows:

S4.2.4 *Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with a GVWR of 10,000 pounds or less.*. Except as provided in S4.2.4.2, each truck and each multipurpose passenger vehicle, except a motor home, manufactured on or after September 1, 1991 that has a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

S4.2.4.1 As used in this section —

(a) "Motor home" means a motor vehicle with motive power that is designed to provide temporary residential accommodations, as evidenced by the presence of at least four of the following facilities: cooking; refrigeration or ice box; self-contained toilet; heating and/or air conditioning; a portable water supply system including a faucet and a sink; and a separate 110-125 volt electrical power supply and/or an LP gas supply.

(b) "Rear outboard designated seating position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating positions adjacent to a walkway located between the seat and the side of the vehicle, which walkway is designed to allow access to more rearward seating positions.

S4.2.4.2 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either:

(i) meet the requirements of S4.2.4 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) when the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle, and, when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of a Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.2.4.3 Any rear outboard designated seating position with a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) shall meet the requrements of S4.2.4, and may use an upper torso belt that detaches at the upper anchorage point to meet those requirements.

4. A new S4.4.3 is added to Standard No. 208, to read as follows:

S4.4 *Buses.*

* * * * *

S4.4.3 Buses manufactured on or after September 1, 1991.

S4.4.3.1 Each bus with a gross vehicle weight rating of more than 10,000 pounds shall comply with the requirements S4.4.2.1 or S4.4.2.2.

S4.4.3.2 Except as provided in S4.4.3.2.2, each bus with a gross vehicle weight rating of 10,000 pounds or less, except a school bus, shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the front and every rear forward-facing outboard designated seating position, and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

S4.4.3.2.1 As used in this section, a "rear outboard designated position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating positions adjacent to a walkway located between the seat and the side of the vehicle, which walkway is designed to allow access to more rearward seating positions.

S4.4.3.2.2 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either:

(i) meet the requirements of S4.4.3.2 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) when the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle, and, when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of a Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.4.3.2.3 Any rear outboard designated seating position with a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) shall meet the requirements of S4.4.3.2, and may use an upper torso belt that detaches at the upper anchorage point to meet those requirements.

S4.4.3.3 Each school bus with a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the right front passenger's designated seating position (if any), and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. The lap belt portion of a Type 2 seat belt assembly installed at the driver's designated seating position and at the right front passenger's designated seating position (if any) shall include either an emergency locking retractor or an automatic locking retractor, which retractor shall not retract webbing to the next locking position until at least 3/4 inch of webbing has moved into the retractor. In determining whether an automatic locking retractor complies with this requirement, the webbing is extended to 75 percent of its length and the retractor is locked after the initial adjustment. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

5. S7.1.1 of Standard No. 208 is amended by revising S7.1.1.3 and by adding a new S7.1.1.5, to read as follows:

S7.1 *Adjustment.*

* * * * *

S7.1.1.3 A Type 1 lap belt or the lap belt portion of any Type 2 seat belt assembly installed at any outboard designated seating position of a vehicle with a gross vehicle weight rating of 10,000 pounds or less to comply with a requirement of ths standard, except walk-in van-type vehicles and school buses, shall meet the requirements of S7.1 by means of any emergency locking retractor that conforms to Standard No. 209 (49 CFR 571.209).

* * * * *

S7.1.1.5 Seat belt assemblies installed at a seating position other than the driver's position that incorporate an emergency locking retractor in the lap belt or the lap belt portion of a Type 2 seat belt assembly shall provide some means other than an external device that requires manual attachment or activation to lock the lap belt or lap belt portion, by preventing additional webbing from spooling out, so that the seat belt assembly can be used to tightly secure a child restraint system.

6. S7.4.2 of Standard No. 208 is amended by revising the introductory text and S7.4.2(c), to read as follows:

S7.4.2 *Webbing tension-relieving device.* Each vehicle with an automatic seat belt assembly or with a Type 2 manual seat belt assembly that must meet the occupant crash protection requirements of S5.1 of this standard installed at a front outboard designated seating position, and each vehicle with a Type 2 manual seat belt assembly installed at a rear outboard designated seating position in compliance with a requirement of this standard, that has either automatic or manual tension-relieving devices permitting the introduction of slack in the webbing of the shoulder belt (e.g., "comfort clips" or "window-shade" devices) shall:

* * * * *

(c) Have, except for open-body vehicles with no doors, and automatic means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device. In the case of an automatic safety belt system, cancellation of the tension-relieving device shall occur each time the adjacent vehicle door is opened. In the case of a manual seat belt required to meet S5.1, cancellation of the tension-relieving device shall occur, at the manufacturer's option, either each time the adjacent door is opened or each time the latchplate is released from the buckle. In the case of a Type 2 manual seat belt assembly installed at a rear outboard designated seating position, cancellation of the tension-relieving device shall occur, at the manufacturer's option either each time the door designed to to allow the occupant of that seating position entry and egress of the vehicle is opened or each time the latchplate is released from the buckle. In the case of open-body vehicles with no doors, cancellation of the tension-relieving device may be done by a manual means.

§571.210 [Amended]

7. S4.1.1 of Standard No. 210 is revised to read as follows:

S4.1.1 Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each forward-facing outboard designated seating position in passenger cars other than convertibles and for each designated seating position for which a Type 2 seat belt assembly is required by Standard No. 208 (49 CFR 571.208) in vehicles other than passenger cars. Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each rear forward-facing outboard designated seating position in convertible passenger cars manufactured on or after September 1, 1991.

§571.222 [Amended]

8. S5(b) of Standard No. 222 is revised to read as follows:

S5. Requirements. (a) * * *

(b) Each vehicle with a gross vehicle weight rating of 10,000 pounds or less shall be capable of meeting the following requirements at all seating positions other than the driver's seat:

(1)(A) In the case of vehicles manufactured before September 1, 1991, the requirements of §§571.208, 571.209, and 571.210 as they apply to multipurpose passenger vehicles; or

(B) In the case of vehicles manufactured on or after September 1, 1991, the requirements of S4.4.3.3. of §571.208 and the requirements of §§571.209 and 571.210 as they apply to school buses with a gross vehicle weight rating of 10,000 pounds or less; and

(2) The requirements of S5.1.2, S5.1.3, S5.1.4, S5.1.5, and S5.3 of this standard. However, the requirements of §§571.208 and 571.210 shall be met at W seating positions in a bench seat using a body block as specified in Figure 2 of this standard, and a particular school bus passenger seat (i.e., a test specimen) in that weight class need not meet further requirements after having met S5.1.2 and S5.1.5, or after having been subjected to either S5.1.3, S5.1.4, or S5.3 of this standard or §571.210.

* * * * *

Issued on: October 27, 1989.

Jeffrey R. Miller
Acting Administrator

54 F.R. 46257
November 2, 1989

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 85-08; Notice 5)
RIN 2127-AC86

ACTION: Final rule.

SUMMARY: The requirements for safety belt systems in trucks, buses and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds manufactured on or after September 1, 1990 include special provisions to make those safety belt systems more comfortable and convenient to use. The final rule that originally established these requirements set forth special performance requirements for belt systems equipped with automatic locking retractors (ALRs). For such belt systems, that rule's special performance requirements focused exclusively on the working of the retractor mechanism itself as the means of ensuring comfort for users of these belt systems.

Following receipt of a petition for reconsideration and the issuance of a notice of proposed rulemaking, the agency is issuing this final rule which expands the special performance requirements for belt systems equipped with ALRs to encompass the working of the entire safety belt system instead of focusing on the retractor mechanism alone. This approach achieves the agency's goal of ensuring comfort for users of belt systems equipped with ALRs, without imposing unnecessary restrictions on innovative means of ensuring comfort that do not depend upon the workings of the retractor mechanism alone.

DATES: The changes made in this rule are effective September 1, 1990. These requirements will apply to all trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds manufactured on or after that date.

SUPPLEMENTARY INFORMATION: Since January 1, 1972, Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208) has required vehicle manufacturers to install safety belt systems in heavy vehicles (i.e., trucks, buses, and multipurpose passenger vehicles [MPVs] with a gross vehicle weight rating of more than 10,000 pounds). The safety belts required in those vehicles have had to meet all of the strength requirements set for belt systems in passenger cars and light trucks, buses, and MPVs (those with a gross vehicle weight rating of 10,000 pounds or less). However, the safety belts required in heavy vehicles have not had to meet several requirements for lighter vehicle safety belt systems that make the safety belts more comfortable to wear and easier to use.

The agency adopted several changes to the requirements for belt systems in heavy vehicles to make such belt systems more comfortable to wear and easier to use in a final rule that was published on July 6, 1988 (53 FR 25337). With respect to the type of retractor required to be installed on heavy vehicle belt systems, this rule required that such belt systems be equipped with either an emergency locking retractor (ELR) or an ALR with anti-cinch capability. For the purposes of that rule, the determination of whether a heavy vehicle safety belt system with an ALR had this anti-cinch capability was made by examining the working of the retractor mechanism alone. In the case of a safety belt assembly equipped with an ALR and installed in a heavy vehicle to comply with this requirement, the retractor could *not* retract webbing to the next locking position until at least ¾ of an inch of webbing had moved into the retractor.

NHTSA received three petitions for reconsideration of this rule. The only one of those petitions that is relevant to this rule is the one that was filed by Indiana Mills & Manufacturing, Inc. (IMMI). IMMI's petition asked NHTSA to amend its July 6, 1988 rule to permit safety belt systems that are equipped with an ALR and installed in heavy vehicles to comply with the ¾ inch minimum webbing travel requirement by means other than the working of the retractor itself. According to IMMI, a minimum webbing travel requirement that considered the performance of the entire belt system in meeting the goal of preventing "cinch down," instead of focusing on the performance of the retractor alone, would permit the development of more innovative means of overcoming the cinch-down problem for safety belt systems equipped with ALRs.

NHTSA reexamined its minimum webbing travel requirements in response to this petition. The purpose of including minimum webbing travel requirements for safety belt systems equipped with ALRs was to ensure that these belt systems would be more comfortable for users than safety belt systems equipped with ALRs that cinched down. Any safety belt system equipped with an ALR that provided enhanced comfort for belt users by preventing "cinch down" would seem to fulfill the purpose served by the minimum webbing travel requirement, *regardless* of whether the retractor alone met that requirement. Accordingly, NHTSA tentatively determined that the current requirement for heavy vehicle safety belt systems is unnecessarily restrictive.

To reflect this tentative determination, the agency issued a July 11, 1989 notice, published at 54 FR 29069, proposing to adopt a less restrictive approach to ensuring occupant comfort when using safety belt systems equipped with ALRs. Instead of focusing solely on the workings of the retractor mechanism to determine if the belt system complies with the minimum webbing travel requirement, as the July 1988 final rule on this subject did, NHTSA proposed in this notice to examine the workings of the belt system *as a whole* to determine if it complies with the minimum webbing travel requirement. A bench test would be used to evaluate the workings of the belt system as a whole. First, the belt system would be buckled. Then the retractor end of the belt system would be anchored. The other end of the belt system would not be anchored during this bench test, and is referred to as the "free end" of the belt system in this rule. The belt webbing would be extended to 75 percent of its length and the ALR would be locked after this initial adjustment. A load of 20 pounds would be applied to the free end of the belt system in the direction away from the retractor. The position of the free end of the belt system would be recorded. Then the 20 pound load would be slowly released (i.e., released within a 30 second period) until the retractor moves to the next locking position. The position of the free end of the belt system would be recorded again. The distance between the recorded positions of the free end of the belt system would have to be equal to or greater than ¾ inch.

NHTSA stated in the July 11, 1989 proposal the agency's belief that this proposed bench test would be satisfied by any safety belt system incorporating an ALR that meets the current requirement for a ¾ inch spacing between ratcheting positions on the retractor. Additionally, vehicles could comply with this proposed bench test if the safety belt system incorporates a device or devices external to the ALR mechanism itself that will operate *automatically* to prevent cinch down. This proposed bench test would *not* be satisfied by devices that must be manually operated to prevent cinch down, because no manual adjustments will be performed during the bench testing.

Four commenters responded to the request for comments on this proposed action. IMMI supported the proposal. The State of Connecticut commented that it supports the concept of moving toward a more performance-oriented test of the entire safety belt system, as proposed in the NPRM, but that it was concerned about the specifics of the bench test proposed in the NPRM. More specifically, Connecticut noted that the proposed bench test would apply a 20 pound load to the free end of the belt system and slowly decrease the load until the retractor moved to the next locking position. Connecticut was concerned that the absence of some intermediate force level at which the belt system must not yet have moved to the next locking position could permit the use of safety belt systems that exert constant force levels objectionable to most wearers.

For instance, Connecticut commented that a belt system would comply with the proposed requirement if it exerted a constant 19 pound load on the wearer. According to Connecticut's comment, a constant 19 pound pull on the safety belt would be objectionable to most wearers and would *not* represent a satisfactory solution to the cinch-down problems associated with ALRs in the past. This commenter suggested that this potential problem could be avoided if the agency were to include a requirement that the free end of the belt assembly shall move less than ¾ inch when the 20 pound pre-load has reached 10 pounds, or some other level. Connecticut commented that this intermediate force level, whether it is set at 10 pounds or some lower level, would be a limit on the belt tension that could be imposed on the wearer.

NHTSA was not persuaded by this comment. While Standard No. 209 does not currently establish any maximum forces that an ALR can impose on a lap belt, NHTSA is unaware of any ALRs currently in use that impose a retractor force of more than one or two pounds. Manufacturers would have no reason to now increase the retractor force up to a level of 19 pounds, because such an increase would make the retractor more expensive and the safety belt system heavier and less comfortable for wearers. Hence, there is no apparent reason for a regulatory requirement to prohibit increases from current retractor force levels.

Additionally, NHTSA does not believe that Connecticut's suggestion to establish an intermediate force level of 10 pounds has any correlation to the real life operational characteristics of an oscillating occupant in a safety belt system. For example, IMMI stated in its submissions that its device requires 14 pounds of force to extend it (which means it would not comply with Connecticut's suggested intermediate force level requirement), but that the force levels on the occupant drop to 9 pounds as soon as the occupant begins to move the system inward. Then the 9 pound force is reduced to 3 to 4 pounds at the retractor, due to belt/clothing friction. If the maximum operational force for anti-cinch devices were limited to 10 pounds, as suggested by Connecticut, it would be possible for a device to be tested at 10 pounds, operate at 5 pounds, and only provide 1 or 2 pounds of force at the retractor, which may not be sufficient to prevent the retractor spring force from extending the anti-cinch device. In effect, then, this 10 pound intermediate force would require safety belt systems to comply with the anti-cinch requirements by means of the retractor mechanism, because it would be very difficult for any anti-cinch devices external to the retractor to overcome the mass and frictional forces needed to prevent cinch down *and* to comply with this intermediate force level. After considering this comment, NHTSA has concluded that the approach proposed in the NPRM offers the best balance of ensuring occupant comfort (by limiting maximum lap belt forces) while allowing maximum design flexibility for manufacturers to achieve the necessary occupant comfort.

Ford Motor Company (Ford) made a comment similar to Connecticut's. Ford stated that belt tensions of up to 20 pounds would be allowed by this proposal, and that such tension levels would be objectionable to most users. Instead, Ford commented that anti-cinch characteristics should be measured at force levels that are more typical and more likely to be acceptable to users, which Ford suggested would be not more than five pounds for the lap belt.

The agency's response to Ford's comment about the need for a test force lower than 20 pounds is the same as that offered above in Connecticut's comment about the need for a lower test force. Essentially, the agency has no reason to believe that manufacturers would raise retractor force levels above the current one or two pound level, because an increase would make the retractor heavier, bulkier, and more expensive, and would be less comfortable for the wearer.

In addition, the anti-cinch device developed by IMMI was reportedly developed to a specific force level and displacement to fulfill the needs of occupants in heavy trucks. IMMI reported that its anti-cinch device has a steady state load on the occupant of 4 to 6 pounds measured at the anti-cinch device, a corresponding load of 2 to 3 pounds when the load is measured at the retractor, but that in the bench test proposed in the NPRM for this rule 13 to 14 pounds is needed to cause the IMMI device or any other anti-cinch device external to the retractor mechanism to function. NHTSA believes that the data reported by IMMI are consistent with what would be expected and that a 13 to 14 pound minimum force level would be required for effective operation of an anti-cinch device external to the retractor mechanism. The agency is not aware of any consumer complaints about safety belt systems equipped with the IMMI anti-cinch device. To the contrary, the IMMI device appears to have proven successful in the marketplace.

This information suggests that persons operating heavy trucks have found 4 to 6 pounds of lap belt force to be reasonably comfortable. It also suggests that some systems that impose approximately 6 pounds of lap belt force in the real world require much higher force levels to function as designed when subjected to the proposed bench test. Accordingly, Ford's suggestion to establish a 5 pound maximum force level as measured in this bench test is not persuasive, nor would it be viable for any anti-cinch devices external to the retractor.

Finally, the Automotive Occupant Restraints Council (AORC) commented that, while it agrees that the requirements for safety belt comfort and convenience should not restrict design or innovation, the requirements must preclude the possibility of the introduction of excessive slack in the lap belt when it is engaged about the occupant. AORC commented that the current requirements in S4.3(i) of Standard No. 209 limit the amount of slack that can be introduced into a belt system by an ALR to one inch. AORC commented that a device that could be manually adjusted to lock-out the ALR would not appear to comply with the proposed test, because the proposed test does not provide for manual adjustment of any devices on the safety belt system. However, AORC was concerned that a device external to the retractor that did *not* require any manual adjustment would apparently be permitted to introduce unlimited slack under the proposed test. AORC commented that unlimited slack should not be permitted in the final rule, and asked that devices external to the retractor not be permitted to introduce more slack into the belt system than the one inch permitted for the ALR.

NHTSA agrees with AORC's comment that anti-cinch devices external to the ALR should not be permitted to introduce an unlimited amount of slack into the safety belt system. Therefore, this rule adopts a limitation on the maximum amount of slack that may be introduced by such anti-cinch devices. However, the agency does not agree with AORC that the same one inch limitation specified for the ALR should be specified for these external devices, for a number of reasons. First, allowing only two inches of slack (one inch from the ALR and one inch from the anti-cinch device) might not solve the cinch-down problem for ALRs installed in trucks that commonly experience rough riding for occupants, such as cement trucks and garbage trucks. If this rule does not solve the cinch-down problem for ALRs in those trucks, it will not have achieved its intended purpose.

Second, the larger occupant space of medium- and heavy-duty trucks means that there is a lesser safety need to minimize occupant excursion in these vehicles than is the case in smaller vehicles. For instance, a Chevrolet Caprice passenger car has a head-to-windshield header distance of 13.9 inches and a head-to-windshield distance of 18.7 inches, using a 50th percentile adult male test dummy for these measurements. A GMC Astro 95 truck tractor has a head-to-windshield header distance of 27 inches and a head-to-windshield distance of 31 inches, measured with the same size test dummy. Because of this larger occupant space, permitting greater slack in these vehicles than would be permitted in passenger cars would not have a significant influence on restraint system effectiveness in these larger vehicles.

Third, the IMMI anti-cinch system has been designed to allow more than one inch of slack. As explained above, NHTSA is reluctant to preclude in effect the use of a currently available means of solving the cinch-down problem absent some indications of a need to do so. In this case, NHTSA is unaware of any indications of safety problems associated with the IMMI anti-cinch device. Accordingly, the agency concludes it would be inappropriate to preclude the continued use of the IMMI anti-cinch device as a means of complying with the new anti-cinch requirements for heavy trucks.

After considering these facts, the agency has decided to include in this rule a provision to limit total slack measured during this bench test of the safety belt system to three inches. This three inch total reflects a maximum of one inch slack permitted to be introduced by the ALR, pursuant to Standard No. 209, and a maximum of two inches slack associated with an anti-cinch device external to the retractor itself. The agency would like to note that the safety belt system must comply with this anti-cinch requirement without requiring any additional actions by the belt wearer. Thus, a device that could be manually adjusted to lock-out the ALR could *not* be the means for complying with this new requirement.

These requirements will apply to trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds manufactured on or after September 1, 1990. This date was chosen since that is also the effective date of the July 1988 amendment to Standard No. 208 requiring that the safety belt systems on these vehicles comply with the anti-cinch requirements by means of the retractor mechanism alone. This rule relieves a restriction in the July 1988 amendments by permitting the anti-cinch requirements to be satisfied either by the working of the retractor mechanism itself *or* by an external device that automatically operates to prevent cinch down. This rule does not impose any additional costs on any party, since any manufacturer that wishes to comply with the anti-cinch requirements by means of the retractor mechanism will continue to be permitted to do so under this rule. Therefore, NHTSA finds for good cause that this rule should become effective on September 1, 1990, instead of at least 180 days after issuance, as specified in section 103(c) of the Safety Act (15 U.S.C. 1392(c)).

NHTSA has considered the effects of this rulemaking action and determined that it is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has also determined that the economic and other impacts of this rule are so minimal that a full regulatory evaluation is not required.

Those heavy vehicle manufacturers that choose to rely on the working of the retractor mechanism alone to comply with the test for cinch down, as required by the current regulatory language will not have to change their plans in response to this final rule. On the other hand, this rule will also give manufacturers the option of adopting other innovative approaches to comply with the test for cinch down. Those manufacturers that choose to take advantage of this rule to use an innovative means of solving cinch down could experience some slight cost savings. However, the costs of complying with the anti-cinch retractor requirement have been estimated throughout this rulemaking as being minimal, so any savings from the costs of anti-cinch retractors would necessarily also be minimal.

NHTSA has also considered the effects of this rule under the Regulatory Flexibility Act. I hereby certify that this rule will not have a significant economic impact on a substantial number of small entities. Few, if any, of the heavy vehicle manufacturers are small entities. To the extent that these manufacturers might experience a cost savings as a result of this proposal, the savings will be minimal, as explained above. Likewise, small organizations and small governmental entities will not be significantly affected by this rule. Although those groups do purchase heavy vehicles, this rule will not result in any price increases for heavy vehicles.

In consideration of the foregoing, 49 CFR §571.208 is amended as follows:

1. S4.3.2.2 of Standard No. 208 is revised to read as follows:

S4.3.2 *Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds, manufactured on or after September 1, 1990.* * * *

* * * * *

S4.3.2.2 *Second option—belt system.* The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at a front outboard seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at a front outboard seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following:

(a) An automatic locking retractor used at a front outboard seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt portion of a seat belt assembly equipped with an automatic locking retractor that is installed at a front outboard seating position must allow at least 3/4 inch, but less than 3 inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.3.2.2(b) of this standard is determined as follows:

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least 3/4 inch but less than 3 inches.

2. S4.4.2.2 of Standard No. 208 is revised to read as follows:

S4.4.2 *Buses manufactured on or after September 1, 1990.* * * *

* * * * *

S4.4.2.2 *Second option—belt system—driver only.* The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at the driver's seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at the driver's seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following:

(a) An automatic locking retractor used at a driver's seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt portion of a seat belt assembly equipped with an automatic locking retractor that is installed at the driver's seating position must allow at least 3/4 inch, but less than 3 inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.4.2.2(b) of this standard is determined as follows:

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least 3/4 inch but less than 3 inches.

Issued on May 1, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 18889
May 7, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 87-08; Notice 6)
RIN 2127-AD12

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: In November 1989, this agency published a final rule mandating the installation of lap/shoulder safety belts in all forward-facing rear outboard seating positions in convertible passenger cars, light trucks and multipurpose passenger vehicles (e.g., passenger vans and utility vehicles), and small buses. This new requirement applies to all such vehicles manufactured on or after September 1, 1991. NHTSA received 14 petitions for reconsideration of this rule.

In response to these petitions, the agency is making several changes to the final rule published in November 1989. These changes are:

1. This notice rescinds the requirement adopted in the November 1989 rule that lap belt portions of safety belts provide some means of locking the lap belt and preventing additional webbing spool out, other than an external device that requires manual attachment or activation by a driver or passenger. Throughout the remainder of this preamble, this requirement is identified as the "lockability requirement." Many petitioners asserted that no objective test for determining compliance with the lockability requirement was specified in the November 1989 final rule, and that the public had not been given notice of and the opportunity to comment on the lockability requirement. This notice responds to these objections by deleting the lockability requirement from the final rule.

However, the agency again tentatively concludes that the substantive purpose of the lockability requirement, i.e., to ensure that rear seat safety belts can tightly secure child safety seats, needs to be addressed in NHTSA's safety standards. The agency hopes to shift the discussion of the lockability requirement toward its substantive merits, and away from the types of objections made to the November 1989 final rule. To that end, a notice of proposed rulemaking to adopt a lockability requirement, including a specific procedure for testing compliance, is published elsewhere in today's edition of the *Federal Register*.

2. The November 1989 final rule included special provisions for lap/shoulder belts installed at rear outboard seating positions on readily removable seats. Such belts were permitted to detach at the upper anchorage only. If those belts were detachable at the upper anchorage, the means of detaching could not include any sort of pushbutton release. A petition for reconsideration asked that lap/shoulder belts on readily removable seats be permitted to detach at either the upper or lower anchorage and that the means of detachment should be permitted to include a pushbutton release. This notice grants the request to permit lap/shoulder belts on readily removable seats to be detachable at either the upper or lower anchorage, but denies the request to permit the detachability to be accomplished by a pushbutton release.

3. The November 1989 final rule required that lap belts or the lap belt portion of lap/shoulder belts installed at *any* rear outboard seating position be equipped with an emergency locking retractor (ELR). A petitioner asked that this requirement be limited to *forward-facing* rear outboard seating positions, so that side-facing or rear-facing outboard seating positions could continue to be equipped with automatic locking retractors (ALRs) on lap belts. Since this rulemaking action had been focused on rear outboard seating positions that are forward-facing, or at least adjustable to be forward-facing, this notice grants the petitioner's request to limit the requirement for ELRs to those types of rear outboard seats.

4. The November 1989 final rule excluded seating positions adjacent to aisleways from the definition of "outboard designated seating position" in trucks, buses, and multipurpose passenger vehicles. A petitioner asked that this same exclusion be extended to passenger cars. This notice grants that request.

DATES: The amendments to S7.1.1.3 and S7.1.1.5

are effective on September 1, 1991. That is the date on which the version of those requirements published in the November 1989 final rule would have become effective. The other amendments made by this rule take effect on [January 28, 1991, 180 days after publication of this rule in the *Federal Register*]. Vehicles manufactured on or after September 1, 1991 must be certified as complying with the requirements of this rule.

Background

On November 29, 1988 (53 FR 47982), NHTSA published a notice of proposed rulemaking (NPRM) proposing to require rear seat lap/shoulder belts to be installed in certain new vehicles. Specifically, this NPRM proposed to require passenger cars (including convertibles), light trucks, light multipurpose passenger vehicles (MPVs), and small buses to be equipped with lap/shoulder safety belts at all forward-facing rear outboard seating positions. Additionally, the NPRM proposed that these rear seat lap/shoulder belts be equipped with a particular type of retractor, that such belts be integral (i.e., the shoulder belt could not be detachable from the lap belt), and that such belts comply with some of the comfort and convenience requirements in Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208).

The agency received more than 70 comments on this NPRM. The issue of whether passenger cars other than convertibles should be equipped with rear seat lap/shoulder belts was relatively straightforward and noncontroversial. The consensus of the commenters was that such a requirement would be appropriate. Hence, to ensure the earliest possible implementation of such a requirement, NHTSA published a final rule on June 14, 1989 (54 FR 25275). That rule addressed only passenger cars other than convertibles, and required that all such vehicles manufactured on or after December 11, 1989 be equipped with rear seat lap/shoulder belts. That rule also expressly deferred resolution of all of the other issues proposed in the NPRM until a later date.

NHTSA published a final rule addressing the other issues raised in the NPRM, including the other vehicle types required to have rear seat lap/shoulder belts, the types of retractors with which those safety belts should be equipped, and the other performance attributes those safety belts should have, on November 2, 1989 (54 FR 46257). The agency received 14 petitions for reconsideration of this rule. This notice responds to those petitions. For the convenience of the reader, this notice uses the same organization and format that the November 2, 1989 final rule did. When a section heading used in the November 2, 1989 preamble is not set forth in this preamble, it means that no petitions for reconsideration requested changes to the rule's provisions discussed in that section.

Requirements of the Rule

Seating Positions Subject to the Requirements

The November 2, 1989 rule limited the requirement for rear seat lap/shoulder belts to outboard seating positions only. The term "outboard designated seating position" is defined at 49 CFR §571.3 as a designated seating position that, among other things, is less than 12 inches from the inside of the vehicle. A separate definition of "outboard designated seating position" was set forth in the November 1989 final rule to exclude seating positions adjacent to aisleways running between the seating position and the near side of the vehicle, even if those seating positions were less than 12 inches from that side of the vehicle. This exclusion of aisleway seats from the rear seat lap/shoulder belt requirement reflected NHTSA's determination that the shoulder belt stretched across the aisleway of a vehicle could cause entry and exit problems for occupants of seating positions to the rear of the aisleway seating position.

The November 1989 rule excluded aisleway seats from the rear seat lap/shoulder belt requirement only if the aisleway seats were in trucks, MPVs, and buses. NHTSA did not extend this exclusion to aisleway seats in the rear of passenger cars because the agency was not aware of any passenger car designs either currently in production or to be produced in the future that incorporate aisleways next to the second row of seats so as to permit access to the third and other more rearward rows of seats.

In its petition for reconsideration, Ford Motor Company (Ford) asserted that the exclusion of aisleway seats from the rear seat lap/shoulder belt requirement should be broadened to apply to aisleway seats in passenger cars as well as the other types of vehicles. According to Ford, the reasons for exempting aisleway seats in vans from rear seat lap/shoulder belt requirements are equally applicable, irrespective of whether the vehicle is classified as a passenger car, truck, MPV, or bus. Ford is implicitly suggesting that passenger vans, especially minivans, could be classified as passenger cars, and that, if such a classification were made, the aisleway seats in the vans would be required to be equipped with lap/shoulder belts if the aisleway seats were outboard seating positions. Ford believes that such aisleway seats should continue to be excluded from the rear seat lap/shoulder belt requirement, regardless of whether the minivan is classified as a passenger car, light truck, MPV, or bus.

NHTSA agrees with Ford's point that the same safety standards should apply to light trucks, MPVs, buses, and passenger cars, as reflected in the agency's rulemaking actions extending provisions that had applied only to passenger cars so that those same provisions will now also apply to light trucks, MPVs, and buses. Accordingly, this rule includes the same definition of "rear outboard designated seating position" for passenger cars that was previously specified for trucks, MPVs, and buses.

Retractor Types Required for Rear Seat Lap/Shoulder Belts

The NPRM contained a detailed discussion of the agency's previous statements on this subject, and repeated the agency's previous conclusion that only ELRs should be permitted as the retractor for the lap belt portion of the lap/shoulder belt system. *See* 53 FR 47987–47989; November 29, 1988. This proposed requirement was based on the fact that ELRs for the lap belt made the belt system more comfortable and convenient for adult occupants, thereby tending to increase use of the belt system. Although active children can make some child restraints unstable if the child restraint is secured by a lap belt that incorporates an ELR, NHTSA knows of no data showing that this potential instability would affect the safety performance of the child restraint in a crash. Additionally, the agency stated that products called "locking clips" can be installed on the webbing of belts equipped with an ELR to prevent webbing movement.

After analyzing its proposal in response to the many comments received on this subject, NHTSA concluded that the low-speed movement of child safety seats held by safety belts that use an ELR seems to have given rise to questions and concerns about the safety and effectiveness of child seats when used with such belts. In the preamble to the final rule, NHTSA stated:

> Even if these questions and concerns have not been substantiated, the public may not be as likely to use child safety seats if there are perceived questions about the effectiveness of those seats. NHTSA has concluded that it is appropriate to take action to remove those perceived questions, so as to maintain public trust and confidence in the efficacy of child seats. 54 FR 46262; November 2, 1989.

To implement this conclusion, NHTSA devised an approach in its final rule intended to both ensure comfort for adult occupants of safety belt systems and tight securing of child safety seats by those same safety belt systems. First, the final rule required that any lap belt or lap belt portion of a lap/shoulder belt installed at an outboard seating position in compliance with Standard No. 208 be equipped with an ELR. In its petition for reconsideration, Ford correctly noted that this requirement would mean that side-facing and rear-facing outboard seating positions would be required to be equipped with ELRs for the lap belts, even though side-facing and rear-facing outboard seating positions were expressly excluded from the lap/shoulder belt requirements. Ford asserted that this was a major change from the proposal, which had been limited to forward-facing outboard seating positions, and that insufficient leadtime had been permitted to allow it to install ELRs on the lap belt in its vehicles with side-facing seats (such as extended cab pickups) and rear-facing seats (such as station wagons).

Upon reconsideration, NHTSA has decided that this provision of the final rule was overly broad. The agency will examine the issue of whether it may be appropriate to amend the retractor requirements for side-facing or rear-facing outboard seating positions. If NHTSA decides to propose such an action, that proposal will be the subject of a separate rulemaking action. For this rulemaking action, however, the agency did not intend to establish or amend any requirements, including retractor requirements, for seating positions that are not forward facing or adjustable to a forward-facing position. *See* 54 FR 46258–46259; November 2, 1989. Therefore, in response to Ford's petition, this notice limits the retractor requirements of S7.1.1.3 to seating positions that are forward facing or adjustable to a forward-facing position.

The second prong of the final rule's approach to ensuring adult comfort and tight securing of child seats from the same belt systems was a new requirement that safety belts that incorporate an ELR in the lap belt or lap belt portion of a lap/shoulder belt shall provide some means, other than an external device requiring manual attachment or activation, that will prevent any further webbing from spooling out until that means is released or deactivated. This requirement, which was set forth in a new S7.1.1.5 of Standard No. 208, would allow safety belt systems equipped with an ELR to secure child seats as tightly as belt systems equipped with an ALR.

All but one of the fourteen petitioners for reconsideration objected to this new requirement in Standard No. 208. The two primary objections to this requirement did not relate to the merits of promoting the tight securing of child seats. First, the petitioners asserted that the NPRM had not given the public notice or opportunity to comment on such a requirement. Hence, according to this argument, the adoption of such a requirement in the final rule violated the informal rulemaking provisions set forth in the Administrative Procedure Act (5 U.S.C. 551 *et seq.*). Second, the petitioners asserted that the absence of any procedures for determining compliance with this requirement meant that the requirement was not stated in objective terms, as required by the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1381 *et seq.*).

NHTSA has tentatively concluded anew that it is necessary and appropriate for Standard No. 208 to include a requirement to ensure that safety belt systems are both comfortable for adult users *and* can tightly secure child safety seats. In the November 2, 1989 final rule, the agency sought to achieve this purpose by means of S7.1.1.5. The petitioners for reconsideration did not address the fundamental questions of the necessity for and validity of the agency's underlying purpose. Instead, the petitioners focused exclusively on the means chosen to accomplish that purpose.

NHTSA wants to focus attention on the purpose of the requirement in S7.1.1.5 and away from the details of the means chosen to achieve that purpose. To do so, this rule removes S7.1.1.5 from Standard No. 208. Elsewhere in today's edition of the *Federal Register*, the agency has published a proposal to readopt S7.1.1.5. The proposed S7.1.1.5 includes an objective test procedure for determining compliance. The addition of the compliance test procedure and the opportunity to comment on this new regulatory requirement will eliminate the procedural objections raised in the petitions for reconsideration. Additionally, since S7.1.1.5 as promulgated in the November 1989 final rule was not scheduled to take effect until September 1991, this new notice and opportunity for comment will not result in any needless delays in establishing a new requirement for safety belts to be both comfortable for adult occupants and able to tightly secure child safety seats.

The Requirements With Which Rear Seat Lap/Shoulder Belts Must Comply For Readily Removable Seats. The November 1989 final rule included special provisions for lap/shoulder belts installed at rear outboard seating positions on readily removable seats. Such belts are permitted to detach at the upper anchorage only. If those belts are detachable at the upper anchorage, the means of detaching cannot include any sort of pushbutton release. Ford's petition for reconsideration asked that lap/shoulder belts on readily removable seats be permitted to detach at either the upper or lower anchorage and that the means of detachment should be permitted to include a pushbutton release.

In the final rule, the agency permitted lap/shoulder belts on readily removable rear seats to be detachable only at the upper anchorage point in response to comments by Ford and GM. Those manufacturers both commented that permitting lap/shoulder belts to be detachable at the upper anchorage would ease the problems of providing lap/shoulder belts at outboard seating positions on readily removable seats. After conducting its own analysis of this question, NHTSA concurred with these comments and adopted the requested provision.

However, in its petition for reconsideration, Ford asserted that limiting the detachment point to the upper anchorage point was "overly design restrictive." This was because, according to Ford, there was no safety reason for permitting the belt system to detach at the upper, but not the lower, shoulder belt anchorage point. While the agency believes there are legitimate safety reasons for permitting the belts to be detachable at only one point, there is no apparent safety purpose served by specifying that the single detachment point must be the upper, and not the lower, shoulder belt anchorage point. Accordingly, this notice amends Standard No. 208 to permit lap/shoulder safety belt systems installed at outboard seating positions on readily removable seats to detach at either the upper or lower shoulder belt anchorage, but not both.

Ford also asked in its petition that Standard No. 208 be amended to permit the means of detachment to be a pushbutton release. In the November 1989 final rule, NHTSA noted that S7.2 of Standard No. 208 has long required safety belt systems to use a *single* pushbutton buckle that releases the occupant from the lap belt and the shoulder belt simultaneously. Because of this requirement, the agency explained that manufacturers could *not* use a pushbutton release to detach the safety belt from the vehicle at an anchorage point, because the belt system would then have *two* pushbutton releases. The agency explained that the requirement for a single pushbutton release helped ensure that an occupant could not easily release either the lap belt or shoulder belt portion of the safety belt system and use only the unreleased portion of the safety belt system. Instead of a pushbutton release at the anchorage point where the safety belt detaches from the vehicle, the agency indicated that manufacturers could use a slide button or slide collar as the release.

Ford asked for reconsideration of this requirement, asserting that a slide button or slide collar release "tends to rattle and provides less control over . . . the fit of the shoulder belt." Even accepting these assertions as correct, NHTSA does not believe they are sufficient reason to permit the use of a pushbutton release as the means for detaching the lap/shoulder belt from the vehicle. As explained in the final rule and above, a pushbutton mechanism that detached a safety belt assembly from the vehicle at an anchorage point would increase the ease with which an occupant could detach either the lap belt or shoulder belt portion of the belt system and use only one part of the safety belt. The agency again concludes that a slide button or slide collar used as the means of detaching a shoulder belt will permit the belt to be detached when the readily removable seat is removed, and minimize the possibility that an occupant will detach a portion of the lap/shoulder belt system when the readily removable seat is in place in the vehicle. To emphasize the agency's intent, express language has been added to the standard *prohibiting* the use of pushbutton mechanisms to detach lap/shoulder belt systems installed for readily removable seats. With respect to Ford's assertions that slide button or collar releases tend to rattle and present more problems for proper shoulder belt fit, NHTSA concludes that the manufacturers have sufficient engineering expertise to resolve such issues.

Ford asked in its petition for an additional year of leadtime for installing rear seat lap/shoulder belts at outboard positions on readily removable seats, if its request to use a pushbutton release to detach safety belts at such positions were denied. Ford stated that this extra leadtime was needed because it would now be required to make changes to its safety belt systems, the anchorages for those systems, and the seat structure of the readily removable seats to comply with the requirement for a single pushbutton release on a belt system. NHTSA believes that this request is reasonable. Ford's vehicles represent an appreciable percentage of the total number of vehicles equipped with readily removable seats, most notably the Aerostar and Econoline vans. These vehicles do not currently use, nor did Ford plan to begin using, a release mechanism that complies with the requirements that are scheduled to take effect on September 1, 1991. Accordingly, Ford will need to make the changes described in its petition. NHTSA has concluded that an additional year of leadtime is needed to allow Ford to make the necessary changes. Therefore, this notice delays the requirement for rear seat lap/shoulder belts to be installed at outboard seating positions on readily removable seats for one year, so that it now applies to vehicles manufactured on or after September 1, 1992.

Economic and Other Impacts of the November 1989 Final Rule

The Recreation Vehicle Industry Association (RVIA) filed a petition for reconsideration of the November 1989 final rule, based on the economic impacts that rule would have on vans, especially vans modified by final stage manufacturers and alterers. RVIA asked that vans with a gross vehicle weight rating (GVWR) of more than 6,000 pounds be excluded from the requirement for rear seat lap/shoulder belts, instead of the 10,000 pound GVWR cap that was established in the November 1989 final rule. The basis for this request was that there would be lesser safety benefits resulting from rear seat lap/shoulder belts in these vehicles (because the vehicles are "structurally stronger, larger and heavier than passenger cars") and higher costs to install those belts (because of the necessary structural modifications).

NHTSA has reexamined its previous decision in response to this request and determined that RVIA has not presented any reasons for changing the requirements of the previously published rule. Notwithstanding RVIA's general assertions about the differences between large vans and passenger cars, the 1988 fatality rate for large vans was slightly higher than the fatality rate for large cars. These comparative fatality rates show that RVIA's assertion that occupants of large vans have a lesser need for safety protection because of the structural differences between vans and cars is *not* borne out by real world experience.

The agency has acknowledged that the costs of installing rear seat lap/shoulder belts in vans will be greater than the costs of installing those safety belts in passenger cars, because vehicles other than passenger cars may need structural modifications to accommodate the shoulder belt portion of lap/shoulder belts at rear seating positions. However, the agency has concluded that the structural modifications generally do not pose any serious technical difficulties and that the safety benefits that would result from rear seat lap/shoulder belts in these vehicles were more than sufficient to justify the additional burden. *See* NHTSA's Final Regulatory Evaluation of this rule in Docket No. 87-08; Notice 5 and the discussion in the NPRM for this rule at 53 FR 47986; November 29, 1988. These agency conclusions were reached after a thorough consideration of all available data. RVIA's petition sets forth no additional evidence or other reasons to believe that the agency conclusions were wrong, so NHTSA has no basis for changing those conclusions in response to the RVIA petition.

Alternatively, RVIA asked that the rear seat lap/shoulder belt requirement be limited to vans that are within the weight limits established for dynamic testing of manual safety belts, i.e., a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. The justification for this request was the costs and burdens that would be imposed on van converters to equip rear outboard seating positions with lap/shoulder safety belts.

NHTSA has often acknowledged that final stage manufacturers and alterers lack the technical expertise and financial resources of the larger manufacturers. Because of the lesser technical and financial capabilities of the final stage manufacturers and alterers, the burdens associated with NHTSA's regulatory requirements will always be proportionally larger for these small entities than for the larger manufacturers. Thus, the relevant question is not whether the burden is proportionally larger for these small entities, but instead whether the burden imposed by a new regulatory requirement is excessive for small entities.

When developing the final rule for rear seat lap/shoulder belts to be installed by small entities like van converters, NHTSA carefully considered the potential burdens the rule would impose on small businesses and determined that any such burdens would be relatively minor. All rear outboard seating positions already installed in the vehicles delivered to van converters for conversion must be equipped with rear seat lap/shoulder safety belts. Thus, if the van converter is not making any modifications to the seating position, it can simply leave in place the rear seat lap/shoulder belt assembly and anchorages installed by the original manufacturer of the vehicle. This imposes no burdens on the van converter.

If the van converter is adding a new rear outboard seating position, or modifying an existing outboard seating position, the van converter will be subject to some additional burdens, but those burdens are far from excessive. For all types of motor vehicles other than buses, manufacturers (including van converters) have long been required to install lap-only belts and anchorages for those belts at each designated seating position. To certify compliance with these requirements, van converters must now add two weldments or make some simple structural modifications for the lap belt anchorages and install a lap-only belt at every rear outboard seating position it adds to a conversion van. To install lap/shoulder belts, instead of lap-only belts, at those seating positions, the van converter must add an additional weldment or make an additional simple structural modification and install a lap/shoulder belt in place of the lap-only belt. This added burden does not require any additional engineering expertise or crash testing. In the Final Regulatory Evaluation that accompanied the November 1989 final rule, NHTSA estimated that the rear seat lap/shoulder belt requirement would increase costs by $13 for each rear outboard seating position in these vehicles. NHTSA concluded that these burdens are not excessive, and RVIA provided no information indicating either that this previous agency conclusion was wrong or that NHTSA had failed to consider some relevant information in reaching this conclusion. Accordingly, RVIA's petition to amend the rear seat lap/shoulder belt requirements is denied.

RVIA also challenged NHTSA's certification that the rear seat lap/shoulder belt rule will not have a significant economic impact on a substantial number of small entities. RVIA noted that a publication identifies more than 2,600 van converters in the United States. However, NHTSA's certification was based upon the fact that the rear seat lap/shoulder belt requirements will *not* have a significant economic impact on small entities, as explained above, regardless of the number of small entities that will be affected.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

1. S4.1.4 of Standard No. 208 is amended by revising S4.1.4.2(b), adding a new S4.1.4.2(c), and revising S4.1.4.2.2, to read as follows:

S4.1.4 *Passenger cars manufactured on or after September 1, 1989.*

* * * * *

S4.1.4.2 (a) * * *

(b) Except as provided in S4.1.4.2.1 and S4.1.4.2.2, each passenger car, other than a convertible, manufactured on or after September 1, 1990 and each convertible passenger car manufactured on or after September 1, 1991 shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR §571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

(c) As used in this section, "rear outboard designated seating position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating position adjacent to a walkway that is located between the seat and the near side of the vehicle and is designed to allow access to more rearward seating positions.

S4.1.4.2.1 * * * * *

S4.1.4.2.2 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.1.4.2 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action.

2. S4.2.4 of Standard No. 208 is amended by revising the introductory text and S4.2.4.3 to read as follows:

S4.2.4 *Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with* *a GVWR of 10,000 pounds or less.* Except as provided in S4.2.4.2 and S4.2.4.3, each truck and each multipurpose passenger vehicle, other than a motor home, manufactured on or after September 1, 1991 that has a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR §571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

* * * * *

S4.2.4.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.2.4 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action.

3. S4.4.3 of Standard No. 208 is amended by revising S4.4.3.2 and S4.4.3.2.3 to read as follows:

S4.4.3 *Buses manufactured on or after September 1, 1991.*

* * * * *

S4.4.3.2 Except as provided in S4.4.3.2.2 and S4.4.3.2.3, each bus with a gross vehicle weight rating of 10,000 pounds or less, except a school bus, shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the front and every rear forward-facing outboard designated seating position, and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR §571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

* * * * *

S4.4.3.2.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.4.3.2 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action.

* * * * *

4. S7.1.1.3 of Standard No. 208 is revised to read as follows:

S7.1.1.3 A Type 1 lap belt or the lap belt portion of any Type 2 seat belt assembly installed at any forward-facing outboard designated seating position of a vehicle with a gross vehicle weight rating of 10,000 pounds or less to comply with a requirement of this standard, except walk-in van-type vehicles and school buses, shall meet the requirements of S7.1 by means of an emergency locking retractor that conforms to Standard No. 209 (49 CFR §571.209).

5. S7.1.1.5 of Standard No. 208 is removed and reserved.

Issued on July 25, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 30914
July 30, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Crash Tests With Unrestrained Dummies
(Docket 74-14; Notice 66)
RIN 2127-AC13

ACTION: Interim final rule with request for comments.

SUMMARY: This rule amends Standard No 208, *Occupant Crash Protection*, by extending the period during which a Hybrid II test dummy will be the only dummy used in compliance tests of vehicles that employ means other than safety belts or air bags to meet the standard. The standard had formerly provided that a Hybrid III test dummy could be used to test such a vehicle manufactured on or after September 1, 1990. This rule delays the use of the Hybrid III test dummy for compliance testing of such vehicles until September 1, 1993. This additional time is needed to allow the agency to complete and evaluate the many research projects that are now underway examining the Hybrid III test dummy. Once this has been done the agency will be able to establish requirements for the use of Hybrid III test dummies that will ensure both that vehicles that do not use safety belts or air bags will provide adequate protection for drivers and passengers in actual crashes and that the Hybrid III test dummy is equivalent to the Hybrid II test dummy in these situations. This rule does not affect the requirement that vehicle manufacturers have the option of specifying the use of either the Hybrid II or the Hybrid III test dummy in compliance testing of vehicles that use either air bags or safety belts to meet the standard.

DATES: *Effective date*: This rule takes effect on September 26,1990.

SUPPLEMENTARY INFORMATION:

Background. The Hybrid II test dummy has been incorporated in Subpart B of 49 CFR Part 572 since August 1, 1973. This test dummy is used to assess the occupant protection afforded vehicle occupants in frontal crashes. To serve this purpose, instruments in the dummy measure the acceleration at the center of gravity of the dummy's head, the acceleration at the center of gravity of the dummy's upper thorax (chest), and the compressive force transmitted axially through each upper leg. These forces cannot exceed the maximum levels set forth in Standard No. 208, *Occupant Crash Protection.* NHTSA had concluded that the Hybrid II test dummy was a reasonable simulation of a human. The maximum force levels set forth in Standard No. 208 were set at levels that would minimize the likelihood of serious injury or death for vehicle occupants in frontal crashes.

For more than a decade, the Hybrid II test dummy was the only test dummy specified in NHTSA's regulations for use in Standard No. 208 compliance testing. However, on July 25, 1986 (51 FR 26688), NHTSA published a rule establishing a second test dummy for use in Standard No. 208 compliance testing. This test dummy was the Hybrid III test dummy, and the specifications for it appear at Subpart E of 49 CFR Part 572. The agency concluded that this test dummy would allow the assessment of more types of potential injuries to vehicle occupants and that this test dummy appeared to be an even more accurate simulation of a human than the older Hybrid II test dummy. The rule establishing the Hybrid III test dummy for use in compliance testing required that the same force levels that are measured and recorded for the Hybrid II test dummy would be measured and recorded for the Hybrid III test dummy, and that the same maximum injury criteria levels would apply to both types of test dummies.

When either of two types of test dummies may be used for compliance testing for a safety standard, it is important that the two types be "equivalent," i.e., that they display only minimal differences in test results when they are exposed to equivalent crash environments. The importance of equivalence is that vehicles, which will pass or fail a safety standard using one type of dummy, will achieve essentially the same result using the other type of dummy. This ensures that compliance or noncompliance with a safety standard is entirely dependent upon vehicle attributes instead of differing attributes of the types of test dummies.

When the Hybrid III test dummy was incorporated into Part 572, NHTSA concluded that the Hybrid II and III test dummies were equivalent when the dummies were restrained by safety belts or air bags. However, the agency concluded that the two types of test dummies were *not* equivalent when they were unrestrained. The chest acceleration measurements for unrestrained Hybrid III dummies were consistently lower than the chest acceleration measurements for unrestrained Hybrid II dummies. If the two test dummies were to be equivalent when they were unrestrained, some measurement of injury producing forces to the chest of the Hybrid III test dummy, in addition to the existing measurement of chest acceleration, would have to be made to compensate for the lower chest acceleration measurements for unrestrained Hybrid III test dummies. Chest injuries generally are caused by excessive loading on the chest, when the chest contacts the restraint system and possibly the steering system, if the occupant is restrained, or the steering system and/or other passenger compartment components, if the occupant is unrestrained. The agency concluded that a measurement of the amount the chest was deflected, or compressed, as measured approximately at the sternum, for the Hybrid III test dummy would appropriately compensate for that dummy's lower chest acceleration measurements when it was unrestrained. Hence, a limit was established on the amount of chest deflection permitted when the Hybrid III test dummy was used in compliance testing.

Both the notice of proposed rulemaking and the final rule adopting the Hybrid III test dummy divided all occupant protection systems into two groups. One chest deflection limit (3.0 inches) was established for air bags ("restraint systems that are gas inflated and provide distributed loading to the torso during a crash") and another chest deflection limit (2.0 inches) was established for all other occupant protection systems. The effect of this latter chest deflection limit was to treat as a single category vehicles in which occupants were restrained by safety belts and vehicles in which occupants were unrestrained. Subsequently, the agency determined that the limited data that were available called into question the wisdom of treating safety-belt restrained and unrestrained occupants as a single group for the purposes of the chest deflection limit.

Reponse to Petitions for Reconsideration of the Rule Establishing the Hybrid III Test Dummy. In response to the petitions for reconsideration of the final rule establishing the Hybrid III test dummy, NHTSA reexamined its previous decision to establish a single chest deflection limit for all occupant protection systems other than air bags. The available accident data suggested that, when the crash forces that produce as much as 2.9 inches of chest deflection in the Hybrid III test dummy are imposed on the human chest by 2-point safety belts, those forces appear not to expose vehicle occupants to a significant risk of serious chest injury. Since the agency had treated occupants restrained by safety belts in the same category as those that were unrestrained for the purposes of the chest deflection limit, one would infer that the same level of chest deflection that appeared not to expose safety belt-restrained occupants to significant risks of serious chest injury would likewise not expose unrestrained occupants to significant risks of serious chest injury. However, the accident data and the limited biomechanical data that were available for unrestrained occupants raised concerns about such an inference.

Further, as explained above, NHTSA was concerned that the Hybrid II and Hybrid III test dummies be equivalent. None of the limited data that were available suggested that a 3 inch chest deflection limit for unrestrained test dummies would make the Hybrid III equivalent to the Hybrid II test dummies in those situations. Because of these concerns, the agency concluded that it should not permit the Hybrid III test dummy to be used for compliance testing with the automatic crash protection requirements of vehicles manufactured before September 1, 1990, which used means other than air bags or automatic safety belts to provide the automatic protection. To the best of the agency's knowledge, no manufacturer had any plans to certify a vehicle design as complying with the automatic crash protection requirements without using automatic safety belts or air bags. Hence, this temporary delay in the use of the Hybrid III test dummy for such vehicles was more significant in theory than in practice. NHTSA stated in the 1988 response to the petitions for reconsideration of the Hybrid III rulemaking that delaying until September 1, 1990 would be sufficient to allow the agency to investigate this subject further, to ensure that the chest deflection limit that would be established for unrestrained Hybrid III test dummies would both meet the need for safety and ensure equivalence of the Hybrid II and Hybrid III test dummies in unrestrained conditions.

Activities After the Response to Petition for Reconsideration. At the time of the March 1988 response to petitions for reconsideration, the agency anticipated that the research needed to determine the appropriate chest deflection limit for unrestrained occupants would be completed early enough to allow the agency to make that determination by September 1, 1990. This anticipation reflected NHTSA's belief that the primary tasks of the research activities would be to develop more sophisticated and suitable instrumentation systems for measuring chest deflection and reviewing the existing biomechanical research to determine what chest deflection limit should be established. NHTSA promptly undertook research to address these tasks.

The research undertaken by the agency and test data received from sources outside the agency, including General Motors, Mercedes-Benz, Toyota, INRETS (a French government research and development group), and the Motor Industry Research Association (a British group), have shown that chest deflection dynamics within the Hybrid III test dummy are far more complex than the agency originally believed and that more sophisticated and suitable instrumentation systems would need to be developed to provide measurements of kinematic distortions of the dummy ribcage. In spite of these unexpected complexities, the agency believes it has developed instrumentation that could be of immediate use. However, the research and test data also raised more basic questions about biomechanical shortcomings of the existing thoracic structure of the Hybrid III test dummy. These biomechanical questions cannot yet be answered, as explained below.

Copies of the testing and research reports describing the testing and research of which the agency is aware and that have become available since March 1988 has been placed in the public docket for this rulemaking. Interested persons are advised to examine those documents for more details on the agency's testing and the results of testing by other entities.

The review of existing biomechanical research and the additional information that has become available since March 19BB raised questions about the suitability of evaluating the potential for thorax injury to vehicle occupants by means of a single point measurement of chest deflection. Test data now indicate that the Hybrid III dummy's centrally located chest deflection sensor measures actual chest deflection only when the load is symmetrically distributed around the chest deflection sensor in the plane of the sternum and when the dummy's chest moves primarily along a single axis, such as a forward-rearward direction, as is generally the case when the dummy is restrained by either a safety belt or an air bag. Agency tests and the test conducted by INRETS show that the existing deflection sensor does not appear to measure true thorax penetration when the thorax is subJected to loading that is concentrated in a small area, when the loading is not symmetrical, or when the impact with the thorax is off-center. The Toyota testing indicated that shifting the positioning of the shoulder belt relative to the Hybrid III dummy's chest deflection sensor affects the measured deflection value and may not indicate the true magnitude of the deflection that occurs.

In response to these questions, NHTSA initiated research to try to develop either supplementary or alternative technologies for measuring chest deflection in the Hybrid III test dummy. This research allowed the agency to develop two alternative technologies for measuring chest deflection. The first approach measures chest deflection by using string potentiometers at eight points mounted internally around the test dummy's thorax. The second approach consisted of developing an instrumented chestband called an External Peripheral Instrument for Deformation Measurement (EPIDM). NHTSA developed the EPIDM because of the extreme difficulties in measuring chest deflection levels of the cadaver thorax during impacts in vehicle crash environments. In addition to these agency research efforts, NHTSA has learned that Mercedes-Benz is exploring methods of determining chest deflections by measuring the strain imposed on the ribs during the impact.

Further, the Society of Automotive Engineers Committee on Human Biomechanics Simulation formed a task force on September 1, 1988. The mandate of this task force is to evaluate, compare, and recommend for practical application appropriate chest deflection measuring technologies. That task force is currently reviewing several existing methods to measure chest deflection in the Hybrid III test dummy At this time, the agency understands that this task force expects to reach conclusions and make its recommendations by early 1991.

If the agency had been correct in its March 1988 belief that all that was needed to make the Hybrid III test dummy acceptable for use in testing unrestrained occupants was to develop more sophisticated and suitable instrumentation systems for measuring chest deflection, no additional postponement of the use of Hybrid III for testing unrestrained occupants would be needed. The eight-point chest deflection measurement could be proposed for use now, and the EPIDM and Mercedes' approach might enhance the measurement capabilities in the future. However, test data, particularly the INRETS and Toyota studies referenced earlier, that have become available since March 1988, have suggested shortcomings in the biofidelity of the Hybrid III thorax as it interacts with typical restraint systems.

In response to these data, NHTSA and other parties have undertaken biomechanical research to verify or disprove these studies and to determine if modifications to the Hybrid III thorax could address the problems suggested by the INRETS and Toyota data. The agency has placed in the docket for this rulemaking action a document listing those research activities relevant to the appropriate chest deflection limit for unrestrained Hybrid III test dummies that have been completed since March 19BB and those that are planned in the near future, both by this agency and by outside parties. The biomechanical research that is now necessary is far more complex and time-consuming than the research the agency anticipated was needed in March 1988. Additionally, biomechanical research is paced by the scarcity of cadavers for use in the testing. Accordingly, it was not possible for NHTSA to satisfactorily resolve the issue of the Hybrid III test dummy in unrestrained situations by September 1, 1990.

Requirements of and Need for this Interim Final Rule. The testing NHTSA now has planned or in preliminary assessment of the test data available by the end of 1992. As this research progresses, it may be determined that the current Hybrid III thorax design will be shown to be adequate, if it includes new chest deflection measurement instrumentation with an appropriate chest deflection limit for unrestrained occupants. Alternatively, the Hybrid III thorax structure may be shown to need further refinements for use in certain types of crash loading situations, such as unrestrained. In that case, if alternative thorax designs are available and the alternative designs appear to overcome the problems of the current Hybrid III thorax in those crash loading situations, the agency would propose to incorporate those alternative designs into the Hybrid III test dummy. If the research program is unable to uncover solutions to any identified shortcomings, the agency would have to determine the most appropriate course of action.

Regardless of which of these scenarios eventually comes to pass, the results of the research program will enable the agency to determine the most appropriate course of action. That research program will be completed by December 1992. Hence, NHTSA believes that it will be able to determine the most appropriate course of action and complete the necessary rulemaking actions by September 1, 1993. The agency has also concluded that the public interest would be best served by prohibiting the use of the Hybrid III test dummy in crash situations where it would be unrestrained, until NHTSA has determined the appropriate chest deflection limits and measurement techniques for the Hybrid III test dummy in those crash situations. Accordingly, this rule specifies that any vehicles manufactured before September 1, 1993 that comply with the automatic restraint requirement without using any type of safety belt or inflatable restraint must use only the Hybrid II test dummy in testing for compliance with the automatic restraint requirement.

The agency finds for good cause that notice and opportunity for comment on this rule before it becomes effective would be impracticable and contrary to the public interest, as explained below. First, the circumstances that have forced this postponement were beyond the agency's control. In this instance, the agency did not anticipate that its research program would raise substantial biomechanical issues with respect to the Hybrid III thorax, nor was there an available body of data indicating that these results were likely. Since neither the need for, nor the appropriate direction of, the additional research were known to NHTSA or any other party, NHTSA had no influence or control over those circumstances.

Second, the agency acted diligently to initiate the supplemental biomechanical testing and to try to devise modifications to the Hybrid III thorax that would have allowed this test dummy to be used for compliance testing in unrestrained situations. However, the magnitude of the biomechanical issues that have become apparent was too great to allow the agency to propose an effective solution at this time.

Third, the agency announced in its 1988 final rule that Hybrid III test dummies could be used in unrestrained testing of vehicles manufactured on or after September 1, 1990. NHTSA fully intended to permit the Hybrid III to be used for unrestrained testing, even though the agency thought it might act at a later date to lower the chest deflection limit for the Hybrid III test dummy when unrestrained. This intention reflected the agency's belief that the basic approach of using chest deflection measurements on the Hybrid III dummy would ensure acceptable protection against thoracic injury for unrestrained vehicle occupants in real world situations, even if the permissible amount of chest deflection were subsequently lowered for unrestrained occupants. However, the available research now suggests that chest deflection measurements on the Hybrid III dummy may not be an acceptable approach to ensuring safety protection for unrestrained vehicle occupants. Since ensuring occupant safety is NHTSA's mission, this recently available research has forced the agency to alter its previously announced intent on this subject.

Fourth, the postponement of the use of the Hybrid III test dummy in unrestrained situations is for a relatively short time, until September 1, 1993. Vehicle manufacturers have already begun the preliminary work on their 1993 models that will be produced before September 1, 1993. NHTSA is not aware of any manufacturer that plans to produce a 1993 model that does not rely on either safety belts or air bags to provide occupant protection. Thus, no manufacturer will have to change its plans in response to this postponement. On the other hand, this issue will be resolved quickly enough to allow manufacturers that wish to pursue development of occupant protection systems that do not use safety belts or air bags to proceed expeditiously.

Fifth, NHTSA will consider all comments that are received on this subject and promptly publish a permanent final rule reflecting NHTSA's evaluation of those comments. To the extent that this interim final rule imposes any unforeseen burdens or otherwise affects some party, the permanent final rule will promptly resolve that problem.

After considering all these factors together, NHTSA has concluded that good cause exists to dispense with notice and comment before this interim final rule takes effect. This same good cause justifies making this final rule effective upon publication in the *Federal Register*, instead of 30 days after publication.

In Consideration of the foregoing, 49 CFT Part 571 is amended as follows:

S5 of Standard No.208 is amended by revising the introductory text of S5.1 and the introductory text of S5.2.1, to read as follows:

S5. Occupant crash protection requirements.

S5.1 Vehicles subject to S5.1 shall comply with either S5.1(a) or S5.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(a) by means not including any type of seat belt or inflatable restraint shall comply with S5.1(a).

* * * * *

S5.2 Lateral moving barrier crash test.

S5.2.1 Vehicles subject to S5.2 shall comply with either S5.2.1(a) or S5.2.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(c) by means not including any type of seat belt or inflatable restraint shall comply with S5.2.1(a).

* * * * *

Issued on: October 31, 1990.

Jerry Ralph Curry
Administrator

55 F.R. 39280
September 26, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208
Occupant Crash Protection

(Docket No. 74-14; Notice 67)
RIN 2127-AD38

ACTION: Final rule.

SUMMARY: Standard No. 208, Occupant Crash Protection, requires vehicles to be equipped with warning light systems designed to remind vehicle occupants to use safety belts. Standard No. 208 has required different warning systems for vehicles equipped with manual belts and vehicles equipped with automatic belts. For vehicles equipped with manual safety belts, the Standard has required that a warning light come on for 4 to 8 seconds when the vehicle's ignition is turned on, regardless of belt use. For vehicles equipped with automatic safety belts, the Standard has required illumination of a warning light for at least 60 seconds when the ignition is turned on, if there are indications that the driver's safety belt is not in use, and allows the light to remain illuminated longer than that. On June 28, 1990, NHTSA proposed an amendment to give manufacturers the option of using in passenger cars equipped with manual belts the same type of warning system currently required in cars equipped with automatic safety belts. The proposed amendment was requested by General Motors Corporation in a December 11, 1989 petition for rulemaking. After considering comments on the proposal, NHTSA is adopting the amendment without substantive change in this final rule. Since the warning system for automatic safety belts is more stringent than the warning system for manual belts, NHTSA believes that the amendment could result in greater safety protection.

EFFECTIVE DATE: The amendments made by this final rule to the *Code of Federal Regulations* are effective January 29, 1991.

Background

Standard No. 208, Occupant Crash Protection (49 CFR 571.208), is intended to reduce the likelihood of occupant deaths and the likelihood and severity of occupant injuries in crashes. The standard requires vehicles to be equipped with occupant restraints (e.g., safety belts) and with warning systems designed to remind vehicle occupants to use safety belts. Standard No. 208 has required different warning systems for vehicles equipped with manual belts and vehicles equipped with automatic belts.

For vehicles equipped with manual safety belts, section S7.3 has required that a warning light come on for 4 to 8 seconds when the vehicle's ignition is turned on, regardless of whether the driver is using his belt. However, there is no requirement that a warning light remain activated after that time, even if the driver's belt is not in use.

For vehicles equipped with automatic safety belts, section S4.5.3.3(b) has required illumination of a warning light for at least 60 seconds when the ignition is turned on, if there are indications that the driver's safety belt is not in use. The warning light is permitted to stay on for longer than 60 seconds. The light must also be activated if the belt is nondetachable and the emergency release mechanism is in the released position.

On December 11, 1989, General Motors Corporation (GM) petitioned NHTSA to amend section S7.3 of Standard No. 208 to allow manufacturers to use a safety belt warning system that meets the requirements for automatic safety belt warning systems as an alternative to the warning system that was specified for manual belt systems. GM stated that increasing the duration of the manual belt warning light beyond the 8-second limitation could increase the effectiveness of the reminder.

NHTSA granted the GM petition on January 5, 1990. On June 28, 1990, NHTSA proposed an amendment to give manufacturers the option of using in passenger cars equipped with manual belts the same type of warning system currently required in cars equipped with automatic safety belts. Since the automatic safety belt warning system is more stringent than the warning system for manual belts, NHTSA tentatively concluded that the amendment could result in greater safety protection.

NHTSA received five comments on the proposal, four from motor vehicle manufacturers and one from an automobile dealers association. All commenters supported the proposal without reservation. One commenter suggested revised regulatory language to provide greater clarity and avoid potential problems of interpretation.

Final Rule

After reviewing the comments, NHTSA has decided to adopt the amendment in this final rule without substantive change. NHTSA has revised the regulatory text of the amendment to provide greater clarity.

The primary purpose of the safety belt warning light requirements in Standard No. 208 is to encourage the use of safety belts. If a manufacturer chooses the newly permitted option, there would be two differences from the warning system requirements previously applicable.

First, the warning light would remain on for at least 60 seconds if the driver did not buckle his or her safety belt. NHTSA stated in the proposal that increasing the duration of the manual belt warning light beyond the 8-second limitation could increase the effectiveness of the reminder and thus increase use of safety belts. No commenters disagreed with this point.

Second, the safety belt warning light would not come on if the driver buckled the safety belt before inserting the ignition key. NHTSA stated in the proposal that this would not have a major impact on safety belt use at other seating positions. In such a case, the driver would already have buckled his or her safety belt and thus set an example for any passengers in the vehicle. No commenter disagreed with this point.

The requirements in Standard No. 208 for a 4 to 8 second audible signal when the ignition switch is turned on and the safety belt is not in use are not changed by this amendment. Since both vehicles equipped with automatic safety belts and vehicles equipped with manual safety belts are required to have the 4- to 8-second audible signal, the amendment does not change those requirements.

NHTSA stated in the proposal that the agency does not believe that the amendment raises any issues under section 125 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1410b). No commenter disagreed with NHTSA's position. Section 125 provides that no Federal motor vehicle safety standard may have the effect of requiring, or provide that a manufacturer is permitted to comply with such standard by means of, a buzzer which operates longer than 8 seconds after the ignition is turned to the "start" or "on" position and is designed to indicate that safety belts are not in use. However, section 125 does not prohibit a Standard permitting a safety belt warning light to remain illuminated for more than 8 seconds. Further, the legislative history of section 125 of the Safety Act does not suggest Congressional disfavor of such an approach.

NHTSA stated in the proposal that the agency intended to make the amendment effective immediately upon its publication in the *Federal Register* as a final rule. No commenter objected to NHTSA's stated intention. NHTSA finds that good cause exists to make the amendment effective immediately upon its publication. The amendment will not result in any additional burden to manufacturers since it simply provides manufacturers an option for the manual safety belt warning system. In addition, the amendment could result in greater safety protection since the automatic belt warning system requirements are more stringent than the manual belt requirements.

In consideration for the foregoing:

Section 571.208 is amended by revising S7.3 to read as follows:

S7.3 A seat belt assembly provided at the driver's seating position shall be equipped with a warning system that, at the option of the manufacturer, either

(1) activates a continuous or intermittent audible signal for a period of not less than 4 seconds and not more than 8 seconds and that activates a continuous or flashing warning light visible to the driver displaying the identifying symbol for the seat belt telltale shown in Table 2 of FMVSS 101 or, at the option of the manufacturer if permitted by FMVSS 101, displaying the words "Fasten Seat Belts" or "Fasten Belts," for not less than 60 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position) when condition (a) exists simultaneously with condition (b), or that

(2) activates, for a period of not less than 4 seconds and not more than 8 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position), a continuous or flashing warning light visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of FMVSS 101 or, at the option of the manufacturer if permitted by FMVSS 101, displaying the words "Fasten Seat Belts" or "Fasten Belts," when condition (a) exists, and a continuous or intermittent audible signal when condition (a) exists simultaneously with condition (b).

(a) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(b) The driver's lap belt is not in use, as determined, at the option of the manufacturer, either by the belt latch mechanism not being fastened, or by the belt not being extended at least 4 inches from its stowed position.

Issued on January 23, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 3222
January 29, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208
Occupant Crash Protection

(Docket No. 74-14; Notice 69)

ACTION: Final rule; technical amendment.

SUMMARY: This agency has discovered some errors in the most recent edition of Title 49 of the Code of Federal Regulations, with respect to NHTSA's occupant crash protection standard. This notice corrects those errors, so that the replacement for this edition of the Code of Federal Regulations will be accurate. No new obligations or duties are imposed on any party as a result of these corrections, since the corrections merely remove obsolete provisions from the Standard.

EFFECTIVE DATE: February 28, 1991.

SUPPLEMENTARY INFORMATION: On June 5, 1989 (54 FR 23986), NHTSA published a final rule amending Standard No. 208, Occupant Crash Protection (49 CFR § 571.208). S11.6 of Standard No. 208 sets forth the positioning procedures for the feet of Hybrid III test dummies positioned at the driver's or right front passenger's position.

Before the effective date of the June 5, 1989 final rule (December 4, 1989), the feet of Hybrid III test dummies could be positioned either in accordance with the procedures for positioning the feet of Hybrid II test dummies or in accordance with some less specific positioning procedures set forth in S11.6.1 through S11.6.3. However, the June 5, 1989 rule took away the option of using the less specific positioning procedure. Instead, that rule required that the feet of Hybrid III test dummies be positioned according to the procedures for positioning the feet of Hybrid II test dummies. The agency expressed this by revising S11.6 in the June 5, 1989 final rule. NHTSA believed that this amendatory language would remove all of S11.6, including the subordinate sections S11.6.1 through S11.6.3, from the version of Standard No. 208 printed in the Code of Federal Regulations, and replace it with the revised S11.6.

However, the October 1, 1990 version of Title 49 of the *Code of Federal Regulations* shows *only* the old language in S11.6 removed and the new S11.6 appearing in its place. Each of the subordinate paragraphs to the old version of S11.6 still appear in the text of Standard No. 208. The result is that S11.6 now specifies that the feet of the Hybrid III test dummy shall be positioned using the same procedures specified for the feet of the Hybrid II test dummy, while S11.6.1 through S11.6.3 provide an option of either using the positioning procedures for the Hybrid II test dummy or some less specific procedures. This is confusing to the reader and does not effectuate the agency's intention of removing the option of using the less specific positioning procedures. This amendment will remedy this problem by ensuring that the next revision of Title 49 of the *Code of Federal Regulations* removes S11.6.1 through S11.6.3 from Standard No. 208.

This amendment imposes no duties or responsibilities on any party, nor does it alter any existing obligations. Instead, this amendment will simply ensure that the public will have a correct copy of Standard No. 208 in Title 49 of the *Code of Federal Regulations*. Accordingly, NHTSA finds for good cause that notice and opportunity for comment on this amendment are unnecessary, and this amendment is effective as soon as this notice is published.

In consideration of the foregoing, 49 CFR § 571.208 is amended as follows:

S11.6.1 through S11.6.3 are removed.

Issued on February 25, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 8232
February 28, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208
Occupant Crash Protection

(Docket No. 74-14; Notice 70)
RIN 2127-AD10

ACTION: Final rule.

SUMMARY: This rule extends the requirements for automatic crash protection, which currently apply to front outboard seats in passenger cars, to front outboard seats in three additional types of light-duty vehicles. With automatic crash protection, occupants of those vehicle types will be protected by means that require no action by vehicle occupants. The effectiveness of automatic crash protection is dynamically tested, that is, a vehicle must comply with specified injury criteria, as measured on a test dummy, when tested by this agency in a 30 miles per hour barrier crash test. The three newly covered vehicle types are trucks, multipurpose passenger vehicles (such as passenger vans and four-wheel drive utility vehicles), and buses, all with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. These vehicles are collectively termed "light trucks" throughout the rest of this preamble.

The automatic crash protection requirements for light trucks will be implemented in a manner that closely parallels the manner in which the automatic crash protection requirements for cars were implemented. As was the case with passenger cars, the automatic crash protection requirements for light trucks will be phased in over a period of several years.

EFFECTIVE DATE: The changes made in this rule become effective September 23, 1991.

Light trucks manufactured before September 1, 1994 will not be required to comply with the automatic crash protection requirements set forth in this rule. Each manufacturer and each importer will be required to install automatic protection in—

20 percent of its light trucks manufactured from September 1, 1994 to August 31, 1995, inclusive;
50 percent of its light trucks manufactured from September 1, 1995 to August 31, 1996, inclusive;
90 percent of its light trucks manufactured from September 1, 1996 to August 31, 1997, inclusive; and
100 percent of its light trucks manufactured on or after September 1, 1997.

Alternatively, a manufacturer may choose to comply with a schedule which postpones by one year the date on which its first light truck must have automatic protection, but accelerates by two years the date on which all of its trucks must be so equipped. Under this alternative schedule, a manufacturer will not be required to equip any light trucks manufactured on or before August 31, 1995 with automatic crash protection, but must equip *all* light trucks manufactured on or after September 1, 1995 with automatic crash protection.

Background

Standard No. 208, Occupant Crash Protection (49 CFR 571.208) is intended to reduce the likelihood of occupant deaths and the likelihood and severity of occupant injuries in crashes. As one means of achieving these goals, Standard No. 208 has long required the installation of safety belts in passenger cars. Since September 1, 1989, Standard No. 208 has also required each new passenger car to be equipped with automatic crash protection for outboard front-seat occupants. Vehicles equipped with automatic crash protection protect their occupants by means that require no action by vehicle occupants. The effectiveness of automatic crash protection is dynamically tested, that is, a vehicle must comply with specified injury criteria, as measured on a test dummy, when tested by this agency in a 30 miles per hour barrier crash test. The two types of automatic crash protection currently offered on new passenger cars are automatic safety belts (which help to assure belt use) and air bags (which supplement safety belts and offer some protection even when safety belts are not used). Automatic crash protection in cars will save thousands of lives and prevent tens of thousands of serious injuries each year when all cars are so equipped.

Although Standard No. 208 has long required the installation of safety belts at all designated seating positions in light trucks, it has not required those vehicles to provide automatic crash protection.

NHTSA decided it was appropriate to consider whether light trucks should be required to offer automatic crash protection in front outboard seating positions, in addition to safety belts at all seating positions. This effort led NHTSA to propose to require automatic crash protection in light trucks in a notice of proposed rulemaking (NPRM) published on January 9, 1990 (55 FR 747).

That NPRM proposed to require automatic crash protection in trucks, multipurpose passenger vehicles (such as passenger vans and utility vehicles), and buses with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, and to measure the effectiveness of the automatic crash protection using the same crash test procedures specified for passenger cars. Additionally, the NPRM proposed to phase in the automatic crash protection requirements, as was done for the passenger car automatic crash protection requirements. Finally, to encourage the production of light trucks with air bags, it proposed to allow a "one-truck credit" provision for vehicles with air bags at the driver's position, along the lines of the "one-car credit" provision for passenger cars.

NHTSA received 34 comments in response to this NPRM. Commenters included vehicle manufacturers, air bag suppliers, trade associations, representatives of the insurance industry, academia, other governmental agencies, and consumers. Several of the manufacturers commented that they would have difficulty complying with some or all of the elements of the proposed implementation schedule. To further explore these comments, NHTSA requested additional information from five vehicle manufacturers (Chrysler, Ford, General Motors, Mazda, and Toyota) on May 24, 1990.

NHTSA has considered and analyzed all of the comments and other information in developing this final rule. For the convenience of the reader, this rule uses the same organization and format as the NPRM did.

Requirements of This Rule

1. *Vehicles Covered by This Rule*

The agency proposed to extend the requirements for automatic crash protection to trucks, multipurpose passenger vehicles, and buses with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. As noted in the NPRM, nearly all trucks and multipurpose passenger vehicles in this weight range will be required to comply with the injury criteria in a 30 mph barrier crash with manual lap/shoulder belts at the front outboard seats fastened around test dummies, or, at the manufacturer's option, with automatic crash protection for those seating positions, as of September 1, 1991. Given that implementation of this new crash testing requirement for light trucks would precede the implementation of the automatic restraint requirement for those vehicles, the agency stated in the NPRM that, "NHTSA believes that the need for structural changes to accommodate the installation of automatic crash protection in light trucks beginning in late 1993 would be minimal because of the changes already necessary to comply with the dynamic testing requirements in Standard No. 208 applicable to light trucks manufactured on or after September 1, 1991." 55 FR 749; January 9, 1990.

The commenters generally concurred with the proposal that trucks and multipurpose passenger vehicles be equipped with automatic crash protection. However, some commenters suggested that the installation of automatic crash protection would not be as simple as was implied in the NPRM, while others asked for additional leadtime to install automatic crash protection, and still others identified particular types of trucks and multipurpose passenger vehicles that could pose unique problems for automatic crash protection. This final rule requires trucks and multipurpose passenger vehicles to be equipped with automatic crash protection.

The NPRM also set forth a proposal to require automatic crash protection in front outboard seats of small buses, even though small buses will not be subject to the dynamic testing requirements that become effective September 1, 1991. The agency stated its belief that automatic crash protection in small buses would be practicable, especially because many van-type buses are based on a platform and drivetrain that are the same as or similar to the platform and drivetrain of van-type multipurpose passenger vehicles that will be subject to the dynamic testing requirements. Further, the NPRM set forth the agency's belief that the safety need for automatic crash protection for the driver and any other front outboard seat occupants in a small bus did not appear to be any different than it is for occupants of front outboard seats of multipurpose passenger vehicles and trucks of similar size and weight. The agency sought comments on these tentative conclusions. No commenters suggested that the agency was incorrect. Accordingly, this rule adopts the proposed requirement for small buses to be equipped with automatic crash protection, for the reasons set forth in the proposal.

The agency also sought comment on its proposal to include certain types of light trucks in the requirement for automatic crash protection, even though those vehicles were excluded from the dynamic testing requirements. These vehicles were:

a. motor homes,

b. convertibles,

c. open-body type vehicles,
d. walk-in van-type trucks,
e. vehicles designed exclusively to be sold to the U.S. Postal Service, and
f. vehicles with chassis-mounted campers.

These types of light trucks were excluded from the dynamic testing requirements because the vehicles are unique in design, often have unique restraint systems, and are intended to accommodate a narrowly defined end use. Additionally, the numbers of these vehicles produced annually are limited, so the overall impact of these vehicle types on light truck safety is proportionally small.

Notwithstanding this previous decision, NHTSA proposed to make these types of light trucks subject to the automatic protection requirements. The NPRM noted that the agency is unaware of any data showing a differing safety need for front-seat occupants of these types of light trucks than for front-seat occupants of other light trucks of comparable size and weight. The agency expressly noted that designs for automatic crash protection may be more complex and the costs for automatic crash protection may well be higher in these particular types of light trucks than in other light trucks. However, NHTSA tentatively concluded that the increased complexity and higher costs were not sufficient to justify allowing these light trucks to provide a lesser level of occupant safety than other light trucks of comparable size and weight. The agency sought public comment on this tentative conclusion in the NPRM.

The agency received extensive comments. Ford commented that a requirement for automatic crash protection would pose particular technical difficulties for manufacturers of motor homes and walk-in vans. Chrysler commented that a requirement for automatic crash protection would pose particular technical difficulties for manufacturers of light truck convertibles and open-body type vehicles. In addition, Chrysler commented that NHTSA had not provided any substantive justification for concluding that automatic crash protection would be practicable for these types of light trucks. General Motors (GM) commented that walk-in van-type vehicles should be excluded from the automatic crash protection requirements because of a lesser safety need for occupant protection in those vehicles. GM commented that these vehicles are typically used to make deliveries in urban areas, and not generally used for highway driving or personal use. GM also commented that only about 30 percent of its walk-in vans are equipped with front passenger seats, and that, in the 1989 model year, GM sold only 137 walk-in vans within the proposed weight ranges. Finally, GM asserted that a considerable redesign of its walk-in vans would be needed to comply with a requirement for automatic crash protection, and that this redesign would not be practical for such a small number of vehicles. The Recreation Vehicle Industry Association (RVIA) commented that the final rule should either exclude motor homes from the automatic restraint requirements or limit the automatic restraint requirements to motor homes with a gross vehicle weight rating of 6,000 pounds or less. According to RVIA, motor homes "are not part of the 'safety problem'" and structural changes to motor homes would be needed to comply with the automatic restraint requirements. Winnebago Industries, a motor home manufacturer, commented that one of its models would have a difficult time complying with the automatic restraint requirements and asked that this model of motor home be excluded from the automatic crash protection requirements.

In response to these comments, NHTSA has carefully reexamined its proposal to include these light truck types in the automatic crash protection requirements. The agency believes it should apply the automatic crash protection requirements to all types of light trucks if it would be practicable to install automatic protection in these vehicles and if the safety benefits of automatic protection would be reasonably related to the cost of such installations. NHTSA has applied this approach to whether the automatic crash protection requirements should be applied to each of the six light truck types that were excluded from the dynamic testing requirements.

With respect to convertibles and open-body type vehicles, the available evidence indicates that it is practicable to install automatic crash protection. Convertible passenger cars are required to include automatic crash protection. Manufacturers such as Chrysler are advertising the merits of air bag technology, especially in convertibles. The transfer of technology from convertible passenger cars to provide automatic crash protection in convertible and open-body light trucks will not require any technological "breakthroughs." Instead, such a transfer will require careful planning and engineering to install automatic crash protection in these types of light trucks.

NHTSA concurs with Chrysler's comment to the extent that it suggests that installing automatic crash protection in convertible and open-body light trucks will be more difficult than in convertible passenger cars, because these types of light trucks are generally designed for off-road or other utility use. This greater degree of difficulty is a good reason for allowing manufacturers some additional leadtime to incorporate automatic crash protection in these vehicles. This final rule does that by providing an additional year in the phase-in, as discussed later in this preamble.

However, NHTSA does not concur with Chrysler's comment to the extent that it suggests that this greater degree of difficulty is sufficient to justify excluding convertibles and open-body type light trucks from the automatic crash protection requirements. As explained above, NHTSA agrees that careful planning and engineering will be needed to modify the automatic crash protection systems used in convertible passenger cars for application to convertible and open-body light trucks. The agency believes that the requirement for automatic crash protection in convertible and open-body light trucks is "practicable" within the meaning of section 103(a) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392(a)), because manufacturers can comply with the requirement by transferring the basic technology from similar vehicles (convertible passenger cars), and making modifications to account for the different characteristics of the light trucks.

The costs for providing automatic crash protection in these trucks are estimated to be roughly comparable to the costs for providing automatic crash protection in convertible passenger cars. Similarly, the safety benefits of automatic crash protection in these trucks should be comparable to the benefits of automatic crash protection in convertible passenger cars. In 1988 alone, 174 front seat occupants of open-body trucks were killed in vehicle crashes. NHTSA has previously concluded that the safety benefits from automatic crash protection in convertible passenger cars are more than adequate to justify the estimated costs associated with installing automatic crash protection in convertibles. *See* 52 FR 10122; March 30, 1987 and 53 FR 15067; April 27, 1988. The agency has no reason to alter that conclusion here.

Accordingly, NHTSA concludes that it is practicable to provide automatic crash protection in light trucks that are convertibles or open-body vehicles. Further, the agency believes that the safety benefits of automatic crash protection in these types of light trucks will be reasonably related to the costs of providing automatic crash protection in these trucks. Therefore, this rule does not exclude convertibles and open-body light trucks from the automatic crash protection requirements.

The next type of light truck examined by the agency was walk-in vans. These vehicles pose special technical difficulties for automatic crash protection, because of their unique design features, including nearly vertical steering columns, fold-away driver's seats, large open doorway areas, and the absence of B-pillars near the driver's seating position. Further, there are no passenger cars similar to walk-in vans, so it would not be possible to transfer, with some modifications, automatic crash protection technology from a similar type of passenger car. Thus, while it might be possible, it would present substantially greater technical and engineering challenges to install automatic crash protection in walk-in vans than would be presented to install automatic protection in the other types of light trucks that were excluded from the dynamic testing requirements for manual safety belts.

In addition, walk-in vans are designed primarily for deliveries in urban areas, where the driver will frequently enter and exit the vehicle to make the deliveries. Hence, these vehicles are less likely than others to be involved in high-speed crashes. Additionally, most walk-in vans are not within the proposed weight limits for light trucks to be equipped with automatic crash protection. In its comments, GM stated that it sold only 137 walk-in vans within the proposed weight limits during 1988. NHTSA concludes that the costs that would be associated with designing a system of automatic crash protection for walk-in vans, which would be spread over the few walk-in vans that fell within these weight limits, would not be reasonably related to the safety benefits anticipated for such walk-in vans. After considering these factors, NHTSA has concluded that the requirement for automatic restraints in light trucks should not apply to walk-in vans.

The agency next examined vehicles designed exclusively to be sold to the U.S. Postal Service. The available evidence indicates that these light trucks would not present any serious problems for the installation of automatic crash protection. Hence, it would be practicable to require automatic crash protection in these light trucks. However, the safety benefits from requiring automatic crash protection in these vehicles would be marginal, because the U.S. Postal Service requires its employees to wear the safety belts in the Postal Service vehicles while on the job. This safety belt use policy should ensure that persons riding in these light trucks will have the safety protection of manual lap/shoulder belts every time they ride in these vehicles. Automatic crash protection would, therefore, offer marginal, if any, additional protection in these vehicles. Given the lesser safety benefits for automatic crash protection in light trucks designed exclusively for sale to the U.S. Postal Service, the agency has decided to exclude these light trucks from the automatic crash protection requirements.

Finally, the agency examined motor homes and vehicles carrying chassis-mount campers. The commenters that addressed the proposal to cover these vehicles did not suggest that there were any particular difficulties presented for installing automatic crash protection in motor homes and vehicles carrying chassis-mount campers. Instead, those commenters focused on the fact that these vehicles are typically manufactured in more than one stage and that the final-stage manufacturers are small businesses.

No commenter identified some characteristic in the design of these vehicles that would make it harder to install automatic crash protection in them than in other types of light trucks, nor is NHTSA aware of any such characteristic. Similarly, there are no indications of any lesser safety need for automatic crash protection in these vehicles. Motor homes and vehicles carrying chassis-mount campers are not designed primarily for use in urban areas, nor is there any reason to believe that safety belt use in these vehicles is substantially greater than in other types of light trucks. Further, the cost of installing automatic crash protection in these vehicles would not exceed the costs of installing automatic protection in other types of light trucks. After examining these factors, there is no apparent basis for excluding these vehicles from the automatic crash protection requirements. Therefore, this rule requires motor homes and vehicles carrying chassis-mount campers to comply with the automatic crash protection requirements.

To the extent that commenters were addressing the particular attributes of motor home manufacturers, instead of the particular attributes of vehicles that are motor homes, the agency believes it is appropriate under the National Traffic and Motor Vehicle Safety Act (the Safety Act) to have the standard apply to all motor homes and vehicles carrying chassis-mount campers. If any manufacturer of motor homes and/or vehicles carrying chassis-mount campers would experience a substantial economic hardship as a result of these requirements, that manufacturer may file a petition requesting a temporary exemption from the automatic crash protection requirements, pursuant to 49 CFR Part 555, Temporary Exemption from Motor Vehicle Safety Standards. NHTSA can consider the special circumstances of vehicle manufacturers in the context of evaluating any such petitions, and take appropriate actions to afford any necessary special treatment for such manufacturers.

2. *Crash Test Procedural and Performance Requirements*

The NPRM proposed that compliance testing for light trucks equipped with automatic crash protection be conducted according to the same test procedures and using the same injury criteria that are currently specified for use in testing passenger cars equipped with automatic crash protection. Ford asked in its comments that calculation of the head injury criterion (HIC) be limited to a 15 millisecond maximum, instead of the currently-specified 36 millisecond maximum. Ford previously raised this identical comment for HIC calculations for passenger cars. NHTSA specifically rejected Ford's earlier comment in the preamble to the rule that established the 36 millisecond maximum for HIC calculations; *see* 51 FR 37028, at 37031; October 17, 1986. In its new comment, Ford did not provide any additional data or information, nor did Ford explain why it believes HIC should be calculated differently for passenger cars and light trucks. There is, therefore, no reason for NHTSA to modify its previous rejection of Ford's 15 millisecond limit.

Ford also commented that a minor adjustment should be made to the test procedures in Standard No. 208 to make them consistent with the procedures in Standards No. 212, Windshield Mounting, and No. 219, Windshield Zone Intrusion. Ford correctly noted that Standards No. 212 and 219 include a provision in the test procedures for trucks, multipurpose passenger vehicles, and buses that "unloaded vehicle weight does not include the weight of work-performing accessories." The effect of this provision is that certain work-performing accessories mounted on the front of trucks, such as snow plows and winches, are not mounted on the vehicle for the crash test. Absent a similar provision in Standard No. 208, those portions of the work-performing accessories that are ordinarily removed from the vehicle when they are not in use (such as the snowplow blade) would not be mounted on the vehicle for the crash test, but any accessories that are mounted on the vehicle before delivery and are not ordinarily removed (such as the snowplow mounting hardware) would remain in place on the vehicle for the crash test.

Ford commented that these differing provisions in Standard No. 208 and Standards No. 212 and 219 would force manufacturers to conduct two different crash tests for the purposes of certifying compliance. If the test procedures for the standards were the same, the manufacturers would only have to conduct one crash test, just as a single test can be used to measure compliance with the three standards for passenger cars. The exclusion of work-performing accessories from the calculation of unloaded vehicle weight in Standards No. 212 and 219 also places the certification burden on the original vehicle manufacturers, instead of the small manufacturers that attach work-performing accessories to new vehicles, and keeps the certification burden manageable for the vehicle manufacturer, because not every different combination of vehicle and work-performing accessory is subject to compliance testing. NHTSA is persuaded by this comment for the reasons offered by Ford. Therefore, this final rule amends S8.1.1(b) of Standard No. 208 to include the same provision in the test procedures for light trucks that has long been included in the test procedures for light trucks subject to Standards No. 212 and 219.

No other commenters addressed the proposal to apply the passenger car test procedures and injury criteria to light trucks with automatic crash protection. With the exception of the modification made in response to the Ford comment discussed above, the proposed procedures are adopted in this final rule.

The NPRM also proposed to establish the same due care defense for light trucks with automatic crash protection as is currently established for passenger cars. Both Ford and GM commented in support of this proposal. It is adopted in this final rule for the reasons stated in the proposal.

3. *Phased-In Implementation of the Automatic Crash Protection Requirements*

a. The Phase-In. The NPRM proposed to "phase in" the automatic crash protection requirements for light trucks in a similar manner as the automatic crash protection requirements were phased in for passenger cars. The commenters supported the concept of implementing automatic crash protection requirements for light trucks by a "phase-in." This rule adopts a "phase-in" for automatic crash protection requirements.

To allow sufficient leadtime before the start of the phase-in for automatic crash protection in light trucks, the agency proposed to begin the phase-in with vehicles manufactured on or after September 1, 1993. This schedule was proposed to allow manufacturers two years after implementation of the dynamic testing requirements for light trucks (on September 1, 1991) to complete the engineering steps and certification testing needed to install automatic crash protection in light trucks. The agency believed this period of leadtime was sufficient to develop automatic crash protection for light trucks because, at the time of the NPRM, NHTSA believed that passenger car technology could be "readily transferred" to light trucks.

A delay in the beginning of the phase-in was urged by all the vehicle manufacturers that commented on that aspect of the notice. They emphasized the number of new regulations that will take effect during this time period, including the extension of several passenger car standards to light trucks, the expiration (in September 1993) of the "one car credit" for passenger cars with an air bag at the driver's position, and new side impact standards for passenger cars. The commenters asserted that the cumulative effect of all these new requirements would tax the engineering, design, development, and testing staff and resources of the vehicle manufacturers to a greater extent than was acknowledged in the NPRM.

Other vehicle manufacturers commented that the timing of the start of the phase-in period would affect the type of automatic crash protection that was installed in light trucks. Because of the development work that will have to be done, especially for the sensors, to install air bags on light trucks, the manufacturers said that an early start to the phase-in would result in manufacturers installing less innovative forms of automatic crash protection, such as non-motorized automatic safety belts. The point of these comments was that the agency would inadvertently discourage the installation of more advanced means of automatic crash protection, such as air bags, if NHTSA required the phase-in to begin too early.

NHTSA has carefully reexamined the proposed September 1, 1993 starting date for the phase-in in light of these comments. In the NPRM, the agency stated that it did not want to begin the phase-in for automatic crash protection too soon after the September 1, 1991 implementation of the dynamic testing requirements for manual safety belts in light trucks. The comments to the NPRM indicate that the transfer of air bag technology from passenger cars to light trucks may be more complex than the agency believed, especially the sensors to deploy the air bag on vehicles that are used off-road. Vehicle manufacturers will need time to develop air bag systems for light trucks. The less time that is available for development and installation of automatic crash protection in light trucks, the less likely it is that manufacturers will choose the more difficult and riskier course of installing more innovative types of automatic crash protection, such as air bags. Instead, the manufacturers would be more likely to install non-motorized automatic safety belts. The agency does not want to inadvertently discourage efforts to install air bags or other innovative types of automatic crash protection in light trucks. After further considering this issue, NHTSA has decided to delay the start of the phase-in period for an additional year. Hence, this rule provides that the automatic restraint requirements will apply to light trucks manufactured on or after September 1, 1994.

A related question concerns the percentage of each manufacturer's light trucks that should be required to be equipped with automatic crash protection in each year of the phase-in, and the length of the phase-in before all subject light trucks should be required to be equipped with automatic crash protection. The NPRM proposed a 3-year phase-in, with 20 percent of a manufacturer's light trucks required to offer automatic crash protection in the first year of the phase-in, 50 percent doing so in the second year of the phase-in, and all light trucks manufactured two years or more after the start of the phase-in equipped with automatic crash protection. Several commenters asked that this phase-in be extended. For example, GM asked that the agency use the same 4-year phase-in that was used for passenger cars (10, 25, 40, and 100 percent), while Chrysler asked for a 5-year phase-in (10, 25, 50, 75, and 100 percent)

NHTSA explained in the NPRM that the phase-in proposed for light trucks was more rapid than what was specified for passenger cars, because the phase-in for automatic crash protection in passenger cars reflected some considerations that are not present for automatic crash protection in light trucks. These considerations were:

1. the need for public familiarity with and acceptance of the different types of automatic crash protection;

2. the need for vehicle manufacturers to design and incorporate automatic crash production in their production vehicles for the first time; and

3. the need to establish a supplier base for automatic crash protection systems.

None of these three considerations apply to the same extent for light trucks. By the start of this phase-in in September of 1994, the public will have seen automatic crash protection in all new passenger cars made in the preceding 5 years. The manufacturers will be able to apply the engineering knowledge and experience that they have acquired over that period to solve the problems that must be overcome to provide automatic crash protection in light trucks. Finally, the air bag suppliers that commented on this rulemaking stated that they will have no trouble developing sufficient capacity to meet the anticipated future demand for their products in light trucks. Hence, NHTSA has concluded that it is appropriate to require a more rapid introduction of automatic crash protection in light trucks than was required in passenger cars.

Ford commented that it supported NHTSA's proposal to adopt a more rapid introduction of automatic crash protection in light trucks than in passenger cars. However, Ford's comments urged the agency to add one additional year to the phase-in, and require 90 percent of light trucks to offer automatic crash protection in this additional year. According to Ford, this 90 percent year would effectively require automatic crash protection on nearly all light trucks, while allowing an additional year to address any unique problems that may arise with particular types of low-volume light trucks, such as larger off-road vehicles.

NHTSA has concluded that this comment has merit. There are many more types of light trucks than passenger cars. If any unanticipated problems should arise in connection with equipping light trucks with automatic crash protection, it is most likely that those problems would occur for one of the unusual (i.e., limited production volume) light truck configurations. A third year of a phase-in set at the 90 percent level would ensure that the public has nearly all the benefits expected from automatic crash protection in light trucks, while also allowing the manufacturers flexibility to accommodate some of the more difficult engineering problems presented by a requirement for automatic crash protection in all light trucks. For example, adding a third year to the phase-in in which 90 percent of all light trucks are required to offer automatic crash protection would permit Chrysler an additional year of time to equip its convertibles and open-body vehicles with automatic crash protection. At the same time, Chrysler would be required to install automatic crash protection in the vast majority of its other light trucks, including minivans and pickups. Accordingly, Ford's suggestion is adopted in this final rule.

The agency also asked for comments on whether small buses should be excluded from the automatic crash protection requirements during the phase-in, and be required to be equipped with automatic crash protection requirements at the end of the phase-in (September 1, 1997). This would have been similar to the approach used for convertible passenger cars during the phase-in of the automatic crash protection requirements for passenger cars. Chrysler and Ford commented that there was no need for small buses to be excluded from the automatic crash protection requirements during the phase-in, and no commenter suggested that small buses should be excluded during the phase-in. Hence, NHTSA has not included any such provision in this final rule.

Range Rover commented that the proposed phase-in schedule would, in effect, require light truck manufacturers that produce only one model to provide automatic crash protection in 100 percent of their light trucks in the first year of the phase-in. This is because manufacturers that make several models of light trucks can select a few models for automatic crash protection to comply with the early years of the phase-in and leave production of the other models unchanged. However, the manufacturer of a single light truck model must design, certify and put into production automatic crash protection for its entire fleet (the single model) beginning with the first year of the phase-in. Range Rover commented that this was unfair, and that the phase-in provided no flexibility or relief for small, single line manufacturers.

NHTSA believes that the proposed phase-in schedule can be viewed as being not necessarily any more difficult for single line manufacturers than for large manufacturers. Since the proposed phase-in schedule requires at least 20 percent of a manufacturer's light trucks to comply with the new automatic crash protection requirement in the first year of the phase-in, in practice each manufacturer must bring at least one model into compliance for that year. Viewed in this way, the burden on a manufacturer with only one model in the U.S. market to bring one model into compliance for the first year may be regarded as not being any different than that of a manufacturer which sells many models. NHTSA further notes that the phase-in for automatic crash protection in passenger cars made no special provisions for single line manufacturers and those manufacturers were able to comply with that phase-in.

On the other hand, the agency recognizes that a single model represents all of a single line manufacturer's production and only a small portion of a multi-line manufacturer's production. It also recognizes that a greater portion of a single line manufacturer's engineering expertise and other resources will be called upon to bring that single line into compliance than a multi-line manufacturer will have to use to achieve compliance for a single line.

The agency has identified an alternative compliance schedule which it believes would help meet the concerns of single line manufacturers, while also being consistent with the need for motor vehicle safety. Under this option, a manufacturer would not need to meet the new requirements for any of its light trucks during the first year of the phase-in (September 1, 1994 to August 31, 1995), but would then be required to meet the requirements for all of its light trucks beginning with the second year of the phase-in (September 1, 1995 to August 31, 1996). A manufacturer choosing this option would thus have four full model years of leadtime to meet the new requirements. While this option would be available to all manufacturers, the information currently available indicates that the larger manufacturers will choose to comply with the 20/50/90 phase-in. NHTSA believes that the 0/100/100 phase-in option would be consistent with the need for motor vehicle safety, since the number of light trucks meeting the new automatic crash protection requirements during the 3-year phase-in period would be considerably higher under this option than under the other 20/50/90 phase-in schedule. Therefore, this final rule adopts an optional phase-in schedule of 0/100/100 to address the concerns of single line manufacturers, as expressed in Range Rover's comment.

b. Calculation of Compliance with Phase-In. NHTSA proposed to carry over most of the procedures used in calculating compliance with the phase-in of passenger cars with automatic crash protection so as to make the same procedures apply during the phase-in of automatic crash protection in light trucks. Specifically, NHTSA proposed to use the same means for assigning responsibility for vehicles with more than one statutory "manufacturer" and the same means for specifying how to calculate the appropriate percentage of the manufacturer's total production during the phase-in. No commenters addressed these proposals, so they are adopted for the reasons set forth in the NPRM.

c. Phase-In Exclusion for Vehicles Manufactured in Two or More Stages and for Altered Vehicles. The NPRM proposed that the automatic crash protection requirements would not apply during the phase-in period to light trucks that were altered or manufactured in two or more stages, but that all light trucks would be subject to those requirements after the phase-in expires. After considering all comments, NHTSA has decided to adopt that proposal.

The Safety Act requires that every manufacturer certify that each of its vehicles complies with all applicable safety standards. NHTSA has previously recognized that this statutory requirement could impose unreasonable burdens on final stage manufacturers if they had to certify not only the work they had performed on the finished vehicle, but also the work performed on the incomplete vehicle by its manufacturer (generally large manufacturers such as Chrysler, Ford, and GM). Therefore, the agency adopted regulations that prescribe the method by which manufacturers of vehicles manufactured in more than one stage shall assure conformity with the safety standards. 49 CFR 567.5 and Part 568.

Under 49 CFR 568.4(a)(7), the manufacturer of an "incomplete vehicle," as defined in 49 CFR 568.3, must provide an "incomplete vehicle document" that states, for each applicable safety standard, either (i) that the vehicle when completed will conform to the standard if no alterations are made in specified components of the vehicle; (ii) the specific conditions of final manufacture under which the completed vehicle will conform to the standard; or (iii) that conformity with the standard is not substantially affected by the design of the incomplete vehicle, and that the incomplete vehicle manufacturer makes no representation as to conformity. Thus, for all standards "affected" by the design of the incomplete vehicle, if the final stage manufacturer completes the vehicle within the specifications set forth by the incomplete vehicle manufacturer, it can be assured that the completed vehicle will comply with the applicable standards.

In addition, pursuant to 49 CFR 567.5(a), the manufacturer of a "chassis-cab," the most common form of incomplete vehicle, must certify that the completed vehicle will conform to all applicable standards if it is completed in accordance with the incomplete vehicle document furnished pursuant to Part 568. (A chassis-cab is defined in 49 CFR 567.3 as "an incomplete vehicle, with a completed occupant compartment, that requires only the addition of cargo-carrying, work-performing, or load-bearing components to perform its intended functions.") Pursuant to 49 CFR 567.5(c), if a final stage manufacturer completes a chassis-cab in accordance with its manufacturer's specifications, it need state only that fact on the certification label to impute responsibility for the completed vehicle's conformity with the applicable standards to the manufacturer of the chassis-cab. (Pursuant to section 159(c)(2) of the Safety Act, 15 U.S.C. § 1419(c)(2), the final stage manufacturer is normally obligated to conduct any recalls that may be necessary to correct noncompliances with safety standards or safety-related defects. However, the manufacturers may assign this responsibility among themselves by contract. 49 CFR 567.5(e), 568.7.)

NHTSA recognizes that manufacturers of incomplete vehicles that are not "chassis-cabs" (such as cowl chassis, cutaway chassis, and stripped chassis) are not required by section 567.5 to certify the compliance of their incomplete vehicles with applicable safety standards. They are, however, required by 49 CFR 568.4 to provide an "incomplete vehicle document" that describes the manner in which the incomplete vehicle may be completed and remain in compliance with the standards "affected" by the incomplete vehicle. On the other hand, the manufacturers of many of these chassis, such as those that do not have completed occupant compartments, will not be making any representations with respect to the conformity of their vehicles with Standard No. 208, since the design of the chassis may not "affect" that standard. Therefore, a final stage manufacturer that chooses to use such a chassis would have the duty to certify that the completed vehicle conformed with Standard No. 208, as would a final stage manufacturer that completed *any* chassis, including a chassis-cab, in a manner that was not consistent with the incomplete vehicle manufacturer's specifications.

Very few (if any) final stage manufacturers have the engineering and financial resources necessary to independently determine whether a completed vehicle complies with a complex safety standard such as Standard No. 208. Thus, as a practical matter, NHTSA anticipates that most, if not all, final stage manufacturers will have to complete their vehicles within specifications established by an incomplete vehicle manufacturer, and, in most cases, they will have to use chassis-cabs.

Similarly, an alterer must certify that every vehicle it alters complies with all applicable safety standards as altered. Alterers perform their alterations on vehicles that have already been certified as complying with all applicable safety standards. The alterer must certify that each of its vehicles continues to comply with all applicable safety standards after the alterer has performed its operations on the vehicle. Alterers must, therefore, have some independent basis for their certifications that the altered vehicles continue to comply with all applicable safety standards. Certifications of continuing compliance for altered vehicles may be based on, among other things, engineering analyses, computer simulations, actual testing, or instructions for alteration voluntarily provided by the original vehicle manufacturer in a "body builder's guide."

The National Truck Equipment Association (NTEA), an association of final stage manufacturers and alterers, suggested that vehicles produced in more than one stage should be excluded from the automatic crash protection requirements. In its comment, NTEA acknowledged that its members can pass through the certification on chassis-cabs that are completed in accordance with the incomplete vehicle manufacturer's instructions. NTEA claimed, however, that not all vehicles can be completed or modified in accordance with those instructions. NTEA suggested that the incomplete vehicle manufacturers might impose severe new restrictions that would effectively "force" final stage manufacturers to complete the vehicle outside the original manufacturer's instructions.

NHTSA has previously considered assertions that incomplete vehicle manufacturers would establish unreasonably stringent limitations on their vehicles. In the rules establishing dynamic testing requirements for manual safety belts in light trucks under Standard No. 208 (53 FR 50221; December 14, 1988) and extending Standard No. 204's steering column rearward displacement limitations to additional light trucks (54 FR 24344; June 7, 1989), NHTSA noted that it did not believe that any incomplete vehicle manufacturer could, as a practical matter, establish unreasonably stringent limitations for its incomplete vehicles. If any incomplete vehicle manufacturer were to do so, final stage manufacturers would purchase their incomplete vehicles from other manufacturers that had established more realistic limitations.

The agency's belief that market forces will prevent incomplete vehicle manufacturers from establishing unreasonably stringent limitations seems to have been correct. No manufacturer has provided NHTSA with any evidence that overly stringent limitations have been or will be imposed on incomplete vehicles subject to any of the existing crash testing requirements. Thus, NHTSA does not find persuasive NTEA's suggestion that unreasonably stringent limitations will be imposed on the completion of incomplete vehicles as a result of this amendment.

NHTSA recognizes that the adoption of the automatic crash protection requirements may lead incomplete vehicle manufacturers to impose some new limitations on the manner in which their vehicles may be completed, in order to assure that the completed vehicle will meet the requirements of the standard. However, there is no reason to believe that final stage manufacturers will be unable to complete their vehicles within those limitations.

NTEA's comments also addressed the fact, discussed above, that under 49 CFR 567.5, only manufacturers of incomplete chassis-cabs are required to provide a formal certification that can be "passed-through" by a final stage manufacturer. When completing an incomplete vehicle that is not a chassis-cab, or when completing an incomplete vehicle outside of the incomplete vehicle manufacturer's instructions, the final stage manufacturer would have to independently certify that the completed vehicle complied with the automatic crash protection requirements. NTEA argued that final stage manufacturers lack the financial and engineering expertise needed to make such a certification, and contended that this obliges NHTSA to permanently exempt those vehicles from the automatic crash protection requirements.

With respect to non-chassis-cabs, NHTSA reiterates that, as provided by 49 CFR Part 568, completion of an incomplete vehicle in accordance with the specifications set forth in an incomplete vehicle document will ensure conformity with applicable standards and thus provide a basis for a final stage manufacturer to certify the completed vehicle. Therefore, with respect to those chassis for which the incomplete vehicle manufacturer provides specifications with respect to Standard No. 208, NTEA's concerns regarding the ability of final stage manufacturers to independently certify these vehicles are not well grounded. However, NHTSA acknowledges that most non-chassis-cabs will not include specifications for Standard No. 208. Thus, final-stage manufacturers that do not have an independent basis for certifying compliance with the automatic crash protection requirements will not be able to use non-chassis-cabs to complete vehicles within the weight ranges subject to the automatic crash protection requirements.

As discussed above, NHTSA agrees that as a practical matter, most final stage manufacturers will not have the resources to develop an independent basis to certify compliance with Standard No. 208 if they do not complete vehicles within the specifications established by incomplete vehicle manufacturers or if the incomplete vehicle manufacturer does not provide specifications applicable to that standard. That is why the agency has consistently suggested that the simplest way for final stage manufacturers to assure that their vehicles will comply with the safety standards is to complete the vehicles in accordance with those specifications. A final stage manufacturer may have to "shop around" among different incomplete vehicles and different manufacturers to find an incomplete vehicle that can be completed in the manner that its customer desires, while remaining within the incomplete vehicle manufacturer's limitations. However, this is not an unreasonable burden in light of the safety benefits of automatic crash protection.

Moreover, NHTSA is not convinced that it will be impossible for final stage manufacturers to establish that vehicles that are completed outside of an incomplete vehicle manufacturer's specifications comply with the automatic crash protection requirements of Standard No. 208. Final stage manufacturers that complete vehicles outside the incomplete vehicle manufacturer's specifications are in the same position as alterers regarding the certification responsibility. That is, the final stage manufacturer and the alterer must base their certification of compliance with the automatic crash protection requirements of Standard No. 208 on the evaluations and analyses made by the final stage manufacturer or alterer, instead of basing their certification on the specifications the original vehicle manufacturer provided for the vehicle. Although it might be too difficult or expensive for an individual final stage manufacturer or alterer to independently certify compliance through crash tests, it may be feasible for several such entities to join together to conduct or sponsor crash tests and/or engineering analyses that would provide an adequate basis for certification.

Volkswagen commented that it believed that it will not be practicable for modified vehicles to comply with the automatic crash protection requirements, particularly if the incomplete vehicle is equipped with an air bag. According to Volkswagen, it is "virtually impossible" for the manufacturer of an incomplete vehicle with an air bag system to provide guidance and certification information to final stage manufacturers, in part because of the different types of special equipment and/or bodies that might be added to the incomplete vehicle. Further, according to Volkswagen, it would be impossible for final stage manufacturers to independently certify compliance without conducting a crash test for each specific configuration. Because of this alleged impracticability, Volkswagen concluded that any light trucks that are produced in two or more stages should be excluded from the automatic crash protection requirements.

NHTSA has previously explained in detail its rejection of similar arguments in the rulemakings extending dynamic testing of manual safety belts to light trucks under Standard No. 208 (53 FR at 50225–50228) and extending Standard No. 204's steering column rearward displacement limitations to additional light trucks (54 FR at 24347–24350). To briefly repeat, manufacturers of all light trucks have been required for more than a decade to certify that their vehicles comply with three standards (Nos. 212, 219, and 301) that use a 30 mph barrier crash test to determine compliance. Throughout that period, manufacturers of incomplete vehicles have been required by 49 CFR Part 568 to provide incomplete vehicle documents that contain certification information and instructions to final stage manufacturers along with the incomplete vehicle. In order to have a basis for the specifications contained in the incomplete vehicle documents—*i.e.*, to assure that vehicles that are completed within those specifications will comply with applicable crash test standards—the incomplete vehicle manufacturer must conduct some analysis of how the chassis would perform in a crash test. While this analysis may be more complex for the dynamic testing and automatic crash protection requirements of Standard No. 208 than for the other Standards that require crash testing, the process is not fundamentally different. Thus, Volkswagen's suggestion that it is not feasible for incomplete vehicle manufacturers to provide guidance to final stage manufacturers is not persuasive.

Ford commented that it believed NHTSA had underestimated the difficulty that the automatic crash protection requirements would pose for final stage manufacturers and alterers. Ford commented that it would "find it relatively manageable" to provide guidance and appropriate limits for Ford vehicles used by final stage manufacturers and alterers *if* the vehicles incorporated Ford-designed seats and occupant protection systems. However, Ford also commented that "alterers appear to believe" that installing different seats is fundamental to their manufacturing and marketing operations and stated that it was unlikely that Ford could provide much useful guidance for seats and occupant protection systems that are not designed and installed by Ford.

Ford's comment is consistent with its reported response to the dynamic testing requirement that will apply to manual safety belts in light trucks manufactured on or after September 1, 1991. In a November 27, 1989 article on page E4 of *Automotive News,* it was reported that, for the purposes of the dynamic testing requirement, Ford's instructions to final stage manufacturers and alterers would require the use of front seats installed by Ford. However, that same article reported that Chrysler and General Motors plan to develop guidelines that will allow final stage manufacturers and alterers to replace the original front seats and still be covered by the original certification of compliance. Thus, it appears that such flexibility is practicable.

If Ford does specify in its incomplete vehicle documents and body builders' guide that final stage manufacturers and alterers could only be assured of compliance with Standard No. 208 if they used Ford's seats, final stage manufacturers and alterers would have two options that would enable them to avoid having to independently certify compliance. They could either use Ford vehicles and complete or modify the vehicle in accordance with Ford's instructions, or use vehicles produced by a different manufacturer that permit the use of a variety of seats. In either case, no significant compliance burden would be imposed on the final stage manufacturer or alterer.

For the foregoing reasons, NHTSA has concluded that there is no need to exclude vehicles produced in two or more stages or altered vehicles from the automatic crash protection requirements once the phase-in has ended. However, somewhat different considerations apply to the issue of whether those requirements should apply during the phase-in, which ends August 31, 1997.

During the phase-in period, manufacturers of completed light trucks will be required to install automatic crash protection in some but not all of their vehicles. If automatic crash protection were not available in the particular type of chassis used by a final stage manufacturer or alterer (perhaps because the chassis manufacturer did not intend to install automatic crash protection in its completed vehicles that are based on that chassis), it is unlikely that the final stage manufacturer or alterer could design, install, and certify a system of automatic crash protection for the vehicle. In recognition of these difficulties, the agency proposed to exclude light trucks manufactured in two or more stages and light trucks that are altered from the automatic crash protection requirements during the 20/50/90 phase-in period.

No commenter opposed this proposal and several supported it. NHTSA remains convinced that it would be impracticable to require final stage manufacturers and alterers to assure that a specified percentage of their vehicles complied with the automatic crash protection requirements of Standard No. 208 during the phase-in. Therefore, this final rule adopts the proposed exclusion of light trucks manufactured in two or more stages and light trucks that are altered from the automatic crash protection requirements during the phase-in. Because of this exclusion, this rule also adopts the proposal to allow original manufacturers the option to either include or exclude their light trucks that are sent to second stage manufacturers and alterers, when determining compliance during the phase-in period for automatic crash protection in light trucks. However, as indicated above, once the phase-in is completed, all light trucks must be equipped with automatic crash protection.

d. Phase-In Reporting Requirements. The agency proposed to adopt substantially the same reporting requirements for light trucks as were previously specified for passenger cars during the phase-in of the automatic crash protection requirements for those vehicles. The agency also proposed to not require information about altered light trucks and light trucks manufactured in two or more stages to be submitted in these reports, because manufacturers of those light trucks were not required to comply with the percentage requirements during the phase-in. No commenters addressed this subject. These requirements are adopted as proposed, for the reasons set forth in the NPRM.

e. Phase-In Certification Requirements. The NPRM proposed to require a separate certification to appear on light trucks that were produced during the phase-in and were intended to be among the percentage of their manufacturer's annual production certified as complying with the automatic crash protection requirements. During the phase-in of automatic crash protection, some of a manufacturer's vehicles are equipped with automatic crash protection, while the rest are equipped only with manual safety belts. However, the information on the certification labels on both vehicles equipped with automatic crash protection and those equipped with only manual safety belts would fail to differentiate between the vehicles.

Additionally, during a phase-in, manufacturers are permitted to equip those vehicles with both manual safety belts and air bags, for example, but not certify the vehicles as complying with the automatic crash protection requirements. Instead, the manufacturers could certify that the vehicles complied with Standard No. 208 by virtue of the manual safety belts and assert the position that the air bags were a voluntary additional means of occupant protection. In this case, nothing on the certification label would alert the agency that these vehicles were not certified as complying with the automatic crash protection requirements.

NHTSA proposed to address the practical difficulties that had arisen in these situations in the passenger car phase-in by requiring manufacturers to affix an additional certification label on their light trucks produced during the phase-in period, if the light trucks were certified as complying with the automatic crash protection requirement. This proposal reflected the agency's tentative conclusions that this additional certification would effectively solve those problems, while imposing only minimal added burdens on the manufacturers.

The commenters strongly disagreed with the agency's proposal. Ford commented that the additional certification label would likely be misleading to consumers. Ford also commented that agency personnel would have ample additional sources for learning whether particular vehicles were certified as complying with the automatic crash protection requirements, including the proposed reports and the proposed requirement to keep records of the vehicle identification numbers of the vehicles certified as complying with the automatic crash protection requirements. Chrysler, Nissan, and Volkswagen all commented that the proposed additional certification label would be an increased burden, even if it were only slight, and that the agency had not articulated any benefits, great or small, that would result from imposing that burden.

After reviewing these comments, the agency has concluded that the proposed additional certification label should not be adopted in this final rule. As noted in the comments, agency personnel will be able to obtain the necessary certification information if the proposed reporting and recordkeeping requirements are adopted for the phase-in. NHTSA can make that information available to the public if there is any confusion about particular light trucks during the phase-in. Thus, there is no compelling reason to require an additional certification label on light trucks during the phase-in.

f. Retention of VINs. For the phase-in of automatic crash protection for passenger cars, NHTSA determined that it was important for enforcement purposes that manufacturers maintain records of the vehicle identification number (VIN) and the type of automatic crash protection installed on each passenger car produced during the phase-in period that was reported to NHTSA as one of the manufacturer's cars equipped with automatic crash protection. Again with respect to passenger cars, the manufacturers were required to retain these records for slightly more than two years after the end of the phase-in. The agency proposed to adopt the same requirements for light trucks. No commenter offered any objections to this proposal. Therefore, this final rule adopts the proposed VIN recordkeeping requirement.

4. *"One-Truck Credit" Provision*

As the requirements for automatic crash protection were being phased-in for passenger cars, NHTSA adopted provisions designed to give car manufacturers an incentive to use more innovative automatic crash protection systems in their vehicles. Accordingly, Standard No. 208 includes provisions so that each car equipped with a non-belt automatic crash protection system for the driver's position, such as an air bag or passive interior, and a manual safety belt for the right front passenger's position will be counted as a vehicle complying with the automatic crash protection requirements. These provisions are referred to as the "one-car credit." NHTSA repeatedly stated its belief that the "one-car credit" would encourage the introduction of non-belt automatic crash protection systems into passenger cars sooner than would occur if manufacturers were simply required to install automatic crash protection systems in both front seating positions simultaneously.

NHTSA tentatively determined it would also be appropriate to offer an incentive for light truck manufacturers to install more innovative systems of automatic crash protection. This tentative determination reflected the agency's belief that, as in the case of passenger cars, the *relative* technological ease of widespread installation in light trucks of passenger-side air bags is less than that of passenger-side automatic belts. Absent some measures to equalize this technological disparity, NHTSA believes that light truck manufacturers would opt for the installation of automatic belts at both the driver's and passenger's positions, instead of installing an air bag at the driver's position and an automatic belt at the passenger's position. Thus, the agency proposed to offer the "one-truck credit" to allow the passage of sufficient time for the relative technological difficulties of passenger-side air bags and passenger-side automatic belts to become nearly equal. The agency tentatively concluded that 4 years was the minimum time sufficient for that purpose. Therefore, the NPRM proposed that the one-truck credit be available for light trucks manufactured during the 4-year period after the beginning of the phase-in of the automatic crash protection requirement.

Chrysler, Ford, and General Motors supported the proposed one-truck credit. The only commenter that objected to the proposal was Motor Voters. According to Motor Voters, market forces may be sufficient to encourage light truck manufacturers to choose air bags as the means for complying with the automatic crash protection requirement. In this case, there would be no need for any additional regulatory incentives. Because of this, Motor Voters suggested in its comments that the one-truck credit be allowed during the phase-in period, but that the one-truck credit provision be ended when the phase-in expires.

NHTSA concurs with Motor Voters' belief that the one-truck credit provision should not be offered for an excessive period of time, because it would then serve to delay for too long the safety benefits of automatic crash protection for the right front passenger position in light trucks. In the preamble to the NPRM, NHTSA also explained that it believed that, if the one-truck credit provision were available for a period of less than 4 years, the short credit would not provide sufficient time to resolve technical issues associated with passenger side air bags in light trucks. Hence, if the one-truck credit were made available for too short a time, it would do little to encourage light truck manufacturers to install driver-side air bags in light trucks. Motor Voters' comments did not set forth any new facts or information not previously considered by the agency in reaching its tentative decision on the appropriate length of time for the one-truck credit provision. A review of the available information reinforces NHTSA's technical judgment that there are special technical problems presented by the installation of air bags in light trucks that can be alleviated by allowing the one-truck credit. After this review, NHTSA has decided to adopt the proposed 4-year duration for the one-truck credit in this final rule.

Other "Credit" Issues During the Phase-In

The agency proposed to adopt the same 1.5 vehicle credit for light trucks that was available for passenger cars during the phase-in. Pursuant to this provision, cars equipped with an air bag or other non-belt means of automatic crash protection at the driver's position, and any type of automatic crash protection at the right front passenger's position, were counted as 1.5 cars equipped with automatic crash protection during the phase-in of the automatic crash protection requirements for passenger cars.

In its comments, Ford stated that the 1.5 credit provides some incentive for truck manufacturers to introduce passenger-side air bags, but that a two-truck credit would be more effective as an incentive. Ford acknowledged that Porsche had sought a two-car credit for passenger cars, and that this request was denied by NHTSA. 51 FR 42598; November 25, 1986. However, Ford commented that most of the agency's reasons for denying the two-car credit for cars would not be applicable for light trucks. Hence, Ford asked NHTSA to reexamine this issue.

In its denial of a two-vehicle credit provision for cars, NHTSA explained that the 1.5 vehicle credit already provided an extra incentive for manufacturers to install air bags for both the driver and right front passenger *and* that no manufacturer had provided detailed data specifically explaining how a two-car credit would serve as an additional incentive to any manufacturer to change its production plans during the phase-in. Absent such a quantification, NHTSA's judgment was that a two-vehicle credit provision could actually serve as a disincentive to installing air bags in the greatest number of vehicles during the phase-in.

The agency believes this reasoning is equally applicable to light trucks. Neither Ford nor any other manufacturer has provided any details about how a two-truck credit would affect their plans to install air bags in their trucks. Absent such information, it is NHTSA's technical judgment that an additional 0.5 vehicle credit over and above the existing 1.5 vehicle credit for trucks with both driver and passenger air bags would not ensure more air bags in light trucks during the phase-in. Hence, this final rule does not include a two-truck credit provision.

During the phase-in of automatic crash protection in passenger cars, NHTSA decided to permit the "carry-forward" of credits for vehicles equipped with automatic crash protection. The carry-forward provisions allow manufacturers that exceed the minimum percentage of vehicles equipped with automatic crash protection in one year of the phase-in to count those excess vehicles as credits toward the specified percentage during any subsequent model years of the phase-in. Additionally, for passenger cars, manufacturers were allowed to count cars produced during the year before the start of the phase-in as credits toward the specified percentage in any year of the phase-in. NHTSA explained that these carry-forward credits would encourage the early introduction of more vehicles with automatic crash protection, provide increased flexibility for vehicle manufacturers, and assure an orderly build-up of production capability for automatic crash protection. The agency proposed to allow the same carry-forward of credits during the phase-in of automatic crash protection for light trucks.

Ford commented that it supported the proposed carry-forward of credits. However, Ford requested that manufacturers be permitted to carry-forward credits for light trucks equipped with automatic crash protection that are produced in the 2 years before the start of the phase-in (i.e., September 1, 1992 to August 31, 1994), instead of the proposed carry-forward of credits for automatic crash protection in light trucks produced in the year before the start of the phase-in (i.e., September 1, 1993 to August 31, 1994). Ford commented that this extension of the carry-forward credit provision would encourage manufacturers to introduce automatic crash protection in light trucks as soon as possible.

NHTSA is persuaded by this comment. To the extent that light truck manufacturers are not permitted to receive credit for trucks equipped with automatic crash protection produced before the start of the phase-in, those manufacturers would have an incentive to hold off the installation of automatic crash protection in their light trucks until they would receive such credit. Otherwise, a manufacturer that installed automatic crash protection as soon as it could in its light trucks would end up installing automatic crash protection in a higher percentage of its vehicles than manufacturers who make lesser efforts to install automatic crash protection, while both received the same credits for purposes of complying with the phase-in. For example, a manufacturer that installs automatic crash protection in 10 percent of its vehicles the model year before the phase-in starts and then in an additional ten percent of its vehicles during the first year of the phase-in (for a total of 20 percent of its vehicles) would not be credited any differently than a manufacturer that equipped 20 percent of its vehicles with automatic crash protection during the first year of the phase-in, if there were no provision allowing carry-forward of credits. Hence, an extension of the period for carry-forward credits serves the interests of safety by encouraging the earliest possible introduction of automatic crash protection. Accordingly, this rule adopts Ford's suggestion to permit the carry-forward of credits for light trucks equipped with automatic crash protection produced in the 2 years before the start of the phase-in.

Obviously, light trucks that are not certified as complying with the automatic crash protection requirements *cannot* be carried forward as credits toward complying with the automatic protection requirements. The agency has slightly revised the provision for calculating credits in S4.2.5.5 of Standard No. 208 and the reporting requirements in § 585.5(b)(2), to ensure that all parties understand that carry-forward credits are only available for light trucks certified as providing automatic crash protection.

Finally, Mazda asked the agency to permit the "carry-back" of credits, a procedure that was explicitly rejected for the passenger car phase-in. "Carry-back" provisions allow manufacturers that fall short of the minimum percentage of vehicles equipped with automatic crash protection in one year of the phase-in to make up the shortfall in future model years of the phase-in. Carry-back provisions were rejected for the passenger car phase-in, because these provisions would allow vehicle manufacturers to delay the installation of automatic crash protection and result in lesser safety benefits for the public.

Mazda did not question the agency's previous conclusions that carry-back credits delay the availability of automatic crash protection. Absent any additional information, NHTSA has no basis for changing its previously stated rejection of the concept of carry-back credits during the phase-in period.

5. *Compatibility with Child Safety Seats*

In the NPRM, the agency proposed to include special requirements for the passenger seating position in two-seater vehicles. The agency proposed that the automatic crash protection system installed at the right front seating position must be capable of being adjusted to secure a child safety seat or the seating position must be equipped with an original equipment manual lap or lap/shoulder belt to secure a child seat. Many vehicle manufacturers that commented on the NPRM objected to this proposal. Motor Voters and the Automotive Occupant Restraints Council both supported the proposal.

After the publication of this NPRM on automatic crash protection in light trucks, the agency published an NPRM devoted to the subject of the compatibility of safety belt systems with child safety seats; 55 FR 30937; July 30, 1990. Instead of addressing this issue in a piecemeal fashion in several different rulemakings, NHTSA believes it is more appropriate to use the child seat compatibility rulemaking as the forum for addressing all concerns about the compatibility of child safety seats and the various occupant protection systems, including automatic crash protection systems. Hence, the subject will not be addressed further in this rulemaking action.

Technical Amendments of Regulatory Language

Ford concluded its comments with a request that NHTSA clarify the interrelationship of three rulemaking actions under Standard No. 208 addressing occupant protection requirements for light trucks. The first of these was the rule requiring dynamic testing of manual safety belts installed in front outboard seating positions in light trucks (52 FR 44898; November 23, 1987), codified at S4.2.2 and S4.2.3 of Standard No. 208. The second rulemaking was the requirement for rear seat lap/shoulder safety belts in light trucks (54 FR 46257; November 2, 1989), codified at S4.2.4 of Standard No. 208. The third rulemaking is this rulemaking requiring automatic crash protection in light trucks, codified at S4.2.5 and S4.2.6 of Standard No. 208.

Ford commented that S4.2.4 appears to require lap/shoulder belts in rear outboard seating positions of most light trucks. However, Ford correctly noted that the dynamic testing requirements for manual safety belts in light trucks and the automatic crash protection requirements for light trucks refer to the older passenger car options for occupant protection, which permit the installation of lap-only safety belts in rear outboard seats of vehicles. Ford suggested that this be clarified. This rule makes the requested clarification, so that no unintended confusion will arise about whether light trucks must be equipped with lap/shoulder belts in rear seating positions.

Ford also commented that it was unclear if the dynamic testing requirements for light trucks equipped with manual safety belts applied to light trucks equipped with manual safety belts that are produced during the phase-in period for automatic crash protection. The answer is that dynamic testing will apply to all subject light trucks manufactured on or after September 1, 1991, including the years during which automatic crash protection will be phased in, that meet the requirements of Standard No. 208 by providing manual lap/shoulder belts at front outboard seating positions. Language has been added to the dynamic testing requirements to make this requirement more explicit.

Finally, Ford commented that it assumed light trucks not subject to the dynamic testing requirements but that would be subject to the automatic crash protection requirement (motor homes, convertibles, open-body vehicles, etc.) would be excluded from a manufacturer's production total when determining compliance with the phase-in. This assumption is incorrect. NHTSA explicitly proposed to include these vehicles and did not propose to exclude such vehicles during the phase-in. This rule does not have any such exclusion.

Regulatory Impacts

NHTSA has examined the impacts of this rulemaking action and determined that it is both "major" within the meaning of Executive Order 12291 and "significant" within the meaning of the Department of Transportation's regulatory policies and procedures, because of both the costs and the public interest associated with this proposed rulemaking action. Accordingly, a Final Regulatory Impact Analysis (FRIA) has been prepared for this proposal, and a copy of the FRIA has been placed in the public docket for this rulemaking action. A copy of the FRIA may be obtained by writing to: Docket Section, NHTSA, Room 5109, 400 Seventh Street, SW, Washington, D.C. 20590.

Table 1 presents the incremental benefits of automatic crash protection assuming all light trucks with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less would have automatic belts, or assuming all light trucks would have driver side air bags, or assuming all light trucks would have air bags for the driver and right front seat passenger. These benefits can be considered to accrue over the lifetime of one model year's production when all light trucks in that model year have automatic crash protection or these benefits can be considered annual benefits at some future date when all light trucks in the fleet incorporate automatic crash protection. These incremental benefits are compared to manual safety belt use rates of 26.6 to 40 percent (26.6 percent was derived from the Fatal Accident Reporting System, and represents belt use in potentially fatal accidents by light truck occupants for 1989; 40 percent is an estimate of potential safety belt use levels in 1995 based on a continuing trend of increased use due to State safety belt use laws, consumer safety awareness, and safety belt education programs).

TABLE 1
Incremental Benefits for Automatic Crash Protection
Assuming Light Trucks with a GVWR of 8,500 Pounds GVWR or Less
And Unloaded Vehicle Weight of 5,500 Pounds or Less
Were Equipped with that Type of Automatic Protection

	Fatalities	AIS 2–5 Injuries	AIS 1 Injuries
Driver Air Bags	1,573 to 1,855	18,688 to 22,178	32,837 to 40,423
Driver and Right Front Air Bags	2,016 to 2,378	23,960 to 28,434	42,098 to 51,824
Automatic Belts Usage			
50 Percent	370 to 1,216	4,353 to 13,829	7,258 to 16,984
60 Percent	949 to 1,796	10,881 to 20,357	14,517 to 24,243
70 Percent	1,529 to 2,375	17,409 to 26,883	21,775 to 31,501

The estimated costs of automatic crash protection for light trucks are shown in Table 2.

TABLE 2
Estimated Consumer Costs of Automatic Crash Protection

Restraint System	Consumer Cost (1989 $)
Driver air bag	$277.86
Driver and RF air bag	404.16
Automatic belts Motorized	185.66
Automatic belts Non-motorized	44.21

The estimated lifetime fuel costs for the added weight of these various types of automatic protection are shown in Table 3.

TABLE 3
Lifetime Fuel Cost
(Present Value, 10% Annual Discount Rate)

Restraint System	Incremental Weight per Vehicle	Total Vehicle Lifetime Fuel Cost (1989 $)
Driver air bag	9.0 lbs.	$12.38
Driver and RF air bag	21.0	28.80
Automatic belts Motorized	10.0	13.75
Automatic belts Non-motorized	5.0	6.89

TABLE 4
Total Vehicle Costs Including
Lifetime Fuel Costs
(Present Value, 10% Annual Discount Rate)

(Without Secondary Weight)

Restraint System	Incremental Weight per Vehicle	Total Per Vehicle Cost Including Lifetime Fuel Cost (1989 $)
Driver air bag	9.0 lbs.	$290.24
Driver and RF air bag	21.0	432.96
Automatic belts Motorized	10.0	199.41
Automatic belts Non-motorized	5.0	51.10

(With Secondary Weight)

Restraint System	Incremental Weight per Vehicle	Total Per Vehicle Cost Including Lifetime Fuel Cost (1989 $)
Driver air bag	15.3 lbs.	$303.76
Driver and RF air bag	35.7	464.47
Automatic belts Motorized	17.0	214.43
Automatic belts Non-motorized	8.5	58.62

Additionally, the agency has analyzed the effects of this proposal on small entities, in accordance with the Regulatory Flexibility Act. This analysis appears at Section IV of the FRIA. Based on the available information, the agency does not believe that a substantial number of small entities will be affected by this final rule, and that any effects on small entities would not be significant economic impacts. Interested persons are invited to examine this section of the FRIA.

The agency has also analyzed this rule under the National Environmental Policy Act and determined that it will not have a significant effect on the human environment. A discussion of this determination can be found in the Environmental Assessment that has been prepared for this rule. This report is available in the public docket for this rulemaking action.

This rule has also been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and NHTSA has determined that it does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

The Office of Management and Budget (OMB) had already approved NHTSA's requirement for phase-in reporting for automatic crash protection in passenger cars (OMB #2127-0535). However, this rule extends the existing passenger car requirements to light trucks during the phase-in of automatic crash protection. This extension is considered to be an information collection requirement, as that term is defined by OMB in 5 CFR Part 1320. Accordingly, the information collection requirement was submitted to and approved by OMB, pursuant to the requirements of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). The reporting and recordkeeping requirements in this rule have been assigned OMB #2127-0535 and approved through April 30, 1993.

In consideration of the foregoing, Chapter V of Title 49 of the Code of Federal Regulations is amended as follows:

S4.2 of Standard No. 208 is amended by revising S4.2.2, S4.2.3, and the title of S4.2.4, and adding new S4.2.5 and S4.2.6, to read as follows:

S4.2 Trucks and multipurpose passenger vehicles with GVWR of 10,000 pounds or less.

* * * * *

S4.2.2 Trucks and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991 and before September 1, 1997. Except as provided in S4.2.4, each truck and multipurpose passenger vehicle with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991 and before September 1, 1997, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2. Each Type 2 seat belt assembly installed in a front outboard designated seating position in accordance with S4.1.2.3 shall meet the requirements of S4.6.

S4.2.3 Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with either a GVWR of more than 8,500 pounds but not greater than 10,000 pounds or with an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less. Except as provided in S4.2.4, each truck and multipurpose passenger vehicle manufactured on or after September 1, 1991, that has either a gross vehicle weight rating which is greater than 8,500 pounds, but not greater than 10,000 pounds, or has an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2.

S4.2.4 Rear outboard seating positions in trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with a GVWR of 10,000 pounds or less. * * *

* * * * *

S4.2.5 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994, and before September 1, 1997.

S4.2.5.1 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994 and before September 1, 1995.

S4.2.5.1.1 Subject to S4.2.5.1.2 and S4.2.5.5 and except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1994 and before September 1, 1995, shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars). A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.2.5.1.2 Subject to S4.2.5.5, the amount of trucks, buses, and multipurpose passenger vehicles specified in S4.2.5.1.1 complying with S4.1.2.1 (as specified for passenger cars) shall be not less than 20 percent of:

(a) The average annual production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1991, and before September 1, 1994, by each manufacturer that produced such vehicles during each of those annual production periods, or

(b) The manufacturer's total production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during the period specified in S4.2.5.1.1.

S4.2.5.2 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1995 and before September 1, 1996.

S4.2.5.2.1 Subject to S4.2.5.2.2 and S4.2.5.5 and except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1995 and before September 1, 1996, shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars). A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.2.5.2.2 Subject to S4.2.5.5, the amount of trucks, buses, and multipurpose passenger vehicles specified in S4.2.5.2.1 complying with S4.1.2.1 (as specified for passenger cars) shall be not less than 50 percent of:

(a) The average annual production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1992, and before September 1, 1995, by each manufacturer that produced such vehicles during each of those annual production periods, or

(b) The manufacturer's total production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during the period specified in S4.2.5.2.1.

S4.2.5.3 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1996 and before September 1, 1997.

S4.2.5.3.1 Subject to S4.2.5.3.2 and S4.2.5.5 and except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1996 and before September 1, 1997, shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars). A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.2.5.3.2 Subject to S4.2.5.5, the amount of trucks, buses, and multipurpose passenger vehicles specified in S4.2.5.3.1 complying with S4.1.2.1 (as specified for passenger cars) shall be not less than 90 percent of:

(a) The average annual production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1993, and before September 1, 1996, by each manufacturer that produced such vehicles during each of those annual production periods, or

(b) The manufacturer's total production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during the period specified in S4.2.5.3.1.

S4.2.5.4 Alternative phase-in schedule. A manufacturer may, at its option, comply with the requirements of this section instead of complying with the requirements set forth in S4.2.5.1, S4.2.5.2, and S4.2.5.3.

(a) Except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1994 and before September 1, 1995, shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars).

(b) Except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1995 shall comply with the requirements of S4.1.2.1 (as specified for passenger cars) of this standard. A vehicle shall not be deemed to be in noncompliance with this Standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

(c) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1995, but before September 1, 1998, whose driver's seating position complies with the requirements of S4.1.2.1(a) of this standard by means not including any type of seat belt and whose right front passenger's seating position is equipped with a manual Type 2 seat belt that complies with S5.1 of this standard, with the seat belt assembly adjusted in accordance with S7.4.2, shall be counted as a vehicle complying with S4.1.2.1.

S4.2.5.5 Calculation of complying trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less.

(a) For the purposes of the calculations required in S4.2.5.1.2, S4.2.5.2.2, and S4.2.5.3.2 of the number of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that comply with S4.1.2.1 (as specified for passenger cars):

(1) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose front right seating position complies with the requirements of S4.1.2.1(a) by any means is counted as 1.5 vehicles, and

(2) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front passenger's seating position is equipped with a manual Type 2 seat belt that complies with S5.1 of this Standard, with the seat belt assembly adjusted in accordance with S7.4.2, is counted as one vehicle.

(3) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that

is manufactured in two or more stages or that is altered (within the meaning of § 567.7 of this chapter) after having previously been certified in accordance with Part 567 of this chapter is not subject to the requirements of S4.2.5.1.2, S4.2.5.2.2, and S4.2.5.3.2. Such vehicles may be excluded from all calculations of compliance with S4.2.5.1.2, S4.2.5.2.2, and S4.2.5.3.2.

(b) For the purposes of complying with S4.2.5.1.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less may be counted if it:

(1) Is manufactured on or after September 1, 1992, but before September 1, 1994, and

(2) Is certified as complying with S4.1.2.1 (as specified for passenger cars).

(c) For the purposes of complying with S4.2.5.2.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less may be counted if it:

(1) Is manufactured on or after September 1, 1992, but before September 1, 1995,

(2) Is certified as complying with S4.1.2.1 (as specified for passenger cars), and

(3) Is not counted towards compliance with S4.2.5.1.2.

(d) For the purposes of complying with S4.2.5.3.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less may be counted if it:

(1) Is manufactured on or after September 1, 1992, but before September 1, 1996,

(2) Is certified as complying with S4.1.2.1 (as specified for passenger cars), and

(3) Is not counted towards compliance with S4.2.5.1.2 or S4.2.5.2.2.

S4.2.5.6 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer.

S4.2.5.6.1 For the purposes of calculating average annual production for each manufacturer and the amount of vehicles manufactured by each manufacturer under S4.2.5.1.2, S4.2.5.2.2, or S4.2.5.3.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer shall be attributed to a single manufacturer as follows, subject to S4.2.5.6.2:

(a) A vehicle that is imported shall be attributed to the importer.

(b) A vehicle that is manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, shall be attributed to the manufacturer that markets the vehicle.

S4.2.5.6.2 A truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified in an express written contract, reported to the National Highway Traffic Safety Administration under 49 CFR Part 585, between the manufacturer so specified and the manufacturer to which the vehicle would otherwise be attributed under S4.2.5.4.1.

S4.2.6 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1997. Except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1997 shall comply with the requirements of S4.1.2.1 (as specified for passenger cars) of this standard, except that walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service may instead meet the requirements of S4.2.1.1 or S4.2.1.2. Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1997, but before September 1, 1998, whose driver's seating position complies with the requirements of S4.1.2.1(a) of this Standard by means not including any type of seat belt and whose right front passenger's seating position is equipped with a manual Type 2 seat belt that complies with S5.1 of this Standard, with the seat belt assembly adjusted in accordance with S7.4.2, shall be counted as a vehicle complying with S4.1.2.1. A vehicle shall not be deemed to be in noncompliance with this Standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

* * * * *

3. A new S4.4.4 is added to Standard No 208, to read as follows:

S4.4 Buses.

* * * * *

S4.4.4 Buses with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994. Each bus with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994 shall comply with the requirements of S4.2.5 and S4.2.6 of this standard, as applicable, for front seating positions, and with the requirements of S4.4.3.2 or S4.4.3.3 of this standard, as applicable, for all rear seating positions.

* * * * *

4. S8.1.1(b) of Standard No. 208 is revised to read as follows:

S8. Test conditions.

* * * * *

S8.1.1 Except as provided in paragraph (c) of this section, the vehicle, including test devices and instrumentation, is loaded as follows:

* * * * *

(b) Multipurpose passenger vehicles, trucks, and buses. A multipurpose passenger vehicle, truck, or bus is loaded to its unloaded vehicle weight plus 300 pounds or its rated cargo and luggage capacity weight, whichever is less, secured in the load carrying area and distributed as nearly as possible in proportion to its gross axle weight ratings, plus the weight of the necessary anthropomorphic test devices. For the purposes of this section, unloaded vehicle weight does not include the weight of work-performing accessories. Vehicles are tested to a maximum unloaded vehicle weight of 5,500 pounds.

* * * * *

PART 585—[AMENDED]

5. The authority citation for Part 585 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.50.

6. Section 585.1 is revised to read as follows:

This part establishes requirements for manufacturers of trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less to submit reports, and to maintain records related to the reports, concerning the number of such vehicles equipped with automatic crash protection in compliance with the requirements of S4.2.5 of Standard No. 208, Occupant Crash Protection (49 CFR § 571.208).

7. Section 585.2 is revised to read as follows:

§ 585.2 Purpose.

The purpose of these reporting requirements is to aid the National Highway Traffic Safety Administration in determining whether a manufacturer of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less has complied with the requirements of Standard No. 208, Occupant Crash Protection (49 CFR § 571.208) to install automatic crash protection in specified percentages of the manufacturer's annual production of those vehicles.

8. Section 585.3 is revised to read as follows:

§ 585.3 Applicability.

This part applies to manufacturers of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. However, this part does not apply to any such manufacturers whose production consists exclusively of:

(a) vehicles manufactured in two or more stages;

(b) walk-in van-type trucks;

(c) vehicles designed to be exclusively sold to the U.S. Postal Service;

(d) Vehicles that are altered after previously having been certified in accordance with part 567 of this chapter.

7. Section 585.4 is revised to read as follows:

§ 585.4 Definitions.

(a) All terms defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used in their statutory meaning.

(b) *Bus, gross vehicle weight rating* or *GVWR, multipurpose passenger vehicle, truck, and unloaded vehicle weight* are used as defined in § 571.3 of this chapter.

(c) *Production year* means the 12-month period between September 1 of the prior year and August 31 of the year in question, inclusive.

8. Section 585.5 is revised to read as follows:

§ 585.5 Reporting requirements.

(a) *General reporting requirements.*

(1) Within 60 days after the end of the production years ending August 31, 1995, August 31, 1996, and August 31, 1997, each manufacturer that manufactured any trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during the production year (other than walk-in van-type trucks, vehicles designed to be exclusively sold to the U.S. Postal Service, vehicles manufactured in two or more stages, or vehicles that were altered after previously having been certified in accordance with part 567 of this chapter) shall submit a report to the National Highway Traffic Safety Administration concerning its compliance with the requirements of Standard No. 208 (49 CFR 571.208) for installation of automatic crash protection in such vehicles manufactured during that production year.

(2) Each report submitted in compliance with paragraph (a)(1) of this section shall:

(i) Identify the manufacturer;

(ii) State the full name, title, and address of the official responsible for preparing the report;

(iii) Identify the production year for which the report is filed;

(iv) Contain a statement regarding the extent to which the manufacturer has complied with the requirements of S4.2.5 of Standard No. 208 (§ 571.208 of this chapter);

(v) Provide the information specified in paragraph (b) of this section;

(vi) Be written in the English language; and

(vii) Be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

(b) *Report content.*

(1) *Basis for phase-in production goals.* Each manufacturer shall report the number of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that it manufactured for sale in the United States for each of the three preceding production years or, at the manufacturer's option, for the production year for which the report is filed. A manufacturer that did not manufacture any trucks, buses, or multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during each of the three preceding production years must report the number of trucks, buses, and multipurpose passenger vehicles with a GVWR or 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured during the production year for which the report is filed.

(2) *Production.* Each manufacturer shall report for the production year for which the report is filed, and for each preceding production year, to the extent that trucks, buses, and multipurpose passenger vehicles produced during the preceding production years are treated under § 571.208 of this chapter as having been produced during the production period for which the report is filed, the information specified in paragraphs (b)(2)(i) through (b)(2)(iii) of this section, inclusive, with respect to its trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less.

(i) The number of those vehicles certified as complying with S4.1.2.1 of Standard No. 208, Occupant Crash Protection (49 CFR § 571.208) because they are equipped with automatic seat belts and the seating positions at which those belts are installed;

(ii) The number of those vehicles certified as complying with S4.1.2.1 of Standard No. 208, Occupant Crash Protection (49 CFR § 571.208) because they are equipped with air bags and the seating positions at which those air bags are installed; and

(iii) The number of those vehicles certified as complying with S4.1.2.1 of Standard No. 208, Occupant Crash Protection (49 CFR § 571.208) because they are equipped with other forms of automatic crash protection, which forms of automatic crash protection shall be described, and the seating positions at which those forms of automatic crash protection are installed.

(3) *Vehicles produced by more than one manufacturer.* Each manufacturer whose reporting of information is affected by one or more of the express written contracts permitted by section S4.2.5.6.2 of § 571.208 of this chapter shall:

(i) Report the existence of each such contract, including the names of all parties to each such contract, and explain how the contract affects the report being filed; and

(ii) Report the number of vehicles covered by each such contract.

11. Section 585.6 is revised to read as follows:

§ 585.6 Records.

Each manufacturer shall maintain records of the vehicle identification number and type of automatic crash protection for each vehicle for which information was reported under § 585.5(b)(2), until December 31, 1999.

Issued on March 20, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 12472
March 26, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208
Occupant Protection

(Docket No. 74-14; Notice 71)
RIN 2127-AD11

ACTION: Final rule.

SUMMARY: This agency has expressed its intention to exclude safety belts that meet dynamic testing requirements from some of the static testing requirements to which all safety belts are subject. Dynamic testing consists of a 30 mile per hour crash test of the vehicle using test dummies as surrogates for human occupants. Since the dynamic test measures the actual occupant protection which the belt provides during a crash, there is no apparent need to subject that belt to static testing procedures that are surrogate and less direct measures of the protection which the belt would provide to its occupants during a crash.

In order to avoid needless regulatory restrictions on safety belts that have been dynamically tested, this rule amends the agency's regulations to more accurately express the scope of the exemption from the static testing requirements for safety belts that are dynamically tested. Specifically, this rule:

1. Excludes all safety belts that are subject to the dynamic testing requirements, regardless of the type of vehicle in which those belts are installed, from some of the static testing requirements for safety belts;

2. Permits the use of load limiters on all safety belts installed at seating positions subject to the dynamic testing requirements, regardless of whether the subject belts are automatic or manual safety belts; and

3. Correctly identifies all of the static testing requirements from which automatic safety belts and manual safety belts subject to the dynamic testing requirements are excluded in the safety standards, instead of listing some of those requirements in the safety standards and adding others in the agency's interpretations and preambles to rules.

This notice also clarifies which safety belts the agency was referring to when it described safety belts as "dynamically tested." NHTSA was referring only to all automatic belts and to manual safety belts that are the only occupant restraint system at a seating position. Thus, any manual safety belts installed at seating positions also equipped with either an automatic safety belt or an air bag are not "dynamically tested" safety belts with the meaning of this rule. Such manual safety belts are, therefore, subject to the strength, webbing width, and other requirements of Standard No. 209. However, this rule excludes manual safety belts installed at seating positions also equipped with either an automatic safety belt or an air bag from the elongation requirements of Standard No. 209. This exclusion will allow maximum engineering flexibility in the design of these manual belt systems, while still ensuring effective occupant protection.

DATES: These amendments take effect April 16, 1991.

SUPPLEMENTARY INFORMATION:

Background

Standard No. 209, Seat Belt Assemblies (49 CFR 571.209), sets forth a series of static tests for strength and other qualities of the webbing and hardware used in a seat belt assembly, along with some additional tests of the seat belt assembly as a whole. Absent a dynamic test, these tests individually evaluate each of the aspects of a belt system that NHTSA believes are necessary to ensure that the belt system will provide adequate occupant protection in a crash. For instance, the strength requirements in Standard No. 209 are intended to ensure that the safety belt is strong enough to withstand the loads imposed by a person using the belt in a crash; the webbing elongation requirements help ensure that the belt will not stretch so much that it provides a lesser level of protection; and so forth. NHTSA assumes that any belt system that achieves the required level of performance in all of these tests will offer adequate occupant protection when the belt system is installed in any vehicle at any seating position.

However, NHTSA has long believed it more appropriate to evaluate the occupant protection afforded by vehicles by conducting dynamic testing, which consists of a crash test of the vehicle using test dummies as surrogates for human occupants. This belief is based on the fact that the protection provided by safety belts depends on more than the performance of the safety belts themselves or of belt components tested individually. Occupant protection depends on the performance of the safety belts themselves and the structural characteristics and interior design of the vehicle. A dynamic test of the vehicle allows NHTSA to evaluate all of the factors that affect occupant crash protection. Further, a dynamic test allows the agency to evaluate the synergistic effects of all these factors working together, instead of evaluating each factor individually. Finally, a dynamic test assesses the vehicle's capabilities for minimizing the risk of injury as measured by test dummies and human-based injury criteria, as opposed to individual belt component tests that are only indirectly related to human injury risk.

For dynamic testing under Standard No. 208, Occupant Crash Protection (49 CFR 571.208), test dummies are placed in the vehicle and the vehicle is subjected to a frontal crash into a concrete barrier at a speed of 30 miles per hour (mph). In evaluating the occupant crash protection capabilities of a vehicle, this dynamic test assesses safety belt performance. A requirement for safety belts to conform to both the dynamic testing requirements of Standard No. 206 and the laboratory testing requirements of Standard No. 209 is thus unnecessary, because Standard No. 208 dynamic testing would evaluate the critical aspects of belt and assembly performance that would be evaluated under Standard No. 209. To avoid such redundancies, automatic safety belts subject to the dynamic testing requirements of Standard No. 208 were excluded from Standard No. 209's laboratory testing requirements for webbing, attachment hardware, and assembly performance shortly after NHTSA established the first dynamic testing requirements in Standard No. 208. See 36 FR 23725; December 14, 1971.

More recently, NHTSA has extended the dynamic testing requirements of Standard No. 208 to manual safety belt systems installed at the front outboard seating positions in passenger cars (51 FR 9800; March 21, 1986) and light trucks and multipurpose passenger vehicles (52 FR 44898; November 23, 1987). In both instances, the agency stated in the preamble to the rule that dynamically tested manual belts should be excluded from the same requirements of Standard No. 209 as automatic belts are, for the same reasons. See 51 FR 9804; 52 FR 44906. On the other hand, both automatic and dynamically tested manual belts are subject to other requirements in Standard No. 209; for example, the retractor performance requirements, the buckle release mechanism performance requirements, and the requirements for corrosion resistance of attachment hardware apply to these types of safety belts. NHTSA subsequently denied petitions for reconsideration and a petition for rulemaking on the question of excluding dynamically tested safety belts from some of the requirements of Standard No. 209. See 53 FR 5579; February 25, 1988. In the denial notice, NHTSA reemphasized its conclusion that there was no safety or other need to justify applying some of the static tests in Standard No. 209 to belt systems that have been dynamically tested in the vehicle in which they are installed.

In addition, the preambles to the rules establishing dynamic testing of some manual safety belt systems in passenger cars and light trucks and multipurpose passenger vehicles stated that dynamically tested manual safety belts should be labeled indicating the seating positions and particular vehicles in which these safety belts could be installed. *See* 51 FR 9804; 52 FR 44906–44907. These labels were intended to minimize the likelihood that a dynamically tested safety belt would be installed in a vehicle or a seating position for which it was not intended. NHTSA subsequently denied a petition for rulemaking, asking that these labeling requirements be amended to apply only to dynamically tested manual belt systems that did not comply with all the static testing requirements of Standard No. 209. 53 FR 50429; December 15, 1988.

However, the regulatory language in Standards No. 208 and 209 did not fully and clearly achieve the agency's expressed intentions. Therefore, the agency proposed to amend the provisions of those standards in four areas in a notice of proposed rulemaking (NPRM) published on January 18, 1990 (55 FR 1681). NHTSA received six comments on this NPRM. Commenters included motor vehicle manufacturers, safety belt manufacturers, and motor vehicle dealers. All of these comments were considered in developing this final rule, and the most significant comments are discussed below. For the convenience of the reader, this rule uses the same organization as the NPRM.

1. *Exclusion for Dynamically Tested Manual Belt Systems Installed in Passenger Cars From Certain Requirements of Standard No. 209*

Volkswagen of America (Volkswagen) submitted a petition asking NHTSA to amend the language in Standard No. 208 so as to achieve the agency's stated intent of excluding dynamically tested manual belt assemblies installed at front outboard seating positions of passenger cars from the webbing width, strength, and elongation requirements of Standard No. 209. Volkswagen noted that, although preambles to rules on dynamic testing have repeatedly indicated that NHTSA was excluding dynamically tested manual belts in passenger cars from certain static testing requirements of Standard No. 209, the current language in section S4.6.1 of Standard No. 208 excludes dynamically tested manual belts in passenger cars from some requirements in Standard No. 209 only if the requirement for automatic restraints in passenger cars were rescinded. Since there was no rescission, there is currently no exclusion from any of the requirements in Standard No. 209 for dynamically tested manual belts in passenger cars.

In the NPRM, NHTSA repeated its previous statements that it is appropriate to exclude all belt systems subject to dynamic testing requirements, including dynamically tested manual belts in passenger cars, from some of the static testing requirements of Standard No. 209. The failure to provide such an exclusion in Standard No. 208 was simply an oversight on NHTSA's part. The agency proposed to correct that oversight in the NPRM.

Chrysler, Ford, and BMW commented that they supported this proposal. The Automotive Occupant Restraints Council (AORC) opposed the proposal. According to AORC, excluding dynamically tested manual belts from some of the static testing requirements in Standard No. 209 might result in adverse safety consequences. For example, AORC noted that the static webbing strength test exposes the webbing to loading that is approximately twice as great as the most heavily-loaded webbing would be exposed to during dynamic testing. This commenter asserted that an "unknowledgeable or reckless" manufacturer could introduce webbing of lesser strength in its dynamically tested safety belts and that this webbing of lesser strength would be a "degraded occupant crash protection product." Similarly, AORC suggested that eliminating the assembly performance requirements for dynamically tested safety belts "could result in a degradation of performance of the seat belt assembly." In the same vein, AORC suggested that elimination of the webbing width requirements for dynamically tested safety belts "would provide the possibility for ill-conceived, unproven significant deviations" from the webbing width specified in Standard No. 209.

AORC had previously raised these concerns about excluding dynamically tested manual belts from some of the static testing requirements of Standard No. 209. NHTSA responded in detail in a February 25, 1988 notice (53 FR 5579). To briefly repeat that response, the agency agreed with AORC that the static testing provisions of Standard No. 209 are well-conceived provisions that have assured adequate levels of occupant crash protection. The agency also agreed that the static testing provisions of Standard No. 209 subject the safety belt to higher force levels than are generally encountered in dynamic testing under Standard No. 208. Thus, it is possible that safety belt manufacturers could make design changes to their dynamically tested manual safety belts that might result in lesser safety protection for belt users. The agency stated that it must determine if this possible action by safety belt manufacturers is sufficiently likely so as to justify some preventive regulatory action.

Automatic belts have been excluded from these static testing requirements since 1971. In those 20 years, NHTSA has no evidence of any instances where automatic safety belts provided any lesser level of safety protection because those belts are excluded from some of the static tests in Standard No. 209. Judging from this record, it seems that the possibility that safety belt manufacturers would take actions that would result in lesser safety protection has not become a reality, in the case of automatic safety belts. There is no apparent reason to believe that this possibility would become a reality in the case of dynamically tested manual belts, and AORC did not suggest such a reason. Hence, there is no apparent need for the static testing requirements in Standard No. 209 to apply to dynamically tested manual safety belts.

In addition to these previously expressed reasons for excluding dynamically tested manual safety belts in general from some of Standard No. 209's static tests, NHTSA believes there is an additional reason to adopt the proposal to exclude dynamically tested manual safety belts in passenger cars from those static tests. Dynamically tested manual safety belts in light trucks are already excluded from those static tests. There is no reason to treat dynamically tested manual safety belts differently, depending on the type of vehicle in which those belts are installed. The differing treatment arose because of an oversight on the agency's part. The adoption of the proposal to treat all dynamically tested manual safety belts in the same way for the purposes of some static testing requirements in Standard No. 209 corrects that oversight.

NHTSA would also like to respond to a point raised in Ford's comments. Ford suggested that manual safety belts installed at seating positions equipped with an air bag could be considered dynamically tested manual safety belts, or a "manual seat belt assembly subject to the requirements of S5.1" of Standard No. 208, as expressed in the proposed regulatory language. Ford correctly noted that S4.1.2.1(a) requires that air bags provide acceptable occupant crash protection in a 30 mph barrier crash test by automatic means alone. S4.1.2.1(c)(2), which requires that manual safety belts be installed at seating positions equipped with air bags, also requires that the seating position provide acceptable occupant protection in another 30 mph barrier crash test with the manual safety belts fastened. According to Ford, this testing meant that the manual safety belts at seating positions equipped with air bags are, strictly speaking, "subject to the requirements of S5.1" and that those belts could be considered dynamically tested manual safety belts.

This interpretation is contrary to NHTSA's intent. The safety belts that NHTSA meant to describe as subject to the crash testing requirements of S5.1 included all automatic belts and manual safety belts that were the only occupant restraint system at a seating position. Thus, any manual belts installed at seating positions also equipped with either automatic safety belts or air bags are not what NHTSA is referring to when it uses the term "dynamically tested manual belts" in preambles or letters of interpretation. To make this clear, the regulatory language adopted in this final rule describes the excluded safety belts as "any manual seat belt assembly subject to the requirements of S5.1 of this standard by virtue of any provision of this standard other than S4.1.2.1(c)(2)."

A result of this clarification is that manual safety belts installed at seating positions also equipped with either automatic safety belts or air bags will remain subject to Standard No. 209's requirements for webbing width, strength, and so forth. This helps ensure that the manual safety belts will provide the intended occupant protection in situations in which the automatic crash protection is not intended to deploy (e.g., in crashes other than frontal crashes and rollovers).

However, the agency believes it is appropriate to exclude manual belts installed at seating positions also equipped with either automatic belts or air bags from the elongation requirements in Standard No. 209. NHTSA concludes that allowing an exclusion from the elongation requirements for these safety belts will permit safety belt designs that optimize the belt force deflection characteristics of the manual belts installed in conjunction with automatic crash protection systems. Optimized designs could achieve better occupant protection. Appropriate amendments have been made to Standards No. 208 and 209 to reflect this exclusion.

2. *Load Limiters on Dynamically Tested Manual Belts*

Ford filed a petition for rulemaking asking that "load limiters" be permitted on dynamically tested manual safety belts. S4.5 of Standard No. 209 includes specific regulatory provisions regarding "load limiters" on safety belt systems. A "load limiter" is defined in section S3 of Standard No. 209 as "a seat belt assembly component or feature that controls tension on the seat belt to modulate the forces that are imparted to occupants restrained by the belt assembly during a crash." Before this rule takes effect, the language of S4.5 of Standard No. 209 allows load limiters to be used on belt assemblies only if that belt assembly is part of an automatic restraint system.

However, the agency explained in the NPRM that it agreed with Ford's suggestion that the agency intended to permit the use of load limiters on dynamically tested manual belt systems. As long as a belt system is installed at a seating position that is subject to dynamic testing requirements, the occupant protection capabilities of the belt system can be evaluated in the dynamic testing. There is no reason to permit the use of load limiters on dynamically tested automatic belt systems, but prohibit their use on dynamically tested manual belt systems. Accordingly, the NPRM proposed to amend S4.5 of Standard No. 209 to allow load limiters to be used on belt systems installed in conjunction with an automatic restraint system or on belt systems installed at a seating position subject to the dynamic testing requirements.

Chrysler and Ford supported this proposal, and no commenters objected to the proposal. The proposed change is made in this final rule, for the reasons set forth in the proposal.

As an adjunct to the proposal to allow load limiters on belt systems installed at a seating position equipped with automatic crash protection, the agency proposed to require those belt systems to be labeled in the same way as automatic belts equipped with load limiters. Ford commented that it did not believe that labeling of dynamically tested safety belts is necessary, irrespective of whether the dynamically tested safety belt is manual or automatic. Thus, Ford asked that the proposed labeling requirement for dynamically tested safety belts with load limiters not be adopted in this final rule.

NHTSA proposed to require dynamically tested manual safety belts equipped with load limiters to be labeled in the same way that dynamically tested automatic belts with load limiters have been required to be labeled since 1981. Prior to Ford's comment, NHTSA had not heard of any suggestion that the labeling requirements for automatic belts with load limiters were unduly burdensome, onerous, confusing, or the like. During this rulemaking, no commenter other than Ford made such a suggestion. Thus, absent some further explanation of the difficulties Ford has experienced, NHTSA does not believe that extending the existing labeling requirements for automatic belts with load limiters to dynamically tested manual belts with load limiters will result in any undue burdens for manufacturers or consumers.

Ford also stated its understanding that the labeling requirements in the proposal would apply to automatic and dynamically tested manual belts only if those belt assemblies:

1. Incorporated a load limiter, and
2. Did not comply with the elongation requirements in Standard No. 209.

Based on this understanding, Ford asked the agency to confirm that NHTSA had not proposed to require labeling of dynamically tested safety belts that include load limiters, but still comply with the elongation requirements in Standard No. 209. Ford's understanding is correct. There is no need to specifically label safety belts that use load limiters, but nevertheless comply with the elongation requirements of Standard No. 209.

After considering the comments, the agency is adopting the proposed labeling requirement for safety belts that incorporate load limiters, with two minor modifications. First, the agency proposed to require that safety belts with load limiters be labeled with information describing the belt system as "dynamically tested." That phrase has been deleted from the required label information in this final rule, to reflect the facts that load limiters may be used on manual belt systems installed at seating positions also equipped with air bags and that those belt systems are *not* what NHTSA means by "dynamically tested manual belts," as explained in the preceding section of this preamble.

Second, the agency proposed to permit load limiters to be installed on "Type 1 or Type 2 seat belt assemblies," if the safety belt were installed at a seating position subject to dynamic testing. Strictly speaking, an automatic safety belt is not a Type 1 or Type 2 seat belt assembly. Thus, notwithstanding NHTSA's express intention to permit load limiters on automatic belts, the proposed regulatory language would not clearly have done so. This final rule deletes the references to Type 1 or Type 2 seat belt assemblies from the regulatory language.

3. *Scope of Exclusion From Standard No. 209 for Dynamically Tested Manual Belt Systems*

Before the effective date of this rule, both Standards No. 208 and 209 exclude dynamically tested manual belt systems from "the requirements of S4.2(a)-(c) and S4.4" of Standard No. 209. However, while this exclusion appears to be a comprehensive listing of the provisions of Standard No. 209 from which dynamically tested safety belts are excluded, it is in fact incomplete. Several previous interpretations and preambles to rulemaking actions have expressed NHTSA's position that dynamically tested manual belt systems are excluded from the requirements of S4.2(d)-(f), as well as the listed sections of Standard No. 209. The NPRM proposed to amend Standard No. 209 so that it would correctly show all of the provisions of Standard No. 209 from which dynamically tested manual belt systems were excluded.

The commenters supported this proposal. It is adopted for the reasons set forth in the NPRM.

4. *Labeling Requirements for Dynamically Tested Manual Safety Belts Installed in Passenger Cars*

At this time, Standard No. 209 requires information about the vehicles and seating positions in which dynamically tested belt systems can be installed to be labeled on dynamically tested manual belt systems for use in light trucks and multipurpose passenger vehicles. However, Standard No. 209 currently does not require any installation information to be labeled on dynamically tested manual belt systems for use in passenger cars. The agency proposed in the NPRM to remedy this inconsistency by revising Standard No. 209 so that it would require installation information to be labeled on all dynamically tested manual belt systems, regardless of the vehicle type in which the belt system will be installed.

This proposal drew the most attention from the commenters. The National Automobile Dealers Association (NADA) supported this proposal, stating that a consistent labeling requirement for safety belts would "certainly benefit" aftermarket installations of those safety belts. On the other side of this issue, Chrysler opposed the proposal, asserting that the proposed requirement would be cumbersome, and not necessary to ensure proper safety belt replacement and performance. Chrysler asserted that it currently has over 300 replacement safety belt part numbers for its 1990 vehicles alone. Because of this complexity and proliferation of parts, Chrysler asserted that dealers and garages do not usually stock replacement safety belts, but order the belts and parts from Chrysler when needed. Accordingly, Chrysler believed that the proposed labeling requirement would not serve any purpose.

Ford also opposed the proposal. According to Ford, dynamically tested safety belts are so complex that it would be extremely difficult to mistakenly install a dynamically tested safety belt in a vehicle or at a seating position other than that for which it is designed. Given this difficulty, Ford argued that it was very unlikely that such an installation could be done inadvertently. Ford suggested that the information proposed to be required to appear on a label on the belt instead be required to appear in the installation instructions required to be provided with safety belt assemblies. BMW and the Automobile Importers Association submitted comments that were substantially similar to the Chrysler and Ford comments.

NHTSA has reconsidered the proposed labeling requirements in response to these comments. On the one hand, the agency does not believe there is any reason to have different labeling requirements for dynamically tested manual belt assemblies to be used in passenger cars than for dynamically tested manual belt assemblies to be used in light trucks. The likelihood that dynamically tested manual safety belts will be inadvertently installed in vehicles or seating positions other than those for which the belts were designed would not differ, depending upon the type of vehicle in which the dynamically tested belt is to be used. The proposal to extend the same labeling requirements that currently apply to dynamically tested manual belts for use in light trucks to dynamically tested manual belts for use in passenger cars was an effort by the agency to ensure that the labeling requirements were consistent.

On the other hand, NHTSA does not want to impose an unnecessary or burdensome labeling requirement. The agency would like to further explore the idea of addressing the inappropriate installation of dynamically tested manual safety belts by means of the installation instructions already required to be furnished with safety belts by S4.1(k) of Standard No. 209. If the installation instructions were required to set forth the information currently required to be labeled on dynamically tested manual safety belts, it would seem that persons installing replacement safety belts would always have access to the information, just as they would if the information were labeled on the safety belt. The only instances in which information might not be available to the installer would be if the installation instructions were lost or if the installer was removing a safety belt from one vehicle and transferring the belt to another vehicle. NHTSA has no indications that either of these events are common occurrences.

To allow for further exploration of this subject, NHTSA plans to initiate a rulemaking action proposing to require that the information currently required to be labeled on dynamically tested manual belts for use in light trucks instead be required to be provided in the installation instructions for all dynamically tested safety belts, both automatic and manual. This proposed requirement would apply to dynamically tested safety belts for use in both passenger cars and light trucks.

Until the agency has completed this planned rulemaking, it would be premature to make any change to the existing requirements for labeling dynamically tested safety belts. Hence, the labeling requirements for dynamically tested manual belts for use in light trucks that are now in place will remain in effect. However, this final rule does not adopt the proposed extension of the labeling requirements for dynamically tested light truck manual safety belts to also cover dynamically tested manual safety belts for use in passenger cars.

This final rule operates to relieve some unintended restrictions on the use of dynamically tested safety belts by adopting regulatory language that reflects the agency's intention, as expressed in preambles of various rules. No additional duties or responsibilities are imposed on any party as a result of these modifications to the regulatory language. Accordingly, NHTSA finds for good cause that these modifications should become effective upon publication in the *Federal Register.*

In consideration of the foregoing, 49 CFR part 571 is amended as follows:

§ 571.208 [Amended]

2. In § 571.208, S4.6 of Standard No. 208 is amended by removing existing sections S4.6.1 and S4.6.3, redesignating existing S4.6.2 as S4.6.1, and adding new sections S4.6.2 and S4.6.3 to read as follows:

S4.6 Dynamic testing of manual belt systems.

* * * * *

S4.6.2 Any manual seat belt assembly subject to the requirements of S5.1 of this standard by virtue of any provision of this standard other than S4.1.2.1(c)(2) does not have to meet the requirements of S4.2(a)–(f) and S4.4 of Standard No. 209 (§ 571.209).

S4.6.3 Any manual seat belt assembly subject to the requirements of S5.1 of this standard by virtue of S4.1.2.1(c)(2) does not have to meet the elongation requirements of S4.2(c), S4.4(a)(2), S4.4(b)(4), and S4.4(b)(5) of Standard No. 209 (§ 571.209).

* * * * *

§ 571.209 [Amended]

3. In § 571.209, S4.5 of Standard No. 209 is amended by revising S4.5(b) and (c) to read as follows:

S4.5 Load limiter.

* * * * *

(b) A seat belt assembly that includes a load limiter and that does not comply with the elongation requirements of this standard may be installed in motor vehicles at any designated seating position that is subject to the requirements of S5.1 of Standard No. 208 (§ 571.208).

(c) A seat belt assembly that includes a load limiter and that does not comply with the elongation requirements of this standard shall be permanently and legibly marked or labeled with the following statement:

This seat belt assembly is for use only in [insert specific seating position(s), e.g., "front right"] in [insert specific vehicles make(s) and model(s)].

4. In § 571.209, S4.6(a) of Standard No. 209 is revised to read as follows:

S4.6 Manual belts subject to crash protection requirements of Standard No. 208.

(a)(1) A manual seat belt assembly, which is subject to the requirements of S5.1 of Standard No. 208 (49 CFR 571.208) by virtue of any provision of Standard No. 208 other than S4.1.2.1(c)(2) of that standard, does not have to meet the requirements of S4.2(a)–(f) and S4.4 of this standard.

(2) A manual seat belt assembly subject to the requirements of S5.1 of Standard No. 208 (49 CFR 571.208) by virtue of S4.1.2.1(c)(2) of Standard No. 208 does not have to meet the elongation requirements of S4.2(c), S4.4(a)(2), S4.4(b)(4), and S4.4(b)(5) of this standard.

* * * * *

Issued on April 10, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 15295
April 16, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208
Crash Tests With Unrestrained Test Dummies

(Docket No. 74-14; Notice 72)
RIN 2127-AC13

ACTION: Final rule.

SUMMARY: This rule adopts as a permanent rule the interim final rule that extended the period during which a Hybrid II test dummy will be the only dummy used in compliance tests of vehicles with "passive interiors," i.e., vehicles that provide occupant protection without using any safety belts or air bags. No commenter objected to the interim final rule. This rule delays the use of the Hybrid III test dummy for compliance testing of such vehicles until September 1, 1993. The agency has determined that this additional time is needed to allow the agency to complete and evaluate the many research projects that are now underway examining the Hybrid III test dummy. This rule does not affect the requirement that vehicle manufacturers have the option of specifying the use of either the Hybrid II or the Hybrid III test dummy in compliance testing of vehicles that use either air bags or safety belts to meet the standard.

EFFECTIVE DATE: This rule takes effect on April 26, 1991.

SUPPLEMENTARY INFORMATION: The Hybrid II test dummy has been used to assess the occupant protection afforded vehicle occupants in frontal crashes since August 1, 1973. The specifications for the Hybrid II test dummy appear at Subpart B of 49 CFR Part 572. The agency has determined that the Hybrid II test dummy provides a reasonable simulation of a human. While the Hybrid II test dummy had been the only test dummy specified in NHTSA's regulations for use in Standard No. 208 compliance testing, the agency published a rule establishing a second test dummy, the Hybrid III, for use in Standard No. 208 compliance testing on July 25, 1986 (51 FR 26688). The specifications for the Hybrid III test dummy appear at Subpart E of 49 CFR Part 572. The agency concluded that this test dummy would allow the assessment of more types of potential injuries to vehicle occupants and that this test dummy appeared to be an even more accurate simulation of a human than the older Hybrid II test dummy. The rule establishing the Hybrid III test dummy for use in compliance testing required that the same force levels that are measured and recorded for the Hybrid II test dummy would be measured and recorded for the Hybrid III test dummy, and that the same maximum injury criteria levels would apply to both types of test dummies.

The agency determined that the two types of test dummies were "equivalent," when the dummies were restrained by safety belts or air bags but were *not* equivalent when they were unrestrained. By "equivalent," the agency means that they displayed only minimal differences in test results when they are exposed to equivalent crash environments. This is critical in compliance testing to ensure that compliance or noncompliance with a safety standard is entirely dependent upon vehicle attributes instead of differing attributes of the types of test dummies. The final rule explained that the chest acceleration measurements for unrestrained Hybrid III dummies were consistently lower than the chest acceleration measurements for unrestrained Hybrid II dummies. To make the two unrestrained test dummies equivalent, some measurement of injury producing forces to the chest of the Hybrid III test dummy, in addition to the existing measurement of chest acceleration, would have to be made to compensate for the lower chest acceleration measurements for unrestrained Hybrid III test dummies. The agency concluded that a measurement of the amount the chest was deflected, or compressed, as measured approximately at the sternum for the Hybrid III test dummy would appropriately compensate for that dummy's lower chest acceleration measurements when it was unrestrained. Hence, a limit was established on the amount of chest deflection permitted when the Hybrid III test dummy was used in compliance testing.

Given the differences in chest acceleration with the two types of unrestrained dummies, the agency concluded in a March 17, 1988 rule (53 FR 8755) that it should not permit the Hybrid III test dummy to be used for compliance testing with the automatic crash protection requirements of vehicles manufactured before September 1, 1990, which used means other than air bags or automatic safety belts to provide the automatic protection. NHTSA anticipated that this delay would be sufficient to allow the agency to investigate this subject further, to ensure that the chest deflection limits for unrestrained Hybrid III test dummies would both meet the need for safety and ensure equivalence of the Hybrid II and Hybrid III test dummies in unrestrained conditions. However, as NHTSA and others conducted research, it became evident that chest deflection dynamics in the Hybrid III test dummy were far more complex than the agency originally believed and that more sophisticated and suitable instrumentation systems would need to be developed to provide measurements of kinematic distortions of the dummy's ribcage.

Interim Final Rule

Based on the above, NHTSA issued an interim final rule prohibiting the use of the Hybrid III test dummy in crash situations where it would be unrestrained, until a determination could be made about the appropriate chest deflection limits and measurement techniques for the Hybrid III test dummy in those crash situations (55 FR 39283, September 26, 1990). The interim final rule specified that any vehicles manufactured before September 1, 1993 that comply with the automatic restraint requirement without using any type of safety belt or inflatable restraint must use only the Hybrid II test dummy in testing for compliance with the automatic restraint requirement. The rule explained that the results of the agency's ongoing research program will be completed by December 1992. At that time, the agency will be able to determine the most appropriate course of action and complete the necessary rulemaking actions by September 1, 1993.

In issuing the interim final rule, the agency found for good cause that notice and opportunity for comment on that rule before it became effective would have been impracticable and contrary to the public interest. For a detailed discussion explaining the agency's determination that there was good cause not to provide notice and comment, the reader should refer to the interim final rule. Among the reasons set forth were that the circumstances that forced this postponement were beyond the agency's control, that the agency had acted diligently to initiate the supplemental testing and other potential modifications to the Hybrid III test dummy, that the agency had fully intended to permit the Hybrid III to be used for unrestrained testing on schedule, and that the postponement of the use of the Hybrid III test dummy in unrestrained situations would be for a relatively short time.

In the interim final rule, NHTSA requested comments on its decision to postpone the use of the Hybrid III test dummy in unrestrained situations and explained that it would consider all comments received on this subject and publish a permanent final rule reflecting NHTSA's evaluation of those comments. That notice also explained that the permanent final rule would resolve any unforeseen burdens resulting from the interim final rule.

Comments to Interim Final Rule and the Agency's Response

In response to the interim final rule the agency received two comments. Chrysler supported the amendment to delay the use of the Hybrid III test dummy in compliance testing of non-air bag, non-seat belt restraint systems and to extend the use of the Hybrid II dummy in such testing. In more extensive comments, General Motors (GM) stated its decision not to oppose the delay of the Hybrid III test dummy for use in "unrestrained" compliance testing of a vehicle that employed a means other than safety belts or air bags to comply with Standard No. 208.

After reviewing these comments received on that notice, NHTSA has decided to issue the interim final rule as a final rule, without any modifications. No commenter suggested that the delay adopted in the interim final rule was inappropriate, burdensome, or otherwise improper. The amendments adopted in the interim final rule are therefore made final by this notice.

In its comments to the interim final rule, GM also petitioned the agency to amend Standard No. 208 to allow only the Hybrid III test dummy to be used during "restrained" compliance testing. Because this petition is outside the scope of this rule, the agency will address it separately instead of in this rule.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. As explained at length in the interim final rule, the agency concluded it was in the public interest to issue the interim final rule. Since the requirements adopted in the interim final rule are adopted verbatim in this final rule, the agency believes that good cause exists to make this final rule effective upon its publication in the *Federal Register.*

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

S5 of Standard No. 208 is amended by revising the introductory text of S5.1 and the introductory text of S5.2.1, to read as follows:

S5. *Occupant crash protection requirements.*

S5.1 Vehicles subject to S5.1 shall comply with either S5.1(a) or S5.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(a) by means not including any type of seat belt or inflatable restraint shall comply with S5.1(a).

* * * * *

S5.2 *Lateral moving barrier crash test.*

S5.2.1 Vehicles subject to S5.2 shall comply with either S5.2.1(a) or S5.2.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(c) by means not including any type of seat belt or inflatable restraint shall comply with S5.2.1(a).

* * * * *

Issued on April 22, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 19306
April 26, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 87-08; Notice 7)

RIN: 2127-AD92

ACTION: Final rule, response to petitions for reconsideration.

SUMMARY: In response to two petitions for reconsideration, this notice amends Standard No. 208, Occupant Crash Protection, to remove the prohibition against pushbutton mechanisms as the means of detaching belts for readily removable seats. The agency has concluded that there is no evidence to support its concerns regarding possible misuse of pushbutton releases in this application. Vehicle manufacturers will benefit from the additional design flexibility allowed by this rule.

EFFECTIVE DATE: The amendments made by this rule are effective on July 8, 1991.

SUPPLEMENTARY INFORMATION:

On November 29, 1988 (53 FR 47982), NHTSA published a notice of proposed rulemaking (NPRM) proposing to require that rear seat lap/shoulder belts be installed in certain new vehicles. Specifically, this NPRM proposed to require passenger cars (including convertibles), light trucks, light multipurpose passenger vehicles (MPVs), and small buses to be equipped with lap/shoulder safety belts at all forward-facing rear outboard seating positions. Additionally, the NPRM proposed that these rear seat lap/shoulder belts be equipped with a particular type of retractor, that such belts be integral (i.e., the shoulder belt could not be detachable from the lap belt), and that such belts comply with some of the comfort and convenience requirements in Standard No. 208, Occupant Crash Protection.

The agency received more than 70 comments on this NPRM. The consensus of commenters was that passenger cars other than convertibles should be equipped with rear seat lap/shoulder belts. Hence, to ensure the earliest possible implementation of such a requirement, NHTSA published a final rule on June 14, 1989 (54 FR 25275). That rule addressed only passenger cars other than convertibles, and required that all such vehicles manufactured on or after December 11, 1989, be equipped with rear seat lap/shoulder belts. That rule also expressly deferred resolution of all of the other issues proposed in the NPRM until a later date.

NHTSA published a final rule addressing the other issues raised in the NPRM, including the other vehicle types required to have rear seat lap/shoulder belts, the types of retractors with which those safety belts should be equipped, and the other performance attributes those safety belts should have, on November 2, 1989 (54 FR 46257). This rule included special provisions for lap/shoulder belts installed at rear outboard seating positions on readily removable seats, by expressly providing that shoulder belts for readily removable seats could be detachable at the upper anchorage. The agency also responded to comments by Ford Motor Company (Ford) and General Motors (GM) concerning a March 1, 1985 interpretation letter from NHTSA's Chief Counsel to Mr. Hiroshi Shimizu of Tokai Rika Co. by stating in the preamble to this rule that the Shimizu interpretation did not preclude the use of all designs of detachable safety belt systems. More specifically, the agency explained that the Shimizu interpretation would preclude the use of pushbutton mechanisms to release shoulder belt anchorages. However, the agency expressly stated that the Shimizu interpretation did *not* preclude the use of other release mechanisms, such as slide buttons or slide collars, for shoulder belt anchorages.

The agency received 14 petitions for reconsideration of this rule. In a final rule responding to those petitions for reconsideration, published on July 30, 1990 (55 FR 30914), the agency made several changes to the November 1989 final rule. Ford's petition for reconsideration raised two issues regarding lap/shoulder belts at readily removable seats. Ford asked the agency to amend the 1989 rule to permit lap/shoulder belts on readily removable seats to be detached at either the upper or lower anchorage and to permit the means of detachment to consist of a pushbutton release.

With respect to the first issue, Ford asserted that limiting the detachment point to the upper anchorage point was "overly design restrictive." According to Ford, there was no safety reason for permitting the belt system to detach at the upper, but not the lower, shoulder belt anchorage point. The agency was persuaded by Ford's argument. While there were legitimate safety reasons for permitting the belts to be detachable at only one point, there was no apparent safety purpose served by specifying that the single point must be the upper, and not the lower, shoulder belt anchorage point. Accordingly, the notice amended Standard No. 208 to permit lap/shoulder safety belt systems installed at outboard seating positions on readily removable seats to detach at either the upper or lower shoulder belt anchorage, but not both.

With respect to the second issue, Ford asked in its petition that Standard No. 208 be amended to permit the means of detachment to be a pushbutton release, asserting that a slide button or slide collar release "tends to rattle and provides less control over...the fit of the shoulder belt." NHTSA did not believe that this was a sufficient reason to permit the use of a pushbutton release as the means for detaching the lap/shoulder belt from the vehicle. NHTSA explained that the prohibition of a pushbutton mechanism as the means of detaching a safety belt from its anchorage helped ensure that an occupant could not easily release either the lap belt or shoulder belt portion of the safety belt system and use only the unreleased portion of the safety belt system. The agency again concluded that a slide button or slide collar used as the means of detaching a shoulder belt would permit the belt to be detached when the readily removable seat is removed, and would also minimize the possibility that an occupant will detach a portion of the lap/shoulder belt system when the readily removable seat is in place in the vehicle. To emphasize the agency's intent, express language was added to the standard prohibiting the use of pushbutton mechanisms to detach lap/shoulder belt systems installed for readily removable seats.

Petitions for reconsideration of this July 1990 response to Ford were received from GM and Chrysler Corporation (Chrysler). These petitions again asked NHTSA to permit the use of pushbutton releases to detach the anchorages of safety belts installed at readily removable seats.

Chrysler, in its petition, contended that there was no demonstrated safety need for the prohibition. Chrysler stated that it will use the pushbutton release in certain rear seating positions in one of its 1991 models because of the "proven performance" of the design and because the parts were readily available. In addition, Chrysler stated that it has taken steps to help ensure that the release is not improperly used, through use of a pushbutton cover that requires a special tool to depress the release and includes the warning, "Caution-Press for seat removal only." Finally, Chrysler argued that the Shimizu interpretation was erroneous. According to Chrysler, S7.2 of Standard No. 208 does not preclude the use of a pushbutton release in the manner requested by its petition, but merely requires that a seat belt user be able to release both the lap and shoulder portions of the belt by means of a single release.

In its petition, GM argued that although the preamble to the November 1989 final rule discussed the issue of pushbutton releases as the mechanism for detaching shoulder belts, the use of a pushbutton was not expressly disallowed in the regulatory language. Hence, GM claimed that, under Section 553 of the Administrative Procedure Act (5 U.S.C §553), it did not have an adequate notice and opportunity to comment on the prohibition. As regards the merits of the prohibition of pushbutton releases, GM asserted that alternate release mechanisms, such as a slide button or collar, may be easier to unfasten than certain pushbutton designs, and, in fact, a prohibition of the pushbutton release would permit the use of a simple hook to attach a safety belt assembly to an anchorage. GM also asserted that the agency has not shown a demonstrated safety need for the rule. In support of its position, GM stated that it has delivered over 400,000 vehicles equipped with a pushbutton release and is not aware of any complaints or cases of misuse concerning the system. GM concluded that this experience did not support the agency's position that a pushbutton release is more likely to be misused.

NHTSA has reexamined its previous decision in response to these petitions. With respect to GM's procedural objection, NHTSA rejects GM's assertion that the public did not have notice of and an opportunity to comment on the prohibition of pushbutton release mechanisms. 5 U.S.C. 553 requires notices of proposed rulemaking to include either "the terms or substance of the proposed rule or a description of the subjects and issues involved." The courts have interpreted this language to mean that the notice must be sufficiently descriptive of the subjects and issues involved so that interested parties may offer informed criticism and comments. *See, e.g. Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 392-394 (D.C. Cir. 1973), *cert. den.*, 417 U.S. 921 (1974). However, the publication of a proposed rule for comment does not of necessity bind an agency to undertake a new round of notice and comment before it adopts a rule which is different—even substantially different—from the proposed rule. *American Iron & Steel Institute v. Environmental Protection Agency*. 568 F.2d 284, 293 (3rd Cir. 1977)., *International Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 632 n.51 (D.C. Cir. 1973). The adequacy of the notice is tested by determining whether it fairly apprised interested persons of the "subjects and issues" before the agency. *Trans-Pacific Freight v. Federal Maritime Commission*, 650 F.2d 1235, 1248-1249 (D.C. Cir. 1980)., *Ethyl Coro. v. Environmental Protection Agency*, 541 F.2d 1, 48 (D.C. Cir.), *cert. den.*, 426 U.S. 941 (1976).

Judged by these criteria, NHTSA concludes that the NPRM was sufficient to apprise all interested persons that the agency was addressing the issue of whether to permit safety belts for readily removable seats to be detachable from the vehicle and what, if any, restrictions should be imposed on the means of detachment. In the preamble to the NPRM, the agency stated: "The agency also believes that manufacturers are capable of designing an integral lap/shoulder belt system that would be nearly as convenient as a nonintegral shoulder belt in MPV's with readily removable seats. For instance, a shoulder belt that is readily detachable at the anchorage could be used for the outboard seating positions." 53 FR 47982, at 47990., November 29, 1988. In response to this discussion in the preamble, both Ford and GM commented that, while they agreed with the agency's intent to permit detachable shoulder belts for readily removable seats, the Shimizu interpretation appeared to prohibit such belt designs. The GM comment may be found on page 7 of Enclosure 1 in NHTSA Docket No. 87-08-N02-033. In response to these comments, the preamble to the final rule explained that the Shimizu interpretation did not prohibit all detachable belt systems, only those belt systems that used a pushbutton as the means of detachment. *See* 54 FR 46257, at 46263., November 2, 1989.

This record shows that the public had notice of and the opportunity to comment on the issue of detachable belts at readily removable seats. The type of release mechanism for detachable belts is one aspect of the issue of detachability. Since the public had express notice that permitting detachable belts at readily removable seats was one of the subjects and issues before the agency, and since the commenters specifically addressed this issue and the Shimizu interpretation in their comments, GM's suggestion that the Administrative Procedure Act required further notice is incorrect.

However, the central point of the Chrysler and GM petitions, asserting that there is no reasonable safety justification for prohibiting pushbuttons as the means of detaching belts, has merit. NHTSA denied Ford's earlier request that pushbuttons be permitted because of the agency's concern that a pushbutton mechanism that detached a safety belt assembly from the vehicle at an anchorage point would increase the ease with which an occupant could detach either the lap belt or shoulder belt portion of the belt system and use only one part of the safety belt. Upon reconsideration, NHTSA agrees with the petitioners that pushbuttons are not inherently more susceptible to misuse than other release designs that would be permitted under the July 1990 final rule. Indeed, a pushbutton design such as was described in Chrysler's petition may be less likely to be misused than most other designs. Additionally, GM stated that it has equipped more than 400,000 of its vehicles that have readily removable rear seats with pushbutton releases. GM stated that it has no indication that these releases have been misused. NHTSA likewise has no evidence of misuse. Upon reconsideration, then, NHTSA has concluded that there is no justification for prohibiting pushbutton mechanisms as the means of detaching belts for readily removable seats. Standard No. 208 is amended to remove that prohibition.

The Shimizu interpretation is, therefore, superseded to the extent that it is inconsistent with the new regulatory provisions for readily removable seats. However, the Shimizu interpretation is still an accurate expression of the requirements of Standard No. 208 for safety belts on seats that are not readily removable.

This rule relieves a restriction, by allowing manufacturers additional design flexibility in determining which release mechanism should be used for the safety belts at readily removable seats. It does not impose any additional obligations on any party. Those manufacturers that wish to use pushbutton releases will now be free to do so, while those manufacturers that wish to use releases other than pushbuttons will also be free to do so. Accordingly, NHTSA finds for good cause that this rule should become effective 30 days after publication, instead of no sooner than 180 days after publication, as generally required by the Safety Act.

* * * * *

S4.2.4.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.2.4 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but not both anchorage points, to meet those requirements. The means for detaching the upper torso belt may use a pushbutton action.

3. S4.4.3 of Standard No. 208 is amended by revising S4.4.3.2.3 to read as follows:

S4.4.3 Buses manufactured on or after September 1, 1991.

* * * * *

S4.4.3.2.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.4.3.2 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt may use a pushbutton action.

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Issued on May 31, 1991

56 F.R. 26039
June 6, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208
Occupant Crash Protection

(Docket No. 74–14; Notice 74)
RIN 2127–AD1O

ACTION: Response to petitions for reconsideration; Technical amendment.

SUMMARY: This notice responds to the two petitions asking for reconsideration of this agency's final rule extending the automatic crash protection requirements currently applicable to passenger cars to light-duty trucks, buses, and multipurpose passenger vehicles. This notice corrects a typographical error noted in one of the petitions, but denies the petitions in all other respects. More specifically, this notice denies a request to change the test conditions to eliminate the claimed effects of electrostatic discharge on the force measurements recorded during compliance testing. The petitioner did not present any evidence to show either that electrostatic discharge occurs during compliance testing or how, even if an electrostatic discharge were to occur, it would affect the force measurements recorded. This notice also denies requests to change the language specifying the distribution of the test load and the applicability of the phase-in requirements to multistage vehicles, because such changes are unnecessary. Finally, this notice denies a request to exempt multistage vehicles from the automatic crash protection requirements Since the petitioner presented no new information or arguments to support its request, NHTSA has no basis for reaching a different conclusion than it reached when it previously considered this issue.

SUPPLEMENTARY INFORMATION:

Background

Federal Motor Vehicle Safety Standard No. 208, Occupant Crash Protection (49 CFR 571.208), is intended to reduce the likelihood of occupant deaths and the likelihood and severity of occupant injuries in crashes. As one means of achieving these goals, Standard No. 208 has long required the installation of safety belts in passenger cars. Since September 1, 1989, Standard No. 208 has also required each new passenger car to be equipped with automatic crash protection for outboard front-seat occupants. Vehicle seating positions equipped with automatic crash protection protect their occupants by means that require no action by the occupants. The effectiveness of a vehicle's automatic crash protection is dynamically tested; that is, a vehicle must comply with specified injury criteria, as measured on a test dummy, when tested by this agency in a 30 mile per hour barrier crash test. The two types of automatic crash protection currently offered on new passenger cars are automatic safety belts (whose automatic nature helps to encourage belt use) and air bags (which supplement safety belts and offer some protection even when safety belts are not used). Automatic crash protection in cars will save thousands of lives and prevent tens of thousands of serious injuries each year when all cars are so equipped.

NHTSA decided it was appropriate to consider whether other light-duty vehicles should be required to provide automatic crash protection The agency focused on trucks, multipurpose passenger vehicles (such as passenger vans and four-wheel drive utility vehicles), and buses, all with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. These vehicles are collectively termed "light trucks" throughout the rest of this preamble Although Standard No. 208 has long required the installation of safety belts at all designated seating positions in light trucks, it has not required those vehicles to provide automatic crash protection. MHTSA concluded that automatic crash protection in light trucks could prevent more than 2,000 fatalities and more than 28,000 serious injuries every year. Moreover, the agency concluded that it would be feasible to equip light trucks with automatic crash protection and that this could be done at a cost that was very reasonable in relation to the safety benefits. These factors led GSA to propose to require automatic crash protection in light trucks in a notice of proposed rulemaking (NPRM) published on January 9, 1990 (55 F.R. 747).

The NPRM proposed to measure the performance of the light truck automatic crash protection by using the same dynamic crash test procedures specified in Standard No. 208 for passenger cars. Additionally, the NPRM proposed to ease the implementation of the light truck automatic crash protection requirements by phasing them in, as was done with the passenger car automatic crash protection requirements. Finally, to encourage the production of light trucks with air bags, it proposed to provide a "one-truck credit" for vehicles with an air bag at the driver's position and a manual safety belt for the other outboard front seat occupant. The provision is similar to the "one-car credit" provided in Standard No. 208 for passenger cars. (See S4.1.4.3 of Standard No. 208.)

NHTSA received 34 comments in response to this NPRM. Commenters included vehicle manufacturers, air bag suppliers, trade associations, representatives of the insurance industry, academia, other governmental agencies, and consumers. Several of the manufacturers commented that they would have difficulty complying with some or all of the elements of the proposed implementation schedule. To further explore the issues raised by these comments, NHTSA requested additional information from five vehicle manufacturers (Chrysler, Ford, General Motors, Mazda, and Toyota) on May 24, 1990.

NHTSA considered and analyzed all of the comments and other submissions by the public in developing the final rule published on March 26, 1991 (56 F.R. 12472). That final rule essentially adopted the requirements proposed in the NPRM, with some minor modifications. The automatic crash protection requirements for light trucks will be phased-in over a period of several years, beginning with light trucks manufactured on or after September 1, 1994. Compliance with the automatic crash protection requirements will be evaluated by conducting the same type of test and using the same injury criteria as Standard No. 208 specifies for passenger cars. Final stage manufacturers and alterers will not be required to assure that a specified percentage of their vehicles comply with the automatic crash protection requirements of Standard No. 208 during the phase-in period. However, once the phase-in is completed, all subject light trucks, including those produced by final stage manufacturers and alterers, must be equipped with automatic crash protection. Interested readers may wish to review the March 26, 1991 final rule for more details about its provisions.

Petitions for Reconsideration

Two timely petitions for reconsideration of the March 26 rule were filed with NHTSA. The petitioners were Ford Motor Co. (Ford) and the National Truck Equipment Association (NTEA). Ford requested the agency to modify the test criteria to reduce test variability; to specify more precisely vehicle loading during compliance tests; and to clarify the applicability of phase-in attribution requirements to multistage vehicles. NTEA argued that there was no safety need to extend the automatic crash protection requirements to multistage work-related light trucks. It argued also that, because of certification difficulties, the requirements were impracticable for final stage manufacturers. Finally, it argued that the agency improperly concluded that the requirements would have no impact on small businesses.

NHTSA Authorization Act of 1991

On December 18, 1991, the President signed into law legislation which includes provisions mandating the installation of air bags in light trucks. That legislation is the Intermodal Surface Transportation Efficiency Act of 1991 (Pub. L. 102–240). The air bag provisions for light trucks appear in Title II, Part B of that Act, also known as the National Highway Traffic Safety Administration Authorization Act of 1991. Section 2508 (105 Stat. 2084–2087) provides that the agency must amend Standard No. 208 to require that the driver's and the front right passenger's seats in light trucks be equipped with air bags. This requirement must apply to 80 percent of each manufacturer's annual production of light trucks manufactured on or after September 1, 1997, and before September 1, 1998, and to all light trucks manufactured after that period. Further, the requirement must apply to all light trucks, making no distinction between those that are single stage and those that are multistage.

NHTSA Response to Petitions for Reconsideration

The actions requested by the petitioners and the agency's responses to those requests are as follows:

1. *Ford Petition.*

(a) *Modify Test Criteria to Reduce Test Variability.* Ford stated in its petition that it "continues to be concerned about the unacceptably high variability and unpredictability in dynamic test results." Ford suggested that the variability would be further exacerbated by the wide range of light truck models. Ford alleged that one cause of variability is electrostatic discharge, which, according to Ford, "can result in much higher HIC readings during dynamic tests conducted on dry winter days than on identical tests conducted on humid summer days." (HIC is an acronym for Head Injury Criterion, and is calculated from readings taken by a triaxial accelerometer mounted in the test dummy's head.) In accordance with this belief, Ford asked for reconsideration of the Standard No. 208 test conditions to eliminate the effects of electrostatic discharge on HIC measurements.

Test data signal anomalies have occasionally been recorded during NHTSA's crash testing. In some of the tests, there were so-called "spikes." A "spike" means a situation in which an apparent force or acceleration is recorded during a crash test, without any explanation for such a force or acceleration occurring at that time or with such magnitude. For example, a spike may consist of the recording of an acceleration of the dummy in a direction that is inconsistent with the direction of the crash forces, a recorded acceleration and deceleration in an impossibly short period of time, a recorded total force of extraordinary magnitude without any corresponding damage to the dummy, and so forth.

NHTSA acknowledges that it is theoretically possible that electrostatic phenomena could play a role in producing spikes in crash tests, especially crash tests of vehicles equipped with air bags. Static electricity can be built up by friction between dissimilar materials. Air bags are made of a fabric material, while the test dummy is clothed in formfitting cotton stretch garments with shoes upon its feet. Either the air bag fabric or the test dummy's clothing or both could contribute to the generation of static electricity under certain conditions during a crash test. However, the agency's acknowledgement that the occurrence of electrostatic discharges is theoretically possible still leaves the agency far from convinced that it should adopt special provisions (such as requiring the test dummy's garments to be grounded to the vehicle structure) to regulate electrostatic discharge during Standard No. 208 compliance tests.

Contrary to Ford's implication, Standard No. 208 currently specifies environmental limits which are to be followed during all compliance crash tests. The stabilized temperature of the test dummy must be between 66° and 78° Fahrenheit when the Hybrid II test dummy is used, and between 69° and 72° Fahrenheit when the Hybrid III test dummy is used. *See* S8.1.12 of Standard No. 208. These temperature limits apply to the test dummy under all ambient weather conditions. Thus, they are to be followed regardless of whether the crash test is conducted on a 20° day in the winter or a 90° day in the summer.

These temperature limits apparently have adequately controlled environmental effects on crash test results. Various manufacturers and independent test laboratories have conducted crash tests all over the world under a wide variety of environmental conditions. NHTSA is not aware of any information suggesting that spikes, whether from electrostatic discharge or other sources, occur more frequently in winter than in summer. Ford did not provide any information in its petition showing that the spikes it experienced during winter testing were disproportionate to the spikes experienced during summer testing. Thus, NHTSA has no reason to conclude that test variability from electrostatic discharges is a serious problem under the existing test procedures.

Further, even if NHTSA were to accept Ford's allegation about test variability, the existence of such variability would not demonstrate or even imply that electrostatic phenomena are the cause of that variability. Nothing in Ford's petition even purports to demonstrate that electrostatic discharges have ever occurred during a Standard No. 208 crash test. Further, NHTSA is not aware of any such information from any other source. Ford also did not show either how electrostatic discharges would influence HID measurements, or the magnitude of error that electrostatic discharges would introduce into the HIC. Absent any evidence either in Ford's petition or from other sources about electrostatic discharges being the source of variability in Standard No. 208 compliance tests, Ford's petition is supported only by speculation and theory. Such a basis, absent any supporting data, is not sufficient justification for changing the existing test procedures in Standard No. 208. This portion of Ford's petition is therefore denied.

(b) *Technical Amendments.* Ford requested three technical amendments to the final rule in its petition for reconsideration. These requests were as follows:

(i) *Vehicle loading during compliance tests.* Ford noted in its petition that, in response to Ford's comments on the NPRM, the final rule revised the vehicle loading for Standard No. 208 testing to make that standard's provisions regarding work-performing accessories on light trucks identical to the corresponding provisions in Standards No. 212 and 219. Those standards exclude the weight of such accessories from unloaded vehicle weight. However, Ford noted that the provisions in Standard No. 208 regarding the proportioning of test load between the axles of the test vehicle (S8.1.1(b) of Standard No. 208) differed slightly from the load proportioning provisions in Standards No. 212 and 219. Ford asserted that the provisions in Standard No. 208 could be interpreted as specifying different load proportioning for that Standard than is specified in Standards No. 212 and 219, and asked that this language in Standard No. 208 be amended to make it identical to that used in Standards No. 212 and 219.

In response to this petition, NHTSA has carefully reexamined the weight distribution provisions in Standards No. 208, 212, 219, and 301. That reexamination shows that the weight distribution provisions of the four standards are now substantively identical, although Standard No. 208's are abbreviated and simplified. In addition, NHTSA has always interpreted Standard No. 208's weight distribution provisions in the manner suggested by Ford. That is, NHTSA places the test dummies in the vehicle and then distributes the cargo weight in proportion to the assigned gross axle weight ratings. The agency has followed this procedure in all of its crash tests of passenger cars to determine compliance with Standard No. 208, since that allows the single crash test to be used for simultaneous evaluation of Standards No. 208, 212, 219, and 301. A different interpretation would force the agency as well as the manufacturers to conduct repetitive crash testing for no valid purpose.

Therefore, NHTSA has always interpreted the weight distribution provisions in these four safety standards to be the same. In addition, no manufacturer other than Ford has sought an interpretation of the Standard No. 208 weight distribution procedures. Further, all manufacturers, including Ford, have conducted their Standard No. 208 certification tests using the same weight distribution as specified in Standards No. 212, 219, and 301. In other words, the simplified and abbreviated weight distribution provisions in Standard No. 208 have not been perceived as ambiguous by any affected parties prior to Ford's petition, and the weight distribution procedures followed for Standard No. 208 testing by both vehicle manufacturers and NHTSA have been the same weight distribution procedures followed for testing under Standards No. 212, 219, and 301. Given these circumstances, it is not necessary to amend the weight distribution provisions in Standard No. 208 to ensure that the procedures will be identical to the weight distribution procedures for testing pursuant to Standards No. 212, 219, and 301. Hence, Ford's request is denied.

(ii) *Applicability of phase-in attribution requirements to vehicles manufactured in more than one stage.* During the phase-in of automatic crash protection for light trucks, it is necessary to attribute vehicles with more than one "manufacturer," as that term is defined in the Safety Act, to a single manufacturer for the purposes of calculating compliance with the percentage requirements of the phase-in. To accomplish this purpose, the final rule provided that the same attribution rules would apply to light trucks as were previously applied to passenger cars. That is, the attribution may be decided between the manufacturers in a written contract, a copy of which is filed with the agency. Absent an agreement among the several manufacturers, an imported vehicle will be attributed to the importer and vehicles made in the U.S. by more than one manufacturer will be attributed to the manufacturer that markets the vehicle. *See* S4.2.5.6 of Standard No. 208.

Ford argued in its petition that the attribution rules could be read to apply to vehicles manufactured in more than one stage, or multistage vehicles, because such vehicles are "produced by more than one manufacturer." To ensure that it was not interpreted in this manner, Ford asked that the attribution rules be amended to expressly state that those rules do not apply to vehicles manufactured in two or more stages.

Ford's requested amendment is unnecessary. Ford apparently did not note that the final rule explicitly provides that multistage vehicles are not subject to the automatic crash protection requirements during the phase-in period. That is, S4.2.5.5(a)(3) of Standard No. 208 provides that any light truck "that is manufactured in two or more stages * * * is not subject to the [phase-in] requirements." This provision applies with respect to all of the light truck phase-in requirements set forth in S4.2.5, including the attribution rules in S4.2.5.6. Thus, since multistage vehicles are excluded from all of the phase-in requirements, it is unnecessary to also specifically exclude such vehicles from each of the individual phase-in requirements.

(iii) *Typographical error in phase-in attribution requirements.* Ford observed that S4.2.5.6.2 Of Standard No. 208, which sets forth the phase-in attribution requirement, refers to an attribution under S4.2.5.4.1. Since there is no such section in the final rule, Ford suggested that this reference was a typographical error, and that the intended reference was actually to S4.2.5.6.1. Ford is correct. This notice corrects the typographical error.

2. *NTEA Petition.*

The NTEA petition argued that NHTSA had not shown that the extension of the automatic crash protection requirements to light trucks manufactured in two or more stages "meets the need for motor vehicle safety," as required by the National Traffic and Motor Vehicle Safety Act. In addition, NTEA argued that the automatic crash protection requirements were not practicable for light trucks manufactured in two or more stages and that final stage manufacturers faced particular certification difficulties with automatic crash protection. Finally, NTEA argued that NHTSA had not properly analyzed the negative affects which NTEA believed this rule would have on small businesses. These points are addressed below.

NTEA's arguments draw heavily upon *National Truck Equipment Association* v. *NHTSA*, 919 F.2d 1148, *rehearing denied*, 928 F.2d 739 (6th Cir. 1990), a case in which a divided panel reversed, in part, the extension of Standard No. 204, Steering Control Rearward Displacement, to light trucks. The majority determined that the safety benefits of the standard were "not at all clear" (*i.d.* at 1154) as applied to multistage light trucks because it "found" that these vehicles are driven by "professional drivers" for "short distances" and at "low speeds" on local streets instead of on "highways." Based on that finding, the majority stated that it was "justified" in examining the economic impact of the extension (*ibid.*). The majority accepted NTEA's argument that the amendment provided no means by which final stage manufacturers could demonstrate compliance with Standard No. 204, and it concluded that the standard would destroy the truck customization industry (*id.* at 1154–1155). Accordingly, the majority found that the amendment did not satisfy the statutory requirement that safety standards be "practicable" (*id.* at 1153). Noting that its ruling addressed only the problems faced by final stage manufacturers, the majority invalidated the extension only "to the extent that it applies to vehicles manufactured by final stage manufacturers that cannot pass through the certification of the initial manufacturer" (*id.* at 1158).

As discussed in detail below, the facts and analyses associated with this rulemaking differ significantly from those associated with the 1987 final rule extending Standard No. 204 to light trucks. First and foremost is the existence of a Congressional mandate requiring air bags in light trucks within the specified weight ranges. This statutory mandate in effect ratifies this agency's extension of the automatic crash protection requirements to multistage light trucks, as well as single stage light trucks. Second, the record in this rulemaking resolves the issues of safety need and consumer choice concerns expressed by the panel majority in *NTEA* v. *NHTSA*. For example, the significant and separate contributions of automatic crash protection to vehicle safety have been widely demonstrated, analyzed, and accepted. Third, the agency has initiated rulemaking (56 F.R. 61395; December 3, 1991) to amend its certification regulations in a manner that would ease the perceived certification burdens on final stage manufacturers. Fourth, significant aspects of NTEA's representations to this agency regarding the Standard No. 208 rulemaking, and similar representations by that organization to the Sixth Circuit regarding the earlier Standard No. 204 rulemaking, can be shown to be unsupported, without merit, or both.

(i) *Safety need.* NTEA argued that NHTSA had not satisfied the statutory criteria that safety standards "meet the need for motor vehicle safety" with respect to "vehicles produced in two or more stages and equipped with a cargo or property-carrying body and/or work-related equipment," because in extending the automatic crash protection requirements to light trucks in general, the agency did not show that this narrow subclass of light trucks has a significant rate of accidents, serious injuries, or fatalities. Absent such a showing, NTEA asserted that NHTSA had not satisfied its obligations under the Safety Act.

As an initial matter, it is instructive to note that implicit in the enactment of the section 2508 of the NHTSA Authorization Act of 1991 is the finding by Congress that requiring the installation of air bags in light trucks, *including* those light trucks "produced in two or more stages and equipped with a cargo or property-carrying body and/or work-related equipment," will enhance motor vehicle safety. This supports and ratifies NHTSA's earlier similar conclusion that the installation of automatic restraints, whether air bags or automatic belts, in light trucks, including those light trucks produced in two or more stages and equipped with a cargo or property-carrying body and/or work-related equipment, will enhance motor vehicle safety.

The basis for that earlier agency conclusion is found in the Final Regulatory Impact Analysis for the March 26, 1991 final rule, filed in Docket No. 74–14, Notice 70. It contains a summary of the safety benefits to be expected from extending the automatic crash protection requirements to light trucks. As shown in that analysis, the final rule could prevent 2,000 deaths and lessen the severity of 28,000 serious injuries every year. These estimated benefits are from all types of light trucks within the specified weight categories, including minivans and compact pickups, motor homes, full-size pickups, and some work-related vehicles produced in two or more stages, such as vans, bread delivery trucks, small dump trucks, tow trucks, etc.

NTEA does not dispute the agency's overall estimate of the rule's safety benefits for all light trucks. Instead, NTEA is limiting its comment to the alleged lack of a demonstrated safety benefit in a particular subcategory of light trucks. NTEA seems to be arguing that NHTSA may not aggregate safety data for light trucks of similar size and weight, but must gather separate data for each subclass and demonstrate a separate safety need for each identifiable subclass. The agency disagrees for three reasons. First, it is undesirable from a statistical standpoint to excessively subdivide the regulated vehicle population and the associated safety data for that population. Second, it is inconsistent with the requirements of the Safety Act to base the applicability of safety standards on the circumstances of manufacture, such as whether a vehicle is manufactured in one or more stages. Third, petitioner has presented no data or analysis justifying subdividing light trucks into work-related light trucks and non-work-related light trucks or subdividing work-related light trucks into single stage work-related light trucks and multistage work-related light trucks.

The inappropriateness of NTEA's approach may be seen by considering the implications of applying it to the most familiar type of vehicle safety rulemaking, that concerning passenger cars. If it were so applied, this agency would have to make a separate showing of safety need for sedans, coupes, station wagons, and hatchbacks, and a further separate showing of safety need for each size class of each type of car, e.g., subcompact sedans, compact sedans, mid-size sedans and full size sedans. If the vehicle population were subdivided into increasingly smaller and smaller units, the small data cells available for each unit might not allow any valid statistical conclusions to be drawn for any unit. Thus, if this approach were taken, GSA could effectively be prevented from ever issuing any safety standards, because it could not show a safety need for any of these subdivided vehicle classes. Such a result is demonstrably inconsistent with the Safety Act, because it would effectively thwart the Safety Act's stated purpose to increase motor vehicle safety through the establishment and implementation of Federal motor vehicle standards.

NTEA goes a step further in the case of light trucks, suggesting that the agency is obliged to subdivide further the existing vehicle categories into vehicles that are manufactured in one stage and vehicles manufactured in two or more stages. Thus, under NTEA's suggested approach, physically similar passenger vans or walk-in vans would be placed in separate subclasses, depending upon whether the vehicle was manufactured by a single manufacturer or in more than one stage.

There are many reasons why this suggestion is not persuasive. Initially, GSA notes that the crash data compiled by NHTSA and the States do not differentiate between vehicles on the basis of the number of stages in which the vehicles were manufactured. Instead, the crash data identify the vehicles involved in the crash by means of the vehicle identification number (VIN) assigned to them. The information coded in the VIN does not by itself indicate whether the completed vehicle was manufactured in one or more stages. while it might be possible to amend the VIN requirements so that the VIN by itself would show the number of stages in which a vehicle was manufactured and to change the existing crash data collection to ensure that this information was obtained, such changes would be difficult and costly. NTFA has not set forth any reason to believe that this significant change in the VIN and crash data collection would be worthwhile.

The agency has long interpreted section 103(f) of the Safety Act as contemplating that vehicles are to be grouped within broad categories based on physical differences between groups of vehicles. The different groupings are sometimes defined by specifically identifying the physical differences between vehicles and other times by referring to the uses for which the vehicles have been designed. This interpretation is consistent with Congress' explicit indication that any different application of the safety standards among vehicles should be based upon vehicle attributes. This indication is provided in section 103(f) of the Act, in which Congress directed the agency to consider, in prescribing standards, whether each proposed standard is "reasonable, practicable and appropriate for the *particular type* of motor vehicle or motor vehicle equipment for which it is prescribed." (Emphasis added.) Regarding that provision, the Senate Committee Report on the Safety Act states:

> Thus it is not intended that standards will be set which will eliminate or necessarily be the same for small cars or such widely accepted models as convertibles and sports cars, so long as all motor vehicles meet basic minimum standards. Such differences would, of course, be based on the type of vehicle rather than its place of origin or any special circumstances of its manufacturer. S. Rep. No. 1301, 89 Cong., 2d Sess., at 6 (1966).

For the purpose of setting and applying the safety standards to appropriate groups of vehicles, NHTSA has defined the basic vehicle groups in 49 CFR S571.3 in accordance with section 103(f)(3) and the legislative history quoted above. The current vehicle groupings are passenger car, multipurpose passenger vehicle, truck, bus, motorcycle, and trailer.

The agency on occasion has applied safety standards only to some vehicles within one of the groups when it has reason to believe that a distinct subgroup within a broad grouping should not be subject to the same safety standards as the other vehicles in the broad grouping. This subdivision is usually done on the basis of the gross vehicle weight rating or unloaded vehicle weight of vehicles. For instance, the extension of the automatic crash protection requirements applies only to those multipurpose passenger vehicles, buses, and trucks that are below specified weights. This differentiation is based on data showing that occupants of the heavier vehicles are at a lesser risk in the event of a crash. These data follow from the laws of physics pursuant to which the occupants of heavier vehicles striking lighter vehicles generally experience lower decelerations (i.e., crash forces) than do the occupants of the lighter vehicles. Clearly, such a subdivision is based upon the characteristics of the vehicles in question, instead of on the identity of their manufacturers or the nature of the manufacturing process.

NTEA's request to establish a special class for work-related light trucks manufactured in two or more stages is contrary to the above-cited language in the legislative history precluding GSA from reliance on special circumstances of manufacture as a basis for differentiating among vehicles for the purposes of the safety standards The agency could, however, subdivide the light truck category into: (a) light trucks designed for certain specified work-related purposes; and (b) all other light trucks, if there were some reason to believe that the different design or use of the first category of trucks somehow indicated a sufficiently different level or type of safety need that would warrant applying more or less stringent requirements, or even no standard at all. Stated otherwise, if the record supported it, NHTSA could impose different standards on a particular type of work-related light truck, such as a tow truck or delivery truck, but NHTSA cannot specify that different standards apply to tow trucks or delivery trucks produced in two or more stages than to tow trucks or delivery trucks produced in a single stage. In any event, neither the materials submitted by NTEA nor the rest of the record indicate that work-related light trucks have less of a safety need for automatic crash protection than other types of light trucks.

In assessing NTEA's arguments, NHTSA begins from the premise that a person driving or riding in a vehicle while on the job is entitled to the same level of safety protection as a person who is driving or riding in a vehicle off the job. Accordingly, unless there is some reason to believe that work-related light trucks are substantially less likely to be involved in crashes, the fact that a vehicle is used extensively or even solely for work-related purposes does not of itself suggest there is any lesser safety need to protect the occupants in the event of a crash.

NTEA suggested two reasons for believing that work-related vehicles were safer in use than other comparably sized vehicles. First, NTEA suggested that most commercial vehicles are driven by "professional drivers." Second, NTEA suggested that most commercial vehicles are not used on the "highways," but are primarily used in short distance, low-speed trips.

NTEA's petition did not provide any data to substantiate either of its claims. Likewise, the petitioner did not elaborate upon these assertions or explain why NTEA believes either of them to be correct. This agency does not believe that these unsupported NTEA assertions demonstrate that there is a lesser safety need to provide automatic crash protection for drivers of work-related, multistage light trucks than for drivers of other light trucks.

NTEA's assertion that most work-related, multistage light trucks are driven by "professional drivers" is misleading. Although many of the drivers of these vehicles may be professionals, those persons are not "professional drivers." Their professionalism lies not in driving, but in the areas of their special training and skills, i.e., plumbing, exterminating, repairing, etc. Locksmith trucks are driven by professional locksmiths, electrical repair company trucks are driven by professional electricians, and so forth. No special license or demonstration of skill is required in most jurisdictions to drive commercial light trucks. Hence, NHTSA concludes that there is no reason to believe that drivers of work-related light trucks as a whole have any more driving skill than drivers of other light trucks.

NHTSA does not find the assertion that commercial vehicles are used primarily in short distance, low-speed trips any more persuasive regarding safety need. Even if it were true that work-related, multistage light trucks are less likely than other light trucks to be driven on long trips on freeways, this would not indicate a lesser safety need. Most accidents occur within 25 miles of place of residence or business. Further, many serious accidents occur on roads other than highways. while it is true that a majority of vehicle occupant deaths occur in rural areas, a substantial number (more than 43 percent) occur in urban areas where NTEA suggested many work-related, multistage vehicles are likely to be operated. In the same vein, while a majority of those urban vehicle occupant deaths occur at night, a sizable number (more than 41 percent) occur during daytime hours when most types of work-related, multistage vehicles are also likely to be operating. Thus, there is no safety data to support NTEAs assertion that work-related, multistage vehicles have a lesser safety need for automatic crash protection than other comparable light trucks.

Additionally, the driving situations in which many work-related, multistage light trucks are used suggests a greater, not a lesser, safety need for automatic crash protection. For example, tow trucks, emergency and rescue vehicles, and snow removal vehicles are frequently driven at high speeds, in hazardous situations, and/or in inclement and less safe weather conditions.

In sum, NHTSA reaffirms its previous conclusion that there is no reason to believe that the safety need for automatic crash protection in work-related, multistage light trucks is any less than the safety need for automatic crash protection in other similarly-sized light trucks. Moreover, the overall safety benefits of automatic crash protection are such that, even if work-related, multistage light trucks were shown to be somewhat less likely to be involved in accidents than other light trucks, there is no reason to believe that the difference is so substantial that the agency could conclude that extending the automatic crash protection requirements to these vehicles does not "meet the need for motor vehicle safety."

(ii) *Practicability*. NTEA next argued that NHTSA had not shown that applying the automatic crash protection requirements to light trucks manufactured in two or more stages was "practicable," as required by section 103 of the Safety Act (15 U.S.C. 1392). In the preamble to the final rule, NHTSA explained:

> Very few (if any) final stage manufacturers have the engineering and financial resources necessary to independently determine whether a completed vehicle complies with a complex safety standard such as Standard No. 208. Thus, as a practical matter, NHTSA anticipates that most, if not all, final stage manufacturers will have to complete their vehicles within specifications established by an incomplete vehicle manufacturer, and, in most cases, they will have to use chassis-cabs. (56 F.R. 12472, at 12478; March 26, 1991.)

In its petition for reconsideration, NTEA argued that this statement demonstrated that the rule was not practicable for final stage manufacturers, because the only way in which NHTSA had suggested final stage manufacturers could comply was to remain within the specifications established by the incomplete vehicle manufacturer. Specifically, NTEA stated that "vehicles exist that cannot always be completed to the end user's satisfaction within the guidelines established by the incomplete vehicle manufacturer to allow for passing through the incomplete vehicle manufacturer's certification. The NTEA expects this rulemaking will increase the number of such vehicles."

The House Committee Report on the Safety Act included the following explanation of the meaning of the term "practicable" in the Safety Act:

> In establishing standards, [NHTSA] must conform to the requirement that the standard be practicable. This would require consideration of all relevant factors, including technological ability to achieve the goal of a particular standard as well as consideration of economic factors. H. Rep. No. 1776, 89th Cong., 2d Sess., at 16 (1966).

Following this legislative guidance, NHTSA must consider practicability from two different perspectives, one technical and the other economic. First, for a standard to be practicable, it must be technically possible for the affected manufacturers to achieve compliance within the specified time limits. In the case of this rule, NHTSA has concluded that it will be technically possible for final stage manufacturers to comply with the automatic crash protection requirement in their light trucks on or before by September 1, 1997.

This conclusion is based upon the fact that NHTSA's regulations provide final stage manufacturers with a technologically feasible means of assuring that their vehicles comply with the automatic crash protection requirements. Specifically, 49 CFR Part 568 requires incomplete vehicle manufacturers to provide specifications along with their incomplete vehicles. Part 568 also provides that completion of an incomplete vehicle in accordance with the specifications set forth in the incomplete vehicle document will ensure conformity with applicable standards and provide the final stage manufacturer with a basis for certifying its completed vehicles. *See* 49 CFR S568.4(a)(7)(i) and (ii). Incomplete vehicle manufacturers need not provide specifications for their incomplete vehicles only if conformity with the particular standard is "not substantially affected by the design of the incomplete vehicle." *See* 49 CFR S568.4(a)(7)(iii). If the incomplete vehicles used by the final stage manufacturers do not provide specifications for completing them in conformity with applicable standards, the final stage manufacturers will have to use different incomplete vehicles, that provide the needed specifications, from which to complete their vehicles.

When examining technical feasibility of new requirements in the safety standards, the issue under the Safety Act is not whether final stage manufacturers can comply with the automatic crash protection or other new requirements without making any changes to their existing practices Instead, the issue is whether it is practicable for final stage manufacturers to make changes to their practices so that they can assure that their completed vehicles will comply with the requirements.

In this case, final stage manufacturers may need to make some changes in the selection of the incomplete vehicle from which the completed vehicle will be built and may need to make some modifications in how they complete the vehicle, so as to ensure that the vehicle will be completed in accordance with the specifications provided in the incomplete vehicle document. However, those changes and modifications will not pose any special technical problems for final stage manufacturers. Accordingly, NHTSA reaffirms its previous conclusion that it is technically possible for final stage manufacturers to comply with the automatic crash protection requirements by completing their vehicles within the specifications established by the incomplete vehicle manufacturer, and basing the certification of the completed vehicle upon the incomplete vehicle manufacturer's specifications.

The second prong of the "practicability" requirement relates to whether a standard's economic impacts are reasonable. That is, NHTSA must consider whether the costs and other economic impacts associated with the rule are excessive. In the final rule, NHTSA concluded that this amendment would not impose an unreasonable economic burden on final stage manufacturers. NTEA has not provided any information that would lead the agency to change this conclusion.

It is true that in the interest of safety, final stage manufacturers may on occasion have to use a different incomplete vehicle from the one initially specified by a customer in order to make all of the modifications desired by the customer. Conversely, in some cases final stage manufacturers will not be able to make all of the modifications desired by a customer who decides not to change the initial selection of an incomplete vehicle. This does not, however, show that the economic impacts of the automatic crash protection requirement are unreasonable for final stage manufacturers. All safety standards impose limits on how a manufacturer can design and manufacture its vehicles and on what vehicles consumers can purchase.

For example, it would certainly cost less to manufacture large trucks if vehicle manufacturers could place their smallest, least expensive brake systems on their largest trucks. However, vehicles with inadequate braking capabilities would pose an unreasonable safety risk on the public roads. Thus, manufacturers of large trucks must instead use larger and more expensive brake systems on these trucks, and consumers must pay a higher price that reflects the added cost to the manufacturer of using a braking system with adequate stopping capabilities, even if some customers would have preferred a less effective system. The greater expense that arises from not permitting manufacturers to equip their vehicles with whatever braking system the customer wants or with the least expensive braking system does not show that the requirement for adequate braking capabilities imposes unreasonable economic burdens. Thus, the proper inquiry is not simply whether it might cost final stage manufacturers more to manufacture their vehicles if they are subject to the automatic crash protection requirement. Neither is it dispositive that final stage manufacturers may not be able to provide the precise version of the type of vehicle their customers desire. It probably will cost final stage manufacturers more to ensure that their vehicles comply with the automatic crash protection requirements. However, this "burden" is fully justified by the improvement in motor vehicle safety associated with this rule. Moreover, the "burden" is a manageable one.

After considering the economic aspects of a practicability determination, NHTSA reaffirms its previous conclusion that the extension of the automatic crash protection requirements to light trucks, including those manufactured in two or more stages, is practicable. It will not impose a significant economic burden on final stage manufacturers to examine the features requested by a customer and determine whether modifications to incorporate those features can be made within the envelope established by the incomplete vehicle manufacturer for a particular incomplete vehicle. Further, there is no reason to believe that the increased costs to purchasers of multistage vehicles that comply with the automatic crash 'protection requirements would be substantially different from the increased costs to purchasers of single stage light trucks that comply with those requirements. In the Final Regulatory Impact Analysis prepared for the final rule, NHTSA estimated that compliance with the automatic crash protection requirements could add $464 (in 1989 dollars) to the cost of a light truck.

(iii) *Consumer choice*. NTEA also argues that the final rule would restrict consumer choice to an extent inconsistent with section 103(f) (3) of the Safety Act and its legislative history. That section provides that, in prescribing safety standards, NHTSA shall consider whether the standards are "appropriate for the particular type of motor vehicle for which it is prescribed." The Senate Report explaining this section provides:

> In determining whether any proposed standard is "appropriate" for the particular type of motor vehicle or item of motor vehicle equipment for which it is prescribed, the committee

intends that the Secretary will consider the desirability of affording consumers continued wide range of choices in the selection of motor vehicles. Thus it is not intended that standards will be set which will eliminate or necessarily be the same for small cars or such widely accepted models as convertibles and sports cars, so long as all motor vehicles meet basic minimum standards.

NHTSA agrees that this language requires the agency to consider whether its standards would impose unreasonable restrictions on consumer choice. The agency recognizes that the extension of the automatic restraint requirements will narrow consumer choice to the extent that consumers who would prefer a multistage light truck that is not certified as providing automatic crash protection will not have that option. It will also narrow consumer choice to the extent that consumers and final stage manufacturers must, in deference to interests of motor vehicle safety, be more careful in selection of incomplete vehicles to be incorporated into multistage light trucks. Further, some design or styling changes might have to be made. However, these are not the sorts of restrictions on consumer choice that is prohibited by the Safety Act.

The actual extent of section 103(f)(3)'s protection of consumer choice is revealed in the test that the section's legislative history sets forth regarding the appropriateness of a standard. The proper test is whether a given standard would eliminate a type of vehicle, such as convertibles or tow trucks. In this case, no information, including the petitioner's arguments, suggests that the extension to light trucks of Standard No. 208's automatic crash protection requirements fails this test.

Petitioner has not argued, much less demonstrated, that the extension of the automatic crash protection requirements would eliminate some particular type of vehicle, e.g., a tow truck, delivery truck, or utility truck. Petitioner has also not suggested that the extension would eliminate or have a substantial adverse effect on key distinguishing attributes of those vehicles. That is, petitioner has made no showing that purchasers will not be able to find chassis types and models that are compatible with desired work-related features, or, conversely, to obtain work-related features or devices that are compatible with a desired chassis. Instead, the petitioner made a much more limited argument, i.e., petitioner argued that this amendment will narrow the range of choice which a vehicle purchaser has in selecting among various chassis models and/or modifications to these chassis.

The fact that the extension of automatic crash protection requirements to light trucks will preclude consumers from buying light trucks without automatic crash protection does not suggest that the extension is inappropriate. Any safety standard or other regulation imposes restrictions on consumer choice. Moreover, those restrictions often make it necessary for the consumer to pay more for a vehicle than otherwise. For example, cars would be simpler and less expensive to produce or purchase if they were produced without any safety belts or other occupant protection, without side door beams, without a fuel system designed to withstand a 30 mph crash, and without a padded dashboard. However, such a car would not comply with Standards No. 201, 208, 214, and 301, and would not meet the goals of the Safety Act that vehicles be made safer.

Some consumers might wish to purchase such a new car without these safety features, in part because they could pay less for such a vehicle. However, the Safety Act does not permit consumers that option. Instead, section 108 of the Safety Act (15 U.S.C. 1397) expressly prohibits the manufacture, sale, or introduction into commerce of new vehicles that do not conform with all applicable safety standards. To this extent, the Safety Act consciously limits consumer choice in order to assure an appropriate level of safety. Thus, it is not a telling point to assert simply that a new requirement in a safety standard will limit consumer choice. Even if true, such an assertion by itself does not even suggest, much less demonstrate, that the new requirement is outside the authority granted in the Safety Act.

There is also no suggestion in either section 103(f)(3) or its legislative history of there being any right on the part of a manufacturer or a consumer to produce a particular type of light truck through mixing and matching incomplete vehicles and vehicle modifications packages without due regard for safety. As explained at length above, this is not the sort of consumer "choice" that Congress sought to protect in section 103(f)(3).

(iv) *Certification difficulties.* NTEA next argued that the automatic crash Protection requirements would result in serious certification problems for final stage manufacturers. NHTSA does not agree that this rule will impose any significant additional certification problems for final stage manufacturers. 49 CFR § 568.4(a)(7) currently requires incomplete vehicle manufacturers to make one of three statements regarding the compliance of their incomplete vehicles with the automatic crash protection requirements (Part 568 sets forth the agency's regulations regarding certification of vehicles manufactured in two or more stages.) These are:

(1) The vehicle will conform to the automatic crash protection requirements if no alterations are made in identified components of the incomplete vehicle [§ 568.4(a)(7)(i)];

(2) The vehicle will conform to the automatic crash protection requirements if specific conditions of final manufacture are followed [§ 568.4(a)(7)(ii)]; or

(3) Conformity with the automatic crash protection requirements is not substantially affected by the design of the incomplete vehicle and the incomplete manufacturer makes no representation as to conformity with the standard [§ 568.4(a)(7)(iii)].

The effect of this regulation is to ensure that final stage manufacturers will have a basis for certifying compliance with the automatic crash protection retirements. However, final stage manufacturers will not be able to use incomplete vehicles for which the incomplete vehicle manufacturer has made the third statement above with respect to the automatic crash protection retirements. When final stage manufacturers choose an incomplete vehicle for which the incomplete vehicle manufacturer has made either of the first two statements above, completion of that incomplete vehicle in accordance with the incomplete vehicle manufacturer's specifications provides the final stage manufacturer with a basis for certifying the compliance of the completed vehicle. This allows final stage manufacturers to certify compliance with the automatic crash protection retirements and any other applicable standards without independent testing, analysis, etc., as long as they stay within the guidelines provided by the incomplete vehicle manufacturers.

The experience of final stage manufacturers in certifying compliance with the dynamic testing requirements in Standard No. 208 for manual belts in light trucks, which went into effect on September 1, 1991, is instructive in considering the practicability of implementing the automatic crash protection requirements. The dynamic testing requirements represented the first time that multistage vehicles were subject to crash testing requirements where compliance was determined using injury criteria and test dummies. Just as is the case with automatic crash protection, few (if any) final stage manufacturers had the engineering and financial resources necessary to independently determine whether a completed vehicle complies wth these dynamic testing requirements. Thus, the simplest, if not the only, practicable way for final stage manufacturers to certify compliance with the dynamic testing requirements was to complete the vehicles in accordance with the specifications established by the incomplete vehicle manufacturer.

The final stage manufacturers represented by the Recreation Vehicle Industry Association (RVIA) were concerned about meeting those requirements. These final stage manufacturers believed it was essential to their business that their van conversions include custom seats at the front outboard seating positions. They were also concerned that the incomplete vehicle manufacturers would establish specifications for the incomplete vehicles that would preclude final stage manufacturers from installing custom seats at front outboard seating positions. If the incomplete vehicle manufacturers were to do so, these van converters feared they would lose a substantial portion of their business.

To ensure that the incomplete vehicle manufacturers established specifications that took into account the need of the final stage manufacturers to install custom seats, the final stage manufacturers acted cooperatively with each other and through the trade association RVIA. The final stage manufacturers met with Chrysler, Ford, and General Motors to explain their concerns about the forthcoming incomplete vehicle specifications.

As a result of this communication and cooperation, Chrysler, Ford and General Motors each established incomplete vehicle specifications that allowed the installation of custom seats by final stage manufacturers, subject to some limitations. To wit, Chrysler established a design envelope on which final stage manufacturers can rely on in certifying compliance with the dynamic testing requirements if the final stage manufacturers use custom seats that arc within that envelope. Ford's incomplete vehicle specifications provide that final stage manufacturers must use the Ford-installed risers, seat cushions, and so forth, but allow the final stage manufacturer to change the seat back. General Motors allows converters to build generic versions of GM seats.

Although all three of these incomplete vehicle manufacturers set forth different limits in their incomplete vehicle specifications, all three sets of specifications allowed final stage manufacturers to continue installing custom seats as part of a van conversion. Thus, final stage manufacturers have been able to continue to produce van conversions with custom seats, while the public receives the safety benefits of van conversions certified as complying with the dynamic testing requirements for manual belts. This same sort of communication and cooperative effort by the incomplete vehicle manufacturers and final stage manufacturers will allow final stage manufacturers to certify that their vehicles comply with the automatic crash protection requirements beginning September 1, 1997.

In addition, the agency has proposed amendments to its certification regulations (49 CFR Parts 567 and 568) that address some of the concerns NTEA raised regarding certification in its petition. In *NTEA* v. *NHTSA*, the majority held that the extension of Standard No. 204 was not practicable as it related to multistage vehicles for which there is not an incomplete vehicle manufacturer certification which the final stage manufacturer can pass through. After noting that NHTSA's regulations do not permit final stage manufacturers that use incomplete vehicles other than chassis-cabs to pass through a certification made by the incomplete vehicle manufacturer, the court observed that it could see no reason why the certification requirements for those incomplete vehicles that are chassis-cabs should differ from those for other incomplete vehicles. In response to these statements by the court, NHTSA issued a notice proposing to extend the existing requirements for certification of chassis-cabs to all incomplete vehicles. (56 F.R. 61392; December 3, 1991).

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

S4.2.5.6.2 of Standard No. 208 is revised to read as follows:

S4.2.5.6.2 A truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified in an express written contract, reported to the National Highway Traffic Safety Administration under 49 CFR Part 585, between the manufacturer so specified and the manufacturer to which the vehicle would otherwise be attributed under S4.2.5.6.1 of this standard.

* * * * *

Issued on June 8, 1992.

Frederick H. Grubbe
Deputy Administrator

57 F.R. 26609
June 15, 1992

MOTOR VEHICLE SAFETY STANDARD NO. 208
Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69–7; Notice No. 9)

S1. Scope. This standard specifies performance requirements for the protection of vehicle occupants in crashes.

S2. Purpose. The purpose of this standard is to reduce the number of deaths of vehicle occupants and the severity of injuries, by specifying vehicle crashworthiness requirements in terms of forces and accelerations measured on anthropomorphic dummies in test crashes, and by specifying equipment requirements for active and passive restraint systems.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses. In addition, S9, *Pressure vessels and explosive devices,* applies to vessels designed to contain a pressurized fluid or gas, and to explosive devices, for use in the above types of motor vehicles as part of a system designed to provide protection to occupants in the event of a crash.

S4. General requirements.

S4.1 Passenger cars.

S4.1.1 Passenger cars manufactured from January 1, 1972, to August 31, 1973. Each passenger car manufactured from January 1, 1972, to August 31, 1973, inclusive, shall meet the requirements of S4.1.1.1, S4.1.1.2, or S4.1.1.3. A protection system that meets the requirements of S4.1.1.1 or S4.1.1.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.1.3.

S4.1.1.1 First option—complete passive protection system. The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.1.1.2 Second option—lap belt protection system with belt warning. The vehicle shall—

(a) At each designated seating position have a Type 1 seat belt assembly or a Type 2 seat belt assembly with a detachable upper torso portion that conforms to S7.1 and S7.2 of this standard;

(b) At each front outboard designated seating position have a seat belt warning system that conforms to S7.3; and

(c) Meet the frontal crash protection requirements of S5.1, in a perpendicular impact, with respect to anthropomorphic test devices in each front outboard designated seating position restrained only by Type 1 seat belt assemblies.

S4.1.1.3 Third option—lap and shoulder belt protection system with belt warning.

S4.1.1.3.1 Except for convertibles and open-body vehicles, the vehicle shall—

(a) At each front outboard designated seating position have a Type 2 seat belt assembly that conforms to Standard No. 209 and S7.1 and S7.2 of this standard, with either an integral or detachable upper torso portion, and a seat belt warning system that conforms to S7.3;

(b) At each designated seating position other than the front outboard positions, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2 of this standard; and

(c) When it perpendicularly impacts a fixed collision barrier, while moving longitudinally forward at any speed up to and including 30 mph., under the test conditions of S8.1 with anthropomorphic test devices at each front outboard position restrained by Type 2 seat belt assemblies, experience no complete separation of any load-bearing element of a seat belt assembly or anchorage.

S4.1.1.3.2 Convertibles and open-body type vehicles shall at each designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2 of this standard, and at each front outboard designated seating position have a seat belt warning system that conforms to S7.3.

S4.1.2 Passenger cars manufactured on or after September 1, 1973, and before September 1, 1986. Each passenger car manufactured on or after September 1, 1973, and before September 1, 1986 shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3.

A protection system that meets the requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3.

S4.1.2.1 First option-frontal/angular automatic protection system. The vehicle shall—

(a) At each front outboard designated seating position meet the frontal crash protection requirements of S5.1 by means that require no action by vehicle occupants;

(b) At each front center designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2; and

(c) Either—

(1) Meet the lateral crash protection requirements of S5.2 and the rollover crash protection requirements of S5.3 by means that require no action by vehicle occupants; or

(2) At each front outboard designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 through S7.3, and that meets the requirements of S5.1 with front test dummies as required by S5.1, restrained by the Type 1 or Type 2 seat belt assembly (or the pelvic portion of any Type 2 seat belt assembly which has a detachable upper torso belt) in addition to the means that require no action by the vehicle occupant.

S4.1.2.2 Second option-head-on automatic protection system. The vehicle shall—

(a) At each designated seating position have a Type 1 seat belt assembly or a Type 2 seat belt assembly with a detachable upper torso portion that conforms to S7.1 and S7.2 of this standard;

(b) At each front outboard designated seating position, meet the frontal crash protection requirements of S5.1, in a perpendicular impact, by means that require no action by vehicle occupants;

(c) At each front outboard designated seating position, meet the frontal crash protection requirements of S5.1, in a perpendicular impact, with a test device restrained by a Type 1 seat belt assembly; and

(d) At each front outboard designated seating position, have a seat belt warning system that conforms to S7.3.

S4.1.2.3 Third option—lap and shoulder belt protection system with belt warning.

S4.1.2.3.1 Except for convertibles and open-body vehicles, the vehicle shall—

(a) At each front outboard designated seating position have a seat belt assembly that conforms to S7.1 and S7.2 of this standard, and a seat belt warning system that conforms to S7.3. The belt assembly shall be either a Type 2 seat belt assembly with a nondetachable shoulder belt that conforms to Standard No. 209 (S571.209), or a Type 1 seat belt assembly such that with a test device restrained by the assembly the vehicle meets the frontal crash protection requirements of S5.1 in a perpendicular impact;

(b) At any center front designated seating position, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (S571.209) and to S7.1 and S7.2 of this standard, and a seat belt warning system that conforms to S7.3; and

(c) At each other designated seating position, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (S571.209) and S7.1 and S7.2 of this standard.

S4.1.2.3.2 Convertibles and open-body type vehicles shall at each designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (S571.209) and to S7.1 and S7.2 of this standard, and at each front designated seating position have a seat belt warning system that conforms to S7.3.

S4.1.3 Passenger cars manufactured on or after September 1, 1986, and before September 1, 1989.

S4.1.3.1 Passenger cars manufactured on or after September 1, 1986, and before September 1, 1987.

S4.1.3.1.1 Subject to S4.1.3.1.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1986, and before September 1, 1987, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

[A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard. **(51 F.R. 9801—March 21, 1986. Effective: May 5, 1986.)**]

S4.1.3.1.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars, specified in S4.1.3.1.1 complying with the requirements of S4.1.2.1 shall not be less than 10 percent of—

(a) the average annual production of passenger cars manufactured on or after September 1, 1983, and before September 1, 1986, by each manufacturer; or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.1.1.

[**S4.1.3.1.3** A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.1.2(a) or its annual production under S4.1.3.1.2(b). **(51 F.R. 37028—October 17, 1986. Effective: November 17, 1986.)**]

S4.1.3.2 Passenger cars manufactured on or after September 1, 1987, and before September 1, 1988.

S4.1.3.2.1 Subject to S4.1.3.2.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1987, and before September 1, 1988, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.1.3.2.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars specified in S4.1.3.2.1 complying with the requirements of S4.1.2.1 shall be not less than 25 percent of—

(a) the average annual production of passenger cars manufactured on or after September 1, 1984, and before September 1, 1987, by each manufacturer; or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.2.1.

[**S4.1.3.2.3** A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.2.2(a) or its annual production under S4.1.3.2.2(b). **(51 F.R. 37028—October 17, 1986. Effective: November 17, 1986.)**]

S4.1.3.3 Passenger cars manufactured on or after September 1, 1988, and before September 1, 1989.

S4.1.3.3.1 Subject to S4.1.3.3.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1988, and before September 1, 1989, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.1.3.3.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars specified in S4.1.3.3.1 complying with the requirements of S4.1.2.1 shall be not less than 40 percent of—

(a) the average annual production of passenger cars manufactured on or after September 1, 1985, and before September 1, 1988, by each manufacturer; or

(b) the manufacturer's annual production. of passenger cars during the period specified in S4.1.3.3.1.

[**S4.1.3.3.3** A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.3.2(a) or its annual production under S4.1.3.3.2(b). **(51 F.R.**

37028—October 17, 1986. Effective: November 17,1986.)]

S4.1.3.4 Calculation of complying passenger cars.

(a) For the purposes of calculating the numbers of cars manufactured under S4.1.3.1.2, S4.1.3.2.2, or S4.1.3.3.2 to comply with S4.1.2.1—

(1) each car whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose front right seating position will comply with the requirements of S4.1.2.1(a) by any means is counted as 1.5 vehicles; and

(2) each car whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front seat seating position is equipped with a manual Type 2 seat belt is counted as one vehicle.

(b) For the purposes of complying with S4.1.3.1.2, a passenger car may be counted if it—

(1) is manufactured on or after September 1, 1985, but before September 1, 1986; and

(2) complies with S4.1.2.1.

(c) For the purposes of complying with S4.1.3.2.2, a passenger car may be counted if it—

(1) is manufactured on or after September 1, 1985, but before September 1, 1987;

(2) complies with S4.1.2.1; and

(3) is not counted toward compliance with S4.1.3.1.2.

(d) For the purposes of complying with S4.1.3.3.2, a passenger car may be counted if it—

(1) is manufactured on or after September 1, 1985, but before September 1, 1988;

(2) complies with S4.1.2.1; and

(3) is not counted toward compliance with S4.1.3.1.2 or S4.1.3.2.2.

S4.1.3.5 Passenger cars produced by more than one manufacturer.

S4.1.3.5.1 For the purposes of calculating average annual production of passenger cars for each manufacturer and the amount of passenger cars manufactured by each manufacturer under S4.1.3.1.2, S4.1.3.2.2 or S4.1.3.3.2, a passenger car produced by more than one manufacturer shall be attributed to a single manufacturer as follows, subject to S4.1.3.5.2—

(a) A passenger car which is imported shall be attributed to the importer.

(b) A passenger car manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, shall be attributed to the manufacturer which markets the vehicle.

S4.1.3.5.2 A passenger car produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified by an express written contract, reported to the National Highway Traffic Safety Administration under 49 CFR Part 585, between the manufacturer so specified and the manufacturer to which the vehicle would otherwise be attributed under S4.1.3.5.1.

S4.1.4 Passenger cars manufactured on or after September 1, 1989.

S4.1.4.1 Except as provided in S4.1.4.2, each passenger car manufactured on or after September 1, 1989, shall comply with the requirements of S4.1.2.1. Any passenger car manufactured on or after September 1, 1989 and before September 1, 1993 whose driver's designated seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front designated seating position is equipped with a manual Type 2 seat belt so that the seating position complies with the occupant crash protection requirements of S5.1, with the Type 2 seat belt assembly adjusted in accordance with S7.4.2, shall he counted as a vehicle complying with S4.1.2.1. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not know in the exercise of due care that such vehicle is not in conformity with this standard.

S4.1.4.2 (a) Each passenger car, other than a convertible, manufactured before December 11, 1989 may be equipped with, and each passenger car, other than a convertible, manufactured on or after December 11, 1989 and before September 1, 1990 shall be equipped with a Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed pursuant to this provision shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1.1 of this standard.

(b) [Except as provided in S4.1.4.2.1 and S4.1.4.2.2, each passenger car, other than a convertible, manufactured on or after September 1, 1990 and each convertible passenger car manufactured on or after September 1, 1991 shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR § 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991.)**

[(c) As used in this section, "rear outboard designated seating position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating position adjacent to a walkway that is located between the seat and the near side of the vehicle and is designated to allow access to more rearward seating position. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991.)**]

S4.1.4.2.1 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either—

(i) meet the requirements of S4.1.4.2 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) when the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle and when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of a Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.1.4.2.2 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.1.4.2, and may use an upper torso belt that detaches at either its upper or lower anchorage point, but not both anchorage points, to meet those requirements. [The means for detaching the upper torso belt may use a pushbutton action. **(56 F.R. 26039—June 6, 1991. Effective: July 8, 1991.)**]

S4.1.5 Mandatory seatbelt use laws.

S4.1.5.1 If the Secretary of Transportation determines, by not later than April 1, 1989, that state mandatory safety belt usage laws have been enacted that meet the criteria specified in S4.1.5.2 and that are applicable to not less than two-thirds of the total population of the 50 states and the District of Columbia (based on the most recent Estimates of the Resident Population of States, by Age, Current Population Reports, Series P–25, Bureau of the Census), each passenger car manufactured under S4.1.3 or S4.1.4 on or after the date of that determination shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3.

S4.1.5.2 The minimum criteria for state mandatory safety belt usage laws are—

(a) Require that each front seat occupant of a passenger car equipped with safety belts under Standard No. 208 has a safety belt properly fastened about his or her body at all times when the vehicle is in forward motion.

(b) If waivers from the safety belt usage requirement are to be provided, permit them for medical reasons only.

(c) Provide for the following enforcement measures—

(1) A penalty of not less than $25.00 (which may include court costs) for each occupant of a car who violates the belt usage requirement.

(2) A provision specifying that the violation of the belt usage requirement may be used to mitigate damages with respect to any person who is involved in a passenger car accident while violating the belt usage requirement and who seeks in any subsequent litigation to recover damages for injuries resulting from the accident. This requirement is satisfied if there is a rule of law in the State permitting such mitigation.

(3) A program to encourage compliance with the belt usage requirement.

(d) An effective date of not later than September 1, 1989.

S4.2 Trucks and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less.

S4.2.1 Trucks and multipurpose passenger vehicles, with a GVWR of 10,000 pounds or less, manufactured on or after January 1, 1976 and before September 1, 1991. Each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of 10,000 pounds or less, manufactured before September 1, 1991, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that forward control vehicles manufactured prior to September 1, 1981, convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2.

S4.2.1.1 First option—complete automatic protection system. The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.2.1.2 Second option-belt system. The vehicle shall have seat belt assemblies that conform to Standard 209 installed as follows—

(a) A Type 1 or Type 2 seat belt assembly shall be installed for each designated seating position in convertibles, open-body type vehicles, and walk-in van-type trucks.

(b) In all vehicles except those for which requirements are specified in S4.2.1.2(a), a Type 2 seat belt assembly shall be installed for each outboard designated seating position that includes the windshield header within the head impact area, and a Type 1 or Type 2 seat belt assembly shall be installed for each other designated seating position.

S4.2.2 Trucks and multipurpose passenger vehicles with a GVWR of 6,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991 and before September 1, 1997. Except as provided in S4.2.4, each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991 and before September 1, 1997, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motorhomes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2. Each Type 2 seat belt assembly installed in a front outboard designated seating position in accordance with S4.1.2.3. shall meet the requirements of S4.6.

S4.2.3 Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with either a GVWR of more than 8,500 pounds but not greater than 10,000 pounds or with an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less. Except as provided in S4.2.4, each truck and multipurpose passenger vehicle manufactured on or after September 1, 1991, that has either a gross vehicle weight rating which is greater than 8,500 pounds, but not greater than 10,000 pounds, or has an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less shall meet the requirements of S4.1.2.1, or at the option of manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2.

NOTE.—*Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.*

S4.2.4 [Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with a GVWR of 10,000 pounds or less.] Except as provided in S4.2.4.2 and S4.2.4.3, each truck and each multipurpose passenger vehicle, other than a motor home, manufactured on or after September 1, 1991 that has a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

S4.2.4.1 As used in this section—

(a) "Motor home" means a motor vehicle with motive power that is designed to provide temporary residential accommodations, as evidenced by the presence of at least four of the following facilities: cooking; refrigeration or ice box; self contained toilet; heating and/or air conditioning; a potable water supply system including a faucet and a sink; and a separate 110–125 volt electrical power supply and/or an LP gas supply.

(b) "Rear outboard designated seating position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating positions adjacent to a walkway located between the seat and the side of the vehicle, which walkway is designed to allow access to more rearward seating positions.

S4.2.4.2 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either—

(a) Meet the requirements of S4.2.4 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(b) When the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle, and, when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of the Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.2.4.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.2.4, and may use an upper torso belt that detaches at either its upper or lower anchorage point, but not both anchorage points, to meet those requirements. [The means for detaching the upper torso belt may use a pushbutton action. **(56 F.R. 26039—June 6, 1991. Effective: July 8, 1991.)]**

[S4.2.5 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994, and before September 1, 1997.

[S4.2.5.1 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994, and before September 1, 1995.

[S4.2.5.1.1 Subject to 54.2.5.1.2 and 54.2.5.1.5 and except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a CAR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1994, and before September 1, 1995, shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars). A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

[S4.2.5.1.2 Subject to S4.2.5.5, the amount of trucks, buses, and multipurpose passenger vehicles specified in S4.2.5.1.1 complying with S4.1.2.1 (as specified for passenger cars) shall be not less than 20 percent of—

(a) The average annual production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1991, and before September 1, 1994, by each manufacturer that produced such vehicles during each of those annual production periods; or

(b) The manufacturer's total production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during the period specified in S4.2.5.1.1.

[S4.2.5.2 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1995, and before September 1, 1996.

[S4.2.5.2.1 Subject to S54.2.5.2.2 and S54.2.5.5 and except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a CAR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less than is manufactured on or after September 1, 1995, and before September 1, 1996, shall comply with there requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars). A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

[S4.2.5.2.2 Subject to S4.2.5.5, the amount of trucks, buses, and multipurpose passenger vehicles specified in S4.2.5.2.1 complying with S4.1.2.1 (as specified for passenger cars) shall be not less than 50 percent of—

(a) The average annual production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1992, and before September 1, 1995, by each manufacturer that produced such vehicles during each of those annual production periods; or

(b) The manufacturer's total production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during the period specified in 54.2.5.2.1.

[S4.2.5.3 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1996, and before September 1, 1997.

[S4.2.5.3.1 Subject to S4.2.5.3.2 and S4.2.5.5 and except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1996, and before September 1, 1997, shall comply with there requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars). A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

[S4.2.5.3.2 Subject to S4.2.5.5, the amount of trucks, buses, and multipurpose passenger vehicles specified in S4.2.5.3.1 complying with S4.1.2.1 (as specified for passenger cars) shall be not less than 90 percent of—

(a) The average annual production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less manufactured on or after September 1, 1993, and before September 1, 1996, by each manufacturer that produced such vehicles during each of those annual production periods; or

(b) The manufacturer's total production of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less during the period specified in S4.2.5.3.1.

[S4.2.5.4 Alternative phase-in schedule. A manufacturer may, at its option, comply with the requirements of this section instead of complying with the requirements set forth in S4.2.5.1, S4.2.5.2, and S4.2.5.3.

(a) Except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1994, and before September 1, 1995, shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3 (as specified for passenger cars).

(b) Except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle, other than walk-in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service, with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured on or after September 1, 1995, shall comply with the requirements of S4.1.2.1 (as specified for passenger cars) of this standard. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

(c) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1995, but before September 1, 1998, whose driver's seating position complies with the requirements of S4.2.1(a) of this standard by means not including any type of seat belt and whose right front passenger's seating position is equipped with manual Type 2 seat belt that complies with S5.1 of this standard, with the seat belt assembly adjusted in accordance with S7.4.2, shall be counted as a vehicle complying with S4.1.2.1.

[S4.2.5.5 Calculation of complying trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less.

(a) For the purposes of the calculations required in S4.2.5.1.2, S4.2.5.2.2, and S4.2.5.3.2 of the number of trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that comply with S4.1.2.1 (as specified for passenger cars)—

(1) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose front right seating position complies with the requirements of S4.1.2.1(a) by any means is counted as 1.5 vehicles; and

(2) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front passenger's seating position is equipped with a manual Type 2 seat belt that complies with S5.1 of this standard, with the seat belt assembly adjusted in accordance with S7.4.2, is counted as one vehicle.

(3) Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less that is manufactured in two or more stages or that is altered (within the meaning of § 567.7 of this chapter) after having previously been certified in accordance with Part 567 of this chapter is not subject to the requirements of S4.2.5.1.2, S4.2.5.2.2, and S4.2.5.3.2. Such vehicles may be excluded from all calculations of compliance with S4.2.5.1.2, S4.2.5.2.2, and S4.2.5.3.2.

(b) For the purposes of complying with S4.2.5.1.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less may be counted if it—

(1) Is manufactured on or after September 1 1992, but before September 1, 1994; and

(2) Is certified as complying with S4.1.2.1 (as specified for passenger cars).

(c) For the purposes of complying with S4.2.5.2.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less may be counted if it—

(1) Is manufactured on or after September 1, 1992, but before September 1, 1995;

(2) Is certified as complying with S4.1.2.1 (as specified for passenger cars); and

(3) Is not counted towards compliance with S4.2.5.1.2.

(d) For the purposes of complying with S4.2.5.3.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less may be counted if it—

(1) Is manufactured on or after September 1, 1992, but before September 1, 1996;

(2) Is certified as complying with S4.1.2.1 (as specified for passenger cars); and

(3) Is not counted towards compliance with S4.2.5.1.2 or S4.2.5.2.2.

[S4.2.5.6 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer.

[S4.2.5.6.1 For the purposes of calculating average annual production for each manufacturer and the amount of vehicles manufactured by each manufacturer under S4.2.5.1.2, S4.2.5.2.2, or S4.2.5.3.2, a truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer shall be attributed to a single manufacturer as follows, subject to S4.2.5.6.2—

(a) A vehicle that is imported shall be attributed to the importer.

(b) A vehicle that is manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, shall be attributed to the manufacturer that markets the vehicle.

[S4.2.5.6.2 A truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified in an express written contract, reported to the National Highway Traffic Safety Administration under 49 CFR Part 585, between the manufacturer so specified and the manufacturer to which the vehicle would otherwise be attributed under

S4.2.5.6.2 A truck, bus, or multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and unloaded vehicle weight of 5,500 pounds or less produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified in an express written contract, report to the National Highway Traffic Safety Administration under 49 CFR Part 585, between the manufacturer so specified and the manufacturer to which the vehicle would otherwise be attributed under [S4.2.5.6.1 of this standard. **(57 F.R. 26609—June 19, 1992 Effective: June 19, 1992.)]**

S4.2.6 Trucks, buses, and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1997. Except as provided in S4.2.4, each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1997 shall comply with the requirements of S4.1.2.1 (as specified for passenger cars) of this standard, except that walk in van-type trucks and vehicles designed to be exclusively sold to the U.S. Postal Service may instead meet the requirements of S4.2.1.1 or S4.2.1.2. Each truck, bus, and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1997, but before September 1, 1998, whose driver's seating position complies with the requirements of S4.1.2.1(a) of this standard by means not including any type of seat belt and whose right front passenger's seating position is equipped with a manual Type 2 seat belt that complies with 55.1 of this standard, with the seat belt assembly adjusted in accordance with 57.4.2, shall be counted as a vehicle complying with S4.1.2.1. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.3 Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds.

S4.3.1 Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds, manufactured on or after January 1, 1972 and before September 1, 1990. Each truck and multipurpose passenger vehicle with a gross vehicle weight rating of more than 10,000 pounds, manufactured on or after January 1, 1972 and before September 1, 1990, shall meet the requirements of S4.3.1.1 or S4.3.1.2. A protection system that meets the requirements of S4.3.1.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.3.1.2.

S4.3.1.1 First option—complete passenger pro tection system. The vehicle shall meet the crash protection requirements of 55 by means that require no action by vehicle occupants.

S4.3.1.2 Second option—belt system. The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209.

S4.3.2 Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds manufactured on or after September 1, 1990. Each truck and multipurpose passenger vehicle with a gross vehicle weight rating of more than 10,000 pounds, manufactured on or after September 1, 1990, shall meet the requirements of S4.3.2.1 or S4.3.2.2. A protection system that meets the requirements of S4.3.2.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.3.2.2.

S4.3.2.1 First option—complete passenger protection system. The vehicle shall meet the crash protection requirements of 55 by means that require no action by vehicle occupants. S4.3.2.2 Second option—belt system. (The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209 of this Part and 57.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at a front outboard seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at the front outboard seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following—

(a) An automatic locking retractor used at a front outboard seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt portion of a seat belt assembly equipped with an automatic locking retractor that is installed at a front outboard seating position must allow at least 3/4 inch, but less than three inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.3.2.2(b) of this standard is determined as follows—

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least 3/4 inch but less than three inches. **(55 F.R. 18889—May 7, 1990. Effective: September 1, 1990.)]**

S4.4 Buses.

S4.4.1 Buses manufactured on or after January 1, 1972 and before September 1, 1990. Each bus manufactured on or after January 1, 1972 and before September 1, 1990, shall meet the requirements of S4.4.1.1 or S4.4.1.2.

S4.4.1.1 First option—complete passenger protection system—driver only. The vehicle shall meet the crash protection requirements of 55, with respect to an anthropomorphic test dummy in the driver's designated seating position, by means that require no action by vehicle occupants.

S4.4.1.2 Second option—belt system—driver only. The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209. S4.4.2 Buses manufactured on or after September 1, 1990. Each bus manufactured on or after September 1, 1990, shall meet the requirements of S4.4.2.1 or S4.4.2.2.

S4.4.2.1 First option—complete passenger protection system—driver only. The vehicle shall meet the crash protection requirements of 55, with respect to an anthropomorphic test dummy in the driver's designated seating position, by means that require no action by vehicle occupants.

S4.4.2.2 Second option-belt system-driver only. The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at the driver's seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at the driver's seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following—

(a) An automatic locking retractor used at a driver's seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt portion of a seat belt assembly equipped with an automatic locking retractor that is installed at the driver's seating position must allow at least ¾ inch, but less than three inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.4.2.2(b) of this standard is determined as follows—

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not an anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least ¾ inch but less than three inches.

S4.4.3 Buses manufactured on or after September 1, 1991.

S4.4.3.1 Each bus with a gross vehicle weight rating of more than 10,000 pounds shall comply with the requirements S4.4.2.1 or S4.4.2.2.

S4.4.3.2 [Except as provided in S4.4.3.2.2 and S4.4.3.2.3, each bus with a gross vehicle weight rating of 10,000 pounds or less, except a school bus, shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the front and every rear forward-facing outboard designated seating position, and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991.)]**

S4.4.3.2.1 As used in this section, a "rear outboard designated position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seats, except any designated seating positions adjacent to a walkway located between the seat and the side of the vehicle, which walkway is designed to allow access to more rearward seating positions.

S4.4.3.2.2 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either—

(i) Meet the requirements of S4.4.3.2 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) When the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and

S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle, and, when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of a Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.4.3.2.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.4.3.2, and may use an upper torso belt that detaches at either its upper or lower anchorage point, but not both anchorage points, to meet those requirements. [The means for detaching the upper torso belt may use a pushbutton action. **(56 F.R. 26039—June 6, 1991. Effective: July 8, 1991.]**

S4.4.3.3 Each school bus with a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the right front passenger's designated seating position (if any), and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. The lap belt portion of a Type 2 seat belt assembly installed at the driver's designated seating position and at the right front passenger's designated seating position (if any) shall include either an emergency locking retractor or an automatic locking retractor, which retractor shall not retract webbing to the next locking position until at least ¾ inch of webbing has moved into the retractor. In determining whether an automatic locking retractor complies with the requirement, the webbing is extended to 75 percent of its length and the retractor is locked after the initial adjustment. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

S4.4.4 Buses with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994. Each bus with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less manufactured on or after September 1, 1994 shall comply with the requirements of S4.2.5 and S4.2.6 of this standard, as applicable, for front seating positions, and with the requirements of S4.4.3.2 or S4.4.3.3 of this standard, as applicable, for all rear seating positions.

S4.5 Other general requirements.

S4.5.1 Labeling and driver's manual information. Each vehicle shall have a label setting forth the manufacturer's recommended schedule for the maintenance or replacement, necessary to retain the performance required by this standard, of any crash-deployed occupant protection system. The schedule shall be specified by month and year, or in terms of vehicle mileage, or by intervals measured from the date appearing on the vehicle certification label provided pursuant to 49 CFR Part 567. The label shall be permanently affixed to the vehicle within the passenger compartment and lettered in English in block capitals and numerals not less than three thirty-seconds of an inch high. Instructions concerning maintenance or replacement of the system and a description of the functional operation of the system shall be provided with each vehicle, with an appropriate reference on the label. If a vehicle owner's manual is provided, this information shall be included in the manual.

S4.5.2 Readiness indicator. An occupant protection system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. The indicator shall monitor its own readiness and shall be clearly visible from the driver's designated seating position. A list of the elements of the system being monitored by the indicator shall be included with the information furnished in accordance with S4.5.1 but need not be included on the label.

S4.5.3 Automatic belts. Except as provided in S4.5.3.1, a seat belt assembly that requires no action by vehicle occupants (hereinafter referred to as an "automatic belt") may be used to meet the crash protection requirements of any option under S4 and in place of any seat belt assembly otherwise required by that option.

S4.5.3.1 An automatic belt that provides only pelvic restraint may not be used pursuant to S4.5.3 to meet the requirements of an option that requires a Type 2 seat belt assembly.

S4.5.3.2 An automatic belt, furnished pursuant to S4.5.3, that provides both pelvic and upper torso restraint may have either a detachable or nondetachable upper torso portion, notwithstanding provisions of the option under which it is furnished.

S4.5.3.3 An automatic belt furnished pursuant to S4.5.3 shall—

(a) Conform to S7.1 and have a single emergency release mechanism whose components are readily accessible to a seated occupant.

(b) In place of a warning system that conforms to S7.3 of this standard, be equipped with the following warning system: At the left front designated seating position (driver's position), a warning system that activates a continuous or intermittent audible signal for a period of not less than 4 seconds and not more than 8 seconds and that activates a continuous or flashing warning light visible to the driver for not less than 60 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position) when condition (A) exists simultaneously with condition (B), and that activates a continuous or flashing warning light, visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of Standard No. 101 or, at the option of the manufacturer if permitted by Standard No. 101, displaying the words "Fasten Seat Belts" or "Fasten Belts", for as long as condition (A) exists simultaneously with condition (C).

(A) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(B) The driver's automatic belt is not in use, as determined by the belt latch mechanism not being fastened or, if the automatic belt is nondetachable, by the emergency release mechanism being in the released position. In the case of motorized automatic belts, the determination of use shall be made once the belt webbing is in its locked protective mode at the anchorage point.

(C) The belt webbing of a motorized automatic belt system is not in its locked, protective mode at the anchorage point.

S4.5.3.4 An automatic belt furnished pursuant to S4.5.3 that is not required to meet the perpendicular frontal crash protection requirements of S5.1 shall conform to the webbing, attachment hardware, and assembly performance requirements of Standard No. 209.

S4.6 Dynamic testing of manual belt systems.

S4.6.1 Each truck and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded weight of less than 5,500 pounds that is manufactured on or after September 1, 1991, and is equipped with a Type 2 seat belt assembly at a front outboard designated seating position pursuant to S4.1.2.3 shall meet the frontal crash protection requirements of S5.1 at those designated seating positions with a test dummy restrained by a Type 2 seat belt assembly that has been adjusted in accordance with S7.4.2. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

[S4.6.2 Any manual seat belt assembly subject to the requirements of S5.1 of this standard by virtue of any provision of this standard other than S4.1.2.1(c)(2) does not have to meet the requirements of S4.2(a)–(f) and S4.4 of Standard No. 209 (§ 571.209). **(56 F.R. 15295—April 16, 1991. Effective: April 16, 1991.)]**

[S4.6.3 Any manual seat belt assembly subject to the requirements of S5.1 of this standard by virtue of S4.1.2.1(c)(2) does not have to meet the elongation requirements of S4.2(c), S4.4(a)(2), S4–4(b)(4), and S4.4(b)(5) of Standard No. 209 (§ 571.209). **(56 F.R. 15295—April 16, 1991. Effective: April 16, 1991.)]**

S5. Occupant crash protection requirements.

S5.1 Vehicles subject to S5.1 shall comply with either S5.1(a) or S5.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, **[**1993**]** that comply with the requirements of

S4.1.2.1(a) by means not including any type of seat belt or inflatable restraint shall comply with S5.1(a). **(56 F.R. 19306—April 26, 1991. Effective April 26,1991.)]**

(a) Impact a vehicle traveling longitudinally forward at any speed, up to and including 30 mph, into a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle under the applicable conditions of S8. The test dummy specified in S8.1.8.1 placed at each front outboard designated seating position shall meet the injury criteria of S6.1.1, S6.1.2,6.1.3, and 6.1.4.

(b) Impact a vehicle traveling longitudinally forward at any speed, up to and including 30 mph, into a fixed collision barrier that is perpendicular to line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle, under the applicable conditions of S8. The test dummy specified in S8.1.8.2 placed at each front outboard designated seating position shall meet the injury criteria of S6.2.1, 6.2.2, 6.2.3, 6.2.4, and 6.2.5.

S5.2 Lateral moving barrier crash.

S5.2.1 Vehicles subject to S5.2 shall comply with either S5.2.1(a) or S5.2.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, [1993] that comply with the requirements of S4.1.2.1(c) by means not including any type of seat belt or inflatable restraint shall comply with S5.2.1(a). **(56 F.R. 19306—April 26, 1991. Effective: April 26, 1991.)]**

S5.3 Rollover. Subject a vehicle to a rollover test under the applicable condition of S8 in either lateral direction at 30 mph with either, at the manufacture's option, a test dummy specified in S8.1.8.1 or S8.1.8.2, placed in the front outboard designated seating position on the vehicle's lower side as mounted on the test platform. The test dummy shall meet the injury criteria of either S6.1.1 or S6.2.1.

S6 Injury criteria.

S6.1 Injury criteria for the Part 572, Subpart B, 50th percentile Male Dummy.

S6.1.1 All portions of the test dummy shall be contained within the outer surfaces of the vehicle passenger compartment throughout the test.

S6.1.2 The resultant acceleration at the center of gravity of the head shall be such that the expression—

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a\,dt \right]^{2.5} t_2 - t_1$$

shall not exceed 1,000 where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2 are any two points in time during the crash of the vehicle which are separated by not more than a 36 millisecond time interval.

S6.1.3 The resultant acceleration at the center of gravity of the upper thorax shall not exceed 60 g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S6.1.4 The compressive force transmitted axially through each upper leg shall not exceed 2,250 pounds.

S6.2 Injury criteria for the Part 572, Subpart E, hybrid III Dummy.

S6.2.1 All portions of the test dummy shall be contained within the outer surfaces of the vehicle passenger compartment throughout the test.

Figure 3a. Location of Anchoring Points for Latchplate Reach Limiting Chains or Strings to Test for Latchplate Accessibility [Using Subpart B Test Device.

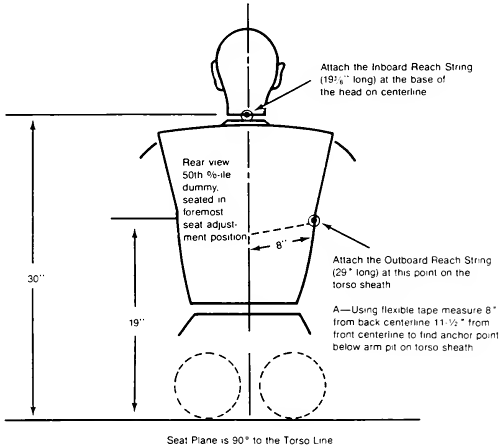
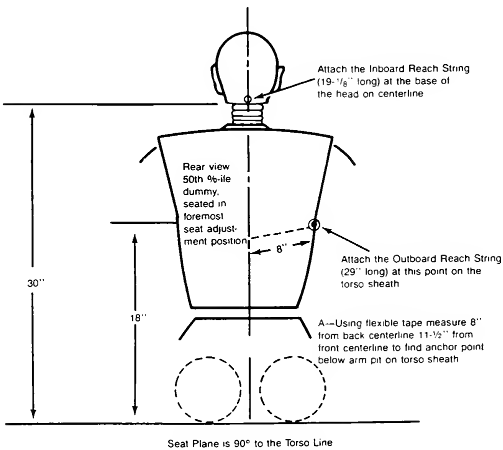


Figure 3b. Location of Anchoring Points for Latchplate Reach Limiting Chains or Strings to Test for Latchplate Accessibility Using Subpart E Test Device.



S6.2.2 The resultant acceleration at the center of gravity of the head shall be such that the expression—

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a dt \right]^{2.5} t_2 - t_1$$

shall not exceed 1,000, where a is the resultant acceleration expressed as a multiple of *g* (the acceleration of gravity), and t_1 and t_2 are any two points in time during the crash of the vehicle which are separated by not more than a 36 millisecond time interval.

S6.2.3 The resultant acceleration calculated from the output of the thoracic instrumentation shown in drawing 78051–218, revision R incorporated by reference in Part 572, Subpart E of this Chapter shall not exceed 60 g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S6.2.4 Compression deflection of the sternum relative to the spine, as determined by instrumentation shown in drawing 78051–317, revision A incorporated by reference in Part 572, Subpart E of this Chapter, shall not exceed 3 inches. **(53 F.R. 8755—March 17, 1988. Effective: March 17, 1988.)]**

S6.2.5 The force transmitted axially through each upper leg shall not exceed 2,250 pounds.

S7. Seat belt assembly requirements.

S7.1 Adjustment.

S7.1.1 Except as specified in S7.1.1.1 and S7.1.1.2, the lap belt of any seat belt assembly furnished in accordance with S4.1.2 shall adjust by means of an emergency-locking or automatic-locking retractor that conforms to § 571.209 to fit persons whose dimensions range from those of a 50th-percentile 6-year-old child to those of a 95th-percentile adult male and the upper torso restraint shall adjust by means of an emergency-locking retractor or a manual adjusting device that conforms to § 571.209 to fit persons whose dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male, with the seat in any position, the seat back in the manufacturer's nominal design riding position, and any adjustable anchorages adjusted to the manufacturer's nominal design position for a 50th percentile adult male occupant. However, an upper torso restraint furnished in accordance with S4.1.2.3.1(a) shall adjust by means of an emergency-locking retractor that conforms to § 571.209. *The provisions for vehicles with adjustable anchorages will apply to vehicles manufactured on or after September 1, 1989, and the provisions for vehicles with tension-relieving devices at seating positions also equipped with air bags will apply to vehicles manufactured on or after September 1, 1990.*

Clearance Test Block

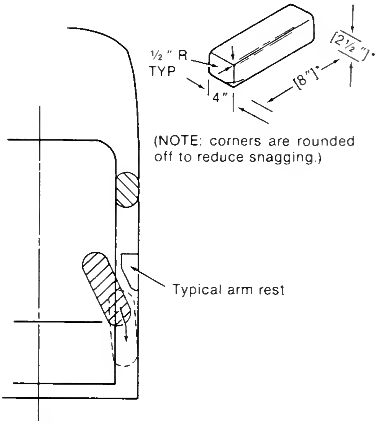


Figure 4. Use of Clearance Test Block to Determine Hand/Arm Access

S7.1.1.1 A seat belt assembly installed at the driver's seating position shall adjust to fit persons whose dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male.

S7.1.1.2. (a) A seat belt assembly installed in a motor vehicle other than a forward control vehicle at any designated seating position other than the outboard positions of the front and second seats shall adjust either by a retractor as specified in S7.1.1 or by a manual adjusting device that conforms to Standard No. 209.

(b) A seat belt assembly installed in a forward control vehicle at any designated seating position other than the front outboard seating positions shall adjust either by a retractor as specified in

S7.1.1 or by a manual adjusting device that conforms to Standard No. 209.

S7.1.1.3 [A Type 1 lap belt or the lap belt portion of any Type 2 seat belt assembly installed at any forward-facing outboard designated seating position of a vehicle with a gross vehicle weight rating of 10,000 pounds or less to comply with a requirement of this standard, except walk-in van-type vehicles and school buses, shall meet the requirements of S7.1 by means of an emergency locking retractor that conforms to Standard No. 209 (49 CFR 571.209). **(55 F.R. 30914—July 30, 1990. Effective September 1, 1991.)]**

(b) The requirements of S7.1.1.3(a) do not apply to the lap belt portion of any Type 2 belt installed in a passenger car manufactured before September 1, 1989, or to walk-in van-type vehicles.

S7.1.1.4 Notwithstanding the other provisions of S7.1–S7.1.1.3, emergency-locking retractors on belt assemblies located in positions other than front outboard designated seating positions may be equipped with a manual webbing adjustment device capable of causing the retractor that adjusts the lap belt to lock when the belt is buckled.

[S7.1.1.5 Removed and Reserved. (55 F.R. 30914—July 30, 1990.)]

S7.1.2 The intersection of the upper torso belt with the lap belt in any Type 2 seat belt assembly furnished in accordance with S4.1.1 or S4.1.2, with the upper torso manual adjusting device, if provided, adjusted in accordance with the manufacturer's instructions, shall be at least 6 inches from the front vertical centerline of a 50th-percentile adult male occupant, measured along the centerline of the lap belt, with the seat in its rearmost and lowest adjustable position and with the seat back in the manufacturer's nominal design riding position.

S7.1.3 The weights and dimensions of the vehicle occupants specified in this standard are as follows—

	50th-percentile 6-year-old child	5th-percentile adult female	50th-percentile adult male	95th-percentile adult male
Weight	47.3 pounds	102 pounds	164 pounds ±3	215 pounds
Erect sitting height	25.4 inches	30.9 inches	35.7 inches ±.1	38 inches
Hip breadth (sitting)	8.4 inches	12.8 inches	14.7 inches ±.7	16.5 inches
Hip circumference (sitting)	23.9 inches	36.4 inches	42 inches	47.2 inches
Waist circumference (sitting)	20.8 inches	23.6 inches	32 inches ±.6	42.5 inches
Chest depth		7.5 inches	9.3 inches ±.2	10.5 inches
Chest circumference:				
(nipple)		30.5 inches.		
(upper)		29.8 inches	37.4 inches ±.6	44.5 inches
(lower)		26.6 inches		

S7.2 Latch mechanism. A seat belt assembly installed in any vehicle, except an automatic belt assembly, shall have a latch mechanism—

(a) Whose components are accessible to a seated occupant in both the stowed and operational positions;

(b) That releases both the upper torso restraint and the lap belt simultaneously, if the assembly has a lap belt and an upper torso restraint that require unlatching for release of the occupant; and

(c) That releases at a single point by a pushbutton action.

S7.3 [A seat belt assembly provided at the driver's seating position shall be equipped with a warning system that, at the option of the manufacturer, either—

(a) Activates a continuous or intermittent audible signal for a period of not less than 4 seconds and not more than 8 seconds and that activates a continuous or flashing warning light visible to the driver displaying the identifying symbol for the seat belt telltale shown in Table 2 of FMVSS 101, or, at the option of the manufacturer if permitted by FMVSS 101, displaying the words "Fasten Seat Belts" or "Fasten Belts," for not less that 60 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position) when condition (a) exists simultaneously with condition (b); or that

(b) Activates, for a period of not less than 4 seconds and not more than 8 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position), a continuous or flashing warning light visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of FMVSS No. 101, or, at the option of the manufacturer if permitted by FMVSS 101, displaying the words "Fasten Seat Belts" or "Fasten Belts" when condition (a) exists, and a continuous or intermittent audible signal when condition (a) exists simultaneously with condition (b). **(56 F.R. 3222–January 29, 1991. Effective: January 29, 1991.)]**

(1) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(2) The driver's lap belt is not in use, as determined at the option of the manufacturer, either by the belt latch mechanism not being fastened, or by the belt not being extended at least 4 inches from its stowed position.

S7.3.1 Deleted

S7.3.2 Deleted

S7.3.3 Deleted

S7.3.4 Deleted

S7.3.5 Deleted

S7.3.5.1 Deleted

S7.3.5.2 Deleted

S7.3.5.3 Deleted

S7.3.5.4 Deleted

S7.3a Deleted

S7.4 Seat belt comfort and convenience. (a) *Automatic seat belts*. Automatic seat belts installed in any vehicle, other than walk-in van-type vehicles, which has a gross vehicle weight rating of 10,000 pounds or less, and which is manufactured on or after September 1, 1986, shall meet the requirements of S7.4.1, S7.4.2, and S7.4.3.

(b) Manual seat belts.

(1) *Vehicles manufactured after September 1, 1986.* Manual seat belts installed in any vehicle, other than manual Type 2 belt systems installed in the front outboard seating positions in passenger cars or manual belts in walk-in van-type vehicles, which have a gross vehicle weight rating of 10,000 pounds or less, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

(2) *Vehicles manufactured after September 1, 1989.*

(i) If the automatic restraint requirement of S4.1.4 is rescinded pursuant to S4.1.5, than manual seat belts installed in a passenger car shall meet the requirements of S7.1.1.3(a), S7.4.2, S7.4.3, s7.4.4 ,S7.4.5, and S7.4.6.

(ii) Manual seat belts installed in a bus, multipurpose passenger vehicle and truck with a gross vehicle weight rating of 10,000 pounds or less, except for walk-in van-type vehicles, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

S7.4.1 Convenience hooks. Any manual convenience hook or other device that is provided to stow seat belt webbing to facilitate entering or exiting the vehicle shall automatically release the webbing when the automatic belt system is otherwise operational and shall remain in the released mode for as long as (a) exists simultaneously with (b), or, at the manufacturer's option, for as long as (a) exists simultaneously with (c)—

(a) The vehicle ignition switch is moved to the "on" or "start" position;

(b) The vehicle's drive train is engaged;

(c) The vehicle's parking brake is in the released mode (nonengaged).

S7.4.2 Webbing tension-relieving device. [Each vehicle with an automatic seat belt assembly or with a Type 2 manual seat belt assembly that must meet the occupant crash protection requirements of S5.1 of this standard installed at a front outboard designated seating position, and each vehicle with a Type 2 manual seat belt assembly installed at a rear outboard designated seating position in compliance with a requirement of this standard, that has either automatic or manual tension-relieving devices permitting the introduction of slack in the webbing of the shoulder belt (e.g., "comfort clips" or "window-shade" devices), shall— **(54 F.R. 46257–November 2, 1989. Effective, May 1,1990.)]**

(a) Comply with the requirements of S5.1 with the shoulder belt webbing adjusted to introduce the maximum amount of slack recommended by the vehicle manufacturer pursuant to S7.4.2(b);

(b) Have a section in the vehicle owner's manual that explains how the tension-relieving device works and specifies the maximum amount of slack (in inches) recommended by the vehicle manufacturer to be introduced into the shoulder belt under normal use conditions. The explanation shall also warn that introducing slack beyond the amount specified by the manufacturer could significantly reduce the effectiveness of the shoulder belt in a crash; and

(c) [Have, except for open-body vehicles with no doors, an automatic means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device. In the case of an automatic safety belt system, cancellation of the tension relieving device shall occur each time the adjacent vehicle door is opened. In the case of a manual seat belt required to meet S5.1, cancellation of the tension-relieving device shall occur, at the manufacturer's option, either each time the adjacent door is opened or each time the latchplate is released from the buckle. In the case of Type 2 manual seat belt assembly installed at a rear outboard designated seating position, cancellation of the tension-relieving device shall occur, at the manufacturer's option either each time the door designed to allow the occupant of that seating position entry and egress of the vehicle is opened or each time the latchplate is released from the buckle. In the case of open-body vehicles with no doors, cancellation of the tension-relieving device may be done by a manual means. **(54 F.R. 46257— November 2,1989. Effective: May 1, 1990.)]**

S7.4.3 Belt contact force. Except for manual or automatic seat belt assemblies that incorporate a webbing tension-relieving device, the upper torso webbing of any seat belt assembly, shall not exert more than 0.7 pounds of contact force when measured normal to and one inch from the chest of an anthropomorphic test dummy, positioned in accordance with S10 or S11 of this standard in the seating position for which that seat belt assembly is provided, at the point where the centerline of the torso belt crosses the midsagittal line on the dummy's chest.

S7.4.4 Latchplate access. Any seat belt assembly latchplate that is located outboard of a front outboard seating position in accordance with S4.1.2, shall also be located within the outboard reach envelope of either the outboard arm or the inboard arm described in S10.6 of this standard and, in the case of a Part 572 Subpart B test dummy, Figure 3A of this standard, or, in the case of a Part 572 Subpart E test dummy, Figure 3B of this standard, when the latchplate is in its normal stowed position and any adjustable anchorages are adjusted to the manufacturer's nominal design position for a 50th percentile male occupant. There shall be sufficient clearance between the vehicle seat and the side of the vehicle interior to allow the test block defined in Figure 4 unhindered transit to the latchplate or buckle. *The provisions for vehicles with adjustable anchorages will apply to vehicles manufactured on or after September 1, 1989, and the provisions for vehicles with tension-relieving devices at seating positions also equipped with air bags will apply to vehicles manufactured on or after September 1,1990.*

NOTE.—*Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.*

S7.4.5 Retraction. When tested under the conditions of S8.1.2 and S8.1.3, with anthropomorphic test dummies whose arms have been removed and which are positioned in accordance with either S10 or S11, or any combination thereof, in the front outboard designated seating positions and restrained by the belt systems for those positions, the torso and lap belt webbing of any of those seat belt systems shall automatically retract to a stowed position either when the adjacent vehicle door is in the open position and the seat belt latchplate is released, or, at the option of the manufacturer, when the latchplate is released.

S7.4.6 Seat belt guides and hardware.

S7.4.6.1 (a) Any manual seat belt assembly whose webbing is designed to pass through the seat cushion or between the seat cushion and seat back shall be designed to maintain one of the following three seat belt parts (the seat belt latchplate, the buckle, or the seat belt webbing) on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant). In addition, the remaining two seat belt parts must be accessible under normal conditions.

(b) The requirements of S7.4.6.1(a) do not apply to—

(1) seats whose seat cushions are movable so that the seat back serves a function other than seating;

(2) seats which are removable; or

(3) seats which are movable so that the space formerly occupied by the seat can be used for a secondary function.

S7.4.6.2 The buckle and latchplate of a manual seat belt assembly subject to S7.4.6.1 shall not pass through the guides or conduits provided for in S7.4.6.1 and fall behind the seat when the events listed below occur in the order specified—

(a) The belt is completely retracted or, if the belt is nonretractable, the belt is unlatched;

(b) The seat is moved to any position to which it is designed to be adjusted; and

(c) The seat back, if foldable, is folded forward as far as possible and then moved backward into position. The inboard receptacle end of a seat belt assembly installed at a front outboard designated seating position shall be accessible with the center arm rest in any position to which it can be adjusted (without having to move the armrest).

S8 Test conditions.

S8.1 General conditions. The following conditions apply to the frontal, lateral, and rollover tests.

S8.1.1 Except as provided in paragraph (c) of this section, the vehicle, including test devices and instrumentation, is loaded as follows:

(a) *Passenger cars.* A passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus the weight of the necessary anthropomorphic test devices.

(b) *Multipurpose passenger vehicles, trucks, and buses.* A multipurpose passenger vehicle, truck, or bus is loaded to its unloaded vehicle weight plus 300 pounds or its rated cargo and luggage capacity weight, whichever is less, secured in the load carrying area and distributed as nearly as possible in proportion to its gross axle weight ratings, plus the weight of the necessary anthropomorphic test devices. **[**For the purposes of this section, unloaded vehicle weight does not include the weight of work-performing accessories. Vehicles are tested to a maximum unloaded vehicle weight of 5,500 pounds. **(56 F.R. 12472—March 26,1991. Effective: September 23,1991.)]**

(c) *Fuel system capacity.* With the test vehicle on a level surface, pump the fuel from the vehicle's fuel tank and then operate the engine until it stops. Then, add Stoddard solvent to the test vehicle's fuel tank in an amount which is equal to not less than 92 and not more than 94 percent of the fuel tank's usable capacity stated by the vehicle's manufacturer. In addition, add the amount of Stoddard solvent needed to fill the entire fuel system from the fuel tank through the engine's induction system.

(d) *Vehicle test attitude.* Determine the distance between a level surface and a standard reference point on the test vehicle's body, directly above each wheel opening, when the vehicle is in its "as delivered" condition. The "as delivered" condition is the vehicle as received at the test site, with 100 percent of all fluid capacities and all tires inflated to the manufacturer's specifications as listed on the vehicle's tire placard. Determine the distance between the same level surface and the same standard reference points in the vehicle's "fully loaded condition." The "fully loaded condition" is the test vehicle loaded in accordance with S8.1.1.(a) or (b), as applicable. The load placed in the cargo area shall be centered over the longitudinal centerline of the vehicle. The pretest vehicle attitude shall be equal to either the "as delivered" or "fully loaded" attitude or between the "as delivered" attitude and the "fully loaded" attitude.

S8.1.2 Adjustable seats are in the adjustment position midway between the forwardmost and rearmost positions, and If separately adjustable in a vertical direction, are at the lowest position. If an adjustment position does not exist midway between the forwardmost and rearmost positions, the closest adjustment position to the rear of the midpoint is used.

S8.1.3 [Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer. Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male occupant. Place each adjustable head restraint in its highest adjustment position. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. **(54 F.R. 29045—July 11, 1989. Effective: September 1, 1989.)** *The provisions for vehicles with adjustable anchorages will apply to vehicles manufactured on or after September 1, 1989, and the provisions for vehicles with tension-relieving devices at seating positions also equipped with air bags will apply to vehicles manufactured on or after September 1, 1990.*]

S8.1.4 Adjustable steering controls are adjusted so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.

S8.1.5 Movable vehicle windows and vents are at the manufacturer's option, placed in the fully closed position.

S8.1.8 Convertibles and open-body type vehicles have the top, if any, in place in the closed passenger compartment configuration.

S8.1.7 Doors are fully closed and latched but not locked.

S8.1.8 Anthropomorphic test dummies.

S8.1.8.1 The anthropomorphic test dummies used for evaluation of occupant protection systems manufactured pursuant to applicable portions of paragraphs S4.1.2, S4.1.3, and S4.1.4 shall conform to the requirements of Subpart E of Part 572 of this Chapter.

S8.1.8.2 Anthropomorphic test devices used for the evaluation of occupant protection systems manufactured pursuant to applicable portions of paragraphs S4.1.2, S4.1.3, and S4.1.4 shall conform to the requirements of Subpart E of Part 572 of this Chapter.

S8.1.9.1 Each Part 572, Subpart B test dummy specified in S8.1.8.1 is clothed in formfitting cotton stretch garments with short sleeves and midcalf length pants. Each foot of the test dummy is equipped with a size 11EE shoe which meets the configuration size, sole, and heel thickness specifications of MIL S–131192 and weighs 1.25 ± 0.2 pounds.

S8.1.9.2 Each Part 572, Subpart E test dummy specified in S8.1.8.2 is clothed in formfitting cotton stretch garments with short sleeves and midcalf length pants specified in drawings 78051–292 and –293 incorporated by reference in Part 572, Subpart E of this Chapter, respectively or their equivalents. A size 11EE shoe specified in drawings 78051–294 (left) and 78051–295 (right) or their equivalents is placed on each foot of the test dummy.

S8.1.10 Limb joints are set at 1g, barely restraining the weight of the limb when extended horizontally. Leg joints are adjusted with the torso in the supine position.

S8.1.11 Instrumentation does not affect the motion of dummies during impact or rollover.

S8.1.12 Temperature of the test dummy.

S8.1.12.1 [The stabilized temperature of the test dummy specified by S8.1.8.1 is at any level between 66 degrees F and 78 degrees F.

S8.1.12.2 The stabilized temperature of the test dummy specified by S8.1.8.2 is at any level between 69 degrees F and 72 degrees F. **(51 F.R. 26688—July 25,1986. Effective: October 23, 1986.)**]

S8.2 Lateral moving barrier crash test conditions. The following conditions apply to the lateral moving barrier crash test—

S8.2.1 The moving barrier, including the impact surface, supporting structure, and carriage, weighs 4,000 pounds.

S8.2.2 The impact surface of the barrier is a vertical, rigid, flat rectangle, 78 inches wide and 60 inches high, perpendicular to its direction of movement, with its lower edge horizontal and 5 inches above the ground surface.

S8.2.3 During the entire impact sequence the barrier undergoes no significant amount of dynamic or static deformation, and absorbs no significant portion of the energy resulting from the impact, except for energy that results in translational rebound movement of the barrier.

S8.2.4 During the entire impact sequence the barrier is guided so that it travels in a straight line, with no significant lateral, vertical or rotational movement.

S8.2.5 The concrete surface upon which the vehicle is tested is level, rigid and of uniform construction, with a skid number of 75 when measured in accordance with American Society for Testing and Materials Method E–274–65T at 40 mph, omitting water delivery as specified in paragraph 7.1 of that method.

S8.2.6 The tested vehicle's brakes are disengaged and the transmission is in neutral.

S8.2.7 The barrier and the test vehicle are positioned so that at impact—

(a) The vehicle is at rest in its normal attitude;

(b) The barrier is traveling in a direction perpendicular to the longitudinal axis of the vehicle at 20 mph; and

(c) A vertical plane through the geometric center of the barrier impact surface and perpendicular to that surface passes through the driver's seating reference point in the tested vehicle.

S8.3 Rollover test condition. The following conditions apply to the rollover test—

S8.3.1 The tested vehicle's brakes are disengaged and the transmission is in neutral.

S8.3.2 The concrete surface on which the test is conducted is level, rigid, of uniform construction, and of a sufficient size that the vehicle remains on it throughout the entire rollover cycle. It has a skid number of 75 when measured in accordance with American Society for Testing and Materials Method E–274–65T at 40 mph omitting water delivery as specified in paragraph 7.1 of that method.

S8.3.3 The vehicle is placed on a device, similar to that illustrated in Figure 1, having a platform in the form of a flat, rigid plane at an angle of 23° from the horizontal. At the lower edge of the platform is an unyielding flange, perpendicular to the platform with a height of 4 inches and a length sufficient to hold in place the tires that rest against it. The intersection of the inner face of the flange with the upper face of the platform is 9 inches above the rollover surface. No other restraints are used to hold the vehicle in position during the deceleration of the platform and the departure of the vehicle.

S8.3.4 With the vehicle on the test platform, the test devices remain as nearly as possible in the posture specified in S8.1.

S8.3.5 Before the deceleration pulse, the platform is moving horizontally, and perpendicularly to the longitudinal axis of the vehicle, at a constant speed of 30 mph for a sufficient period of time for the vehicle to become motionless relative to the platform.

S8.3.6 The platform is decelerated from 30 to 0 mph in a distance of not more than 3 feet, without change of direction and without transverse or rotational movement during the deceleration of the platform and the departure of the vehicle. The deceleration rate is at least 20g for a minimum of 0.04 seconds.

S9. Pressure vessels and explosive devices.

S9.1 Pressure vessels. A pressure vessel that is continuously pressurized shall conform to the requirements of 49 CFR § 178.65–2, –6(b), –7, –9(a) and (b), and –10. It shall not leak or evidence visible distortion when in accordance with § 178.65–11(a) and shall not fail in any of the ways enumerated in § 178.65–11(b) when hydrostatically tested to destruction. It shall not crack when flattened in accordance with § 178.65–12(a) to the limit specified in § 178.65–12(a)(4).

S9.2 Explosive devices. An explosive device shall not exhibit any of the characteristics prohibited by 49 CFR § 173.51. All explosive material shall be enclosed in a structure that is capable of containing the explosive energy without sudden release of pressure except through overpressure relief devices or parts designed to release the pressure during actuation.

S10. Test dummy positioning procedures. [Position a test dummy, conforming to Subpart B of Part 572 of this chapter, in each front outboard seating position of a vehicle as set forth below in S10 through S10.9. Each test dummy is restrained during the crash tests of S5 as follows— **(54 F.R. 23986—June 5, 1989. Effective: December 4, 1989.)**]

(a) In a vehicle equipped with automatic restraints at each front outboard designated seating position that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(1), each test dummy is not restrained during the frontal test of S5.1, the lateral test of S5.2 and the rollover test of S5.3 by any means that require occupant action.

(b)(1) In a vehicle equipped with an automatic restraint at each front outboard seating position that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(2), each test dummy is not restrained during one frontal test of S5.1 by any means that require occupant action. If the vehicle has a manual seat belt provided by the manufacturer to comply with the requirements of S4.1.2.1(c), then a second frontal test is conducted in accordance with S5.1 and each test dummy is restrained both by the automatic restraint system and the manual seat belt, adjusted in accordance with S10.9.

(2) In a vehicle equipped with an automatic restraint only at the driver's designated seating position, pursuant to S4.1.3.4(a)(2), that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(2), the driver test dummy is not restrained during one frontal test of S5.1 by any means that require occupant action. If the vehicle also has a manual seat belt provided by the manufacturer to comply with the requirements of S4.1.2.1(c), then a second frontal test is conducted in accordance with S5.1 and the driver test dummy is restrained both by the automatic restraint system and the manual seat belt, adjusted in accordance with S10.9. At the option of the manufacturer, a passenger test dummy can be placed in the right front outboard designated seating position during the testing required by this section. If a passenger test dummy is present, it shall be restrained by a manual seat belt, adjusted in accordance with S10.9.

(c) In a vehicle equipped with a manual safety belt at the front outboard designated seating positions that is certified by its manufacturer to meet the requirements of S4.6, each test dummy is restrained by the manual safety belts, adjusted in accordance with S10.9, installed at each front outboard seating position.

S10.1 Vehicle equipped with front bucket seats. Place the test dummy's torso against the seat back and its upper legs against the seat cushion to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10. Center the test dummy on the seat cushion of the bucket seat and set its midsagittal plane so that it is vertical and parallel to the centerline of the seat cushion.

S10.1.1 Driver position placement.

(a) Initially set the knees of the test dummy 11¾ inches apart, measured between the outer surfaces of the knee pivot bolt heads, with the left outer surface 5.9 inches from the midsagittal plane of the test dummy.

(b) Rest the right foot of the test dummy on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, set it initially perpendicular to the lower leg and place it as far forward as possible in the direction of the pedal centerline with the rearmost point of the heel resting on the floor pan. Except as prevented by contact with a vehicle surface, place the right leg so that the upper and lower leg centerlines fall, as close as possible, in a vertical longitudinal plane without inducing torso movement.

(c) [Place the left foot on the toeboard with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toeboard and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toeboard, set it initially perpendicular to the lower leg and place it as far forward as possible with the heel resting on the floor pan. If necessary to avoid contact with the vehicle's brake or clutch pedal, rotate the test dummy's left foot about the lower leg. If there is still pedal interference, rotate the left leg outboard about the hip the minimum distance necessary to avoid the pedal interference. Except as prevented by contact with a vehicle surface, place the left leg so that the upper and lower leg centerlines fall, as close as possible, in a vertical plane. For vehicles with a foot rest that does not elevate the left foot above the level of the right foot, place the left foot on the foot rest so that the upper and lower leg centerlines fall in a vertical plane. **(51 F.R. 31765—September 5, 1986. Effective: September 5, 1986.)**]

S10.1.2 Passenger position placement.

S10.1.2.1 Vehicle with a flat floor pan/ toeboard. (a) Initially set the knees 11¾ inches apart, measured between the outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet on the vehicle's toeboard with the heels resting on the floor pan as close as possible to the intersection point with the toeboard. If the feet cannot be placed flat on the toeboard, set them perpendicular to the lower leg centerlines and place them as far forward as possible with the heels resting on the floor pan.

(c) Place the right and left legs so that the upper and lower leg centerlines fall in vertical longitudinal planes.

S10.1.2.2 Vehicles with wheelhouse projections in passenger compartment.

(a) Initially set the knees 11¾ inches apart, measured between outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet in the well of the floor pan/toeboard and not on the wheelhouse projection. If the feet cannot be placed flat on the toeboard, initially set them perpendicular to the lower leg centerlines and then place them as far forward as possible with the heels resting on the floor pan.

(c) If it is not possible to maintain vertical and longitudinal planes through the upper and lower leg centerlines for each leg, then place the left leg so that its upper and lower centerlines fall, as closely as possible, in a vertical longitudinal plane and place the right leg so that its upper and lower leg centerlines fall, as closely as possible, in a vertical plane.

S10.2 Vehicle equipped with bench seating. Place a test dummy with its torso against the seat back and its upper legs against the seat cushion, to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10.1.

S10.2.1 Driver position placement. Place the test dummy at the left front outboard designated seating position so that its midsagittal plane is vertical and parallel to the centerline of the vehicle and so that the midsagittal plane of the test dummy passes through the center of the steering wheel rim. Place the legs, knees, and feet of the test dummy as specified in S10.1.1.

S10.2.2 Passenger position placement. [Place the test dummy at the right front outboard designated seating position so that the midsagittal plane of the test dummy is vertical and longitudinal, and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the test dummy at the driver's position. Place the legs, knees, and feet of the test dummy as specified in S10.1.2. **(51 F.R. 31765—September 5, 1986. Effective: September 5, 1986.)**]

S10.3 Initial test dummy head and arm placement. With the test dummy at its designated seating position as specified by the appropriate requirements of S10.1 or S10.2, place the upper arms against the seat back and tangent to the side of the upper torso. Place the lower arms and palms against the outside of the upper legs.

S10.4 Test dummy settling.

S10.4.1 Test dummy vertical upward displacement. Slowly lift the test dummy parallel to the seat back plane until the test dummy's buttocks no longer contact the seat cushion or until there is test dummy head contact with the vehicle's headlining.

S10.4.2 Lower torso force application. Apply a rearward force of 50 pounds against the center of the test dummy's lower torso in a horizontal direction. The line of force application shall be 6.5 inches above the bottom surface of the test dummy's buttocks.

S10.4.3 Test dummy vertical downward displacement. Remove as much of the 50-pound force as necessary to allow the test dummy to return downward to the seat cushion by its own weight.

S10.4.4 Test dummy upper torso rocking. Apply a 10- to 15-pound horizontal rearward force to the test dummy's lower torso. Then apply a horizontal forward force to the test dummy's shoulders sufficient to flex the upper torso forward until its back no longer contacts the seat back. Rock the test dummy from side to side 3 or 4 times so that the test dummy's spine is at any angle from the vertical in the 14- to 16-degree range at the extremes of each rocking movement.

S10.4.5 Test dummy upper torso force application. While maintaining the 10- to 15-pound horizontal rearward force applied in S10.4.4 and with the test dummy's midsagittal plane vertical, push the upper torso back against the seat back with a force of 50 pounds applied in a horizontal rearward direction along a line that is coincident with the test dummy's midsagittal plane and 18 inches above the bottom surface of the test dummy's buttocks.

S10.5 Belt adjustment for dynamic testing. With the test dummy at its designated seating position as specified by the appropriate requirements of S8.1.2, S8.1.3, and S10.1 through S10.4, place and adjust the safety belt as specified below.

S10.5.1 Manual safety belts. Place the Type 1 or Type 2 manual belt around the test dummy and fasten the latch. Pull the Type 1 belt webbing out of the retractor and allow it to retract; repeat this operation four times. Remove all slack from the lap belt portion of a Type 2 belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times so that the excess webbing in the shoulder belt is removed by the retractive force of the retractor. Apply a 2 to 4 pound tension load to the lap belt of a single retractor system by pulling the upper torso belt adjacent to the latchplate. In the case of a dual retractor system, apply a 2 to 4 pound tension load by pulling the lap belt adjacent to its retractor. Measure the tension load as close as possible to the same location where the force was applied. After the tension load has been applied, ensure that the upper torso belt lies flat on the test dummy's shoulder.

S10.5.2 Automatic safety belts. Ensure that the upper torso belt lies flat on the test dummy's shoulder after the automatic belt has been placed on the test dummy.

S10.5.3 Belts with tension-relieving devices. If the automatic or dynamically-tested manual safety belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer for normal use in the owner's manual for the vehicle.

S10.6 Placement of test dummy arms and hands. With the test dummy positioned as specified by S10.4 and without inducing torso movement, place the arms, elbows, and hands of the test dummy, as appropriate for each designated seating position in accordance with S10.6.1 or S10.6.2. Following placement of the arms, elbows and hands, remove the force applied against the lower half of the torso.

S10.6.1 Driver's position. Move the upper and the lower arms of the test dummy at the driver's position to their fully out-stretched position in the lowest possible orientation. Push each arm rearward permitting bending at the elbow, until the palm of each hand contacts the outer part of the rim of the steering wheel at its horizontal centerline. Place the test dummy's thumbs over the steering wheel rim and position the upper and lower arm centerlines as close as possible in a vertical plane without inducing torso movement. The thumbs shall be over the steering wheel rim and are lightly taped to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 2 pounds and not more than 5 pounds, the tape shall release the hand from the steering wheel rim.

NOTE.—*Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.*

S10.6.2 Passenger position. Move the upper and lower arms of the test dummy at the passenger position to the fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the upper arm contacts the seat back and is tangent to the upper part of the side of the torso, the palm contacts the outside of the thigh, and the little finger is barely in contact with the seat cushion.

S10.7 Repositioning of feet and legs. After the test dummy has been settled in accordance with S10.4, the safety belt system has been positioned, if necessary, in accordance with S10.5, and the arms and hands of the test dummy have been positioned in accordance with S10.6, reposition the feet and legs of the test dummy, if necessary, so that the feet and legs meet the applicable requirements of S10.1 or S10.2

S10.8 Test dummy positioning for latchplate access. The reach envelopes specified in S7.4.4. are obtained by positioning a test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

S10.9 Test dummy positioning for belt contact force.

S10.9.1 Vehicle manufactured before September 1, 1987. To determine compliance with S7.4.3 of this standard, a manufacturer may use, at its option, either the test procedure of S10.9.1 or the test procedure of S10.9.2. Position the test dummy in the vehicle in accordance with the appropriate requirements specified in S10.1 or S10.2 and under the conditions of S8.1.2 and S8.1.3. Fasten the latch and pull the belt webbing three inches from the test dummy's chest and release until the webbing is within one inch of the test dummy's chest and measure the belt contact force.

S10.9.2 Vehicle manufactured on or after September 1, 1987. To determine compliance with S7.4.3. of this standard, position the test dummy in the vehicle in accordance with the appropriate requirements specified in S10.1 or S10.2 and under the conditions of S8.1.2 and S8.1.3. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Fasten the latch and pull the belt webbing three inches from she test dummy's chest and release until the webbing is within one inch of the test dummy's chest and measure the belt contact force.

S11 Positioning procedure for the Part 572 Subpart E Test Dummy.

Position a test dummy, conforming to Subpart E of Part 572 of this Chapter, in each front outboard seating position of a vehicle as specified in S11.1 through S11.6. Each test dummy is restrained in accordance with the applicable requirements of S4.1.2.1, 4.1.2.2 or S4.6.

S11.1 Head. [The transverse instrumentation platform of the head shall be horizontal within ½ degree. To level the head of the test dummy, the following sequences must be followed. First adjust the position of the H point within the limits set forth in S11.4.3.1 to level the transverse instrumentation platform of the head of the test dummy. If the transverse instrumentation platform of the head is still not level, then adjust the pelvic angle of the test dummy within the limits specified in S11.4.3.2 of the standard. If the transverse instrumentation platform of the head is still not level, then adjust the neck bracket of the test dummy the minimum amount necessary from the non-adjusted "0" setting to ensure that the transverse instrumentation platform of the head is horizontal within ½ degree. The test dummy shall remain within the limits specified in S11.4.3.1 and S11.4.3.2 after any adjustment of the neck bracket. **(54 F.R. 23986—June 5, 1989. Effective: December 4, 1989.)]**

S11.2 Arms.

S11.2.1 The driver's upper arms shall be adjacent to the torso with the centerlines as close to a vertical plane as possible.

S11.2.2 The passenger's upper arms shall be in contact with the seat back and the sides of torso.

S11.3 Hands.

S11.3.1 The palms of the driver test dummy shall be in contact with the outer part of the steering wheel rim at the rim's horizontal centerline. The thumbs shall be over the steering wheel rim and shall be lightly taped to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 2 pounds and not more than 5 pounds, the tape shall release the hand from the steering wheel rim.

NOTE.—*Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamo testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.*

S11.3.2 The palms of the passenger test dummy shall be in contact with outside of thigh. The little finger shall be in contact with the seat cushion.

S11.4 Torso.

S11.4.1 In vehicles equipped with bench seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver dummy shall be vertical and parallel to the vehicle's longitudinal centerline, and pass through the center of the steering wheel rim. The midsagittal plane of the passenger dummy shall be vertical and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the driver dummy.

S11.4.2 In vehicles equipped with bucket seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver and the passenger dummy shall be vertical and shall coincide with the longitudinal centerline of the bucket seat.

S11.4.3 Lower torso.

S11.4.3.1 H-point. The H-point of the driver and passenger test dummies shall coincide within ½ inch in the vertical dimension and ½ inch in the horizontal dimension of a point ¼ inch below the position of the H-point determined by using the equipment and procedures specified in SAE J826 (Apr 80) except that the length of the lower leg and thigh segments of the H-point machine shall be adjusted to 16.3 and 15.8 inches, respectively, instead of the 50th percentile values specified in Table 1 of SAE J826.

S11.4.3.2 Pelvic angle. As determined using the pelvic angle gage (GM drawing 78051–532 incorporated by reference in Part 572, Subpart E of this chapter) which is inserted into the H-point gaging hole of the dummy, the angle measured from the horizontal on the 3 inch flat surface of the gage shall be 22½ degrees plus or minus 2½ degrees.

S11.5 Legs. The upper legs of the driver and passenger test dummies shall rest against the seat cushion to the extent permitted by placement of the feet. The initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches. To the extent practicable, the left leg of the driver dummy and both legs of the passenger dummy shall be in vertical longitudinal planes. Final adjustment to accommodate placement of feet in accordance with S11.6 for various passenger compartment configurations is permitted.

S11.5.1 The legs of the driver and passenger test dummy shall be placed as provided in S11.5.2 or, at the option of the vehicle manufacturer until September 1, 1991, as provided in S10.1.1 for driver and S10.1.2 for the passenger, except that the initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches for both the driver and the passenger rather than 14½ inches as specified in S10.1.1(a) for the driver and 11¾ inches as specified in S10.1.2.1(a) and S10.1.2.2(a) for the passenger.

S11.5.2 The upper legs of the driver and passenger test dummies shall rest against the seat cushion to the extent permitted by placement of the feet. The initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches. To the extent practicable, the left leg of the driver dummy and both legs of the passenger dummy shall be in vertical longitudinal planes. To the extent practicable, the right leg of the driver dummy shall be in a vertical plane. Final adjustment to accommodate placement of feet in accordance with S11.6 for various passenger compartment configurations is permitted.

NOTE.—*Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.*

S11.6 Feet. [The feet of the driver test dummy shall be positioned in accordance with S10.1.1 (b) and (c) of this standard. The feet of the passenger test dummy shall be positioned in accordance with S10.1.2.1 (b) and (c) of this standard, as appropriate. **(54 F.R. 23986—June 5, 1989. Effective: December 4, 1989.]**

S11.6.1 Removed. (56 F.R. 8232—February 28, 1991)

S11.6.2 Removed. (56 F.R. 8232—February 28, 1991)

S11.6.3 Removed. (56 F.R. 8232—February 28, 1991)

S11.7 Test dummy positioning for latchplate access. The reach envelopes specified in S7.4.4 are obtained by positioning a test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

S11.8 Test dummy positioning for belt contact force. To determine compliance with S7.4.3 of this standard, position the test dummy in the vehicle in accordance with the requirements specified in S11.1 through S11.6 and under the conditions of S8.1.2 and S8.1.3. Pull the belt webbing three inches from the test dummy's chest and release until the webbing is within 1 inch of the test dummy's chest and measure the belt contact force.

S11.9 Manual belt adjustment for dynamic testing. With the test dummy at its designated seating position as specified by the appropriate requirements of S8.1.2, S8.1.3 and S11.1 through S11.6, place the Type 2 manual belt around the test dummy and fasten the latch. Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 2 to 4 pound tension load to the lap belt. If the belt system is equipped with a tension-relieving device introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer for normal use in the owner's manual for the vehicle. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor.

[S12 Removed. (54 F.R. 23986—June 5, 1989.)] Interpretation

The concept of an occupant protection system which requires "no action by vehicle occupants," as that term is used in Standard No. 208, is intended to designate a system which will perform its protective restraining function after a normal process of ingress or egress without separate deliberate actions by the vehicle occupant to deploy the restraint system. Thus, the agency considers an occupant protection system to be automatic if an occupant has to take no action to deploy the system but would normally slightly push the seat belt webbing aside when entering or exiting the vehicle or would normally make a slight adjustment in the webbing for comfort.

36 F.R. 4600
March 10, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

Motor Vehicle Safety Standard No. 209 (32 F.R. 2415, as amended 32 F.R. 3310), specifies requirements for seat belt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks and buses, incorporating by reference the requirements of Department of Commerce, National Bureau of Standards, *Standards for Seat Belts for Use in Motor Vehicles* (15 C.F.R. Part 9; 31 F.R. 11528).

The Administrator of the Federal Highway Administration has determined in the interests of clarity and ease of reference that the requirements specified by 15 C.F.R. Part 9 should be incorporated into Standard No. 209 where it is presently incorporated only by reference. Therefore Standard No. 209 is hereby amended by deleting present paragraph S3 and adding new paragraphs S3, S4, and S5, so as to incorporate the requirements of 15 C.F.R. Part 9. Accordingly 15 C.F.R. Part 9 is hereby deleted.

Since this amendment imposes no additional burden on any person and involves no substantive change in the requirements of Standard No. 209, notice and public procedure hereon are unnecessary and good cause is shown that an effective date earlier than 180 days after issuance is in the public interest and the amendment may be made effective less than 30 days after publication in the *Federal Register*. The requirement of former Paragraph S3 of Standard No. 209 that seat belt assemblies shall use the attachment hardware specified in 15 C.F.R. § 9.3(f) "or approved equivalent hardware" has been incorporated into new Paragraph S4.1(f) of Standard No. 209.

This amendment is made under the authority of sections 103, 117(c) and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. secs. 1392, 1405(c), and 1407) and the delegation of authority contained in the Regulations of the Office of the Secretary (49 C.F.R. § 1(c)), and is effective upon publication in the *Federal Register*.

Issued in Washington, D.C., on December 24, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

34 F.R. 115
January 4, 1969

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses (Docket No. 69–23; Notice No. 2)

This notice amends Federal Motor Vehicle Safety Standard No. 209 in § 571.21 of Title 49 of the Code of Federal Regulations, to upgrade the requirements for seatbelt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks, and buses. As amended, the standard is both an equipment and a vehicle standard. The equipment aspect applies to a seatbelt assembly manufactured on or after the effective date. The vehicle aspect applies to an assembly installed in a vehicle manufactured on or after the effective date, regardless of when the assembly was manufactured.

During the period since the original issuance of Standard No. 209, laboratory tests and experience with actual seatbelt usage have disclosed areas where improvements in performance requirements are necessary. Consequently, a notice of proposed amendments to the standard was published on March 17, 1970 (35 F.R. 4641) to upgrade the performance requirements for seatbelt assemblies. Interested persons were given an opportunity to comment on the contents of the proposed rule. These comments, and other available data, have been carefully considered in the development of these amendments.

Paragraph S4.1(f) of the standard is amended to make it clear that a manufacturer may use bolts other than the specified bolts if the substituted bolts are equivalent.

The standard formerly required a Type 1 or Type 2 seatbelt assembly to be adjustable to fit an occupant with the weight and dimensions of a 95th-percentile adult male. To insure that belt assemblies can be adjusted to fit the range of occupants who may use them, paragraph S4.1(g) is amended to require each Type 1 or Type 2 seatbelt assembly to be adjustable to fit occupants whose weight and dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male. A belt assembly installed for an adjustable seat must conform to the requirements regardless of seat position. Several comments noted that no dimensions were specified in the notice for the various occupants which a belt assembly must fit. To remedy the problem, the standard provides a table of weights and dimensions for 5th-percentile adult females and 95th-percentile adult males.

In the notice, it was proposed to reduce the force required to release seat belt buckles from 30 to 22.5 pounds and to require that the release force for pushbutton-type buckles be applied no closer than 0.125 inch from the edge of the pushbutton access opening. In light of comments received, and other available information, the value of 30 pounds has been retained. The procedure for testing the buckle release force of a pushbutton-type buckle has been amended as proposed, however, to insure that the release force will not be applied so close to the edge of the access opening that the button might tilt in a manner unrepresentative of actual use conditions and thereby exaggerate the release force.

The buckle crush release requirements are amended to extend the standard's crush release requirements to all Type 1 and Type 2 seatbelt buckles, and to require application of the test load to areas of a buckle other than directly over the center of the release mechanism. Experience has indicated that non-pushbutton buckle release mechanisms are also subject to impairment when compressed, and occupants using such buckles are therefore provided equivalent protection by the extension of the buckle crush release requirements. In laboratory tests on pushbutton-type buckles, buckle release or malfunction occurred when a compressive force as low as 275 pounds was applied to a surface area other than the area directly over the pushbutton. The amended test will tend to eliminate buckle designs that are prone to accidental damage, or that release during the initial phase of the accident.

The notice proposed a new buckle latch test procedure in which a specified tensile load was to be applied at 30° to the buckle. In the light of comments received and other information that has become available indicating that the requirement was not justified, the procedure has not been adopted.

In response to comments that the acceleration levels proposed in the notice were too high, the acceleration level above which an emergency-locking retractor must lock has been reduced from 2g, as proposed, to 0.7g, and the acceleration level below which the retractor must not lock has been reduced from 1g to 0.3g. For reasons of occupant convenience, the notice proposed that the required upper limit on acceleration had to be met only when the webbing was extended to the length necessary to fit a 5th-percentile adult female. Upon review it has been determined that the proposed free travel distance could make a belt unsafe for use by a child, and, further, that an adequate measure of convenience is provided by the requirement that a belt not lock at accelerations of less than 0.3g. Accordingly, the standard does not limit the belt withdrawal range within which the acceleration levels must be met. For similar reasons, the retraction force requirements are required to be met regardless of the amount of belt withdrawal.

As stated in the notice, the hex-bar abrasion test does not adequately simulate the type of webbing abrasion caused by some buckles. The standard as amended retains the hex-bar test, but supplements it with an additional abrasion requirement, under which webbing is required to retain at least 75 percent of its breaking strength after being repeatedly passed through the assembly buckle or manual adjustment device.

Effective date: September 1, 1971.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 209 in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . .

Issued on March 3, 1971.

Douglas W. Toms,
Acting Administrator.

36 F.R. 4607
March 10, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies for Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 209, in § 571.21 of Title 49, Code of Federal Regulations, to clarify the method in which the buckle release force of a Type 3 seat belt assembly is measured.

The standard provides (S4.3(d)(1), S5.2(d)(1)) that the force required to release a Type 3 assembly buckle is measured following the assembly test of S5.3, with a force of 45±5 pounds applied to a torso block restrained by the Type 3 assembly. The test procedure was intended to represent the situation in which the vehicle is inverted and the child is held by the harness. The force applied along the line of the belt is of primary significance, but it appears that the release force of some buckles is significantly increased by the pressure of the torso block on the back of the buckle. This pressure is not regarded as representative of actual conditions, in that the hard surface of the torso block offers much more resistance than would a child's body. To eliminate the effects of such pressure by the torso block, section S5.3(c)(1) of the standard is amended to read as set forth below.

Since this amendment is interpretative and clarifying in intent and imposes no additional burden on any person, notice and public procedure thereon are unnecessary.

Effective date: April 1, 1971.

The major usage of Type 3 seat belt assembly buckles will be on child seating systems that comply with Standard No. 213, effective April 1, 1971. So that the amendment to Standard No. 209 will have maximum effect, good cause is found for establishing an effective date sooner than 180 days after issuance. Since the amendment is interpretative in nature and relieves a restriction, there is also good cause for establishing an effective date sooner than 30 days after issuance.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 209, in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . .

Issued on March 23, 1971.

Douglas W. Toms,
Acting Administrator.

36 F.R. 5973
March 27, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69–23; Notice No. 3)

Reconsideration and Amendment

The purpose of this notice is to respond to petitions filed pursuant to § 553.35 of Title 49, Code of Federal Regulations, requesting reconsideration of various amendments to Motor Vehicle Safety Standard No. 209, Seat Belt Assemblies, that were published March 10, 1971 (36 F.R. 4607). The petitions are granted in part and denied in part. Requests not expressly discussed in this notice should be considered denied.

1. One of the results of the March 10 amendments was that as of September 1, 1971, the standard would have become a vehicle standard as well as an equipment standard, *i.e.*, vehicles manufactured after the effective date would have had to have equipment conforming to the new requirements. The amendments relating to emergency-locking retractors are such, however, that with normal production tolerances it would be difficult to manufacture retractors that conform to the currently applicable requirements so that they would also conform to the post-September 1 requirements, and *vice-versa*. This creates an awkward situation, in which retractors supplied to vehicle manufacturers for use on September 1 would have to be made on September 1 and not before.

The vehicle aspect of the standard is therefore being deleted, and the date on which the amended requirements become mandatory is postponed to January 1, 1972, to coincide with the effective date of the new Standard No. 208. To allow for efficient changeover, manufacturers are permitted to manufacture belts to either the current or the amended requirements between September 1, 1971, and January 1, 1972.

2. With respect to the technical amendments to the attachment hardware requirements in S4.1(f), American Safety Equipment Corporation requested that the reference to Standard No. 210 be omitted, so that anchorage nuts, plates, and washers would not have to be supplied if the vehicle has an anchorage that does not require them. The request has been found reasonable, and the standard is amended accordingly.

3. The National Highway Traffic Safety Administration has also evaluated requests by the American Safety Equipment Corporation concerning the range of occupants that a belt must adjust to fit, the test buckle release force test procedure, and the buckle crush resistance test procedure. The amended adjustment requirements (S4.1(g)(1) and (2)) specify more exactly the range of occupants that was intended by the original standard. The importance of having installed belts of proper length for the normal range of occupants outweighs, in the agency's judgment, the effort involved in ascertaining vehicle dimensions. The adjustment requirements are therefore not changed. With respect to the buckle test procedures, the petitioner's requests relating to the clarity of the buckle release procedure and to the need for an explanatory diagram to accompany the crush test are also denied. Although the buckle release test no longer refers to a method for testing lever action buckles, the method was little more than a suggestion and may in some cases have conflicted with the intent of the procedure that the force shall be applied so as to produce maximum releasing effect. The diagram requested to show the buckle crush procedure is not regarded as essential to understanding the procedure and has not been adopted.

4. Although no petition was received directly relating to the subject, the Swedish Trade Commission, on behalf of the Swedish manufactur-

ers, has expressed uncertainty as to how the crush test is to be applied to seat belt assemblies that have a buckle mounted on a rigid or semi-rigid bracket between the front seats. As described by the Commission, one design would tend to bend downwards under the pressure of the test device long before the required force of 400 pounds could be reached. In this case, the buckle will have to be supported from beneath, just as the conventional lap belt has to have some rigid backing in order to reach the 400-pound level. It is anticipated that if additional questions are raised concerning the method of force application to specific buckles, such questions can be answered through administrative interpretation.

5. Several petitions questioned the need to test a vehicle-sensitive emergency-locking retractor by accelerating it "in three directions normal to each other with its central axis oriented horizontally". The pendulum device used in most vehicle-sensitive retractors can sense lateral accelerations and sense the tilt of the vehicle, but it cannot readily sense upward or downward accelerations of the type required by the three-direction test when the retractor is oriented horizontally. It was suggested by Volvo that a retractor that locks when tilted to 35° in any direction should be exempt from the acceleration requirement. Volkswagen recommended accelerating the retractor in the horizontal plane in two directions normal to each other. On reconsideration, the National Highway Traffic Safety Administration has concluded that it is appropriate to relieve such a retractor from the vertical acceleration requirement when it is oriented horizontally and to establish an alternative to the requirement that it lock when accelerated in directions out of the horizontal plane, but that accelerations within the horizontal plane should continue to be required.

Accordingly, S5.2(j) is amended to require a vehicle-sensitive retractor to be accelerated in the horizontal plane in two directions normal to each other. During these accelerations, the retractor will be oriented at the angle in which it is installed in the vehicle. In addition, the retractor must either lock when accelerated in orientations out of the horizontal as prescribed in the March 10 rule or lock by gravity when tilted in any direction to any angle greater than 45°.

6. One petitioner questioned the correctness of requiring webbing-sensitive retractors to be accelerated in the direction of webbing retraction, rather than in the direction of webbing withdrawal. The usage is necessary because under the test procedures of S5.2(j) it is the *retractor*, and not the webbing, that is accelerated. The acceleration must be in the direction that will reel the webbing out of the retractor—*i.e.*, the direction in which the webbing moves when retracting.

7. An additional question on retractor acceleration levels concerns the distance which a belt must be withdrawn in determining compliance with the requirement that the retractor shall not lock at 0.3g or less (S4.3(j)(ii)). The Hamill Manufacturing Company has requested an amendment to S4.3(j)(ii) to provide that the retractor shall not lock before the webbing extends a short distance at an acceleration of 0.3g. The National Highway Traffic Safety Administration recognizes that many retractors may be velocity-sensitive to some degree as well as acceleration-sensitive. Although a retractor that locks at too low a velocity would be an inconvenience, the NHTSA recognizes that an occupant does not ordinarily accelerate the belt after an initial pull and that the usual velocity involved in withdrawing the belt is low. On reconsideration, the NHTSA has therefore decided to amend S4.3(j)(ii) to provide that the retractor shall not lock before the webbing extends 2 inches at 0.3g.

8. Several petitioners pointed out that the requirements for retractor force specified in S4.3(j)(iii) and (iv) were not appropriate for systems in which a single length of webbing is used to provide both lap and shoulder restraint. In a typical installation of this sort, the webbing passes from a floor-mounted retractor up to a fitting on the B-pillar, then down across the shoulder to a slip joint on the buckle connector, and from there back across the lap to an outboard floor attachment. Although such a system may provide satisfactory restraint, it cannot simultaneously exceed a retractive force of 1.5 pounds on the lap belt and have a retractive

force on the shoulder belt of between 0.45 and 1.1 pounds, and it would therefore fail to conform to the standard as published March 10.

Upon reconsideration, the National Highway Traffic Safety Administration has decided to amend S4.3(j) by establishing retraction forces for 3-point systems that employ a single length of webbing. A new subsection (v) is added that requires such a system to have a retraction force falling within the range 0.45 pounds-1.50 pounds, and (iii) and (iv) are amended so that they do not apply to retractors in such systems. This range was suggested by Volkswagen, Volvo, and Klippan, and is considered to be a reasonable compromise between the need to provide complete retraction of the belt when not in use and the need to limit the force so that it will not be uncomfortable to occupants.

Effective date: January 1, 1972, except that seat belt assemblies manufactured on or after September 1, 1971 and before January 1, 1972, may conform either to the current requirements of Standard No. 209 in 49 CFR 571.21 or to the requirements of Standard No. 209 as amended by this notice and the notice of March 10, 1971 (36 F.R. 4607).

Issued on August 26, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 17430
August 31, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies

(Docket No. 73-16; Notice 2)

The purpose of this notice is to amend certain requirements of Motor Vehicle Safety Standard No. 209 (49 CFR 571.209), *Seat belt assemblies*, relating to the width of belt webbing and to the performance of seat belt retractors. The amendments were proposed in a notice published June 20, 1973 (38 FR 16084).

In the June 20 notice, the agency proposed to allow the width of those portions of a combination lap and shoulder belt that do not touch the occupant to be less than the 1.8 inches formerly required by the standard. The Chrysler Corporation, in its comment, suggested that narrower webbing should also be permitted for the type of lap belt that is used by itself. The agency agrees that a lap belt in combination with a shoulder belt (known as Type 2 assembly) is indistinguishable from an independent lap belt (Type 1 assembly), as far as the width of its webbing is concerned, and is therefore amending the standard to permit narrower webbing for non-contact portions of Type 1 belts as well as Type 2 belts.

Chrysler also requested narrower webbing for non-contact portions of children's harnesses (Type 3 assemblies). In view of the close-fitting design of Type 3 assemblies, the agency has not found a benefit to be gained from the use of narrower webbing in the few areas of non-contact. The Type 3 requirements are not being amended at this time. The American Safety Equipment Corporation requested that the contactability of the webbing with occupants be determined with a range of occupants. The agency remains persuaded that the use of a 95th percentile adult male occupant will be sufficient to insure that the narrower webbing will not touch any occupant who uses the seat. The agency therefore declines to adopt American Safety's suggestion.

The proposed amendment of the emergency-locking retractor requirements of S4.3 drew several comments, not all of them relating to the parts of S4.3 that were proposed to be changed. Mercedes Benz requested revision of the requirement of S4.3(j)(2) that the retractor must not lock before the webbing extends 2 inches under an acceleration of 0.3g or less. The 0.3g requirement had been carried over without change from the previous version of S4.3 and was thought to be a reasonable means of preventing retractors from being inconveniently sensitive. The NHTSA does not find sufficient cause at this time to alter its conclusion concerning the most appropriate minimum level and is therefore retaining the minimum level of 0.3g.

A second issue raised by Mercedes Benz concerns the treatment under section S4.3(j) of a retractor having both vehicle sensitive and webbing sensitive features. It has been the NHTSA's position that with respect to the maximum permissible locking level, a dual-action retractor would conform if it met either of the applicable requirements. Thus, a dual-action retractor whose webbing-sensitive mechanism locks within 1 inch at an acceleration of 0.7g will conform, even though its vehicle-sensitive mechanism is not capable of locking at its required level. With respect to the minimum locking level, however, different considerations apply. The agency's intent in providing a minimum level below which the retractor must not lock is to enhance the convenience of the system. The webbing-sensitive mechanism that locks below 0.3g would be no less inconvenient if coupled with a vehicle sensitive mechanism than it would be if used by itself. The agency has therefore concluded that a dual-action retractor may conform to the maximum locking acceleration level of 0.7g (S4.3(j)(1)) with either mechanism, but that it must conform to both minimum locking level requirements (S4.3(j)(2) and (3)).

The tilt angle of 17° proposed as the minimum locking level for vehicle sensitive retractors was stated by several comments to be too high. Although there was general agreement as to the advisability of using a tilt test rather than an acceleration test, lower tilt angles were suggested, ranging downward to 11°. After considering the comments, the NHTSA has concluded that a moderate downward revision to 15° will prevent retractor lockup in normal road operation and has adopted that angle in S4.3(j)(3). The suggestion by Ford and American Motors that the "retractor drum's central axis" may be difficult to determine in complicated mechanisms has been found to have merit and the requirement as adopted refers to the orientation at which the retractor is installed in the vehicle.

The proposed revisions to the minimum retraction force requirements for retractors attached to upper torso restraints encountered several objections, the principal one being that no one was certain about the meaning of the proposed requirement that the retractor should "retract the webbing fully." The quoted language had been proposed in response to a petition by General Motors requesting amendment of the requirement that the retractor exert a retractive force of not less than 0.45 pound. The GM petition had requested a force of 0.2 pound, but the agency's initial intent, as reflected in the notice, was to grant a potentially greater relief by deleting reference to a specific minimum force. It appears from the confusion in the comments that a contrary result might be produced in some cases, and the agency has therefore concluded that a simple reduction in the force level to the level requested by GM is the least complicated and most readily enforceable means of lowering the minimum force level. The suggestion by Ford, that the ability to retract is implicit in the definition of retractor and that no minimum force level is required, has some merit, but the agency prefers to retain a measurable minimum level.

There were several questions of interpretation concerning the point at which the retraction force is to be measured. The test procedures of S5.2 provide that the webbing is to be fully extended, passing over any hardware or other material specified for use with the webbing, and that it is then to be retracted and the retraction force measured as the lowest force within plus or minus 2 inches of 75 percent extension. The procedure is intended to measure the ability of the retractor to retract the webbing as installed in the vehicle, and the point of measurement most consistent with this intent is the most distant point of the webbing from the retractor. The NHTSA intends to conduct its measurements in this fashion.

The proposed amendment to S5.2 that would amend the test procedures to reflect the limitation of the 0.3g acceleration level to webbing-sensitive retractors was not objected to and is adopted as proposed.

In consideration of the foregoing, S4.2(a), S4.3(j), and S5.2(j) of Motor Vehicle Safety Standard No. 209, 49 CFR § 571.209, are amended. . . .

Effective date: August 28, 1973. The NHTSA finds it desirable to allow manufacturers to produce seat belt assemblies under the requirements as hereby amended (which generally are relaxed relative to previous requirements) prior to the effective date of the next phase of Standard No. 208 (49 CFR 571.208). It is therefore found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 23, 1973.

James B. Gregory
Administrator

38 F.R. 22958
August 28, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies

(Docket No. 73–16; Notice 4)

This notice amends Standard No. 209, *Seat belt assemblies*, 49 CFR 571.209, to reduce the minimum retraction force required of emergency-locking retractors attached to lap belts from 1.5 pounds to 0.6 pounds. This amendment to S4.3 (j)(4) responds to a rulemaking petition submitted by Toyo Kogyo.

A notice of proposed rulemaking published October 2, 1973 (38 F.R. 27303), proposed the modification because the 1.5-pound force could prove excessive for occupant comfort, and experience with the 0.6-pound level in automatic-locking retractors has been satisfactory. Their performance at 0.6 pounds does not support an assertion in one comment to the docket that degradation of the retractor elements over time would result in almost total loss of retractive force. All other comments to the docket were favorable.

In consideration of the foregoing, S4.3(j)(4) of Motor Vehicle Safety Standard No. 209, *Seat belt assemblies*, 49 CFR 571.209, is amended....

Effective date: January 24, 1974. Because the amendment relaxes a requirement and creates no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 18, 1974.

James B. Gregory
Administrator

39 F.R. 2771
January 24, 1974

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies

(Docket No. 74-9; Notice 7)

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: This notice responds to five petitions for reconsideration and petitions for rulemaking concerning Standard No. 213, *Child Restraint Systems*. In response to the petitions, the agency is changing the labeling requirements to permit the use of alternative language, modifying the minimum radius of curvature requirement for restraint system surfaces and extending the effective date of the standard from June 1, 1980, to January 1, 1981. In addition, several typographical errors are corrected in Standard No. 209, *Seat Belt Assemblies*.

DATES: The amendments are effective on May 1, 1980. The effective date of the standard is changed from June 1, 1980, to January 1, 1981.

FOR FURTHER INFORMATION CONTACT: Mr. Vladislav Radovich, Office of Vehicle Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264).

SUPPLEMENTARY INFORMATION: On December 13, 1979 (44 F.R. 72131) NHTSA published in the *Federal Register* a final rule establishing Standard No. 213, *Child Restraint Systems*, and making certain amendments to Standard No. 209, *Seat Belt Assemblies and Anchorages*. Subsequently, petitions for reconsideration were timely filed with the agency by Cosco, General Motors, Juvenile Products Manufacturers Association (JPMA), and Strolee. Subsequent to the time for filing petitions for reconsideration, Strolee also filed a petition for rulemaking to amend the standard. After evaluating the petitions, the agency has decided to modify, as fully explained below, some of the requirements of Standard No. 213. All other requests for modifications are denied. The agency is also correcting several minor typographical errors in the text of Standard No. 209.

Labeling

Standard No. 213 requires manufacturers to place a permanently mounted label on the restraint to encourage its proper use. General Motors (GM) petitioned for reconsideration of three of the labeling requirements.

Section S5.5.2(f) of the standard requires each child restraint to be labeled with the size and weight ranges of children capable of using the restraint. In its petition, GM said that the requirement could "unnecessarily preclude some children from using the restraint or suggest use by children too large for the restraint." GM also commented that some infant restraints are intended to be used from birth and thus the lower size and weight limitation serves no purpose.

In addition, GM said that stating the upper size limit for infant restraints in terms of seated height rather than in standing height is a more appropriate way to set size limitations for infants. For example, GM said that an infant with a short torso and long legs might be precluded from using the restraint if the limitation is stated in terms of standing height, while an infant with short legs and a torso too long for the restraint would be inappropriately included among ones who could supposedly use the restraint. GM requested that infant restraints be allowed to be labeled with an optional statement limiting use by upper weight and seated height.

NHTSA agrees that specifying a lower weight and size limit is unnecessary for an infant carrier designed to be used from birth and has amended the standard accordingly. The agency has decided not to adopt GM's proposal to state the upper size limit in seating rather than standing height. The purpose of the label is to provide important instructions and warnings in as simple and understandable terms as possible. Standing height, rather than seating height, is a measurement parents are familiar with and which is commonly measured during pediatric examinations. As GM pointed out, it is possible to establish a limit based on standing height which would exclude any infant whose seating height is too high to properly use the restraint. Therefore, the agency will continue to require the upper size limit to be stated in terms of standing height.

GM also requested that manufacturers be allowed to establish a lower usage limit for restraints used for older children based on the child's ability to sit upright rather than on his or her size and weight. GM said the lower limit "is not as dependent upon the child's size as it is on the child's ability to hold its head up (sit upright) by itself. This important capability is achieved at a wide range of child sizes." NHTSA agrees that the type of label GM proposes can clearly inform parents on which children can safely use a restraint and therefore will permit use of such a label.

Section S5.5.2(g) of the standard requires the use of the word "Warning" preceding the statement that failure to follow the manufacturer's instructions can lead to injury to a child. GM requested that the word "Caution" be permitted as an alternative to "Warning." GM said that since 1975 it has used caution in its labels and owners' and service manuals as a lead or signal word where the message conveys instructions to prevent possible personal injury. GM said that the words caution and warning are generally accepted as synonymous.

The agency believes that the word "Warning," when used in its ordinary dictionary sense, is a stronger term that conveys a greater sense of danger than the word "Caution" and thus will emphasize the importance of following the specified instructions. Therefore, the agency will continue to require the use of the word "Warning."

Section S5.5.2(k) of the standard requires restraints to be labeled that they are to be used in a rear-facing position when used with an infant. GM said that while the requirement is appropriate for so-called convertible child restraints (restraints that can be used by infants in a rear-facing position and by children in a forward-facing position), it is potentially misleading when used with a restraint designed exclusively for infants. GM said the current label might imply that the restraints can be used in forward-facing positions with children. GM recommended that restraints designed only for infants be permitted to have the statement, "Place this infant restraint in a rear-facing position when using it in the vehicle." The agency's purpose for establishing the labeling requirement was to preclude the apparent widespread misuse of restraints designed for infants in a forward-facing rather than rear-facing position. Since GM's recommended label will accomplish that goal, the agency is amending the standard to permit its use.

Radius of Curvature

Section S5.2.2.1(c) of the standard requires surfaces designed to restrain the forward movement of a child's torso to be flat or convex with a radius of curvature of the underlying structure of not less than 3 inches. Ford Motor Co. objected to the 3-inch limitation on radius of curvature arguing that measuring the radius of curvature of the underlying structure would eliminate designs that have not produced serious injuries in actual crashes. Ford said the shield of its Tot-Guard has a radius of curvature from 2.2 to 2.3 inches and it had no evidence of serious injury being caused by the shield when the restraint has been properly used.

The purpose of the radius of curvature requirement was to prohibit the use of surfaces that might concentrate impact forces on vulnerable portions of a child's body. It was not the agency's intent to prohibit existing designs, such as the Tot-Guard, which have not produced injuries in actual crashes. Since a 2-inch radius of curvature should therefore not produce injury the agency has decided to change the radius of curvature requirement from 3 to 2 inches.

Although the standard sets a minimum radius of curvature for surfaces designed to restrain the forward movement of a child, it does not set a minimum surface area for that surface. Prototypes of new restraints shown to the agency by some manufacturers indicate that they are voluntarily incorporating sufficient surface areas in their designs. The agency encourages all manufacturers to use surface areas at least equivalent to those of the designs used by today's better restraints.

Occupant Excursion

Section S5.1.3.1 of the standard sets a limit on the amount of knee excursion experienced by the test dummy during the simulated crash tests. It specifies that "at the time of maximum knee forward excursion the forward rotation of the dummy's torso from the dummy's initial seating configuration shall be at least 15° measured in the saggital plane along the line connecting the shoulder and hip pivot points."

Ford Motor Co. objected to the requirements that the dummy's torso rotate at least 15 degrees. Ford said that it is impossible to measure the 15 degree angle on restraints such as the Tot-Guard since the test dummy "folds around the shield in such a manner that there is no 'line' from the shoulder to the hip point." In addition, restraints, such as the Tot-Guard, that enclose the lower torso of the child can conceal the test dummy hip pivot point.

The agency established Ted the knee excursion and torso rotation requirements to prevent manufacturers from controlling the amount of test dummy head excursion by allowing the test dummy to submarine excessively during a crash (i.e., allowing the test dummy to slide too far downward underneath the lap belt and forward, legs first). A review of the agency's testing of child restraints shows that current designs that comply with the knee excursion limit do not allow submarining. Since the knee excursion limit apparently will provide sufficient protection to prevent submarining, the agency has decided to drop the torso rotation requirement. If future testing discloses any problems with submarining, the agency will act to establish a new torso rotation requirement as an additional safeguard.

Head Impact Protection

Section S5.2.3 requires that each child restraint designed for use by children under 20 pounds have energy-absorbing material covering "each system surface which is contactable by the dummy head." Strolee petitioned the agency to amend this requirement because it would prohibit the use of unpadded grommets in the child restraint. Strolee explained that some "manufacturers use grommets to support the fabric portions of a car seat where the shoulder belt and lap belt penetrate the upholstery. These grommets retain the fabric in place and give needed support where the strap comes through to the front of the unit." Because of the use of the grommets in positioning the energy-absorbing padding and belts, the agency does not want to prohibit their use. However, to ensure that use of the grommets will not compromise the head impact protection for the child, the agency will only allow grommets or other structures that comply with the protrusion limitations specified in section S5.2.4. That section prohibits protrusions that are more than ⅜ of an inch high and have a radius of less than ¼ inch. Because this amendment makes a minor change in the standard to relieve a restriction, prior notice and a comment period are deemed unnecessary.

Belt Requirements

Strolee petitioned the agency to amend the requirement that all of the belts used in the child restraint system must be 1½ inches in width. Strolee said that straps used in some restraints to position the upper torso restraints have " 'snaps' so that the parent may release this positioning belt conveniently." Strolee argued that such straps should be exempt from the belt width requirement since "the snap would release far before any loads could be experienced."

The agency still believes that any belt that comes into contact with the child should be of a minimum width so as not to concentrate forces on a limited area of the child. This requirement would reduce the possibility of injury in instances where the snap on a positioning strap failed to open. Strolee's petition is therefore denied.

Strolee has also raised a question about the interpretation of section S5.4.3.3 on belt systems. Strolee asked whether the section requires a manufacturer to provide both upper torso belts, a lap belt and a crotch strap or whether a manufacturer can use a "hybrid" system which uses upper torso belts, a shield, in place of a lap belt, and a crotch strap. The agency's intent was to allow the use of hybrid systems. The agency established the minimum radius of curvature requirements of section S5.2.2.1(c) to ensure that any shield used in place of a lap or other belt would not concentrate forces on a limited area of the child's body. NHTSA has amended section S5.4.3.3 to clarify the agency's intent. Because this is an interpretative amendment, which imposes no new restrictions, prior notice and a comment period are deemed unnecessary.

Height Requirements

Strolee asked the agency to reconsider the requirements for seat back surface heights set in section S5.2.1.1. Strolee argued that the higher seat back required by the standard would restrict the driver's rear vision when the child restraint is placed in the rear seat.

The final rule established a new seat back height requirement for restraints recommended for use by children that weigh more than 40 pounds. To provide sufficient protection for those children's heads, the agency required the seat back height to be 22 inches. The agency explained that the 22-inch requirement was based on anthropometric data showing that the seating height of children weighing 40 or more pounds can exceed 23 inches. The agency still believes that 22-inch requirement is necessary for the protection of the largest child for which the restraint is recommended. NHTSA notes that child restraints can be designed to accommodate the higher seat backs without allowing the overall height of the child restraint to unduly hinder the driver's vision.

Padding

In its petition, JPMA claimed that the standard "calls for the application of outdated specifications" for determining the performance of child restraint padding in a 25-percent compression-deflection test. A review of the most recent edition of the American Society for Testing and Materials (ASTM) handbook shows that the compression-deflection test in two of the three ASTM standards referenced by the agency has not changed. The third standard (ASTM D1565) referenced by the agency has been replaced. However, the replacement standard does not contain a 25 percent compression-deflection test. Therefore, the agency will continue to use the three ASTM standards referenced in the December 1979 final rule.

Effective Date

Cosco, Strolee, and the Juvenile Products Manufacturers Association (JPMA) petitioned the agency for an extension of the June 1, 1980, effective date. They requested that the effective date be changed to at least January 1, 1981, and Strolee requested a delay until March 1, 1981. They argued that the June 1, 1980, effective date does not allow manufacturers sufficient time to develop, test and tool new child restraints.

Testing done for the agency has shown that many of the better child restraint systems currently on the market can meet the injury criteria and occupant excursion limitation set by the standard. Some of those seats would need changes in their labeling, removal of arm rests and new belt buckles and padding to meet the standard. Such relatively minor changes can be made in the time available before the June 1, 1980, effective date.

Several manufacturers have informed the agency that they are designing new restraints to meet the standard. Based on prototypes of those restraints shown to the agency, NHTSA believes that these new restraints may be more convenient to use, less susceptible to misuse and provide a higher overall level of protection than current restraints. Based on leadtime information provided by individual manufacturers and the JPMA, the agency concludes that extending the standard from June 1, 1980, to January 1, 1981, will provide sufficient leadtime. Providing a year's leadtime is in agreement with the leadtime estimates provided by the manufacturers as to the time necessary for design and testing, tooling and buckle redesign.

Compatibility With Vehicle Belts

On December 12, 1979, NHTSA held a public meeting on child transportation safety. At that meeting, several participants commented about the difficulty, and in some cases the impossibility, of securing some child restraint systems with a vehicle lap belt because the belt will not go around the restraint. Testing done by the agency during the development of the recently proposed comfort and convenience rulemaking also confirms that problem. The agency reminds child restraint manufacturers that Standard No. 213, *Child Restraint Systems,* requires all child restraints to be capable of being restrained by a vehicle lap belt.

Corrections

In the final rule published on Standard No. 209, *Seat Belt Assemblies,* there were a number of typographical errors, such as listing the lower chest circumference of the 5 percentile female as 36.6 inches rather than the correct figure of 26.6 inches. Those errors have been corrected.

In addition, the final rules for Standards No. 209 and No. 213 inadvertently did not include a requirement on belt resistance to buckle abrasion. The notice of proposed rulemaking for both standards included the belt buckle abrasion requirements, which were not opposed by any of the commenters. The standards have therefore been amended to include that requirement.

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Issued on April 23, 1980.

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Administrator
45 F.R. 29045
May 1, 1980