TABLE I—PLIES

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
6.00-13	1010	32	1080	36	1140	40
6.50-13	1150	32	1230	36	1300	40
7.00-13	1270	32	1360	36	1440	40
6.45-14	1120	32	1200	36	1270	40
6.95-14	1230	32	1310	36	1390	40
7.35-14	1360	32	1450	36	1540	40
7.75-14	1500	32	1600	36	1690	40
8.25-14	1620	32	1730	36	1830	40
8.55-14	1770	22	1890	36	2000	40
8.85-14	1860	32	1990	36	2100	40
5.60-15	970	32	1040	36	1105	40
5.90-15	1050	32	1130	36	1200	40
6.85-15	1230	32	1320	36	1390	40
7.35-15	1390	32	1480	36	1570	40
7.75-15	1490	32	1590	36	1690	40
8.85-15	1610	32	1720	36	1820	40
8.25-15	1620	32	1730	36	1830	40
8.45-15	1740	32	1860	36	1970	40
8.55-15	1770	32	1890	36	2000	40
8.85-15	1860	32	1980	36	2100	40
9.00-15	1900	32	2030	36	2150	40
9.15-15	1970	32	2100	36	2230	40
8.90-15	2210	32	2360	36	2500	40

TABLE I—PLIES—Continued

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
A70–13	1060	32	1130	36	1200	40
D70–13	1320	32	1410	36	1490	40
D70–14	1320	32	1410	36	1490	40
E70–14	1400	32	1490	36	1580	40
F70–14	1500	32	1610	36	1700	40
G70–14	1620	32	1730	36	1830	40
H70–14	1770	32	1890	36	2010	40
J70–14	1860	32	1980	36	2100	40
L70–14	1970	32	2100	36	2230	40
C70–15	1230	32	1320	36	1390	40
D70–15	1320	32	1410	36	1490	40
E70–15	1400	32	1490	36	1580	40
F70–15	1500	32	1610	36	1700	40
G70–15	1620	32	1730	36	1830	40
H70–15	1770	32	1890	36	2010	40
J70–15	1860	32	1980	36	2100	40
K70–15	1900	32	2030	36	2150	40
L70–15	1970	32	2100	36	2230	40

TABLE I—PLIES—Continued

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
165–13	1050	32	1130	36	1200	40
175–13	1150	32	1240	36	1350	40
185–13	1270	32	1390	36	1510	40
155R13	950	32	1015	36	1075	40
155R14	1010	32	1080	36	1140	40
155R15	1015	32	1085	36	1150	40
165R13	1010	32	1080	36	1140	40
165R14	1120	32	1200	36	1270	40
165R15	1130	32	1200	36	1270	40
175R14	1230	32	1310	36	1390	40
185R14	1360	32	1450	36	1540	40
185/70R13	1090	32	1140	36	1190	40
145–14*	865	32	905	36	935	40
145–15	895	32	940	36	975	40
195–15	1550	32	1680	36	1820	40
205–15	1700	32	1840	36	2000	40

* Dash Radial—Not an "R" Radial

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems for Passenger Cars and Multipurpose Passenger Vehicles

(Docket No. 69–11a)

In May 1968 the Director of the National Highway Safety Bureau issued a public advisory, stating that numerous cases of injury and death from accidental operation of power windows had been reported to the Bureau. He warned that many of those injuries and deaths had occurred because power windows could be closed when the ignition switch was off. In the advisory, the Director cautioned owners of vehicles with power-operated windows to have the wiring adjusted to prevent closure of the windows when the ignition switch is off.

It has been determined that the interests of motor vehicle safety require the imposition of a safety standard which will reduce, if not eliminate, the toll of deaths and injuries resulting from accidents involving power-operated windows.

A notice of proposed rule making relating to power-operated window systems in passenger cars and multipurpose passenger vehicles was published in the *Federal Register* on August 23, 1969 (34 F.R. 13608). Comments were requested concerning two objectives of the proposal: (1) To minimize the likelihood of personal injury or death occurring when a person is caught between a closing window and the frame, channel or seal, and (2) to insure that vehicle occupants can make emergency exits from vehicles equipped with power-operated windows in the event of a severe accident.

The comments received have been given careful consideration in the formulation of the safety standard issued today. To achieve the first major objective it was proposed that a power-operated window, once opened, not close when the ignition key of the vehicle is not in the "on" or "start" position. This proposal would have prohibited operation of windows when the key was in the "accessory" position, a position provided to avoid battery discharge and possible damage to the electrical system. The proposal would also have prohibited activation of power tailgate windows from the exterior of the vehicle. Several commenters objected that the proposal would in these respects prohibit widely accepted convenience features without corresponding safety benefits. These comments have been determined to have merit, and the standard as presently issued has been modified to require that a power-operated window system not be operative, except by muscular force or by operating an outside lock, when the key is removed from the ignition lock or is in an off position. This permits operation of windows with the key in the "accessory" position, as well as by a key-locking system on the exterior of the vehicle.

To achieve the second objective, it was proposed that a control be required that would open power-operated windows from inside the passenger compartment of the vehicle, regardless of the key position. Allowance of such a control, however, might tend to defeat the first major objective, and also make it easier for thieves to enter a locked vehicle. Further, an accident severe enough to jam a vehicle door very likely would be severe enough to jam the window in its channel or to interfere with the power source for emergency operation of the window. For these reasons this proposal has not been adopted in Standard No. 118. The standard does, however, permit installation of master control switches for overriding control of power-operated windows when the ignition key is in a position other than off.

Comments indicated an assumption that power-operated interior partitions were covered, as they were intended to be, though not specifically mentioned in the preamble of the proposal. To insure that there is no ambiguity on the point, Standard No. 118 includes partitions in the requirements.

The subject matter covered by this rulemaking action is being adopted at this time because it has been determined that it is feasible and that it can be implemented at an early date. The notice of proposed rule making upon which this rulemaking action is based was issued in conjunction with an advance notice of proposed rule making (34 F.R. 13609, Aug. 23, 1969) on power-operated window systems that dealt with the subject of mechanisms that would interrupt, stop, or reverse the direction of the window when a predetermined force is exerted on an object between the glazing and the frame, channel, or seal upon which it closes, and other fail-safe considerations. The advance notice involved engineering and economic problems of a substantial magnitude. Those problems and their solutions are undergoing further study and will be given consideration for rulemaking based on the results thereof.

In consideration of the foregoing, 49 CFR 571.21, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 118, Power-Operated Window Systems . . . .

Effective date: February 1, 1971.

Issued on July 17, 1970.

Douglas W. Toms,
Director,
National Highway Safety Bureau

35 F.R. 11797
July 23, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

(Docket No. 74–1; Notice 3)

The purpose of this notice is to amend Standard No. 118, *Power-Operated Window Systems*, 49 CFR 571.118, to permit the operation of power windows under certain conditions when the ignition is not in the "on" position.

On September 23, 1974, the agency published a notice (39 F.R. 34062) proposing to allow the operation of power windows, when the key that controls the vehicle's engine is in the off position or is removed from the lock, only in circumstances where (1) only muscular force is used, or (2) a key-locking system on the vehicle's exterior is activated, or (3) a door that has no frame meeting the upper edge of the closed window is opened a specified amount and a switch separate from the normal power window switch is activated.

Nine comments were submitted to the docket, all of which approved of the basic proposal to allow operation of the power windows when the vehicle engine is not running. General Motors, who suggested the proposal as it was published, supported its adoption. However, most of the commenters objected to the proposed provision that a separate switch be required to operate a window when the door is open to a degree sufficient to permit a ball the size of a child's head to pass between the top edge of the fully closed window and the vehicle's roof rail. The objection was based on a contention that the separate switch provision was design restrictive and not necessary from a safety standpoint. According to the comments, required use of a separate switch for activation of the windows when the doors are opened would not assure a higher level of safety than use of the normal power activation switch.

The NHTSA finds merit in commenters arguments. It is the considered opinion of the agency that the absence of a separate switch requirement will have no effect on the safety of the power-operated window system since no switch would be capable of activation unless the vehicle's door were opened to the specified distance. For this reason the proposed separate switch requirement is deleted. Manufacturers will thus be free to install whatever type of activation system they wish, as long as the criteria of S3(c) are satisfied.

In addition, the description of the locations between which the test ball must fit appears to need clarification. It is the agency's intention that the ball be capable of passing between the upper rear corner of the fully closed window and the vehicle's roof rail. Therefore, the term "trailing edge" in S3(c) is changed to "upper rear corner."

In consideration of the foregoing, S3. of Standard No. 118, *Power-Operated Window Systems* (49 CFR 571.118) is amended. . . .

Effective date: Because this amendment relieves a restriction and imposes no additional burden on any person, 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: July 23, 1975.

James B. Gregory
Administrator

40 F.R. 31773
July 29, 1975

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

[Docket No. 82-07; Notice 2]

ACTION: Final Rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standard (FMVSS) No. 118, *Power-Operated Window Systems,* to permit the operation of a vehicle's power windows and partitions during the interval between the shutting off of the engine and the opening of a front door on the vehicle. This amendment, which was proposed in response to a petition from General Motors Corporation (GM), would permit the manufacturers to offer power window systems which are more convenient than current systems. The agency believes the amendment would increase design flexibility without adversely affecting safety.

DATES: This amendment is effective on May 5, 1983.

SUPPLEMENTARY INFORMATION: In 1970, NHTSA issued FMVSS 118 in response to numerous cases of injury and death resulting from accidental operation of power windows. The standard sought to address the main source of these accidents, the unsupervised use of power windows by children, which could result in the child being caught between the closing window or partition and the window or partition frame.

The standard provides that power-operated window and partition systems may be operable only in certain specified circumstances. First, operation is permitted when the vehicle's ignition switch is in the "ON," "START," or "ACCESSORY" position. The rationale for permitting operation in that situation is that the driver would presumably still be in the vehicle to supervise the operation of the windows by any children who are passengers. Second, the standard permits operation of the systems by "muscular force." Third, the systems may also be operated by a key-locking system on the exterior of the vehicle. Here again, the driver would presumably be able to observe the window or partition being closed to assure that the closing track is clear. Fourth, the standard permitted operation of the systems when the key is in the "off" position or removed from the vehicle and the door is opened a specified amount. This provision, which applies only to vehicles having doors with no frame meeting the upper edge of the closed window, was added to the standard in 1975 in response to a petition from GM. However, neither GM nor any other manufacturer ever produced the system which this provision was intended to permit, and it appears that no manufacturer plans to offer such a system in the future.

On April 1, 1982, in 47 FR 13845, the agency proposed to permit operation of power windows and partitions in a fifth circumstance, in response to another petition from GM. Under this proposal, these systems would be operable during the interval between the time the vehicle's ignition key is shut off to the time one of the vehicle's doors is opened. This provision would permit windows to be operable in situations such as refueling stops at service stations, an added convenience for the driver. However, it would also assure, except in rare circumstances that the driver is still in the vehicle and able to supervise the operation of the windows. The provision was proposed as a method of increasing driver convenience and was anticipated to have no impact on safety.

The agency received 28 comments on the proposal. Comments from the vehicle manufacturers favored the proposal, with some having proposals for slight refinements of the proposed regulatory language. Comments were also received from a number of individuals, most of whom opposed the amendment. After careful consideration of these comments, the agency has determined to promulgate the proposed amendment.

The individuals who opposed the proposed amendment generally argued that the change would permit the operation of power windows by unsupervised children and therefore would be a detriment to safety. Based on the agency's review of the comments and conversations with several of these individuals, it appears that they were unaware that the window systems would cease being operational as soon as the engine is shut off and a door is opened and would remain nonoperational even if the door were again closed. Thus, the proposal would tend to assure that the driver is in the car when the windows can move. Once this aspect of the proposal was explained to the individuals, they no longer opposed the amendment.

While there is a possibility under the new option for power windows to be operational without the driver being present in the vehicle, that possibility could arise only in rare circumstances. Further, similar possibilities exist under one of the existing options. For example, under the new option, a driver could get out of a vehicle, leaving the engine running and close the door. The windows would still be operational. Then, if the driver's window were open so that he or she could reach through the open window instead of opening the door to shut the engine off, the windows would continue to be operational. Similarly, under one of the current options, power windows would be operable in the same circumstances, at least until the driver reached into the vehicle and shut of the engine. The agency believes that these circumstances would rarely occur and would be even less likely to occur when children were in the car. Accordingly, the agency believes that this potential detriment would, if it occurs at all, be very small. Even if it does occur, it could be offset by a small benefit suggested by other commenters. They felt that the amendment would provide a security advantage, by permitting drivers to quickly close the vehicle's windows for protection without first having to turn on the ignition switch. Overall, the agency does not anticipate that the proposal would result in any increase in injuries or deaths.

Several manufacturers argued for certain modifications to the proposed rule. Mercedes-Benz argued that the interval after engine shut-off during which the windows are operable should end when one of the *front* doors is opened. American Motors made a similar suggestion. The agency agrees that, in the case of four door automobiles, it is unlikely that the driver would exit from one of the rear doors and entry to or exit from rear seats should not impede the ability of the driver to supervise children in the vehicle. Therefore, the agency has adopted this suggestion.

Fiat Motors suggested that the agency permit the use of systems incorporating a 20 second time delay, i.e., windows would be operable for 20 seconds after the engine is shut off regardless of whether a door had been opened. Such a system could provide a brief interval during which children in a vehicle would be unsupervised and the power window system would be operational, possibly increasing the risk of the types of accidents FMVSS 118 was designed to prevent. The agency believes, on the basis of current information, that adoption of the proposal is not appropriate. If Fiat or any other commenter wishes to present data or arguments with regard to the safety impacts of such a system, the agency will reconsider permitting the use of this type of system.

American Motors Corporation (AM) also suggested several clarifications to the proposed rule. First, AM suggested that the rule explicitly state that power window and partition systems may be operable when the ignition switch is in the "ACCESSORY" position after a door is opened. Since the standard always permitted systems to be operable whenever the ignition key is in the "ACCESSORY" position, no substantive change would be involved. The agency has attempted to clarify this point. AM further suggested that references in the standard to the "key that controls activation of the vehicle's engine" be replaced by "ignition switch." However, the standard would apply to any systems used in electric vehicles or other motor vehicles which operate by energy produced by means other than ignition. Therefore, the latter suggestion has not been adopted.

AM also favored the deletion of the provision permitting the operation of power windows in certain vehicles when a door is opened a specified amount, since that provision never has and likely never would be used. Since this provision is apparently obsolete, it has been deleted.

The agency is making this amendment effective immediately upon publication, since the amendment "relieves a restriction" within the meaning of 5 U.S.C. 553(d)(1), by permitting the use of certain systems which were previously unauthorized. The agency also finds that making this amendment effective immediately is in the public interest, in accordance with section 103(e) of the National Traffic and Motor Vehicle Safety Act, since doing so will permit the use of more convenient power window systems at an early date. Also, since the amendment relieves a restriction in FMVSS 118, providing 180 days lead time is unnecessary.

NHTSA has determined that this proceeding does not involve a "major rule" within the meaning of section 1, paragraph (b), of Executive Order 12291 because it is not likely to have an effect on the economy of $100 million or more, to result in a major increase in costs or prices, or to have a significant adverse effect on competition, employment, investment, productivity, innovation, or the ability of United States firms to meet foreign competition. Similarly, this action is not deemed "significant" for purposes of Department of Transportation procedures for internal review of regulatory actions. The economic impacts of this Amendment are so minimal as to not warrant preparation of a full regulatory evaluation, since the amendment merely permits the use of certain systems which were previously prohibited.

Pursuant to the Regulatory Flexibility Act, the agency has considered the impact of this rulemaking action on small entities. I certify that this action will not have a significant economic impact on a substantial number of small entities, including small organizations or governmental units. Therefore, a regulatory flexibility analysis is not required for this action. The agency has concluded that few, if any, manufacturers of power window systems are small entities and that the impacts of this rule on those companies which decide to take advantage of the new alternative method of compliance should be minimal. There would be no significant impact on the cost of new vehicles manufactured in accordance with the new provision. Therefore, there should be no significant impact on small entities which purchase vehicles with power windows.

In consideration of the foregoing, 49 § 571.118 is amended as follows:

1. Section 3 is revised to read as follows:

S3. Power window or partition systems may be operable only in the following circumstances.

(a) When the key that controls activation of the vehicle's engine is in the "ON", "START", or "ACCESSORY" position;

(b) By muscular force unassisted by a vehicle power source;

(c) Upon activation by a key-locking system on the exterior of the vehicle; or

(d) During the interval between the time a running engine is turned off and the opening of either of a two-door vehicle's doors or, in the case of a vehicle with more than two doors, the opening of either of its front doors.

Issued on April 29, 1983

Raymond A. Peck, Jr.,
Administrator

48 F.R. 20237
May 5, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

[Docket No. 82-07; Notice 3]

ACTION: Final rule, response to petition for reconsideration.

SUMMARY: This notice responds to a petition for reconsideration filed by General Motors Corporation with regard to the agency's recently issued rule amending Federal Motor Vehicle Safety Standard (FMVSS) No. 118, *Power-Operated Window Systems.* GM requested that the agency clarify the language of this amendment, which permits operation of power windows during the interval between the shutting off of a vehicle engine and the opening of a door. NHTSA agrees that the clarification suggested by GM is consistent with the agency's intent in originally amending the standard, and the agency is therefore further amending the standard accordingly.

EFFECTIVE DATE: October 14, 1983.

SUPPLEMENTARY INFORMATION: On May 5, 1983, NHTSA published a final rule amending FMVSS 118 (49 CFR 571.118), in response to a rulemaking petition filed by General Motors Corporation. The GM petition requested that the standard be amended to permit operation of power windows during the interval between the shutting off of a "running engine" and the opening of the vehicle's front doors. GM sought this amendment to permit it to offer power window systems which GM believes are more convenient to use. Prior to this amendment, vehicles had to be designed so that a driver who shut his or her vehicle's engine off but remained in the vehicle would have to turn the vehicle ignition back to the "ON" or "ACCESSORY" position in order to operate the windows.

FMVSS 118 was originally issued to prevent injuries resulting from automative power windows closing on small children. Prior to the issuance of that standard, such injuries most often occurred when children operated the windows without the driver present. The standard seeks to minimize the likelihood of this unsupervised operation of the windows by requiring that operation of the windows be controlled by a key, typically the ignition key. This requirement assures, in most instances, that the driver is present in the vehicle when power windows are operable.

The GM petition was found by the agency to be consistent with this concept of positive key control of power window operation. Between the time a running engine is shut off and the opening of a front door, the driver of the vehicle would in all likelihood still be in the vehicle and able to assure that children in the vehicle were not playing with the windows. Therefore, the agency granted the GM rulemaking petition and amended FMVSS 118 to permit window operation during that time interval. See 48 FR 20237, May 5, 1983.

On June 3, 1983, GM requested that the agency clarify the langauge adopted in the May 5th amendment, either by issuing an interpretation concerning the specified language or by amending the language. The problem pointed out by GM is that most power window systems do not actually sense whether an engine is running. Instead, they sense the position of the ignition locking device, which usually correlates very closely with the operation or nonoperation of the engine. Thus, for example, in a system designed to comply with the amended standard by sensing the key position, if the ignition key were turned to the "ON" position and then the "OFF" position, the power windows would remain operable until a front door opened. However, strictly speaking, this hypothetical situation might not involve turning off a "running engine" (for example, when the engine stalls). Therefore, such a system could be considered in violation of the standard.

The agency agrees with GM that there is no significant safety-related difference between window systems which sense key position and those which sense engine operation. The important consideration from the agency's perspective is the assurance that the driver is likely to be present in the vehicle to supervise operation of the power windows. These two possible system designs appear to provide equal assurance that the driver is present. Requiring that the power window system sense engine operation in addition to key position would, on the other hand, add substantially to the cost of such systems. Therefore, NHTSA is herein amending FMVSS 118 to clarify the time interval during which power window operation is permissible, consistent with the GM request. This action is being taken in the form of an amendment to the standard rather than as an interpretation, to provide the clearest public notice of the requirements of FMVSS 118. This amendment is consistent with the original intent of the May 5th amendment.

The agency is making this amendment effective immediately upon publication since the amendment merely clarifies an existing provision of FMVSS 118. The agency finds that making this amendment effective immediately is in the public interest in accordance with Section 103(e) of the National Traffic and Motor Vehicle Safety Act, because the amendment will facilitate the use of more convenient power window systems at an early date. Also, since the amendment does not add any substantive requirements to FMVSS 118, providing 180 days lead time is unnecessary.

NHTSA has determined that this proceeding does not qualify as a "major rule" within the meaning of section 1, paragraph (b), of Executive Order 12291 because it is not likely to have an effect on the economy of $100 million or more, to result in a major increase in costs or prices, or to have a signficant adverse effect on competition, employment, investment, productivity, innovation, or the ability of the United States firms to meet foreign competition. Similarly, this action is not deemed "significant" for purposes of Department of Transportation procedures for internal review of regulatory actions. The economic impacts of this amendment are so minimal as to not warrant preparation of a full regulatory evaluation, since the amendment merely clarifies regulatory language permitting the use of certain systems which were prohibited prior to May 5, 1983.

Pursuant prior to the Regulatory Flexibility Act, the agency has considered the impact of this rulemaking action on small entities. I certify that this action will not have a significant economic impact on a substantial number of small entities, including small organizations or governmental units. Therefore, a regulatory flexibility analysis is not required for this action. The agency has concluded that few, if any, manufacturers of power window systems are small entities, and that the impacts of this rule on any manufacturer should be minimal. There would be no significant impact on the cost of new vehicles manufactured in accordance with the new provision. Therefore, there should be no significant impact on small entities which purchase vehicles with power windows.

In consideration of the foregoing, 49 CFR 571.118 is amended as follows:

1. Section 3(d) is revised to read as follows:

(d) During the interval between the time the locking device which controls the activation of the vehicle's engine is turned off and the opening of either of a two-door vehicle's doors or, in the case of a vehicle with more than two doors, the opening of either of its front doors.

Issued on October 7, 1983.

Diane K. Steed
Deputy Administrator

48 FR 46793
October 14, 1983

MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

(Docket No. 69-11a)

S1. Purpose and scope. This standard specifies requirements for power-operated window and partition systems to minimize the likelihood of death or injury from their accidental operation.

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

S3. Requirements. Power window or partition systems may be operable only in the following circumstances.

(a) When the key that controls activation of the vehicle's engine is in the "ON", "START", or "ACCESSORY" position;

(b) By muscular force unassisted by a vehicle power source;

(c) Upon activation by a key-locking system on the exterior of the vehicle; or

(d) [During the interval between the time the locking device which controls the activation of the vehicle's engine is turned off and the opening of either of a two-door vehicle's doors or, in the case of a vehicle with more than two doors, the opening of either of its front doors. (48 F.R. 47693—October 14, 1983. Effective: October 14, 1983)]

35 F.R. 11797
July 23, 1970

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71–18; Notice 3)

This notice establishes a new Motor vehicle safety standard No. 119 *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, which specifies performance and labeling requirements for new pneumatic tires designed for highway use on multipurpose passenger vehicles, trucks, buses, trailers and motorcycles manufactured after 1948, and which requires treadwear indicators in tires, and rim matching information concerning those tires.

Notices of proposed rulemaking on this subject were published on August 5, 1971 (36 F.R. 14392), and July 8, 1972 (37 F.R. 13481).

The July 1972 notice proposed that, instead of including the voluminous "tire tables" of tire size designations, maximum loads and inflation pressures, and dimensions in the standard, the manufacturers continue as at present to use the industry association tire and rim manuals for the purpose of product standardization. Since the only tire characteristics relevant to the safety performance tests of the standard are general tire type, speed restrictions, maximum load rating, load range, and rim diameter, all of which are readily available or labeled on the tire itself, the tables are not necessary for the performance requirements. To prevent these private associations from having ultimate regulatory power over individual manufacturers, a provision was included in the proposal by which a manufacturer who wished to differ from the values in the association tables could do so by providing separate information to the NHTSA, to his dealers, and to the public upon request. To prevent the under-rating of tires of an established size designation, another provision would prohibit the assignment by a manufacturer of a maximum load rating to a particular tire size designation that is lower than the load rating already published elsewhere for that tire size designation.

Many domestic tire manufacturers objected to lack of tire tables on the grounds that it in effect endorsed non-standardization of tire specifications. They and some representatives of the trucking industry speculated that there might be danger of mis-match arising from the production of tires whose dimensions deviate substantially from the published dimensional specifications for tires of that size designation. Several of the domestic manufacturers recommended inclusion of the (American) Tire and Rim Association tables in the standard because of the experience that domestic manufacturers have with road conditions in the United States.

Other manufacturers, however, supported the deletion of tire tables for several reasons. They argued that a single standard would discourage innovation in tire design and suggested that the complexities of selection and maintenance of truck tires could not be reduced to a single table of values. They asserted that standardized new-tire dimensions do not eliminate the need to measure tires for proper dual matching, because tires wear differently in use and thereafter rarely match new or used tires of the same size.

Upon consideration of all relevant information, the NHTSA has concluded that the position taken in the proposal is sound, and it is adopted in the rule. The inclusion in the Code of Federal Regulations of load-inflation and dimension tables for every road tire sold in this country (they presently are included in Standard 109 only for passenger cars) would be a vastly cumbersome process, not only in its inception but as a continuous maintenance task. The NHTSA finds no justification at this time for undertaking to monitor substantively the manufacturer processes and testing that lead to the continual changes in the standard association tables, so its function in this regard would be largely clerical. The point is not, as the (U.S.) Rubber Manufacturers Association asserted, primarily one of "administrative convenience". It is that no justification has been found for locking both the government and the world tire industry into a restrictive and unwieldy system by which the Code of Federal Regulations is formally amended every time a manufacturer decides to add a tire size, or change the load rating or dimensional specifications of one of its tires. There are many reasons to avoid over-regulation; "administrative convenience" is among the least of them.

This agency has no intent to dilute the standardizing function of the trade-association table systems that presently are used to provide necessary tire and rim information to dealers and users. These systems monitor the safety aspects of tire dimension and load rating satisfactorily now without government regulation, and the NHTSA expects that they will continue to do so. No evidence has been presented of under- or over-sizing of tires that would warrant the institution of a massive government regulatory program in that area. If such a practice should arise in the future to a degree that constitutes a public hazard, the NHTSA has ample authority to deal with it specifically, as a safety-related defect, and prospectively, under its rulemaking powers.

The argument that the agency should include only the domestic Tire and Rim Association tables, thereby requiring foreign tire manufacturers to build tires under the specifications, and presumably the approval, of the domestic association, is found to be without merit. The wording and the legislative history of the National Traffic and Motor Vehicle Safety Act show a clear Congressional intent to give evenhanded treatment to domestic and foreign manufacturers of motor vehicles and equipment, and this has always been the policy of the NHTSA. This agency has no evidence that foreign associations or manufacturers lack the information necessary to produce safe tires for the American market.

Finally, the argument that the agency could or should by some means prevent "proliferation" of new tire sizes is without substance. No concrete justification has been presented for attempting to limit the introduction of new tire sizes, and to date no significant safety problems have been found caused by the addition of new tire sizes. The NHTSA assumes that the competition and consumer demand forces of the private sector will operate as in other areas of our economy, to produce a satisfactory product population.

The criteria for tire failure in the endurance and high speed laboratory tests have been substantially modified from those of the proposal in response to comments to this docket and Docket 71–10, Notice 2 (37 F.R. 19381, September 20, 1972), which proposed identical changes in the passenger car tire failure criteria. This regulation adopts the same failure criteria as were adopted in final form for passenger car tire tests on September 28, 1973 (38 F.R. 27050), and relies on several new and revised definitions found in Standard 109. The preamble to the passenger car tire amendment fully explains the modifications made, and it is only noted here that the changes are substantially in agreement with manufacturers' requests to specify the tire failures with particularity. A pre-test inspection has been added to discover failures in construction evident without dynamic testing. Additionally the required air pressure following the test run has been raised to 100 percent of the original pressure.

Several comments questioned the inclusion of all non-passenger car tires in one standard, pointing out that tire design differs radically to optimize desirable characteristics for each vehicle type and application. However, this standard does not attempt to measure the optimum characteristics of each type of non-passenger tire. This standard only establishes minimum performance characteristics which any type of tire must satisfy to be safely used on public highways. Passenger car tires have been subjected to such a standard in the past and this proposal extends a comparable minimum standard to all other tire types designed for highway use. The requirements recognize the design differences between tire types by establishing different test values for different tire types, size, construction, load ranges, and speed restrictions.

Comments to the docket requested physical tolerances and related accommodations for test purposes. These arise from misunderstanding of the legal nature of the safety standards, which are performance levels that each vehicle or item of motor vehicle equipment must meet, and not instructions for manufacturer testing. The temperature conditions for tire testing have been reworded to reflect the legal meaning and the NHTSA testing practices relative to tire standards. The proposed standard would make clear that the tire must be capable of meeting the requirements when tested at any ambient temperature up to 100° F. The legal significance of this requirement is explained in a general provision of Part 571, § 571.4, *Explanation of usage*. In NHTSA compliance testing, the ambient temperature would be maintained in a range between 90° and 100° F., and any test failure under those conditions would be considered a failure to meet the standard. Manufacturer testing should be directed at proving the tire's capability in the exercise of due care, by testing under conditions at least as adverse as any that could be established in accordance with these procedures.

The trucking industry questioned the advisability of labeling maximum inflation and load rating on the tire because it appeared to prohibit the adjustment of pressures to road conditions. The purpose of the labeling is to establish test values for the tire and to warn the user of the tire's maximum capabilities . The label does not prohibit adjustment of pressure to suit road conditions or prevent a manufacturer from recommending other inflation-load combinations on the tire or in accompanying literature to suit specific circumstances.

European manufacturers objected to the requirement that load rating be indicated by a "load range" index not in world-wide use. The primary purpose of the load range index is to indicate categories of strength within the size designations, for user information and test purposes. It should be understood that a manufacturer may use whatever additional systems he chooses to indicate his assessment of tire strength. Information such as metric equivalents and ply ratings, for example, may be added to sidewall labeling as long as the required information appears in the required format on the tire.

Several manufacturers suggested that labeling appear on only one side of a tire when both sides of the tire, as mounted, will be available for inspection. Accordingly, motorcycle tires must now be labeled on one side only, but the inaccessibility of both sidewalls on truck and bus tires for visual inspection precludes one-sidewall labeling of these categories.

Despite this inaccessibility, however, the identification code appears on one sidewall only, because placing the ID slug in the upper half of a hot process mold is a difficult and dangerous operation. In response to another labeling request, the DOT symbol must not be placed on the tire before the effective date of the standard.

Several manufacturers argued for greater design freedom in the placement of treadwear indicators because the proposed locations could generate useless, arbitrary information when applied to "lug" tread designs. In response, tread "groove", "width", and "depth" have been defined so that the treadwear indicators are placed to indicate wear in that portion of the tread which contacts the ground.

Several comments on the endurance requirement requested lower test loads and speed to approximate actual driving conditions on flat surfaces. The NHTSA does not utilize the laboratory test wheel to simply approximate road conditions but rather to apply strictly controlled amounts of stress to moving tires over long periods in order to measure a minimum level of performance. Industry testing established these values and they have been independently verified in NHTSA's Safety Systems Laboratory as an accurate gauge of tire endurance. Another manufacturer expressed confusion about the appropriate endurance test standards for mining and logging tires. These tires are generally speed-restricted tires and should be tested in accordance with the values established in Table III for all other speed-restricted tires.

In response to another comment, it should be noted that test accuracy also requires a standardized test wheel diameter, because the wheel's curvature directly affects a tire's ability to absorb strain.

Several manufacturers requested elimination of the pressure reading following the 47-hour run so that they could run the tire to destruction in accordance with industry test practices without stopping to make the measurement. This request can not be granted because the new procedures for evaluating tire failure necessitate stopping after the run to inspect the tire, in addition to stopping to take a pressure reading.

Comments raised the validity of the strength test when applied to tires incorporating recent innovations in tire design. It appears that recent changes in the construction of passenger car tires, especially the addition of belts under the tread, have tended to make the strength test specified in Standard 109 obsolete (38 F.R. 1055, January 8, 1973). However, the construction of non-passenger tires permits accurate measurement of tire strength without the "bottoming out" problem noted in the comments, if the proper plunger size and breaking energy value are used. A differential in breaking energy value between tubed and tubeless tires accommodates the smaller dimensions of the newer tubeless configurations that replace tube tires of the same load range. The "light truck" category accommodates the different design and construction materials which manufacturers use in these tires designated for this specialized service. The NHTSA does not agree that lower breaking energy values should apply to tires under 7 inches in section width as suggested in one comment, because these tires are no smaller than typical passenger car tires subjected to similar testing and similar conditions on the highway. In response to another comment, the NHTSA has concluded that differences in the construction of steel-belted tires are not sufficient to justify lower energy values in the plunger test similar to those extended to rayon tires.

Objections to the high speed performance requirements questioned the testing of all light tires (load ranges A, B, C, and D) under the same high-speed conditions. The NHTSA has eliminated speed-restricted tires from the requirements but will maintain high-speed requirements for all motorcycle, trailer, and truck tires. While it is true that these tires are specially constructed for their purpose and often are mounted on vehicles marked with speed restrictions, there is no assurance that these tires will be properly utilized. The difficulty lies with drivers who ignore rental trailer speed limits, subject boat or mobile home trailer tires to higher than recommended speeds, attempt to improve the performance of their low speed motorcycles, or drive trucks equipped with light truck tires at high speed on the highway. This probability of abuse creates a safety problem which can be met by requiring these tires to withstand such high speed abuse. Load range D tires over 15 inches in section width are presently subject to the high speed test but may be reclassified on the basis of future test experience.

Comments to the docket objected to the proposed effective date and requested up to 18 months leadtime following issuance of the standard on the grounds that the large variety of tires to be certified requires substantial enlargement of test facilities. This standard has been in various proposal stages for 4 years, however, which has provided the tire industry ample opportunity to make plans for the acquisition and installation of test facilities and therefore leadtime of 9 months is considered adequate.

In consideration of the foregoing, a new Standard 119, *New pneumatic tires for vehicles other than passenger cars*, is added to Part 571 of Title 49, Code of Federal Regulations, to read as set forth below.

Effective date: September 1, 1974.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on November 5, 1973.

James B. Gregory
Administrator

38 F.R. 31299
November 13, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other than Passenger Cars

(Docket 71-18; Notice 5)

This notice amends Standard 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, by changing the effective date from September 1, 1974, to March 1, 1975.

A major concern of manufacturers commenting on Standard 119 as it was published in final form on November 13, 1973, (38 F.R. 31299), with a September 1, 1974, effective date, was the limited leadtime in which to modify tire molds and certify the conformity of tires. Correct use of the DOT symbol, lettering height, and clarification of treadwear indicator language required attention before the changeover process could begin.

Manufacturers requested up to 11 months' additional leadtime in view of these difficulties. Amendments have been proposed that would resolve these specific problems. Because the range of non-passenger car tires is so great, however, the National Highway Traffic Safety Administration has determined that even with these changes an additional 6 months' leadtime is justified to accomplish full certification.

Other matters raised by petitions for reconsideration are presently under consideration and will be answered in accordance with the procedures of 49 CFR 553.35, *Petitions for reconsideration.*

In consideration of the foregoing, Standard 119 (49 CFR § 571.119) is amended by changing the effective date of September 1, 1974, to March 1, 1975.

Because this amendment creates no additional burden, and because changeover scheduling must begin immediately, it is found for good cause shown that notice and public procedure thereon are impracticable and unnecessary.

(Secs. 103, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on January 29, 1974.

James B. Gregory
Administrator

39 F.R. 4087
February 1, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other than Passenger Cars

(Docket 71–18; Notice 6)

This notice responds to petitions for reconsideration on Standard 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, published November 13, 1973 (38 F.R. 31299). In response to comments by twelve tire manufacturers and trade associations, the definitions, labeling, and performance provisions of the standard are amended in several respects.

Justification for Issuance of Standard 119

The Rubber Manufacturers Association (RMA), supported by most domestic tire manufacturers, petitioned for withdrawal of Standard 119 on the grounds that promulgation of the standard did not satisfy the criteria for the establishment of Motor Vehicle Safety Standards set out in § 103 of the National Traffic and Motor Vehicle Safety Act of 1966. Section 103(f) of the Act requires that the formulation of a standard include consideration of its appropriateness for particular items of motor vehicle equipment, relevant safety data, and the extent to which it will contribute to carrying out the purposes of the Act. As formulated a standard must be practicable, meet the need for motor vehicle safety, and be stated in objective terms.

In petitioning for withdrawal of Standard 119 for failure to "meet the need for motor vehicle safety," the RMA and those tire manufacturers who support its position effectively assert that no tire safety hazard exists which can be met by Standard 119. The National Highway Traffic Safety Administration (NHTSA) does not agree.

Congress recognized a tire safety problem. The Senate held hearings on and considered a bill devoted totally to tire safety (S1643). The House included a separate title in H.R. 13228 to emphasize tire safety as a particularly important area for the issuance of safety standards.

> In a number of bills which have been introduced in both Houses as well as in a bill which has passed the Senate (S.2669) the necessity for standards for tires was considered as an independent problem and without reference to its relationship to the total traffic safety problem. S.2669 is confined only to the improvement of tires for passenger cars and station wagons. The committee decided that although *tires are a highly important part of the total traffic safety problem* they are, nevertheless, an integral part of it and should be dealt with in the context of the problem and not in a piecemeal fashion. . . .
>
> However the committee did feel that it was necessary to emphasize this aspect of the safety problem and to establish certain specific requirements which should be contained in the Secretary's standards on tires. (emphasis supplied) H.R. Rep. No. 1776, 89th Cong., 2d Sess. 32 (1966).

On the House floor, Representative Springer detailed the effect of the legislation on motor vehicle equipment.

> Obviously, the most important piece of equipment which comes to mind is the tire. The other body treated this subject in separate legislation, but it seems to me, and it did to our committee, that tire standards must be part and parcel of any legislation which seeks to impose standards of safety for the cars on the highway. Consequently, a portion of the bill was devoted specifically to this subject. It requires minimum standards for all tires, and then sees to it that the buyer will have all the information he needs to make a decision as to the tire he needs.

112 Cong. Rec. 18,780 (daily ed. Aug. 17, 1966)

Congress showed particular interest in passenger car tires, but did not limit the legislation to them, as suggested by Firestone in its petition for reconsideration. As the House report notes, Title II represents a broadening of the tire safety issue from passenger cars and station wagons. The language of Title II refers to tires of "each motor vehicle" and to a uniform tire quality grading system "for motor vehicles." Section 204 is devoted to regrooved tires which are commonly utilized on non-passenger cars.

The NHTSA has concluded that the tire safety problems recognized by Congress can best be met by Standard 119. The standard requires labeling and tire-rim matching information to aid proper application of the tire, and minimum performance levels to ensure adequate designed-in safety for normal use and predictable abuse on the road. The standard is directed at misuse of tires as well as their correct use.

It is true that Bureau of Motor Carrier Safety statistics indicate that professional maintenance, cost consciousness, and frequent state inspections result in a lower than normal number of tire failures on interstate haulers. These figures, however, are not representative of tire conditions throughout the multipurpose passenger vehicle (MPV), truck, bus, motorcycle, and trailer categories. Congress mandated minimum tire safety standards although it was aware that tire failure statistics were difficult to isolate, realizing that tire design, while not a major cause of failures in well-maintained tires, could offer a margin of safety where tires are misused. Hearings on S.1634 Before the Senate Commerce Committee on Tire Safety, 89th Cong., 1st Sess., ser. 89–37 at 41 (1965); Hearings on S.3005 Before Senate Commerce Committee on Traffic Safety, 89th Cong., 2nd Sess., ser. 89–49 at 158, 159 (1966). In its formulation of the standard, the NHTSA considered data which showed that worn and misapplied tires create a significant safety hazard. Standard 119 ensures that the information required by Congress to be on tires, along with additional tire-rim matching information and treadwear indicators, are available to the unknowledgeable individual who must select, maintain, and replace non-passenger tires periodically. The RMA itself argued for the inclusion of load-rating information in this standard as an effective means to eliminate the dangers of proliferation and misapplication of tire sizes. In the area of tire design, the minimum performance levels in Standard 119 ensure a margin of safety for persons who may misapply or abuse tires despite the label information and treadwear warnings.

The NHTSA experience with performance standards for passenger car tires also supports Standard 119 rulemaking. Since the beginning of certification testing by the manufacturers and compliance testing by the NHTSA, the percentage of test failures has dropped from approximately 5.6% to less than 1%. At the same time 88 recalls of 1,436,118 tires have removed from the road substantial numbers of tires which could not be shown in the exercise of due care to be able to meet the minimum requirements. Standard 119 has similar performance tests, calculated to produce close surveillance of test failure percentages and recalls when a faulty tire design is identified. The performance test levels vary according to tire type to ensure that the standard is reasonable, practicable, and appropriate for the particular tire design in its intended service application.

The NHTSA has found that Standard 119 will weed out faulty tire design and promote safety. The test values of Standard 119 were originally proposed by industry and checked by the NHTSA at its Safety Systems Laboratory. The RMA conducted a similar series of tests at that time and later endorsed the requirements as modified in minor respects:

> The laboratory tests and values in the proposed FMVSS 119 as amended by our comments would set standards of performance that would enable the industry to design tires that would ensure safe operation on the highways. Comment #4 to Docket 1–5, Notice 7 (p 6).

By reference to *H & H Tire Company v. United States Department of Transportation*, 471 F2d 350 (7th Cir 1972), the RMA and Firestone raised the issue of Standard 119's practicability. This requirement, at § 103(a) of the Act, was interpreted in *H&H* to mean that the NHTSA must determine the technological and economic consequences of the standard on the regulated industry. In that case the Court determined that the retread tire industry could be destroyed by the expense of major product redesign or the loss of business which could result from passing on these costs in higher prices to the typical retread consumer. The Court also pointed out that the retread consumer might use older worn tires longer than previously and thereby in effect increase the tire hazard problem in response to Standard 117.

In contrast, the NHTSA has determined that compliance with Standard 119 does not require significant or impracticable technological change. Tests run at the Safety Systems Laboratory indicate that a sampling of production-run tires can meet the required performance levels, as they are now constructed. An analysis of benefits and costs demonstrates that the costs of additional testing are less than the estimated savings in property and lives. Finally, the consumer of new tires is less likely than the retread consumer to shift his tire purchase habits and has less opportunity to do so. The NHTSA has carefully determined the technological and economic impact of Standard 119 on the new tire industry and found it to be practicable.

The NHTSA totally disagrees with the RMA and Firestone in their final argument that safety-related defect notification offers adequate protection to consumers without the addition of a safety standard. Firestone inaccurately equates the effect of a standard with that of a notification campaign, claiming that in either case a manufacturer must recall tires containing defects or face civil penalties. Issuance of a standard imposes significantly greater responsibility on a manufacturer to assure himself in the exercise of due care that his product is safe before it is sold and subsequent use reveals a safety-related defect.

Technical Consideration of Standard 119

The Application section (S3.) raised several questions about the standard's relationship to Standard 109-type tires, experimental tires, and low speed and off-road vehicle tires. The standard applies to new tires designed for highway use on non-passenger-car motor vehicles. The present language makes clear that tires which do not meet these criteria are not subject to the standard, including those tires subject to Standard 109. The tire manufacturer himself must determine whether his tires, restricted or not to speeds under 35 mi/h, or used on slow-moving vehicles on or off the highway, were designed by him for highway use. As an example, Dunlop cited moto-cross tires which use the public highway "during the course of competitions." Without evidence to the contrary, however, the NHTSA assumes that these tires are used to get to and from the competition over the public highways. In answer to a related request for interpretation by Bridgestone, it is the designed and intended use of the tire (as realistically anticipated by the manufacturer) that matters, not a simple marking such as "Not For Highway Use" on the tire sidewall. In the case of "experimental" or "survey" tires the tires are designed for highway test purposes and are subject to the standard.

The definition of light truck tire has been revised in response to comments from the RMA and the Japan Automobile Tire Manufacturers Association. They cited a number of light truck tires which may or may not share a common size designation or dimensions with passenger tires, but still require special test values because of their heavy-service construction.

Standard 119 does not include the voluminous "tire tables" of tire size designation, maximum loads and inflation pressures, and dimensions requested by the domestic tire industry. An explanation of this approach accompanied issuance of the rule (38 F.R. 31299, November 13, 1973). While the RMA and Goodyear have restated their earlier position that product standardization can only be assured by Government publication of industry association tables, they did not respond to the extensive justification made with the rule. The NHTSA concludes that its determination is sound.

Nearly all tire manufacturers commented on Standard 119's labeling provisions and the amount of leadtime necessary to implement them. To resolve the most pressing problems, the NHTSA has already issued notices that postpone the effective date of the standard 6 months and propose a lettering size and depth, use of the DOT symbol prior to the standard's effective date, and clarification of the treadwear indicator requirement. (39 F.R. 4087, February 1, 1974, 39 F.R. 3967, January 31, 1974). All other petitions which concern the labeling provisions are treated in this response.

The RMA and the European Tyre and Rim Technical Organization (ETRTO) requested changes in paragraph S6.5(d) ("Tire marking"), several of which are adopted in this amendment. The word "corresponding" is inserted before "inflation pressure" to accommodate tires whose maximum load rating is not at maximum inflation. Punctuation is removed from the legend that appears on the tire to simplify stamping. The example is revised to make clear that "TIRE RATED FOR SINGLE AND DUAL LOAD" and "TIRE RATED ONLY FOR SINGLE LOAD" do not appear on the tire sidewall. ETRTO suggested that a title appear on the tire to qualify the information provided, but the NHTSA has concluded that the information alone is more helpful to the unknowledgeable user, and that a knowledgeable user would refer to the tire tables for exact information before changing tire inflation pressure.

Paragraph S6.5(e) on speed restricted tires has been clarified to limit the requirement to tires restricted to 55 mi/h or less. S6.5(f) remains unchanged, because the National Traffic and Motor Vehicle Safety Act of 1966 requires that the actual number of plies and ply composition appear on the tire sidewall. The words "tube type" appear on tires under S6.5(g) because many consumers are unaware of the significant distinctions between tube type and tubeless tires. Dunlop's request that treadwear indicators be required on tires that are regrooved is beyond the authority under which Standard 119, applying only to new tires, was issued.

Paragraph S6.5(j) calls for a single letter to appear on the tire to indicate categories of strength within the size designation, for user information and test purposes. As the ETRTO pointed out, a requirement for any additional wording such as "load range" could confuse international standardization efforts. Manufacturers are, of course, entitled to add labeling information as long as the required information appears in the required format on the tire.

The maximum load rating provision in S6.6 requires tires of a particular size to have a maximum load rating at least as great as the lowest rating published for that size. In this way the publications do not mislead a consumer who assumes that a particular tire size must have only the load ratings listed. The RMA advocated that more particular load rating information be supplied to aid in actual tire selection. Reference to any factors other than tire size, however, would detract from the desired concept that, for one tire size, there is one lowest maximum load rating, and that load rating is published.

Two substantial requests were raised with regard to the endurance requirement. Uniroyal petitioned for a reduction in the duration of the three test phases to 4 hours each. The NHTSA is considering that submission but must deny action on it at this time because an independent evaluation of the procedures has not yet been conducted, and because there has not been notice or opportunity to comment on the proposal by all interested persons.

The RMA petitioned for 34-hour endurance testing of all tires subject to the high speed test (S6.3) on the grounds that the 47-hour speed/endurance test would be redundant. The NHTSA agrees and has revised Table III accordingly.

The ETRTO proposed new test values for some motorcycle tires, but the request was unclear as to the meaning of the 62 mi/h criterion and the unsupported request cannot be granted. If, in the future, the ETRTO petitions for rulemaking to revise the table, an explanation of the criterion and a justification for the test values would permit an informed decision.

Comments to the strength test questioned plunger size and energy values, the computation procedures, and the appropriateness of the test to mobile home, special trailer, wide base, and radial tires.

The RMA argued that the limited service of most mobile home and special trailer tires could not justify the increased cost necessary to upgrade the strength of the tires to meet the requirement. The NHTSA has consistently treated mobile homes and other trailers as full-fledged motor vehicles and applied applicable standards rigorously to reduce the number of crashes in which mobile homes are involved, as indicated by BMCS statistics. The RMA request is denied to ensure that equally-rated tires on towed and towing vehicles will, in fact, meet equal minimum strength requirements.

The RMA and ETRTO generally advocated larger plungers or reduced energy values for tires and the ETRTO petitioned for the exclusion of radial tires from the strength test. The NHTSA has determined that the established values and plunger sizes, drawn from industry experience, adequately measure tire strength. Any future petitions for rulemaking to change these values should be accompanied by detailed supporting data, as was submitted by Uniroyal in its petition for reconsideration.

Comments again requested that a plunger which contacts the rim be considered to have established an energy value which meets the strength requirement. The NHTSA reiterates its position that the standard's present energy values measure the strength of a well-constructed non-passenger car tire before the tire breaks or the plunger contacts the rim. Specific test values may be revised based on future test experience, but revision of the calculation procedures used for all tires is not justified. The request for three plunger applications in the case of 12-in. or smaller diameter tires has been granted.

Michelin and the ETRTO have inquired as to the NHTSA's position with regard to tubeless tires above load range J. Such tires, when marketed in the United States, are subject to this standard, and the NHTSA would like the benefit of detailed description of, and test experience with, these tires before it establishes test requirements. It is requested that support for ETRTO or Michelin values be submitted to the NHTSA Tire Division.

The high speed performance requirement was adopted to test different tire characteristics from those tested under the endurance performance requirement. The test is run only on non-speed-restricted tires in the lighter load ranges because, for tires of heavier construction, the endurance test alone develops temperatures which evaluate all the characteristics satisfactorily. The RMA and several manufacturers have pointed out that the endurance test can serve this purpose for large tires even in the lighter ranges, and the NHTSA, therefore, restricts the high speed requirements to motorcycle tires and to non-speed-restricted tires of 14.5-in nominal rim diameter or less marked Load Range A, B, C, or D. Light truck tires and other tires which are 14.5-in and smaller remain subject to the high speed requirements because the NHTSA has determined that the high speed test measures different values than the endurance test in these smaller sizes.

The definition of tire failure is closely related to the endurance and high speed performance tests. The RMA and several tire manufacturers requested re-definitions of several terms and revision of the tire cooling procedures related to tire failure. The NHTSA has established Docket 71–10, *New pneumatic tires, revised performance requirements*, to treat the re-definition of tire failure, and will respond to these issues in a notice to that docket.

Interested persons should remember that, in addition to the amendments set forth below, the NHTSA has already amended the effective date of the Standard to March 1, 1975, and has proposed amendments to the lettering, DOT certification, and treadwear provisions which will be acted on when comments have been considered.

In consideration of the foregoing, amendments are made to Parts 571 and 574 of Title 49, Code of Federal Regulations. . . .

Effective date: March 1, 1975.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on February 7, 1974.

James B. Gregory
Administrator

39 F.R. 5190
February 11, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71-18; Notice 7)

This notice amends Standard No. 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, to specify lettering sizes and modified treadwear indicator requirements for tires. In addition, it amends Part 574, *Tire Identification*, 49 CFR 574, to permit the labeling of certain tires with the symbol DOT prior to the effective date of the standard. This notice also responds to petitions for reconsideration of Standard 119's effective date by maintaining the present date of March 1, 1975.

To avoid a costly production shutdown on the effective date to engrave tire molds with the DOT compliance symbol required by the standard, the National Highway Traffic Safety Administration (NHTSA) proposed a modification of the Part 574 prohibition on the symbol's use prior to the effective date (39 F.R. 3967, January 31, 1974). The Rubber Manufacturers Association and five tire manufacturers agreed that the DOT should be engraved on tire molds prior to the effective date, but objected to the expense of covering the DOT with a label stating that "no Federal motor vehicle safety standard applies to this tire," when the DOT appears on tires which (presumably) satisfy Standard 119 requirements. Firestone pointed out that the large label size could obscure other label information. Goodrich noted that, as proposed, the DOT could be molded on tires which met no standard and could mislead a user if the label fell off.

The NHTSA will not permit the appearance of the DOT compliance symbol on any item of motor vehicle equipment to which no standard is applicable. The terms "applicability" and "applies" have only one meaning for Federal motor vehicle safety standards: that the vehicle or equipment concerned is subject to a safety standard. To permit use of the DOT symbol on vehicles or items of motor vehicle equipment to which no standard applies would confuse the meaning of the symbol and the concept of compliance.

In response to Firestone and Goodrich, the NHTSA has modified the lettering size on the label and limited use of the DOT symbol to tires for which a standard has been issued. With the small lettering size, the rubber labels used on retread tires can be applied over the DOT symbol in fulfillment of the requirement. Another method which manufacturers did not mention but which would be permissible is the removal of the DOT at the same time imperfections are buffed off the tire.

All comments on the proposal objected to the specific location requirements for treadwear indicators based on the concept of even tread wear across the tread width. Goodyear demonstrated in a meeting with the NHTSA Tire Division on February 13, 1974, and detailed in its submission to the Docket, the difficulty in equating ideal tire wear with actual road experience. They recommended the simpler concept that a tire has worn out when any major tread groove has only $\frac{2}{32}$ in tread remaining. The NHTSA has concluded that treadwear indicators must be placed at the discretion of the manufacturer to give a person inspecting the tire visual indication of whether the tire has worn to a certain tread depth. Accordingly, the lateral location requirements for treadwear indicators have been deleted from the standard.

There was no discussion of the lettering size and depth proposal, and these proposals are adopted as proposed.

The comments requested reconsideration of the standard's March 1, 1975, effective date (published February 1, 1974, 39 F.R. 4087), asserting the need for 18 months of lead time following publication of this notice to engrave tire molds as required by the standard. The NHTSA has found that 11 months is sufficient leadtime to accomplish these changes, and accordingly these petitions are denied.

To correct an inadvertent omission in the amendment of Standard No. 119 in response to petitions for reconsideration (39 F.R. 5190, February 11, 1974), superscripts are added to Table III entries for "All other, A, B, C, D range tires".

In consideration of the foregoing, Parts 571 and 574 of Title 49, Code of Federal Regulations, are amended. . . .

Effective date: Standard No. 119 amendments: March 1, 1975. Part 574 amendment: April 3, 1974. Because the Part 574 amendment creates no additional burden, and because modification of tire molds must begin immediately, it is found for good cause shown that an effective date less than 180 days after issuance is in the public interest.

(Secs. 103, 112, 119, 201, Pub. L. 89–563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on March 28, 1974.

James B. Gregory
Administrator

39 F.R. 12104
April 3, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 74-25; Notice 2)

This notice amends the definition of "test rim" in 49 CFR 571.109 (Motor Vehicle Safety Standard No. 109) and modifies related provisions of that section and § 571.110 (Motor Vehicle Safety Standard No. 110). A conforming amendment is made to similar provisions in § 571.119 (Motor Vehicle Safety Standard No. 119). The notice of proposed rulemaking on which this amendment is based was published on July 10, 1974 (39 F.R. 25329).

The definition of "test rim" has previous to this amendment referenced the 1967 and earlier editions of publications of various foreign and domestic tire and rim associations as the source for determining rim specifications and appropriate tire/rim matching information for testing tires to the requirements of Motor Vehicle Safety Standard No. 109, and for equipping passenger cars pursuant to Motor Vehicle Safety Standard No. 110. The Rubber Manufacturers' Association petitioned that this reference be changed because the publications have become outdated in terms of the rim information they provide. This amendment, which adopts the proposed rule of July 10, 1974, in essentially the form proposed, deletes the references to the 1967 and earlier publications and substitutes for them the publications of the various associations current at the time of tire manufacture.

Under the amendment, a "test rim" will be any rim listed for use with a tire size designation in any of the current publications of the various foreign and domestic tire and rim associations. The listing will apply to all tires that fit the description (by tire size designation, use category, etc.) unless the publication itself or a separately published manufacturer's document states otherwise. A manufacturer wishing to except any tire manufactured by him from any listing would be expected to request the association to publish the exception in its publication. If it does not, the manufacturer must himself publish the exception in his own listing, which he must distribute to his dealers, this agency, and to any member of the public on request. The language of the proposal is clarified, and a conforming amendment made to Standard No. 119 to show that an exception must be published in each association publication listing the tire and rim combination. The amendment further specifies that a "listing" of a rim must contain dimensional specifications, including diagrams, for the rim. This is necessary to provide for uniformity of rim dimensions and reflects the present practice of association publications of publishing such dimensional specifications. However, dimensional specifications or a diagram of a rim need not be included in manufacturers' separate listings if the specifications and diagram for the rim appear in each association publication where it is listed.

By referencing the current publications, the amendment ends the need for Appendix "A" of Standard No. 110, which lists tire/rim combinations approved for use subsequent to the 1967 and earlier associations publications. The associations and various manufacturers should ascertain that all tire/rim combinations presently listed in that Appendix are incorporated into at least one of their respective publications before the effective date of this amendment. Moreover, the addition of new tire/rim combinations subsequent to the effective date becomes the sole responsibility of the industry. Appendix "A" of Standard No. 109, listing tire size designations, is not affected by this amendment.

An effect of the amended definition of test rim is to clarify this agency's position that each tire must be able to pass each performance requirement (except that for physical dimensions) of Standard No. 109 with any rim with which it is listed, regardless of rim width, unless that tire is specifically excepted from each listing where it appears. The requirements for physical dimensions must be met only on a test rim of the width specified for the tire size designation in Standard No. 109. A tire failing the requirements on any test rim would be considered as having failed the requirements on all test rims. This continues existing NHTSA enforcement policy.

One of the two comments received regarding the proposal objected to this aspect of the amendment, arguing that some manufacturers have traditionally certified conformity on the basis of test results using only the test rims of the specified test rim width and that no safety problems had been encountered. The NHTSA believes, however, that the interest of safety demands that manufacturers ensure that tires certified as conforming to Standard No. 109 will conform to the standard's requirements on any rim which the manufacturer lists for use with the tire and with which the tire may consequently be used in service. This position has been reflected in the guidelines for the additions of new tire/rim combinations to the Appendix of Standard No. 110, which have required that the manufacturer demonstrate conformity to Standard No. 109 on each newly requested rim. If a manufacturer doubts the ability of his tires to conform to the standard on certain recommended rims, he has the option of excepting his tires from being used with those rims. No other objections to the proposed rule were received.

In light of the above, amendments are made to 49 CFR §§ 571.109, 571.110, and 571.119 . . . .

Effective date: August 5, 1975 for Standards No. 109 and 110; March 1, 1975, for Standard No. 119. The amendment to Standard No. 119 is of a clarifying nature, and should be made effective with the existing effective date of that standard. The amendment does not require substantial leadtime for conformity, and it is found for good cause shown that an effective date less than 180 days from publication is in the public interest.

(Secs. 103, 119, 201. 202, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. §§ 1392, 1407, 1421, 1422; delegation of authority at 49 CFR 1.51.)

Issued on January 31, 1975.

James B. Gregory
Administrator

40 F.R. 5529
February 6, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71-18, Notice 10)

This notice establishes a uniform tire testing temperature for the test requirements of the Uniform Tire Quality Grading regulation and the Federal motor vehicle safety standard for non-passenger-car tires. This amendment simplifies existing requirements by permitting various tire tests to be conducted at the same temperature.

Effective date: July 17, 1978.

For further information contact:

Arturo Casanova III, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1715).

Supplementary information: The National Highway Traffic Safety Administration (NHTSA) proposed on March 3, 1977, to amend the ambient temperature conditions for tire testing contained in Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (49 CFR 571.119), and in Part 575, *Uniform Tire Quality Grading* (49 CFR 575.104) (UTQG). The purpose of this proposed amendment was to harmonize existing tire testing temperatures as requested by the Goodyear Tire and Rubber Company. The ambient temperatures were previously specified as follows:

Standard No. 109: "100±5° F."

Standard No. 119: "any temperature . . . up to 100° F."

UTQG: "at 105° F."

In the notice of proposed rulemaking, the agency proposed to amend Standard No. 119 and UTQG to reflect the tire temperature utilized in Standard No. 109 (100±5° F.). As an alternative method of expressing the test temperature, the NHTSA proposed to amend the standards to specify "any temperature up to 95° F.

Five comments were received in response to that proposal. All comments favored the proposed amendment that would have instituted a 100±5° F. temperature. The Vehicle Equipment Safety Commission did not take a position on this proposal.

After consideration of the issues involved in the proposal and review of the comments, the agency has determined that the test temperature should be expressed as "any temperature up to 95° F." Accordingly, Standard No. 119 and UTQG are amended to specify temperature testing at "any temperature up to 95° F." It is the NHTSA's opinion that the 95° F. test temperature is in effect the same test temperature as would be achieved by using the 5-degree tolerance (100±5).

The NHTSA has often stated in interpretations on similar issues that the use of tolerances in safety standards reflects a misunderstanding of the legal nature of the safety standards. Standards are not instructions, but performance levels that vehicles or equipment are required by law to be capable of meeting. Any tolerance in this context would be meaningless and misleading, since it would merely have the effect of stating a performance level that the equipment must meet when tested by the government, but in a confusing manner.

Recognizing that no measurement is perfectly precise, a manufacturer's tests should be designed to show, using tire testing temperature as an example, that his tires will comply with the requirements at exactly 95° F. This may be done in at least two ways: (1) by using a test method that corresponds so closely to the required temperature that no significant differences could occur as a result of differences between the actual temperature and the specified one, or (2) by determining which side of the specified temperature is adverse to the product tested, and being sure that the actual temperature of the test differs from the specified one on the adverse side.

The amendment of Standard No. 119 and UTQG to reflect the 95° F. temperature creates a different temperature phraseology for those standards than exists in Standard No. 109 which still has the $100 \pm 5°$ F. temperature. As stated earlier, the NHTSA considers the Standard No. 109 temperature tolerance to mean in actuality "any temperature up to 95° F." However, since modification of that standard was not proposed in the earlier notice, the agency does not amend it in this final rule. However, the agency intends to issue an interpretive amendment that will amend Standard No. 109 to adopt the alternative expression for tire temperature testing (any temperature up to 95° F.) unless objections are received.

In accordance with Departmental policy encouraging analysis of the impact of regulatory actions upon the public and private sectors, the agency has determined that this modification will result in no appreciable safety gains or losses. These amendments may result in slightly lower costs for tire temperature testing since all temperatures will be uniform.

Since these amendments relieve restrictions and impose no additional burdens, it is found for good cause shown that an immediate effective date is in the public interest.

In consideration of the foregoing, the following amendments are made in Parts 571 and 575 of Title 49, Code of Federal Regulations. . . .

The program official and lawyer principally responsible for the development of this rulemaking document are Arturo Casanova and Roger Tilton, respectively.

(Secs. 103, 112, 119, 201, 203, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1421, 1423); delegation of authority at 49 CFR 1.50.)

Issued on July 12, 1978.

Joan Claybrook
Administrator

43 F.R. 30541-30542
July 27, 1978

MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

S1. Scope. This standard establishes performance and marking requirements for tires for use on multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles.

S2. Purpose. The purpose of this standard is to provide safe operational performance levels for tires used on motor vehicles other than passenger cars, and to place sufficient information on the tires to permit their proper selection and use.

S3. Application. This standard applies to new pneumatic tires designed for highway use on multipurpose passenger vehicles, trucks, buses, trailers and motorcycles manufactured after 1948.

S4. Definitions. All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

"Light truck tire" means a tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

"Model rim assembly" means a test device that (a) includes a rim which conforms to the published dimensions of a commercially available rim, (b) includes an air valve assembly when used for testing tubeless tires or an innertube and flap (as required) when used for testing tube-type tires, and (c) undergoes no permanent rim deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber when a tire is properly mounted on the assembly and subjected to the requirements of this standard.

S5. Tire and rim matching information.

S5.1 Each manufacturer of tires shall ensure that a listing of the rims that may be used with each tire that he produces is provided to the public. For purposes of this section, each rim listing shall include dimensional specifications and a diagram of the rim. However, a listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of a rim if the rim's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b). The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires, to any person upon request, and in duplicate to: Tire Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590; or

(b) Contained in publications, current at the date of the manufacture of tire or any later date, of at least one of the following organizations:

The Tire and Rim Association.

The European Tyre and Rim Technical Organisation.

Japanese Industrial Standards.

Deutsche Industrie Norm.

The Society of Motor Manufacturers and Traders, Ltd.

British Standards Institution.

Scandinavian Tire and Rim Organisation.

S5.2 Information contained in a publication specified in S5.1(b) which lists general categories of tires and rims by size designation, type of construction, and/or intended use, shall be considered to be manufacturer's information pursuant to S5.1 for the listed tires, unless the publication itself or specific information provided according to S5.1(a) indicates otherwise.

S6. Requirements Each tire shall be capable of meeting any of the applicable requirements set forth below, when mounted on a model rim assembly corresponding to any rim designated by the tire manufacturer for use with the tire in accordance with S5. However, a particular tire need not meet further requirements after having been subjected to and met the endurance test (S6.1), strength test (S6.2), or high speed performance test (S6.3).

S6.1 Endurance.

S6.1.1 Prior to testing in accordance with the procedures of S7.2, a tire shall exhibit no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

S6.1.2 When tested in accordance with the procedures of S7.2:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

(b) The tire pressure at the end of the test shall be not less than the initial pressure specified in S7.2(a).

S6.2 Strength. When tested in accordance with the procedures of S7.3 a tire's average breaking energy value shall be not less than the value specified in Table II for that tire's size and load range.

S6.3 High speed performance. When tested in accordance with the procedures of S7.4, a tire shall meet the requirements set forth in S6.1.1 and S6.1.2(a) and (b). However, this requirement applies only to motorcycle tires and to non-speed-restricted tires of 14.5-in nominal rim diameter or less marked load range A, B, C, or D.

S6.4 Treadwear indicators. Except as specified below, each tire shall have at least six treadwear indicators spaced approximately equally around the circumference of the tire that enable a person inspecting the tire to determine visually

TABLE I—Strength Test Plunger Diameter

Tire type:	Plunger Diameter (inches)
Light truck	$\frac{3}{4}$
Motorcycle	$\frac{5}{16}$
Tires for 12-inch or smaller rims, except motorcycle	$\frac{3}{4}$
Tires other than the above types:	
Tubeless:	
17.5-inch or smaller rims	$\frac{3}{4}$
Larger than 17.5-inch rims:	
Load range F or less	$1\frac{1}{4}$
Load range over F	$1\frac{1}{2}$
Tube type:	
Load range F or less	$1\frac{1}{4}$
Load range over F	$1\frac{1}{2}$

TABLE II—Minimum Static Breaking Energy (Inch-Pounds)

Plunger diameter	$\frac{5}{16}$ Inch	$\frac{3}{4}$ Inch		$1\frac{1}{4}$ Inch		$1\frac{1}{2}$ Inch	
Tire characteristic	Motorcycle	All 12-inch or smaller rim size	-Light truck -17.5 inch or smaller Rim Tubeless	Tube type	Tubeless	Tube type	Tubeless
Load range							
A	150	600	2000	----	----	----	----
B	300	1200	2600	----	----	----	----
C	400	1800	3200	6800	5100	----	----
D	---	2400	4550	7900	6500	----	----
E	---	3000	5100	12500	8600	----	----
F	---	3600	5700	15800	12500	----	----
G	---	----	6300	----	----	20200	1500
H	---	----	6800	----	----	23000	18500
J	---	----	----	----	----	25000	19500
L	---	----	----	----	----	27000	----
M	---	----	----	----	----	28500	----
N	---	----	----	----	----	30000	----

For rayon cord tires, applicable energy values are 60 percent of those in table.

TABLE III—Endurance Test Schedule

Description	Load range	Test wheel speed (rpm)	Test load: Percent of maximum load rating			Total test revolutions (thousands)
			I 7 hrs.	II 16 hrs.	III 24 hrs.	
Speed-Restricted service						
55 m.p.h.	All	125	66	84	101	352.5
50 m.p.h.	C, D	150	75	97	114	423.0
	E, F, G, H, J, L	100	66	84	101	282.0
35 m.p.h.	All	75	66	84	101	211.5
Motorcycle	All	250	[1]100	[2]108	117	510.0
All others	A, B, C, D,	250	[1]75	[2]97	114	510.0
	E	200	70	88	106	564.0
	F	200	66	84	101	564.0
	G	175	66	84	101	493.5
	H, J, L, N	150	66	84	101	423.0

[1] 4 hours for tire sizes subject to high speed requirements (S6.3)
[2] 6 hours for tire sizes subject to high speed requirements (S6.3)

whether the tire has worn to a tread depth of one-sixteenth of an inch. Tires with 12-inch or smaller rim diameter shall have at least three such treadwear indicators. Motorcycle tires shall have at least three such indicators which permit visual determination that the tire has worn to a tread depth of one-thirty-second of an inch.

S6.5 Tire marking. Except as specified below, each tire shall be marked on each sidewall with the information specified in paragraphs (a) through (j) of this section. The markings shall be placed between the maximum section width (exclusive of sidewall decoration or curb ribs) and the bead on at least one sidewall. The marking shall be in letters and numerals not less than 0.078 inches high and raised above or sunk below the tire surface not less than 0.015 inches, except that the marking depth shall be not less than 0.010 inches in the case of motorcycle tires. The tire identification and the DOT symbol labeling shall comply with Part 574 of this chapter. Markings may appear on only one sidewall and the entire sidewall area may be used in the case of motorcycle tires and recreational, boat baggage, and special trailer tires.

(a) The symbol DOT, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards. This symbol may be marked on only one sidewall.

(b) The tire identification number required by Part 574 of this chapter. This number may be marked on only one sidewall.

(c) The tire size designation as listed in the documents and publications designated in S5.1.

(d) The maximum load rating and corresponding inflation pressure of the tire, shown as follows:

(mark on tires rated for single and dual load)
Max load single ________ lbs at ________ psi cold
Max load dual ________ lbs at ________ psi cold
(Mark on tires rated only for single load)
Max load ____________ lbs at ____________ psi cold

(e) The speed restriction of the tire, if 55 mi/h or less, shown as follows:

Max speed _________ mph

(f) The actual number of plies and the composition of the ply cord material in the sidewall, and, if different, in the tread area.

(g) The words "tubeless" or "tube type" as applicable.

(h) The word "regroovable" if the tire is designed for regrooving.

(i) The word "radial" if a radial tire.

(j) The letter designating the tire load range.

S6.6 Maximum load rating. If the maximum load rating for a particular tire size is shown in one or more of the publications described in S5.1(b), each tire of that size designation shall have a maximum load rating that is not less than the published maximum load rating, or if there are differing published ratings for the same tire size designation, not less than the lowest published maximum load rating for the size designation.

S7. Test procedures.

S7.1 General conditions.

S7.1.1 The tests are performed using an appropriate new tube, tube valve and flap assembly (as required) that allows no loss of air for testing of tube-type tires under S7.2, S7.3, and S7.4, and tubeless tires under S7.3.

S7.1.2 The tire must be capable of meeting the requirements of S7.2 and S7.4 when conditioned at any ambient temperature up to 100° F. for 3 hours before the test is conducted, and with an ambient temperature maintained at any level up to 100° F. during all phases of testing. The tire must be capable of meeting the requirements of S7.3 when conditioned at any ambient temperature up to 70° F. for 3 hours before the test is conducted.

S7.2 Endurance. (a) Mount the tire on a model rim assembly and inflate it to the inflation pressure corresponding to the maximum load rating marked on the tire. Use single maximum load value when the tire is marked with both single and dual maximum load.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a) immediately before mounting the tire rim assembly.

(c) Mount the tire-rim assembly on an axle and press it against a flat-faced steel test wheel that is 67.23 inches in diameter and at least as wide as the tread of the tire.

(d) Apply the test load and rotate the test wheel as indicated in Table III for the type of tire tested conducting each successive phase of the test without interruption.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

S7.3 Strength. (a) Mount the tire on a model rim assembly and inflate it to the pressure corresponding to the maximum load, or maximum dual load where there is both a single and dual load marked on the tire. If the tire is tubeless, a tube may be inserted to prevent loss of air during the test in the event of puncture.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a).

(c) Force a cylindrical steel plunger, with a hemispherical end and of the diameter specified in Table I for the tire size, perpendicularly into a raised tread element as near as possible to the centerline of the tread, at a rate of 2 inches per minute, until the tire breaks or the plunger is stopped by the rim.

(d) Record the force and the distance of penetration just before the tire breaks, or if it fails to break, just before the plunger is stopped by the rim.

(e) Repeat the plunger application at 72° intervals around the circumference of the tire, until five measurements are made. However, in the case of tires of 12-in rim diameter or less, repeat the plunger application at 120° intervals around the circumference of the tire, until three measurements are made.

(f) Compute the breaking energy for each test point by the following formula:

$$W = \frac{FP}{2}$$

where

W = Breaking energy
F = Force in pounds, and
P = Penetration in inches.

(g) Determine the average breaking energy value for the tire by computing the average of the values obtained in accordance with (f).

S7.4 High speed performance.

(a) Perform steps (a) through (c) of S7.2.

(b) Apply a force of 88 percent of the maximum load rating marked on the tire (use single maximum load value when the tire is marked with both single and dual maximum loads), and rotate the test wheel at 250 rpm for 2 hours.

(c) Remove the load, allow the tire to cool to 100° F., and then adjust the pressure to that marked on the tire for single tire use.

(d) Reapply the same load, and without interruption or readjustment of inflation pressure, rotate the test wheel at 375 rpm for 30 minutes, then at 400 rpm for 30 minutes, and then at 425 rpm for 30 minutes.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

38 F.R. 31299
November 13, 1973

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71–19; Notice 3)

This notice establishes a new Federal Motor Vehicle Safety Standard No. 120, *Tire selection and rims for motor vehicles other than passenger cars*, 49 CFR 571.120, and amends 49 CFR Part 567, *Certification*. The new standard specifies tire and rim selection requirements for multipurpose passenger vehicles (MPV's), trucks, buses, trailers, and motorcycles, and marking requirements for rims for use on these vehicles. It also adds tire and rim matching information to the items required to appear on such vehicles' certification labels. The amendment to Part 567 makes that regulation consistent with the new standard. The notice is based on proposals which were published August 3, 1971 (36 F.R. 14273) and June 3, 1974 (39 F.R. 19505).

The standard requires new vehicles (other than passenger cars, which are the subject of Standard No. 110) to be equipped with tires that comply with either Standard No. 109, *New Pneumatic Tires—Passenger Cars*, or Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars*. The tires must be fitted to rims which have been designated by the tire manufacturer, in accordance wifh S4.4 of Standard No. 109 or S5.1 of Standard No. 119, as suitable for use with those tires. The designations are made by listing the tire-rim matching information in one of seven industry-maintained publications or by furnishing this information to dealers of the manufacturer's tires, to any person upon request, and to the NHTSA.

Each axle must be equipped with tires the sum of whose load ratings is not less than that axle system's Gross Axle Weight Rating (GAWR). In certain situations, discussed below, a vehicle may be equipped with used tires of adequate load rating that were originally manufactured to comply with Standard No. 119. Adequacy is determined as follows: the sum of the maximum load ratings of the tires must be equal to or greater than the GAWR which is specified on the Part 567 certification label, with an exception discussed below. If the certification label lists more than one GAWR-tire combination for the axle, the sum of the tires' maximum load ratings must meet or exceed the GAWR that corresponds to the tires' size designation. If more than one combination is listed, but the size designation of the actual tires on the vehicle is not among those listed, then the sum of the load ratings must simply meet or exceed the lowest GAWR which does appear.

Rims must be marked with five items of information: the size designation (and, in the case of multipiece rims, the type designation), an indication of the source of the rim's nominal dimensions, and the DOT symbol must appear on the weather side, while identification of the manufacturer and date of manufacture may appear at any place on the rim's surface. The standard does not explicitly require that a rim conform to its published dimensions. If a rim's deviation from these nominal dimensions is so great that a safety hazard is presented, however, the defect notification and remedy provisions of the National Traffic and Motor Vehicle Safety Act of 1966, as amended, provide authority to deal with the hazard.

To reduce the possibility of confusion and to minimize the number of characters stamped on the rim, the standard establishes a set of code letters to indicate the source of the rim's nominal dimensions. "T", "E", "J", "D", "M", "B", and "S" indicate the industry publications listed in Standards Nos. 109 and 119, while "N" indicates an independent listing with tire dealers and the NHTSA. The proposed requirement that the marking indicate the date of the publication has not been adopted because it does not appear necessary. The standard does not require manufacturers to be identified with a code number assigned by the NHTSA, because no action has been taken on the proposal published in the Federal Register on June 7, 1973 (38 F.R. 14968). The rim manufacturer is free to use his name, trademark, or a symbol of his choice. Because a rim's maximum load rating may be limited by its disc, this standard does not require that the maximum load rating be marked. The rim's maximum inflation pressure, while not affected by the choice of disc, is potentially misleading without additional marking of the disc. These rim markings are being considered in conjunction with further NHTSA rulemaking activity concerning wheels.

Several commenters objected to the proposed requirement of a tire-rim information label, separate from and adjacent to the certification label required by Part 567. Upon consideration of these comments, the NHTSA agrees that a separate placard is unnecessary. GVWR and GAWR are already required to appear on the certification label. If the required manufacturer exercises his option of listing more than one GVWR-GAWR combination, he is already required to indicate the proper tire size designations after each weight rating. Standard No. 120 further requires, for vehicles other than passenger cars, the following information to appear after each weight rating and tire size designation listed on the certification label: rim size designation, cold inflation pressure for the tires, and speed restriction (if any) for the tires. This information is now required to appear even when only one GVWR-GAWR combination is listed. The Part 567 label is thus expanded to include the information that would have appeared on the separate label described in S5.4 of the proposed Standard No. 120.

Many commenters pointed to the large number of possible axle-tire-rim combinations and suggested that the information label would be too large and confusing. Some discussed the vehicle manufacturer's difficulty in ensuring that the required information appear, given the common practice of changing tires and rims after a new vehicle has been shipped to a dealer. These commenters appear to have misunderstood the various proposed and existing requirements. Part 567 does not, in its prior form or as amended today, require a listing for more than one GVWR-GAWR-tire combination. Further, while S5.1.2 of Standard No. 120 requires the tires with which a new vehicle is equipped to be of adequate load rating for the GAWR, and while S5.3 requires an indication of tires adequate for the GAWR, there is no requirement that the actual tires be listed on the certification label. The tire information on that label is intended as a guide which tells the user what replacement tires, *as a minimum*, are appropriate for the listed GAWR and what rims are appropriate for those tires.

Guerdon Industries, Inc., objected to the requirement that vehicles be restricted to the load limits molded on tire sidewalls. The pointed to the mobile home industry's practice of loading tires to 150 percent of their load ratings, and argued that this practice should be permitted to continue. Examination of data compiled by the Bureau of Motor Carrier Safety, however, shows that from 1969 to 1972 (the most recent years for which figures are available), tires accounted for 18.0 percent of reported mobile home accidents. The NHTSA therefore rejects the proposition that such overloading does not present a safety hazard. There is no exception to the requirement that all vehicles be equipped with tires of adequate load rating.

Some commenters requested that tire overloading be permitted under restricted speed conditions. These commenters appear to have misunderstood the scope of the standard. Vehicles-in-use are regulated by the States and by the Bureau of Motor Carrier Safety. Standard No. 120 does not prohibit the overloading of tires in speed-restricted service, or otherwise regulate the use of tires or vehicles. The GVWR and GAWR information on the certification label is based on unrestricted service.

The formula described above for tire selection is subject to an exception for MPV's, trucks, buses, and trailers which are equipped with passenger car tires. The combined maximum load rating of the passenger car tires on an axle must be equal to or greater than 110 percent of the axle's GAWR. Some comments supported this exception as it was proposed. Others suggested that passenger car tires be permitted on such vehicles without the 110% factor, while the RMA and others argued that passenger car tires should not be permitted on trailers at all. The NHTSA rejects the argument that the 110% correction factor is unnecessary. Because non-passenger-car service on the average puts greater stresses on a tire (for example, trucks and trailers are driven at or near their maximum rated loads more often than passenger cars), a given load rating for a Standard No. 109 tires does not have the same meaning as the identical load rating for a Standard No. 119 tire. Conversely, the NHTSA has found no evidence that passenger car tires are inadequate for trailer service when the load correction factor is applied. The 110 percent factor is therefore adopted as proposed.

As proposed, the standard included an exception to the requirement that new vehicles be equipped with new tires conforming to Standard No. 109 or 119. Used tires were to be permitted on a truck, bus, or trailer (other than a mobile structure trailer) under the following conditions: the tires were originally manufactured to comply with Standard No. 119; they were of adequate load rating; they were owned or leased by the purchaser; and they were installed on the new vehicle at its place of manufacture at the purchaser's request. Comments on this exception were generally favorable, although one mobile home manufacturer objected to the exclusion of mobile structure trailers. The exception was intended to accommodate commercial delivery practices in the truck, bus, and trailer industry. While fleets which lease tires on a mileage-contract basis or which install their own used tires on new vehicles are in a good position to know the condition of these tires, the mobile home purchaser has no knowledge of the history of used tires installed on his vehicle. The proposed exception to the new tire requirement is therefore not extended to include all mobile structure trailers. It is, however, extended to include those delivered to the purchaser by a motor carrier, because a motor carrier (who is subject to Bureau of Motor Carrier Safety regulations) can be expected to be more familiar with tire safety needs than a typical purchaser. To clarify the proposed language, " originally manufactured to comply with Standard No. 119," the words "as evidenced by the DOT symbol" have been added to the text of the standard.

Several commenters pointed out that certain vehicles are designed for non-uniform side to side loading, and suggested that the proposed method of determining the necessary tire load rating from the GAWR (dividing GAWR by the number of wheel positions on the axle) is inadequate for such vehicles. These commenters argued that tire load rating should be based on the maximum wheel load, rather than on the GAWR. The standard issued today does not specify the maximum load rating to be exceeded by each tire on any given axle. Instead, it requires the sum of those load ratings to meet or exceed the GAWR. The manufacturer of an asymmetrically designed vehicle can therefore equip an axle with tires of differing load ratings. The NHTSA agrees that each tire should be capable of carrying its maximum expected wheel load. At this time, however, the NHTSA considers its defect authority, combined with the new standard, adequate to ensure that vehicles are equipped with such tires.

Definitions have been added to clarify the meaning of "rim base," "rim size designation," "rim type designation," "rim diameter," "rim width," and "weather side." Definitions suggested for other terms have not been included in the standard because the meanings have been found to be widely understood or self evident.

Many comments pointed out problems with a single effective date. For example, for marked rims to be available to vehicle manufacturers in time, and interval is necessary between the effective dates for the rim marking requirement and the requirement that vehicles be equipped with rims that comply with the standard. Similarly, to require all used tires, otherwise permitted by S5.1.3 to have originally been manufactured to comply with Standard No. 119 would, without a delay in the effective date, cause the waste of pre-Standard No. 119 tires of adequate load-carrying capacity. Accordingly, a staggered system of effective dates is established as set out below.

In consideration of the foregoing, Chapter V of Title 49, Code of Federal Regulations, is amended....

Effective dates: For the amendment to Part 567: September 1, 1976. For Standard No. 120: August 1, 1976, for the rim marking requirements (S5.2), and September 1, 1976, for the remaining requirements except as otherwise provided in the standard.

(Secs. 103, 112, 114, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on January 19, 1976.

James B. Gregory
Administrator

41 F.R. 3478
January 23, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71–19; Notice 4)

This notice delays the effective dates of certain requirements of Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars, and of the conforming amendment to 49 CFR Part 567, Certification, that was issued along with the standard. Its purpose is to permit manufacturers to avoid the burden of preparation for compliance with requirements that the NHTSA has determined should be amended. There is no delay, however, in the standard's basic tire and rim selection requirements, which become effective September 1, 1976.

Standard No. 120 (49 CFR § 571.120) was issued on January 19, 1976 (41 FR 3478; January 23, 1976; Notice 3). It specifies requirements for tire and rim selection, rim marking, and the provision of tire and rim information on vehicle certification labels. Part 567, the certification regulation, was amended in the same FEDERAL REGISTER notice, to accommodate the additional labeling.

Manufacturers are expected to begin preparations for compliance with a standard at the time a final rulemaking notice is issued. Lead times are established in accordance with this expectation, despite the possibility of future amendments. Fifteen petitions for reconsideration of Standard No. 120 have been received. From the petitions and other information available to this agency, the NHTSA has determined that certain provisions of the standard should be amended. However, the agency finds it impracticable to respond to the petitions by May 24, 1976, the date by which a response would be expected under its policy regarding such responses (49 CFR Part 553, Appendix). The agency plans to respond to the petitions not later than July 1, 1976. Without a delay of certain effective dates, manufacturers would be forced to make preparation for compliance with requirements that will, in all likelihood, be changed.

Accordingly, this notice changes from September 1, 1976, to September 1, 1977, the effective date of the requirement, found in S5.3, that certain information appear on a vehicle's certification label. The effective date of the conforming amendment to Part 567, *Certification*, is similarly changed to September 1, 1977. The effective date of S5.2, *Rim Marking*, is changed from August 1, 1976, to August 1, 1977. The date by which vehicles must be equipped with rims that are marked in accordance with the standard, which is presently specified in S5.1.1 as March 1, 1977, is changed to September 1, 1979. The NHTSA is considering the possibility of eliminating this requirement entirely, to simplify the phase-in of properly marked rims as they become available.

Manufacturers should note that, apart from the changed effective date for the requirement in S5.1.1 that vehicles be equipped with properly marked rims, there is no delay in the September 1, 1976, effective date of the standard's basic requirement, S5.1 (*Tire and Rim Selection*).

The symbol "DOT" is required by S5.2(c) to appear on every non-passenger-car rim manufactured on or after the effective date of the rim marking requirements, as a certification by the manufacturer of the rim that it complies with all applicable Federal motor vehicle safety standards. Several manufacturers have requested permission to begin stamping the symbol on rims that otherwise comply with the standard, before that effective date. In the past, the NHTSA has in similar situations taken the position that such use of the DOT symbol to indicate "anticipatory compliance" would necessarily be a false or misleading certification, because no standard would in fact be in effect at the time of its use.

The agency has determined that a limited relaxation of this principle will not adversely affect its enforcement authority, yet will both foster early compliance with impending requirements and ease manufacturer's difficulties in transition to new production procedures. Accordingly, the NHTSA will not consider the use of the symbol "DOT" on an item of motor vehicle equipment that is not subject to any applicable and effective standard to be "false or misleading" if the following conditions are met: (i) there has, as of the date of manufacture of the item of equipment, been issued as a final rule a Federal motor vehicle safety standard to which the item of equipment would, but for that date's being earlier than the standard's effective date, be subject; and (ii) the item of equipment meets all requirements set out in the standard as most recently published before the date of manufacture of the equipment. The NHTSA will continue to consider other, unauthorized uses of the symbol to be "false or misleading in a material respect" within the meaning of Section 108(a)(1)(C) of the National Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1398(a)(1)(C)).

This interpretation will permit the requested stamping that is discussed above. It will not permit the restamping, requested by several manufacturers, of previously manufactured rims that are in stock. These latter requests, however, are no longer of practical significance because of the other actions taken in this notice.

In consideration of the foregoing, the effective date of the amendment to 49 CFR Part 567, *Certification*, that was published on January 23, 1976 (49 FR 3478) is changed from September 1, 1976, to September 1, 1977, and changes are made to 49 CFR § 571.120 (Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*) . . . .

Effective date: These changes in the text of the Code of Federal Regulations should be made immediately.

(Sec. 103, 112, 114, 119, 201, 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on April 29, 1976.

Robert L. Carter
Acting Administrator

41 F.R. 18659
May 6, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71-19; Notice 5)

This notice amends Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars (49 CFR 571.120), to permit until February 28, 1977, the equipping of new non-passenger-car vehicles with tires that do not meet certain tire labeling requirements but that otherwise meet all requirements of Standard No. 119 (New Pneumatic Tires for Vehicles Other Than Passenger Cars).

Standard No. 120 was issued on January 19, 1976 (41 FR 3478; January 23, 1976; Docket No. 71-19, Notice 3). It specifies tire and rim selection requirements for multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, and marking requirements for rims for use on these vehicles. It also adds tire and rim matching information to the items required to appear on such vehicles' certification labels. A staggered sequence of effective dates was set out in Notice 3, beginning with September 1, 1976.

In Notice 4 (41 FR 18659; May 6, 1976), the NHTSA delayed several of these effective dates, to permit manufacturers to defer preparation for compliance with the corresponding requirements pending action on petitions for reconsideration of Notice 3. The NHTSA expects to respond to these petitions in the near future. Notice 4 did not, however, change the basic September 1, 1976, effective date of the tire and rim selection requirements of S5.1. Beginning on that date, S5.1.1 of Standard No. 120 would require, with an exception that is not relevant here, new non-passenger-car vehicles to be equipped with tires that meet either Standard No. 109 (which is applicable to passenger car tires) or Standard No. 119 (which is applicable to all other tires). The practical effect is to require most such vehicles to be equipped with Standard 119 tires, because Standard 109 tires are appropriate for use only on certain non-passenger-car vehicles.

Standard No. 119 became effective on March 1, 1975, with an option to delay implementation of its labeling requirements until March 3, 1975 (see 40 FR 8188; February 26, 1975).

The NHTSA has received petitions for rulemaking from International Harvester (IH) and Ford Motor Company. International Harvester indicated that, in anticipation of the recent strike against the nation's four largest tire manufacturers, it had accumulated an excess inventory of "pre-Standard 119 tires." IH stated that these tires meet the performance requirements of Standard No. 119 but not the labeling requirements. It petitioned for a six-month delay of the September 1, 1976, effective date of Standard No. 120's tire selection requirements, to permit the orderly depletion of this inventory.

Ford's petition focused on the difficulty, due to the strike, in obtaining in the near future sufficient quantities of tires that comply fully with Standard No. 119. Ford indicated that there are similar pre-Standard 119 tires available to it. It petitioned for an amendment to Standard No. 120 to permit the use of such insufficiently labeled tires.

The NHTSA believes that the approach suggested by Ford, because it will provide the necessary relief while preserving the required level of performance, is preferable to a simple delay of the September 1, 1976, effective date. Safety of performance of such tires or of vehicles equipped with them is thus not a major issue. The NHTSA has determined that, while granting the relief requested by these petitions may temporarily make enforcement by this agency more difficult and may postpone the availability of certain tire labeling information to users of new vehicles subject to Standard No. 120, the avoidance of a serious disruption in the truck manufacturing process in this situation is appropriate and in the public interest. Accordingly, this notice adds a new section to Standard No. 120 that permits, for six months, the use of tires that are not properly labeled but otherwise meet all requirements of Standard No. 119.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200; April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. This action imposes no new economic or environmental costs. It creates the benefit of avoidance of serious economic disruption. In light of this benefit and the fact that the required level of tire performance is preserved, any loss in safety benefits would be insignificant in this case.

Because of the imminent effective date of a requirement which would otherwise lead to serious economic disruption, the NHTSA for good cause finds that notice and public procedure on this amendment are impracticable and contrary to the public interest.

In consideration of the foregoing, 49 CFR 571.120 (Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars) is amended by the addition of a new section. . . .

Effective date: August 27, 1976. Because this amendment relieves a restriction, it is found, for good cause shown, that an immediate effective date is in the public interest.

(Secs. 103, 112, 114, 119, 201, 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on August 27, 1976.

Robert L. Carter
Acting Administrator
41 F.R. 37115
September 2, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71–19; Notice 6; Docket No. 75–32; Notice 2)

This notice responds to petitions for reconsideration of the newly established Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*, by amendments to the standard in the areas of tire and rim selection, rim making, and tire label information. A minor amendment of Part 567, "Certification," is also made. In addition, the decision that the agency no longer regulates mobile structure trailers (mobile homes) is also set forth, along with appropriate conforming amendments of Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and § 571.3, *Definitions*, of Part 571.

Standard No. 120 (49 CFR 571.120) establishes that multipurpose passenger vehicles (MPV's), trucks, buses, motorcycles, and trailers shall be equipped with tires and rims that are adequate to support the fully loaded vehicle under contemplated operating conditions. The legislative history of the National Traffic and Motor Vehicle Safety Act (the Act) (15 U.S.C. 1381, et seq.) and § 202 of that Act establish Congress' concern that motor vehicles could be equipped with inadequate tires and that regulation would be necessary to protect against this problem:

> Sec. 202. In standards established under title I of this Act the Secretary shall require that each motor vehicle be equipped by the manufacturer or by the purchaser thereof at the time of the first purchase thereof in good faith for purposes other than resale with tires which meet the maximum permissible load standards when such vehicle is fully loaded with the maximum number of passengers it is designed to carry and a reasonable amount of luggage.

Standard No. 120 was promulgated January 19, 1976 (41 FR 3478, January 26, 1976), and 17 petitions for reconsideration of particular provisions were filed by vehicle, tire, and rim manufacturers, and by trade associations representing these manufacturers. In view of the length of time that has been taken to respond to these petitions for reconsideration, the effective dates for implementation of several of the standard's provisions were delayed (41 FR 18659, May 6, 1976) (41 FR 36657, August 31, 1976). The standard's basic provision for tire and rim selection (S5.1) was not delayed and became effective September 1, 1976.

Tire and rim selection. The primary effect of Standard No. 120 is fulfillment of § 202 of the Act by specification of the minimum load-carrying characteristics of tires on motor vehicles not already subject to the passenger car tire and rim selection requirements of Standard No. 110, *Tire Selection and Rims*, of Part 571. The rim selection requirements of the standard are limited (use of a rim designated as suitable by the tire manufacturer for use with its product; use of "DOT" labeled rims on and after September 1, 1979) in anticipation of more comprehensive regulation of rims as part of an upcoming wheel standard.

Tire selection consist of two elements: With one exception, each vehicle must be equipped with tires that comply with Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (or Standard No. 109, *New Pneumatic Tires*), and the load rating of the tires on each axle of the vehicle must together at least equal the gross axle weight rating (GAWR) for that axle. The term GAWR is defined in § 571.3 of Part 571 as ". . . the value specified by the vehicle manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces." The GAWR concept formalizes the decision each manufacturer makes about the load-bearing ability of the tires, rims, axle, brakes, and suspension components (at a minimum) chosen to support and control the loaded vehicle.

The Truck Equipment Body Distributors Association (TEBDA) questioned the requirement that, with one exception, each vehicle subject to Standard No. 120 be equipped with tires that conform to Standard No. 119 (or Standard No. 109). TEBDA's March 17, 1976, letter concerned certification of trucks equipped for agricultural service with Goodyear "Terra-Tires." The "Terra-Tire" is one example of tires that are placed on specialized motor vehicles which operate both on and off the highway. The tires are specially designed and are unable to be certified to either of the tire performance standards.

Section S5.1.1 specifies that "each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirement of [the tire] standard[s]. . . ." This language is intended to exclude from the requirement for Standard 119 (or 109) tires of those vehicles which the manufacturer (or person later in the chain of distribution) decides to equip with tires other than "tires for highway service." The decision is left with the manufacturer at this time in view of the absence of data that demonstrates problems in the use of these tires that would justify their elimination. Any pattern of accident occurrence that points to unsafe utilization of non-highway service tires would presumably constitute a safety-related defect and could lead to revision of Standard No. 120 to regulate them. At this time, the answer to TEBDA is that the tire selection requirements of S5.1.1 (and S5.1.2 as a logical extension of S5.1.1) would not apply to a vehicle equipped with non-highway service tires. It is emphasized that this exclusion from Standard No. 120 bears no direct relationship to the determination of whether a particular vehicle qualifies as a "motor vehicle" as that term is defined in § 102(3) of the Act.

The second requirement for tire selection (S5.1.2) is that "[t]he sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system. . . ." Comparable further specification exists when multiple ratings appear on the certification label, or the tires used on the vehicle are not listed on the certification label.

Because no petition directly raised objections to the requirements of S5.1.2, the agency first addresses issues raised in a separate and outstanding NHTSA proposal dealing with tire choice and its relationship to GAWR. The action (Definition of "Gross Axle Weight Rating," 40 FR 58152, December 15, 1975) proposed that the GAWR determination be based on, among other things, the vehicle's maximum attainable speed or the maximum load rating of the tire established by the tire manufacturer at 60 mph, whichever is lower. The proposed modification was intended to reflect the industry practice of assigning (in most cases) and labeling (in accordance with Standards 119 and 109) a tire's basic load-carrying capabilities in recognition of the unrestricted highway speeds to which it is normally exposed. This formalization of GAWR determination was intended to prevent manufacturers from assigning higher capabilities to tires than their 60-mph ratings, based on arbitrarily low speeds.

Most comments supported the GAWR proposal, although several truck manufacturers asked that the term "maximum attainable speed" be specifically defined as it is elsewhere in NHTSA regulations. Ford Motor Company opposed the proposed change in the definition of GAWR as an arbitrary selection of only one of the many criteria that enter into the determination of GAWR. The company suggested that other means exist to prevent assignment of arbitrary GAWR's based on tire ratings other than those established at 60 mph and so labeled on the tire sidewall.

The NHTSA agrees with Ford and notes that the "other means" to regulate this practice exist in the tire selection requirements of S5.1.2 of Standard No. 120. At the time of the GAWR proposal, Standard No. 120 had not been made final. Since its implementation on September 1.

1976, a manufacturer is free to determine GAWR as in the past, but the maximum load ratings (marked on the tire sidewall) of tires on the vehicle must be at least equal the GAWR listed. For this reason, the NHTSA's proposal for amendment of the GAWR definition is considered unnecessary and is therefore withdrawn. Further notice and opportunity for comment will precede any further action on the proposal set forth in that notice.

Several issues were raised in regard to the GAWR proposal that should be addressed for purposes of clarification. The Heavy & Specialized Carriers Conference of the American Trucking Associations (HSCC) cautioned the NHTSA against requiring an "unrestricted speed GAWR" on the Part 567 certification label in view of two State laws (or regulations) that no vehicle can operate on the state highways at gross vehicle weights greater than those listed on the vehicle in accordance with Federal regulations. It is common practice to load some "heavy hauler" vehicles to a gross vehicle weight that exceeds the unrestricted speed ratings of the vehicle tires, because the vehicle's tires are capable of carrying greater weight at reduced speeds.

As issued, Standard No. 120 required that the maximum load ratings of the tires at least equal the GAWR. This effectively limits the GVWR to the sum of these GAWR's (except in the case of semi-trailers). In the agency's view, however, the problem cited by HSCC can be avoided by listing additional GAWR's (calculated for reduced speed operation) at the end of the certification plate following the required data on the label. This practice has been followed by members of the Truck Trailer Manufacturers Association (TTMA) and was confirmed as permissible by the NHTSA in a March 5, 1975, letter to the TTMA. In order to aid resolution of issues that may arise between States that wish to refer to the certification label and operators that wish to continue the additional rating system, the agency hereby makes an interpretive amendment to Part 567 to specify where additional ratings may appear.

Based on this understanding of the relationship between choice of tires under S5.1.2 of Standard No. 120 and the determination of GAWR under § 567.4 of Part 567, a modification of the requirements of Standard No. 120 is justified. In the case of a vehicle that is incapable of the 60-mph speed used by tire manufacturers to establish the maximum load rating that is stamped on the tire sidewall (typically a powered vehicle and not a trailer), it would not be reasonable to require the GAWR's to be strictly limited to the sum of the maximum load ratings of the tires on the vehicle. This is because the vehicle will never achieve the speeds for which maximum load ratings were established. In many cases, provision is made to rate tires for a greater load at the lower (but maximum) speed of which a vehicle is capable. In recognition of this extremely limited specialized situation, the agency amends S5.1.2 to permit installation of tires with reduced speed capabilities in the case of vehicles whose maximum attainable speed is not greater than 50 mph. This amendment is considered to be a technical adjustment of language to fully implement the intent of the final rule as it was established. A separate amendment of § 571.3 is made to establish the basis for determination of a vehicle's maximum attainable speeds.

Volkswagen raised a separate issue concerning the requirement that the sum of maximum load ratings at least equal the GAWR of the axle system. This provision, in the case of an MPV, truck, bus, or trailer that is equipped with passenger car tires, requires that the maximum load ratings on the tires be reduced by approximately 10 percent before calculating the sum. The purpose of this 10-percent reduction in tire rating is to account for the generally harsher treatment (impulse and surge loading in the case of MPV's off-road) to which the tires of a vehicle other than a passenger car are exposed that is not accounted for in passenger car tire ratings. Volkswagen requested data showing that MPV's actually experience more abusive treatment in use.

The MPV category is based in part on the existence of characteristics that make these vehicles less amenable to passenger car standards. If Volkswagen has data indicating that the two categories actually experience identical usage, the NHTSA would prefer to adjust the definition to ensure that these vehicles are subject to all passenger car standards. Until that time, the existing rationale for excusing these vehicles from some passenger car standards dictates the use of higher strength tires.

As earlier noted, the rim selection requirements of Standard No. 120 are not substantial, consisting of a requirement that the rims be listed by the tire manufacturer as suitable for use with its tires, and a requirement that, on and after September 1, 1979, the rims used on a vehicle be labeled as specified in S5.2 of the standard. The September 1, 1979, date for use of labeled rims replaced a March 1, 1977, date that proved impractical in view of large inventories of unlabeled rims that exist and will exist long after rim labeling is begun. In establishing the later effective date, the agency noted that it was considering the possibility of eliminating this requirement entirely, to simplify the phase-in of properly marked rims as they become available. Experience with phase-in of newly regulated equipment in other areas such as tires and brake hoses has demonstrated that the requirement for labeled equipment on and after a particular date can create substantial inventory and potential economic waste problems. In view of experience that the delay of labeling requirements has not substantially impeded certification verification and defect actions, the NHTSA has decided to withdraw the requirement (that appears as the last sentence of S5.1.1). It is noted that withdrawal of this requirement does not affect the requirement of S5.1.2 that rims be listed as suitable by the tire manufacturer for use with the tires with which the vehicle is equipped, or the requirement of S5.2 that rims be labeled with specified information.

Mobile structure trailers. With regard to the applicability of this standard and other standards as a general matter, the NHTSA takes this opportunity to publish in the *Federal Register* its conclusion that enactment of the National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the Mobile Home Act) impliedly repealed this agency's authority to regulate mobile homes. This conclusion was announced in a May 5, 1976, letter to the Department of Housing and Urban Development that stated in relevant part:

> The National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the "Mobile Home Act") established within the Department of Housing and Urban Development a comprehensive program for the regulation of mobile homes. We have concluded that one result of that statute's enactment was the implied repeal of the NHTSA's authority with respect to mobile homes. Accordingly, we consider that the enactment has the effect of amending the Vehicle Safety Act's definition of "motor vehicle" to exclude "mobile homes" as the latter term is defined in the Mobile Home Act.

The effect of this conclusion is that tire and rim selection for mobile homes (known as "mobile structure trailers" by the NHTSA) is no longer subject to Standard No. 120 or other regulations issued under authority of the Act. For this reason, references to "mobile structure trailer" in Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and the general definitions section of Part 571 (§ 571.3) are deleted.

On the same subject, a May 25, 1976 (and supplementing July 7, 1976), letter from Firestone to the NHTSA asked whether tires manufactured exclusively for mobile homes and tires that are used on mobile homes (although manufactured for other uses) are subject to regulation under the Act. Similar questions were raised as to the status of rims, some of which are designed exclusively for use on mobile homes and some of which are used on mobile homes and other vehicles.

As for tires, Standard No. 109 applies to "tires for use on passenger cars" and Standard No. 119 applies to "tires designed for highway use on [specified motor vehicles]." By these terms, neither standard applies to tires designed exclusively for use on mobile homes. In the case of tires actually used on mobile homes but designed for use also on vehicles subject to the Act, the agency considers such tires to be subject to the standards' requirements because they constitute motor vehicle equipment as that term is defined in § 102(4) of the Act.

As for rims, Standard No. 110 contains specifications only for rims that equip passenger cars and therefore contains no requirements that would directly require performance of a rim that was installed on a mobile home. Standard No. 120 applies to rims "for use on" MPV's, trucks, buses, motorcycles, and trailers (other than mobile structure trailers) and therefore would not apply to rims designed exclusively for use on mobile homes. In the case of rims designed for use on any of the motor vehcile types listed, the NHTSA would consider Standard No. 120's requirements applicable, and labeling in accordance with S5.2 would be required.

Rim marking. The second requirement of Standard No. 120 is an equipment requirement specifying five items of information (six in the case of multipiece wheels) that must appear on any rim for use on MPV's, trucks, buses, trailers, or motorcycles. The requirements for location of the information varies according to the type of information and whether the rim is part of a single or multipiece wheel. In answer to a question raised by Kelsey-Hayes and Motor Wheel, it is confirmed that these marking requirements have no bearing on the use of the rim on passenger cars, except as future labeling requirements in Standard No. 110 might prohibit one or more of the items required by S5.2. This eventuality is considered to be extremely unlikely.

Based on a comprehensive review of the petitions for reconsideration, the agency has decided that some requested modifications in labeling requirements are justified. The Japanese Automobile Manufacturers Association and Suzuki asked that required labeling be permitted to be embossed as well as impressed on the rim. Volkswagen (and representatives from Motor Wheel and Goodyear in a February 4, 1976, meeting with the NHTSA) asked that rim labeling be permitted on the disc portion of a single-piece wheel. The agency considers these suggestions to constitute justifiable options that would not diminish the level of motor vehicle safety represented by the standard, and the standard is accordingly amended.

Motor Wheel requested amendment of the standard to state that labeling of multipiece rims is permitted in the bolt hold area. The agency does not consider the addition of advisory information to be a desirable drafting practice because the mention of bolt hole locations would imply that some restriction on location exists when in fact it does not. In answer to another question from Motor Wheel, more than one "rim type designation" on rim components of a multipiece wheel is permitted by the standard.

Motor Wheel and Goodyear also asked if numbers that contain decimals or "trailing zeroes" e.g., 7.50) could be shortened by deleting the decimal and "trailing zero." The agency believes that abbreviation by dropping the zero will not be confusing and amends the standard to include an example of such abbreviation. Confusion would result from dropping the decimal.

In response to a request by Motor Wheel and Budd Company for a specific provision in S5.1.2 that the marking requirements only apply to newly manufactured wheels, the agency notes the general applicability statement in § 571.7, governing the applicability of all standards found in Part 571, states that ". . . each standard set forth in subpart B of this part applies according to its terms to all motor vehicles or items of motor vehicle equipment the manufacture of which is completed on or after the effective date of the standard." Thus, the standard only applies to rims manufactured on or after the effective date of S5.2.

Manufacturers asked for several revisions of the marking requirements which the agency has considered and concludes are unjustified. This discussion treats the requests in the order that the markings in question appear in S5.2.

With regard to the requirement for marking with a designation that indicates the source of the rim's published dimensions (S5.2(a)), Daido Corporation asked whether the Japanese Industrial Standards' symbol (a stylized combination of the letters J, I, and S) or the letters "JIS" would meet the requirements of S5.2(a)(3) for use of letter "J." The agency interprets its labeling requirements as strictly as any other portion of its requirements and concludes that neither "JIS" nor the JIS symbol would conform to the requirement of S5.2(a)(3). In response to a similar request by Volkswagen to permit "DIN" in place of "D," the agency has considered the idea of permitting the manufacturer the option of a choice of designations, and concludes they are undesirable in the interests of maintaining uniformity and comprehension.

Grove Manufacturing suggested that the single letter designations of "D" and "E" could be mistaken for the load ranges that appear on tires and on the certification label. The agency concludes that the designations on the rim are sufficiently separated to preclude confusion and therefore the recommendation by Grove is not undertaken.

The "rim size designation" required by S5.2(b) is defined in S4 to mean the rim diameter and width. Daido and Volkswagen asked that a width designation followed by a diameter designation be considered as satisfying the requirement for designation of diameter and width. The agency specified the existing order to distinguish rim designations from tire designations. This order of information is being considered as the uniform practice to be adopted by the International Standards Organization. For reasons of uniformity, the requests are denied.

Volkswagen asked that the "DIN" symbol be permitted to signify compilance of the rim with Standard No. 120 in place of the "DOT" symbol required by S5.2(c) for this purpose. The agency does not find that the requirement of § 114 of the Act for certification is satisfied by use of a designation that has a wholly different meaning. Volkswagen's request is therefore denied.

Certification label. The third requirement of Standard No. 120 is that information about suitable tires and rims for use on the vehicles, along with appropriate inflation pressure and speed restriction information, be placed on a label on the vehicle (S5.3). As amended April 29, 1976 (41 FR 18659, May 6, 1976), the standard requires that the information appear on the certification labels of vehicles manufactured on or after September 1, 1977.

Some manufacturers and the Truck Trailer Manufacturers Association (TTMA) objected to the provision of this information on grounds that valid information already appears on the tires and rims that equip the vehicle, and that the information could mislead a person to think that only the listed tires and rims could be used on the vehicle. With regard to the first objection, the NHTSA disagrees and notes that an improper choice of tires or rims (as could occur by replacing original equipment with "custom" rims or the equivalent in tires) could permanently mislead vehicle owners as to the suitable selection of tires and rims. As for the possibility of misleading, the agency believes that a heading over the tire-rim listings (specifically, "SUITABLE TIRE-RIM CHOICE") can be added to the requirements for optional use by a manufacturer who believes the information would be otherwise misleading. With regard to General Motors' note that an owner should be guided by all available information on tire choice (e.g., information in the owner's manual), the agency notes its longstanding position that manufacturers may add statements referring the reader to other publications for additional information.

It is apparent from the examples cited by manufacturers that the decision to place all required data on the certification label could prove cumbersome in some cases, particularly those involving a heavy truck with several available axle combinations. In view of these problems, the agency has decided to remove the restriction on location and permit the information to appear on the certification label or on a separate label that conforms to the requirements for certification labels. The NHTSA notes that this option to provide information on a separate label responds to concern of the Truck Body and Equipment Association (TBEA) for the responsibilities of its final-stage manufacturing membership. The agency does not believe the tire and rim information would be as useful in a location entirely separate from the certification label, and it therefore declines to adopt General Motors' suggestion to use the Veheile Identification label.

Motorcycle manufacturers and General Motors pointed out that the requirements for listing tire and rim information after GVWR in the case of vehicles such as motorcycles, that only utilize one GVWR listing, is redundant and therefore wasteful of space. Other manufacturers suggested that the tire-rim information was redundant in the case of multiple GVWR listings, although this is not the case because of the need to associate the appropriate GVWR with GAWR's that may exceed the GVWR. In any event, these comments suggest that GVWR and GAWR could be better linked by revision of the example format to reduce the amount of information that must be listed. The solution is to permit listing of the GVWR alone, followed immediately by corresponding GAWR's and appropriate tire-rim information. The clearer format would be used for single and multiple listings. This revision is described in the new example that accompanies the rule changes at the end of this notice. In conformity with this simplification, the rule is also amended to delete the requirements for GVWR tire-rim-inflation listings. Depending on manufacturers' reactions to the simplified format, a similar change could be undertaken for the passenger car example found in Part 567 (§ 567.4(h)(1)).

With regard to the items of information that must be listed in accordance with S5.3, General Motors and the TTMA argued that "tires . . . appropriate *as a minimum* for the GAWR" [emphasis added] could be construed to require tires with load ratings less than those that the manufacturer would choose to recommend. To eliminate any ambiguity, the agency replaces "at a minimum" with "as specified by S5.1.2."

Suzuki asked whether "cold inflation pressure" means the maximum inflation pressure specified by the tire manufacturer. The TTMA also asked for clarification on this point. The answer is that the requirement does not call for maximum pressure, but the pressure specified by the tire manufacturer as sufficient to carry the load specified by the vehicle manufacturer as the tire's share of the assigned GAWR.

Michelin Tire Corporation noted that listing inflation pressure could be misleading in the case of tire designations that call for different inflation pressures depending on the tire construction. It is the agency's view that any possibility of confusion can easily be avoided by an indication that the tire designation represents a radial tire, so that a person substituting a non-radial tire size with the same designation is aware that the two tires are not identical.

The TBEA requested clarification of the term "maximum speed" as it appeared in the example that accompanied the final rule. The TBEA appeared to misunderstand the example as a reference to the speed capabilities of the vehicle instead of the speed restriction of the tires. The agency has in mind only the rare tire types constructed for transit buses and mining and logging operations and so designated. Goodyear and the TTMA appeared to have the same mistaken impression of the requirement.

Speed-restricted vehicles have now been addressed under S5.1.2. In view of the confusion that arose over the requirement, and the agency's assumption that the users of these tires are knowledgeable in the use of the tires, it has been decided to drop the requirement of S5.3(d) altogether.

The TTMA raised several other questions with regard to the information that appears along with the GAWR. In answer to these questions, the effective dates of the standard are such that the manufacturer will be required to list the information specified by S5.3 on and after September 1, 1977. Also, it is not permissible to "bracket" the GVWR and GAWR values for a particular vehicle by specifying the minimum and maximum values that any tire-rim choice could provide. Section 567.4 of Part 567 requires that the GVWR and GAWR's representing the manufacturer determination of the particular vehicle's characteristics must be listed.

The standard does not require the information specified in S5.3 to be listed alongside the additional GVWR's and GAWR's that a manufacturer might list at the end of its certification label as reduced speed ratings. Lastly, the agency does not agree that the GAWR ratings for a semi-trailer are not related to the trailer's GVWR. While the trailer's axles do not support the entire weight of the vehicle, it is still the case that the various GVWR's that could be assigned to a semi-trailer are affected by the

GAWR values that can be assigned, and that the GVWR probably differs depending on the GAWR value assigned. In this sense the GAWR's assigned to a semitrailer's axles do "correspond" to its GVWR.

In accordance with Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The new options, simplification, and reduction of marking and labeling requirements should make compliance with the standard less costly, while the changes are not expected to significantly reduce the level of motor vehicle safety. The exception for speed-restricted vehicles provided in S5.1.2 represents a correction of the requirements to reflect the agency's intent not to prevent the assignment of greater load-carrying capabilities to vehicles at lower speeds. Permitting this practice to continue will result in the avoidance of new costs in the economy.

In consideration of the postponement of effective dates already granted for rim marking and the tire information labeling, the agency concludes that the present effective date schedule permits adequate time for compliance.

In view of the three notices that have modified the test of Standard No. 120, the entire standard (incorporating the amendments made by this notice) is published for the convenience of persons affected.

In consideration of the foregoing, Chapter V of Title 49, Code of Federal Regulations, is amended. . . .

Effective date: Changes to the text of the *Federal Register* may be made immediately. The provisions of Standard No. 120 are in effect at this time, except as otherwise provided in the standard.

(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 January 28, 1977.

John W. Snow
Administrator

42 F.R. 7140
February 7, 1977

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars (Docket No. 80-16; Notice 2)

ACTION: Final rules.

SUMMARY: This rule makes several minor interpretive and editorial changes to Federal Motor Vehicle Safety Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars.* With respect to the tire and rim selection information required to appear on a placard in new vehicles, the rule requires that the lettering be of specified dimensions and that the information be written in the English language. The rule also incorporates the substance of an existing interpretation of this standard permitting the purchaser of a new vehicle to request the vehicle manufacturer to install the purchaser's retread tires on the vehicle; changes one of the rim labeling examples listed in the standard; and corrects the names of two tire standardization organizations listed in the standard.

EFFECTIVE DATE: December 1, 1984.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars* (49 CFR § 571.120), specifies tire and rim selection requirements and rim marking requirements for motor vehicles such as trucks, buses, and motorcycles. (Throughout the balance of this preamble, the term "motor vehicles" is used to refer to all types of motor vehicles other than passenger cars.)

Standard 120 was initially published at 41 FR 3478, January 23, 1976. In the course of reviewing this standard, NHTSA noted that some portions of the standards contained minor errors and other portions needed clarification. To correct these shortcomings, NHTSA published a Notice of Proposed Rulemaking (NPRM) at 45 FR 71834, October 30, 1980.

The NPRM proposed changes in the following four areas of the standard:

(1) Requiring the tire and rim selection information which must appear on a placard in the vehicle to be in the English language and of specified dimensions;

(2) Narrowing the provision permitting the purchaser of a new vehicle to have the manufacturer install the purchaser's used tires on the new vehicle, and incorporating the results of an existing interpretation to permit the use of retreaded tires in the same circumstances as used tires;

(3) Changing one of the rim labeling examples listed in the standard; and

(4) Correcting the names of two tire standardization organization listed in the standard.

NHTSA received 13 comments on the NPRM. One comment addressed the first proposed change, stating that there were no objections to the proposed change, if it would permit the use of multilingual labels on vehicles with one of the labels in English and of the specified dimensions. NHTSA generally permits the use of multilingual labels, as long as one part of the label clearly shows the required information in the proper format and in the English language. No change is contemplated in this policy. No other comments were received on this proposed change to the standard, and it is adopted as proposed.

All of the other 12 comments received by the agency opposed the portion of the second proposed change which would limit the use of used and retreaded tires on new vehicles to mileage contract purchasers. (A mileage contract purchaser is a purchaser whose vehicles are equipped with tires purchased or leased from a tire supplier on a cost per mile basis). In the NPRM, the agency stated that this limitation had been implicit in the final rule establishing Standard 120 and that, absent this limitation, "the purchaser could send the vehicle manufacturer palpably unsafe tires (e.g., bald tires or poorly repaired cut tires) and request that these tires be mounted on the new vehicle."

The commenters argued that, regardless of the original intent of the agency when the standard was issued in 1976, the practice since that time has been for almost all vehicle fleets to send tires from their tire banks (tire banks are composed of tires with usable tread left on them which have been taken off vehicles no longer in service) to the vehicle manufacturer for installation on any new vehicles they buy. It was asserted that the proposed language amending Standard 120 would prohibit this practice and increase costs for these vehicle fleets, without any data suggesting that there is a safety problem associated with this practice. Most of the commenters stated that the proposed prohibition was unnecessary since it would not make any sense for a vehicle purchaser to spend $65,000 to $75,000 on a new vehicle, and then install unsafe tires on that vehicle. Further, one commenter noted that the agency's proposal would not prevent a purchaser who wanted to install unsafe tires on a vehicle from doing so. This commenter correctly noted that Standard 120 does not require that new vehicles be equipped with tires. Hence, according to this commenter, a purchaser would simply order a new vehicle delivered without any tires, and then install the unsafet tires on the truck after it was delivered.

NHTSA is persuaded by these comments, and is not adopting the proposed limitation. This rule does amend the standard to permit the installation of retreaded tires on new vehicles, as proposed in the NPRM. All commenters who addressed this change supported it. Further, the practice of using retread tires on new vehicles has been permitted since the agency's issuance in 1978 of an interpretation of Standard 120.

One change has been made to the language proposed in the NPRM to permit retreaded tires to be mounted on new vehicles. The NPRM would have required that retreaded tires to be mounted on new vehicles have a DOT symbol on the tire, to show that the originl casing was manufactured in compliance with Standard 119. That standard sets forth performance and labeling requirements for new vehicle tires. However, such a requirement would directly contradict another NHTSA requirement in 49 CFR Part 574, *Tire Identification and Recordkeeping.* Section 574.5 states, "The DOT symbol shall not appear on tires to which no Federal Motor Vehicle Safety Standard is applicable..." No Federal motor vehicle safety standard is applicable to retreaded vehicle tires. Hence, adopting the proposed requirement would either necessitate amending section 574.5 or force retreaders to violate one of these two requirements dealing with the presence of a DOT symbol on these tires.

The agency has decided not to require that retreaded tire mounted on new vehicles bear the DOT symbol placed on the tires by their original manufactures. Further, the agency is publishing in today's *Federal Register* a proposal to amend section 574.5 to permit retreaders of tires for use on motor vehicles other than passenger cars either to leave the DOT symbol on the tires or to remove the symbol. The agency has tentatively concluded that continuing to require the removal of the symbol does not serve any safety purpose. As the proposal notes, the value of the DOT symbol on a retreaded tire in assessing the probable performance of the tire is believed by the agency to be very significant. Intervening factors such as latent problems with the carcass of the original tire, inadvertent damage to the carcass during the retreading process, the amount of old tread are of far greater significance in determining the performance of the retreaded tire than the condition of the carcass when the tire was new.

No comments were received on the agency's third and fourth proposed changes, which are minor editorial corrections. These are adopted herein as proposed.

NHTSA has analyzed the impacts of this action and determined that they are not "major" within meaning of Executive Order 12291 or "significant" within the meaning of the Department of Transportation regulatory policies and procedures. The principal impacts of this rule are to clarify some portions of the standard, and to explicitly authorize existing industry practices, which have been permitted by an interpretation of the standard. There will be no additional paperwork or costs imposed on vehicle manufacturers, tire manufacturers, or the public as a result of this rule. There will be no cost savings either, since the rule merely authorizes existing practices. Accordingly, a full regulatory evaluation has not been prepared.

The Regulatory Flexibility Act is not applicable to this rule, because that Act applies only to rulemaking proceedings in which the NPRM was issued on or after January 1, 1981. The NPRM in this action was issued in October 1980. If that Act were applicable, NHTSA would certify that this rule will not "have a significant economic impact on a substantial number of small entities" and state that a Regulatory Flexibility Analysis was therefore not required. This rule will simply clarify existing requirements without any economic impacts on small entities.

Issued on May 11.

49 F.R. 20822
May 17, 1984

MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

S1. Scope. This standard specifies tire and rim selection requirements and rim marking requirements.

S2. Purpose. The purpose of this standard is to provide safe operational performance by ensuring that vehicles to which it applies are equipped with tires of adequate size and load rating and with rims of appropriate size and type designation.

S3. Application. This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, and to rims for use on those vehicles.

S4. Definitions. All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

"Rim base" means the portion of a rim remaining after removal of all split or continuous rim flanges, side rings, and locking rings that can be detached from the rim.

"Rim size designation" means rim diameter and width.

"Rim diameter" means nominal diameter of the bead seat.

"Rim width" means nominal distance between rim flanges.

"Rim type designation" means the industry or manufacturer's designation for a rim by style or code.

"Weather side" means the surface area of the rim not covered by the inflated tire.

S5. Requirements.

S5.1 Tire and rim selection.

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of Standard No. 109 (§ 571.109) or Standard No. 119 (§ 571.119), and with rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 of Standard No. 109 or S5.1 of Standard No. 119, as applicable.

S5.1.2 Except in the case of a vehicle which has a speed attainable in 2 miles of 50 mph or less, the sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system as specified on the vehicle's certification label required by 49 CFR Part 567. If the certification label shows more than on GAWR for the axle system, the sum shall be not less than the GAWR corresponding to the size designation of the tires fitted to the axle. If the size designation of the tires fitted to the axle does not appear on the certification label, the sum shall be not less than the lowest GAWR appearing on the label. When a tire listed in Appendix A of Standard No. 109 is installed on a multipurpose passenger vehicle, truck, bus, or trailer, the tire's load rating shall be reduced by dividing by 1.10 before calculating the sum.

S5.1.3 [In place of tires that meet the requirements of Standard No. 119, a truck, bus, or trailer may at the request of a purchaser be equipped at the place of manufacture of the vehicle with retreaded or used tires owned or leased by the purchaser, if the sum of the maximum load ratings meets the requirements of S5.1.2. Used tires employed under this provision must have been originally manufactured to comply with Standard No. 119, as evidenced by the DOT symbol. (49 F.R. 20822—May 17, 1984. Effective: December 1, 1984)]

S5.2 Rim marking. On and after August 1, 1977, each rim or, at the option of the manufacturer in the case of a singlepiece wheel, wheel disc shall be marked with the information listed in paragraphs (a) through (e), in lettering not less than one-eighth inch high, impressed to a depth or, at the option of the manufacturer, embossed to a height of not less than 0.005 inch. The information listed in paragraphs (a) through (c) shall appear on the weather side. In the case of rims of multipiece construction, the information listed in paragraphs (a) through (e) shall appear on the rim base and the information listed in paragraphs (b) and (d) shall also appear on each part of the rim.

(a) A designation which indicates the source of the rim's published nominal dimensions, as follows:

(1) "T" indicates The Tire and Rim Association.

(2) "E" indicates The European Tyre and Rim Technical Organisation.

(3) ["J" indicates Japan Automobile Tire Manufacturers Association.]

(4) "D" indicates Deutsche Industrie Norm.

(5) "M" indicates The Society of Motor Manufacturers & Traders, Ltd.

(6) "B" indicates British Standards Institution.

(7) "S" indicates Scandinavian Tire and Rim Organization.

(8) "N" indicates an independent listing pursuant to S4.4.1(a) of Standard No. 109 or S5.1(a) of Standard No. 119.

(b) The rim size designation, and, in case of multipiece rims, the rim type designation. For example: 20 × 5.50, or 20 × 5.5.

(c) The symbol DOT, constituting a certification by the manufacturer of the rim that the rim complies with all applicable motor vehicle safety standards.

(d) A designation that identifies the manufacturer of the rim by name, trademark, or symbol.

(e) The month, day, and year, or the month and year, of manufacture, expressed in numerals. For example,

"September 4, 1976" may be expressed as:

$$90476, \quad \frac{904}{76} \quad \text{or} \quad \frac{76}{904}$$

"September 1976" may be expressed as:

$$976, \quad \frac{9}{76} \quad \text{or} \quad \frac{76}{9}$$

S5.3 Label information. (For vehicles manufactured on and after September 1, 1977) The information specified in S5.3.1 through S5.3.3 shall, in the format set forth following this section, appear either—

(a) After each GAWR listed on the certification label required by § 567.4 or § 567.5 of this chapter, or at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in § 567.4(b) through (f) of Part 567 of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.1 [Vehicles manufactured before December 1, 1984. Each vehicle manufactured before December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5 in the format set forth following this section. The information shall appear either—

(a) After each GAWR listed on the certification label required by § 567.4 or § 567.5 of this chapter; or, at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in § 567.4(b) through (f) of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.2 [Vehicles manufactured on and after December 1, 1984. Each vehicle manufactured on and after December 1, 1984 shall show the information specified in S5.3.3 through S5.3.5 in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—

(a) After each GAWR listed on the certification label required by § 567.4 or § 567.5 of this chapter; or, at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in § 567.4(b) through (f) of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.3 [The size designation of tires (not necessarily those on the vehicle) appropriate (as specified in S5.1.2) for the GAWR.

[**S5.3.4** The size designation and, if applicable, the type designation of rims (not necessarily those on the vehicle) appropriate for those tires.

[**S5.3.5** Cold inflation pressure for those tires. (49 F.R. 20822—May 17, 1984. Effective: December 1, 1984)]

S6. Vehicles manufactured from September 1, 1976, to February 28, 1977. Notwithstanding any other provision of this standard, a vehicle to which this standard applies that is manufactured during the period from September 1, 1976, to February 28, 1977, shall meet each requirement of this standard, with the following exception: In place of tires that meet Standard No. 119 (§ 571.119), the vehicle may be equipped with tires that meet every requirement of that standard other than the tire marking requirements of S6.5 of that standard.

41 F.R. 3478
January 23, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses and Trailers

(Docket Nos. 70-16, 70-17; Notice No. 2)

The purpose of this notice is to amend § 571.21 of Title 49, Code of Federal Regulations, by adding Motor Vehicle Safety Standard No. 121, Air Brake Systems—Trucks, Buses and Trailers. Notices of proposed rulemaking on this subject were published on June 25, 1970 (35 F.R. 10368) and June 26, 1970 (35 F.R. 10456). The comments received in response to the notices and information obtained at a technical conference held on October 20, 1970 (35 F.R. 14736, September 22, 1970) have been considered in the development of the final rule. The trailer requirements are joined with the truck and bus requirements in a single air brake systems standard.

The standard as adopted specifies requirements for the safe performance of air brake systems under normal and emergency conditions. It should be noted that the term "air brake system" as defined in the standard applies to the brake configuration commonly referred to as "air over hydraulic," in which failure of either medium can result in complete loss of braking ability.

The standard establishes a set of requirements to govern the braking behavior of a vehicle during application of the service brakes. Principal among these are stopping performance requirements that include a minimum stopping distance requirement for trucks and buses and lateral stability and wheel lockup requirements for all vehicles. To more accurately reflect the friction characteristics of a surface with a skid number of 75, the stopping distances for trucks and buses on a dry surface have been increased over those proposed in the notice. The required distance from 60 m.p.h. is now 245 feet rather than 216 feet and the distance from 20 m.p.h. is 33 feet rather than 29 feet. The stopping distance on a wet surface at 20 m.p.h., 54 feet, has been retained. Several comments indicated that there are no test facilities on which the 60 m.p.h. stop on a wet surface can be safely conducted. As a measure of brake efficiency, moreover, the 20 m.p.h. stop on a wet surface satisfactorily indicates the vehicle's behavior at higher speeds, and the standard therefore specifies only the 20 m.p.h. stopping distance test.

The requirement that the vehicle stay within a 12-foot-wide lane has been adopted as proposed. The proposed requirement that no wheel lock except momentarily has been modified to permit lockup to occur on the leading nonsteerable axle on vehicles having more than two nonsteerable axles. A review of available information indicates that satisfactory control of the vehicle can be maintained if lockup is avoided on two nonsteerable axles. The rule also permits lockup at speeds under 10 m.p.h. Such low speed lockup is not considered hazardous and allows greater flexibility in brake system designs.

Some comments stated that the requirement for a controlled stop without lockup favored one variety of stability-controlling device—the antilock device—over other systems such as load proportioning devices. Several comments seemed to assume that the proposal required antilock devices. The requirement that the vehicle stop without locking its wheels reflects the Administration's judgment that a vehicle with locked wheels, whatever its equipment, is unstable and uncontrollable in an emergency situation. The Administration recognizes the likelihood that manufacturers of some types of vehicles may have to incorporate proportioning or antilock devices into their systems in order to meet the stopping distance requirement. However, the manner in which lockup is prevented is not specified in the standard, and if a proportioning device or any other device can produce the desired result, it may be incorporated into the vehicle's braking system.

Although an antilock device is not required, if it is used on a vehicle it must conform to several requirements. A warning signal must be provided to warn of total system failure, a failed device must not interfere with the operation of the service brake, and electrical elements in the system must be powered through the vehicle's stop lamp circuit. Of these requirements, the first was the subject of comments that indicated some uncertainty as to the nature of a total system failure. The reason for the requirement is that a driver ought to be warned in the event that a system on which he has come to rely has stopped working altogether. Monitoring of each device separately would be difficult and costly, while monitoring of the shared elements of the system, such as the electrical circuitry, would be relatively simple. Although electrical problems would be the most likely cause of total failure, other components may also produce such failure and the language of the requirement has not been limited to a specific type of failure. A requirement that electrical power for antiskid devices on trailers must be provided through the stop lamp circuit has been added to insure the functioning of antilock systems in vehicle combinations in which the towed vehicle has an antilock system.

The requirements for actuation and release times, for brake retardation force, and for brake power have been modified somewhat in the light of information provided by the comments. The notice proposed timing curves for brake actuation and release, but subsequent review has indicated that adhesion to a timing curve is less significant than the basic ability to apply and release the brakes quickly. The curves have therefore been omitted in favor of a single application time of 0.25 second and a single release time of 0.50 second. These values are somewhat less stringent than those proposed in the notice, and reflect the judgment that a system that can meet the stopping distance requirements without lockup has less need for the rapid times originally proposed. Vehicles intended to tow other vehicles equipped with air brakes must still meet the actuation and release times with a 50-cubic-inch test reservoir attached to the service line outlet, but the requirements for pressurization of the test reservoir itself have been deleted.

The brake retardation force requirement was the subject of numerous comments, some to the effect that the retardation force was too high to permit safe operation of vehicle combinations in which new and old vehicles are mixed, and others to the effect that the forces were too high to be achieved with reliability by available friction materials. The Administration has determined that compatibility problems are substantially lessened if the vehicle has the ability to stop without lockup and that the retention of a relatively high retardation force requirement will not lead to significant compatibility problems. It has been determined, however, that the stopping distance requirements can be met by brakes having a somewhat lower retardation force capacity than proposed, and a lower force requirement is therefore adopted.

Comments regarding the proposed brake power requirements stated that the fade characteristics required of the linings might exceed the limits of existing technology and might not be compatible with the retardation force requirements. In the light of these comments and other information it has been determined that the brake power requirements should be reduced. Accordingly the standard as adopted requires 10 decelerations at a rate of 9 feet per second per second at intervals of 72 seconds with the air pressure at 90 p.s.i. or less, and a final deceleration at 14 f.p.s.p.s. from 20 m.p.h. with a service line air pressure of 108 p.s.i. or less. In the light of the diminished power requirements, the recovery requirements have been retained with a minor adjustment from 45 p.s.i. to 40 p.s.i. in the minimum air pressure required.

A series of alterations have been made in the equipment requirements in response to comments and as a result of reevaluation by the Administration. First among these is the alteration of the stop lamp switch requirement to permit use of a pneumatic switch. The requirements for compressor capacity have been modified to require it to increase air pressure in the reservoirs from 85 p.s.i. to 100 p.s.i. in not more than 25 seconds, in place of the proposed requirement of 0–85 p.s.i. in 2 minutes. The mandatory requirement for a supply reservoir has been removed, and the overall reservoir capacity for trucks and buses has been reduced to 12 times the combined brake chamber capacity. The drain valve requirement has been simplified, the tolerance on the air pressure gauge has been broadened to ±7 percent of the compressor cut-out pressure, and the low air pressure warning requirement has been modified to permit visible, nonaudible signals within the driver's forward field of view.

The notice proposed that each truck and bus have a split service brake system. It has been determined that the additional cost and greater complexity of a split system on vehicles equipped with air brakes are not accompanied by safety benefits great enough to justify requiring a split system. Accordingly, the requirement has been deleted. The remaining system with emergency capabilities is the parking brake system, and it has been determined that a parking brake system complying with the applicable requirements of the standard will provide a safe means of stopping the vehicle in the event of service brake failure.

Two aspects of the parking brake system were the subject of considerable comment. A number of comments stated that no maximum static retardation force should be specified, and several comments stated that the parking brakes should not apply automatically. The standard as adopted retains both the maximum retardation and the automatic application requirements. Each has a role in the safe operation of the parking brake system. If no maximum retardation force were specified, there would be considerable risk of lockup during emergency braking. The requirement as adopted, however, raises the upper limit on the quotient

$$\frac{\text{static retardation force}}{\text{GAWR}}$$

from 0.33 to 0.40.

Comments stated that automatic application of the brakes while the vehicle is in motion could induce hazardous instability, due to wheel lockup or to the unexpected nature of the braking. It has been determined that adequate safeguards exist in the standard to avoid such problems. The required low pressure warning signal must operate at a pressure well above the automatic application pressure so that the driver will have sufficient warning of incipient brake application. In addition, the limit on retardation force will act to prevent lockup under all but the most severe conditions. With respect to trailers, the automatic functioning of the parking brake system is further insured by the deletion of the proposed requirement for a check valve or similar device to protect the trailer's air pressure.

The parking brake controls have been considerably simplified by uniting in one control the manual on-off operation and the release-after-automatic-application function.

Many comments revealed a misunderstanding about the Administration's purpose in specifying test conditions. It should be understood that the standards are not instructions for, or descriptions of, manufacturer tests. For example, the condition that states that "(t)he wind velocity is zero," simply means that the vehicle must meet the applicable tests if (among other things) the air is still, that is, if the wind neither helps nor hinders the vehicle's performance. One way in which the manufacturer could check his vehicle's conformity with reference to the zero wind condition is to run the braking test with a resultant tailwind. With reference to another condition, such as the surface with a skid number of 75, the test could be run on a surface having a skid number lower than 75. Manufacturers are required to exercise due care to insure that their vehicles will meet the standard if tested by the Administration under the specified conditions, but they are at their own discretion in devising an appropriate testing program for that purpose.

A few changes have been made in the test conditions. The notice had proposed, in addition to the zero wind condition, that the vehicle stay in the roadway with a wind of 30 m.p.h. from any direction. On review, the 30-m.p.h. speed has been determined to be excessive and to unduly increase the problems of testing. In addition, most stability problems are controlled by preventing wheel lockup, as required by the standard, and the crosswind condition has therefore been deleted. In place of the "lightly loaded vehicle weight," a weight condition based on the vehicle's unloaded weight is used.

Effective date. Because of the development work and preparation for production that this standard will require, it is found that an effective date later than 1 year from the date of issuance is in the public interest. Accordingly, the standard is effective January 1, 1973.

In consideration of the above, § 571.21 of Title 49 of the Code of Federal Regulations is amended by adding Motor Vehicle Safety Standard No. 121 as set forth below. This standard 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 19, 1971.

Douglas W. Toms,
Acting Administrator, National Highway Traffic Safety Administration

36 F.R. 3817
February 27, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses, and Trailers

(Dockets No. 70–16 and 70–17; Notice 3)

The purpose of this notice is to respond to petitions requesting reconsideration of Motor Vehicle Safety Standard No. 121, *Air Brake Systems*, § 571.121 of Title 49, Code of Federal Regulations. After issuance of the standard on February 19, 1971 (36 F.R. 3817, February 27, 1971), petitions for reconsideration were filed pursuant to 49 CFR 535.35 by a number of vehicle and equipment manufacturers. This notice grants some of the requests by smending the standard, and denies other requests.

1. *Service brake system.* The service brake system requirements have been reorganized for reasons of clarity and have been amended with respect to the order of testing and the number of tests to be conducted. The dynamometer tests have been separated from the road tests and placed in section S5.4. The road test section has been amended to specify the order in which the stopping tests are to be run. The section is further amended to provide that a truck or bus will be stopped six times for each combination of loading, speed and road conditions and that it will be considered to meet the requirement if one stop is made in the required distance with the required stability and freedom from wheel lockup. This amendment has been adopted to ease the problems arising from a test driver's unfamiliarity with a vehicle's behavior. To accomodate antilock systems that permit some wheels to lock for longer periods than others, the reference to "momentary" lockup in S5.3.1 and S5.3.2 has been amended to refer to "controlled" lockup.

S5.3.2, *Stopping Capability, Trailers*, has been amended in minor respects, to make it clear that the 90 p.s.i. pressure level is system-wide and not confined to the brake control lines, and to provide that the trailer is to stop the combination of vehicles without benefit of the towing vehicle's brakes.

The brake power requirements of S5.4.2 and the dynamometer test conditions of S6.2 are each amended to refer to the drum "or disc" to avoid the possibility that the sections would be misconstrued as requiring drum brakes. The brake recovery requirements of S5.4.3 are amended by lowering the minimum air pressure requirement to 20 p.s.i. from 40 p.s.i. This amendment is based on a reassessment of the problems associated with over-recovery that has led the NHTSA to conclude that 20 p.s.i. is a reasonable level.

The requirements concerning antilock system failure and the provision of power for antilock systems on trailers have been separated from the other service brake requirements and placed in S5.5.

2. *Service brake retardation force.* The standard as adopted in February 1971 required the brakes on each axle to produce specified retardation forces at each of several brake chamber air pressures. As indicated in the issuance of the standard, the primary goal of the retardation force requirement was to insure brake compatibility between vehicles used in combination. On review of petitions requesting exemption of vehicles that do not tow other vehicles from the retardation force requirements, the NHTSA has determined that for these vehicles the requirements are not necessary. Accordingly, S5.4.1 is amended to apply only to vehicles that are intended to tow or to be towed by another vehicle equipped with air brakes.

In response to petitions objecting to axle by axle force calculations, the retardation force requirements are further amended to provide that the retardation force for all axles shall be added together and divided by the sum of gross axle ratings to arrive at the values shown in Table III. The effect of the amendment is to allow greater flexibility in the allocation of braking force between axles.

The overall braking force required of the vehicle's brakes, however, remains the same as before. The NHTSA has considered and rejected the requests for different retardation values and for substitution of SAE J992a for the dynamometer tests of S5.4.1. The present retardation force requirements in Table III are considered to be a reasonable accommodation between the need for compatibility with existing vehicles and the need to establish a uniform pattern of brake response over the range of operating pressures. The dynamometer procedures of S5.4.1.1, which permit measurement of brake forces on an individual vehicle, are more suited to the regulatory purpose of this standard than are the procedures of SAE J992a, which provides for road testing of vehicles in combination. The agency recognizes that the availability of dynamometers of sufficient capacity is a concern to many petitioners, but available evidence indicates that dynamometer access will not be a major long-term problem. The petitions to delete dynamometer testing are therefore denied.

3. *Parking brake system.* The parking brake system required by S5.4 of the standard had several features that were widely objected to by the petitioners. In particular, petitioners objected to the requirement for automatic application of the parking brakes in the event of pressure loss. Although the standard specified a maximum retardation force level of 0.40 to reduce the possibility of lockup during automatic application, many petitioners stated that automatic application of the brakes would surprise the driver and adversely affect his handling of the vehicle.

The NHTSA remains convinced that automatic application of the parking brake is a satisfactory means of providing braking in the event of service brake failure. The low pressure warning signal required by S5.1.5 is considered adequate to warn a driver of impending application of the parking brake to avoid most of the effects of surprise. However, review of the petitions has persuaded the agency that automatic application of the parking brake need not be mandatory. Accordingly, the standard is amended to provide for an alternative parking brake system that is manually, and not automatically, applied.

To accommodate the new alternative, the parking brake requirements have been reorganized into two main sections: S5.6, which specifies requirements for parking brakes generally, and S5.7, which sets out the emergency braking capabilities for automatic systems (S5.7.1) and manual systems (S5.7.2) on trucks and buses. A third section (S5.8) deals with the emergency braking of trailers.

The general requirements of S5.6 are derived from S5.4 of the original standard, with some additions and amendments. The braking force generated by the parking brakes is measured, at the manufacturer's option, either by a static draw bar test, which must produce a force level of 0.28, or by a holding test on a 20% grade. The tests are to be conducted in both forward and rearward directions. As provided in the original standard, the parking brakes must be applied by an energy source that is independent of the air pressure in the service brake system.

Additional changes have been made in S5.6 with respect to the requirements for the parking brake control. The standard as published in February 1971 specified the shape and color of the parking brake control, as well as its location, and provided that manual operation and release after automatic application should be accomplished by movement of a single control. After review of the petitions, it has been decided to allow greater flexibility in the design and operation of the control. Efforts are now underway within the industry to standardize controls, and it may be that a consensus will be reached upon which a more standardized control can be based. In the meantime, the standard's specifications have been reduced to requiring the control to be separate from the service brake control, operable from the normal driving position, and identifiable as to its method of operation. The shape, color, and number of controls, and the method of operation, are left to the judgment of the manufacturer.

The major difference between the emergency braking performance required of a vehicle with a manual system and the performance required of a vehicle with an automatic system is that a vehicle with a manual parking brake is required by S5.7.2.3 to meet a stopping distance test with an air pressure failure in the service brake system. Although a manufacturer may elect to use the parking brakes to provide this emergency stopping capacity, he may use other components to supplement the parking brakes or he may use a system entirely independent of the parking brakes.

A vehicle with an automatic parking brake may, at the manufacturer's option, either meet the stopping distance test of S5.7.2.3, or have a maximum static retardation force not greater than 0.40, measured in accordance with S5.6.1. Several petitioners requested deletion of the maximum retardation force levels for automatic brakes. Although the agency remains concerned about the effects on a vehicle's stability of automatic brake application, it has determined that a vehicle capabable of meeting specified stopping distance requirements when the brakes are automatically applied should not be held to the maximum force level requirement.

With respect to both automatic and manual brakes, provision is made for control of the parking brakes of the towed vehicle. It was noted by some petitioners that automatic application of a towing vehicle's brakes, without simultaneous application of a towed vehicle's brakes, could lead to unstable braking and possibly to jackknifing. To lessen the risk of such instability, the automatic brake requirements are amended to require the venting of the towed vehicle's supply line so that its brakes will apply upon application of the towing vehicle's brakes.

4. *Other provisions amended.* In S4 the definition of "antilock system" has been amended to refer to "rotational wheel slip" to distinguish the phenomenon controlled by the antilock systems from other types of wheel slip. The definitions of "gross axle weight rating," "gross vehicle weight rating," and "unloaded vehicle weight" have been omitted, since they have been incorporated in the general definitions section of Part 571, 49 CFR 571.3(b).

The equipment requirements have been amended in a number of minor respects. S5.1.1 has been amended to include supply reservoir capacities. The reservoir capacity required has not been changed, but the requirement is clarified by striking the words "greater than" in S5.1.2.1 and in S5.2.1.1. The requirement for a towing vehicle protection valve (S5.1.3) has been amended by the use of the broader term "system" in place of "valve."

The pressure gauge requirement (S5.1.4) has been amended to require a gauge in each service brake system, rather than to require a gauge directly on the service reservoir. The warning signal requirement (S5.1.6) is amended in response to petitions to provide that warning must be by means other than the pressure gauge indicator. The antilock warning signal requirement (S5.1.6), has been amended to limit the warning to the event of electrical failure, pending investigation of other types of failure for which a warning may be practicable.

5. *Petitions denied.* Several requests for amendment of the equipment requirements have been denied. A request that the service reservoirs be connected in series has been rejected as unnecessary and design restrictive. Requests for reduction in minimum reservoir capacity are also denied. The present requirement of 12 times the combined volume of service brake chambers has been applied by the SAE to intracity buses and school buses for some time and is considered a reasonable requirement for other vehicles, particularly in the light of additional demands made on air capacity by antilock systems.

Several petitions requested amendment of the vehicle weights specified in S5.3 for the service brake tests. Requests were made for additional weight on the vehicle in its unloaded condition to allow for the weight of the completed body and for safety equipment such as roll bars used during testing. Since the vehicles tested by the NHTSA will be completed vehicles, however, it is not appropriate to specify an additional weight. If an incomplete vehicle manufacturer wishes to ascertain the performance of this vehicle in one or more of its completed variations, he may do so by placing weights on the incomplete vehicle, by actually mounting a body on it, or by any other means that are reasonably calculated to evaluate the braking performance of the completed vehicle. With respect to safety equipment, the NHTSA regards the problem of weight associated with safety devices as easily surmountable. Each of the petitons requesting changes in the weights specified in S5.3 is accordingly denied.

A number of petitions requested increases in the stopping distance required by S5.3.1. The distances specified are considered reasonable and well within the state of the art. Greater distances would increase the disparity between trucks and cars and be contrary to the interests of safety. The petitions are denied. Similarly, the petitions for an increase in the skid number of the dry surface from 75 to 80 are denied. The 75 number is representative of road surfaces, and has been a part of the consumer information requirements long enough that the availability of skid pads should not be a probelm. Similarly, the requests that 30 skid number tests be run on dry pavement or that they be abandoned are denied. Braking in wet weather is an evident problem with vehicles of all types, and the NHTSA regards the wet-track test as an essential part of the standard.

The stopping capability requirement for trailers (S5.3.2) was the subject of petitons requesting deletion of the 90-p.s.i. pressure level requirement and objecting to the uncertainty involved in determining whether the tractor or the trailer is responsible if the trailer leaves the 12-foot-wide lane. The NHTSA regards a uniform service line pressure specification as an appropriate means of insuring uniformity in trailer response, even though some tractors may be designed to modulate air pressure in the lines. Since only the trailer is to be braked, the cause of deviation from the lane will be the trailer's brakes, not the tractor's. The petitions are denied.

The actuation and release requirements of S5.3.3 and S5.3.4 were subject to a variety of objections. One petitioner requested deletion of both requirements, while others requested elimination of the 50-cubic-inch test reservoir for trailers that tow other trailers. On review, the NHTSA has decided to deny the petitions. Although the stopping distance test of S5.3.1 necessarily limits the actuation time that a manufacturer can allow, the additional constraint placed on timing by S5.3.3 has the important effect of producing full braking at a very early point during the braking maneuver where the speed is greatest and the effects of a reduction in speed most significant from the standpoint of the forces involved in a crash. The brake release time has an important bearing on the maneuverability and directional stability of vehicles in emergency situations. It can sometimes be as important for the brakes to come off quickly and evenly as for them to be applied quickly.

The 50-cubic-inch test reservoir has been employed for some time in the SAE brake testing. It has therefore been retained. Other suggestions in the petitions for service reservoir timing and for additional test component specifications are not adopted at this time but may be appropriate subjects for future amendment.

With respect to the loading conditions specified in S6.1.1, a number of petitioners stated that the front-rear brake balance needed to achieve conforming performance on a truck-tractor loaded to GVWR in its bob-tail configuration would not be the best balance for that tractor when towing a trailer. This appears to be a valid objection, but the most obvious alternative—testing with a trailer in tow—involves complexities that have not been fully discussed in the petitions. A notice is therefore being prepared to propose that a truck tractor be tested with a trailer during the stopping distance tests.

Effective date: September 1, 1974. Review of the numerous petitions for extension of the effective date from January 1, 1973, has led to the conclusion that an effective date of September 1, 1974, would permit a longer period of fleet testing to evaluate the durability of the new systems and that the resulting production systems are likely to be substantially improved by the additional time allowed. An effective date later than one year from the date of issuance is therefore found, for good cause shown, to be in the public interest.

In consideration of the above, Motor Vehicle Safety Standard No. 121, Air Brake Systems, in § 571.21 of Title 49, Code of Federal Regulations, is amended to read as set forth below. 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 by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on February 16, 1972.

Douglas W. Toms
Administrator

37 F.R. 3905
February 24, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses and Trailers

(Docket No. 70–17; Notice No. 4)

The purpose of this notice is to respond to petitions filed pursuant to 49 CFR § 553.35, seeking reconsideration of the amendments to Motor Vehicle Safety Standard No. 121, Air Brake Systems, published February 24, 1972 (37 F.R. 3905). The petitions are granted in part and denied in part.

I. *Amendments*

S5.1.6 International Harvester stated that the operation of the antilock warning system should be the same as that of the low pressure warning signal under S5.1.5. S5.1.6 presently requires an audible warning of at least 10 seconds duration regardless of whether the visible signal required by the section is within the driver's forward field of view. The change requested by International Harvester would require an audible warning only if the visual warning is out of the driver's forward field of view. On reconsideration, the NHTSA has concluded that the system requested by International Harvester will give the driver adequate warning of antilock system failure. S5.1.6 is therefore being amended to parallel S5.1.5.

S5.1.5 and S5.1.6 In a letter designated as a request for clarification or interpretation, General Motors suggested that because diesel systems do not have an "on" position, they might be considered exempt from the requirement that the antilock warning signal must operate when the ignition is in the "on" position. Although the NHTSA does not consider it likely that the requirement will be understood as exempting diesels, the agency has concluded that amending the standard to refer to the "run" position as suggested by GM would avoid any possibility of misinterpretation. S5.1.5 and S5.1.6 are amended accordingly.

S5.2.1.1 Midland-Ross requested that a pressure should be specified at which the protected reservoir should be capable of releasing the parking brakes. On reconsideration, it seems appropriate to specify a pressure that corresponds to the lower end of the range of pressures maintained by current compressors. The section is therefore amended to specify a pressure of 90 p.s.i. The related question of when the brake is considered to be released, also raised by Midland-Ross, does not require amendment. The NHTSA considers a brake to be released at the point where it no longer exerts any torque.

S5.2.1.2 In response to a question in the Midland-Ross petition and a related request for interpretation by Wagner Electric Corporation, this section is amended by adding the word "service" before "reservoir", so that the section, as amended, requires the total service reservoir volume to be at least eight times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms. The amendment reflects the basic intent of S5.2.1.2, which is to have a specified volume of air available to the service brakes.

S5.4 Several petitioners stated that S5.4 appeared to exempt some vehicles from the dynamometer requirements. This impression is erroneous, in that all vehicles are required to conform to S5.4. The source of the confusion appears to be the sentence in S5.4 which states that "[a] brake assembly that has undergone a road test pursuant to S5.3 need not conform to the requirements of this section". The intent of the standard is to conduct the dynamometer tests on new brake assemblies, and the quoted sentence was intended to make it clear that a single brake assembly would not have to pass the road test and the dynamometer test in succession. The sentence is being amended to clarify its meaning.

S5.7.1.4 This section is amended in response to a request by Wagner Electric, to require manual application whenever the system pressure prevents automatic application.

II. *Provisions not amended*

With respect to the remaining petitions, no changes are being made in the standard. In some cases this is because the petitioner has misinterpreted the applicable provisions to his disadvantage and needs no amendment to obtain the relief he wants. In other cases, the agency has concluded that the requested amendments do not serve the need for motor vehicle safety. In one or two cases, the change requested may prove desirable but cannot be fully evaluated without further information. The following discussion deals with the petitioned requirements in numerical order.

S3. Clark Equipment Company requested the addition of trailer converter dollies to the list of affected vehicles. The addition is not necessary, in that a converter dolly is a "trailer" within the meaning of that term in 49 CFR 571.3(b).

S5.1 Clark Equipment Company requested an amendment to exclude vacuum brake systems from the equipment requirements of S5.1. Despite the reference to a vacuum assist in S4, the standard does not apply to vacuum brakes and therefore does not require vacuum systems to have the equipment described in S5.1.

S5.1.2.2 It was suggested by Midland-Ross that the requirement that the reservoir must be capable of "withstanding" the specified pressure was not sufficiently precise. It may be that experience will show a need for quantification of this requirement, but the agency does not consider it to be necessary at this time. A reservoir will be considered to withstand the test pressure if it shows no pressure loss during the test interval.

S5.1.3 It was suggested by Midland-Ross that the requirements for the towing vehicle protection system should be amended to indicate the degree of protection required and the operating modes protected. The agency's response is much the same as its response on S5.1.2.2: the suggestion may prove to have merit, if systems appear which cause problems in service. At this point, however, the agency will retain the broad requirement that a towing vehicle must have a system to protect it from the loss of air pressure in the towed vehicle, without regard to the system's design or method of operation.

S5.1.5 Midland-Ross requested an increased pressure level at which the low pressure warning signal actuates, so that it would be above the protection valve trip pressure used in new trailers. The requested change is not necessary, in that the standard does not now prevent the manufacturer from setting the signal actuation level at a pressure above 60 p.s.i. If Midland-Ross wishes to set its level at 80 p.s.i., it may do so.

S5.1.6 Clark Equipment Company requested that the antilock warning signal requirements be expanded to apply to the failure of a towed vehicle's antilock system. The NHTSA is receptive to further discussion of this issue. However, it has decided not to adopt the request at this time. Trailers are not required to have provision for antilock warning systems, and requiring towing vehicles to accommodate systems that are not likely to exist would be unjustified.

S5.3.1 Two petitioners requested amendments of the stopping distance requirements. The Carlisle Corporation requested a longer stopping distance, and Midland-Ross requested that the reference to "controlled lockup" be amended to specify a system that would provide for resumption of wheel rotation at some point before the speed falls to 10 m.p.h. Both requests are denied. The distances specified are considered to be appropriate and within the current state of the art. The requested change with respect to wheel lockup would permit systems in which all wheels could be completely locked for substantial periods, a situation that S5.3.1 was designed to avoid.

S5.3.3 Midland-Ross requested that Figure 1, referenced by this section, should be amended by specifying a pressure of 100 p.s.i. in both reservoirs, by omitting the tractor protection valve from the test rig, and by employing a service brake control valve rather than a brake pedal. Because S5.3.3 specifies a pressure of 100 p.s.i., it should be clear that each reservoir would be at that pressure, and no amendment is necessary.

A protection valve is used because such valves are in widespread use, even though they are not required by the standard. The service brake pedal specified in Figure 1 is a service brake foot control valve. No change of label appears necessary.

S5.4.1 International Harvester requested the deletion of this section as unnecessary. As stated before, the purpose of the section is to promote compatibility between the brakes of vehicles used in combination. The agency is of the opinion that it serves the stated function and has therefore retained it.

S5.4.2 Wagner Electric and the Carlisle Corporation each objected to certain aspects of this section. Wagner Electric requested the reinstatement of the phrase "at least" before the deceleration of 9 f.p.s.p.s., and requested the use of the phrase "a minimum" in S5.4.2.1, on the grounds that it is impossible to achieve a deceleration rate of exactly 9 f.p.s.p.s. In response, it should be pointed out that it is not necessary for a manufacturer to conduct his tests at exactly the specified rate, but only to test in such a manner as to assure himself that if the brakes were to be tested at that rate they would meet the requirements. It is to his advantage to test under less favorable conditions than those specified in the standard. The insertion of the language requested by Wagner would, if anything, make the test more severe for the manufacturers, in that the government could run tests with average decelerations in excess of 9 f.p.s.p.s. making the "worst case" situation much more difficult to ascertain.

The Carlisle Corporation objected to procedural disparities between the retardation force tests of S5.4.1 and the brake power tests of S5.4.2. The basic procedural difference between the sections is that the measurement period under S5.4.1 begins when the specified air pressure is reached whereas the period under S5.4.2 begins with the onset of deceleration. Although it may be that different instrumentation will be required in the two tests, they are not for that reason inconsistent or incompatible. The NHTSA considers each procedure to be appropriate for the aspect of performance that it measures.

S5.4.3 The Carlisle Corporation requested a further reduction in the lower limit of the recovery force, from the current level of 20 p.s.i. to 10 p.s.i. The NHTSA considers a brake system that produces a deceleration of 12 f.p.s.p.s. with a pressure of only 10 p.s.i. to be too sensitive and therefore denies the petition.

S5.5.2 Clark Equipment Company objected to the use of the stop lamp circuit to power the antilock system. The basis for the requirement is the need for compatibility between trucks and trailers made by different manufacturers. The stop lamp circuit is the most suitable electrical connection between trucks and trailers because it is always energized when the brakes are applied. It was therefore chosen as the source of power. The agency is of the opinion that the stop lamp circuit has adequate power for single trailer applications. For multiple trailers, it may be necessary to employ complementary systems as permitted by S5.5.2. The petition is therefore denied.

S5.6.1 In response to a request for interpretation by International Harvester, the intent of this section is to require parking brakes on each axle other than steerable front axles.

S5.6.2 Midland-Ross suggested the amendment of this section to specify that a sliding bogie on a semitrailer shall be placed in its most favorable position. As presently worded, the section is silent with respect to bogies so that the NHTSA will be obliged to test in a manner that favors the manufacturer. However, if there are indications that the position of the bogie makes a substantial difference in the braking performance of the vehicle, the agency will consider rulemaking to specify that the trailer must meet the requirements with the bogie in any position.

S5.7.1.1 Wagner Electric requested an amendment to provide for brake application when the pressure in "any" service reservoir is less than the automatic application pressure level. The section now requires application when "all" service reservoirs are below that level. The NHTSA does not consider the requested amendment necessary to permit the type of system that Wagner envisions. It is permissible under the present wording for a manufacturer to have a system that applies the brakes upon a low pressure signal from a single reservoir. To require operation in such a case, as Wagner requests, would eliminate systems that are capable of fully applying the service brakes despite low pressure in one reservoir.

S5.7.2.2 The Clark Equipment Company requested deletion of "brake fluid housing" from the list of items whose failure must not affect the parking brake system. The purpose of the section is to make it clear that the sharing of components by the service and emergency braking systems should not be construed as permitting malfunction of the parking brake system despite the provisions of S5.6.3. The petition is denied.

S5.8 The Clark Equipment Company requested the deletion of the phrase "or S5.6.2" from this section, on the grounds that it converts the requirement into a parking brake requirement that may be weaker than the emergency braking performance currently required under the regulations of the Bureau of Motor Carrier Safety. However, despite the use of .20 rather than the value of .28 specified in S5.6.1, the trailer under S5.6.2 is loaded to its GVWR and the supporting dolly is unbraked so that the braking performance required by the two sections is nearly identical. The NHTSA has therefore decided to retain the option of S5.6.2 under S5.8.

S6.1.1 Midland-Ross requested that the loading of a trailer be based on the sum of its GAWR's rather than on its GVWR. A GVWR designation for trailers is required by Part 567, and the agency considers it appropriate to specify GVWR as the test condition under this section.

S6.1.7 International Harvester again questioned the appropriateness of using a skid number of 75 for road tests. This issue has been raised a number of times in the course of the various braking standard rulemakings. Although the NHTSA is not prepared at this time to state that a number higher than 75 ought to be selected, the agency intends to collect additional data concerning road surfaces with a view to possible future changes.

S6.1.9 Midland-Ross stated that parking brake tests for semitrailers should be conducted with the trailer front end supported by the trailer landing gear. The use of the parking brakes as part of the emergency braking system and the unknown effect of the friction in the landing gear system weigh against the adoption of this requirement. The petition is denied.

S6.2.1 The Carlisle Corporation requested that a 5% tolerance be specified in the dynamometer loading. The request is denied, for the reasons given in the preceding discussion of Wagner Electric's petition on S5.4.2.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 121, 49 CFR § 571.121 is amended . . . .

Effective date: September 1, 1974.

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 June 21, 1972.

Douglas W. Toms
Administrator

37 F.R. 12495
June 24, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 73–13; Notice 3)

This notice amends Motor Vehicle Safety Standard No. 121, *Air brake systems*, by modifying the emergency stopping distance requirements for truck-tractors, the parking brake requirements for trailer converter dollies, and the recovery requirements for antilock equipped brakes, and by establishing a new test condition for loaded truck-tractors, special test conditions for certain drive and axle configurations, and a new burnish condition for road tests.

The amendments adopted by this notice represent a partial adoption of the changes proposed in Docket No. 73–13, Notice 1 (38 F.R. 14963; June 7, 1973). The comments to the proposal were divided as to the merits of most of the changes proposed. Running throughout the comments, however, was an overriding concern with lead time. Although a manufacturer might favor a change, such as the proposed change in the burnish condition, he may find himself unable to adjust to it within the time remaining before the standard becomes effective on September 1, 1974. The NHTSA, for its part, does not consider the proposed changes significant enough to warrant postponing the effective date of the standard. The agency has therefore adopted two provisions for which lead time appears to be a problem—the new burnish condition and the new truck-tractor test condition—as options for the period between September 1, 1974, and September 1, 1976. Of the remaining changes proposed in Docket 73–13, some are adopted effective September 1, 1974, others are not being adopted and will not be further considered for adoption, and others remain as candidates for adoption. If the latter are adopted, they will become effective at some date beyond September 1, 1974. The treatment accorded each of the proposed changes is set out in order below.

S4. Definitions were proposed for "isolated reservoir" and "service reservoir". Insofar as the principal use of these definitions was to be in proposed amendments which are not being adopted at this time, there is little purpose in adding them to S4 at this time. They are therefore not adopted.

S5.1.2.5 This new section was to have been added to prevent the diversion of air from the service reservoirs into other reservoirs when the service reservoir pressure is below 60 psi. In addition to questions of lead time, several comments stated that the equipment served by auxiliary reservoirs, such as windshield wipers, often plays a role in safety as significant as that of the brake system. In consideration of these factors, the section is not being adopted at this time, and if subsequently adopted will take into account both lead time and the effects on other safety systems.

S5.1.3 The amendment proposed to the towing vehicle protection system requirements was to have accompanied the amended emergency braking requirements of S5.7, and would have designated the protection system as the system enabling the vehicle to meet the emergency stopping requirements of S5.7.2.2 and S5.7.2.3. The agency has decided to defer action on the amendments to S5.7, as discussed below, and accordingly takes no final action on S5.1.3 at this time.

S5.1.6 An amendment was proposed to the antilock failure signal requirements in response to a petition by Berg Manufacturing Company. Berg has subsequently withdrawn its petition, and in the absence of compelling reasons to adopt the proposed change, the NHTSA has decided not to amend S5.1.6.

S5.2.1.1 The requirement for the reservoir used to release the parking brakes was to be amended to specify two brake releases, rather than one, and to specify the initial pressure from which these releases were to be accomplished. The agency continues to regard these changes favorably, but has decided to defer final action until the issuance of amendments concerning the parking and emergency systems, as discussed under sections S5.6 and S5.7.

S5.3.1 and **S5.3.2.** Rather than amend the general language of these sections concerning the circumstances under which lockup is permitted during a stop, the agency has decided to leave the sections essentially unaltered. In response to requests to clarify the treatment accorded liftable axles, the section is amended to permit, in effect, liftable axles without antilock on vehicles with more than two nonsteerable axles. Liftable axles on vehicles with two nonsteerable axles would continue to be subject to the no-lockup requirement except for controlled lockup allowed by an antilock system.

The principal change proposed for S5.3.1 and S5.3.2 had been a change in the description of permissible lockup from "controlled lockup allowed by an antilock system" to "lockup of wheels controlled by an antilock system that does not permit more than half the wheels on any controlled axle to lock more than momentarily." The intent of the proposed revision was to forestall systems whose "control" over the lockup of wheels, although nominally within the meaning of the language, might be so marginal as to permit more than half the wheels on a tandem axle to lock throughout the duration of a stop. The proposed amendment, however, was read by some manufacturers as expressly permitting systems in which half the wheels on each axle would not be sensed or monitored by the antilock controller or cycled by the antilock system. Such was not the intent of the proposal. It appears, on further review, that such systems are not currently in prospect. The agency has concluded that the better course is not to amend the "controlled lockup" language at this time, but to observe developments in the industry, with a view toward amending the requirements if subsequent events indicate a safety need.

S5.3.4 The notice had proposed increasing the release time for trailers from 0.50 second to 0.60 second. In the face of several objections to the proposal on the grounds that it ran counter to the need for coordination of braking between vehicles in combination, and on the basis of information indicating that the timing problem is solvable for trailers, the proposal is being withdrawn.

S5.4.1 The notice had proposed deleting the retardation force requirement, leaving it applicable only to towed vehicles. The change had been proposed as a result of the proposed amendment to the tractor test conditions whereby the tractor would be tested with a trailer. In the light of the comments, and of the continuance of the current tractor test conditions as an option, the NHTSA has decided not to adopt the proposed change.

S5.4.3 The notice proposed to delete the minimum recovery pressure requirement for brakes equipped with antilock systems, leaving the 20 psi minimum force level for other brakes. Upon further consideration, the agency has concluded that a minimum recovery force requirement should be retained for antilock equipped brakes, but at a level below 20 psi. The agency has determined that 12 psi is a minimum level that permits a greater variety of brake linings while retaining a residual protection against oversensitive brakes in the event of antilock failure. Accordingly, the agency adopts 12 psi as the minimum recovery force for antilocked brakes.

S5.6 The parking brake requirements of S5.6 had been one of the principal areas affected by the proposal. In addition to changes in the parking brake application requirements and deletion of the optional static pull test for parking brake holding ability, the notice had proposed new requirements for parking brake stopping capability. This latter proposal received almost unanimous criticism. Although the agency has not concluded that the proposal is without merit, the issues raised by the comments and the evident lead time problems associated with the proposal have led the agency to conclude that no further action should be taken without additional notice and opportunity for comment and that the effective date for any such requirement should lie beyond September 1, 1974.

Of the remaining changes to S5.6 proposed by the notice, only the exemption of converter dollies from the parking brake requirements is being adopted at this time. The proposed deletion of the optional static pull test of S5.6.2 has not been carried out, and the options of S5.6.1 and S5.6.2 will be retained. The proposed parking brake application requirements of S5.6.6 and S5.6.7, which had reflected amendments proposed to the emergency braking requirements of S5.7 are not being adopted at this time, pending further rulemaking on S5.7.

S5.7 The notice had proposed substantial revisions to the emergency braking requirements of S5.7, principally in response to a petition by ATA and to an earlier petition by Ford. The majority of the changes proposed in response to the ATA petition continue to be viewed favorably by the NHTSA. However, review of the comments suggests both that further refinements are necessary and that the proposed changes will require additional time for implementation. The agency is therefore deferring final rulemaking action on the aspects of S5.7 addressed by the ATA to a later date and will issue such changes as it may decide upon with an effective date beyond September 1, 1974.

Amendments to the emergency stopping distance requirements, presently contained in S5.7.2.3 of the standard, were proposed by two successive notices. In Docket 73-4, Notice 1 (38 F.R. 6831), the agency proposed a favorable response to a petition by Ford concerning the emergency stopping distances for short-wheelbase two-axle truck-tractors in the unloaded condition. When tested in this weight condition, truck-tractors are driven without a trailer—a condition in which they are seldom operated over the road. The effect of the proposed amendment would have been to permit a limited number of truck-tractors equipped with modulated emergency braking systems to stop in a somewhat longer distance than that permitted other vehicles with modulated emergency braking.

Comments to Docket 73-4 indicated that there were other vehicles whose braking systems were complicated by the shorter emergency stopping distance. In response to these comments, the agency proposed in Docket No. 73-13, Notice 1, to apply the longer stopping distances to other vehicles in the unloaded condition provided they were capable of stopping within the shorter distance with the assistance of the parking brakes. The comments to Docket No. 73-13 objected to the use of the parking brake in this fashion, and some asserted that if the longer distance were appropriate for some vehicles it should be appropriate for all. Upon review of the comments, the agency has decided against a general lengthening of emergency stopping distances. Upon weighing the rarity of truck-tractor operation without a trailer against the potential costs of modifying truck-tractors to meet the shorter stopping distance in that configuration, however, the agency has concluded that the longer stopping distances specified in Column 4 of Table II should be applicable to truck-tractors, regardless of weight distribution or number of axles, but that other vehicles should continue to meet the emergency stopping distances of Column 3 of Table II. Section S5.7.2.3 is amended accordingly.

S5.8 The notice had proposed to transfer the emergency braking capability requirement for trailers from S5.8 to S5.6.7. Until such time as the agency decides to adopt S5.6.7, S5.8 will be retained. To provide emergency capability for converter dollies, in the absence of mandatory parking brakes for them, the NHTSA has amended the section to provide for application of the dolly's service brakes in the event of complete air pressure loss in the control lines. This system is presently installed in virtually all dollies, as a result of regulations issued by the Bureau of Motor Carrier Safety (49 CFR 393.43) and is considered to be a practicable substitute for the parking brakes in emergency situations.

S6.1 A number of revisions to the test conditions of S6.1 were proposed. These revisions are adopted in substance, with some changes in structure and in section numbering. The new truck-tractor test condition, whose insertion as S6.1.2 had caused confusion as to the fate of the old S6.1.2, has been adopted as S6.1.10, thereby leaving the current sections S6.1.2 to S6.1.9 with their present numbering.

S6.1.8 The road test burnish procedures proposed in the notice are being adopted as an optional procedure for the period September 1, 1974, to September 1, 1976. After September 1, 1976, the new burnish procedure will replace the older procedure as the only burnish prescribed for road tests. This two-step arrangement appears necessary to permit manufacturers whose testing to date has been conducted with the current burnish procedure, and who need additional time, to phase in the new procedure.

S6.1.10 A similar phase-in has been found necessary for the new tractor test conditions. Several manufacturers had stated that their evaluation programs had been conducted without trailers and that retesting would be necessary in order to certify their vehicles under the new conditions. The new conditions are therefore adopted as an option for the period September 1, 1974, to September 1, 1976. During this period a manufacturer may choose to test his vehicles under either loading condition, and such tests as the NHTSA conducts will be in the loading condition chosen by the manufacturer for the vehicle under test.

S6.1.10.1 The control trailer to be used under S6.1.10 is specified as conforming to Standard No. 121.

S6.1.10.2 The center of gravity of the loaded trailer is specified as being at a height of 66±3 inches above the ground. There was a variety of opinion in the comments as to how high the center of gravity should be, but upon reviewing the comments the agency has concluded that the 66±3 inch range originally proposed is reasonably representative of loading conditions. Axle load shift due to the rake angle of the trailer bed does not appear to be a problem in that each axle of the trailer is loaded to its GAWR when the trailer is connected to the tractor.

S6.1.10.3 and **S6.1.10.4** In response to comments suggesting that the lengths and weight ratings of the trailers specified in the proposal were not those in most general use, the agency has increased the length of the trailer specified in S6.1.10.3, reduced the length of the trailer specified in S6.1.10.4, and lowered the gross axle weight rating for each trailer.

S6.1.10.5 The loading condition of the trailer for tests of the tractor's brakes is substantially the same as that proposed in the notice. The tractor's fifth wheel does not have to be adjustable, as some comments inferred, but if it happens to be adjustable it must be adjusted to produce the specified weight distribution. The axle loads are to be measured at the tire-ground interfaces, in response to comments that the former reference to the "force transmitted to the tractor axles through the kingpin" was not clear as to the method of measurement.

S6.1.10.6 and **S6.1.10.7** These sections are designed to establish performance specifications for the trailers to be used for truck-tractor testing. They are not intended as performance requirements for trailers, but only as test equipment specifications for the tractor tests. The trailer loading condition specified is somewhat different from that used in testing the performance of the tractor, because the tests are aimed at isolating the performance of the trailer brakes. The location of the fifth wheel is specified as the position determined under S6.1.10.5, but the trailer is loaded so that its axle is at its gross axle weight rating and its kingpin is at unloaded weight.

The actuation and release times specified for the trailer in the evaluation tests were questioned by several comments. It may be necessary, in some cases, for a special valve to be installed on the tractor if the tractor's system is too slow to actuate the trailer's brakes in the time specified. The purpose of the timing specification is simply to remove the tractor's performance as a factor in the trailer brake evaluation. When the trailer is used in tests of a tractor pursuant to S5.3.1 it will, of course, be connected to the tractor's normal control system.

In addition to specifying the same loading in S6.1.10.7 as in S6.1.10.6, the ratio applied to determine the trailer's stopping distance under S6.1.10.7 has also been revised to conform to that used in S6.1.10.6. To accommodate tractors that are not capable of 60-mph speeds, each section now specifies that the trailer is tested at the speed at which the tractor for which it will be used is tested.

S6.1.11 and **S6.1.12** These sections relate to special drive conditions and the position of liftable axles, and are adopted as proposed.

S6.1.13 This new section was proposed to establish performance requirements for the trailer timing test rig specified in Figure 1. In the light of objections in the comments to the performance levels specified, the agency is deferring final rulemaking at this time and will issue such changes as it may decide upon with an effective date beyond September 1, 1974.

The tables and figures proposed for adoption or amendment by the notice are adopted as proposed, except for the omission of the parking brake dynamic test from Table I.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 121, *Air brake systems* (49 CFR 571.121), is amended . . . .

Effective date: September 1, 1974.

(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 December 20, 1973.

James B. Gregory
Administrator

39 F.R. 804
January 3, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74-10; Notice 2)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.121, in response to several petitions for reconsideration of amendments to the standard published January 3, 1974 (39 F.R. 804), and after consideration of comments on a proposal published March 1, 1974 (39 F.R. 7966). A notice of proposed rulemaking has been issued separately to propose modification of the standard as it applies to trailers.

Reconsideration of Amendments—73-13; Notice 3

The amendments under reconsideration concern emergency stopping distance requirements for truck tractors, parking brake requirements for trailer converter dollies, recovery requirements for antilock-equipped brakes, a new test condition for loaded truck-tractors, special test conditions for certain drive and axle configuration, and a new burnish condition for road tests. Several manufacturers commented on issues which lie beyond the scope of those amendments and are therefore inappropriate for treatment in this response. Wagner Electric and Midland-Ross' petitions to amend S5.1.2.1 and S5.2.1.2 (Midland also petitioned on S5.1.2.2 and S5.2.1.3) and Wagner's petition to modify Table III retardation values will therefore be considered as petitions for new rulemaking to be answered in a separate notice.

The American Trucking Association (ATA) requested reconsideration of NHTSA's decision to permit either automatic or modulated emergency brake systems as options while further consideration of the modulated system takes place. As stated in Notice 3, the NHTSA has concluded that some aspects of the system may need refinement and that all vehicle manufacturers cannot in any case make all their vehicles conform to modulated brake system requirements by the standard's effective date. Accordingly, while the majority of the changes proposed in response to the ATA petition continue to be viewed favorably, for the present ATA's petition is denied.

Wagner Electric and General Motors objected to the retention of brake retardation force requirements for towing vehicles as redundant in view of the stopping distance requirements which also apply to them. The NHTSA proposed deletion of these dynamometer requirements previously and, having considered the latest submissions and information, hereby amends S5.4.1 to delete towing vehicles from the standard's requirements. The NHTSA has tentatively concluded that the stopping distance requirements can establish satisfactory brake balance between towed and towing vehicles, and that the cost of dynamometer testing is not justified by corresponding safety benefits. It should be noted that the dynamometer test may be reinstituted if experience demonstrates its need.

Fruehauf, in a late submission to this docket and in other docket comments, has emphasized the importance to lateral stability of a slower release time for trailers. A 0.60-sec maximum release time proposed in Notice 1 was not acted on in Notice 3 in the belief that it ran counter to the need for coordination of braking between vehicles in combination, but further study has persuaded this agency that a slightly slower release time for trailers is not detrimental to safe operation of combination vehicles. S5.3.4 has been amended accordingly.

General Motors and the Motor Vehicle Manufacturers Association (MVMA) petitioned for deletion of the 12 lb/in^2 minimum pressure requirement for brakes controlled by an antilock system. The purpose of the minimum pressure is to eliminate oversensitive brakes because of the difficulty in modulating them. The lower value was established for antilock-controlled brakes on the assumption that a functioning antilock would normally compensate for oversensitivity. A residual value was retained in the event of antilock failure, not to compensate for driver surprise, as assumed by the MVMA, but rather to aid the driver in his efforts to carefully modulate a sensitive brake. The NHTSA has seen no evidence to support the assertions made by MVMA that this requirement could downgrade stopping performance. Except for General Motors' request to clarify antilock "control" in this section, the petitions to amend S5.4.3 are accordingly denied. S5.4.3 is modified to substitute "subject to the control of" in place of "controlled" to make clear that the antilock need not be activated.

General Motors and the MVMA objected to the test condition where a vehicle "is loaded to its gross vehicle weight rating, distributed proportionately to its gross axle weight ratings", arguing that this distribution formula could lead to overload of one or more axles. The General Motors illustration indicates a misunderstanding of the section's wording. The phrase "is loaded to its gross vehicle weight rating" describes a weight condition, that of the fully loaded vehicle, and the provision requires that this weight be distributed in proportion to the gross axle weight ratings. General Motors and the MVMA apparently interpreted the phrase to describe only that portion of the gross vehicle weight rating which "is loaded" on an unloaded truck to bring its weight up to GVWR. The condition states that what is distributed proportionately is the gross vehicle weight *rating* (*i.e.* the weight of the loaded vehicle), and not just that portion of the rating that constitutes the "load." There is no mathematical possibility of overloading an axle under this condition, since the GVWR must be no more than the sum of the GAWR's.

Ford stated with respect to S6.1.10.5 that "on some vehicles, it may not be possible to adjust the fifth wheel to a position in which the tractor can be loaded to GVWR without exceeding the GAWR of one axle." It may be that Ford's problem arises from the same misunderstanding described above with respect to GM and MVMA. To the extent, however, that the Ford petition implies that a manufacturer can establish a GVWR for a truck tractor which can not be attained without axle overload, the petition is based on a misconception of GVWR and is therefore denied.

Wagner Electric requested that the loadings in S6.1.10.6 be made uniform with S6.1.10.5 and S6.1.10.7. These loadings are not intended to be uniform, however, because the first condition specifies loading for purposes of truck-tractor testing, while the latter two conditions only establish test equipment specifications for the "control trailer test device" which is used in testing the truck-tractor. S6.1.10.6 and S6.1.10.7 loadings differ so that the service brake and emergency brake capabilities of the control trailer are separately designed to place greater demands on the truck tractor's service braking system than its emergency braking system. The calculations are based on an evaluation of the capacity of the brakes that are expected to be placed on production trailers in accordance with the dynamometer test requirements.

For the benefit of manufacturers who mistakenly consider these test conditions to be minimum performance requirements, it should be emphasized that the S6.1.10.6 and S6.1.10.7 values are conditions, i.e., characteristics of the control trailer test device which must be duplicated as closely as possible for testing. As with any other test device characteristic, to the degree that the control trailer can not produce exactly the right stopping distance, the certifying manufacturer should ascertain conformity of his vehicles under slightly more adverse conditions than those specified, in this case by slightly reducing the trailer brakes' capacity (to stop in the specified distance).

General Motors objected that the lighter control trailer capacities (18,000 and 32,000 pounds in place of 20,000 and 40,000 pounds) specified in the amendment would lower control trailer performance and thereby increase the performance required of truck tractors. The change was made to specify commonly used trailers, to aid manufacturers in meeting the September 1, 1974, effective date. The NHTSA continues to consider the increased availability of test devices to be more significant to promulgation of a fully satisfactory final rule than the small quantitative change noted by General Motors, and their petition is therefore denied.

General Motors and the MVMA requested specification of test load density to resolve difficulties in establishment of the "worst case" center of gravity height when testing trucks. Specification of a test load density, however, is unnecessary. The manufacturer of a truck or incomplete vehicle should establish the limits of placement of the load center of gravity as a part of his design considerations, to be specified in the Part 568 document for an incomplete vehicle or in his instructions to users in the case of a completed one. This establishes an envelope within which the vehicle is certified to comply with Standard 121 under full load. Once that envelope is established, the appropriate load densities to test the vehicle's conformity can be derived from it.

Several petitions were received with regard to brake burnish procedures. The MVMA and Ford requested reinclusion of language found in the proposal that specified an acceleration procedure for vehicles unable to reach the specified speed in one mile. General Motors submitted minor changes of an editorial nature and new language to specify an increased deceleration rate for vehicles unable to reach the specified speed in one mile. The NHTSA has concluded that language which appeared in the proposal and reflects current SAE procedure should be adopted. The General Motors increased deceleration method represents a new procedure which has not been evaluated by the NHTSA or proposed in any previous rulemaking. The suggestion of 50 snubs before allowing a cooling period is also a new General Motors proposal which the NHTSA has not had the opportunity to evaluate. With the exception of one recommendation, General Motors' editorial suggestions are adopted to be consistent with the titles in Table IV. The word "maximum" was deleted from S6.1.8.1 at the request of several manufacturers because it was inappropriate to the specification of temperature range.

Ford requested the addition of a burnish procedure for parking brakes which do not utilize the service brake components. Language has been added to specify a burnish procedure for these brakes in accordance with the manufacturer's recommendations.

Two other issues were raised with regard to the road test conditions. To answer Wagner Electric's petition for clarification of S6.1.10.7, the "valve controlling the trailer brakes" may or may not be part of the normal commercial system of the tractor depending on whether or not the normal system can provide the timing specified. The purpose of standardizing timing specifications is simply to remove the tractor's performance as a factor in the test trailer brake evaluation. When the trailer is used in tests of a tractor pursuant to S5.3.1, it will, of course, be connected to the tractor's normal control system.

General Motors questioned the safety benefit of wheel lockup requirements for liftable axles on buses equipped with two non-steerable axles if other axles other than the liftable axle can themselves meet the stopping distance requirements. The agency considers the controlled performance of the liftable axle to be of considerable benefit for added stability under braking conditions other than straight ahead braking required by the standard, and on this basis it denies the GM petition.

In other areas of the standard, General Motors petitioned for longer emergency stopping distances for all vehicles, reasoning that an exception to the values for truck-tractors in an unloaded condition (based on rarity of operation) could be as easily justified for the rare emergency stop situation of any vehicle. The rationale ignores the fact that the emergency values were established in the first place with the rarity of such occurrences in mind, and that the exception is posited on the combined rarity of unladen truck-tractor operation involved in an emergency situation. The problem of testing chassis-cabs can be met by specifying conformity to S5.7.2.3 with a specified weight on the rear axle representing the vehicle body weight. General Motors' petition to apply column 4 values to all vehicle emergency stopping distance requirements is therefore denied.

Wagner Electric petitioned to modify the wording of S5.8 concerning emergency application of trailer converter dolly service brakes so that the wording would be identical to Bureau of Motor Carrier Safety regulations (49 CFR 393.43). Wagner's proposed wording, however, applies to towing vehicle performance, where the triggering signal is a low, fixed air pressure, and the wording would not be appropriate for trailer performance, where the triggering signal is a venting of the supply line to the atmosphere. The S5.8 language is actually compatible with § 393.43(b), in that BMCS calls for towing vehicles to have an automatic means of activating the emergency features of the trailer air brakes, and S5.8 calls for compatible automatic features on the trailers. Wagner's petition is therefore denied.

General Motors asked whether the S5.4 requirement that brake assemblies meet tests in sequence actually exempts some brakes from all three tests if they are elsewhere exempted from the first. Paragraph S5.4 does not exempt any brake assemblies from any requirement. The brakes on a vehicle which does not have to comply with S5.4.1 must comply with S5.4.2 and S5.4.3.

Several comments requested correction of the omission of the words "in the service brake system" from S5.7.2.3 as published in Notice 3. The omission was inadvertent and has been corrected.

General Motors requested an indication that stopping sequence steps 2 and 3 in Table I apply only to truck-tractors. The steps have been changed to indicate that these steps apply only to truck-tractor testing by means of a control trailer. As for the objection that S6.1.10.7 implies the emergency system of a truck-tractor must control the trailer spring brakes, S6.1.10.7 has been clarified by the addition of a qualifying phrase. S6.1.10.6 and S6.1.10.7 have been further clarified by adding headings to indicate that they are test equipment specifications.

In a separate submission to Docket 73-13, Wagner Electric requested clarification of the trailer test rig timing issue, which had been reserved in Notice 3 as a candidate for adoption at some later date. Midland-Ross also raised the issue with regard to a requested modification of Figure 1. The petitions pointed out that an NHTSA test showing a failure would be inconclusive if it were compared to manufacturer testing conducted on a faster rig, and showing conformity. The remedy is to specify "legal baseline" actuation and release times, so the manufacturer will know the precise conditions under which his equipment must meet the requirements, and both government and industry testing can be conducted so as to produce conclusive results. The NHTSA therefore establishes the actuation and release values proposed in Notice 1 with minor modification. They will not become effective until September 1, 1975, to maintain the validity of testing already conducted. The values are set at two-significant-figure accuracy in agreement with Wagner that the values should match the actual trailer performance values. Because the actuation time is lowered to 0.06 seconds, the NHTSA may find it necessary to improve its test rig's speed by removing the tractor protection valve. Therefore, the valve has been made optional. The performance of the test device had been modified from the original proposal so that initiating signal points are the same as for the actual performance tests, and so that initial release pressure agrees with the 95-psi requirement of the performance tests.

Other issues raised by Wagner and Midland-Ross in petitions to Notice 3 will be answered in a later notice.

March 1, 1974 Proposals

The NHTSA proposed modification of the standard's effective date, brake actuation times, and road and dynamometer tests as they apply to the service brake system and emergency stopping performance of all vehicles subject to the standard except trailers (39 F.R. 7966, March 1, 1974). The proposals would have affected vehicle types separately to reflect the particular problems faced by fire fighting vehicles, "special permit" vehicles, on/off-highway vehicles, and standard highway trucks and buses. Manufacturer concern centered on the availability of components to meet the standard by September 1, 1974, and the reliability of the antilock systems which will be utilized by most manufacturers to meet the requirements. Having carefully considered the comments submitted in response to this proposal, the NHTSA hereby delays the standard's effective date for trucks and buses to

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74-10; Notice 6)

This notice responds to six petitions for reconsideration of recent amendments to Standard No. 121, *Air brake systems*, 49 CFR 571.121, which established a March 1, 1975, effective date for trucks and buses, and optional interim requirements until September 1, 1975, for trucks with certain heavy or front steerable drive axles. In addition, this notice also responds to several questions on the burnish procedure recently raised by International Harvester.

The NHTSA established the March 1, 1975, effective date for trucks and buses after comprehensive consideration of numerous petitions from manufacturers and users of air brake-equipped vehicles (39 F.R. 17550, May 17, 1974). Manufacturer concerns centered on the availability and reliability of components involved in the new brake systems, particularly antilock devices, and on leadtime necessary to modify vehicles to accept these components.

Ford Motor Company is the only manufacturer of air brake-equipped trucks which petitioned for reconsideration of the March 1, 1975, implementation date for the standard's basic provisions. After the time for petitions for reconsideration had closed, Chrysler Corporation reported on an accident which occurred during certification testing of a vehicle equipped with antilock devices, and urged the delay of Standard No. 121 for an indefinite period. The American Institute of Merchant Shipping also requested an indefinite delay in the standard's implementation.

Ford petitioned for a further 6-month delay in the standard as it applies to truck-tractors, and a one and one-half year delay as the standard applies to other trucks and buses. Ford asserts that the suspension and brake modifications necessary to meet the dry-stopping distance requirements will compromise vehicle handling and stability, increase the danger of load shifts, and force the introduction of antilock devices before Ford considers them reliable. The requested extension would be used to evaluate the effect of the new componentry on overall safety.

The issues in the Ford petition have been carefully considered by the NHTSA in the process of rulemaking and, with the exception of load shifting, were addressed in the preamble to the amendments which established the March 1, 1975, date. The NHTSA has reviewed each of Ford's concerns, and concludes that implementation of the standard as scheduled for trucks and buses is reasonable, practicable, and meets the need for motor vehicle safety.

With regard to the handling and stability problems experienced by some short-wheel-based vehicles in meeting the stopping distance requirements, the NHTSA maintains its determination that adequate time has been made available to make the major redesign necessary in some vehicles, or to make the decision to discontinue the production of models which are simply too short to meet the requirements despite design changes. International Harvester, in its comments on the rulemaking, indicated that it had been ready to meet the proposed January 1, 1975, effective date and would actually suffer economic losses in waiting for the March 1, 1975, implementation.

The availability and reliability of antilock systems which will be used by many manufacturers in meeting the requirements was questioned by Ford in its petition. In response to Ford's assertion that a manufacturer's report on field experience with 8,000 antilock units does not appear in the record, a letter from Kelsey-Hayes (February 1, 1974) containing this information was placed in the NHTSA Docket Section before March 1, 1974. The NHTSA continues to monitor antilock production and testing and cannot agree that the evidence indicates antilocks will decrease the safety of the new trucks in highway operation. Since May, the NHTSA engineering staff has visited six of the seven major antilock manufacturers to discuss antilock reliability and availability. At least half of these manufacturers pointed out that their plants were prepared for full production to meet the September 1, 1974, date, and that they had had to delay production schedules because of the six-month delay. Low volume production is presently available to vehicle manufacturers for their testing and evaluation.

Concerning antilock reliability, a substantial amount of proprietary information was reviewed as well as the publicly-known information that no highway accident has been attributed to the failure of antilock devices. Kelsey-Hayes pointed out that it is selling approximately 250 axle units each month for retrofit. Following these visits, the NHTSA sent the seven major antilock manufacturers requests for reliability data under its investigatory authority, which will become part of the record although it may be of a proprietary nature which would justify not making it public. This data will show millions of axle miles of antilock operation with a malfunction rate comparable to other equipment presently in highway service, and no highway accidents attributable to the device.

Chrysler Corporation reported on a proving-ground accident on May 16, 1974, in which an antilock-equipped truck rolled over after its rear wheels locked and caused skidding during a stop from 60 mph. The manufacturer of the antilock system reported that the device functioned as it was designed to but in response to a false signal. The important point, however, as noted in the May rulemaking, is that the accident occurred as a result of rear-wheel lockup during a panic-type, full brake application that would also have occurred if the vehicle had not been equipped with antilock. In other words, a panic stop always involves the risk of uncontrolled skid due to lockup, and the presence of the antilock only improves the chances of a safe stop in the vast majority of instances in which it functions properly.

Ford requested an interpretation of S5.5.1 of the standard that would permit use of a pressure limiting valve to the front axle that operates when it senses electrical failure of the antilock system. The NHTSA has advised Ford (and Bendix Corporation) that S5.5.1 does not prohibit use of such a valve designed to operate in the event of electrical failure.

Ford also raised the problem of load shift under heavy braking. The NHTSA has considered the effects of the standard and notes that, under normal circumstances, stops will continue to be made at the same deceleration as in the past, consistent with driver comfort and load stability. Only in emergency situations will the full torque of the new brakes be utilized and in this event, the NHTSA concludes that the shorter stopping distances outweigh the possible safety problem of load shift.

The Ford petition pointed out that any failure of component manufacturers to supply the new 121 components would make compliance with the standard impossible. As of this date the NHTSA finds that supplier production is on schedule and will provide components on time. As recently as July 26, 1974, Rockwell International assured the NHTSA that its production is on schedule.

For these reasons the Ford petition and Chrysler request are denied. The NHTSA would like to establish the issuance of this notice as the final form of Standard No. 121 with regard to its effective date and the stopping distance requirements, for purposes of review under § 105(a)(1) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. § 1394). Thus, while several areas treated later in this notice will be subject to further reconsideration, the effective dates and stopping distance requirements will be final as to any person who will be adversely affected by them.

While International Harvester supported the March 1, 1975, date for standard highway trucks and buses (it would have preferred a January 1, 1975, date), they did petition for reconsideration of the NHTSA decision to apply the full stopping distances to vehicles equipped with front steerable drive axles after September 1, 1975. White Motor Company and Diamond Reo Trucks, Inc., also petitioned for 1 year's delay in implementation of the full requirements for these axles.

The majority of front steerable drive axles are found on vehicles which use the road regularly at highway speeds and which require the same stopping capability as lighter vehicles. In most cases, their non-planetary construction permits an uncomplicated adaptation to the standard's torque requirements. Furthermore, one vehicle manufacturer indicates that it has successfully redesigned steerable drive axles in the 18,000- to 23,000-pound GAWR range to meet Standard No. 121. White, International Harvester, and Diamond Reo state that the lighter axles in this category are unavailable, but not technically unfeasible. The unavailability stems from supplier decisions to concentrate on the more common non-driving axles found on standard highway vehicles in great numbers. An August 8, 1974, letter from Rockwell Standard to Docket 74–10 supports the conclusion that the axles can be manufactured, but will not be available until September 1, 1976. Accordingly, the NHTSA has reconsidered the present effective date of September 1, 1975, for full requirements applicable to front steerable drive axles and delays for one year the full requirements for those axle sizes which are not available until September 1, 1976.

Diamond Reo and White also requested reconsideration of the implementation of full requirements for vehicles equipped with a front steerable non-driving axle with a GAWR of 16,000 pounds or more, which are subject to interim dynamometer requirements from March 1, 1975, to September 1, 1975. The manufacturers base their requests for a 1-year delay on difficulties in securing a proven brake assembly capable of handling the higher torque levels. B. F. Goodrich recently dropped development of its heavy air-over-hydraulic disc brake system, to which at least one truck manufacturer, White Trucks, was committed. White states that disc brakes are necessary for heavy front axles and has encountered severe axle-to-axle imbalance problems in its attempts to use other disc brake assemblies at this date. A major axle supplier has notified the NHTSA that the axle itself can be ready by September 1975.

The NHTSA has evaluated the foundation brake assemblies available to this vehicle group and concludes that a year's field testing and experience is necessary and desirable to assure that the new components will perform as designed when placed in highway service. For this reason the full requirements of Standard No. 121 will become effective for vehicles with a front steerable axle of 16,000 pounds GAWR or more on September 1, 1976.

With regard to this vehicle group, International Harvester claimed that the requirement that the brakes be "fully applied" was unfairly introduced into the interim requirements and interferes with braking action. Apparently full pressure applications may cause erratic behavior in some large vehicles with very light bodies, during dry stops in the unloaded condition.

Full application is required to ensure that vehicles provide the lateral tractive capability of an unlocked wheel during panic braking. This interim requirement was proposed in March 1974 as relief from full requirements which have been in effect since February 1971. The NHTSA does not consider it unfair to propose and make final an optional stopping requirement which represents relief from more stringent requirements. More important, the NHTSA considers it crucial to maintain complete directional stability in a panic stop, loaded or unloaded, if the vehicle is unable to meet the stopping distance requirements in that condition. Accordingly, the International Harvester petition is denied.

Diamond Reo also requested that the interim stopping distances for standard highway vehicles be adopted as the full requirements. Their vehicles meet the shorter distances but not by a sufficient margin to absolutely assure them that every one of their vehicles will pass. The fact that the vehicles are capable of stopping well within the shorter distances persuades the NHTSA that this safety level can and should be maintained. Manufacturers are required by the Safety Act to "exercise due care" in certifying that vehicles comply with the applicable standards (15 U.S.C. § 1397(b)(2)). In view of the statutory language, Diamond Reo's request for reconsideration is denied.

In a related matter, the NHTSA has been asked by the *Federal Register* to redesignate the present Table V as Table IIa, which is accomplished in this notice.

Manufacturers raised several matters which were not addressed by Notice 2 and are not, therefore, properly raised as petitions for reconsideration. The NHTSA finds it desirable, however, to respond to them in this notice, in view of the standard's imminent effective date.

Most important was a question by International Harvester in a July 27, 1974, visit by NHTSA engineers to their plant. They indicated that some 121 vehicles may have difficulty in achieving the required burnish temperatures because of the use of the automatic pressure limiting valve that tailors the torque at the front axle. The burnish conditions of Standard No. 121 essentially standardize the preparation of new truck, bus, and trailer brakes for testing under the standard.

In the absence of a specification for these valves, it appears that manufacturers have instituted various practices to assure uniformly good burnishes. It is apparent that different vehicles respond to the burnish procedure with distinctive problems and require solutions tailored to their particular brake packages.

From a regulatory standpoint, however, an optional procedure complicates enforcement of a standard, particularly where a manufacturer has tested one way and the NHTSA tests the other. Test results with the limiting valve, for example, may not be easily comparable with test results in which the valve was bypassed. Both the manufacturer and the NHTSA need a specification that permits flexibility in achieving a uniform burnish in different vehicles, but does not permit two burnish options.

To end this confusion, the NHTSA further specifies the burnish procedure to require that a limiting valve be in use except in the event the temperature of the hottest brake on a rear axle exceeds the temperature of the hottest brake on the front axle by 125° F. In this way the manufacturer and the NHTSA will follow the same test procedure. It should be emphasized that this specification in no way invalidates the testing undertaken to date. Such data can be the basis of certification.

In answer to another International Harvester question, brake adjustments can be made during the burnishing to control brake temperatures. It should be noted that NHTSA is considering a limit on adjustments to three, to be made only during the first 250 snubs. Finally, the NHTSA has indicated to Kelsey-Hayes that it would add "after-stop" to the burnish procedures to describe the specified temperatures more precisely. The NHTSA intends to measure the temperatures within 30 seconds of brake release, but will not reject manufacturer readings taken at any time if they are reasonably related to the temperatures actually generated by the snubs. This latitude is necessary to avoid invalidation of manufacturer testing up to this time.

International Harvester asked that the parking brake requirements of S5.6.2 be modified to require 20 percent grade holding ability "to the limit of traction". The NHTSA has determined that the present grade holding capability is desirable, and it has already provided an alternative requirement in the standard that brakes with a specified static retardation force be provided on all axles. The NHTSA concludes that the option makes a reduction of the grade-holding requirements unnecessary.

Diamond Reo requested that air reservoir volume on trucks and buses be reduced from present requirements. The NHTSA has already reduced the volume from 16 times the combined service brake chamber volumes to 12 times that volume, and concludes that a further reduction is not in the interests of motor vehicle safety. The Diamond Reo request concerning the antilock electrical circuit has already been answered by a letter denial of June 28, 1974.

Wagner Electric requested a minor revision of Figure 1, Trailer Test Rig, which the NHTSA makes in the interests of consistency of terminology. The word "control" is substituted for "pedal".

Finally, the NHTSA has been receiving some indications that manufacturers may arbitrarily specify a higher GAWR than normal simply to avoid requirements of the standard. The NHTSA therefore takes this opportunity to explain the manufacturer's responsibility to specify the GAWR of axle systems on his products.

The NHTSA defines gross axle weight rating as follows:

"Gross axle weight rating" or "GAWR" means the value specified by the manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Because the GAWR is measured at the tire-ground interfaces, it means that the tires, wheels, brakes, and suspension components are included in the determination. It is obvious that the GAWR of the whole system cannot exceed the rating of any one component, such as tires. Both the NHTSA in its compliance tests and defects investigations, and the Bureau of Motor Carrier Safety on the road, will judge the vehicle on the basis of the values assigned. Therefore it is in the interest of the manufacturer to assign values which accurately reflect the load-bearing ability of the vehicle and its tires and suspension.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

Effective date: March 1, 1975. Because the Standard's effective date for trucks and buses occurs sooner than 180 days and because these amendments create no additional burden, it is found for good cause shown that an earlier effective date than 180 days from the date of publication 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 November 6, 1974.

James B. Gregory
Administrator

39 F.R. 39880
November 12, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 11)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.212, to establish a new test category (and an effective date) for highly specialized tractor-trailer vehicle combinations, and to specify modified brake retardation force requirements for trailers until September 1, 1976.

The National Highway Traffic Safety Administration (NHTSA) proposed these actions, along with other actions that deal with specialized trucks, in a notice published November 14, 1974 (39 F.R. 40168). The NHTSA is acting as soon as possible on the retardation force and integral tractor-trailer issues because they directly affect the manufacture of trailers, which will be subject to the standard's requirements on January 1, 1975. The issue of exemption for oversize and specialized trucks (which have a March 1, 1975, effective date) will be addressed in the near future by a separate notice.

The NHTSA takes note of its recent proposal and request for comments on a postponement of this standard (39 F.R. 43639, December 17, 1974). The NHTSA is proceding with this rulemaking action independently of that proposal to maintain as much continuity as possible in the regulation as presently issued.

The manufacturers and users of auto transporter combination vehicles and the Truck Trailer Manufacturers Association supported the proposal to exempt "integral tractor-trailers" from applicability of the standard until September 1, 1976, because of their particular testing difficulties. It has been suggested that the term "integral tractor-trailer" should be replaced by a more descriptive designation of the combination vehicles in question. The NHTSA agrees and modifies the definition to refer to the transportation of motor vehicles, and to change the defined term to "auto transporters." The comments requested deletion of a requirement in the definition which limited these vehicles to those designed "by a single manufacturer, or person who alters a certified vehicle." The comments expressed concern that the phrase would eliminate the manufacture of tractor and trailer portions separately. Some manufacturers also believed that the reference to "certified vehicles" meant that any incomplete truck tractor equipped with 121-type equipment would have to be certified upon completion by the manufacturer of auto transporters.

The cited requirement does not exclude manufacture by separate individuals of the two portions of the combination, although the preamble inadvertently referred to "trucks and trailers manufactured by a single manufacturer for use in combination." It is possible that one or more persons other than a vehicle manufacturer or alterer may be responsible for the integral design. The NHTSA therefore deletes the phrase in question to permit continued flexibility in the design of these vehicles.

The reference to alteration of a "certified vehicle" confused some businesses which modify stock truck-tractors for use in auto transporters. They believed that a completed vehcile that had been certified to meet Standard No. 121, or an incomplete vehicle with documents referring to Standard No. 121, could not qualify for an exemption as a portion of an auto transporter. In actuality, a complete and certified vehicle, or an incomplete vehicle, can be modified to become a portion of an auto transporter, which would thereby qualify for exemption whatever its previous status.

Bankhead Transportation requested clarification with regard to manufacture of new auto transporter trailers to be fitted to existing truck tractors that are modified to accept the new trailer, These trailers constitute a portion of an auto transporter and as such are exempt until September 1, 1976. The NHTSA has modified the language of S5.3 in one respect from that proposed, to make clear that a transporter trailer manufactured without an equivalent transporter tractor would be tested separately under the requirements of S5.3.2 after September 1, 1976.

The NHTSA also proposed that the retardation force requirements of the standard, which apply to trailers (and, of an optional basis, to a small category of large trucks until September 1, 1967), be somewhat reduced because of the degree of variability being experienced in brake lining performance. The NHTSA requested comments on lower values and on whether such new values should be permanent, or only temporary while further information is developed on variability.

With the exception of General Motors Corporation and Automotive Research Associates, Incorporated (which suggested changes in dynamometer procedures instead of values), the commentors supported the reduction of retardation force values for trailers. General Motors argued that brake force reductions of the trailer should not be undertaken without similar reductions in stopping distance requirements for trucks, and is particular towing vehicles.

The NHTSA, in an amendment published May 17, 1974 (39 F.R. 17750), has already acknowledged the variability of production brake assemblies on trucks and buses by establishing longer stopping distances for an interim period until September 1, 1975. The NHTSA recently denied a petition by Diamond Reo to make these longer distances the permanent values of the standard (39 F.R. 39880). A Paccar Corporation petition presently under consideration on the subject of stopping distances also raises the issue of relaxed stopping requirements. The NHTSA concludes that its decision on that petition will be responsive to the points raised by General Motors.

Several comments on the proposed lower retardation forces included data that further substantiate the determination that variability of brake linings is not sufficiently small to permit 100 percent compilance of every brake assembly at the present values. Wagner Electric Corporation, which originally petitioned for use of the values proposed by the NHTSA, has submitted new data which support a slightly lower minima force level to support the desired mean performance of approximately 60 pounds. Data supplied by Raybestos Manhattan demonstrate a variability to the 3-sigma limit of slightly more than 20 percent calculated by the NHTSA on earlier testing. Molded Materials Company disagreed that compatibility of combination vehciles required 60 percent mean retardation values, but supported the proposed lower minimum force levels as a means to achieve compatibility. Abex Corporation supported the lower values so that actual production experience could be accumulated as a basis for future changes.

The NHTSA concludes on the basis or submitted data that values slightly lower than those proposed will better accommodate the demonstrated variability of brake lining material. Therefore, values of 0.06, 0.13, 0.20, 0.27, 0.34, 0.41, and 0.47 will replace the present values for trailers.

Manufacturers and users of brake lining differed on whether the new values should permanently replace the previous values. The NHTSA did not receive conclusive information indicating that the variability in performance will remain in production units. The NHTSA concludes, therefore, that interim values will permit the accumulation of significant field experience on vehicle compatibility and lining variability, and that a judgment will be made on the basis of that data in the future.

Only Kelsey-Hayes commented on the proposal to apply these new retardation force values to trucks with heavy (or driving) front axles during their interim requirements. As a manufacturer of front axle brake assemblies for this vehicle category, Kelsey-Hayes pointed out that the revision was not supported for truck front axle brake assemblies and would require an unjustified retooling for a period of no more than 18 months. The NHTSA agrees that the data underlying the proposal supports a modification for trailer brake assemblies only. Accordinglv the NHTSA does not reduce the optional interim retardation force requirements for trucks specified in S5.1.3.2.

In a separate matter, Rockwell International Corporation asked whether the discussion of 100 percent compliance with Standard No. 121's retardation force requirements was a modification of earlier NHTSA discussion on the "due care" responsibility of each manufacturer to ensure that each of his products meets the requirements of the standard (39 F.R. 17750, May 17, 1974). The requirement to exercise "due care" that each vehicle comply with Standard No. 121 is a statutory requirement (15 U.S.C. 1397), and the above-cited discussion remains the NHTSA position.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571. 121) is amended. . . .

Effective date: January 1, 1975. Because of the imminent effective date of the standard for trailers (January 1, 1975), the National Highway Traffic Safety Administration finds, for good cause shown, that an effective date sooner than 30 days 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 C.F.R. 1.51)

Issued on December 31, 1974.

James B. Gregory
Administrator

40 F.R. 1246
January 7, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

(Docket No. 74–10; Notice 12)

Air Brake Systems

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. 571.121, to delete as of September 1, 1976, the emergency brake option that for trucks and buses permits automatic application of the parking brakes in place of a modulated emergency brake system. A notice of proposed rulemaking to be issued shortly proposes modification of the air brake system parking brake requirements and the trailer emergency braking requirements.

Based on a December 1972 petition from the American Trucking Associations (ATA), the NHTSA proposed elimination of the automatic parking brake for use as an emergency braking capability (38 F.R. 14963, June 7, 1973). In response to comments on that proposal which stated that leadtime was insufficient to implement the proposal by September 1, 1974, the NHTSA indicated it would defer final action to a later date and issue any changes with an effective date beyond September 1, 1974 (39 F.R. 804, January 3, 1974). The NHTSA again indicated in May 1974 that "the majority of the changes proposed in response to the ATA petition continue to be viewed favorably." (39 F.R. 17550, May 17, 1974). The NHTSA has now completed its consideration of the modulated braking provision and hereby amends the standard as proposed in June 1973, with an effective date of September 1, 1976, to permit adequate time for engineering necessary changes. It appears, in fact, that the majority of new brake systems are designed to meet generally the modulated emergency brake requirements.

The fundamental change is elimination of the option that permits automatic application of the parking brakes in place of a modulated emergency brake system. The NHTSA agrees with the ATA that a driver should not be forced to use two different methods of applying the emergency brakes, depending on what vehcile he is driving at the time.

In the parikng brake system proposal to be published shortly, it is proposed that the parking brake provisions found as options in the present S5.7 be made mandatory in a revised S5.6 parking brake section. Thus the present S5.7 requirement that a vehicle with a modulated brake capability also have a parking brake capable of manual application at any service reservoir pressure level would be found in the parking brake section. Also the requirement that the parking brake be capable of application in the event of a failure of specific components common to the service brake and emergency braking systems would be moved to the revised parking brake section. Finally the requirement that a parking brake be releasable only if it can be reapplied would be found in the new parking brake provisions.

Several other requirements proposed in June 1973 for the modulated emergency brake system are found in this amendment. The modulated emergency brake must be applied, released, and be capable of modulation, by means of the service brake control. The NHTSA has concluded that the driver is most likely to maintain the best control of his vehicle when he can modulate any braking available to him througd a single control. The emergency system must be capable of two full applications and releases in the event the service brake system fails. This ensures that a disabled vehicle can be safely moved off the roadway.

As proposed in June 1973 and made final in this notice, the emergency brake system of a towing vehicle must operate in the event the trailer air control line or the trailer supply and control lines fail. These requirements ensure that a loaded combination vehicle can stop in specified distances with a failed control line, and that a loaded straight truck (capable of towing) or "bobtail" tractor-trailer is capable of stopping in the event a trailer breaks away. Additionally, the service brake control of a towing vehicle must be capable of modulating the brakes on a towed vehicle following a failure on the towing vehicle. Also, the emergency stopping distance requirement presently in the standard becomes the only permissible test of a truck or bus emergency braking system.

A new test condition has been added to specify when to vent the control and supply lines to atmosphere for test purposes.

As noted above, the majority of these changes appear to be incorporated in large measure in the design of the new brake systems. The NHTSA concludes that truck and bus manufacturers are capable of meeting these modulated brake requirements by September 1, 1976.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571.121) is amended. . . .

Effective date: September 1, 1976.

(Sec. 103, 119 Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407), delegation of authority at 49 C.F.R. 1.51 and 49 C.F.R. 501.8).

Issued on January 10, 1975.

James B. Gregory
Administrator

40 F.R. 2989
January 17, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 14)

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. 571.121, to exempt a small category of oversize and construction vehicles from the applicability of the standard. The exemption criteria were proposed in a January 28, 1975, notice (40 F.R. 4153), which expanded the criteria for this specialized vehicle category in response to comments on an earlier exemption proposal (39 F.R. 40168, November 14, 1974).

In making the proposal, the NHTSA tentatively determined that the specialized configuration of this small category makes compliance with the standard so difficult and expensive that an exemption from the standard would be justified. It was noted that the vehicle function in these cases generally results in restricted operation on the highway (e.g., at low speed, in permit operation, or during daylight hours) and that as a result, vehicle exposure on the highway is limited.

The NHTSA proposed a series of criteria intended to comprehensively identify vehicles with these characteristics. Permanent exemption would be granted to any vehicle that has (1) an overall vehicle width of 108 inches or more, (2) a speed attainable in two miles of not more than 33 mph, (3) a speed attainable in two miles of not more than 45 mph, all-wheel drive, and no cargo- or passenger-carrying capacity, (4) an axle that has a GAWR of 29,000 pounds or more, (5) two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle; or (6) a steerable drive axle driven through gear reduction contained within the wheel.

Three of the numbered criteria ((3), (5), and (6)) were intended to describe the lighter and more maneuverable vehicles whose drive axle configuration or high center of gravity make conformity with the standard expensive and difficult. An example of this vehicle type is the large, carrier-mounted mobile crane. Based on submitted comments, it appears that these criteria should be combined as a single compound criterion in order to avoid inequities in the applicability of the standard. Specifically, either of the criteria numbered (5) or (6) could, of itself, permit heavy or cargo-carrying vehicles on the highway at unlimited speed without 121-type brakes while far smaller vehicles would be subject to the regulation. To accomplish the rearrangement, the exception criteria numbered (3), (5), and (6) are combined in a new category (d) to require for this exception that an expected vehicle have a speed attainable in two miles of not more than 45 mph, no cargo- or passenger-carrying capacity, and either (1) all-wheel drive, (2) a steerable drive axle driven through gear reduction contained within the wheel, or (3) two or more front steerable axles.

It is recognized that total withdrawal of the 16,000-pound tandem steerable axle exemption would make those vehicles with an unlimited highway speed unavailable until the axles are developed or the vehicle speed is reduced to 45 mph. Therefore the NHTSA will make final its proposed 16,000-pound exemption, but only for the interim period until September 1, 1976.

With regard to the 45-mph maximum speed criterion, FMC Corporation suggested that the speed be raised somewhat to ensure that vehicles excepted on this criterion can use the interstate highway system. The NHTSA does not agree that it should encourage use on the interstate system of large, high-center-of-gravity vehicles that are not subject to a minimum braking standard. Accordingly, FMC's request is denied.

Little comment was received on the other criteria. Ford Motor Company suggested a 24,000-pound figure in place of the 29,000-pound proposal. For reasons cited in the January proposal in response to an identical request by Mack this request is denied.

To the degree that this amendment does not grant the requests for exemption raised by Marmon Transmotive in its December 23, 1974, letter to the Administrator, that petition is denied.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571.121) is amended. . . .

Effective date: March 1, 1975. Because these amendments relieve a restriction and because of the imminence of the standard's effective date, it is found for good cause shown that an effective date sooner than 30 days from the date of their 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 C.F.R. 1.51.)

Issued on February 28, 1975.

James B. Gregory
Administrator

40 F.R. 8953
March 4, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 15)

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. § 571.121, in response to petitions for reconsideration of requirements established for trucks and buses, by revision of the retardation force requirements applicable to on/off highway vehicles until September 1, 1975, or September 1, 1976.

The National Highway Traffic Safety Administration (NHTSA) established the final form of Standard No. 121 for purposes of judicial review in November 1974 (39 F.R. 39880, November 21, 1974) (Notice 6). Notice 6 established interim stopping distance requirements for standard highway vehicles, and retardation force requirements for some on/off highway vehicles. Petitions for reconsideration of the decision were received from White Motor Corporation, Mack Trucks, International Harvester, PACCAR Corporation, Diamond Reo, and Breeze Corporations. General Motors effectively requested reconsideration in its response to a separate November notice (39 F.R. 40168, November 14, 1974) (Notice 7) by supporting reduced trailer requirements only with corresponding reduction of truck stopping distance requirements.

General Motors, in its response to Notice 7, indicated that similar 121 vehicles can register as much as a 20-percent difference in stopping distances as a result of uncontrolled variability in brake component performance. International Harvester, which until recently had supported 5-percent longer stopping distances on an interim basis, now points to certain variables, including brake linings, in requesting longer distances on a permanent basis. Diamond Reo reported the same experience in its comments to Notice 2 of Docket No. 74–10. PACCAR requested that S5.3 (stopping distance) be "temporarily repealed" and that longer stoping distances be considered for the future. The NHTSA concludes that PACCAR's request is essentially a petition for rulemaking to increase the stopping distances on a permanent basis.

These positions raise issues which can arise whenever a standard is first implemented: (1) that production variables are so great that inordinate compilance margins are required and (2) that the brake packages necessary to achieve these compliance margins are so aggressive that the handling qualities and durability of affected vehicles are significantly degraded. The NHTSA is, of course, interested in receiving on a continuing basis any new technical information (particularly test data on production vehicles) that bears on these important safety issues. Based on the information submitted to date, however, NHTSA is not prepared to grant the outstanding petitions at this time.

PACCAR also requested that the stopping distance requirements be delayed until the performance of antilock systems and certain test procedures, conditions, and the control trailer test device are specified in areas considered deficient by PACCAR. While these issues might appropriately be considered for future rulemaking, the NHTSA does not agree that change of these important elements of the standard should delay orderly implementation of the standard. Accordingly, the PACCAR request in these areas is denied.

The second area of the standard in which manufacturers seek reconsideration is limited relaxation of requirements for vehicles with front steerable drive axles (S5.3.1.2). Based on unavailability of this axle design, vehicles manufactured before September 1, 1975, with a front steerable drive axle of any size may meet retardation force requirements in place of stopping distance requirements. Because of unavailability of the lighter front driving axles for a greater period, vehicles manufactured before September 1, 1976, with a front steerable drive axle with a gross axle weight rating (GAWR) of less than 18,000 pounds may meet retardation force requirements in place of stopping distance requirements.

Diamond Reo, International Harvester, and Mack Trucks, Inc., now request that the heavier axles also be permitted relaxed requirements until September 1, 1976. White Motor Company in its response to Notice 10 of Docket No. 74–10 requested the relaxed requirements until September 1, 1977. The NHTSA indicated in Notice 6 that this axle type is available and has been offered by Oshkosh Truck Company to the other manufacturers of this vehicle class. While Diamond Reo does not indicate it considered the Oshkosh axle, the other manufacturers indicate that redesign of their limited vehicle output in this area to accept the Oshkosh axle would be unjustified because of cost. Oshkosh, on the other hand, has offered to provide, at cost, technical assistance in the installation of Oshkosh axles to non-Oshkosh pilot test vehicles, and consultation and review of test data obtained from truck-manufacturer-conducted tests.

The NHTSA concludes, based on all information available, that the axle is available at this time and that sufficient leadtime has been made available for the location and testing of an axle of this type. The manufacturers who request further delay do not claim that the installation is technologically unfeasible or otherwise impracticable. Although they cite adverse economic consequence for the limited numbers of vehicles they produce in this category, this argument does not consider the major economic consequences for the Oshkosh Company, who state that 72 percent of their vehicle production would be adversely affected by any further delay. The petitions of White, International Harvester, Diamond Reo, and Mack are accordingly denied.

Due to unavailability until September 1, 1976, front steerable non-driving axles with a GAWR in excess of 16,000 pounds are permitted the same relaxed requirements as the driving axles just discussed. White Motor Corporation, in its comments to Notice 10 of Docket No. 74–10, requested the relaxed requirements be extended to September 1, 1977, because of the long leadtime associated with manufacture of these vehicles. The NHTSA will monitor the availability of these axles to ensure their readiness for September 1, 1976, and will consider a later effective date for them if they are not available as presently scheduled. At this time, however, it appears that the axles will be ready sufficiently in advance of September 1, 1976, to permit satisfaction of the full requirements on that date. Accordingly White's petition is denied.

As earlier noted, both the vehicles equipped with certain driving or non-driivng front steerable axles are permitted to meet retardation force requirements in place of distance requirements for an interim period. A reduction of these retardation force requirements was the subject of a proposal in Notice 7, which was acted on for trailers in Notice 11 (40 F.R. 1246, January 7, 1975). It was concluded that no argument had been made for a temporary reduction of retardation forces on the front axle of heavy trucks, most of which are integral trucks which experience high levels of dynamic load shift during braking. Comments by PACCAR to Notice 6, however, emphasized that retardation force requirements at the rear axle could be reduced because the load shift off the rear axle effectively results in over-torque of that axle.

The NHTSA's intent in substituting retardation force requirements for stopping distance is to ensure the best braking that is presently available, and it appears that rear brake retardation requirements may, in some cases, inhibit the tailoring of brake systems on different vehciles to achieve this goal. The most satisfactory means to reduce rear axle requirements while maintaining front axle requirements is to eliminate requirements for the vehicle as a whole, to permit the manufacturer latitude in selecting retardation force requireemnts at the rear axle. The present requirements for front axle retardation forces remain in the standard, and by this notice, the NHTSA deletes the requirement for retardation force values for the vehicle as a whole.

PACCAR requested complete withdrawal of the retardation force requirements, as well as the brake power and fade requirements as they affect all trucks. The NHTSA, of course, considers these characteristics of a brake system fundamental, and does not agree that the requirements are impracticable or should be withdrawn. PACCAR's request is therefore denied.

With regard to the vehicles that may meet retardation force requirements in place of stopping distances, International Harvester requested confirmation that S6.3.1.2 is an option that the manufacturer may choose to ignore in the loaded or unloaded condition if the vehcile in question meets the stopping distance requirements in that condition. This agency stated in the preamble to Notice 6 that "the NHTSA considers it crucial panic stop, loaded or unloaded, if the vehicle is to maintain complete directional stability in a unable to meet the stopping distance requirements in that condition." International Harvester's understanding of this language is correct.

PACCAR requested deletion of brake actuation requirements as redundant in view of stopping distance requirements. The NHTSA has considered elimination of the requirements previously, and concluded at that time that the requirement should be maintained (37 F.R. 3905, February 24, 1972). At this time the actuation requirements ensure fast braking on the vehicles under S5.3.1.2 which need not meet stopping distance requirements. The NHTSA will consider this PACCAR request for future rulemaking but does not act on the petition for amendment at this time.

Finally, PACCAR requested specification of antilock performance characteristics. The standard does not require antilock systems, and the NHTSA has concluded that specification for manufacturers who utilize these devices would be design restrictive, without a corresponding safety benefit. No manufacturer other than PACCAR indicates that a safety need exists to specify the cycling of antilocks, and the NHTSA is unable to determine from the PACCAR petition what evidence exists that antilock specification would improve vehicle handilng. PACCAR's petition is accordingly denied.

In areas unrelated to the petitions for reconsideration, the NHTSA corrects an error in S6.1.8.1 and adds a clarifying word to S5.7.1.2, without in any way changing the requirements of those paragraphs.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. § 571.121) is amended. . . .

Effective date: March 21, 1975. Because of Standard No. 121's March 1, 1975, effective date and because this order relieves a restriction, it is found for good cause shown that an effective date sooner than 30 days from the date of publication of that order is in the public interest.

(Sec. 103, 119, 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 C.F.R. 1.51).

Issued on March 14, 1975.

James B. Gregory
Administrator

40 F.R. 12797
March 21, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 16)

This notice responds to three petitions for reconsideration of the National Highway Traffic Safety Administration's December 31, 1974, decision to implement Standard No. 121, *Air brake systems*, as scheduled on January 1, 1975, for trailers and on March 1, 1975, for trucks and buses. The petition of American Fire Apparatus Company for reconsideration of the September 1, 1975, effective date for fire fighting apparatus is granted for a period of six months. The petitions of the Milk Industry Foundation and of Representative James H. Quillen for delay of the standard as a whole are denied. The petition of White Motor Corporation has already been responded to by Notice 15 of Docket No. 74–10 (40 F.R. 12797, March 21, 1975).

The Milk Industry Foundation (the Foundation) requested delay of the standard as it applies to trucks and buses until March 1, 1976, to permit further testing of the new braking systems (and redesign as necessary) and to conduct an analysis of the economic impact of the standard. The Foundation believes that insufficient time has been allowed for vehicle testing.

The NHTSA has evaluated the readiness of manufacturers to meet the standard throughout the four years since issuance. The original January 1, 1973, effective date was delayed until September 1, 1974. In early 1974, the vehicle and component test programs involved in implementation were again evaluated, and the NHTSA proposed delay of the effective date to January 1, 1975 (39 F.R. 7966, March 1, 1974) (39 F.R. 17563, May 17, 1974). Based on submitted comments, it was determined that a March 1, 1975, effective date for trucks and buses, and a January 1, 1975, date for trailers would permit adequate time to complete preparations for the standard's implementation (39 F.R. 17750, May 17, 1974) (39 F.R. 20380, June 10, 1974). These delays were undertaken although one manufacturer expressed readiness to meet the September 1974 date, and International Harvester, the largest manufacturer of air-braked vehicles, expressed readiness to meet the January 1, 1975, effective date. This decision was reevaluated in November 1974 and found to remain valid, although a few larger vehicle types were permitted a later date (39 F.R. 39880, November 12, 1974).

The Foundation also requested that the standard be delayed until its economic impact is evaluated. The NHTSA conducted an evaluation of economic impact shortly before implementation of the standard (39 F.R. 43639, December 17, 1974) and, based on several hundred comments, concluded that the standard should be implemented (40 F.R. 1248, January 7, 1975). The NHTSA disagrees with the Foundation that the evaluation should have been conducted in accordance with Executive Order 11821 (on inflation impact studies) when the final criteria and procedures for implementation of the Order were not yet established. The NHTSA has committed itself to continue monitoring the effectiveness of its standard in accordance with its statutory mandate, with a view to identifying any modifications that would lower costs while achieving comparable levels of safety.

As indicated by the submissions of the Milk Industry Foundation, there has evidently been much confusion among user groups such as the dairy industry over the effect of the braking standards on their operations. In order to meet the requirements that a vehicle stop in a specified distance when tested by the government, chassis manufacturers have in some cases specified center of gravity heights for conformity purposes that are lower than the loaded center of gravity of trucks that these operators are accustomed to using. The body builders who complete and certify the trucks have passed these center of gravity specifications on to the user groups. This has given rise to fears on the part of the dairy industry and others that they must reduce the loads carried on their trucks.

Actually, this is neither the legal effect nor the intended policy effect of the standard. The standard does not regulate the manner in which trucks are loaded or used on the road, and users are free to use their own judgment in loading their trucks, as they have been in the past. The standard is designed so that a properly-designed vehicle which satisfies its performance requirements under the conditions stipulated for compliance testing will perform safely under all reasonable conditions or real world use. Trucks equipped with the stronger and better-modulated brakes required by the standard, when loaded similarly to those in the past, should in fact be much safer both for their occupants and for the rest of the driving public than comparable vehicles were before. If the NHTSA should discover vehicles being produced that do not perform safely when loaded in a normal manner and can establish that this condition is attributable to deficiencies in vehicle manufacture or design, it can proceed against their manufacturers under its safety-related defect jurisdiction.

Representative Quillen requested consideration of a significant postponement of the standard, believing that a delay would increase truck sales. An examination of the truck market indicates that several months' inventory of trucks manufactured without the new systems remained unsold on March 1, 1975, suggesting that the economic downturn, rather than the new systems, accounts for many lost sales. The American Trucking Associations statistics on general freight tonnage indicate a steady decline in highway tonnage from the high figure reached in November 1973. It does appear that some of the slowdown is attributable to "pre-buying" of trucks to avoid Standard No. 121, but this effect would occur whatever the date of implementation. Accordingly the petitions of the Milk Industry Foundation and Representative Quillen are denied.

American Fire Apparatus Company has requested that the NHTSA reconsider its decision to implement the standard as scheduled, so far as it applies to fire fighting vehicles. NHTSA policy has been to grant fire fighting vehicles a minimum of two years from the issuance of any standard to achieve compliance because of the unique leadtime problems associated with the industry. (49 CFR § 571.8). On this basis, the NHTSA granted a delay of the effective date from September 1, 1974, to September 1, 1975, for these vehicles at the request of American Fire Apparatus (39 F.R. 17750, May 17, 1974). At the same time the general implementation date was extended six months. The NHTSA agrees that fire fighting apparatus is entitled to a full year's delay because of its long leadtime problems.

By this notice, the NHTSA denies all outstanding petitions for reconsideration of Standard No. 121's effective dates, with the exception of the date for fire fighting vehicles.

In consideration of the foregoing, Standard No. 121 (49 CFR § 571.121) is amended. . . .

Effective date: June 16, 1975. Because the previously established effective date for fire fighting apparatus was less than 180 days after the date of publication of this amendment in the *Federal Register*, it is found for good cause shown that an effective date less than 180 days from the date of publication 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 May 12, 1975.

James B. Gregory
Administrator

40 F.R. 21031
May 15, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 17)

This notice responds to six petitions for reconsideration of a recent amendment of Standard No. 121, *Air Brake Systems*, 49 CFR 571.121. That amendment deleted as of September 1, 1976, the emergency brake option that permits automatic application of parking brakes in place of a modulated emergency brake system on trucks and buses (40 FR 2989, January 17, 1975). In addition, that notice standardized the operation of the emergency brake control, specified a minimum number of emergency brake applications and releases, and provided for the integrity of the towing vehicle braking system in the event of failure of the air lines to the towed vehicle. On the basis of information and arguments presented by several petitioners, the National Highway Traffic Safety Administration (NHTSA) hereby withdraws the amendment that specified a minimum number of emergency brake applications and releases.

None of the petitions for reconsideration objected to the NHTSA's deletion of automatic parking brake application as a means of providing emergency braking capability. There were no objections to the specification that the emergency brake system control be the same control as that for the service brake system. These provisions remain unchanged, and will become effective September 1, 1976.

The standard tests the emergency braking capability of a vehicle by introducing a "single failure in the service brake system." Bendix Corporation requested that this requirement be replaced by a requirement for emergency braking capability "with either circuit's reservoir at zero psi." Presumably Bendix is suggesting that the "split system" design found on today's air-braked trucks be tested by draining either side of the system. Standard No. 121 does not specify a particular type of emergency brake system and cannot therefore specify failing any particular component. The NHTSA believes a vehicle should be capable of making stable in-line stops within the specified distance with a failure in any hose or reservoir in the service brake system. For instance, a failure in the air hose to the right front wheel should not make it impossible for a driver to keep the vehicle within a 12 foot wide lane. The agency does intend to clarify the status of various air lines in powered vehicles, particularly towing vehicles, to answer questions raised by International Harvester and the State of California concerning service brake system failure. These clarifications will appear in an upcoming notice on parking brake systems.

International Harvester, Ford, Midland-Ross, and Bendix objected to the requirement of S5.7.3 that requires the emergency brake system to be capable of not less than two applications and releases, as determined by brake chamber air pressure of 60 psi or more during the pressure phase of operation, and brake chamber air pressure of not more than 1 psi during the pressure release phase of operations. The manufacturers (and the American Trucking Associations) were concerned that the specification of 1- to 60-psi values was design-restrictive and would force substantial redesign of vehicles before the existing new designs can be thoroughly tested. Some of the petitions questioned whether the test would be conducted statically or dynamically.

The NHTSA is concerned that manufacturers not be unduly burdened with modifications to their systems during the initial introduction period of the standard. The agency has regularly indicated in its correspondence that it is monitoring implementation of the standard to minimize disruption and costs while maintaining the standard's safety benefits. The maximum and minimum pressure values in question were specified simply as objective testing criteria and are not intended as design restrictions that fulfill a safety function.

In view of the redesign problems noted and their accompanying disruption, the NHTSA withdraws the application-and-release specification and will not reestablish it without further notice and opportunity to comment. (In answer to Bendix's question, it is noted that the 60 psi value in the pressure release phase was not intended to replace the "zero-torque" criterion for release of spring brakes.)

Midland-Ross, International Harvester, and Ford expressed several objections to the three requirements of S5.7.4 and the related test conditions of S6.1.14. The requirements are intended to assure that a combination vehicle remains capable of emergency braking performance in the event of hose failure between the towed and towing vehicles, including failure of both hoses due to trailer breakaway.

Comments incorrectly assumed that the requirements specify modulation of the trailer braking system in the event of hose failure under S5.7.4(b) and (c). In fact, section S5.7.4 does not require trailer braking requirements, but only specifies that a towing vehicle meet the enumerated requirements under certain conditions.

To eliminate confusion about the role of trailers in these tests, sections S5.7.4(a) and (b) are hereby revised to make it clearer that the vented line(s) to the trailer are only test conditions under which the towing vehicle must demonstrate emergency braking stopping distance capability. To eliminate a separate source of confusion in section S5.7.4(a), which is intended to simulate trailer breakaway, the section is also revised to eliminate an incorrect requirement for testing with a failed control line and an intact trailer supply line.

Midland-Ross and International Harvester objected to the test conditions of S6.1.14, which underlie S5.7.4(a) and (b). The S6.1.1.4 procedure is intended to simulate a trailer breakaway or, in the alternative, a failed control line on a loaded combination vehicle. International Harvester expressed the belief that five new tests were thereby added to the standard. It is now made clear that only one additional test of a single-unit vehicle capable of towing is required, and two additional tests of a truck tractor are required. These tests are conducted in the test sequence at steps 4(e) (loaded) and 6(e) (unloaded).

International Harvester questioned as unrealistic the criterion in S6.1.14 that specifies a 1-minute delay in braking following rupture of a brake line. The NHTSA recognizes that the towing vehicle protection system is expected to act in much less than 1-minute to protect the air pressure in the towing vehicle from the effects of a loss of air pressure in the towed vehicle. The 1-minute interval is intended only to permit adverse "testing-to-failure" of an inadequately designed system. As a practical matter, the NHTSA will test when air pressure is lowest during the 1-minute period.

Midland-Ross implied in its comments on S6.1.14 that the S5.7.4(a) test would be conducted with a trailer attached whose emergency brake system is activated during testing. As noted earlier, S5.7.4 applies only to a towing vehicle and only its brakes are tested. In S5.7.4(a), no trailer is attached to the towing vehicle (simulating a breakaway). In S5.7.4(b), a trailer is attached (simulating a failure), but only tractor brake activation is permissible.

Midland-Ross expressed the belief that S5.7.4 (c) requires modulation of the trailer brakes in the event of a failed air control or supply line. In fact, the section only requires that a towing vehicle be capable of modulating the air in the supply or control line following a single failure in the service brake system on the towing vehicle, but does not require modulation of the towed vehicle emergency brake system under any circumstances (including control line failure). The requirement ensures that a single failure in the truck itself will not prevent modulation of an unimpaired system from the towing vehicle protection system rearwards. A clarification has been added to limit the single failure to the service brake system of the towing vehicle, not including either of the air lines to the towed vehicle.

Because several modifications are being made to the requirements of S5.7 as previously published, the NHTSA is republishing the entire provisions of S5.7 as they will become effective September 1, 1976, although paragraphs S5.7, S5.7.1, S5.7.2, and S6.1.14 remain unchanged.

In consideration of the foregoing, S5.7 of Standard No. 121 (49 CFR § 571.121) is amended, effective September 1, 1976. . . .

Effective date: September 1, 1976.

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

Issued on July 23, 1975.

James B. Gregory
Administrator

40 F.R. 31771
July 29, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 2)

This notice amends Standard No. 121, *Air Brake Systems*, 49 CFR 571.121, to establish new service brake system stopping distances until January 1, 1978, and increase brake actuation and release times on trucks, buses, and trailers. This notice also excludes from the standard trailers with an unloaded vehicle weight that is not less than 95 percent of the gross vehicle weight rating (GVWR), and any other vehicle with an unloaded vehicle weight that is not less than 95 percent of the GVWR and which has a maximum speed of 45 mph.

The NHTSA proposed reduction of Standard No. 121's stopping distance requirements (40 FR 24915, June 11, 1975), because data submitted by manufacturers of air-braked vehicles and air brake components indicated that variability of performance of certain braking and related components could in some vehicles necessitate more aggressive brake packages than are desirable to achieve the stopping distances contemplated in development of the standard. The agency also proposed increases in permissible brake actuation times to promote optimum cycling of the antilock systems used by most manufacturers in meeting the stopping distances. At the same time, the agency denied the petitions of the American Trucking Associations (ATA) and Consolidated Freightways (Consolidated) for extension of the required stopping distances as necessary to eliminate the necessity of high-torque brakes and antilock systems, and for suspension in whole or part of the standard's requirements. The denials were based on NHTSA's view that increased directional stability is critical to improvement of brake system performance on heavy vehicles, particularly articulated vehicles, that share the highway with passenger cars and other light vehicles.

Vehicle manufacturers and component suppliers supported without exception the increase in stopping distances. Additional discussions and data submitted by some manufacturers indicate that substantial effort is being made to identify and control all of the variables which affect compliance of air-braked vehicles with Standard No. 121. Most manufacturers recommended that the proposed extended distances be made permanent, but the NHTSA concludes that insufficient data exist at this time on which to base such a decision. Accordingly, the stopping distances are modified as proposed for a period that ends January 1, 1978. The NHTSA does not, therefore, accept the recommendations of Freightliner and Mack for longer distances, or the Freightliner recommendation for testing at 55 mph.

The proposed language has been modified to specify correctly the NHTSA's intent to extend service brake stopping distances on a skid number 75 surface for all vehicles under S5.3.1.2 and S5.3.1.3. Also, the additional sentence proposed for S5.3.1.3 was essentially redundant in view of the modifications to Table IIa, and that sentence has been deleted.

Manufacturers also supported the proposed increase in permissible brake actuation timing from 0.35 to 0.40 seconds for trucks and buses, from 0.25 to 0.35 seconds for trailer converter dollies, and from 0.25 to 0.30 seconds for trailers other than trailer converter dollies. The ATA recommended establishment of a minimum as well as maximum limit. While this suggestion may have merit, the NHTSA does not have sufficient time at this point to fully consider the suggestion, and will therefore treat it as a petition for rulemaking.

Bendix suggested that the increased actuation be permitted only for an interim period, but the NHTSA has evidence of degraded performance generated by the present timing which justifies a permanent change. Bendix is requested to submit any data for consideration that support its view that superior systems will exist by January 1, 1978, that provide both a faster and smoother response.

Freightliner Corporation repeated its view that actuation and release times are design-restrictive without corresponding safety benefit. While the NHTSA is willing to consider Freightliner's view for future action, it is noted that the ATA suggestion of minimum and maximum limits conflicts directly with Freightliner's point of view. In any case, elimination of these requirements was not contemplated by the scope of the proposal and will not be undertaken at this time.

Several manufacturers indicated that the petitions for longer actuation time implied the need for an increase in brake release times as well. White Motor Corporation supplied data substantiating the view that optimization of increased brake actuation times depends in part on design freedom to increase the release time in the necessary valving. Although increased release times were not proposed by the June notice, an increase in release times comparable to actuation times was contemplated by the intent of the modifications to permit somewhat slower valve action. To accomplish the intended revision, the NHTSA concludes that it is in the public interest to modify both the actuation and release time of S5.3.3 and S5.3.4 by an increase in permissible timing of 0.05 seconds. Fruehauf's suggested increase in trailer timing to 0.35 will be further considered, but the NHTSA does not believe it necessary to act on this level of increase without benefit of comments by interested persons.

The ATA, Consolidated, the Milk Industry Foundation, and Hackney Brothers submitted arguments that the stopping distance and brake timing modifications were insufficient to solve fundamental cost and reliability problems attributed by them to Standard No. 121. The ATA cited recall campaigns of antilock systems as evidence that the presence of high-torque front brakes on some trucks creates safety problems in the event of antilock malfunction. The ATA also asserted that "no lockup" performance on trailers contributes insignificantly to highway safety, and asked that antilock, if mandated, be required only on a vehicle's drive axles.

Consolidated relied on a manufacturer's statements of vehicle instability with the 121 brake systems as a ground for suspension of the standard. The company also cited cost estimates for the standard, and requested that they be substantially reduced by dropping the "no lockup" requirement entirely, or requiring it only on the vehicle's drive axles, and by extending stopping distances to eliminate the requirement for front axle 121-type brakes.

The NHTSA has undertaken an extensive evaluation of the standard's effect on truck braking characteristics. One element of that evaluation is testing by the NHTSA's Safety Research Laboratory of pre-121 and 121-equipped truck tractors. One series of tests (on a dry surface with a skid number somewhat higher than 75) included a stop from 60.8 mph in 231.2 feet by a 121-equipped International Harvester tractor (with front axle antilock disconnected and a full brake application) and a 121-equipped trailer in which the front wheel brakes never locked up. This experience indicates that 121-type front brake package need not be so aggressive as to create a safety hazard in the event of an antilock malfunction which escapes the notice of the driver.

The NHTSA's monitoring of the standard's implementation also supports NHTSA's position that the malfunctions experienced in initial antilock production and installation are an inevitable consequence of the introduction of a new system in high production. Those malfunctions that have been determined to be safety-related and that could result in unsafe highway operation have been recalled for remedy by the manufacturers concerned.

The NHTSA has evaluated Consolidated's revised cost objections to the standard. The information submitted does not modify the NHTSA's earlier conclusions. Accordingly, the NHTSA reaffirms its decisions not to revise or revoke the standard as requested by the ATA, Consolidated, the Milk Industry Foundation, or Hackney Brothers.

Consolidated characterized its comments as both a petition for reconsideration and, in the alternative, as a petition to modify the standard. A petition for reconsideration may under 49 CFR 553.35 be submitted in response to a "rule" issued by the agency, but the denial of a petition is not itself a "rule" within the meaning of that section. Therefore Consolidated's "petition for reconsideration" is invalid. Considered in the alternative as a petition for rulemaking to modify the standard, the NHTSA denies the petition for the reasons noted.

Other comments to the docket requested changes to the standard which the NHTSA will consider further but cannot dispose of at this time. The revisions in this notice must be issued prior to September 1, 1975, so that manufacturers are not required to meet the 245-foot stopping distance which becomes effective September 1, 1975. The issues, in addition to others noted earlier, that will be further considered are: (1) Freightliner's request for deletion of the dynamometer requirements for the front axle; (2) PACCAR's request for modification of dynamometer requirements on the drive axles; and (3) several manufacturers' requests for a decreased grade in the parking brake requirement. The NHTSA does not agree with Freightliner that the test surface and control trailer specifications are insufficiently objective, or that the wet surface and emergency brake stopping distances need to be increased. Testing by the NHTSA Safety Research Laboratory does not indicate a need to increase these distances. The agency will, of course, continue to evaluate any new data that indicate more objective specifications can be reasonably implemented, or that longer distances are advisable.

The third proposal for modification of the standard was revision of the standard's applicability to exclude trailers with a GVWR of 10,000 pounds or less, trailers with an unloaded vehicle weight that is not less than 95 percent of its GVWR, and any other vehicle that has a maximum speed of 45 mph, an unloaded vehicle weight that is not less than 95 percent of its GVWR, and no passenger-carrying capacity.

No comments opposed the exclusion of trailers whose unloaded vehicle weight is not less than 95 percent of the GVWR, and the standard is accordingly amended to exclude this vehicle group.

The State of California objected to exclusion of light trailers (GVWR of 10,000 pounds or less) on several grounds. Their comments point out that a light trailer built for low density loads can be dangerously overloaded. The State also cited that ease with which higher GVWR trailers could be derated in order to take advantage of the exclusion for lighter vehicles. California also noted the increased complexity of enforcement of the standard with added exclusions of this type. Altec Industries, which petitioned for the exclusion, argued that the exclusion should be broadened to 15,000 pounds GVWR. On balance, the NHTSA agrees with California that the exclusion might create more safety problems than safety benefit. In view of this conclusion, the agency has decided not to revise the standard's applicability in this respect.

The NHTSA also proposed exclusion of vehicles with the following characteristics: a speed attainable in 2 miles of not more than 45 mph, an unloaded vehicle weight that is not less than 95 percent of the vehicle GVWR, and no passenger-carrying capacity. Manufacturers of those vehicles generally supported the proposal but expressed confusion over each of the criteria. The largest question arose over the meaning of what constitutes the "unloaded vehicle weight." Crane Carrier, FMC Corporation, The Heavy Specialized Carriers Conference (HSCC), and Koehring pointed to the significant difference between the GVWR and the actual traveling weight of crane carrier models, considering special equipment which may or may not be included with the vehicle as optional or be permitted on the vehicle in transit.

The NHTSA has expressed the unloaded vehicle weight criterion in terms defined in § 571.3 of its regulations (49 CFR § 571.3) in a way which avoids these problems raised by the manufacturers. As defined, "unloaded vehicle weight" will normally be the GVWR of a vehicle minus its rated cargo load and its assigned occupant weight (at least 150 pounds). The rated cargo load would not include the weight of portions of a vehicle which are essential to its specialized function whether or not they are removed in accordance with State regulation for transit purposes. To arrive at "unloaded vehicle weight," a manufacturer must only refer to the GVWR he has assigned to his vehicle, and subtract from it the rated cargo load he has assigned plus 150 pounds of each occupant position. These calculations are totally separate from the presence of particular optional equipment or necessary components which may or may not be removed for highway travel.

Manufacturers and the HSCC also asked whether occupant positions for crew members such as flagman or crane operator could be provided without constituting "passenger-carrying capacity." The NHTSA uses the word passenger in this context to mean a person who does not help to operate the vehicle or its equipment, *i.e.*, who is not part of an operating crew. Positions for the crew necessary to operate a vehicle's specialized equipment would not disqualify a vehicle under the passenger-carrying criterion.

Manufacturers recommended that the speed limitation of 45 mph be raised to 50 mph to allow unrestricted travel on all highway systems. The NHTSA remains convinced that this equipment with a high center of gravity and limited braking poses a safety problem when traveling at near highway speed in the flow of traffic. With the national speed limit at 55 mph, it is considered prudent to limit the speed of air-braked vehicles without 121 brake systems to a maximum attainable speed of 45 mph. For the benefit of the HSCC, it is noted that the definition of maximum attainable speed specifies a level surface for the basis of speed determination.

With regard to these vehicles, American-Coleman Company has requested that all vehicles equipped with a front steerable drive axle of 8,000 pounds GVWR or more be excluded from the requirements of Standard No. 121. The NHTSA has already fully considered this request, and in a series of notices (30 FR 40168, November 14, 1974; 40 FR 4153, January 28, 1975; 40 FR 8953, March 4, 1975), explained its reasons for not proposing such an exclusion. American-Coleman's petition is repetitious of its earlier petition and contains no new data for consideration. Accordingly, it is denied.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

Effective date: August 27, 1975. Because these amendments do not impose additional requirements on any person and because they must replace provisions effective September 1, 1975, it is found for good cause shown to be in the public interest that they become effective sooner than 30 days following publication in the *Federal Register*.

(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 15, 1975.

Robert L. Carter
Acting Administrator

40 F.R. 38160
August 27, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–7; Notice 3)

This notice amends Standard No. 121, *Air Brake Systems*, 49 CFR 571.121, to permit bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvests to meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

This amendment follows reevaluation of a petition filed by Utility Trailer Manufacturing Company, in light of further data submitted by the company on August 6, 1975, and September 23, 1975 (these materials appear in NHTSA Docket No. 75–5). The NHTSA proposed to exclude certain specialized agricultural trailers from the emergency and parking brake requirements because "spring" brakes utilized for these systems were creating particular difficulty in harvest operations (40 FR 13316, March 26, 1975). Comments persuaded the agency not to proceed with the proposal at that time for two reasons (40 FR 28097, July 3, 1975). It appeared that control of air leakage and the installation of a manual parking brake control would permit disengagement in most cases, and that manual release and application would serve in the instances when all air had leaked away. The second reason to withdraw the proposal was that the excluded category was not defined well enough to limit the extent of the exclusion.

Utility has since supplied information indicating that air leakage cannot be controlled sufficiently to rely on it for the release of spring parking brakes under the specialized conditions of harvest operations. More significantly, Utility reports that inexperienced persons who mechanically release the spring brakes often fail to reengage them for highway operation, permitting the trailer to operate on the highway without a secondary means of braking.

With regard to the agency's concern that manufacturers supplying spring brakes to meet the standard would be placed at a competitive disadvantage by the exclusion, utility indicates that the manufacturers of the specialized trailers in question would approve of a parking and emergency braking system other than spring brakes. The competitive disadvantage would actually have occurred only with those highway trailers that were unintentionally included in the overly broad proposed definition.

With the newly submitted information in mind, the NHTSA has decided to issue the proposed exclusion, but in a more limited form than proposed. To limit the effect of this amendment to those trailers for which it is intended, the proposed definition is modified to describe more precisely trailers that are actually disconnected from highway truck-tractors and drawn through the fields as part of their function.

As discussed in the preamble to the proposal, the exclusion would have entirely excluded the trailers from the standard's emergency and parking brake requirements, relying on Bureau of Motor Carrier Safety Regulations to ensure the use of a "breakaway" system in their place. It is now apparent, however, that many of the vehicles in question would operate intrastate only, and that the breadth of the proposal must be somewhat restricted, to exclude only vehicles that are fitted with a breakaway system that complies with BMCS requirements.

In order to permit manufacturers of these specialized vehicles to commence manufacture for the 1976 harvest season, the NHTSA has decided to extend the duration of the limited exclusion from the proposed date of January 1, 1976, to March 1, 1976. Utility requested that the date be extended to June 30, 1976, and the NHTSA will issue a further proposal if any further delay of this magnitude appears justified.

In consideration of the foregoing, S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) are amended. . . .

Effective date: December 5, 1975. Because this amendment does not place additional requirements on any person, and because manufacturers must be informed of future requirements for their products, it is 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 November 28, 1975.

James B. Gregory
Administrator

40 F.R. 56898
December 5, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 6)

This notice amends Standard No. 121, *Air Brake Systems*, to suspend until January 1, 1977, the service brake stopping distance requirements as they apply to buses.

The NHTSA proposed a 1-year suspension of service brake stopping distances (40 FR 52856, November 13, 1975) following a public meeting on Standard No. 121 (49 CFR 571.121). Bus performance was reviewed by manufacturers and users, and by Rockwell International Corporation, presently the manufacturer of most of the axles and antilock components installed in transit and intercity buses. Other data collected by the NHTSA substantiate a pattern of erratic behavior in bus antilock equipment used in most transit and intercity operation that warrants disconnection while a correction is fully developed. The proposed suspension was based on manufacturer and user requests for a period in which modified hardware could be field-evaluated along with other antilock systems being offered for bus applications.

The comments uniformly supported the proposed suspension of service brake stopping distance requirements (including the "no lockup" requirement) for transit and intercity buses. However, component suppliers, bus manufacturers, and bus users differed over the extent of the proposal in three areas.

Rockwell and General Motors expressed concern that the preamble to the proposal had not made clear whether the proposal was intended to meet problems other than erratic antilock performance. Transport of New Jersey also objected that the proposal might be narrowly construed to mean that only the "no lockup" aspect of the stopping distance requirements would be suspended. AM General questioned whether the revision included "any attempt to impose stopping distance and lane limit test requirements."

The NHTSA proposed suspension of the service brake stopping distance requirements (S5.3.1) in their entirety, not just the "no lockup" requirements of the section. Suspension of the entire requirement was intended to moderate the maintenance and misadjustment problems that are associated with the faster wearing brake linings provided in compliance with the standard.

General Motors noted that, because of the unique configuration of the braking system on its new transit bus, the limited nature of the NHTSA's proposed suspension, specifically the continuation of the partial system failure requirements; inadvertently prevents their bus from utilizing the lower-coefficient linings intended by the proposal. This issue is presently under consideration by the agency, and may be the subject of another proposal to be issued shortly.

The second area of concern to some manufacturers was whether the NHTSA intended to cover school buses with the proposed exclusion. General Motors and Wagner Electric Corporation expressed the view that school buses should not be included. International Harvester, Crown Coach, and several school districts believed that the vehicles should be included in the suspension. The NHTSA intended to include school buses in its proposal and, based on review of the comments, has concluded that these buses should be included in the suspension.

International Harvester pointed out that the stop-and-go cycle of school buses can cause distinctive stresses on the air brake system that are similar to that encountered in transit bus operation. While not made explicit, Crown Coach's comments illustrate that some school buses utilize the same axles and antilock component as transit and intercity buses. Limiting the suspension to a portion of the air-braked school buses would create an unintended economic disadvantage for some school buses of this type.

Wagner and General Motors argued that some school buses utilize truck chassis and brake systems, and that these systems do not suffer from the same problems as the bus components criticized at the public meeting. It is true that the components utilized generally in trucks and also used in some buses have been determined to be reliable (40 FR 59222, December 22, 1975). The usage cycles of various vehicles are, however, evidently an important factor in some of the problems that have been experienced. Considering the similarity in the usage of school buses to that of transit buses, this agency has decided that the most desirable course of action is to include school buses in the suspension of stopping distance requirements.

The third area in which commenters questioned the extent of the proposal was the length of the suspension. Bus operators and their associations (*e.g.*, National Association of Motor Bus Owners (NAMBO), American Public Transit Association (APTA), Chicago Transit Authority) and bus manufacturers (General Motors, AM General, and Eagle International) generally argued that a 1-year evaluation period following development of adequate corrections to existing or new hardware would be necessary. Motor Coach Industries and Transportation Manufacturing Corporation (manufacturers of the majority of intercity buses) supported the 1-year proposal without commenting on the adequacy of the proposed 1-year suspension period. Rockwell, as the present manufacturer of most of the transit and intercity bus axles and antilock systems, cautioned the NHTSA that a specific date for the effectiveness of S5.3.1 would reduce the thoroughness of the evaluation program. The company did support the 1-year suspension.

The proposal was for a 1-year suspension only. This agency has not found this to be an emergency situation that would justify promulgating a delay greater than that proposed without the benefit of notice and opportunity to comment. Therefore, the NHTSA hereby makes final its proposed 1-year suspension of the stopping distance requirements, and will further evaluate the requests for a longer period of suspension. Bus manufacturers have stated that they intend to initiate field evaluation of improved antilock systems, and this agency will actively monitor these efforts as the basis for future action. The support of field testing by NAMBO and APTA will also be important in making meaningful evaluations of anticipated system modifications.

Chrysler, Freightliner, and International Harvester recommendations on other aspects of the standard and its applicability to other vehicle types have been responded to in the NHTSA's recent proposal for modification of the standard's performance levels for trucks, buses and trailers (40 FR 59222, December 22, 1975).

AM General asked whether buses manufactured during the suspension could be required to be retrofitted in the future. The answer is no. The motor vehicle safety standards in effect at any date apply according to their terms only to vehicles manufactured on that date. In answer to AM General's question whether the antilock system on 121-equipped buses may "be completely deactivated and dismantled and the vehicle returned to the pre-FMVSS #121 status," it is the position of the NHTSA that manufacturers and operators are the persons qualified and required to determine the safest configuration for operation of their vehicles, subject to applicable Bureau of Motor Carrier Safety regulations. With regard to the effect of Federal law on the modification of safety systems, a manufacturer of air-braked buses that conform to the air brake standard may instruct the owners of its products to disconnect the antilock system used to meet the standard, for the period necessary to correct a safety-related defect in the system that may make its operation hazardous.

It is also noted that this amendment constitutes the NHTSA's favorable response to APTA's October 6, 1975, request for modification of the standard, and the October 22, 1975, petition of the Eastern Bus Maintenance Men's Conference concerning Standard No. 121.

In consideration of the foregoing, S5.3.1 of Standard No. 121 (49 CFR 571.121) is amended by the addition of the phrase "Except for a bus manufactured before January 1, 1977, and" at the beginning of the first sentence.

Effective date: January 6, 1976. Because this amendment represents a relaxation of the requirements of the standard and does not place additional requirements on any person, it is 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 (14 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on January 6, 1976.

James B. Gregory
Administrator

41 F.R. 1598
January 9, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

(Docket No. 75–5; Notice 5)

Air Brake Systems

This notice amends Standard No. 121, *Air Brake Systems*, by extending until June 30, 1976, the period in which bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvest can meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

Standard No. 121, 49 CFR 571.121, presently permits this specialized agricultural trailer category the option, until March 1, 1976, of meeting the parking brake requirements of the standard (actuation by an energy source unaffected by air loss in the service brake system) or the air-actuated "breakaway" system that complies with Bureau of Motor Carrier Safety requirements (49 CFR § 393.43). The NHTSA proposed extension of the March date to June 30, 1976 (41 FR 1763, January 12, 1976) to permit completion of the bulk agricultural commodity trailers necessary for the 1976 harvest season, in response to a petition of the Utility Trailer Manufacturing Company. In a separate action, the NHTSA has also proposed that the present parking brake requirements for all vehicles subject to the standard be broadened in a closely similar fashion to permit the use of an air energy source, with single diaphragm brake chambers as well as dual diaphragm brake chambers for actuation of the parking brake (40 FR 56920, December 5, 1975). It is clear, however, that separate and swifter action than the general proposal is necessary to permit the manufacture of trailers for the 1976 harvest.

Utility Trailer Manufacturing Company supported the extension of the period to June 30, 1976, and advocated extension of the option to all other air-braked vehicles. Wesco Truck and Trailer Sales (Wesco) also supported the proposal and suggested that a 2-year suspension of the standard would permit perfection of the new brake systems. Wesco recommended that the parking brake system be made optional on this type of agricultural trailer. Fruehauf Corporation supported the proposal without qualification.

In view of the comments received and the NHTSA's continued view that the special considerations for in-field use should be given to agricultural trailers with regard to parking brake requirements, the agency has decided to amend the standard as proposed. The other recommendations by Utility and Wesco are noted, but they do not fall within the limits of action proposed by the NHTSA.

In consideration of the foregoing, the last sentences of paragraphs S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) are amended by changing the date "March 1, 1976" to "June 30, 1976."

Effective date: February 26, 1976. Because this amendment creates no additional requirements for any person, and because trailer manufacturers need to know the extent of the option period as the basis for planning manufacturing schedules, 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 February 20, 1976.

James B. Gregory
Administrator

41 F.R. 8347
February 26, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Parking Brakes

(Docket No. 75–16; Notice 27)

Action: Final rule.

Summary: This notice amends the air brake standard to expand the latitude which a vehicle manufacturer has in selecting means to comply with the parking brake requirements. The amendment makes final one of several changes to the parking and emergency brake requirements that had been proposed previously. The other proposed changes have been reexamined in light of comments to the proposal and to a separate proposal outlining plans for replacement of FMVSS 121 by a new standard. . The NHTSA has decided to suspend rulemaking action on those items until research results and other further information is available.

Effective date: August 9, 1979.

For further information contact:

Mr. Duane Perrin, Office of Crash Avoidance, National Highway Traffic Safety Administration, Washington, D.C., 20590 (202–426–2153).

Supplementary information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1. 1975, and for trucks and buses since March 1, 1975. The standard contains requirements for service brake systems, emergency brake systems, and parking brake systems.

More than four years' experience with the standard on the part of manufacturers, users, the agency, and other interested parties indicate a possibility that some of the emergency and parking brake performance requirements could be more broadly stated to allow new design options that offer a level of safety equivalent to that offered by existing designs. On September 14, 1978, the NHTSA issued a notice of proposed rulemaking (43 FR 41056) that would have substantially revised the parking brake requirements for all vehicles and the emergency brake requirements for trailers. Subsequent to the issuance of that proposal, a mandate was issued by the U.S. Court of Appeals for the Ninth Circuit, invalidating certain aspects of FMVSS 121 (43 FR 48646, October 19, 1978). In light of the court decision, the NHTSA has tentatively decided to issue a new heavy duty vehicle brake standard, FMVSS 130, which will eventually replace FMVSS 121. An Advance Notice of Proposed Rulemaking (ANPRM) on Standard No. 130 was issued in February (44 FR 9783, February 15, 1979).

Responses to the ANPRM on Standard No. 130 underscored the need for stability in the industry. To achieve stability, commenters suggested avoiding unnecessary changes in Standard No. 121, which remains in effect until FMVSS 130 is issued. In addition, commenters on the September notice pointed out areas where some of the proposed changes need further research and consideration. For these reasons, most of the changes to the parking and emergency brake sections of Standard No. 121 that were proposed in September are being tentatively put aside. Some of the changes proposed in the September notice may be raised again in the new proposal for Standard No. 130, after further information is obtained by the agency.

The NHTSA has determined, however, that one of the proposed changes should not be delayed until rulemaking is completed on FMVSS 130. That change allows the application of parking brakes by means of service brake air, as long as the application can be made when a failure exists in the service brake system, and as long as the parking brake is held in the applied position by mechanical means. The standard previously required parking brakes to be applied by a separate energy source, and this change allows an alternative to the spring-applied parking brake systems now used. The alternative systems could be less costly and have essentially the same performance as current systems. In addition, the change allows more compact systems to be produced for vehicles such as auto transporters where space for mounting of components is at a premium.

The changes to the parking brake application requirements proposed in September (Docket No. 75–16; Notice 22) were opposed by the California Highway Patrol (CHP), on the assumption that a diaphragm inside a brake chamber is considered part of the brake chamber housing, and that the proposal would have allowed a reduction in safety over current systems. Previous interpretations, however, have clarified that a brake chamber housing is only the outer body of the chamber and does not include the diaphragm. Thus, the prescribed performance must be achieved with any type of failure in the service brake system, including a ruptured diaphragm. The NHTSA concludes, therefore, that this interpretation satisfies the concerns of the CHP. The CHP also suggested a slight rewording to indicate that the required force is applied at the drawbar and not in the parking brake itself. The wording has been changed somewhat to clarify that point.

The American Trucking Associations (ATA) and Transquip Industries objected to the proposal because it would require a second reservoir on an air-applied parking brake system in order for the parking brakes to be applied in the event of a failure of the service reservoir. The NHTSA understands that the use of only one reservoir would reduce cost. However, it would also offer a significant reduction in performance as compared to present systems, because certain service brake system failures could occur for which there would be no secondary means of braking the vehicle. Accordingly, the NHTSA concludes that ATA and Transquip Industries' objections do not warrant any change in the amendment.

Traffic Transport Engineering, an auto transporter manufacturer, requested clarification of whether two relay valves would be required in an air-applied system, since the parking brakes would have to be capable of application with any single failure, and the relay valve could fail. Since relay valve failures are relatively common, the NHTSA considers it necessary to preserve the performance achieved by present systems. Currently, the failure of a relay valve would not prevent emergency application of the trailer brakes. Thus, if a manufacturer chooses to equip a trailer with air-applied parking brakes, he would have to devise a means of achieving a brake application in case of failure of the service brake relay valve. That could be accomplished by using a second relay valve and reservoir.

The Dolphin Brake Corporation asked for clarification of the proposed wording to deterbine whether or not their parking brake that applies by means of hydraulic fluid would meet the requirements. The NHTSA believes that the wording is sufficiently clear to indicate that, like an air-applied system, such a brake would only meet the requirements if a mechanical means of holding the application in the event of loss of fluid pressure were incorporated.

In order to minimize changes to FMVSS 121, the amended wording for application and holding will remain in one paragraph, S5.6.3, as currently in the standard.

Since this amendment relieves a restriction it is being made effective immediately.

In consideration of the foregoing, the first sentence of paragraph S5.6.3 of Standard No. 121 (49 CFR 571.121) is amended . . . .

The principal authors of this notice are Duane Perrin of the Office of Crash Avoidance and Roger Tilton of the Office of Chief Counsel.

Issued on August 6, 1979.

Joan Claybrook
Administrator

44 F.R. 46850
August 9, 1979

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 28)

Action: Correction.

Summary: On August 9, 1979, the NHTSA published in the *Federal Register* a final rule amending the applicability section (S3) of Standard No. 121, *Air Brake Systems.* That notice, which added a sentence to the end of S3, contained an error in its reference to section S5.7.3. The notice appears to show that the entire section of S5.7.3 no longer applies to trucks and trailers, when the agency intended only for subparagraphs (a) and (b) to be inapplicable to trucks and trailers. These vehicles do have to comply with S5.7.3(c). Accordingly, the August 9 notice is corrected by changing the last sentence of section S3 to read: Notwithstanding any language to the contrary, sections S5.3.1, S5.3.1.1, S5.3.2, S5.3.2.2, S5.7.1, S5.7.3(a) and S5.7.3(b) of this standard are not applicable to trucks and trailers.

Effective date: September 13, 1979.

For further information contact:

Mr. Scott Shadle, Office of Crash Avoidance, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202–426–2153).

Issued on September 4, 1979.

Michael M. Finkelstein
Associate Administrator for
Rulemaking

44 F.R. 53166
September 13, 1979

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Correction

(Docket No. 75–16; Notice 29)

Action: Final rule; correction.

Summary: On August 9, 1979, the NHTSA published in the *Federal Register* a final rule amending the applicability section (S3) of Standard No. 121, *Air Brake Systems.* On September 13, the agency published a correction of that final rule. An error was made in the September 13, correction when reference to section S5.3.2.1 was inadvertently deleted from the notice. . Accordingly, the final rule is corrected by changing the last sentence of section S3 to read: Notwithstanding any language to the contrary, §§ 5.3.1, 5.3.1.1, 5.3.2, 5.3.2.1, 5.3.2.2, 5.7.1, 5.7.3(a) and 5.7.3(b) of this standard are not applicable to trucks and trailers.

Effective date: October 1, 1979.

For further information contact:

Mr. Scott Shadle, Office of Crash Avoidance, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202–426–2153).

Issued on September 25, 1979.

Michael M. Finkelstein
Associate Administrator for
Rulemaking

44 F.R. 57100
October 4, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems
(Docket No. 79-03; Notice 4)

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 121, Air Brake Systems, to require trucks, buses and trailers equipped with air brakes to have service brake systems acting on all wheels. This amendment is being made in response to reports from several manufacturers that some trucks and trailers were soon to be constructed without front axle brakes. The agency concludes that such a change would result in a serious downgrading of existing brake systems and, accordingly, issues this amendment to prevent this from happening.

EFFECTIVE DATE: This amendment is effective July 24, 1980

FOR FURTHER INFORMATION CONTACT:
Mr. John Machey, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1714)

SUPPLEMENTARY INFORMATION: On October 18, 1979, the agency published a notice of proposed rulemaking (44 FR 60120) proposing the implementation of a small part of a new safety standard, Standard No. 130, Heavy Duty Vehicle Brake Systems. The agency has also issued two ANPRMs relating to long- and short-term rulemaking issues concerning Standard No. 130. Resolution of the issues raised in those notices will occur after all necessary agency research and analyses have been completed. The October 18 notice, which was very limited in its scope, proposed the implementation of a requirement that heavy duty vehicles have brakes acting on all wheels. The requirement was proposed in response to a developing problem that was brought to the agency's attention by both vehicle and equipment manufacturers concerning front axle brakes.

Standard No. 121, Air Brake Systems, formerly required trucks and trailers to comply with certain stopping distances and other road test requirements. To achieve these requirements, trucks and trailers were equipped with front axle brakes which aid significantly in improving vehicle stopping capability. However, in *PACCAR* v. *NHTSA*, 573 F.2d, 632 (9th Cir. 1978) *cert. den'd* 439 U.S. 862, the road test requirements were invalidated as they apply to trucks and trailers. In light of this development, several manufacturers tentatively decided to remove front axle brakes as a way to reduce slightly the costs associated with the production of heavy duty vehicles.

When the agency discovered that manufacturers intended to remove front axle brakes, the NHTSA reexamined data available to it concerning the effect that such a removal of brakes would have upon the capability of these vehicles to make safe stops. The results of this examination, which were detailed in the proposal and which are available in the docket, lead the agency to conclude that the removal of front axle brakes increases a vehicle's stopping distance. The amount of this increase depends upon the type of vehicle, the vehicle loading and the effectiveness of its remaining brake systems. Sometimes the increase in stopping distances is substantial.

The agency considers any increase in the stopping distance of heavy vehicles to be contrary to the interests of safety. Existing heavy duty vehicles equipped with front axle brakes already have longer stopping distances than many smaller vehicles on the road. This disparity in the stopping distances between large and small vehicles increases the likelihood of accidents between vehicles when both are involved in emergency braking maneuvers. To permit a reduction in the braking capabilities of heavy vehicles, that would result in exacerbating the disparity between the stopping distances of heavy and lighter vehicles, could result in an increased risk of accidents to the occupants of both vehicle groups. To prevent the downgrading of heavy vehicle brake systems, the agency issued its notice of proposed rulemaking to require brakes acting on all wheels.

Sixteen comments were received in response to the notice of proposed rulemaking. Most of the commenters concurred with the agency's attempt to prevent the downgrading of heavy duty vehicle brake systems. However, many of the commenters raised minor objections to the manner in which the proposed action was to be taken.

The largest single complaint from the commenters concerning the proposal was that it would implement only a small portion of a new safety standard. Many commenters suggested that the agency should not implement any part of that standard (Standard No. 130) until all research has been completed and the agency is prepared to issue the standard in its entirety. In connection with this comment, several manufacturers suggested that the proposed amendment would be more appropriately placed in Standard No. 121.

Manufacturers argued the merits of amending Standard No. 121 rather than implementing Standard No. 130 in several ways. First, they argued that by implementing Standard No. 130 in a piecemeal fashion, the agency is subjecting itself to many of the criticisms that have surrounded Standard No. 121. Therefore, they suggested that the agency defer action on Standard No. 130 until a complete standard can be issued. Further, they stated that the implementation of a new safety standard would increase paperwork and would require changes in certification labels and incomplete vehicle documents. They suggest these changes would add costs and would require extending the leadtime before the proposed requirement could become effective. On the other hand, manufacturers stated that an amendment of Standard No. 121 would not require them to change certification labels or modify incomplete vehicle documents. This would lower the costs associated with the proposal. Also, the leadtime for implementing a change in Standard No. 121 would be minimal.

In response to the manufacturers first argument that no portion of Standard No. 130 should be implemented until the entire standard is ready for issuance, the agency disagrees. Currently, the NHTSA is conducting several research programs concerning heavy duty vehicle brakes. Some of this rulemaking is long-term while some is short-term. The agency contemplates implementation of some portions of the short-term rulemaking actions prior to obtaining information on all of its long-term rulemaking goals. This is the typical rulemaking process for many of the agency's standards. It is not in the interest of safety to defer short-term safety gains while waiting for the results of long-term safety rulemaking.

The agency is more persuaded by the manufacturers's second argument that implementation of a portion of Standard No. 130 at this time would unnecessarily impose additional paperwork burdens upon manufacturers, whereas amending Standard No. 121 to accomplish the same result would not increase their paperwork burdens. As the NHTSA indicated in the notice proposing this amendment, the agency seeks only to maintain the existing quality of braking systems. Whether this goal is achieved by amending Standard No. 121 or implementing part of Standard No. 130 is not important to the agency. However, since manufacturers would prefer amending Standard No. 121 and since implementing part of Standard No. 130 would be more costly, the agency agrees with those commenters who would prefer an amendment of Standard No. 121, and that standard is amended by this notice. Several commenters objected to the proposal on the grounds that it was a design standard rather than a performance standard. These commenters suggested that the agency should delay amendments implementing any requirements until the correct performance requirements are developed. The agency disagrees.

All of the agency's safety standards affect design choices to some degree. The very setting of any performance standard implies some narrowing of design choice. Although the agency attempts to minimize the effect, in some instances a significant limitation on design is necessary to secure a particular type of safety improvement. Standard No. 121 does not differ from other safety standards in its effect on design. It uses performance requirements although some elements of design are restricted. Even though this amendment increases slightly the standard's effect on design choice, the standard remains performance oriented. Further, the effect of the old standard was to require brakes acting on all wheels. Although this amendment is more specific in that requirement, the result is the same. Commenters should note that the agency is not specifying the design of the brakes that must be used on each wheel. Accordingly, the NHTSA concludes that this amendment does not substantially or unnecessarily affect design and allows manufacturers significant flexibility in the design and improvement of their braking systems.

As a result of the *PACCAR* decision and the resulting possibility of brake performance downgrading, the agency is forced to take immediate corrective action. The *PACCAR* decision raised questions concerning the stopping distance requirements for trucks and trailers. The Court urged the agency to reexamine its stopping distance requirements and to ensure the propriety of any requirement that might be reimposed. In response, the agency has commenced exploratory rulemaking to determine the appropiate stopping distances for trucks and trailers. When the rulemaking is completed, it is contemplated that stopping distance requirements will be reimposed. The agency cannot reimpose those requirements until the research is completed. Given the absence of stopping distance requirements for trucks and trailers, and the time required for reimplementing stopping distances and the immediate problem of brake system downgrading, the agency must adopt a more expedient approach to prevent the existing levels of safety in heavy-duty vehicle brakes from being reduced.

Kelsey-Hayes supported this rulemaking action but at the same time requested an interpretation of an entirely unrelated section of Standard No. 121. Unrelated requests for interpretations should not be included with docket comments on a specific proposal. The agency will, however, respond to Kelsey-Hayes by a letter or in a separate notice.

In accordance with Executive Order 12044, the agency has reviewed the impacts of this proposed amendment and has determined that it is not significant. Since the amendment will merely require manufacturers to continue to manufacture vehicles as they are doing currently, the costs associated with this amendment will be minimal. Further, the agency has adopted the manufacturers' suggestions to incorporate this amendment in Standard No. 121 to further minimize the possibility of any increased costs.

Since this amendment imposed no additional burdens upon any manufacturer and only requires manufacturers to continue existing manufacturing practices and since it is in the interest of safety to prohibit as soon as possible the manufacture of vehicles without front axle brakes, the amendment is effective 45 days after publication in the Federal Register. In the notice proposing this amendment, commenters objected to an immediate effective date especially if the amendment were made in Standard No. 130. Commenters indicated that more time would be required to change certification labels. Since the amendment is being incorporated into the existing Standard No. 121, the agency considers these objections to the effective date to be no longer valid. Nonetheless, the agency is giving 45 days of leadtime to ensure that all manufacturers have ample time to comply with the requirements.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations, Part 571 is amended by revising Standard No. 121, Air Brake Systems, as follows:

1. A new paragraph S5.1.8 is added to 49 CFR Part 571.121 to read:

S5.1.8 Brake distribution. Each vehicle shall be equipped with a service brake system acting on all wheels.

2. A new paragraph S5.2.2 is added to 49 CFR Part 571.121 to read:

S5.2.2 Brake distribution. Each trailer shall be equipped with a service brake system acting on all wheels.

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Joan Claybrook
Administrator

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MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses and Trailers

(Docket Nos. 70-16, 70-17; Notice No. 2)

S1. Scope. This standard establishes performance and equipment requirements for braking systems on vehicles equipped with air brake systems.

S2. Purpose. The purpose of this standard is to insure safe braking performance under normal and emergency conditions.

S3. Application. This standard applies to trucks, buses, and trailers equipped with air brake systems. However, it does not apply to:

(a) Any vehicle that has an overall vehicle width of more than 102 inches with extendable equipment in the fully retracted position;

(b) Any vehicle equipped with an axle that has a gross axle weight rating (GAWR) of 29,000 pounds or more;

(c) Any truck or bus that has a speed attainable in 2 miles of not more than 33 mph;

(d) Any truck that has a speed attainable in 2 miles of not more than 45 mph, an unloaded vehicle weight that is not less than 95 percent of its GVWR, and no capacity to carry occupants other than the driver and operating crew;

(e) Any trailer that has a gross vehicle weight rating GVWR of more than 120,000 pounds and whose body conforms to that described in the definition of "Heavy hauler trailer" set forth in S4;

(f) Any trailer that has an unloaded vehicle weight which is not less than 95 percent of its GVWR; and

(g) Any load divider dolly.

In addition, the standard does not apply to a heavy hauler trailer manufactured before January 1, 1979; any vehicle manufactured before January 1, 1979, that, in combination with another vehicle, constitutes a part of an auto transporter; and any vehicle manufactured before September 1, 1977, that has a GAWR for any axle of 24,000 pounds or more, or two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle.

S4. Definitions.

"Air brake system" means a system that uses air as a medium for transmitting pressure or force from the driver control to the service brake, but does not include a system that uses compressed air or vacuum only to assist the driver in applying muscular force to hydraulic or mechanical components.

"Antilock system" means a portion of a service brake system that automatically controls the degree of rotational wheel slip at one or more road wheels of the vehicle during braking.

"Auto transporter" means a truck and a trailer designed for use in combination to transport motor vehicles, in that the towing vehicle is designed to carry cargo at a location other than the fifth wheel and to load this cargo only by means of the towed vehicle.

"Heavy hauler trailer" means a trailer with one or more of the following characteristics:

(1) Its brake lines are designed to adapt to separation or extension of the vehicle frame; or

(2) Its body consists only of a platform whose primary cargo-carrying surface is not more than 40 inches above the ground in an unloaded condition, except that it may include sides that are designed to be easily removable and a permanent "front-end structure" as that term is used in § 393.106 of this title.

"Initial brake temperature" means the average temperature of the service brakes on the hottest axle of the vehicle 0.2 miles before any brake application.

"Load divider dolly" means a trailer composed of a trailer chassis and one or more axles, with no solid bed, body, or container attached, and which is designed exclusively to support a portion of the load on a trailer or truck excluded from all the requirements of this standard.

"Skid number" means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials Method "E-274-70 (as revised July 1974)" at 40 mph, omitting water delivery as specified in paragraphs S7.1 and 7.2" of that method.

"Speed attainable in two miles" means the speed attainable by accelerating at maximum rate from a standing start for two miles on a level surface.

S5. Requirements. Each vehicle shall meet the following requirements under the conditions specified in S6.

S5.1 Required equipment—trucks and buses. Each truck and bus shall have the following equipment:

S5.1.1 Air Compressor. An air compressor of sufficient capacity to increase air pressure in the supply and service reservoirs from 85 pounds per square inch (psi) to 100 (psi) when the engine is operating at the vehicle manufacturer's maximum recommended rpm within a time, in seconds, determined by the quotient

$$\frac{\text{actual reservoir capacity} \times 25}{\text{required reservoir capacity}}$$

S5.1.2 Reservoirs. One or more service reservoir systems, from which air is delivered to the brake chambers, and either an automatic condensate drain valve for each service reservoir or a supply reservoir between the service reservoir system and the source of air pressure.

S5.1.2.1 The combined volume of all service reservoirs and supply reservoirs shall be at least twelve times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms.

S5.1.2.2 Each reservoir shall be capable of withstanding an internal hydrostatic pressure of five times the compressor cutout pressure or 500 p.s.i., whichever is greater for 10 minutes.

S5.1.2.3 Each service reservoir system shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and the source of air pressure, by check valves or equivalent devices whose proper functioning can be checked without disconnecting any air line or fitting.

S5.1.2.4 Each reservoir shall have condensate drain valve that can be manually operated.

S5.1.2.3 Towing vehicle protection system. If the vehicle is intended to tow another vehicle equipped with air brakes, a system to protect the air pressure in the towing vehicle from the effects of a loss of air pressure in the towed vehicle.

S5.1.4 Pressure gauge. A pressure gauge in each service brake system, readily visible to a person seated in the normal driving position, that indicates the service reservoir system air pressure. The accuracy of the gauge shall be within plus or minus 7 percent of the compressor cut-out pressure.

S5.1.5 Warning signal. A signal, other than a pressure gauge, that gives a continuous warning to a person in the normal driving position when the ignition is in the "on" or "run" position and the air pressure in the service reservoir system is below 60 psi. The signal shall be either visible within the driver's forward field of view, or both audible and visible.

S5.1.6 Antilock warning signal. A signal on each vehicle equipped with an antilock system that gives a continuous warning to a person in the normal driving position when the ignition is in the "on" or "run" position in the event of a total electrical failure of the antilock system. The signal shall be either visible within the driver's forward field of view or both audible, for a duration of at least 10 seconds, and continuously visible. The signal shall operate in the specified manner each time the ignition is returned to the "on" or "run" position.

S5.1.7 Service brake stop lamp switch. A switch that lights the stop lamps when the service brake control is statically depressed to a point that produces a pressure of 6 psi or less in the service brake chambers.

S5.1.8 Brake distribution. Each vehicle shall be equipped with a service brake system acting on all wheels.

S5.2 Required equipment—trailers. Each trailer shall have the following equipment:

S5.2.1 Reservoirs. One or more reservoirs to which the air is delivered from the towing vehicle.

S5.2.1.1 A reservoir shall be provided that is capable, when pressurized to 90 psi, of releasing the vehicle's parking brakes at least once and that is unaffected by a loss of air pressure in the service brake system.

S5.2.1.2 Total service reservoir volume shall be at least eight times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms.

S5.2.1.3 Each reservoir shall be capable of withstanding an internal hydrostatic pressure of 500 p.s.i. for 10 minutes.

S5.2.1.4 Each reservoir shall have a condensate drain valve that can be manually operated.

S5.2.1.5 Each service reservoir shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and its source of air pressure by check valves or equivalent devices.

S5.2.2 Brake distribution. Each trailer shall be equipped with a service brake system acting on all wheels.

S5.3 Service brakes—road tests. The service brake system on each truck and bus shall, under the conditions of S6.1, meet the requirements of S5.3.1, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. The service brake system on each trailer shall, under the conditions of S6.1, meet the requirements of S5.3.2, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. However, the truck and trailer portions of an auto transporter (if both are manufactured after January 1, 1979) shall, in combination, meet the requirements of S5.3.1 as they apply to a single unit truck or bus, in place of the requirements of S5.3.2 as they apply to the trailer portion, and in place of the requirements of S5.3.1 as they apply to the truck portion in the loaded condition.

S5.3.1 Stopping distance—trucks and buses. Except for a school bus when stopped six times for each combination of weight, speed, and road condition specified in S5.3.1.1, in the sequence specified in Table I, the vehicle shall stop at least once in not more than the distance specified in Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway and without lockup of any wheel at speeds above 10 mph except for

(a) Controlled lockup of wheels of not more than one second allowed by an antilock system, or

(b) Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable, nonsteerable axles on a vehicle with more than two nonsteerable axis.

TABLE I

STOPPING SEQUENCE

1. Burnish
2. Control trailer service brake stops at 60 mph (for truck-tractors tested with a control trailer in accordance with S6.1.10.6).
3. Control trailer emergency brake stops at 60 mph (for truck-tractors tested with a control trailer in accordance with S6.1.10.7).
4. Stops with vehicle at gross vehicle weight rating:
    - (a) 20 mph service brake stops on skid number range 71-81.
    - (b) 60 mph service brake stops on skid number range 71-81.
    - (c) 20 mph service brake stops on skid number range 20-30.
    - (d) 20 mph emergency brake stops on skid number range 71-81.
    - (e) 60 mph emergency brake stops on skid number range 71-81.
5. Parking brake test with vehicle loaded to gross vehicle weight rating.
6. Stops with vehicle at unloaded weight plus 500 lb.:
    - (a) 20 mph service brake stops on skid number range 71-81.

(b) 60 mph service brake stops on skid number range 71-81.

(c) 20 mph service brake stops on skid number range 20-30.

(d) 20 mph emergency brake stops on skid number range 71-81.

(e) 60 mph emergency brake stops on skid number range 71-81.

7. Parking brake test with vehicle at unloaded weight plus 500 lb.

S5.3.1.1 Stop the vehicle from 60 m.p.h. and 20 mph on a surface with a skid number in the range of 71 to 81, and from 20 mph on a wet surface with a skid number in the range of 20 to 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation). If the speed attainable in 2 miles is less than 60 mph, the vehicle shall stop from a speed in Table II that is 4 to 8 mph less than the speed attainable in 2 miles.

TABLE II.—Stopping Distance in Feet

Vehicle speed in miles per hour	Service Brake stopping distance		Emergency Brake stopping distance	
	Column 1 Skid Skid No. 71-81	Column 2 Skid No. 20-20	Column 3 Skid No. 71-81	Column 4
20	35	60	83	85
25	53		123	131
30	75		170	186
35	101		225	250
40	131		288	325
45	165		358	409
50	203		435	504
55	246		520	608
60	293		613	720

S5.3.2. Stopping capability—trailers. When tested at each combination of weight, speed, and road condition specified in S5.3.2.1, in the sequence specified in Table I, with air pressure of 90 psi in the control line and service reservoir system and with no application of the towing vehicle's brakes, a trailer shall stop without any part of the trailer leaving the roadway and without lockup of any wheel at speeds above 10 mph, except for

(a) Controlled lockup of wheels of not more than one second allowed by an antilock system; or

(b) Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable; nonsteerable axles on a trailer with more than two nonsteerable axles; or

(c) In the case of an axle system having more than four wheels, lockup of any wheel other than the outermost wheel at each end of the axle system.

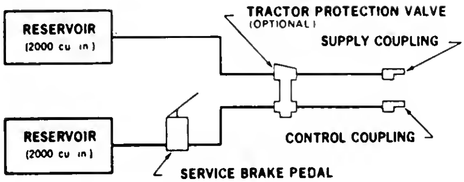
S5.3.2.1 Stop the vehicle from 60 m.p.h. and 20 mph on a surface with skid number in the range of 71 to 81, and from 20 mph on a wet surface with a skid number in the range of 20 to 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including instrumentation).

S5.3.2.2 When stopped in accordance with S5.3.2., any trailer designed exclusively for harvesting logs or pulpwood and constructed with a skeletal frame with no means for attachment of a solid bed, body, or container, and with an arrangement of air control lines and reservoirs designed to minimize damage in off-road operations, need not meet the requirements relating to wheel lockup, but must nevertheless meet the requirements of staying within the 12-foot lane.

S5.3.3 Brake actuation time. With an initial service reservoir system air pressure of 100 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, reach 60 psi in not more than 0.45 seconds in the case of trucks and buses, 0.35 seconds in the case of trailer converter dollies, and 0.30 seconds in the case of trailers other than trailer converter dollies. A vehicle designed to tow a vehicle equipped with air brakes shall be capable of meeting the above actuation time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above actuation time requirement with its brake system connected to the test rig shown in Figure 1.

FIGURE 1

TRAILER TEST RIG



S5.3.4 Brake release time. With an initial service brake chamber air pressure of 95 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, fall to 5 psi in not more than 0.55 seconds in the case of trucks and buses, and fall to 5 psi in not more than 0.65 seconds in the case of trailers, including trailer converter dollies. A vehicle designed to tow another vehicle equipped with air brakes shall be capable of meeting the above release time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above release time requirements with its brake system connected to the test rig shown in Figure 1.

S5.4 Service brake system—dynamometer tests. When tested without prior road testing, under the conditions of S6.2, each brake assembly shall meet the requirements of S5.4.1, S5.4.2, and S5.4.3 when tested in sequence and without adjustments other than those specified in the standard. For purposes of the requirements of S5.4.2 and S5.4.3, an average deceleration rate is the change in velocity divided by the deceleration time measured from the onset of deceleration.

S5.4.1 Brake retardation force. The sum of the retardation forces exerted by the brakes on each vehicle designed to be towed by another vehicle equipped with air brakes shall be such that the quotient

$$\frac{\text{sum of the brake retardation forces}}{\text{sum of GAWRs}}$$

relative to brake chamber air pressure shall have values not less than those shown in Column 1 of Table III. Retardation force shall be determined as follows:

TABLE III
BRAKE RETARDATION FORCE

BRAKE RETARDATION FORCE GAWR Column 1	BRAKE CHAMBER PRESSURE, p.s.i. Column 2
0.05	20
0.12	30
0.18	40
0.25	50
0.31	60
0.37	70
0.41	80

S5.4.1.1 After burnishing the brake pursuant to S6.2.6, retain the brake assembly on the inertia dynamometer. With an initial brake temperature between 125°F and 200°F, conduct a stop from 50 mph, maintaining brake chamber air pressure at a constant 20 psi. Measure the average torque exerted by the brake from the time the specified air pressure is reached until the brake stops and divide by the static loaded tire radius specified by the tire manufacturer to determine the retardation force. Repeat the procedure six times, increasing the brake chamber air pressure by 10. After each stop, rotate the brake drum or disc until the temperature of the brake falls to between 125°F. and 200°F.

S5.4.2 Brake power. When mounted on an inertia dynamometer, each brake shall be capable of making 10 consecutive decelerations at an average rate of 9 fpsps from 50 mph to 15 mph, at equal intervals of 72 seconds, and shall be capable of declerating to a stop from 20 mph at an average deceleration rate of 14 fpsps one minute after the 10th aceleration. The series of decelerations shall be conducted as follows:

S5.4.2.1 With an initial brake temperature between 150°F and 200°F for the first brake application, and the drum or disc rotating at a speed equivalent to 50 mph, apply the brake and decelerate at an average deceleration rate of 9 fpsps to 15 mph. Upon reaching 15 mph, accelerate to 50 mph and apply the brake for a second time 72 seconds after the start of the first application. Repeat the cycle until 10 decelerations have been made. The service line air pressure shall not exceed 100 psi during any deceleration.

S5.4.2.2 One minute after the end of the last deceleration required by S5.4.2.1 and with the drum or disc rotating at a speed of 20 mph, decelerate to a stop at an average deceleration rate of 14 fpsps. The service brake line air pressure shall not exceed 108 psi.

S5.4.3 Brake recovery. Starting 2 minutes after completing the tests required by S5.4.2, the brake of a vehicle other than either front axle brake of a truck-tractor shall be capable of making 20 consecutive stops from 30 mph at an average deceleration rate of 12 ft/s/s, at equal intervals of 1 minute measured from the start of each brake application. The service line air pressure needed to attain a rate of 12 ft/s/s shall be not more than 75 lb./in.^{2}, and not less than 20 lb./in.^{2} for a brake not subject to the control of an antilock system, or 12 lb./in.^{2} for a brake subject to the control of an antilock system.

S5.5 Antilock system.

S5.5.1 Antilock system failure. On a vehicle equipped with an antilock system, electrical failure of any part of the antilock system shall not increase the actuation and release times of the service brakes.

S5.5.2 Antilock system power—trailers. On a trailer equipped with an antilock system that requires electrical power for operation, the power shall be obtained from the stop lamp circuit. Additional circuits may also be used to obtain redundant sources of electrical power.

S5.6 Parking brake system. Each vehicle other than a trailer converter dolly shall have a parking brake system that under the conditions of S6.1 meets the requirements of S5.6.1 or S5.6.2, at the manufacturer's option, and the requirements of S5.6.3 and S5.6.4. However, a trailer that is designed to transport bulk agricultural commodities in off-road harvesting sites and to a processing plant or storage location, as evidenced by skeletal construction that accommodates harvest containers, a maximum length of 28 feet, and an arrangement of air control lines and reservoirs that minimizes damage in field operations, shall meet the requirements of this section or, at the option of the manufacturer, the requirements of § 393.43 of the title.

S5.6.1 Static retardation force. With all other brakes rendered inoperative, during a static drawbar pull in a forward or rearward direction, the static retardation force produced by the application of the parking brakes shall be:

(a) In the case of a vehicle other than a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GAWR}}$$

is not less than 0.28 for any axle other than a steerable front axle; and

(b) In the case of a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GVWR}}$$

is not less than 0.14.

S5.6.2 Grade holding. With all parking brakes applied, the vehicle shall remain stationary facing uphill and facing downhill on a smooth, dry portland cement concrete roadway with a 20% grade, both (a) when loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation).

S5.6.3 Application and holding. The parking brakes shall be applied by an energy source that is not affected by loss of air pressure or brake fluid pressure in the service brake system. Once applied, the parking brakes shall be held in the applied position solely by mechanical means.

S5.6.4 Parking brake control—trucks and buses. The parking brake control shall be separate from the service brake control. It shall be operable by a person seated in the normal driving position. The control shall be identified in a manner that specifies the method of control operation.

The parking brake control shall control the parking brakes of the vehicle and of any air braked vehicle that it is designed to tow.

S5.7 Emergency brake system—trucks and buses. Each vehicle shall be equipped with an emergency brake system which, under the conditions of S6.1, conforms to the requirements of S5.7.1 through S5.7.3. The emergency brake system may be a part of the service brake system or incorporate portions of the service brake and parking brake systems.

S5.7.1 Emergency brake system performance. When stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid number of 75, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in Column 3 of Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway, except that a truck-tractor tested at its unloaded vehicle weight plus 500 pounds shall stop at least once in not more than the distance specified in Column 4 of Table II.

S5.7.1.1 Automatic application. The parking brakes shall be automatically applied and the supply line to any towed vehicle vented to atmospheric pressure when the air pressure in all service reservoirs is less than the automatic application pressure level. The automatic application pressure level shall be between 20 and 45 p.s.i.

S5.7.1.2 Automatic braking performance. With the parking brake automatically applied, a vehicle shall either be capable of meeting the requirements of S5.7.2.3, with distances measured from the point of automatic application, or shall have a static retardation force quotient not greater than 0.40 for any axle, determined in accordance with S5.6.1.

S5.7.1.3 Release after automatic application. After automatic application, the parking brakes shall be releasable at least once by means of a parking control. The parking brakes shall be releasable only if they can be automatically reapplied and exert the force required by S5.6 immediately after release.

S5.7.1.4 Manual operation. The parking brakes shall be manually operable and releasable when the air pressure in the service reservoir system is sufficient to keep the parking brakes from automatically applying.

S5.7.2 Emergency brake system operation. The emergency brake system shall be applied and released, and be capable of modulation, by means of the service brake control.

S5.7.2.1 Emergency braking control. The emergency braking system shall be controlled by the service brake control or the parking brake control. The control for the emergency braking system shall control the brakes on any towed vehicle equipped with air brakes.

S5.7.2.2 Emergency braking system failure. In the event of a failure of a valve, manifold, brake fluid housing, or brake chamber housing that is common to the service brake and emergency braking systems, loss of air shall not cause the parking brake to be inoperable.

S5.7.2.3 Emergency braking stopping distance. Except as specified in S5.7.2.3.1 and S5.7.2.3.2, when stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid number of 75, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold, brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in column 3 of Table II, measured from the point at which movement of the brake control begins, without any part of the vehicle leaving the roadway, except that a truck-tractor tested at its unloaded vehicle weight plus 500 pounds shall stop at least once in not more than the distance specified in Column 4 of Table II.

S5.7.2.3.1 A truck manufactured before September 1, 1976, that has a front steerable nondriving axle with a GAWR of 16,000 pounds or more, or a front steerable drive axle with a GAWR of less than 18,000 pounds, and a truck manufactured before September 1, 1975, that has a front steerable drive axle of any GAWR, must stop in accordance with S5.7.2.3 without any part of the vehicle leaving the roadway, but need not stop in the distances specified.

S5.7.2.3.2 When stopped in accordance with S5.7.2.3, a truck or bus manufactured before September 1, 1975, other than a truck described in S5.7.2.3.1, shall stop at least once for each speed and weight condition on a surface with a skid number of 75 in not more than the distance specified in Table IIa instead of meeting the stopping distances specified in Table II for stops on a surface with a skid number of 75.

S5.7.3 Towing vehicle emergency brake requirements. In addition to meeting the other requirements of S5.7, a vehicle designed to tow another vehicle equipped with air brakes shall—

(a) In the case of a truck-tractor in the unloaded condition and a single unit truck which is capable of towing an air-brake equipped vehicle and is loaded to gross vehicle weight rating, be capable of meeting the requirements of S5.7.1 by operation of the service brake control only, with the trailer air supply line and air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14;

(b) In the case of a truck-tractor loaded to gross vehicle weight rating, be capable of meeting S5.7.1 by operation of the service brake control only, with the air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14; and

(c) Be capable of modulating the air in the supply or control line to the trailer by means of the service brake control with a single failure in the towing vehicle service brake system as specified in S5.7.1.

S5.8 Emergency braking capability—trailers. Each trailer other than a trailer converter dolly shall have a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the supply line is at atmospheric pressure. A trailer converter dolly shall have, at the manufacturer's option, (a) a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the supply line is at atmospheric pressure, or (b) an emergency system that automatically controls the service brakes when the serivce reservoir is at any pressure above 20 lb./in.^{2} and the supply line is at atmospheric pressure. However, a trailer that is designed to transport bulk agricultural commodities in off-road harvesting sites and to a processing plant or storage location, as evidenced by skeletal construction that accommodates harvest containers, a maximum length of 28 feet, and an arrangement of air control lines and reservoirs that minimizes damage in field operations, shall meet the requirements of this section or, at the option of the manufacturer, the requirements of § 393.43 of this title.

S6 Conditions. The requirements of S5 shall be met under the following conditions. Except as otherwise specified, where a range of conditions is specified, the vehicle must be capable of meeting the requirements at all points within the range.

S6.1 Road test conditions.

S6.1.1 Except as otherwise specified, the vehicle is loaded to its gross vehicle weight rating, distributed proportionally to its gross axle weight ratings.

S6.1.2 The inflation pressure is as specified by the vehicle manufacturer for the gross vehicle weight rating.

S6.1.3 Unless otherwise specified, the transmission selector control is in neutral or the clutch is disengaged during all decelerations and during static parking brake tests.

S6.1.4 All vehicle openings (doors, windows, hood, trunk, cargo doors, etc.) are in a closed position except as required for instrumentation purposes.

S6.1.5 The ambient temperature is between 32°F and 100°F.

S6.1.6 The wind velocity is zero.

S6.1.7 Unless otherwise specified, stopping tests are conducted on a 122-foot wide, level, straight roadway having a skid number in the range of 71 to 81, inclusive, chosen at the option of the manufacturer. The vehicle is aligned in the center of the roadway at the beginning of the stop.

S6.1.8 The brakes are burnished before testing in accordance with S6.1.8.1. However, for vehicles with parking brake systems not utilizing the service brake friction elements, burnish the friction elements of such systems prior to the parking brake test according to the manufacturer's recommendations.

S6.1.8.1 With the transmission in the highest gear appropriate for the series given in Table IV make 500 brake applications at a deceleration rate of 10 ft/s/s, or at the vehicle's maximum deceleration rate, if not less than 10 ft/s/s, in the sequence specified in Table IV. After each brake application, accelerate to the speed specified and maintain that speed until making the next brake application at a point 1 mile from the initial point of the previous brake application. If a vehicle cannot attain the specified speed in 1 mile, continue to accelerate until the specified speed is reached or until the vehicle has traveled 1.5 miles from the initial point of the previous brake application. If during any of the brake applications specified in Table IV, the hottest brake raches 500° F, make the remainder of the 500 applications from that snub condition except that a higher or lower snub condition shall be used as necessary to maintain an after-stop temperature of 500° F ± 50° F. Any automatic pressure limiting valve is in use to limit pressure as designed, except that any automatic front axle pressure limiting valve is bypassed if the temperature of the hottest brake on a rear axle exceeds the temperature of the hottest brake on a front axle by more than 125° F. A bypassed valve is reconnected if the temperature of the hottest brake on a front axle exceeds the temperature of the hottest brake on a rear axle by 100° F. After burnishing, adjust the brakes as recommended by the vehicle manufacturer.

Table IV

Series	Snubs	Snub conditions (highest speed specified)
1	175	40 to 20 mph.
2	25	45 to 20 mph.
3	25	50 to 20 mph.
4	25	55 to 20 mph.
5	250	60 to 20 mph.

S6.1.9 Static parking brake tests for a semitrailer are conducted with the front end supported by an unbraked dolly. The weight of the dolly is included as part of the trailer load.

S6.1.10 In a test other than a static parking brake test, truck-tractor is tested at its gross vehicle weight rating by coupling it to a flatbed semitrailer (hereafter, control trailer) as specified in S6.1.10.1 to S6.1.10.7.

S8.1.10.1 The control trailer conforms to this standard.

S6.1.10.2 The center of gravity of the loaded control trailer is on the trailer's longitudinal centerline at a height of 66 ± 3 in. above the ground.

S6.1.10.3 For a truck-tractor with a rear axle gross axle weight rating of 26,000 lb or less, the control trailer has a single axle with a gross axle weight rating of 18,000 lb and a length, measured from the transverse centerline of the axle to the centerline of the kingpin, of 258 ± 6 in.

S6.1.10.4 For a truck-tractor with a total rear axle gross axle weight rating of more than 26,000 lb the control trailer has a tandem axle with a combined gross axle weight rating of 32,000 lb and a length, measured from the transverse centerline between the axles to the centerline of the kingpin, of 390 ± 6 in.

S6.1.10.5 The control trailer is loaded so that its axle is loaded to its gross axle weight rating and the tractor is loaded to its gross vehicle weight rating, with the tractor's fifth wheel adjusted so that the load on each axle measured at the tire-ground interface is most nearly proportional to the axles' respective gross axle weight ratings.

S6.1.10.6 Test equipment specification. The control trailer's service brakes are capable of stopping the combination from the maximum speed at which the tractor is tested, under the conditions of S6.1, without assistance from the tractor brakes, in the distance found by multiplying the value 68, 90, 115, 143, 174, 208, or 245 (corresponding to a speed of 30, 35, 40, 45, 50, 55, or 60 mph as appropriate for the truck-tractor tested) by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the tractor's fifth wheel adjusted as specified in S6.1.10.5, the trailer service reservoirs pressurized to 100 lb./in.², and the trailer loaded so that its axle is at gross axle weight rating and its kingpin is at empty vehicle weight. The stopping distance is measured from the point at which movement of the valve controlling the trailer brakes begins. The service brake chambers on the trailer reach 60 lb./in.² in not less than 0.20 second and not more than 0.30 second, measured from the instant at which movement of the valve controlling the trailer brakes begins.

S6.1.10.7 Test equipment specification. The control trailer's emergency brakes are capable of stopping the combination under the conditions of S6.1 from the maximum speed at which the tractor is tested, without assistance from the tractor's brakes, in the distance found by multiplying the emergency brake stopping distance in column 3 of Table II by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the combination loaded in accordance with S6.1.10.5. Stopping distance is measured from the point at which movement of the valve controlling the trailer brakes begins. In the case of control trailers that utilize parking brakes for emergency stopping capability, the pressure in the trailer's spring parking brake chambers falls from 95 lb./in.² to 5 lb./in.² in not less than 0.50 second and not more than 0.60 second, measured from the instant at which movement of the valve controlling the trailer's spring parking brakes begins.

S6.1.11 Special drive conditions. A vehicle equipped with an interlocking axle system of a front wheel drive system that is engaged and disengaged by the driver is tested with the system disengaged.

S6.1.1.12 Liftable axles. A vehicle with a liftable axle is tested at gross vehicle weight rating with the liftable axle down and at unloaded vehicle weight with the liftable axle up.

[**S6.1.13** The trailer test rig shown in Figure 1 is capable of increasing the pressure in a 50 cubic inch reservoir from atmospheric to 60 lb./in.² in 0.06 second, measured from the first movement of the service brake control to apply service brake pressure and of releasing pressure in such a reservoir from 95 to 5 lb./in.² in 0.22 second measured from the first movement of the service brake control to release service brake pressure.

S6.1.14 In testing the emergency braking system of towing vehicles under S5.7.3(a) and S5.7.3(b) the hose(s) is vented to the atmosphere at any time not less than 1 second and not more than 1 minute before the emergency stop begins, while the vehicle is moving at the speed from which the stop is to be made and any manual control for the towing vehicle protection system is in the position to supply air and brake control signals to the vehicle being towed. No brake application is made from the time the line(s) is vented until the emergency stop begins and no manual operation of the parking brake system or towing vehicle protection system occurs from the time the line(s) is vented until the stop is completed.

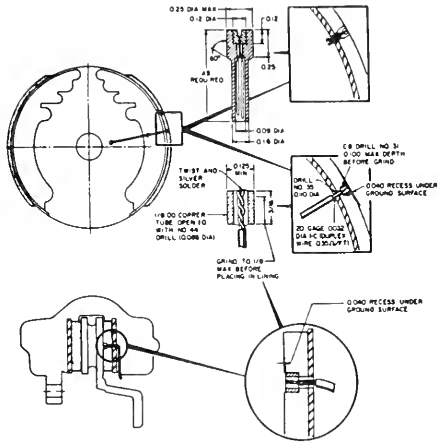
S6.1.15 *Initial brake temperature.* The temperature of each brake is measured by a single plug-type thermocouple installed in the center of the lining surface of the most heavily loaded shoe or pad as shown in Figure 2. The thermocouple is outside any center groove. With the exception of conditions specified for burnishing brakes in paragraph S6.1.8, repetitive test runs are separated by an interval of time sufficient to reach any initial brake temperature in the range of 150°F to 200°F. If the initial brake temperature for the first stop in a test procedure has not been reached, heat the brakes to the initial brake temperature by making not more than 10 snubs from not more than 40 to 10 mph at a deceleration not greater than 10 fpsps.

S6.2 Dynamometer test conditions.

S6.2.1 The dynamometer inertia for each wheel is equivalent to the load on the wheel with the axle loaded to its gross axle weight rating.

S6.2.2 The ambient temperature is between 75°F and 100°F.

FIGURE 2
THERMOCOUPLE INSTALLATION



S6.2.3 Air at ambient temperature is directed uniformly and continuously over the brake drum or disc at a velocity of 2,200 feet per minute.

S6.2.4 The temperature of each brake is measured by a single plus type thermocouple installed in the center of the lining surface of the most heavily loaded shoe or pad as shown in Figure II. The thermocouple is outside any center groove.

S6.2.5 The rate of brake drum or disc rotation on a dynamometer corresponding to the rate of rotation on a vehicle at a given speed is calculated by assuming a tire radius equal to the static loaded radius specified by the tire manufacturer.

S6.2.6 Brakes are burnished before testing as follows: Place the brake assembly on an inertia dynamometer and adjust the brake as recommended by the brake manufacturer. Make 200 stops from 40 mph at a deceleration of 10 fpsps, with an initial brake temperature on each stop of not less than 315°F and not more than 385°F. Make 200 additional stops from 40 mph at a deceleration of 10 fpsps with an initial brake temperature on each stop of not less than 450°F and not more than 550°F. After burnishing, the brakes are adjusted as recommended by the brake manufacturer.

S6.2.7 The brake temperature is increased to a specified level by conducting one or more stops from 40 mph at a deceleration of 10 fpsps. The brake temperature is decreased to a specified level by rotating the drum or disc at a constant 30 mph.

36 F.R. 3817
February 27, 1971

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 122 (49 CFR § 571.-122) that establishes performance requirements for motorcycle brake systems. A notice of proposed rulemaking on this subject was published on March 24, 1971 (36 F.R. 5516).

The safety afforded by a motorcycle's braking system is determined by several factors, including stopping distance, linear stability while stopping, fade resistance, and fade recovery. A safe system should have features that both guard against malfunction and stop the vehicle should a malfunction occur in the normal service system. Standard No. 122 covers each of these aspects of brake safety, establishing equipment and performance requirements appropriate for two-wheeled and three-wheeled motorcycles. These requirements do not differ greatly from the proposals, and comments received in response to the notice have been considered in promulgating the rule.

I. *Equipment.* Each motorcycle is required to have either a split hydraulic service brake system or two independently actuated service brake systems. The latter system encompasses a hydraulic service brake system combined with a hand operated parking brake system. Although several objections were received to the split hydraulic service brake system proposal, the NHTSA has determined that partial failure braking features are necessary in the event of a hydraulic pressure loss in the normal service brake system. If a motorcycle has a hydraulic service brake system, it must also have a reservoir for each master cylinder, and a master cylinder reservoir label advising the proper grade of DOT brake fluid. If the service brake system is a split hydraulic type, a failure indicator lamp is required.

Additionally, three-wheeled motorcycles must be equipped with a friction type parking brake with a solely mechanical means to retain engagement. Some commenters felt that pin or pawl type brakes should be permitted. The Administration does not know of an impact test adequate to test the strength of a mechanical lock, and pin or pawl type brakes, prone to failure upon impact, have been found to be inadequate. The NHTSA concurs, however, with comments objecting to the proposed parking brake indicator lamp, and has determined that the safety benefits involved are negligible in comparison with the expense of providing it.

II. *Performance.* Conformity with performance requirements will be determined by subjecting motorcycles to a series of road tests. Vehicles must demonstrate the effectiveness of their service brake systems by stopping within specified distances from 30 mph, 60 mph, 80 mph, and from a speed divisible by 5 mph that is 4 mph to 8 mph less than the maximum vehicle speed.

Motorcycles will demonstrate fade resistance of their braking systems by making recovery stops subsequent to a series of fade stops from 60 mph. The hand lever force for the final recovery stop must be within plus 20 pounds and minus 10 pounds of the baseline check average force. This is a modification of the proposed "plus 10 pounds or 20 percent, whichever, is less, and minus 20 percent," based upon comments requesting the substitution of absolute values. The same modification is made in the final water recovery stop. The maximum speed fade and recovery proposal has not been adopted, as two and three-wheeled motor vehicles do not have the inherent cooling problems that braking systems on four-wheeled vehicles experience. Retention of the 60 mph stops will ensure that the system maintain adequate stopping ability despite the high temperatures created by prolonged use, and may reveal undesirable brake lining characteristics such as glazing.

The test sequence has been rearranged so that the parking brake system test for three-wheeled motorcycles occurs immediately before the water recovery test. At this point in the test sequence the brakes will have been fully burnished, and the test will therefore be more indicative of service performance. Parking brake application forces have been modified from the proposal, and specify a maximum applied force of not more than 90 pounds for a foot-operated system and 55 pounds for a hand-operated system. These forces are identical to those specified in S6.10, the test condition on brake actuation forces, and result in a uniformity of brake actuation forces throughout the standard.

Finally, a motorcycle must demonstrate acceptable stopping performance after its brake system has been exposed to water. Comments expressed dissatisfaction with the proposed test procedure, stating that complete immersion of the brakes is not indicative of the manner in which they become wet in actual service. NHTSA agrees that poor braking performance often is not attributable to complete immersion, but rather to prolonged exposure to a constant spray from the road surface. However, there is no basis on which to specify a test procedure reflecting these conditions, and the immersion procedure has, therefore, been retained.

At the end of the test procedure the brake system must pass a durability inspection.

All stops must be made without lockup of any wheel. Two-wheeled motorcycles must remain within an 8-foot-wide lane during stops (modified from the proposed 6-foot-wide lane), and three-wheeled ones within a lane equal to vehicle width plus five feet. Some commenters asked that tests be performed with the clutch engaged. However, the effectiveness of a brake system in bringing a vehicle to a stop within required distances is more accurately judged by requiring that stops be made with the clutch disengaged; there is less reliance on extraneous factors such as use of engine retardation as a braking assist and the varying skills of individual drivers when shifting downward through gears.

Regarding test conditions, comments were received that it is unnecessary for both braking systems of a two-wheeled motorcycle to be within the specified pedal and lever force range simultaneously. The Administration did not concur with these comments. The safety of cyclists requires not only that motorcycles be capable of stopping within specified distances, but also that this capability be demonstrated when reasonable forces are applied to the brake lever and pedal.

Several commenters also objected to the "impossibility" of the test condition that "the wind velocity is zero." The comment reveals misunderstanding of the significance of the test conditions. A manufacturer may test for compliance by running the tests under any wind conditions that are adverse to the vehicle; obviously if the vehicle meets the requirements under adverse wind conditions, it will meet them under no-wind conditions. Similarly, the Government will prove noncompliance by orienting the test runs so that wind conditions are favorable to the vehicle. Thus, the condition uniquely allows testing under whatever wind conditions are present. It is retained as the most practicable and least burdensome test method for all parties.

Effective date: September 1, 1973. Because of the necessity to allow manufacturers sufficient production leadtime, it is found for good cause shown, that an effective date later than one year after issuance is in the public interest.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by adding § 571.122, Motor Vehicle Safety Standard No. 122, *Motorcycle Brake System.*

This notice is issued under the authority of section 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 National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on: March 1, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 5033
March 9, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

(Docket No. 1–3; Notice No. 4)

This notice responds to petitions for reconsideration of Motor Vehicle Safety Standard No. 122 (49 CFR § 571.122), and changes the effective date of the standard to January 1, 1974.

Motor Vehicle Safety Standard No. 122 establishing requirements for motorcycle braking equipment, stopping distance, brake system fade and recovery, and wet brake recovery, effective September 1, 1973, was published on March 9, 1972 (37 F.R. 5033). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the rule were filed by Japan Automobile Manufacturers Association, Inc. ("JAMA"), and Cushman Motors ("Cushman") through counsel. In response to these petitions, the effective date of the standard is being changed. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Lining inspection requirement.* S5.1.5 of Standard No. 122 requires a brake system to be installed "so that the lining thickness of drum brake shoes may be visually inspected, either directly or by use of a mirror without removing the drums. . . ." JAMA has petitioned that the word "indirectly" be substituted for "by use of a mirror" in order to allow use of a device such as a wear indicator on the outside of front and rear brake panels. The NHTSA considers wear indicators to be a "direct" method of visual inspection since the extent of lining wear may be determined without removal of the drums. There is no need to amend the Standard to allow their use, and JAMA's petition is denied.

2. *Brake wetting procedure.* The procedure for wetting the brakes prior to testing for wet brake recovery (S7.10.2) specifies the complete immersion of brake assemblies.

JAMA has petitioned that a water trough be substituted, with water depth varying according to the cycle's tire rim size, through which the cycle would be driven for 2 minutes at a speed of 10 m.p.h. JAMA notes that this is similar to the procedure NHTSA proposed in Docket No. 70–27, *Hydraulic Brake Systems*, and commented that the same procedure should apply to all motor vehicles.

The NHTSA has determined that the inherent instability of two- and three-wheeled vehicles under wet road conditions justifies a different test procedure. The difference in configuration between motorcycles and four-wheeled vehicles is distinct enough that there is no assurance motorcycle brakes will be wet, or wet uniformly, by the trough method. It is recognized that neither method may represent the way brakes become wet under actual road conditions, but immersion of brake assemblies has been determined to be the more efficiently reproducible method of establishing a condition under which motorcycle brake system performance may be evaluated. The petition is denied.

3. *Stopping distance.* JAMA and Cushman petitioned for a relaxation of the stopping distance requirements of Table I. JAMA recommended that the stopping distance values in Column II (Preburnish effectiveness, partial mechanical system) and Column III (Effectiveness—total system) up to and including 70 m.p.h. be the stopping distances specified in SAE Recommended Practice J109a. This would mean an increase in range of 39–136 feet for the preburnish stopping distances, and 1–15 feet for total system effectiveness over the values of Standard No. 122. JAMA alleges that stopping distance is highly dependent upon the rider's

ability to control the brakes, and it requested the increased stopping distances to compensate for variations in the rider's skill.

Cushman, whose three-wheeled vehicles have a top speed of 38 m.p.h., requests that all stopping distances from 30 m.p.h. and 35 m.p.h. be modified, alleging that the only way it can meet the stopping distances is by redesigning its vehicle. Cushman also states that it is unaware of any incident where the stopping distances achieved by its present vehicle have become a factor in an accident, and that accordingly there is no need for the stopping distances set forth in Table I, as they apply to Cushman, in order to protect the public.

The NHTSA recognizes that its standards on braking (the forthcoming amendment to Standard No. 105, *Hydraulic Brake Systems*, Standard No. 121, *Air Brake Systems*, and Standard No. 122, *Motorcycle Brake Systems*) impose stringent requirements on the manufacturers of all types of vehicles, and that, in some instances, redesign may be necessary. But because of the ever increasing numbers of vehicles on urban and interstate roadways, and of passenger-miles traveled, the NHTSA considers improved braking systems to be the highest priority in its program of accident avoidance. Prompt and accurate braking response is deemed especially critical in providing a margin by which the vulnerable motorcyclist may escape death or serious injury. While the fatality rate for all motor vehicle occupants fell 3.8 per cent in 1970, it rose 18.9 per cent for motorcycle riders. Motorcycles account for less than 2.3 per cent of total vehicle registrations, but they are involved in 3.6 per cent of all fatal accidents. Therefore, the necessity that the industry achieve the full capability of the present state of the art has been found to outweigh the problems caused the individual manufacturers by compliance.

The NHTSA recognizes the effect of rider control upon stopping distance in the wording of S7. which deems stopping distance requirements met if only one of the specified number of stops occurs within the maximum allowable stopping distances. Comments to Docket No. 1–3 indicate that it is clearly reasonable and practicable to require motorcycles to meet the stopping distances adopted for Standard No. 122. The petitions of JAMA and Cushman are denied.

4. *Effective date.* JAMA has requested a 4 month delay in the effective date of Standard No. 122 because model changeover time for Japanese manufacturers extends through autumn to the end of the year. It estimates that only 50 per cent of the industry could be brought into compliance by September 1, 1973. In light of the design changes that may be necessitated, the Administrator finds this request reasonable and that for good cause shown a later effective date is in the public interest. The effective date of Standard No. 122 is hereby changed to January 1, 1974.

The notice is issued pursuant to 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 National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on June 9, 1972.

Douglas W. Toms
Administrator

37 F.R. 11973
June 16, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

(Docket No. 1–3; Notice 6)

This notice amends Motor Vehicle Safety Standard No. 122, *Motorcycle Brake Systems*, 49 CFR 571.122, to modify the master cylinder labeling and the wetting procedure for the water recovery test, effective January 1, 1974.

The amendment is based upon a notice published December 15, 1972, (37 F.R. 26739). The NHTSA proposed a change in the wording of the master cylinder reservoir label which would be identical to that specified in Motor Vehicle Safety Standard No. 105a, *Hydraulic Brake Systems* (37 F.R. 17970). In addition, a change in the wetting procedure for the water recovery test was proposed to require sequential immersion of the front and rear brake assemblies in lieu of simultaneous immersion.

The comments received generally supported the proposal. Some minor changes were requested, and Standard No. 122 is being amended accordingly. The reservoir labeling requirements have been modified in format in a manner consistent with recent amendments to Standard No. 105a (38 F.R. 13017). The height of the lettering has been retained at 3/32 of an inch. In order to avoid any misinterpretation, it is the NHTSA's intent to have the label completed with DOT and the grade of fluid designed for use in the system and not a manufacturer's brand name and number. If, however, silicone-based or petroleum-based fluids are appropriate for the system design specific fluids may be designated until a DOT grade and performance requirements have been specified. A contrast in color will be required only of printed labels. For this purpose, it has been decided that raised or lowered letters will provide a sufficient degree of legibility.

Finally, based on a comment made by the Japan Automobile Manufacturers Association, Inc. (JAMA), the wetting procedure for the water recovery test has been changed to extend the maximum testing time from 5 minutes to 7 minutes. JAMA stated that immersion of the rear brake first would still create engine stall problems if the water were allowed to enter the engine through the muffler(s) during the front brake assembly immersion period. The NHTSA feels strongly that the front brake should be immersed last due to potential instabilities created by a "grabbing" front brake. The extra time which has been allotted should be sufficient for manufacturers to provide protection for the exhaust system, thereby alleviating the problem of engine stall, and providing a measure of relief for those who considered the 5-minute period as excessively short.

In consideration of the foregoing, 49 CFR § 571.122, Motor Vehicle Safety Standard No. 122, is amended. . . .

Effective date: January 1, 1974.

(Secs. 103, 112, 119 Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 38 F.R. 12147)

Issued on May 30, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 14753
June 5, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

(Docket No. 74–16; Notice 2)

This notice amends 49 CFR 571.108, 571.122, and 571.123, Motor Vehicle Safety Standards Nos. 108, 122, and 123, to modify current requirements that apply to motor-driven cycles.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking published on April 12, 1974 (39 F.R. 13287) and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to petitions by Cycles Peugeot, Ateliers de la Motobecane, and S.I.N.F.A.C., manufacturers, and Bermuda Bikes, Inc., and Robert F. Smith, retail dealers. The notice proposed that a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps, and may be equipped with a stop lamp with one-half the photometric output otherwise required. Braking fade and recovery requirements also would not apply to these low-speed vehicles. Maximum stopping distance values for the various tests should be added for test speeds of 25, 20, and 15 mph. Finally, a braking control on the left handlebar would be a permissible alternative to the required right foot braking control.

The comments received addressed both areas of performance covered in the proposal, and areas where no standards currently exist, such as motors, transmissions, pedals, and a request for exemption from Standard No. 119, *Tires for Vehicles Other Than Passenger Cars*. As these latter comments cover matters beyond the scope of the proposal, this notice does not discuss them. The agency, however, has been formally petitioned for rulemaking covering transmissions and Standard No. 119, and will respond to the petitioners in the near future.

The decision by NHTSA not to establish a separate category of vehicle was objected to by some commenters. In support of their request, they argued that the majority of motor-driven cycles have engines producing only 1.5 to 2 horsepower, and consequent low maximum speeds, reducing the need for forward lighting that is currently required of these vehicles. Petitioners submitted no data justifying their request. The NHTSA, however, intends to study the matter of forward lighting for low-powered two-wheeled vehicles through a research contract with the University of Michigan. When the contract is completed the agency will then decide whether further rulemaking is warranted.

The proposal distinguished motor-driven cycles on the basis of maximum speed attainable in 1 mile, rather than on horsepower, and the value selected, 30 mph, fell within the maximum (40 mph) and minimum (20 mph) suggested by commenters. The NHTSA has concluded therefore that the distinction should be adopted as proposed.

Some manufacturers requested restrictive controls on power plant output, apparently in fear that the engine of a vehicle with a top speed of 30 mph or less could be modified to exceed that speed, and therefore cause the vehicle to no longer comply with the Federal standards. This agency has not found that course of action to be practicable. The various ways to modify a vehicle after purchase cannot be anticipated or prevented at the manufacturer level. On the other hand, the great majority of consumers use their vehicles in the form in which they were purchased. The motor-driven cycle category itself contains a limitation of 5 horsepower, which will be applicable to the special lighting modifications. In the NHTSA's judgment, modifications by consumers and the consequent equipment requirements should continue to be regulated at the State level.

The fact that the agency took no action to propose a reduction in existing headlamp requirements for motor-driven cycles was criticized by several manufacturers as unduly restrictive because of the low speed and power output of their vehicles. No justification has been shown for such a change. Motor-driven cycles therefore must have sufficient generating and/or battery capacity to meet the headlamp requirements.

There was no substantive objection to the actual proposals for omission of turn signals, reduced stop lamp photometrics, relief from brake fade requirements, inclusion of maximum allowable stopping distances for low speeds, and rear brake control placement. Accordingly, the standards are being amended in the manner proposed.

Standard No. 122 is also being amended to delete the final effectiveness test (S5.5) for those motor-driven cycles excused from the fade and recovery requirements. The purpose of the final effectiveness test is to check the stopping ability of the vehicle after the fade and recovery tests. Since this requirement has been eliminated for motor-driven cycles of low top-speed, the final effectiveness test is redundant, and an unnecessary duplication of the second effectiveness test. No safety purpose is served by its retention. Language is also added to the fade and recovery and final effectiveness test procedures (S7.6, S7.7, and S7.8), making it clear that they do not apply to motor-driven cycles whose speed attainable in 1 mile is 30 mph or less.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: October 14, 1974. As the amendments allow new options for compliance, relieve restrictions, and impose no additional burdens on regulated persons, it is found for good cause shown tha an effective date earlier than 180 days after issuance of the amendments 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 September 6, 1974.

James B. Gregory
Administrator

39 F.R. 32914
September 12, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

This notice corrects an error in paragraph S7.8.1 of 49 CFR 571.122, Motor Vehicle Safety Standard No. 122, *Motorcycle Brake Systems*.

On March 24, 1971 NHTSA proposed (36 FR 5516) as part of its anticipated motorcycle braking standard, that the final effectiveness test "repeat S7.6 including S7.3.1". Proposed S7.6 was the service brake system second effectiveness test. When Standard No. 122 was issued on March 9, 1972 (37 F.R. 5033) the proposal was adopted, in S7.8.1, that the final effectiveness test "Repeat S7.6 including S7.3.1". However, in the development of the final rule the test sequence was rearranged and the second effectiveness test had become S7.5. Through oversight, a corresponding change was not made in the final effectiveness test provisions. Accordingly the change is being made by this notice.

In consideration of the foregoing, paragraph S7.8.1 of 49 CFR § 571.122, Motor Vehicle Safety Standard No. 122 is revised to read "S7.8.1 *Service brake system.* Repeat S7.5 including S7.3.1".

Effective date: December 10, 1974. Because the notice corrects an error and creates no additional burden upon any person, it is 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 December 4, 1974.

James B. Gregory
Administrator

39 F.R. 43075
December 10, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

(Docket No. 75-27; Notice 4)

This notice amends Standard No. 105-75, *Hydraulic Brake Systems*, and Standard No. 122, *Motorcycle Brake Systems*, to modify the means for establishing the frictional resistance of the surface on which stopping distance tests are conducted. A similar amendment is made to Part 575, *Consumer Information*, of Title 49 of the Code of Federal Regulations.

The National Highway Traffic Safety Administration (NHTSA) proposed the change in Standard No. 105-75 (49 CFR 571.105-75), Standard No. 121, *Air Brake Systems* (49 CFR 571.121), Standard No. 122 (49 CFR 571.122), and the Consumer Information Regulations (49 CFR 575.101) in response to a petition from British-Leyland Motors Limited (40 FR 45200, October 1, 1975). The existing test procedure in these regulations has specified use of the American Society for Testing and Materials (ASTM) E-274-65T procedure, using an ASTM E249 tire that is no longer manufactured.

Responses were received on the proposed ASTM change from White Motor Corporation (White), Mack Trucks, Inc. (Mack), Freightliner Corporation (Freightliner), Ford Motor Company (Ford), General Motors Corporation (GM), Chrysler Corporation (Chrysler), American Motors Corporation (AMC), and International Harvester (IH). The National Motor Vehicle Safety Advisory Council made no comment on the proposal.

Most commenters supported use of the new test procedure and tire, although they differed in recommendations for correlating the reading produced under the new procedure with that produced under the old procedure. Manufacturers are presently certifying compliance to brake standards on test surfaces with a satisfactory reading under the old procedure, and they should be able to continue testing and certifying compliance on the same surface without any increase in the severity of the tests. To accomplish this transition, the correlation in readings between the procedures has been determined, and the difference is reflected in a change of the dry surface value from "skid number" 75 to "skid number" 81.

Freightliner urged postponement of any action until it could be supported by "adequate and statistically reliable test data." AMC also recommended that the NHTSA do nothing "until the industry has had sufficient time to evaluate and verify the performance of the ASTM E501 test tire on all types of surfaces."

The change in procedure is prompted by the ASTM decision to utilize a new tire in ascertaining the frictional coefficient of test surfaces. As a result the old tire is no longer manufactured and only the new tire is available for skid number measurement. Manufacturers have conducted comparative tests with the new tire to determine the correlation between the readings given by the two tires. Neither Freightliner nor AMC submitted data showing that the agency's proposal to adjust the dry surface skid number upwards is unjustified. Only Mack submitted data and it supported the NHTSA and Federal Highway Administration test data that have been placed in the docket. General Motors considered the agency's proposed upward adjustment to be the maximum desirable based on its data. International Harvester, Chrysler, and Ford supported the change in dry surface skid number without qualification, and White suggested that a skid number of 85 be utilized. The agency finds that the AMC and Freightliner requests for further delay are unjustified.

Ford and Freightliner asked that the skid number for the lower coefficient (wet) surface also be adjusted. The agency's purpose in proposing the adjustment is limited to changes necessary to avoid a modification of the test surfaces or an increase in the severity of performance levels specified under the safety standards. The NHTSA earlier concluded that change of the wet surface specification was unnecessary, and no evidence has been supplied that would modify the earlier determination.

General Motors noted that an editorial change to the newer ASTM procedure does not appear in early publications of that procedure. To put all interested persons on notice of the editorial change, the NHTSA has included the change in its references to the ASTM E274–70 procedure.

Freightliner asserted that the newer procedure included modification of a formula that justified a larger upwards adjustment than that proposed by the agency. Actually, the modifications only corrected an error in the earlier formula which had no effect on the determination of frictional coefficient. Manufacturers either utilized a test trailer that obviated the need for calculations using the formula, or were aware of the error and corrected for it in their calculations. Thus the adjustment requested by Freightliner is not warranted.

In accordance with recently-enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16201, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this amendment on the public and private sectors, including possible loss of safety benefit. Because the new references to procedures and a test tire are expected to accord with existing practices, the amendment is judged not to have any significant impact on costs or benefits of the standards and consumer information item that are modified by the change.

Standard No. 121, *Air Brake Systems*, is presently subject to judicial review under § 105(a) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1394(a)). The U.S. Court of Appeals hearing the petition for review has indicated that it prefers to review the standard as it presently exists, without unnecessary amendment. To the degree possible, the agency is complying with that request and therefore, in the case of Standard No. 121, will delay the update of ASTM procedure until review is completed.

It is noted that this change in procedure for ascertaining the frictional resistance of the test surface does not invalidate data collected using the older procedure, and manufacturers can presumably certify on the basis of stopping distance tests conducted on surfaces measured by the old tire.

In consideration of the foregoing, amendments are made in Chapter V of Title 49, Code of Federal Regulations.

Effective date: June 14, 1976. Because the older test tire is no longer manufactured, and because the amendment of procedure and test tire is intended only to duplicate the existing procedure and tire, this amendment creates no additional requirements for any person, and 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 June 8, 1976.

James B. Gregory
Administrator

41 F.R. 24592
June 17, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 122

(Docket No. 78-14; Notice 1)

Motorcycle Brake Systems

This notice amends Motor Vehicle Safety Standard No. 122 *Motorcycle Brake Systems*, to incorporate an interpretation, clarifying that the parking brake system test for a 3-wheeled motorcycle does not require that a vehicle be held on a 30 percent grade for 5 minutes if the limit of traction of its braked wheels is reached on a lower grade so that the vehicle begins to slide. This notice also amends the standard to clarify the conditions under which traction is determined. The action is occasioned by a recent interpretation of the agency provided in response to a petition for temporary exemption from Standard No. 122 by Daihatsu Motor Company whose B-20 vehicle's limit of traction was reached on a 20 percent grade (43 F.R. 36548). The amendment has no effect upon safety since it is a statement and clarification of an existing agency interpretation.

Effective date: As an interpretative rule, the amendment is effective upon publication in the Federal Register. October 10, 1978.

For further information contact:

Scott Shadle, Office of Rulemaking, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2153).

Supplementary information: Paragraph S5.6 of 49 CFR 571.122, Motor Vehicle Safety Standard No. 122, requires in part that the parking brake system for a 3-wheeled motorcycle "be capable of holding the motorcycle, for 5 minutes in both forward and reverse directions, on a 30 percent grade. . . ." Recently the agency entertained a petition from Daihatsu Motor Company, Ltd. for a renewal of an exemption granted an electric motor-driven cycle in 1976 because of the inability of its braked wheels to hold it on a 30 percent grade in the reverse direction. The agency disposed of the petition by publishing an interpretation allowing Daihatsu to certify compliance with Standard No. 122, stating that the agency did not intended "to dictate design requirements such as center of gravity location and tire design mandating that the vehicle itself have a limit of traction sufficient to hold it on a grade that is 30 percent or greater when its wheels are braked." (43 F.R. 36548)

NHTSA has decided to incorporate this interpretation into Standard No. 122 by appropriate amendments to the parking brake system requirement (S5.6) and test procedures (S7.9). A similar limit-of-traction provision already exists with respect to the parking brake system requirements for hydraulically braked vehicles (paragraph S5.2.1 of 49 CFR 571.105).

This notice also amends Standard No. 122 to set forth the road surface on which traction is to be determined. As in the case of the parking brake test conditions in paragraph S6.9 of 49 CFR 571.105 and paragraph S5.6.2 of 59 CFR 571.121, Air Brake Systems. this notice specifies a surface of clean, dry, smooth portland cement concrete.

Because the amendment is an interpretative rule, under the Administrative Procedures Act it may be adopted without prior notice and public comment (5 U.S.C. 553(b)).

The principal authors of this amendment are Taylor Vinson of the Office of Chief Counsel and John Carson of the Office of Rulemaking.

In consideration of the foregoing. 49 CFR 571.122, Motor Vehicle Safety Standard No. 122 is amended. . . .

(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 October 3, 1978.

Joan Claybrook
Administrator

43 F.R. 46547-46548
October 10, 1978

MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

S1. Scope. This standard specifies performance requirements for motorcycle brake systems.

S2. Purpose. The purpose of the standard is to insure safe motorcycle braking performance under normal and emergency conditions.

S3. Application. This standard applies to motorcycles.

S4. Definitions.

"Braking interval" means the distance measured from the start of one brake application to the start of the next brake application.

"Initial brake temperature" means the temperature of the hottest service brake of the vehicle 0.2 miles before any brake application.

"Skid number" means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials (ASTM) Method E-274-70 (as revised July 1974) at 40 mph, omitting water delivery as specified in paragraphs 7.1 and 7.2 of that method.

"Stopping distance" means the distance traveled by a vehicle from the start of the brake application to the point where the vehicle stops.

"Split service brake system" means a brake system consisting of two or more subsystems actuated by a single control designed so that a leakage-type failure of a pressure component in a single subsystem (except structural failure of a housing that is common to all subsystems) shall not impair the operation of the other subsystem(s).

S.5 Requirements. Each motorcycle shall meet the following requirements under the conditions specified in S6, when tested according to the procedures and in the sequence specified in S7. Corresponding test procedures of S7 are indicated in parentheses. If a motorcycle is in-

TABLE I

STOPPING DISTANCES FOR EFFECTIVENESS, FADE AND PARTIAL SYSTEM TESTS

	Stopping distance, feet			
	Effectiveness tests			
Vehicle test speed m.p.h.	Preburnish effectiveness total system (S5.2.1) I	Preburnish effectiveness partial mechanical systems (S5.2.2) II	Effectiveness total system (S5.4) (S5.7.1) III	Effectiveness partial hydraulic systems (S5.7.2) IV
15	13	30	11	25
20	24	54	19	44
25	37	84	30	68
30	54	121	43	97
35	74	165	58	132
40	96	216	75	173
45	121	273	95	218
50	150	337	128	264
55	181	407	155	326
60	216	484	185	388
65			217	415
70			264	527
75			303	606
80			345	689
85			389	788
90			484	872
95			540	971
100			598	1076
105			659	1188
110			723	1302
115			791	1423
120			861	1549

TABLE II

BRAKE TEST SEQUENCE AND REQUIREMENTS

SEQUENCE L.C.	Test procedure	Requirements
1. Instrumentstion check	S7.2	
2. First (Preburnish) effectivess test:		
(a) Service brake system	S7.3.1	S5.2.1
(b) Partial service brake system	S7.3.2	S5.2.2
3. Burnish procedure	S7.4	
4. Second effectiveness test	S7.5	S5.3
5. First fade and recovery test	S7.6	S5.4
6. Reburnish	S7.7	
7. Final effectiveness test:		
(a) Service brake system	S7.8.1	S5.5.1
(b) Partial service brake system	S7.8.2	S5.5.2
8. Parking brake test		
(three-wheeled motorcycles only)	S7.9	S5.6
9. Water recovery test	S7.10	S5.8
10. Design durability	S7.11	S5.8

capable of attaining a specified speed, its service brakes shall be capable of stopping the vehicle from the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile, within stoppping distances that do not exceed the stopping distances specified in Table 1.

S5.1 Required equipment—split service brake system. Each motorcycle shall have either a split service brake system or two independently actuated service brake systems.

S5.1.1 Mechanical service brake system. Failure of any component in a mechanical service brake system shall not result in a loss of braking ability in the other service brake system on the vehicle.

S5.1.2 Hydraulic service brake system. A leakage failure in a hydraulic service brake system shall not result in a loss of braking ability in the other service brake system on the vehicle. Each motorcycle equipped with a hydraulic brake system shall have the equipment specified in S5.1.2.1 and S5.1.2.2.

S5.1.2.1 Master cylinder reservoirs. Each master cylinder shall have a separate reservoir for each brake circuit, with each reservoir filler opening having its own cover, seal, and cover retention device. Each reservoir shall have a minimum capacity equivalent to one and one-half times the total fluid displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir move from a new lining, fully retracted position to a fully worn, fully applied position. Where adjustment is a factor, the worst condition of adjustment shall be used for this measurement.

S5.1.2.2 [Reservoir labeling. Each motorcycle shall have a brake fluid warning statement that reads as follows, in letters at least 3/32 of an inch high:

"**WARNING:** Clean filler cap before removing. Use only ______ fluid from a sealed container." (Inserting the recommended type of brake fluid as specified in 49 CFR § 571.116, e.g. DOT 3)

The lettering shall be—

(a) Permanently affixed, engraved or embossed;

(b) Located so as to be visible by direct view, either on or within 4 inches of the brake fluid reservoir filler plus or cap; and

(c) Of a color that contrasts with its background, if it is not engraved or embossed.

S5.1.3. Split service brake system. In addition to the equipment required by S5.1.2 each motorcycle equipped with a split service brake system shall have a failure indicator lamp as specified in S5.1.3.1.

S5.1.3.1 Failure indicator lamp.

(a) One or more electrically operated service brake system failure indicator lamps that is mounted in front of and in clear view of the driver, and that is activated—

(1) In the event of pressure failure in any part of the service brake system, other than a structural failure of either a brake master cylinder body in a split integral body type master cylinder system or a service brake system failure indicator body, before or upon application of not more than 20 pounds of pedal force upon the service brake.

(2) Without the application of pedal force, when the level of brake fluid in a master cylinder reservoir drops to less than the recommended safe level specified by the manufacturer or to less than one-half the fluid reservoir capacity, whichever is the greater.

(b) All failure indicator lamps shall be activated when the ignition switch is turned from the "off" to the "on" or to the "start" position.

(c) Except for the momentary activation required by S5.1.3.1(b), each indicator lamp, once activated, shall remain activated as long as the condition exists, whenever the ignition switch is in the "on" position. An indicator lamp activated when the ignition is turned to the "start" position shall be deactivated upon return of the switch to the "on" position unless a failure exists in the service brake system.

(d) Each indicator lamp shall have a red lens with the legend "Brake Failure" on or adjacent to it in letters not less than 3/32 of an inch high that shall be legible to the driver in daylight when lighted.

S5.1.4 Parking Brake. Each three-wheeled motorcycle shall be equipped with a parking brake of a friction type with a solely mechanical means to retain engagement.

S5.1.5 Other requirements. The brake system shall be installed so that the lining thickness of drum brake shoes may be visually inspected, either directly or by use of a mirror without removing the drums, and so that disc brake friction lining thickness may be visually inspected without removing the pads.

S5.2 Service Brake System. First (pre-burnish) effectiveness.

S.5.2.1 Service brake system. The service brakes shall be capable of stopping the motorcycle from 30 mph and 60 mph within stopping distances which do not exceed the stopping distances specified in Column I of Table I (S7.3.1).

S5.2.2 Partial service brake system. Each independently actuated service brake system on each motorcycle shall be capable of stopping the motorcycle from 30 mph and 60 mph within stoping distances which do not exceed the stopping distances specified in Column II of Table I (S7.3.2).

S.5.3 Service brake system—second effectiveness. The service brakes shall be capable of stopping the motorcycle from 30 mph, 60 mph, 80 mph, and the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile if this speed is 95 mph or greater, within stopping distances that do not exceed the stopping distances specified in Column III of Table I (S7.5).

S5.4 Service brake system—fade and recovery.

These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S.5.4.1 Baseline check—minimum and maximum pedal forces. The pedal and lever forces used in establishing the fade baseline check average shall be within the limits specified in S6.10 (S7.6.1).

S5.4.2 Fade. Each motorcycle shall be capable of making 10 fade stops from 60 mph at not less than 15 fpsps for each stop (S7.6.2).

S5.4.3 Fade recovery. Each motorcycle shall be capable of making five recovery stops with a pedal force that does not exceed 90 pounds, and a hand lever force that does not exceed 55 pounds for any of the first four recovery stops and that for the fifth recovery stop is within plus 20 pounds and minus 10 pounds of the fade test baseline check average force (S7.6.3).

S5.5 Service brake system—final effectiveness. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S5.5.1 Service brake system. The service brakes shall be capable of stopping the motorcycle in a manner that complies with S5.3 (S7.8.1).

S5.5.2 Hydraulic service brake system—partial failure. In the event of a pressure component leakage failure, other than a structural failure of either a brake master cylinder body in a split integral body type master cylinder system or a service brake system failure indicator body, the remaining portion of the service brake system shall continue to operate and shall be capable of stopping the motorcycle from 30 mph and 60 mph within stopping distances that do not exceed the stopping distances specified in Column IV of Table I (S7.8.2).

S5.6 Parking brake system. The parking brake system shall be capable of holding the motorcycle stationary (to the limits of traction of the braked wheels), for 5 minutes, in both forward and reverse directions, on a 30 percent grade, with an applied force of not more than 90 pounds for a foot-operated system and 55 pounds for a hand-operated system (S7.9).

S5.7 Service brake system—water recovery.

S5.7.1 Baseline check. The pedal and lever forces used in establishing the water recovery baseline check average shall be within the limits specified in S6.10 (S7.10.1).

S5.7.2 Water recovery test. Each motorcycle shall be capable of making five recovery stops with a pedal force that does not exceed 90 pounds, and a hand lever force that does not exceed 55 pounds, for any of the first four recovery stops, and that for the fifth recovery stop is within plus 20 pounds and minus 10 pounds of the baseline check average force (S7.10.2).

S5.8 Service brake system design durability. Each motorcycle shall be capable of completing all braking requirements of S5 without detachment of brake linings from the shoes or pad, detachment or fracture of any brake system components, or leakage of fluid or lubricant at the wheel cyclinder and master cylinder reservoir cover, seal, or retention device (S7.11).

S6. Test conditions. The requirements of S5 shall be met under the following conditions. Where a range of conditions is specified, the motorcycle shall be capable of meeting the requirements at all points within the range.

S6.1 Vehicle weight. Motorcycle weight is unloaded vehicle weight plus 200 pounds (including driver and instrumentation), with the added weight distributed in the saddle or carrier if so equipped.

S6.2 Tire inflation pressure. Tire inflation pressure is the pressure recommended by the manufacturer for the vehicle weight specified in paragraph S6.1.

S6.3 Transmission. Unless otherwise specified, all stops are made with the clutch disengaged.

S6.4 Engine. Engine idle speed and ignition timing settings are according to the manufacturer's recommendations. If the vehicle is equipped with an adjustable engine speed governor, it is adjusted according to the manufacturer's recommendation.

S6.5 Ambient temperature. The ambient temperature is between 32° and 100° F.

S6.6 Wind velocity. The wind velocity is zero.

S6.7 Road surface. Road tests are conducted on level roadway having a skid number of 81. The roadway is 8 feet wide for two-wheeled motorcycles, and overall vehicle width plus 5 feet for three-wheeled motorcycles. The parking brake test surface is clean, dry, smooth portland cement concrete.

S6.8 Vehicle position. The motorcycle is aligned in the center of the roadway at the start of each brake application. Stops are made without any part of the motorcycle leaving the roadway and without lockup of any wheel.

S6.7 Thermocouples. The brake temperature is measured by plug-type thermocouples installed in the approximate center of the facing length and width of the most heavily loaded shoe or disc pad, one per brake, as shown in Figure 1.

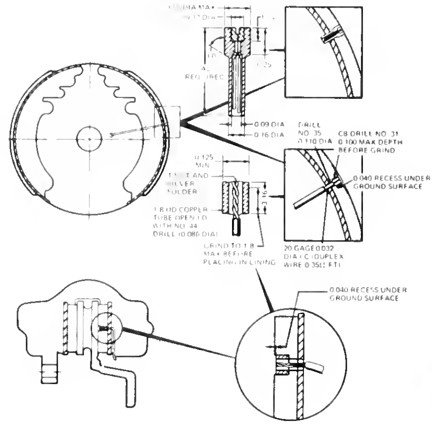
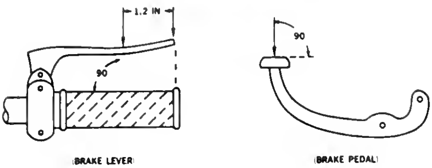


FIGURE 1

TYPICAL PLUG TYPE THERMOCOUPLE INSTALLATIONS

S6.10 Brake actuation forces. Except for the requirements of the fifth recovery stop in S5.4.3 and S5.7.2 (S7.6.3 and S7.10.2) the hand lever force is not less than five and not more than 55 pounds and the foot pedal force is not less than 10 and not more than 90 pounds. The point of initial application of the lever forces is 1.2 inches from the end of the brake lever grip. The direction of the force is perpendicular to the handle grip on the plane along which the brake lever rotates, and the point of application of the pedal force is the center of the foot contact pad of the brake pedal. The direction of the force is perpendicular to the foot contact pad on the plane along which the brake pedal rotates, as shown in Figure 2.

FIG. 2 DIRECTION OF FORCE



S7. Test procedures and sequence. Each motorcycle shall be capable of meeting all the requirements of this standard when tested according to the procedures and in the sequence set forth below without replacing any brake system part, or making any adjustments to the brake system other than as permitted in S7.4. A motorcycle shall be deemed to comply with S5.2, S5.3 and S5.5 if at least one of the stops specified in S7.3, S7.5 and S7.8 is made within the stopping distances specified in Table I.

S7.1 Braking warming. If the initial brake temperature for the first stop in a test procedure (other than S7.10) has not been reached, heat the brakes to the initial brake temperature by making up to 10 stops from 30 mph at a deceleration of not more than 10 fpsps. On independently operated brake systems, the coldest brake shall be within 10° F of the hottest brake.

S7.2 Pretest instrumentation check. Conduct a general check of test instrumentation by making not more than 10 stops from a speed of not more than 30 mph at a deceleration of not more than 10 fpsps. If test instrument repair, replacement, or adjustment is necessary, make not more than 10 additional stops after such repair, replacement or adjustment.

S7.3 Service brake system - first (preburnished) effectiveness test.

S7.3.1 Service brake system. Make six stops from 30 mph and then six stops from 60 mph with an initial brake temperature between 130° F and 150° F.

S7.3.2 Partial service brake system. For a motorcycle with two independently actuated service brake systems, repeat S7.3.1 using each service brake system individually.

S7.4 Service brake system—burnish procedure. Burnish the brakes by making 200 stops from 30 mph at 12 fpsps. The braking interval shall be either the distance necessary to reduce the initial brake temperature to between 130° F and 150° F or 1 mile, whichever occurs first. Accelerate at maximum rate to 30 mph immediately after each stop and maintain that speed until making the next stop. After burnishing adjust the brakes in accordance with the manufacturer's recommendation.

S7.5 Service brake system—second effectiveness test. Repeat S7.3.1. Then, make four stops from 80 mph and four stops from the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile if that speed is 95 mph or greater.

S7.6 Service brake system—fade and recovery test. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S7.6.1 Baseline check stops. Make three stops from 30 mph at 10 to 11 fpsps for each stop. Compute the average of the maximum brake pedal forces and the maximum brake lever forces required for the three stops.

S7.6.2 Fade stops. Make 10 stops from 60 mph at not less than 15 fpsps for each stop. The initial brake temperature before the first brake application shall be between 130° F and 150° F. Initial brake temperatures before brake applications for subsequent stops shall be those occurring at the distance intervals. Attain the required deceleration as quickly as possible and maintain at least this rate for not less than three-fourths of the total stopping distance for each stop. The interval between the starts of service brake applications shall be 0.4 mile. Drive 1 mile at 30 mph after the last fade stop and immediately conduct the recovery test specified in S7.6.3.

S7.6.3 Recovery test. Make five stops from 30 mph at 10 to 11 fpsps for each stop. The braking interval shall not be more than 1 mile. Immediately after each stop accelerate at maximum rate to 30 mph and maintain that speed until making the next stop.

S7.7 Service brake system—reburnish. Repeat S7.4 except make 35 burnish stops instead of 200 stops. Brakes may be adjusted after reburnish if no tools are used. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S7.8 Service brake system—final effectiveness test. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S7.8.1 Service brake system. Repeat S7.5 including S7.3.1.

S7.8.2 Partial service brake system test. Alter the service brake system on three-wheeled motorcycles to induce a complete loss of braking in any one subsystem. Determine the line pressure or pedal force necessary to cause the brake system failure indicator to operate. Make six stops from 30 mph and then six stops from 60 mph with an initial brake temperature between 130° F and 150° F. Repeat for each subsystem. Determine that the brake failure indicator is operating when the master cylinder fluid level is less than the level specified in S5.1.3.1(a) (2), and that it complies with S5.1.3.1(c). Check for proper operation with each reservoir in turn at a low level. Restore the service brake system to normal at completion of this test.

S7.9 Parking brake test. Starting with an initial brake temperature of not more than 150° F drive the motorcycle downhill on the 30 percent grade with the longitudinal axis of the motorcycle in the direction of the grade. Apply the service brakes with a force not exceeding 90 pounds to stop the motorcycle and place the transmission in neutral. Apply the parking brake by exerting a force not exceeding those specified in S5.6 Release the service brake and allow the motorcycle to remain at rest (to the limit of traction of the braked wheels) for 5 minutes. Repeat the test with the motorcycle parked in the reverse (uphill) position on the grade.

S7.10 Service brake system—water recovery test.

S7.10.1 Baseline check stops. Make three stops from 30 mph at 10 to 11 fpsps for each stop. Compute the average of the maximum brake pedal forces and of the maximum brake lever forces required for the three stops.

S7.10.2 Wet brake recovery stops. Completely immerse the rear brake assembly of the motorcycle in water for 2 minutes with the brake fully released. Next completely immerse the front brake assembly of the motorcycle in water for 2 minutes with the brake fully released. Perform the entire wetting procedure in not more than. 7 minutes. Immediately after removal of the front brake from water, accelerate at a maximum rate of 30 mph without a brake application. Immediately upon reaching that speed make five stops, each from 30 mph at 10 to 11 fpsps for each stop. After each stop (except the last) accelerate the motorcycle immediately at a maximum rate to 30 mph and begin the next stop.

S7.11 Final inspection. Upon completion of all the tests inspect the brake system in an assembled condition, for compliance with the brake lining inspection requirements. Disassemble all brakes and inspect:

(a) The entire brake system for detachment or fracture of any component;

(b) Brake linings for detachment from the shoe or pad;

(c) Wheel cylinder, master cylinder, and axle seals for fluid or lubricant leakage;

(d) Master cylinder for reservoir capacity and retention device; and

(e) Master cylinder label for compliance with S5.1.2.2.

37 F.R. 5033
March 9, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays

(Docket No. 70-26; Notice 3)

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 123 (49 CFR § 571.123) that establishes requirements for motorcycle controls and displays. A notice of proposed rulemaking on this subject was published on November 6, 1970 (35 F.R. 17117).

The National Highway Traffic Safety Administration estimates that over 3,000 accidents may be avoided annually by specifying a uniform standard for motorcycle controls and displays. As this agency commented in the prior notice: "Controls and displays link the operator and the machine, and if there is confusion as to their location, interpretation, or operation, a dangerous situation may result. A cyclist, especially the novice and the cyclist who has changed from one make of machine to another, must not hesitate when confronted with an emergency." The purpose of the new standard is to minimize operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

The basic operational requirement of Standard No. 123 is that handlebar-mounted controls be operable throughout their full range without the operator removing his hand from the handgrip. Standard No. 123 requires all motorcycles to have a supplemental engine stop control, operable from the right handlebar, intended for use in emergency situations. Notice of this require ment was proposed in Notice 2 to Docket No. 69-20, *Accelerator Control Systems* (35 F.R. 15241). Standard No. 123 also requires that if any of ten other specified equipment items are provided on a motorcycle, the location and method of operation of the applicable control shall be standardized. These items are: manual clutch or integrated clutch and gear change, foot-operated gear change, headlamp upper-lower beam control, horn, turn signal lamps, ignition, manual fuel shutoff control, twist-grip throttle, front wheel brake, and rear wheel brakes. Motorcycles that are designed and sold exclusively for use by law enforcement agencies are excluded from Standard No. 123, as the configuration of certain controls on such vehicles, necessary for law enforcement purposes, differs from that required by the new standard. Proposals applicable to the instrument illumination intensity control, the electric starter, and the kick starter have not been adopted as insufficient correlation with motor vehicle safety has been found for these items.

As noted below, some of the location and operational requirements that were proposed have not been adopted in the following instances Otherwise, the location and operation of controls are required as proposed.

1. *Foot-operated gear change.* The likelihood of inadvertent engagement of reverse gear has been found to be so slight that a means to prohibit it has not been found necessary. Further, no requirement has been specified for location of neutral gear. Under Proposal A, neutral would have occurred lowest in the gear sequence. Proposal A was not adopted because of the likelihood of overshooting low gear when downshifting, thus contributing to a possible loss of control. In Proposal B, the transmission would be put into neutral by a rearward motion of the operator's heel on a control device separate from the shift lever. This method was not adopted since it appears to have no inherent safety advantages over any other means of finding neutral. The intent of Proposal B was to ensure that neutral can reliably be selected when desired without being selected inadvertently when not

desired. The conventional neutral light may serve as an aid to such shifting; however, any system which requires eye movements away from the road merely to shift gears cannot be considered to be an adjunct to safety.

The present standard does not impose specific requirements for ease of locating the gear position, or for protection against inadvertent shifting into neutral. However, the Administration considers these to be desirable objectives and will consider amending the standard if it appears necessary to do so.

2. *Headlamp control.* Because heavy gloves are needed for safe riding, only a simple "up for higher beam, down for lower beam" requirement has been adopted.

3. *Turn signal lamps.* Because turn signal lamps are not a required item of motorcycle equipment until January 1, 1973, and the industry is experimenting with various controls, Standard No. 123 specifies only that the turn signal lamp control be located on the handlebars.

4. *Ignition:* Because of the adoption of the requirement that motorcycles be equipped with a supplemental engine stop control on the right handlebar, the need to specify a location and method of operation for the ignition has diminished. Accordingly, the sole ignition control requirement is that the "off" position be counterclockwise from all other positions.

5. *Manual fuel shutoff control.* The requirements adopted do not apply to automatic fuel shutoff controls. No location for a manual control is specified. Based upon comments, revisions have been made in the direction of valve operation.

Substantial modifications have been made as well in the display proposals. Because of the limited range within which displays can be located on a motorcycle, it has been determined that no specific location requirements are necessary. Illumination of the neutral position and the speedometer has been deemed essential; the proposal that a green lamp indicate neutral position has been adopted, and the speedometer must be illuminated whenever the headlamp is activated. Because turn signals and upper beam indicators are covered in Standard No. 108, they have been omitted from the display illumination requirements of Standard No. 123.

Proposals for control identification, stands, and passenger foot-rests have been adopted substantially as proposed. Since operating instructions are invariably provided with motorcycles, the NHTSA has not adopted the proposal covering them.

Effective date: September 1, 1974. Because of the leadtime necessary for preparation for production, it is found, for good cause shown, that an effective date later than one year after the issue date is in the public interest.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by adding § 571.123, Motor Vehicle Safety Standard No. 123, *Motorcycle Controls and Displays*, as set forth below.

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 from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on April 4, 1972.

Douglas W. Toms
Administrator

37 F.R. 7207
April 12, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays

This notice responds to petitions for reconsideration of Motor Vehicle Safety Standard No. 123 (49 CFR § 571.123) and amends the standard in minor respects.

Motor Vehicle Safety Standard No. 123, establishing requirements for the location, operation, identification, and illumination of motorcycle controls and displays, effective September 1, 1974, was published on April 12, 1972 (37 F.R. 7207). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the rule were filed by Japan Automobile Manufacturers Asociation, Inc. ("JAMA"), Kawasaki Motors Corp. (Kawasaki), and Cushman Motors ("Cushman") through counsel. In response to these petitions the standard is being revised in minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Manual fuel shutoff valve.* Standard No. 123 requires that the manual fuel shutoff control point downward when in the "on" position, forward in the "off" position, and upward to supply fuel from a reserve source if one is provided.

JAMA has requested that the configuration found on most Japanese motorcycles be adopted: "off" with the control position to the left, "reserve" to the right, and "on" downward. JAMA's request was originally made in response to the notice proposing control positions for the shut-off valve, and was considered at that time. JAMA's petition is denied. The NHTSA has determined that the control should be standardized by requiring its operation along a longitudinal rather than a transverse axis. In this location there is a greater likelihood that in the event of a crash, the control will be carried by inertia to the off position, thereby shutting off the fuel.

JAMA also asked for an interpretation of the words "control pointing" asking if the words mean the direction of a non-operational pointer indicating the off-position, or the direction of the control end operated by the fingers. "Control pointing" means the direction of the control end operated by the fingers. To eliminate this possible ambiguity, the word "pointing" is deleted from the entry in Table I.

2. *Headlamp control.* The NHTSA requires, in Standard No. 123, that the upper headlamp beam be activated with an upward motion of the beam control, and the lower beam by a downward motion. Kawasaki has asked that these positions be reversed. It reasons that when the left thumb is under the handlebar, the lower beam control can be more quickly activated with an upward movement of the thumb, rather than by raising the thumb above the switch and then depressing it. The Administration denies Kawasaki's request, as it is considered contrary to good human factors engineering. Control mechanisms which are used for increasing the output of a system are generally designed to be switched upward for higher intensity.

3. *Speedometer graduations.* Both JAMA and Kawasaki have petitioned for reconsideration of the requirement that major and minor graduations and numerals appear at the 10 and 5 mph intervals respectively, alleging that operator confusion could be caused by a clutter of numerals and graduations at 5 mph intervals. The NHTSA considers these petitions to have merit and is amending Standard No. 123, to require only minor graduations at the 5 mph intervals.

4. *Control identification.* JAMA has petitioned for an amendment of Table 3 to eliminate identification of some controls and to identify only control positions. The petition also requested abbreviation of the identification presently required. JAMA alleges difficulty in providing all the identification marks due to lack of

space around the handlebar. It argues that an individual operator will not mistake one equipment item for another on different cycles when all controls are uniformly located as specified by Standard No. 123.

The Administration denies JAMA's petition. Labeling control positions without identifying the control itself could confuse the novice motorcyclist and may contribute to traffic hazards. During the initial learning stage the cyclist will not be able to identify controls by their required location. Further, there are no common abbreviations with universal acceptance for the controls mentioned, *viz.*, choke, starter, horn, and neutral indicator.

JAMA also requested a clarification as to whether control identification must be indicated in capital letters. The answer is no: use of upper or lower case lettering is at the manufacturer's discretion. Kawasaki asked whether it is permissible to add information to the tachometer identification indicating that it registers thousands of revolutions per minute. The marking requirements of the standard are minimum requirements only, and the NHTSA has no objection to further identification of this nature for the tachometer.

5. *Three-wheeled motorcycles.* Cushman manufactures three-wheeled motorcycles. It alleged that many of the requirements of Standard No. 123 are incompatible with the configuration of its vehicle. It requested that Standard No. 123 be amended to exclude three-wheeled motorcycles that are designed to achieve a maximum speed no greater than 40 mph. Cushman raised a number of specific objections concerning control location and operation, identification, and displays. In view of the disposition of Cushman's petition it is not necessary to discuss the objections in detail.

Cushman's petition is denied for the following reasons. Petitioner manufactures two types of three-wheeled vehicles, identical except for steering configuration. One type employs handlebars, the other a steering wheel. Its sales literature indicates that most models manufactured with handlebars are intended for industrial applications on private property, and are not intended to be licensed as motor vehicles for use on the public roads. The remaining models manufactured with handlebars are intended for police use. Standard No. 123 does not apply to this type of vehicle. Cushman's models intended for street use are equipped with the steering wheel as standard equipment. The standard does not apply to motorcycles with steering wheels. A denial of Cushman's petition means only that, after September 1, 1974, three-wheeled motorcycles for street use may not be sold with the handlebar option.

6. *Miscellaneous.* A typographical error is corrected concerning the integrated clutch and gear change.

In consideration of the foregoing, 49 CFR § 571.123, Motor Vehicle Safety Standard No. 123, is revised . . . . *Effective date:* September 1, 1974, the same effective date as the standard as previously issued (37 F.R. 7207).

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 August 22, 1972.

Douglas W. Toms
Administrator

37 F.R. 17474
August 29, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 123

(Docket No. 74–16; Notice 2)

This notice amends 49 CFR 571.108, 571.122, and 571.123, Motor Vehicle Safety Standards Nos. 108, 122, and 123, to modify current requirements that apply to motor-driven cycles.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking published on April 12, 1974 (39 F.R. 13287) and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to petitions by Cycles Peugeot, Ateliers de la Motobecane, and S.I.N.F.A.C., manufacturers, and Bermuda Bikes, Inc., and Robert F. Smith, retail dealers. The notice proposed that a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps, and may be equipped with a stop lamp with one-half the photometric output otherwise required. Braking fade and recovery requirements also would not apply to these low-speed vehicles. Maximum stopping distances values for the various tests would be added for test speeds of 25, 20, and 15 mph. Finally, a braking control on the left handlebar would be a permissible alternative to the required right foot braking control.

The comments received addressed both areas of performance covered in the proposal, and areas where no standards currently exist, such as motors, transmissions, pedals, and a request for exemption from Standard No. 119, *Tires for Vehicles Other Than Passenger Cars.* As these latter comments cover matters beyond the scope of the proposal, this notice does not discuss them. The agency, however, has been formally petitioned for rulemaking covering transmissions and Standard No. 119, and will respond to the petitioners in the near future.

The decision by NHTSA not to establish a separate category of vehicle was objected to by some commenters. In support of their request, they argued that the majority of motor-driven cycles have engines producing only 1.5 to 2 horsepower, and consequent low maximum speeds, reducing the need for forward lighting that is currently required of these vehicles. Petitioners submitted no data justifying their request. The NHTSA, however, intends to study the matter of forward lighting for low-powered two-wheeled vehicles through a research contract with the University of Michigan. When the contract is completed the agency will then decide whether further rulemaking is warranted.

The proposal distinguished motor-driven cycles on the basis of maximum speed attainable in 1 mile, rather than on horsepower, and the value selected, 30 mph, fell within the maximum (40 mph) and minimum (20 mph) suggested by commenters. The NHTSA has concluded therefore that the distinction should be adopted as proposed.

Some manufacturers requested restrictive controls on power plant output, apparently in fear that the engine of a vehicle with a top speed of 30 mph or less could be modified to exceed that speed, and therefore cause the vehicle to no longer comply with the Federal standards. This agency has not found that course of action to be practicable. The various ways to modify a vehicle after purchase cannot be anticipated or prevented at the manufacturer level. On the other hand, the great majority of consumers use their vehicles in the form in which they were purchased. The motor-driven cycle category itself contains a limitation of 5 horsepower, which will be applicable to the special lighting modifications. In the NHTSA's judgment, modifications by consumers and the consequent equipment requirements should continue to be regulated at the State level.

The fact that the agency took no action to propose a reduction in existing headlamp requirements for motor-driven cycles was criticized by several manufacturers as unduly restrictive because of the low speed and power output of their vehicles. No justification has been shown for such a change. Motor-driven cycles therefore must have sufficient generating and/or battery capacity to meet the headlamp requirements.

There was no substantive objection to the actual proposals for omission of turn signals, reduced stop lamp photometrics, relief from brake fade requirements, inclusion of maximum allowable stopping distances for low speeds, and rear brake control placement. Accordingly, the standards are being amended in the manner proposed.

Standard No. 122 is also being amended to delete the final effectiveness test (S5.5) for those motor-driven cycles excused from the fade and recovery requirements. The purpose of the final effectiveness test is to check the stopping ability of the vehicle after the fade and recovery tests. Since this requirement has been eliminated for motor-driven cycles of low top-speed, the final effectiveness test is redundant, and an unnecessary duplication of the second effectiveness test. No safety purpose is served by its retention. Language is also added to the fade and recovery and final effectiveness test procedures (S7.6, S7.7, and S7.8), making it clear that they do not apply to motor-driven cycles whose speed attainable in 1 mile is 30 mph or less.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: October 14, 1974. As the amendments allow new options for compliance, relieve restrictions, and impose no additional burdens on regulated persons, it is found for good cause shown that an effective date earlier than 180 days after issuance of the amendments 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 September 6, 1974.

James B. Gregory
Administrator

39 F.R. 32914
September 12, 1974

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 123

Federal Motor Vehicle Safety Standards; Motorcycle Controls and Displays [Docket No. 80-05; Notice 2]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 123, *Motorcycle Controls and Displays*, to allow use of "r/min" as an alternative to "R.p.m." to indicate revolutions per minutes to the tachometer. This action is taken pursuant to a grant of two petitions for rulemaking. A notice of proposed rulemaking was published on Arpil 10, 1980 (45 FR 24515). The primary benefit of the amendment is that it will allow use of metric units for identification that are widely used by other countries.

EFFECTIVE DATE: September 20, 1983.

SUPPLEMENTARY INFORMATION: The Japan Automobile Manufactuers Association, Inc. and the Motorcycle Industry Council, Inc. petitioned for rulemaking to amend Federal Motor Vehicle Safety Standard No. 123, *Motorcycle Controls and Displays*, to provide the option of using "r/min" as well as the existing "R.p.m." letters on the tachometer to indicate revolutions per minute.

According to petitioners, such an amendment would allow metric units for identifications that are widely accepted internationally. Under the metric system the unit describing rotational frequency is "r/min", recognized by both the International Standards Organization and the U.S. Society of Automotive Engineers. Such an amendment would not affect safety and would be in the interest of international standards harmonization.

The agency granted the petitions and on April 10, 1980, proposed alternative amendments (45 FR 24515). The first, effective upon publication, would have allowed optional use of "R.p.m." or "r/min". The second would have allowed "r/min" immediately upon publication" and required its exclusive use eventually.

All comments to the notice of proposed rulemaking supported the first alternative, and the standard is being amended to allow use of either "R.p.m." or "r/min" as an acceptable means of identification of revolutions per minute. It should be understood that this requirement is inclusive of minute variations from the letters indicated, such as use of capital letters or omission of periods, and that such usage or omission will not be deemed failures to comply with Standard No. 123. Because the amendment imposes no additional burden on any persons and contributes to the international harmonization of vehicle standards, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance of this amendment is in the public interest.

The agency's examination has shown that this rulemaking action is not a major regulation under Executive Order 12291 "Improving Government Regulations," or a significant regulation under the Department's regulatory policies and procedures, and that a regulatory impact analysis is not required. Further, the cost impacts will be so minimal that preparation of a full regulatory evaluation is not warranted. Amendment of the standard will impose no additional manufacturer requirements but will allow producers flexibility to adopt tachometers that are now precluded by the current requirements of Standard No. 123. The cost savings resulting from taking advantage of that flexibility would be insubstantial.

The agency has also considered the impacts of this amendment in relation to the Regulatory Flexibility Act. I certify that amending Standard No. 123 would not have a significant economic effect on a substantial number of small entities. Accordingly, no initial regulatory flexibility analysis has been prepared. Based on available information, the agency believes no manufacturers of motorcycles are small businesses as that term is defined for purposes of the Flexibility Act. Small organizations and governmental jurisdictions which purchase fleets of motor vehicles would probably not be significantly affected. The difference in cost of vehicles equipped with current tachometers and those permitted by the amendment would be insubstantial at most.

In consideration of the foregoing, the letters "R.p.m." in Column 2 of Table 3 of 49 CFR 571.123, Motor Vehicle Safety Standard No. 123, are revised to read "R.p.m. or r/min".

Issued on September 14, 1983.

Diane K. Steed
Deputy Administrator

48 FR 42819
September 20, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays [Docket No. 83-13; Notice 2]

ACTION: Final rule

SUMMARY: The purpose of this notice is to amend Safety Standard No. 123, *Motorcycle Controls and Displays*, to allow greater flexibility in mounting the manual fuel control shut-off valve. This action is taken pursuant to a grant of a petition for rulemaking and a notice of proposed rulemaking published on September 6, 1983 (48 FR 40286). Its primary benefit is that it will relieve a current design restriction which is demed no longer necessary for motor vehicle safety.

EFFECTIVE DATE: October 8, 1984.

SUPPLEMENTARY INFORMATION: Table 1 of Standard No. 123 specifies that the manual fuel shut-off control have the following modes of operation: "off", with the control forward, "on", with the control downward, and "reserve" (if provided), with the control upward. No requirements are specified for the location of the control. However, Standard No. 123 has generally been interpreted as requiring control rotation around a transverse axis.

In March 1981 Bajaj Auto Ltd. asked NHTSA for an "exemption" from this requirement in order to mount its fuel shut-off control so that it could be rotated around a longitudinal axis. In establishing the original operational modes, NHTSA had justified them by stating that in the event of a crash there was a greater likelihood that the control would be carried forward by inertia to the "off" position, thereby shutting off the fuel. In Bajaj's opinion, this effect would be unlikely except in the most severe collisions because of the low weight of the operating control lever, and the tightness of the control valve necessary to guard against inadvertent closure of the control in normal operation. After deliberation, and its own informal investigation, the agency concurred with Bajaj's reasoning and decided to treat Bajaj's request as a petition for rulemaking. Bajaj was informed of this decision in 1982.

The agency tentatively decided that motor vehicle safety through standardization of controls is best served in this instance by retaining the relationships of the control positions to each other while allowing the manufacturer to place the control so that it may operate in its required positions around either a longitudinal or transverse axis. It was proposed that when the control is rotated around a longitudinal axis, the "off" position shall be "horizontal" with the other positions downward for "on" and upward for "reserve on". In the horizontal position, the control can be pointing either to the right or left.

Comments were received from American Honda Motor Co., Japan Automobile Manufacturer's Association (JAMA), Kawasaki Motors Corp., USA, and BMW Bikers of Metropolitan Washington. The manufacturers supported the proposal, and requested further amendments responsive to rotation about a vertical axis. BMW Bikers urged the agency to consider the potential hazards that might result were the control relocated so far inboard as to be difficult to reach and manipulate.

More specifically, a request was made that Standard No. 123 be amended to allow future designs of manual shut-off valves that would be rotational around a vertical axis. Kawasaki recommended that rotation be allowed around any axis. It was also recommended that the rotational axis be allowed to vary by plus or minus 30 degrees, as the exact axis of rotation (zero degrees) may be difficult to achieve because of the shape of the fuel tank and other vehicle components.

The agency has reviewed these requests and believes that they have merit as relief of design restrictions. However, the proposal did not ask for comments on the advisability of rotation around a vertical axis, or on a 30 degree tolerance. Therefore, the standard is being amended in the manner specified in the proposal.

With respect to the concern expressed by BMW Bikers, it is true that mounting the control around the longitudinal axis might make it awkward to reach and difficult to operate, but the agency does not believe that any manufacturer will change its current design in a manner that would make it less appealing to the consumer. The new location does represent a convenient location for motorscooters such as are manufactured by the petitioner.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291 "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures, and that neither a regulatory impact analysis nor a full regulatory evaluation is required. The rule imposes no additional requirements but permits manufacturers greater flexibility in locating the control concerned.

NHTSA has analyzed this rule for the purposes of the National Environmental Policy Act. The rule will have no effect on the human environment since the weight and quantity of materials used in the manufacture of motorcycles is not changed. No impact on safety is anticipated.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. I certify that this rule will not have a significant economic impact on a substantial number of small entities, and no initial regulatory flexibility analysis has been prepared. Manufacturers of motorcycles, those affected by the rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Finally, small organizations and governmental jurisdictions will not be significantly affected since the price of new motorcycles will be minimally impacted.

Because the amendment relieves a restriction, is optional in nature, and furthers international harmonization, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest, and the amendment is effective 30 days after publication in the *Federal Register*.

In consideration of the foregoing, the operation requirements for the manual fuel shut-off control (item 7) in Column 3 of Table 1 of 49 CFR 571.123, Motor Vehicle Safety Standard No. 123, are revised to read as follows:

"on"—Control downward.

"off "—Control forward (if control rotates around a transverse axis) or Horizontal—Left or Right (if control rotates around a longitudinal axis).

"reserve on"—(if provided) Control upward.

(Secs. 103, 119, Pub. L. 87-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 31, 1984.

Diane K. Steed
Administrator

49 FR 35380
September 7, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays [Docket No. 83-14; Notice 2]

ACTION: Final rule.

SUMMARY: Standard No. 123, *Motorcycle Controls and Displays*, specifies requirements for the location, operation, identification and illumination of controls and displays in two- and three-wheeled motor vehicles. This notice amends Standard No. 123 by adding symbols as an option to the words which are presently required to identify motorcycle controls and displays. This amendment brings the standard into harmony with latest documents promulgated by the International Standard Organization. The changes should reduce compliance costs by promoting international harmonization. This action results in part from a petition for rulemaking submitted by BMW of North America.

A notice of proposed rulemaking on this subject was published on September 6, 1983 (48 FR 40282).

EFFECTIVE DATE: October 11, 1984.

SUPPLEMENTARY INFORMATION: Standard No. 123, *Motorcycle Controls and Displays*, specifies requirements for the location, operation, identification and illumination of controls and displays in motorcycles. The purpose of the standard is to ensure the accessibility and visibility of controls and displays and to facilitate their quick and proper identification and selection by a driver in order to reduce the safety hazards caused by the diversion of the driver's attention from the driving task, and by mistakes in selecting controls.

Among its requirements, Standard No. 123 specifies the use of certain words for the identification of several controls and displays. The standard is silent as to the use of symbols in addition to or in place of words. BMW of North America petitioned for rulemaking to amend the standard so that symbols may be used. Its petition was granted on August 30, 1983, and a notice of proposed rulemaking implementing the grant was published on September 6, 1983 (48 FR 40282).

The symbols proposed were those developed by the International Standards Organization (ISO). Certain ISO symbols have also been adopted by the United Nations Economic Commission for Europe (ECE) and the European Economic Community (EEC).

Costs would be reduced by facilitating international harmonization. Manufacturers which produce vehicles for sale in both this nation and abroad would not have to produce separate dashboards or controls and displays to meet conflicting identification requirements.

NHTSA proposed that Table 3 be amended by adding a new column containing ISO symbols for supplemental engine stop, manual choke, electric starter, headlamp upper-lower beam control, horn, turn signals, neutral indicator, upper beam indicator, and fuel tank shut-off valve. These symbols could be used in addition to, or in lieu of, the words presently required. A footnote was added to clarify that the framed area of certain symbols may be filled in.

There are issues associated with the use of symbols for which NHTSA was especially interested in soliciting comments.

The first of these issues was the number and type of symbols that can be used to greatest effect. The ISO is a nonregulatory body. The European regulatory body (ECE) has additional, and in some instances different, symbols. There are potential safety and cost savings advantages to reaching consensus on the most effective symbols. In NHTSA's opinion, symbols should identify only the most important controls and displays. The proposal listed symbols covering only 9 controls and displays included in Table 3; the ISO standard for motorcycles (ISO 6727) has 22. NHTSA solicited comments on the number of those symbols that should be required or permitted, with attention to the question whether a proliferation of symbols contributes to confusion rather than providing clarification.

Another issue was whether, if the required words are used, a manufacturer should be allowed to supplement those words with symbols which it has developed on its own. Some of the ISO-approved symbols may have an unclear relationship to the function concerned, and in these instances manufacturers may have developed a more relevant symbol.

A further issue was the permissibility of deviation from exact replication of a symbol, such as use of a light symbol with four rays rather than the five depicted. The agency proposed that the symbols specified shall be "substantially in the form" shown in the new table to cover minor errors that have an inconsequential relationship to motor vehicle safety. NHTSA was interested in comments on this issue as well. A final issue was whether all symbols, including those in Standard No. 101, should be placed in a separate regulation that is not a Federal motor vehicle safety standard.

Comments on the notice were received from Japan Automobile Manufacturers Association (JAMA), Kawasaki Motors Corp. U.S.A., Yamaha Motor Corp. U.S.A., Chrysler Corp., General Motors Corp., Suzuki Motor Co. Ltd., and BMW Bikers of Washington.

The use of ISO symbols was unanimously supported, Kawasaki commenting that this is a step towards harmonization of American requirements with those of other nations. Several commenters suggested, however, that the proposed revision of Table 3 appeared redundant in requiring use of words to identify control operation (Column 4) if a symbol were also used. The agency agrees with this comment and the final rule allows several options for control and control position function identification: by only the symbol (Column 3), by wording (Column 2 and Column 4), or by both symbol and wording (Column 2, Column 3, and Column 4). In addition, a manufacturer may provide symbols and words where none are shown in the Columns. Although expressed in rewritten form, previous specifications of paragraph S5.2.3 continue to apply: permission to spell out control identification abbreviations, placement of identification on or adjacent to the control, position, and appearance of identification to the operator in an upright position.

Kawasaki pointed out to the agency that most modern motorcycles do not rely on a "choke" device but incorporate an enrichening circuit in the carburator. It asked that amendments be made to Columns 1 and 2 to reflect that fact, allowing "Mixture Enrichment" in addition to "Manual Choke", and "Enrichener" as well as "Choke". While the agency believes that most operators will continue to use the word "choke" to describe the system that enriches the fuel-air mixture, the agency has decided to extend the terminology associated with this control to acknowledge the existence of alternative technology to aid in cold starting. Table 3, Column 1 will therefore contain the equipment designation "Manual Choke or Mixture Enrichment" and Table 3, Column 2 will contain the control and display identification "Choke or Enrichener".

NHTSA's request for comments on the issue of the number and types of symbols that could be used to greatest effect was addressed only inferentially with the comment that the agency had not proposed use of all ISO symbols for motorcycles. NHTSA had also asked whether if the required words were used, a manufacturer should be allowed to supplement those words with symbols other than those of the ISO which may have an unclear relationship to the function concerned. Those who commented felt that only ISO symbols should be permitted, and some asked that the entire list be provided. The amendment that is the subject of this notice allows a manufacturer to apply its own symbols for ignition, tachometer, and speedometer as none are specified for these displays and controls in Column 3. It was brought to the agency's attention that the electric starter symbol may not be the one currently approved by the ISO. The agency has been able to substantiate that the symbol proposed (adopted by the ISO in 1981 and also the symbol specified by ECE Regulation No. 60) is the current ISO symbol and the final rule thus adopts the symbol of the proposal.

Manufacturers supported the concept of the permissibility of minor deviations from exact replication of the ISO symbols, which may be occasioned by space limitations on small vehicles such as motorcycles. Accordingly, the standard is amended as proposed, requiring only that a symbol be "substantially in the form" shown in Column 3.

Finally, there was general agreement that symbols in Standard No. 123 and Standard No. 101, *Controls and Displays*, should be joined in a separate regulation that is not a Federal motor vehicle safety standard. The agency shall consider these comments in future rulemaking.

The agency has assessed the economic and other impacts of these amendments and determined that the amendment is neither a major rule within the meaning of Executive Order 12291 nor a significant rule under the Department of Transportation's regulatory policies and procedures. Further, the agency concludes that the economic and other consequences of these amendments are so minimal as not to require preparation of a full regulatory evaluation. The impact is minimal because the cost difference between using words and symbols is negligible and because use of symbols instead of words is optional.

In consideration of the foregoing, the following amendments are made in §571.123 and Chapter V of Title 49, Code of Federal Regulations:

1. Section S5.2.3 is revised to read:

§571.123 Standard No. 123; motorcycle controls and displays.

S5.2.3 *Control and display identification.* If an item of equipment in Table 3, Column 1, is provided, the item and its operational function shall be identified by:

(a) A symbol substantially in the form shown in Column 3; or

(b) Wording shown in both Column 2 and Column 4; or

(c) A symbol substantially in the form shown in Column 3 and wording shown in both Column 2 and Column 4.

The abbreviations "M.P.H.", "r/min", "Hi", "Lo", "L", "R", and "Res" appearing in Column 2 and Column 4 may be spelled in full. Symbols and words may be provided for equipment items where none are shown in Column 2, Column 3, and Column 4. Any identification provided shall be placed on or adjacent to the control or display position, and shall appear upright to the operator.

* * * * *

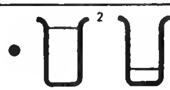
2. Table 3 is revised to read:

Issued on August 31, 1984

Diane K. Steed
Administrator

49 FR 35503
September 10, 1984

Table 3
Motorcycle Control and Display Identification Requirements

No.	Column 1 Equipment	Column 2 Control and Display Identification Word	Column 3 Control and Display Identification Symbol	Column 4 Identification at Appropriate Position of Control or Display
1	Ignition	Ignition		Off
2	Supplemental Engine Stop (Off, Run)	Engine Stop		Off, Run
3	Manual Choke or Mixture Enrichment	Choke or Enrichener		
4	Electric Starter			Start[1]
5	Headlamp Upper-Lower Beam Control	Lights	 [2] [2]	Hi, Lo
6	Horn	Horn		
7	Turn Signal	Turn	 [2] [3]	L, R
8	Speedometer	M.P.H.		M.P.H.[4]
9	Neutral Indicator	Neutral	N	
10	Upper Beam Indicator	High Beam	 [2]	
11	Tachometer	R.P.M. or r/min.		
12	Fuel Tank Shutoff Valve (Off, On, Res.)	Fuel	 [2] [2]	Off, On, Res.

[1] Required only if electric starter is separate from ignition switch.
[2] Framed areas may be filled.
[3] The pair of arrows is a single symbol. When the indicators for left and right turn operate independently however, the two arrows will be considered separate symbols and may be spaced accordingly.
[4] M.P.H. increase in a clockwise direction. Major graduations and numerals appear at 10 mph intervals, minor graduations at the 5 mph intervals. (37 F.R. 17474—August 29, 1972. Effective: 9/1/74)

MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays

(Docket No. 70-26; Notice 3)

S1. Scope. This standard specifies requirements for the location, operation, identification, and illumination of motorcycle controls and displays, and requirements for motorcycle stands and footrests.

S2. Purpose. The purpose of this standard is to minimize accidents caused by operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

S3. Application. This standard applies to motorcycles equipped with handlebars, except for motorcycles that are designed, and sold exclusively, for use by law enforcement agencies.

S4. Definitions. "Clockwise" and "counterclockwise" mean opposing directions of rotation around following axes, as applicable:

(a) The operational axis of the ignition control, viewed from in front of the ignition lock opening;

(b) The axis of the right handlebar on which the twist-grip throttle is located, viewed from the end of that handlebar;

(c) The axis perpendicular to the center of the speedometer, viewed from the operator's normal eye position.

S5. Requirements.

S5.1 Each motorcycle shall be equipped with a supplemental engine stop control, located and operable as specified in Table I.

S5.2 Each motorcycle to which this standard applies shall meet the following requirements:

S5.2.1 Control location and operation. If any item of equipment listed in Table 1, Column 1, is provided, the control for such item shall be located as specified in Column 2, and operable as specified in Column 3. Each control located on a right handlebar shall be operable by the operator's right hand throughout its full range without removal of the operator's right hand from the throttle. Each control located on a left handlebar shall be operable by the operator's left hand throughout its full range without removal of the operator's left hand from the handgrip. If a motorcycle with an automatic clutch is equipped with a supplemental rear brake control, the control shall be located on the left handlebar. If a motorcycle is equipped with self-proportioning or anti-lock braking devices utilizing a single control for front and rear brakes, the control shall be located and operable in the same manner as a rear brake control.

S5.2.2 Display illumination and operation. If an item of equipment listed in Table 2, Column 1, is provided, the display for such item shall be visible to a seated operator under daylight conditions, shall illuminate as specified in column 2, and shall operate as specified in Column 3.

S5.2.3 Control and display identification. [If an item of equipment listed in Table 3, Column 1, is provided, the item and its operational function shall be identified by;

(a) A symbol substantially in the form shown in Column 3; or

(b) Wording shown in both Column 2 and Column 4; or

(c) A symbol substantially in the form shown in Column 3 and wording shown in both Column 2 and Column 4.

The abbreviations "M.P.H.", "r/min", "Hi", "Lo", "L", "R", and "Res" appearing in Column 2 and Column 4 may be spelled in full. Symbols and words may be provided for equipment items where none are shown in Column 2, Column 3, and Column 4. Any identification provided shall be placed on or adjacent to the control or display position, and shall appear upright to the operator. (49 F.R. 35503—September 10, 1984. Effective: October 11, 1984)]

Control positions shall be identified as specified in Column 3, to signify the function performed at that setting. The abbreviations used in Columns 2 and 3 are minimum requirements and appropriate words may be spelled in full. Identification shall appear to the operator in an upright position.

Functional identification need not be provided for equipment items with no entry in Column 3.

S5.2.4 Stands. A stand shall fold rearward and upward if it contacts the ground when the motorcycle is moving forward.

S5.2.5 Footrests. Footrests shall be provided for each designated seating position. Each footrest for a passenger other than an operator shall fold rearward and upward when not in use.

TABLE 1.—Motorcycle Control Location and Operation Requirements

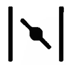
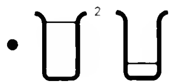
Equipment Control	Location	Operation
Column 1	*Column 2*	*Column 3*
1. Manual clutch or integrated clutch and gear change	Left handlebar	Squeeze to disengage clutch.
2. Foot operated gear change	Left foot control	An upward motion of the operator's toe shift transmission toward lower numerical gear ratios (commonly referred to as "higher gears"), and a downward motion toward higher numerical gear ratios (commonly referred to as "lower gears"). If three or more gears are provided it shall not be possible to shift from the highest gear directly to the lowest gear, or vice versa.
3. Headlamp upper-lower beam	Left handlebar	Up for upper beam, down for lower beam. If combined with the headlight on-off switch, means shall be provided to prevent inadvertent actuation of the "off" function.
4. Horn	Left handlebar	Push to activate.
5. Turn signal lamps	Handlebars	
6. Ignition		"Off—counterclockwise from other positions.
7. Manual fuel shutoff control		[“On”—Control downward. "Off—Control forward, (if control rotates around a transverse axis) or Horizontal—Left or Right (if control rotates around a longitudinal axis). "Reserve On"—(if provided) Control upward. (49 F.R. 35380—September 7, 1984. Effective: October 8, 1984)]
8. Twist-grip throttle	Right handlebar	Self-closing to idle in a clockwise direction after release of hand.
9. Supplemental engine stop	Right handlebar	
10. Front wheel brake	Right handlebar	Squeeze to engage.
11. Rear wheel brakes	Right foot control [1] Left handlebar permissible for motor-driven cycles.	Depress to engage.

[1] See S5.2.1 for requirements for vehicles with a single control for front and rear brakes, and with a supplemental rear brake control.

TABLE 2.—Motorcycle Display Illumination and Operation Requirements

Display	Illumination	Operation
Column 1	*Column 2*	*Column 3*
1. Speedometer	Yes	The display is illuminated whenever the headlamp is activated.
2. Neutral indication	Green display lamp	The display lamp illuminates when the gear selector is in neutral position.

Table 3
Motorcycle Control and Display Identification Requirements

No	Column 1 Equipment	Column 2 Control and Display Identification Word	[Column 3 Control and Display Identification Symbol	Column 4 Identification at Appropriate Position of Control or Display
1	Ignition	Ignition		Off
2	Supplemental Engine Stop (Off, Run)	Engine Stop		Off, Run
3	Manual Choke [or Mixture Enrichment]	Choke [or Enrichener]		
4	Electric Starter			Start[1]
5	Headlamp Upper-Lower Beam Control	Lights	 [2]	Hi, Lo
6	Horn	Horn		
7	Turn Signal	Turn	 [2] [3]	L, R
8	Speedometer	M.P.H.		M.P.H.[4]
9	Neutral Indicator	Neutral	N	
10	Upper Beam Indicator	High Beam	 [2]	
11	Tachometer	R.P.M.		
12	Fuel Tank Shutoff Valve [(Off, On, Res.)]	Fuel	 [2]	Off, On, Res.]

[1] Required only if electric starter is separate from ignition switch.

[2] Framed areas may be filled.

[3] The pair of arrows is a single symbol. When the indicators for left and right turn operate independently however, the two arrows will be considered separate symbols and may be spaced accordingly

[4] M.P.H. increase in a clockwise direction. Major graduations and numerals appear at 10 mph intervals, minor graduations at the 5 mph intervals. (49 F.R. 35380—September 7, 1984 Effective: October 8, 1984)

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 124

Accelerator Control Systems

(Docket No. 69–20; Notice 3)

The purpose of this notice is to establish a new motor vehicle safety standard that specifies requirements for accelerator control systems of passenger cars, multi-purpose passenger vehicles, trucks and buses.

A notice of proposed rulemaking on this subject was published September 30, 1970 (35 F.R. 15241). The majority of comments received supported the proposal. There were some objections and questions, which have been considered in formulating the final rule.

In the previous notice, the Administrator indicated the importance of this standard in reducing the number of accidents caused by runaway engines. Since 1966, sixty recall campaigns totalling over 2.9 million vehicles have involved this problem. Three percent of all complaints in the Administration's files have reported malfunctioning accelerator or carburetor systems. Because the ability of a driver to control his vehicle is directly related to the proper functioning of the accelerator control system, it is essential that this system perform as expected, especially when the driver removes the actuating force. Therefore, the standard sets requirements to ensure the reliability of accelerator control systems over a wide range of driving conditions. Each system must include two independent sources of energy (such as springs) which shall return the throttle to idle upon the removal of the actuating force. In the case of breakage or disconnection in the accelerator system, the throttle shall return to idle either at the time of breakage or at the removal of the actuating force.

The latter requirement differs from the NPRM, which mandated a return to idle only when the actuating force was removed. Industry comments raised valid objections to this requirement. In some cases, if a breakage occurred and the system had to keep operating until the driver took his foot off the pedal, a complicated system of sensors would have to be built into the throttle which would activate the redundant energy sources precisely at the time of actual removal. Such a device would be too expensive for its possible safety benefit, since the incidence of accidents from engine loss of power are minimal when compared with runaway overspeed statistics. Manufacturers, therefore, have been given the option to use either return-to-idle mode.

Although many comments suggested modification of the temperature range, the ambient temperature levels in the NPRM are retained. A review of meteorological data indicates that these figures conform to possible driving conditions in various areas of the United States.

There are four other proposed requirements in the NPRM that are not included in the final rule. These are the 300-pound force requirement, the coverage of automatic speed control systems, the freedom-of-movement requirement, and the coverage of motorcycles.

Several commenters raised objections to the 300-pound overforce, and some asked for a lesser force than 300 pounds. It was found on review that the safety benefits of an overforce test has not been demonstrated sufficiently and the requirement has been dropped from the rule.

The rule does not contain requirements for automatic speed control devices. It was found that although nine recall campaigns involving 61,176 vehicles have concerned these devices, no relationship to accelerator overspeed accidents could be established from automatic speed controls. Of the 540 multi-disciplinary accident reports that were studied in formulating the final rule, none mentioned the automatic system. The requirements of the NPRM reiterated SAE recommendations that are already used by manufacturers.

The "freedom-of-movement" paragraph raised the objections of subjectivity and difficulty of implementation. Enforcement through compliance testing would lead to controversy over the imprecise meaning of "necessary chafing." It appears that to comply with the final rule, the accelerator system will have to be free of excessive and unsafe rubbing and friction.

The decision to eliminate motorcycles from the applicability of this standard is based on the fact that motorcycles are so different in design from the other vehicles covered that definitions and failure modes are dissimilar. Also, a safety standard specifically tailored for motorcycle controls (Docket 70-26) will be issued this year.

This issue of the Federal Register contains a Notice of Proposed Rule-making to amend Standard No. 124 (37 F.R. 7108). The proposal is that the two independent sources of energy would return the throttle idle within one half second after the removal of the actuating force or a breakage or disconnection in the accelerator control system.

This standard is directed at the hazard caused by a failure in the accelerator control system. Those engine overspeed incidents caused by other failure modes such as broken or worn engine mounts are not addressed by this rulemaking action. The NHTSA is presently developing performance requirements for safety under other failure modes.

In consideration of the foregoing, Part 571 of Title 49, Code of Federal Regulations, is amended by adding a new § 571.124, Motor Vehicle Safety Standard No. 124, as set forth below.

Effective Date: September 1, 1973.

Because of the development work and preparation for production that this standard will require, it is found that an effective date later than 1 year from the date of issuance is in the public interest. Accordingly, the standard is effective September 1, 1973.

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 March 31, 1972.

Douglas W. Toms
Administrator

37 F.R. 7097
April 8, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 124

Accelerator Control Systems

(Docket No. 69-20;Notice 5)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 124 (49 C.F.R. 571.124), and to amend the standard to specify time requirements for the return of a vehicle's throttle to the idle position.

On April 8, 1972 (37 F.R. 7097), Motor Vehicle Safety Standard No. 124 was published, establishing requirements for accelerator control systems, effective September 1, 1973. Simultaneously, a notice was published (37 F.R. 7108) proposing that when the driver removes the actuating force from the accelerator control or in the event of a breakage or disconnection in the accelerator control system, the return to idle position shall occur within one-half second.

I. Pursuant to 49 C.F.R. 553.35, petitions for reconsideration of the rule were filed by Alfa Romeo, American Automobile Association (AAA), American Motors Corporation, Chrysler Corporation, Diamond Reo Trucks, Incorporated, Ford Motor Company, General Motors Corporation (GM), International Harvester Company, Japan Automobile Manufacturers Association (JAMA), Jeep Corporation, Jesse R. Hollins, Mack Trucks, Incorporated, MacMillan Engineering Lab, Motor Vehicle Manufacturers Association of the United States, Incorporated, (MVMA) (formerly Automobile Manufacturers Association, Incorporated), and Rolls-Royce Motors Limited.

Favorable consideration has been granted to some of these petitions, and accordingly, the standard is being amended in some minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

GM and Ford requested that vehicles over 10,000 pounds GVWR be exempted from the standard, while Mack and Diamond Reo requested an exemption for vehicles of 26,000 and 25,000 pounds or more GVWR, respectively. Petitioners argued that since these vehicles are driven by professionally trained drivers, are equipped with engine governors, have a horsepower to weight ratio that does not mandate a fail-safe requirement, and have not been the subject of a defect notification campaign, there is no need for the rule's applicability.

The NHTSA denies petitioners' request. Available information shows that accidents resulting from throttle failure do not occur only among the less experienced drivers, nor are they diminished by the presence of engine governors or by changes in the horsepower to weight ratio. Further, these vehicles have been the subject of defect notification campaigns, and accident reports submitted to the Bureau of Motor Carrier Safety disclose that an average of two accidents occur per month in which the cause is attributed to "overspeed incidents", indicating the type of failure the standard is designed to eliminate.

Additionally, GM stated that the standard's test requirements are not justified by the possible additional safety benefit that may accrue. They argued that the only method by which it could assure compliance is by immersion of the entire vehicle in a low temperature cell. GM stated that sufficient facilities to conduct such tests on all their vehicles are not available, and even if they were, the test burden is impracticable because of the complications of determining where over the length of the vehicle the ambient temperature measurements should be taken.

The NHTSA does not view Standard No. 124 as a qualification procedure by which a manufacturer can assure himself or his customers that the vehicle now has a fail-safe system. The rule is intended to provide a minimum performance requirement, and does not mandate that assurances of being in compliance must be made by immersing the total vehicle in a low temperature cell. Assurances of compliance may come from other procedures.

Several petitioners provided data showing that it is a common practice in the automobile industry to include the "throttle lever" or "actuating lever" as part of the carburetor. They ask that these devices be interpreted to be part of the fuel metering device so as to afford them greater freedom of design.

The NHTSA agrees with this interpretation. The "throttle lever" or "actuating lever" as described by the petitioners is a component of the fuel metering device.

Additionally, several petitioners requested that the definition of "idle position" be amended to take into consideration delay units or "dash pots" which are frequently used on idle settings to slow the return of the throttle during its last few degrees of rotation to prevent stalling and excessive exhaust emissions. In essence, petitioners request that the return to idle time be measured to the point at which the throttle first comes in contact with the delay unit or "dash pot." This request is in accordance with the intended meaning of the standard. For clarification, the NHTSA is amending the definition of "idle position" to be the specific point of throttle closure at which the throttle first comes in contact with an engine idle speed control device.

Mack and Alfa Romeo petitioned that "hand throttles" and throttle positioners be specifically excluded from the definition of "idle position". Petitioners stated that in the event such a device is used a return to the preset throttle position occurs upon release of the driver-operated accelerator control system. This request is granted. If a driver chooses to raise the lowest engine speed threshold by the use of a throttle positioning device, the throttle should return to that new position within the same time requirements specified in section S5.3. Accordingly, the NHTSA is amending the definition of "idle position" to provide for the use of throttle positioners.

JAMA requested that the engine warm-up provisions for cold temperatures be clarified, so that it would be possible to conduct tests "after warming up the engine according to the manufacturer's recommendation." Standard No. 124 is silent as to engine warm-up, and states only "when the engine is running" as a condition for the test. Although the advantages of following the manufacturer's warm-up procedures are recognized, it is felt that in most instances the driving public does not adhere to those recommendations. Therefore, to afford the driving public as broad a coverage of the rule as is possible, JAMA's petition is denied.

AAA and Chrysler petitioned for an amendment of the ambient temperature range. AAA urged that since colder temperatures are commonplace in Alaska and that hotter temperatures are used by vehicle manufacturers to test fuel system control devices, a more severe temperature range should be established. Chrysler stated that the minus 40 degree figure exceeds automotive practice by 30 degrees and asked that a performance level of minus 10 degrees be established.

In determining the temperature limits to be used, the NHTSA attempted to provide motor vehicle safety without establishing impracticable design goals. Weather data discloses that although temperatures of minus 40 degrees Fahrenheit are encountered in many parts of the United States, colder temperatures are unusual. For this reason, minus 40 degrees Fahrenheit was determined to be the lowest temperature consistent with the needs of motor vehicle safety. Conversely, vehicle operations in temperatures exceeding 125 degrees Fahrenheit are also unusual. Accordingly, it was determined that temperature limits of minus 40 degrees to plus 125 degrees Fahrenheit will allow for most climatic conditions encountered in the United States. The petitions are therefore denied.

Several petitioners asked for an interpretation of the phrase "The system shall include at least two sources of energy" in section S5.1 and whether it includes energy sources attached to the fuel metering service. Petitioners stated that a strict interpretation would cause excessive design restrictions. If a return spring attached to the fuel metering device is capable of returning the throttle to its idle position after the failure of other energy sources, it meets the intent of the standard and should not be disallowed. Accordingly, paragraph S5.1 is amended by replacing the phrase "The system shall include at least two sources of energy" with "There shall be at least two sources of energy".

JAMA asked whether, if a system includes three or more springs, each spring must be independently capable of returning the throttle to the idle position. They argued that a system could still remain adequately fail-safe as long as the other springs operating together can meet the requirements. The intent of paragraph S5.1 is to eliminate the driver's dependence on a single accelerator return spring. The NHTSA concurs with JAMA's comments and is amending paragraph S5.1 to make it clear that independent capability of return springs is not required if remaining energy sources are collectively capable of returning the throttle to the idle position.

The standard as issued required that the throttle return to the idle position "whenever any element of the accelerator control system becomes disconnected or broken." Several petitioners seek an interpretation of this wording. GM suggested that a disconnection or breakage within the driver-operated accelerator control system was the only failure mode addressed by the standard. Ford asked whether the requirement was intended to cover failures caused by bending, twisting, jamming, or introduction of foreign matter. The NHTSA's intent is to assure safety under conditions of a single failure due only to a severing or disconnection in the accelerator control system. To clarify this interpretation, the NHTSA is changing the word "breakage" to "severance" in paragraph S1, and the word "broken" to "severed" in the first sentence of paragraph S5.2. Further, the phrase "whenever any element of the accelerator control system" is changed to "whenever any one component of the accelerator control system" for purposes of clarification.

Ford and JAMA petitioned that the effective date of the standard be delayed one year. Petitioners stated that additional time was necessary to allow for the creation and confirmation of design changes and to resolve any conflicts with emission control requirements.

The NHTSA considers the complexity of the requirements of standard No. 124 to be minimal and has granted relief on several issues effecting design time, and therefore sees no justification for delaying the effective date of the standard. The petitions are denied.

II. On April 8, 1972 (37 F.R. 7108) a notice was published proposing that when the driver removes the actuating force from the accelerator control or in the event of a breakage or disconnection in the accelerator control system, the return to idle position shall occur within one-half second. Available information indicates that in most instances the time for driver reaction from the accelerator control pedal to the brake is approximately one-half second, and this time was chosen for the proposal. In response to the notice, many commentors objected to the one-half second proposal and stated that it did not adequately take into consideration the viscous nature of lubricants in extremely cold temperatures and the impracticability of this time requirement for the very large systems in heavy trucks and buses. The NHTSA recognizes the validity of these objections, and allowances have accordingly been made for extreme low temperature. An idle time of 3 seconds is established for any vehicle tested or conditioned in ambient air of 0 degrees Fahrenheit or colder.

Large systems, similar to those used on rear-engine buses, have sufficient mass and friction to preclude the possibility of compliance with the one-half second proposal, unless very high spring forces, which would require large changes in pedal forces, are used. Several commentators stated that tests for conformity with the proposed requirements show that compliance would be possible if the maximum time were extended to 2 seconds. The NHTSA finds these comments to have merit, and 2 seconds is established as the maximum return time for vehicles with a GVWR over 10,000 pounds.

Many comments pertaining to passenger car systems stated that the one-half second proposed is too severe a requirement. One commentor stated that extra time will be required if one of the return energy sources fails. It was pointed out that precedent for an extra allowance can be found in the dual braking system requirement, which allows added distance for stopping when half the system has failed. The accelerator standard, however, does not deal with a mechanism with the same redundancy as the braking system and it is felt that the maximum time selected should allow for the possibility of one energy source failing.

There are a large number of models and engine sizes in the passenger car industry, and a large number of variety of accelerator control systems are designed and built each year. One commentor suggested that ". . . a one second time limit would considerably increase design options . . ." and "presently accepted pedal feel can be retained. . . ." Accordingly, one second has been decided upon as having the qualities of providing a reasonable maximum time for compliance testing of vehicles of 10,000 pounds or less GVWR at temperatures above 0 degrees Fahrenheit.

In response to questions raised by several petitioners, "ambient temperature is defined as the surrounding air temperature, at a distance such that it is not significantly affected by heat from the vehicle under test. The definition contrasts the ambient temperature, intended to simulate a general outdoor temperature, from temperatures under the hood or otherwise in close proximity to the vehicle.

In consideration of the foregoing, 49 CFR 571.124, Motor Vehicle Safety Standard No. 124, is revised to read as set forth below.

Effective date: September 1, 1973.

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 September 20, 1972.

Douglas W. Toms
Administrator

37 F.R. 20033
September 23, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 124

Accelerator Control Systems

(Docket No. 69-20; Notice 6)

The purpose of this notice is to respond to petitions for rulemaking to amend and petitions for reconsideration of Motor Vehicle Safety Standard No. 124 (49 CFR 571.124).

On September 23, 1972 (37 F.R. 20033), Motor Vehicle Safety Standard No. 124 was published specifying time requirements for the return of a vehicle's throttle to the idle position. Pursuant to 49 CFR 553.35, petitions for reconsideration were filed by Japan Automobile Manufacturers Association, Inc. (JAMA) and Volkswagen of America, Inc. Additionally, pursuant to 49 CFR 553.31, a petition for rulemaking to amend the standard was filed by the Ford Motor Company.

Favorable consideration has been granted to some of the requests and accordingly, the standard is being amended in some minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

Volkswagen requested that the test requirements for cold temperatures be clarified, in order to determine whether it is possible to use supplementary starting devices and to "pump" the accelerator control pedal during and after the presoak and prior to the test. The advantages of using supplementary devices and warmup procedures are recognized, but in many instances, the driving public either does not adhere to the manufacturer's recommended warmup procedures or uses other procedures. The intent of the standard is to afford the driving public as broad a coverage of the rule as is possible, by simulating as closely as possible actual conditions. Accordingly, for purposes of testing compliance the engine may be started by the use of any supplementary starting devices and procedures except those which would induce the vehicle into motion by the application of an external force.

Volkswagen also asked the NHTSA to define the speed at which the accelerator pedal is "to be released" to mark the beginning of the test determining the return of the throttle to idle position. The agency's intent is to provide protection in the variety of situations that may be encountered on the road. The vehicle, therefore, must be capable of meeting the requirements no matter how rapidly or slowly the driver's foot is lifted from the pedal. The actuating force actually is not "removed" from the pedal until the foot is no longer in contact with it, so the measured time period for throttle return does not begin until the instant when the foot leaves the pedal.

Further, Volkswagen asked the NHTSA to define a "running engine." Volkswagen stated that during cold testing an engine could start, run for approximately 6 seconds, and then stall. Volkswagen theorized that it would be possible to have an accelerator system fail the test requirements during this 6-second interval, although the engine would be incapable of causing a safety problem. The phrase "engine running" defines a condition without which throttle return to idle position has no significance. The intent of the standard is to prevent any safety problems caused by faulty throttle return over a broad range of operating circumstances and temperature conditions. The condition of a running engine, regardless of torque produced, is a clearly definable point at which a safety problem could begin to occur. Therefore, the vehicle must be capable of meeting the requirements whenever the engine is rotating without the application of any external force.

JAMA requested that the time requirements for maximum return to idle position when tested in temperatures between 0 and minus 40 degrees

Fahrenheit be applied "only when there is no failure of the source of energy and no disconnection or severance of components." JAMA stated that in order for a system to meet the time requirements of the rule during cold testing, the "required pedal effort would be increased to an extent that would not be acceptable to the ordinary driver." In its earlier comments to Notice 3, (37 F.R. 7097), JAMA stated that if each energy source was independently required to return the throttle to idle within the specified time requirements, increased pedal forces would be necessary. In response to this comment and to allow a manufacturer design freedom, the standard was amended by Notice 5, (37 F.R. 20033), to specify that independent capability of energy sources to return the throttle to idle position was not required. The amendment also gave an additional time allowance for return to idle position for vehicles tested or conditioned in cold temperatures. Based on these factors and on the comments received from other manufacturers, this agency's position is that the standard provides enough latitude for a manufacturer to feasibly meet the pedal force requirements and the time requirements for return to idle, even if there is a failure of one source of energy or a severance or disconnection occurs. The petition is therefore denied.

Ford pointed out that under the requirements section, S5.1 states that, "There shall be at least two sources of energy" and that this seemed at variance with the intent expressed in the preamble to Notice 5 that energy sources do not have to be contained in the accelerator control system. To further clarify the intent expressed in Notice 5, the phrase in S.5 "The vehicle shall be equipped with a driver-operated accelerator control system that meets the following requirements" is changed to "The vehicle shall meet the following requirements . . . ."

Ford also asked for a clarification of the word "failure" in S5.1. Ford stated that the word was ambiguous in that it would allow for abnormal operating conditions outside the scope of the standard's intent to assure safety under conditions of a single failure due to a severance or disconnection in the system. To clarify the standard's intent, the phrase in S5.1 which states that, "In the event of failure of one source of energy the remaining source or sources shall be capable of returning the throttle" is changed to "In the event of failure of one source of energy by a single severance or disconnection, the throttle shall return . . . ."

Further, in the first sentence of S5.2 the word "becomes" is changed to "is" and the phrase "at a single point" is added to the end of the sentence to clarify this meaning.

In consideration of the foregoing, 49 CFR 571.124, Motor Vehicle Safety Standard No. 124, is revised to read as set forth below.

Effective date: September 1, 1973.

(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 January 24, 1973.

Douglas W. Toms
Administrator

38 F.R. 2980
January 31, 1973

MOTOR VEHICLE SAFETY STANDARD NO. 124
ACCELERATOR CONTROL SYSTEMS

(Docket No. 69-20; Notice 3)

S1. Scope. This standard establishes requirements for the return of a vehicle's throttle to the idle position when the driver removes the actuating force from the accelerator control, or in the event of a severance or disconnection in the accelerator control system.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries resulting from engine overspeed caused by malfunctions in the accelerator control system.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

S4. Definitions.

S4.1 "Driver-operated accelerator control system" means all vehicle components, except the fuel metering device, that regulate engine speed in direct response to movement of the driver-operated control and that return the throttle to the idle position upon release of the actuating force.

"Fuel metering device" means the carburetor, or in the case of certain engines, the fuel injector, fuel distributor, or fuel injection pump.

"Throttle" means the component of the fuel metering device that connects to the driver-operated accelerator control system and that by input from the driver-operated accelerator control system controls the engine speed.

"Idle position" means the position of the throttle at which it first comes in contact with an engine idle speed control appropriate for existing conditions according to the manufacturer's recommendations. These conditions include, but are not limited to, engine speed adjustments for cold engine, air conditioning, and emission control, and the use of throttle setting devices.

"Ambient temperature" means the surrounding air temperature, at a distance such that it is not significantly affected by heat from the vehicle under test.

S4.2 In the case of vehicles powered by electric motors, the word "throttle" and "idle" refer to the motor speed controller and motor shutdown, respectively.

S5. Requirements. The vehicle shall meet the following requirements when the engine is running under any load condition, and at any ambient temperature between minus 40° Fahrenheit and plus 125° Fahrenheit after 12 hours of conditioning at any temperature within that range.

S5.1 There shall be at least two sources of energy capable of returning the throttle to the idle position within the time limit specified by S5.3 from any accelerator position or speed whenever the driver removes the opposing actuating force. In the event of failure of one source of energy by a single severance or disconnection, the throttle shall return to the idle position within the time limits specified by S5.3, from any accelerator position or speed whenever the driver removes the opposing actuating force.

S5.2 The throttle shall return to the idle position from any accelerator position or any speed of which the engine is capable whenever any one component of the accelerator control system is disconnected or severed at a single point. The return to idle shall occur within the time limit specified by S5.3, measured either from the time of severance or disconnection or from the first removal of the opposing actuating force by the driver.

S5.3 Except as provided below, maximum time to return to idle position shall be 1 second for vehicles of 10,000 pounds or less GVWR, and 2 seconds for vehicles of more than 10,000 pounds GVWR. Maximum time to return to idle position shall be 3 seconds for any vehicle that is exposed to ambient air at 0 to minus 40 degrees Fahrenheit during the test or for any portion of the 12-hour conditioning period.

37 F.R. 7097
April 8, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard No. 125 (49 CFR § 571.125) that would establish shape, size, and performance requirements for warning devices that do not have self-contained energy sources. The devices are carried in motor vehicles and are erected to alert approaching motorists to the presence of a disabled vehicle.

A notice of proposed rulemaking on this subject was published on November 11, 1970 (36 F.R. 17350). The comments received in response to the notice have been considered in this issuance of a final rule.

As noted in the proposed rule, the standard will supplement the vehicular hazard warning signal lamps required by F.M.V.S.S. No. 108, *Lamps, Reflective Devices, and Associated Equipment*, in minimizing the likelihood of rear end collisions between oncoming traffic and disabled vehicles.

The standard is issued as an equipment standard and establishes requirements only for warning devices which do not have self-contained energy sources. Because provision of warning devices in new vehicles is optional, the instructions regarding the number of devices to be used are recommendations, rather than requirements, and the storage location requirement is deleted.

The standard requires that the device be bidirectional, lowers the minimum length of the triangle legs, and increases the permissible deviation from a vertical plane for the triangle when the device is placed on the road. It reduces the required minimum candlepower of the red reflective material and raises the luminance requirement for the orange fluorescent material. It also adds definitions of "reflex reflective," deletes one of the two definitions of the colors "red" and "orange," and deletes one of the two reflectivity requirements. With respect to the conditioning requirements, the standard lowers the high temperature requirement.

Several of the comments submitted by foreign motor vehicle manufacturers stated that the warning device should conform to the recommendations of international advisory groups. The Economic Commission of Europe (E.C.E.), a United Nations-sponsored council of which twenty-six nations, including the United States, are members, is in the process of developing specifications for warning triangles to be ratified by national governments. The NHTSA has adopted most of the proposed E.C.E. requirements with the exception of the minimum candlepower requirement for wide angle positioning of the device. The NHTSA has determined that a lower minimum candlepower than that required by the E.C.E. provides adequate protection and is a more realistic reflection of the state of the art.

Comments from the domestic automobile industry objecting to mandatory provision of warning devices stated that available information does not justify the additional cost of supplying them in new vehicles. The NHTSA has concluded that it is necessary to collect further data regarding effectiveness of warning devices and frequency of use by consumers so that more accurate cost-benefit analyses may be made. For these reasons, the provision of warning devices has been made optional by issuing an equipment standard.

Numerous manufacturers of fusees submitted comments which described the merits of fusees and concluded that the proposed rule would prohibit the use of fusees. Neither the rule as issued nor the proposed rule applies to devices which have a self-contained energy source, such as fusees, flare pots, and electric lanterns. Thus these devices may continue to be used as an alternative or a supplement to the device described in the standard.

Numerous comments from private citizens and State officials expressed concern that the required triangular shape of the warning device would prohibit the triangular Slow Moving Vehicle emblem currently used on many motor vehicles. Other comments supported the use of the triangular device because the triangular shapes would be used for similar purposes, to alert oncoming traffic that a reduction of speed is necessary due to a vehicle ahead. The Administration supports the dual use of the triangular symbol and it is intended that the warning device and the Slow Moving Vehicle emblem be complementary. As discussed in the notice of proposed rulemaking, State laws regarding slow moving vehicle emblems would be preempted by the standard only to the extent that they forbid the use of the triangular warning device intended by the standard.

Many comments recommended that the warning device be bi-directional in order to eliminate the possibility of placing the warning device with the non-reflective side facing oncoming traffic. It was pointed out that the increased cost of a bi-directional device over a unidirectional device would be minimal relative to the safety benefits provided. The NHTSA agrees, and accordingly the standard as issued requires the device to be bi-directional.

Some commenters felt that the motorist would subject himself to an additional safety hazard in placing the device approximately 100 feet behind the vehicle. Some suggested that the device be placed either on top of the vehicle or be capable of attaching to a window frame. While it is of course true that walking in a roadway can be hazardous, in the judgment of the NHTSA this risk is outweighed by the safety benefits of positioning the device at a distance behind the vehicle. Such positioning provides a greater distance over which oncoming traffic can recognize and respond to the warning and thus affords greater protection to the disabled vehicle.

Figures 3 through 9 indicating recommended positioning of warning devices have been consolidated into a single diagram indicating the suggested placement of the devices.

The permissible deviation from a vertical plane for the triangle when the device is placed on the road has been increased from five degrees to ten degrees in response to comments from manufacturers. The NHTSA has determined that the change will not alter the effectiveness of the device. The required distance above the ground of the lower edge of the triangle has been increased from one-half to one inch to improve the effectiveness of the device when water or mud collects on the roadway.

The minimum length of the legs of the triangle has been lowered from 18 to 17 inches, to correspond to the range of lengths permitted by the Bureau of Motor Carrier Safety.

The minimum width of the red reflective material has been clarified at the request of two manufacturers of reflex reflectors to correspond to industry terminology.

The definitions of the colors "red" and "orange" have been clarified in light of the comments, by the deletion of the definition in terms of nanometers. The NHTSA has concluded that definitions in terms of chromaticity coordinates and purity are sufficient. In order to standardize the requirement with respect to current color specification practice, the required chromaticity coordinates have been changed slightly.

The reflectivity requirement has been clarified to state that the material must be reflex reflective, and a definition of "reflex reflective" has been added to the standard. The reflectivity requirement in terms of candlepower per square inch has been found to be superfluous, and accordingly has been deleted.

The Economic Commission of Europe requested that the required total minimum candlepower per incident foot candle for an observation angle of 0.2 degrees be lowered from 120 candlepower to correspond to the international specifications. The NHTSA has concluded that 80 candlepower will provide sufficient protection and the minimum candlepower has been lowered accordingly.

In order to standardize the requirement with respect to current photometric practice, the luminance requirement for orange fluorescent material in the warning device has been raised from not less than 30 percent to not less than

35 percent of that of a flat magnesium oxide surface. The luminance criterion, "when compared under the light from an overcast sky," has been changed to read "when subjected to a 150-watt high pressure xenon compact arc lamp."

Many equipment manufacturers stated that the 200 degree Fahrenheit requirement for the high temperature conditioning is not justified by evidence showing that the device must withstand temperatures at that level when in use. This contention has been found to have merit, and the temperature requirement has been lowered to 150 degrees.

Effective date: January 1, 1974. Because the standard is issued later than anticipated, the effective date has been extended from January 1, 1972 to January 1, 1974. The NHTSA has concluded that this date will permit manufacturers of warning devices which do not have self-contained energy sources and which do not meet the specifications of the standard to retool for manufacture of complying devices. It is therefore found, for good cause shown, that an effective date more than one year from the date of issuance is in the public interest.

In consideration of the above, a new § 571.125, Standard No. 125, Warning Devices, is added to Title 49, Code of Federal Regulations. . . .

This rule is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on March 1, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 5038
March 9, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

(Docket 4–2; Notice 5)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 125, Warning Devices, in § 571.125 of Title 49, Code of Federal Regulations. The standard was issued on March 1, 1972 (37 F.R. 5038).

The Amerace-Esna Corporation suggested that the 98% purity requirement for the red reflex reflective material be deleted since the trichromatic color coefficients provide sufficient definition of the red color. The NHTSA agrees, and furthermore has determined that the purity requirement for the orange fluorescent material should be deleted for the same reasons. Accordingly, S5.3.1(c) and S5.3.2(c) are deleted from the rule.

Hawes Industries, Inc. requested that the standard permit the use of a triangular warning device designed to be secured on the roof of a motor vehicle. They stated that the roof location was more convenient to the consumer than the recommended positioning behind the car and afforded as much or more protection. As stated in the preamble to the standard, a number of comments advocating positioning of the device on the vehicle roof or side were received and reviewed by the NHTSA in the formulation of the final rule. The Administration determined that placement of the device behind the vehicle would provide maximum protection by affording a greater distance for recognition and response by oncoming traffic. For this reason, it has recommended positioning of the device 100 feet behind the vehicle and requires an illustration indicating this location to be provided in the instructions. The standard does not prohibit manufacture or sale of a device capable of being mounted on a vehicle roof, as long as it meets all the Standard 125 requirements, including the capability of being set up on the ground.

The standard requires that an illustration depicting recommended positioning of the device be included with the instructions for the device. The Administration is amending S5.1.5(c) to clarify its intent that the illustration provided be substantially identical to Figure 3.

The standard as issued establishes separate width requirements for red reflex reflective material and orange fluorescent material affixed to the faces of the warning device. Rowland Development Corporation stated that it manufactures a "dual purpose fluorescent orange-red reflective material," and requested that the separate width requirements be suspended when such material is used. The request appears to have merit, but NHTSA has concluded that an evaluation of the requirements pertaining to the fluorescent orange material is necessary before it can respond to this request. A notice of proposed rulemaking containing proposed changes will be issued when the evaluation is completed. When the final revised requirements for the fluorescent material are established, a precise definition of the dual purpose material can be formulated.

Prof. D. M. Finch of the University of California stated that in order to clarify the color requirements the respective sources of illumination for the measurement of the red and orange color should be specified. The NHTSA agrees that this should be done, and accordingly S5.3.1 has been modified to specify the use of a lamp with a tungsten filament operating at 2,854° K for the red measurement. The source of illumination for the measurement of the orange color will be specified with the revision of the fluorescent material requirements referred to above.

The word "tungsten" is inserted before the word "filament" in the rule, as a clarification of the test conditions for red color and reflectivity.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 125, Warning Devices, 49 CFR § 571.125, is amended. . . .

Effective date: January 1, 1974.

This notice is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on June 19, 1972.

Douglas W. Toms
Administrator

37 F.R. 12323
June 22, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

Docket No. 4–2; Notice 6)

The purpose of this notice is to respond further to petitions for reconsideration and amendment of Motor Vehicle Safety Standard No. 125, Warning Devices, § 571.125 of Title 49, Code of Federal Regulations. The standard was issued on March 1, 1972, (37 F.R. 5038). On June 22, 1972, a previous notice of amendments and reconsideration of the standard was published (37 F.R. 12323).

With respect to the configuration of the device Rowland Development Corporation stated that it manufactures a dual purpose fluorescent orange and red reflective material and requested that the separate width requirements for red reflex reflective material and orange fluorescent material affixed to the faces of the device be suspended when such material is used. The NHTSA has concluded that the use of such dual purpose material as an alternative to separate material is permissible if the material is capable of meeting the requirements of Standard 125. S5.1.1, S5.2.3, S5.5, and S6.2(a) are hereby modified accordingly, and the separate width requirements will not be applicable when dual purpose material is used.

Tri-Lite interpreted the standard as permitting the use of a flag as part of a "combination signal device" as long as the device did not violate S5.2.1(b), relating to obstruction of the reflective and fluorescent material. In a previous letter to Tri-Lite the NHTSA had stated that the standard would be interpreted to allow such additions. (Docket entry N4–4–2–10, July 18, 1972.) Upon further consideration, the agency has determined that permitting additions to the device will lessen its effectiveness by degrading the uniformity of its shape. Accordingly, the use of additional shapes or attachments will not be permitted, and a new S5.2.6 is added to that effect.

A number of petitions regarding the orange fluorescent material were received. Personnel from the National Bureau of Standards suggested that the requirements for the color of the orange fluorescent material be amended so as not to penalize colors that have the same hue but are stronger than the present maximum y and minimum x values. The NHTSA agrees with the suggestion and S5.3.2 has been amended accordingly.

Tri-Lite stated that the fluorescent material deteriorates over time and is therefore unreliable. It requested that the provision of orange fluorescent material on the device be made optional. The NHTSA recognizes that deterioration of fluorescence is a possibility; however, it is felt that the requirement of an opaque container and the improving technology of fluorescent materials should offset the possible problem. It is anticipated that the device will be used only infrequently, in emergencies, by most drivers. The request of Tri-Lite is therefore denied.

Rowland Corp. requested that the luminance requirement be expressed in terms relative to the amount of fluorescent material affixed to the device rather than the percentage figure of magnesium oxide presently required. The agency position is that a minimum level of luminance is necessary for identifiability, but that a somewhat lower limit for luminance of the orange material could be suitable if more material is used. Accordingly, S5.5 has been amended to lower the minimum relative luminance relative to magnesium oxide from 35% to 25%, and to require a minimum product of that relative luminance and width in inches of the device of 44. Dayglo Color Corp. requested that two sources of light for luminance test, Source C and Source D–65, be permitted in addition to the xenon arc lamp specified in the standard. The NHTSA has concluded that the most consistent test results are provided when the material is diffusely irradiated with undispersed light from a high-pressure xenon arc lamp to simulate daytime conditions. As a general rule, alternative test procedures for a single property are inadvisable, and no sufficient justification for them has been shown here. Therefore the Dayglo request is denied.

In light of evidence that differing relative luminance values are obtained from different procedures used to measure it, a procedures paragraph (S6.3) for the luminance testing of the orange fluorescent material has been added to the standard. The procedure is adapted from the publication "Colorimetry", of the International Commission on Illumination (CIE Publication No. 15, E-1.3.1, 1971).

Two petitions dealt with the stability requirements. Rowland Development Corporation requested that the standard permit the manufacture of a triangle device constructed of flexible material which is secured at the outer corners of the triangle and is otherwise free to flex with the wind. Safety Triangles Company requested that the device be permitted to tilt to a position up to 30° from the vertical rather than the presently allowed 10°. These requests were directed at permitting manufacturers to produce lighter and cheaper devices. TheNHTSA has concluded that if the triangle is permitted to flex in the wind or tilt to a position up to 30° from the vertical, the attitude of the triangle is altered so that the shape of the equilateral triangle is distorted, thus detracting from one of the goals of the standard. The present performance requirements and the consequent cost factors have been found to be reasonable. These requests are accordingly denied.

With respect to reflectivity testing, Rowland stated that candlepower requirements for an observation angle of 0.2° were superfluous and not related to true highway situations, and requested their deletion. The NHTSA has determined in the formulation of the standard that the specified reflectivity requirements allow a maximum recognition and detection distance to oncoming traffic. Accordingy, the requirements for the 0.2° observation angle are retained

In consideration of the foregoing, Motor Vehicle Safety Standard No. 125, Warning Devices, 49 CFR § 571.125, is amended. . . .

Effective date: January 1, 1974.

(Sec. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 23, 1973.

Douglas W. Toms
Administrator

38 F.R. 2760
January 30, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

(Docket No. 74–2; Notice 10)

The purpose of this amendment to Motor Vehicle Safety Standard No. 125 (49 CFR 571.125), Warning Devices, is to prescribe the color specifications for the orange and red materials used in the warning devices authorized under the standard.

On April 6, 1973, the NHTSA issued a proposal on this subject (38 F.R. 8752). The comments from industry were generally in agreement with the method for testing the orange fluorescent material, although several requested that light source C be allowed for testing of the orange fluorescent material. After consultation with testing laboratories and the National Bureau of Standards, NHTSA has concluded that for purposes of obtaining repeatable results and simulating daylight conditions, source C does not provide the necessary ultraviolet radiation. Therefore, the use of the xenon arc lamp has been incorporated into the standard and will be required for testing of the orange color and luminescence of the daylight fluorescent material.

The majority of the commenters and the National Bureau of Standards agreed that the direct illumination method for testing of standard orange fluorescent material for both color and luminance should be continued, and the integrating sphere method should be used for dual-purpose materials. The industry, including the testing laboratories, have had sufficient time to utilize this method and repeatable results have been obtained.

The color definition equation for the orange fluorescent material has been broadened from $x+y=0.943$ to $x+y=0.93$. The majority of those commenting had no objection to broadening the area of the orange fluorescent material, but one equipment manufacturer desired the red boundary to be extended from $y=0.35$ to $y=0.34$. NHTSA concludes that to do so would place this boundary line too near the red area for proper differentiation between orange and red. Since orange is used as a daylight material, it should not be similar to the red material in color.

As proposed, the three-digit system in the straight-line equations for the boundary of the orange and red colors has been converted to a two-digit system, as this degree of accuracy is sufficient for general testing purposes.

The final amendment to the standard establishes the type of light to be used for testing the orange material used in dual purpose material. Of particular importance in this test procedure is separating the red retroreflective and orange fluorescent material. The majority of the commenters and the National Bureau of Standards recommended that the xenon arc lamp be used, as it provides sufficient ultraviolet radiation to simulate daylight conditions with overcast sky, if the unmodified spectrum illuminating the material is at an angle of incidence of 45° and the angle of observation is 90°. In this procedure, which is adopted, the material is illuminated diffusely by an integrating sphere.

Because a number of amendments to Standard No. 125 have been issued, the standard is hereby reissued in its entirety.

In light of the foregoing, 49 CFR § 571.125, Standard No. 125, Warning Devices, is amended to read as set forth below.

Effective date: Nov. 11, 1974.

(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: Aug. 2, 1974.

James B. Gregory
Administrator

39 F.R. 28636
August 9, 1974

MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

S1. Scope. This standard establishes requirements for devices, without self-contained energy sources, that are designed to be carried in motor vehicles and used to warn approaching traffic of the presence of a stopped vehicle, except for devices designed to be permanently affixed to the vehicle.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries due to rear end collisions between moving traffic and disabled vehicles.

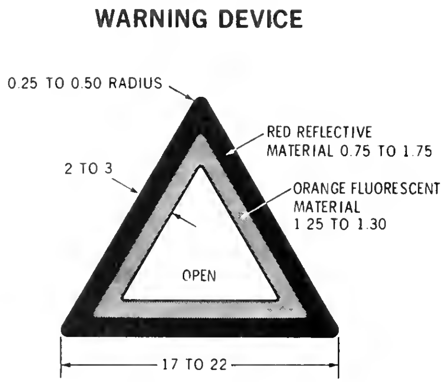
S3. Application. This standard applies to devices without self-contained energy sources, that are designed to be carried in motor vehicles and used to warn approaching traffic of the presence of a stopped vehicle, except for devices designed to be permanently affixed to the vehicle.

S.4. Definitions. "Entrance angle" means the angle having as its sides the line through the center, and normal to the face, of the object to be tested, and the line from the center of the object to the center of the source of illumination (Figure 2).

"Fluorescent" means the property of emitting visible light due to the absorption of radiation of a shorter wave-length which may be outside the visible spectrum.

"Observation angle" means the angle having as its sides the line from the observation point to the center of the object to be tested and the line from the center of that object to the center of the source of illumination (Figure 2).

"Reflex reflective" means reflective of light in directions close to the direction of incident light, over a wide range of variations in the direction of incident light.



DIMENSIONS OF WARNING DEVICE (Inches)

Figure 1

S5. Requirements.

S5.1 Equipment.

S5.1.1 Reflex reflective material and fluorescent material that meet the requirements of this standard shall be affixed to both faces of the warning device. Alternatively, a dual purpose orange fluorescent and red reflective material that meets the requirements of this standard (hereafter referred to as "dual purpose material") may be affixed to both faces in place of the reflective and fluorescent materials.

S5.1.2 Each warning device shall be protected from damage and deterioration—

(a) By enclosure in an opaque protective reusable container, except that two or three warning devices intended to be sold for use as a set with a single vehicle may be enclosed in a single container; or

(b) By secure attachment to any light-tight, enclosed and easily accessible compartment of a new motor vehicle with which it is supplied by the vehicle manufacturer.

S5.1.3 The warning device shall be designed to be erected, and replaced in its container, without the use of tools.

S5.1.4 The warning device shall be permanently and legibly marked with:

(a) Name of manufacturer;

(b) Month and year of manufacture, which may be expressed numerically, as "6/72", and

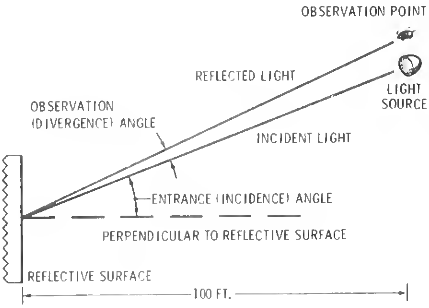
(c) The symbol DOT, or the statement that the warning device complies with all applicable Federal motor vehicle safety standards.

S5.1.5 Each warning device shall have instructions for its erection and display.

a) The instructions shall be either indelibly printed on the warning device or attached in such a manner that they cannot be easily removed.

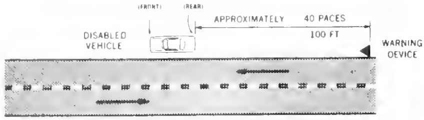
(b) Instructions for each warning device shall include a recommendation that the driver activate the vehicular hazard warning signal lamps before leaving the vehicle to erect the warning device.

(c) Instructions shall include the illustration depicted in Figure 3 indicating recommended positioning.



REFLECTIVITY TEST DIAGRAM

Figure 2



RECOMMENDED WARNING DEVICE POSITIONING

Figure 3

S5.2 Configuration

S5.2.1 When the warning device is erected on level ground:

(a) Part of the warning device shall form an equilateral triangle that stands in a plane not more than 10° from the vertical, with the lower edge of the base of the triangle horizontal and not less than 1 inch above the ground.

(b) None of the required portion of the reflective material and fluorescent material shall be obscured by any other part of the warning device except for any portion of the material over which it is necessary to provide fasteners, pivoting beads or other means to allow collapsibility or support of the device. In any event, sufficient reflective and fluorescent material shall be used on the triangle to meet the requirements of S5.4 and S5.5.

S5.2.2 Each of the three sides of the triangular portion of the warning device shall not be less than 17 and not more than 22 inches long, and not less than 2 and not more than 3 inches wide (Figure 1).

S5.2.3 Each face of the triangular portion of the warning device shall have an outer border of red reflex reflective material of uniform width and not less than 0.75 and not more than 1.75 inches wide, and an inner border of orange fluorescent material of uniform width and not less than 1.25 and not more than 1.30 inches wide (Figure 1). However, this requirement shall not apply if the dual purpose material is used.

S5.2.4 Each vertex of the triangular portion of the warning device shall have a radius of not less than 0.25 inch and not more than 0.50 inch.

S5.2.5 All edges shall be rounded or chamfered, as necessary to reduce the possibility of cutting or harm to the user.

S5.2.6 The device shall consist entirely of the triangular portion and attachments necessary for its support and enclosure, without additional visible shapes of attachments.

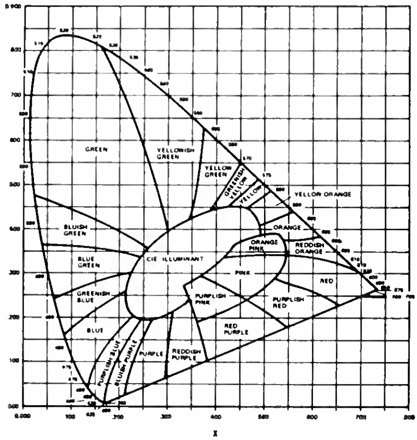


Figure 4 - CIE Chromaticity Diagram

S5.3 Color.

S5.3.1 The color of the red reflex reflective material on the warning device shall have the following characteristics, both before and after the warning device has been conditioned in accordance with S6.1, when the source of illumination is a lamp with a tungsten filament operating at 2856° Kelvin color temperature. Expressed in terms of the International Commission on Illumination (CIE) 1931 standard colorimetric observer system (CIE chromaticity diagram, Figure 4), the chromaticity coordinates of the red reflex reflective material shall lie within the region bounded by the spectrum locus and the lines on the diagram defined by the following equations:

Boundary	*Equations*
Yellow	$y=0.33$
White	$x+y=0.98$

S5.3.2 The color of the orange fluorescent material on the warning device shall have the following characteristics, both before and after the warning device has been conditioned in accordance with S6.1, when the source of illumination is a 150-watt high pressure xenon compact arc lamp. Expressed in terms of the International Commission on Illumination (CIE) 1931 standard colorimetric observer system, the chromaticity coordinates of the orange fluorescent material shall lie within the region bounded by the spectrum locus and the lines on the diagram defined by the following equations:

Boundary	*Equation*
Yellow	$y=0.49x+0.17$
White	$x+y=0.93$
Red	$y=0.35$

The 150-watt high pressure xenon compact arc lamp shall illuminate the sample using the unmodified spectrum at an angle of incidence of 45° and an angle of observation of 90°. If dual purpose material is being tested, it shall be illuminated by a 150-watt high pressure xenon compact arc lamp, whose light is diffused by an integrating sphere.

S5.4 Reflectivity. When the red reflex reflective material on the warning device is tested in accordance with S6.2, both before and after the warning device has been conditioned in accordance with S6.1, its total candlepower per incident foot candle shall be not less than the values specified in Table I for each of the listed entrance angles.

S5.5 Luminance. When the orange fluorescent material on the warning device is tested in accordance with S6.3, both before and after the warning device has been conditioned in accordance with S6.1, it shall have a minimum relative luminance of 25 percent of a flat magnesium oxide surface and a minimum product of that relative luminance and width in inches of 44.

S5.6 Stability. When the warning device is erected on a horizontal brushed concrete surface both with and against the brush marks and subjected to a horizontal wind of 40 miles per hour in any direction for 3 minutes—

(a) No part of it shall slide more than 3 inches from its initial position;

(b) Its triangular potion shall not tilt to a position that is more than 10° from the vertical; and

(c) Its triangular position shall not turn through a horizontal angle of more than 10° in either direction from the initial position.

TABLE 1. Total Minimum Candlepower Per Incident Foot Candle

Observation Angles-Degrees	Entrance Angles - Degrees 0	10 up	10 down	20 left	20 right	30 left	30 right
0.2	80	80	80	40	40	8.0	8.0
1.5	0.8	0.8	0.8	0.4	0.4	0.08	0.08

S5.7 Durability. When the warning device is conditioned in accordance with S6.1, no part of the warning device shall become warped or separated from the rest of the warning device.

S6. Test Procedures.

S6.1 Conditions.

S6.1.1 Submit the warning device to the following conditioning sequence, returning the device after each step in the sequence to ambient air at 68° F. for at least 2 hours.

(a) Minus 40° F. for 16 hours in a circulating air chamber using ambient air which would have not less than 30 percent and not more than 70 percent relative humidity at 70° F.;

(b) 150° F. for 16 hours in a circulating air oven using ambient air which would have not less than 30 percent and not more than 70 percent relative humidity at 70° F.;

(c) 100° F. and 90 percent relative humidity for 16 hours;

(d) Salt spray (fog) test in accordance with American Society of Testing and Materials Standard B-117, Standard Method of Salt Spray (fog) testing, August 1964, except that the test shall be for 4 hours rather than 40 hours; and

(e) Immersion for 2 hours in water at a temperature of 100° F.

S6.2 Reflectivity Test. Test the red reflex reflective material as follows:

(a) Unless dual purpose material is used, prevent the orange fluorescent material from affecting the photometric measurement of the reflectivity of the red reflex reflective material, either by separation or masking.

(b) Use a lamp with a tungsten filament operating at 2856° Kelvin color temperature as the source of illumination.

(c) Place the source of illumination 100 feet from the red reflex reflective material (Figure 2).

(d) Place the observation point directly above the source of illumination (Figure 2).

(e) Calculate the total candlepower per incident foot candle of the red reflex reflective material at each of the entrance and observation angles specified in Table 1.

S6.3 Luminance Test. Test the orange fluorescent material as follows:

(a) Unless dual purpose material is used, prevent the red reflex reflective material from affecting the photometric measurement of the luminance of the orange fluorescent material.

(b) Using a 150-watt high pressure xenon compact arc lamp as the light source, illuminate the test sample at an angle of incidence of 45° and an angle of observation of 90°. If dual purpose material is being tested, illuminate the sample diffusely through an integrating sphere.

(c) Measure the luminance of the material at a perpendicular viewing angle, with no ray of the viewing beam more than 5° from the perpendicular to the specimen.

(d) Repeat the procedure for a flat magnesium oxide surface, and compute the quotient (percentage) of the luminance of the material relative to that of the magnesium oxide surface.

37 F.R. 5038
March 9, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71-7; Notice 2)

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 126 (49 CFR 571.126) that requires manufacturers of slide-in campers and of trucks that would accommodate them to provide information concerning proper loading and load distribution. A notice of proposed rulemaking on this subject was published on April 9, 1971 (36 F.R. 6837).

The purpose of the new standard is to provide information that can be used to reduce overloading and improper load distribution in truck-camper combinations, and to prevent accidents resulting from the adverse effects of these conditions on vehicle handling and braking. Standard No. 126 requires manufacturers of slide-in campers to permanently affix a label to a rear surface of each camper that includes the weight of the camper when it contains standard equipment, and water, bottled gas, and ice box with ice or refrigerator. The camper manufacturer is also required to provide, in an owner's manual or other document delivered with the camper, a picture showing the location of the longitudinal center of gravity of the camper when loaded and a picture showing a proper match of the slide-in camper on a typical truck. Standard No. 126 also requires manufacturers of trucks to which a camper could be attached to provide, in an operator's manual or other document delivered with the truck, a picture showing the manufacturer's recommended longitudinal center of gravity zone for the cargo weight rating, and one depicting the proper match of a truck and slide-in camper.

Standard No. 126 differs from the proposal in several aspects. The standard as proposed would have applied to incomplete vehicles intended for completion as trucks, and to multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. These categories have been excluded from the final rule, which applies to trucks that would accommodate slide-in campers. These generally are pick-up trucks. In excluding other proposed categories the NHTSA considers that the information the manufacturer of an incomplete vehicle must furnish pursuant to 49 CFR Part 568, *Vehicles Manufactured in Two or More Stages*, should be sufficient to assist a final assembler in permanently installing a chassis-mount camper on a truck chassis, or in assembling a vehicle such as a motor home.

The proposal would also have required that a label be permanently affixed to each cargo compartment that would specify the maximum recommended weight for a load placed in the compartment. Commenters argued persuasively that camper owners would disregard a series of weight capacity labels on all storage compartments, and the proposal was not adopted. The final rule requires the certification label and the owner's manual to provide a figure denoting camper weight, which as noted previously includes the weight of standard equipment, a refrigerator, or ice box with ice, and maximum capacity of water and bottled gas. The cubic capacity of the refrigerator or weight of ice, the weight of bottled gas, and the gallons of water encompassed in the maximum weight figure will also be listed on the permanent label and in the owner's manual. The camper manufacturer may exclude any of these items from the label if the camper is not designed to accommodate them, provided that a notation to that effect appears in the owner's manual. The standard also requires a manufacturer to provide a listing of optional or additional equipment that the camper is designed to carry, and the respective weight of each if the unit weight exceeds 20 pounds.

The label will also state the month and year of manufacture, and a recommendation that the user consult the owner's manual or data sheet for the weight of optional and additional equipment. The label is to be mounted in a plainly visible location on a surface at the rear of the camper other than the roof, steps or bumper extension.

The proposed reference point, or the distances of the camper center of gravity from the reference point, have not been adopted for use on the exterior label. Manufacturers of campers generally have had no experience with the relatively complex vertical center of gravity measurement techniques. Truck manufacturers pointed out a number of variables that would have to be considered, and stated that the limiting envelope would not be rectangular as implied by the proposal. Other comments objected to the end of the truck's axle shaft as a reference point for specifying a recommended cargo center of gravity zone. Variations in the longitudinal center of gravity of the load are, however, known to have a direct relationship to a truck's gross axle loading, and can adversely affect the steering and stopping ability of the vehicle. The camper manufacturer will therefore be required to provide in the owner's manual a picture showing the location of the camper's longitudinal center of gravity within 2 inches, under specified load conditions. A manufacturer can easily measure the longitudinal center of gravity of a slide-in camper by balancing it on a transverse horizontal rod. The camper owner's manual must also contain specific advice on proper choice of truck to which a camper may be mounted, and proper loading of the camper once it is attached. Truck manufacturers in turn are required to include in the operator's manual a picture showing the recommended longitudinal center of gravity zone for the cargo weight rating and loading recommendations.

In order to allow the relatively small camper manufacturers time to consider the recommendations of truck manufacturers, and to modify camper designs if needed, a camper manufacturer need not provide center of gravity location information until July 1, 1973.

Effective date: January 1, 1973, with additional requirements effective July 1, 1973. Because compliance with the rule does not involve extensive leadtime, the Administrator finds for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

In consideration of the foregoing, 49 CFR Part 571 is amended by adding § 571.126, Standard No. 126, *Truck-Camper Loading*. . . .

This notice is issued under the authority of Sections 103, 112, 114, and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1401, 1403, and 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on August 3, 1972.

Douglas W. Toms
Administrator

37 F.R. 16497
August 15, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71–7; Notice 4)

This notice responds to petitions for reconsideration of 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, *Truck-Camper Loading*. The portion of the regulation requiring information to be provided by camper manufacturers is retained as a Federal motor vehicle safety standard, and a vehicle information number is added to the list of information to be provided. The portion of the rule applicable to truck manufacturers is reissued as a consumer information regulation by a separate notice (37 F.R. 26607).

Standard No. 126, establishing requirements for slide-in campers and trucks that would accommodate them, was published on August 15, 1972 (37 F.R. 16497). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the standard were filed by Chrysler Corporation (Chrysler), Ford Motor Company (Ford), General Motors Corporation (GM), Jeep Corporation (Jeep), Motor Vehicle Manufacturers Association of the United States, Inc. (MVMA), Recreational Vehicle Institute, Inc. (RVI), and Toyota Motor Sales, U.S.A., Inc. (Toyota).

In response to information contained in several of these petitions the standard is being amended in certain respects. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Statutory Authority*. Standard No. 126 as issued applied to slide-in campers and to trucks that would accommodate them. It required manufacturers of slide-in campers to attach to their products a label containing the name of the manufacturer, the month and year of manufacture, a certification of conformity, and information concerning the camper's maximum weight. The standard also required camper manufacturers to provide the same information and certain additional items in a manual or other document to accompany each camper. A parallel requirement was adopted applicable to truck manufacturers; they were required to provide information in a manual or other document supplied with their products that would assist truck owners in choosing a properly matched camper.

Chrysler, Ford, GM, Jeep, and MVMA questioned the authority to issue the requirements of 49 CFR § 571.126 as a Federal motor vehicle safety standard rather than in the form of a Consumer Information Regulation (49 CFR Part 575), alleging that Standard No. 126 is "neither a performance standard nor does it provide any objective criteria for determining compliance."

The NHTSA does not agree that it lacks authority to issue Standard No. 126 in the form in which it appeared. Actually, the regulation was issued under the combined authority of four sections of the Act: section 103 (the authority for the Federal motor vehicle safety standards), section 112 (the primary authority for technical information and data to be provided by a manufacturer to NHTSA and the consumer), section 114 (the authority for vehicle and equipment certification) and section 119 (the general rulemaking authority). Many of the existing standards contain information requirements, and it is the position of this agency that such provisions fully satisfy the statutory criteria as objective performance requirements. The question therefore is in most respects the merely formal one of whether the rule is called a "safety standard" or a "consumer information regulation," and codified accordingly.

On reconsideration of all aspects of the standard, however, this agency has determined that there is an advantage to issuing the requirements for trucks in the form of a consumer information regulation. 49 CFR § 575.6(b) requires all Part 575 consumer information to be made available to prospective purchasers in dealer showrooms, and paragraph (c) of that section requires such information to be furnished directly to the NHTSA. Neither of these requirements applies to information furnished pursuant to Part 571 safety standards. Part 575 consumer information regulations are enforceable in substantially the same manner and with the same sanctions as safety standards. The requirements for trucks in 49 CFR § 571.126 are therefore reissued as a new consumer information regulation, 49 CFR § 575.103, by an action published in this issue, 37 F.R. 26607.

2. *Effective date.* The requirement for pictures showing camper center of gravity and proper truck-camper match that camper manufacturers were to provide as of July 1, 1973, is being deferred 2 months, and will not be required until September 1, 1973. RVI has petitioned for an extension of the effective date of these requirements to January 1, 1974, on the basis that the extension "would give the relatively small camper manufacturers additional time to conform camper design to the center of gravity envelopes developed by the truck manufacturers." The regulation, however, only requires manufacturers to provide information, not to redesign their products. The NHTSA finds that RVI has shown insufficient justification to support its request, and the petition is denied.

3. *Definitions.* RVI petitioned that its definition of "camper" be adopted so that there would be no confusion within the recreational vehicle industry as to whether the standard applied to motor homes and pickup covers. RVI's petition was similar to the one it submitted for reconsideration of Standard No. 205, *Glazing Materials.* The NHTSA has not adopted the RVI definition, but it has defined the terms "camper" and "slide-in camper" so as to clarify these terms and differentiate them from "motor home" and "pickup cover," also defined in Standard No. 205. "Cargo weight rating" was defined as "the maximum weight of cargo . . . that can safely be carried by a vehicle under normal operating conditions. . . ." Ford objects that the definition is subjective and urges that the term be redefined as "the maximum weight of cargo . . . that the truck manufacturer specifies may be carried on the vehicle." The NHTSA concurs generally with Ford's views. The definition has been rewritten to make clear that the rating, like GVWR and GAWR, is to be assigned at the discretion of the manufacturer.

4. *Information.* Ford believes the reference to "total load" in paragraph S5.1.2(c) is misleading "in that users may easily understand this to be the total load on the truck." It suggests substitution of the term "cargo load." Ford's point is well made, and the term is redesignated "total cargo load" as a clarification.

Toyota has asked that paragraph S5.1.2(e) be amended to substitute four inches for the requirement that camper manufacturers provide a picture showing the location of the center of gravity of the camper within an accuracy of two inches under the loaded condition. The petition is denied. The intent of the specification is to insure an accuracy within two inches, in either direction, in effect, a range of four inches. The NHTSA does not consider this tolerance to be overly demanding.

Finally, RVI states that its members have had difficulty in interpreting Figure 2 and requests the NHTSA to more clearly indicate "that the terminology 'Mount at Aft End of Truck Cargo Area' means that the designated point in the figure signifies the point where the identified surface of the camper abuts the rearmost edge or surface of the cargo area of the truck, presumably the tailgate in most configurations." To clarify its intent the NHTSA is changing the language in question to "point that contacts rear end of truck bed."

5. *Vehicle Identification Number (VIN.)* The NHTSA proposed on August 15, 1972 (Docket No. 71-7; Notice 3, F.R. 16505) that slide-in campers be identified by a VIN, consisting of arabic numerals, roman letters, or both. The notice also proposed to require that the VIN of two campers manufactured by a manufacturer within a ten year period shall not be identical. No objections were raised to the proposal, and Standard No. 126 is amended to adopt the pro-

posed requirements, reworded slightly effective January 1, 1973.

In consideration of the foregoing, 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, is amended. . . .

Effective date: January 1, 1973, with additional requirements effective September 1, 1973. Because the amendment consists principally of the reissue of existing requirements, and compliance with the amendment requiring a VIN does not involve extensive leadtime, the Administrator finds for good cause shown that an effective date eariler than 180 days after issuance is in the public interest.

This notice is issued under the authority of sections 103, 112, 114, and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1401, 1403, and 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on: December 6, 1972.

Douglas W. Toms
Administrator

37 F.R. 26605
December 14, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71-7; Notice 7)

This notice responds to a petition for reconsideration of 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, *Truck-camper loading*, with an amendment allowing optional wording of a portion of the placard to be affixed to campers, and of other required information. The amendments are effective upon publication in the *Federal Register*.

On August 15, 1972 Motor Vehicle Safety Standard No. 126 was originally published (37 F.R. 16497). In response to petitions for reconsideration the standard was republished on December 14, 1972 (37 F.R. 26605) with amendments that included minor changes in the text of information required to be furnished to purchasers of slide-in campers.

Paragraph S5.1.2(a) of Standard No. 126 requires each manufacturer of a slide-in camper to provide in a manual or other document delivered with each camper "the statement and information provided on the certification label as specified in paragraph S5.1.1". Among this information is the month and year that the camper was manufactured. The Trailer Coach Association has asked in a letter dated December 29, 1972 that wording such as "see certification label for date of manufacture" be substituted for the month and year of manufacture, contending that "to require manufacturers to list the month and year of manufacture in each vehicle owner's manual would be an unnecessary hardship in view of the production and shipping schedule which varies greatly from time to time during the year."

The NHTSA believes that the request of TCA is reasonable, and is treating TCA's letter as a petition for reconsideration filed pursuant to 49 CFR 553.35. However, since the information requirement became effective January 1, 1973, and because of the possibility that manufacturers now providing this data may wish to continue to do so, the manufacturer should have the option of including either the month and year of manufacture or a reference to the certification label. The standard is being amended to provide this option.

In the amendments published on December 14, 1972 two minor changes were made in terminology. In Paragraph S5.1.2(c) the phrase "total load", which appears twice, was changed to "total cargo load" as a clarification. Further clarification was provided in an amendment to Figure 2, Camper Center of Gravity Information where the legend "Mount at Aft End of Truck Cargo Area" was changed to "Point That Contacts Rear End of Truck Bed". In view of the amendments to § 575.103 delaying the effective date 30 days until April 1, 1973, and permitting use of the earlier form until October 1, 1973 (Docket No. 71-7; Notice 6 (38 F.R. 4400)), camper manufacturers who have printed manuals with the old terminology should be afforded the same opportunity as truck manufacturers to exhaust obsolete stocks of materials. Appropriate amendments are therefore made to Standard No. 126, including a 30 day delay in the pictorial information that was to have been provided as of September 1, 1973.

In consideration of the foregoing 49 CFR § 571.126 Motor Vehicle Safety Standard No. 126 is amended . . . .

Effective date: February 14, 1973. Because the amendments create no additional burden it is found for good cause that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Sec. 103, 112, 114, and 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1403 and 1407; delegation of authority at 49 CFR 1.51.)

Issued on February 12, 1973.

Douglas W. Toms
Administrator

38 F.R. 4399
February 14, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71–7; Notice 8)

This notice corrects the amendment to 49 CFR § 571.126, Standard No. 126, *Truck-camper loading*, published on February 14, 1973 (38 F.R. 4399). The amendment to paragraph S5.1.2(a) erroneously referred to "the information required by subparagraphs (c) and (d) of paragraph S5.1.1". The reference should have been to "subparagraphs (b) and (c)".

Additionally, the opening statement of the preamble erroneously stated that the amendment allowed "optional wording of a portion of the placard to be affixed to campers, and of other required information". The amendment itself correctly allowed optional wording of information provided in the manual or other document delivered with the camper, not on the placard.

Effective date: March 9, 1973. Because the amendment corrects an error, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 112, 114 and 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1403, and 1407; delegation of authority at 49 CFR 1.51.)

Issued on March 5, 1973.

Douglas W. Toms
Administrator

38 F.R. 6392
March 9, 1973

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71–7; Notice 10)

This notice amends Standard No. 126, *Truck-Camper Loading*, by removing the requirement that a camper's vehicle identification number (VIN) be printed in its owner's manual. Such a modification will reduce the cost of compliance with the standard, without adversely affecting the level of safety prescribed.

Effective Date: April 27, 1978.

For Further Information Contact:

Kevin Cavey, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–2716).

Supplementary Information: On November 29, 1973, the NHTSA issued a notice proposing to amend Standard No. 126, *Truck-Camper Loading*, to remove the requirement that the vehicle identification number (VIN) of each camper be printed in its owner's manual (38 FR 32945). The amendment, requested by the Recreation Vehicle Industry Association, was proposed to reduce the burdens and costs associated with compliance with the requirement.

Comments were received from Ford, the Recreation Vehicle Industry Association, and the Recreational Vehicle Division of the Trailer Coach Association. The Vehicle Equipment Safety Commission did not submit comments.

The three comments received supported the suggested modification. Some commenters asserted that the requirement added little to vehicle safety while resulting in increased costs and the increased possibility of errors associated with inserting the incorrect VIN in an owner's manual. The NHTSA concurs with the commenters and concludes that the intent of the requirement can be achieved by permitting a manufacturer to state in the owner's manual that the VIN can be found by referring to the camper's certification label. Accordingly, Standard No. 126 is amended to make optional the provision of the VIN in a camper's owner's manual. If the VIN is not placed in the owner's manual, a reference must be made in the manual to the location of the VIN on the certification label.

In consideration of the foregoing, the second sentence of paragraph S5.1.2 of Standard No. 126, 49 CFR Part 571.126 is amended. . . .

Since this amendment relieves a restriction and imposes additional burden on any person, it is found for good cause shown that an immediate effective date is in the public interest.

The principal authors of this notice are Kevin Cavey of the Office of Vehicle Safety Standards and Roger Tilton of the Office of Chief Counsel.

(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 April 21, 1978.

Joan Claybrook
Administrator

43 F.R. 17946
April 27, 1978

MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71-7; Notice 2)

S1. Scope. This standard requires manufacturers of slide-in campers to affix a label to each camper that contains information relating to certification, identification, and proper loading, and to provide more detailed loading information in the owner's manual.

S2. Purpose. The purpose of this standard is to provide information that can be used to reduce overloading and improper load placement in truck-camper combinations, and unsafe truck-camper matching, in order to prevent accidents resulting from the adverse effects of these conditions on vehicle steering and braking.

S3. Application. This standard applies to slide-in campers.

S4. Definitions.

"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.

"Cargo weight rating" means the value specified by the manufacturer as the cargo-carrying capacity, in pounds, of a vehicle, exclusive of the weight of occupants in designated seating positions.

"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.

S5. Requirements.

S5.1 Slide-in camper.

S5.1.1 Labels. Each slide-in camper shall have permanently affixed to it, in a manner that it cannot be removed without defacing or destroying it, in a plainly visible location on an exterior rear surface other than the roof, steps, or bumper extension, a label containing the following information in the English language lettered in block capitals and numerals not less than $\frac{3}{32}$-inch high, of a color contrasting with the background, in the order shown below and in the form illustrated in Figure 1.

MFG. BY: (CAMPER MANUFACTURER'S NAME)
(MONTH AND YEAR OF MANUFACTURE)
THIS CAMPER CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
CAMPER WEIGHT IS ______ LBS. MAXIMUM
WHEN IT CONTAINS STANDARD EQUIPMENT, ______
GAL. OF WATER, ______ LBS. OF BOTTLED GAS,
AND ______ CUBIC FT. REFRIGERATOR (or ICE
BOX WITH ______ LBS. OF ICE, as applicable).
CONSULT OWNER'S MANUAL (or DATA SHEET as applicable) FOR WEIGHTS OF ADDITIONAL OR OPTIONAL EQUIPMENT.
(VEHICLE IDENTIFICATION NUMBER)

FIGURE 1. Label for Campers

(a) Name of camper manufacturer. The full corporate or individual name of the actual assembler of the camper shall be spelled out, except that such abbreviations as "Co.," or "Inc.," and their foreign equivalents, and the first and middle initials of individuals may be used. The name of the manufacturer shall be preceded by the words "Manufactured By" or "Mfd. By".

(b) Month and year of manufacture. It may be spelled out (*e.g.*, "June 1973"), or expressed in numerals (*e.g.*, "6/73).

(c) The statement: "This camper conforms to all applicable Federal Motor Vehicle Safety

Standards in effect on the date of manufacture shown above." The expression "U.S." or "U.S.A." may be inserted before the word "Federal."

(d) The following statement completed as appropriate: "CAMPER WEIGHT IS ________ LBS. MAXIMUM WHEN IT CONTAINS STANDARD EQUIPMENT, ________ GAL. OF WATER, ________ LBS. OF BOTTLED GAS, AND ________ CUBIC FT. REFRIGERATOR (or ICE BOX WITH ________ LBS. OF ICE, as applicable). CONSULT OWNER'S MANUAL (or DATA SHEET as applicable) FOR WEIGHTS OF ADDITIONAL OR OPTIONAL EQUIPMENT."

"Gal. of water" refers to the volume of water necessary to fill the camper's fresh water tanks to capacity. "Lbs. of bottled gas" refers to the weight of gas necessary to fill the camper's bottled gas tanks to capacity. The statement regarding a "Refrigerator" or "Icebox" refers to the capacity of the refrigerator with which the vehicle is equipped or the weight of the ice with which the icebox may be filled. Any of these items may be omitted from the statement, if the corresponding accessories are not included with the camper, provided that the omission is noted in the camper owner's manual as required in paragraph S5.1.2(a).

(e) Vehicle Identification Number. Each slide-in camper shall have a number assigned by its manufacturer for identification purposes consisting of arabic numerals, roman letters, or both. No two slide-in campers manufactured by the same manufacturer within any 10-year period shall have the same Vehicle Identification Number.

S5.1.2 Owner's manual. Each slide-in camper manufacturer shall provide with each camper a manual or other document containing the information specified in S5.1.2(a) through S5.1.2(d). The information in S5.1.2(e) and S5.1.2(f) shall also be provided with each camper manufactured on or after October 1, 1973.

(a) The statement and information provided on the certification label as specified in paragraph S5.1.1. Instead of the information required by subparagraphs (b), (c), and (e) of paragraph S5.1.1, a manufacturer may use the statements, "See camper certification label (located on camper's rear exterior surface) for month and year of manufacture and for the Vehicle Identification Number" and "This camper conforms to all applicable Federal Motor Vehicle Safety Standards in effect on the date of manufacture."

(b) A list of other additional or optional equipment that the camper is designed to carry, and the maximum weight of each if its weight is more than 20 lbs. when installed.

(c) The statement: "To estimate the total cargo load that will be placed on a truck, add the weight of all passengers in the camper, the weight of supplies, tools, and all other cargo, the weight of installed additional or optional camper equipment, and the manufacturer's camper weight figure. Select a truck that has a cargo weight rating that is equal to or greater than the total cargo load of the camper, and whose manufacturer recommends a cargo center of gravity zone that will contain the camper's center of gravity when it is installed." Until October 1, 1973, the phrase "total load" may be used instead of "total cargo load."

(d) The statements: "When loading this camper store heavy gear first, keeping it on or close to the camper floor. Place heavy things far enough forward to keep the loaded camper's center of gravity within the zone recommended by the truck manufacturer. Store only light objects on high shelves. Distribute weight to obtain even side-to-side balance of the loaded vehicle. Secure loose items to prevent weight shifts that could affect the balance of your vehicle. When the truck-camper is loaded, drive to a scale and weigh on the front and on the rear wheels separately to determine axle loads. The load on an axle should not exceed its gross axle weight rating (GAWR). The total of the axle loads should not exceed the gross vehicle weight rating (GVWR). These weight ratings are given on the vehicle certification label that is located on the left side of the vehicle, normally the dash panel, hinge pillar, door latch post, or door edge next to the driver on trucks manufactured on or after January 1, 1972. If weight ratings are exceeded, move or remove items to bring all weights below the ratings."

(e) A picture showing the location of the longitudinal center of gravity of the camper within an accuracy of 2 inches under the loaded condition specified in paragraph S5.1.1(d), in the manner illustrated in Figure 2. Until October 1, 1973 the phrase "Mount at Aft End of Truck Cargo Area" may be used in Figure 2 instead of "Point That Contacts Rear End of Truck Bed"

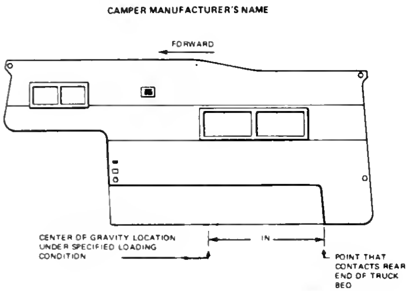


FIGURE 2 - CAMPER CENTER OF GRAVITY INFORMATION

(f) A picture showing the proper match of a truck and slide-in camper in the form illustrated in Figure 3.

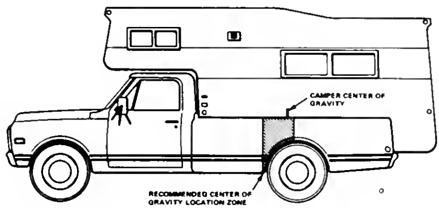


FIGURE 3 - EXAMPLE OF PROPER TRUCK AND CAMPER MATCH

37 F.R. 16497
August 15, 1972

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 127

Speedometers and Odometers; Controls and Displays (Docket No. 76-06; Notice 12 and Docket No. 1-18; Notice 22)

ACTION: Final rule.

SUMMARY: This notice revokes Standard No. 127, *Speedometers and Odometers.* This action is based on the agency's conclusion that such a standard is unlikely to yield any significant safety benefits. Revocation of the standard will result in cost savings for manufacturers and consumers.

DATES: The revocation is effective on March 25, 1982. Petitions for reconsideration must be received by March 22, 1982.

SUPPLEMENTARY INFORMATION: On October 22, 1981 (46 F.R. 51788), the agency proposed revoking Standard No. 127, *Speedometers and Odometers* (49 CFR 571.127). After evaluating all of the comments submitted on the proposal, the agency has decided to revoke the standard. Significant comments to the docket are addressed below.

Preemption

General Motors and Renault raised the issue of what effect the revocation of Standard No. 127 would have on the ability of States to adopt their own safety laws on speedometers and odometers. GM requested the agency to declare that speedometers and odometers not be subject to regulation by the States because the agency has determined that only Federal regulation of the subject is appropriate.

The legislative history of the National Traffic and Motor Vehicle Safety Act shows that one goal of the Act is to estabish a uniform national safety program that applies to all vehicles before they are first sold to consumers. Congress directed that the agency establish and maintain Federal safety standards on significant safety problems. The Senate Report on the Act stated that the agency is to issue safety standards for those "vehicle characteristics that have a significant bearing on safety" (S. Rep. No. 1301, 89th Cong., 2d Sess. 6 (1966)).

In the case of Standard No. 127, the agency recognizes that there is a nexus between safety and having a speedometer and odometer. Based on available data, however, the agency has determined that the current requirements are not yielding and cannot be expected to yield significant safety benefits.

In revoking this standard, NHTSA intends that other levels of government be preempted from establishing similar requirements. The agency believes that regulation of speedometers and odometers is not appropriate at this time at any level based on the absence of data indicating regulatory methodologies exist which would in fact yield significant safety benefits. Contrary regulatory decisions at other levels of government would negate the agency's exercise of discretion and undermine the Congressional goal of uniform national standards.

Further, refraining from regulation will facilitate experimentation by the manufacturers in providing more effective ways of improving speedometer and odometer performance and thus possibly providing significant safety benefits. Manufacturers indicated in their comments that they voluntarily intend to continue meeting many of the speedometer requirements. They also indicated that they would continue to provide anti-tampering odometer features that they voluntarily adopted prior to implementation of the standard. During this rulemaking, some manufacturers, such as GM, have indicated that they will continue their odometer development programs. GM said it may install additional cost-effective anti-tampering features. In addition, the technology of odometers is rapidly advancing as manufacturers begin developing electronic odometers.

Because the agency continues to recognize the safety nexus in the area of speedometer and odometer regulation. NHTSA will continue to monitor manufacturer development programs and the effectiveness of anti-tampering features voluntarily adopted by manufacturers. If speedometer and odometer features are developed that provide a significant safety benefit, the agency will consider whether a Federal safety standard would be appropriate and necessary under the Safety Act. Exercise the agency's authority in this fashion will allow the market place to function freely to develop new, more effective designs.

Speedometer Requirements

Most of the commenters supported the agency's proposal to delete the speedometer requirements of the standard because of their apparent lack of significant safety benefits. Those requirements provided that each speedometer be graduated in miles per hour and kilometers per hour, have the numeral "55" highlighted on the miles per hour scale and indicate a maximum speed on the scale of not more than 85 mph or 140 km/h.

All of the vehicle manufacturers commenting on the proposal indicated that they would voluntarily continue to provide some of the features formerly required by the standard. American Motors, Chrysler, Ford, General Motors, Mack, Renault, Subaru, and Volvo White Truck Corporation said they would maintain a maximum scale reading of 85 mph or less. Honda said it would modify its speedometers to show the maximum speed capabilities of its vehicles. Many of the vehicle manufacturers, such as Ford, General Motors and Honda, said they also would continue to provide speedometers graduated in both miles and kilometers per hour.

American Motors, Ford, Mack, Renault, Subaru, and Volvo White said they would also continue to highlight the "55" mph position on the speedometer scale. General Motors said it would continue to highlight "55" on its speedometers with analog scales; however, it may not continue to include the numeral "55" on all speedometer scales. Honda said it would drop the highlighting. Chrysler and Volkswagen did not indicate what action they would take on highlighting the 55 mile per hour position.

Subaru supported the retention of the requirement to limit the maximum speed shown on the speedometer scale to 85 miles per hour, arguing that it would help minimize the temptation for young drivers to drive at excessive speeds. Similar arguments were raised by the Center for Auto Safety (CFAS).

Subaru also supported retaining the requirement that the numeral "55" be highlighted on the speedometer scale, arguing that it reminded drivers of the national speed limit. Again, similar arguments were raised by CFAS. Private individuals submitting comments on the maximum speed, dual scale calibrations and highlighting issues split equally between those supporting the revocation and those opposing it.

The agency has concluded that the limitation on the maximum speed shown on the speedometer scale is unnecessary. The limitation was, at best, only a psychological deterrent. Consumers are voluntarily placing far more effective limits on maximum speed by the shift to vehicles with four cylinder engines. In addition, most manufacturers limited the maximum speed shown on their speedometer scales before the standard went into effect and have indicated that they will continue to do so in the absence of a Federal standard.

The highlighting of the numeral "55" was intended to provide an easily visible reminder as to whether the national speed limit was being exceeded. The agency does not have any data, nor was any provided in the comments, indicating that the reminder has been effective.

The requirement that the speedometer scale be calibrated in kilometers and miles per hour no longer serves a safety purpose since the Federal Highway Administration has dropped its plans to add metric values to roadside signs.

Odometer Requirements

Most of the commenters favored the revocation of the odometer requirements. Those requirements specified that, as of September 1, 1982, odometers must indicate when they have advanced or have been advanced beyond a reading of either 89,999 or 99,000 miles or kilometers. In addition, the odometer must have been designed so as to either prevent reversal or provide an indication that they have been reversed. Finally, replacement odometers would have to differentiated from original equipment odometers so that new replacement odometers with low distance readings cannot be substituted for original equipment odometers with high mileage readings.

Vehicle manufacturers unanimously supported revocation of the odometer requirements. Most of the comments from individual citizens favored retaining the odometer requirements. However, the principal reason mentioned for supporting the requirement was to prevent consumer fraud rather than to promote safety. The State of Wisconsin and the CFAS also opposed the revocation.

Wisconsin and CFAS argued that the mileage of the vehicle is an important indication of its safe operating condition. CFAS said that, for example, if an odometer reads 2,000 miles, instead of the actual mileage of 30,000, a consumer will not check the brake lining on the vehicle. Wisconsin argued that many used vehicles are maintained with minimal costs and may not be given the check-up needed to detect impending or existing vehicle equipment failures. CFAS also repeated the agency's rationale for originally adopting the odometer standard by arguing that an altered odometer might cause a purchaser to fail to check his or her vehicle adequately, forego preventive maintenance or be unwilling to make necessary repairs.

Wisconsin also noted that in the statement of purpose (section 401) for the odometer disclosure provisions of the Motor Vehicle Information and Cost Savings Act, Congress said that an accurate odometer can assist a purchaser in determining a vehicle's safety.

The purpose of the Cost Savings Act is to provide purchasers with legal remedies to pursue against persons who tamper with odometers. The Act neither authorizes the issuance of equipment standards to accomplish that purpose nor does it govern the issuance of safety standards.

The agency can issue and maintain a standard only under the National Traffic and Motor Vehicle Safety Act and only if it can demonstrate that the standard meets the need for motor vehicle safety by yielding significant safety benefits. As already noted, the legislative history of the Act shows that the agency is to concentrate on standards addressing significant safety problems. The agency has never disputed that mileage is a factor that may influence some drivers to take preventive maintenance measures. The primary issue is whether other factors, such as vehicle appearance and performance, play a more important role in influencing drivers regarding vehicle systems that have a direct relationship to safety.

The Tri-Level Study of the Causes of Accidents, discussed in the notice proposing to revoke the standard, indicates that of all the vehicle-related causes of accidents, there were four predominant categories of problems. Those categories are (1) brake system problems, (2) tire and wheel problems, (3) steering system problems, and (4) communication system problems (problems with lights, signals, glazed surfaces, etc.) All of those categories involve components which must be periodically replaced or serviced regardless of mileage. Deterioration in the performance, such as brakes pulling to one side, or in appearance, such as low tire tread depth, are readily apparent to the driver and should do more to alert the driver to potential safety-related problems than does the mileage of the vehicle. Thus, the findings of the Tri-Level study support the agency's conclusion that the role of mileage and thus the odometer in alerting drivers to potential safety problems is apparently not crucial, while the role of appearance and performance is significant.

Effects of Revocation

The agency has evaluated the economic and other effects of this final rule and determined that the rule is neither major as defined by Executive Order 12291 nor significant as defined by the Department of Transportation's regulatory policies and procedures. A final regulatory evaluation of the effects of the final rule has been prepared and placed in the public docket. Copies of the regulatory evaluation are available in the Docket Section at the address given at the beginning of this notice.

Effects on Speedometers

Revocation of Standard No. 127's requirements for speedometers will have little, if any, effect on safety. As the comments submitted by the vehicle manufacturers demonstrated, vehicles had speedometers long before the standard went into effect and will continue to have them even after the standard has been revoked. In addition, manufacturers indicated that they will voluntarily continue to equip their speedometers with most of the features formerly required by the standard.

The potential safety effect of the standard's speedometer requirement for highlighting the numeral "55" is unquantifiable. The requirement for calibration of the speedometer scale in mph and km/h is no longer necessary since the Federal Highway Administration has dropped its proposal to add metric distances on roadside highway signs.

The agency's 1976 regulatory evaluation on Standard No. 127 projected that the requirement that the limitation on the maximum speed shown on the speedometer scale would be five percent effective in reducing accidents involving young drivers. The projected effectiveness was based on the assumption that the 85 mph maximum speed indication would be a psychological deterrent to high speed driving. However, the agency has no data indicating that the speedometer scale limitation is effective to any extent in reducing the tendency to drive too fast and in reducing the resultant accidents and injuries. Also, the commenters provided no data indicating that the limitation had any actual effect.

The agency expects little or no economic effect from the revocation of the speedometer requirements on consumers, vehicle manufacturers or speedometer manufacturers. As mentioned previously, vehicle manufacturers intend to retain most of the features previously installed in response to the standard. The costs of those features are minimal.

Effects on Odometers

As discussed above, revocation of the anti-tampering requirements for odometers should have little effect on vehicle safety. Revocation of the odometer requirement should produce a small consumer saving resulting from the use of less expensive odometers. All of the vehicle manufacturers indicated that they would not install odometers meeting the full anti-tampering requirements in the absence of a standard. Manufacturers, such as Chrysler, Ford, and General Motors, indicated that they would continue to provide odometers equipped with anti-tampering equipment that the manufacturers voluntarily installed prior to the standard. In addition, manufacturers have indicated that they will continue their odometer development programs. General Motors, for example, said it will consider equipping its vehicles with additional anti-tampering features if cost-effective methods are developed.

The agency is concerned that based upon its review of the facts and record, the actual positive benefits (i.e., the prevention or inhibition of actual odometer tampering as a result of the relatively slight but expensive changes which would be required by the rule) would be minimal. Because of the uncertainties regarding the effectiveness of the odometer requirements in preventing tampering, the agency is unable to estimate the extent to which the odometer provisions would prevent tampering and thus decrease the amount of any economic injury suffered by consumers.

On the other hand, revocation of the odometer requirements could result in more tampering than might otherwise have occurred with respect to odometers of used vehicles built after September 1, 1982. The amount of any potential increase will, however, be reduced by any further development and voluntary installation of new anti-tampering features by vehicle manufacturers. Increased tampering which does occur would cause an increase in the amount of economic injury to consumers as a result of their overpaying for used vehicles with lowered odometer readings. Such economic harm, however, if any, is unrelated to the agency's safety mission and can be redressed in other forums as well. NHTSA is separately exploring alternative methods of addressing the problem of odometer tampering.

Revocation of the odometer requirements will provide economic benefits both for vehicle manufacturers, in a savings of capital expenditures necessary to comply with the provisions and in variable cost savings, and for all consumers purchasing such cars. The potential consumer cost savings are estimated to be approximately $12,000,000 annually.

Standard No. 101

Revocation of Standard No. 127 necessitates a minor amendment to Standard No. 101, *Controls and Displays*. Standard No. 101 requires speedometers to be identified by the words

"MPH and Km/h." Since speedometers are no longer required to be graduated in miles and kilometers per hour, the agency is modifying the requirement of Standard No. 101. Speedometers must be identified by the abbreviation "MPH" unless the speedometer is graduated in both miles per hour and kilometers per hour, in which case the identification phrase will be "MPH and Km/h." GM noted that the commonly accepted abbreviation for kilometer per hour is "km/h" rather than "Km/h." Because the difference between a capital or lower case "k" is insignificant, the agency will allow the use of either version.

Regulatory Flexibility Act

In accordance with the Regulatory Flexibility Act, the agency has evaluated the effects of this action on small entities. Based on that evaluation, the Administrator certifies that the revocation of Standard No. 127 will not have a significant effect on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared.

Few, if any, of the speedometer or odometer manufacturers are small businesses as defined in the Regulatory Flexibility Act. Small organizations and governmental jurisdictions which purchase fleets of motor vehicles would probably not be significantly affected by the revocation of the standard. As already discussed, the speedometer provisions have little safety value and impose little cost. Since these entities typically buy new vehicles, they are not subject to the problems of odometer tampering.

National Environmental Policy Act

The agency has also analyzed this action for the purposes of the National Environmental Policy Act. The agency has determined that revocation of the standard will not have any significant effect on the human environment.

Effective Date

The agency proposed that the revocation become effective upon publication of the final rule in the *Federal Register.* Ford and Volkswagen both urged that agency to publish a final rule before the end of January to avoid the unnecessary expenditure of funds. Ford said that if the rule is not revoked before then, it will have to spend additional capital funds at a rate of $25,000 per week. Volkswagen did not provide a specific estimate of its expenditures.

Volvo White objected to the revocation becoming effective on publication. It said that most of its vehicles are manufactured in two or more stages and must be accompanied by a chassis cab certification label and incomplete vehicle document that is presented to the final stage manufacturer. Volvo White said that if the standard is revoked on the date of publication of the final rule, some of its vehicle will have preprinted certification labels and documents which would incorrectly certify that the vehicles are in compliance with Standard No. 127.

Volvo White requested the agency either to retain a portion of the current standard by requiring speedometers to have dual calibrations and display a maximum speed of 85 miles per hour; or permit manufacturers to certify to non-existent safety standards; or revoke the standard effective on September 1, 1982.

As previously discussed, the agency has decided not to retain any of the speedometer requirements because of their limited safety benefits. Setting a September 1, 1982, effective date could result in manufacturers' unnecessarily spending funds to continue complying with the speedometer requirements which the agency has found have limited safety benefits. Allowing manufacturers to certify to non-existent standards is not appropriate, since purchasers would interpret the manufacturer's certification to mean that the vehicle actually complied with the standard even though it is no longer in effect.

To account for the problems faced by manufacturers of two-stage vehicles and to avoid the unnecessary expenditure of funds by manufacturers, the agency has decided to make the revocation effective in 35 days. This will allow two-stage manufacturers to make the changes to their certification labels and incomplete vehicle documents to delete the certification to Standard No. 127; the cost of those changes should be minor. The agency therefore finds, for good cause shown, that an early effective date for the revocation of the standard is in the public interest since it will avoid the unnecesary expenditure by manufacturers on requirements that have no significant safety benefits.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

In consideration of the foregoing, the following amendments are made in Part 571 of Title 49 of the Code of Federal Regulations:

§571.127 [Removed]

1. Section 571.127 is removed.

§517.101-80 [Amended]

2. In Table 2 of 571.101-80, the identifying word or abbreviation for the speedometer display (row 8, column 3) is revised to read: "MPH[6]."

3. A footnote 6 is added to Table 2 of §571.101-80 to read:

[6]If the speedometer is graduated in miles per hour and in kilometers per hour, the identifying words or abbreviation shall be "MPH and km/h" in any combination of upper or lower case letters.

Issued on January 6, 1982.

Raymond A. Peck, Jr.
Administrator

47 F.R. 7250
February 18, 1982

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Few, if any, of the speedometer or odometer manufacturers are small businesses as defined in the Regulatory Flexibility Act. Small organizations and governmental jurisdictions which purchase fleets of motor vehicles would probably not be significantly affected by the revocation of the standard. As already discussed, the speedometer provisions have little safety value and impose little cost. Since these entities typically buy new vehicles, they are not subject to the problems of odometer tampering.

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§571.127 [Removed]

1. Section 571.127 is removed.

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3. A footnote 6 is added to Table 2 of §571.101-80 to read:

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Issued on January 6, 1982.

Raymond A. Peck, Jr.
Administrator

47 F.R. 7250
February 18, 1982

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 he 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

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 relative velocity of 15 miles per hour, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds.

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. (47 F.R. 52450 November 22, 1982. Effective: December 22, 1982)]

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 8, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 15065
October 9, 1968

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.

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

S4. Requirements. A head restraint that conforms to either (a) or (b) shall be provided at each outboard front designated 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 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 form shall not be displaced to more than 4 inches perpendicularly rearward of the displaced entended 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.

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:

(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.(b) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position:

(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

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 with a GVWR of 10,000 pounds or less. 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. Each passenger car and each multipurpose passenger vehicle, truck and bus with an unloaded weight of 4,000 pounds or less manufactured on or after September 1, 1981, shall meet the requirements of S5.1.

S5. Rearward displacement requirements.

S5.1 The upper end of the steering column and shaft shall not be displaced horizontally rearward parallel to the longitudinal axis of the vehicle relative to an undisturbed point on the vehicle more than 5 inches, determined by dynamic measurement, when the vehicle, loaded to its unloaded vehicle weight, is impacted perpendicularly into a fixed collision barrier at a forward longitudinal velocity of 30 miles per hour.

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 13, 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 rule-making 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

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 2/3 of an inch high and have a radius of less than 1/4 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.

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

Issued on April 23, 1980.

Joan Claybrook
Administrator
45 F.R. 29045
May 1, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies

(Docket No. 80-12; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 209, *Seat Belt Assemblies,* to exempt seat belts installed in conjunction with automatic restraint systems from the belt elongation requirements of the standard. This amendment is based on a petition for rulemaking submitted by Mercedes-Benz of North America and follows the publication of a proposal. The amendment permits manufacturers to install belt systems incorporating load-limiting devices which are intended to make further reductions in head and upper torso injuries during an accident. Some load-limiting belt systems utilize webbing that elongates more than is currently allowed by Standard No. 209. This amendment would permit this and other type systems to exceed the maximum elongation allowed by the standard.

DATES: This amendment is effective January 12, 1981.

ADDRESSES: Any petition 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. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2264).

SUPPLEMENTARY INFORMATION: Safety Standard No. 209, *Seat Belt Assemblies* (49 CFR 571.209), specifies performance requirements for seat belts to be used in motor vehicles. One of these performance requirements specifies the maximum amount that the webbing of a belt assembly is permitted to extend or elongate when subjected to certain specified forces (paragraph S4.2(c)). Mercedes-Benz of North America petitioned NHTSA to exempt seat belt assemblies installed in passenger cars in conjunction with air cushion restraint systems from the webbing elongation requirements of the standard. The agency granted that petition and issued a notice of proposed rulemaking to amend the standard on August 4, 1980 (45 F.R. 51626).

Mercedes is considering the use of a belt system that incorporates a load-limiting device. A load-limiter is a seat belt assembly component or feature that controls tension on the seat belt and modulates or limits the force loads that are imparted to a restrained vehicle occupant by the belt assembly during a crash. Load-limiting devices are intended to reduce head and upper torso injuries through increased energy management. A load-limiter can be a separate component of the seat belt system, such as a torsion bar that allows the retractor to reel out additional webbing when a certain designed force level is reached. The load-limiter can also be a feature of the webbing itself, such as webbing that will elongate to certain designed lengths when subjected to particular force levels. Mercedes is interested in using the latter type load-limiting system. However, the webbing in the Mercedes belt system would elongate beyond the limits that are currently specified in Standard No. 209. Mercedes' petition stated that this type belt system should be allowed in vehicles equipped with air cushion restraints since the two systems used in conjunction with one another can be designed to achieve the maximum reduction in head injuries and upper-torso injuries.

Although safety belts protect occupants from life-threatening impacts with the vehicle interior, the forces necessarily generated by the belts upon occupants during a crash can result in upper torso injury. As noted in the notice of proposed rulemaking, data available to the agency indicate that load-limiting belts can reduce these injuries, as well as working in combination with an automatic restraint system to provide protection for impacts with the vehicle interior. The proposal specified that both Type 1 (lap belts) and Type 2 (combination lap and shoulder belts) manual belts having load-limiting devices and used in conjunction with automatic restraints would be exempted from the elongation requirements. Additionally, the proposal specified that such belts would have to be labeled to clarify that they are intended for use only in vehicles equipped with automatic restraint systems.

The proposal limited the use of load-limiting belts to vehicles equipped with automatic restraints since there are currently no dynamic performance requirements or injury criteria for manual belt systems used alone. There are no requirements to ensure that a load-limiting belt system would protect vehicle occupants from impacting the steering wheel, instrument panel and windshield, which would be very likely if the belts elongated beyond the limits specified in Standard No. 209. Therefore, the elongation requirements are necessary to ensure that manual belts used as the sole restraint system will adequately restrain vehicle occupants.

Nine comments were submitted in response to the August 4 proposal, all supporting the exemption for load-limiting belts. Vehicle manufacturers stated that the proposed exemption from the elongation requirements would allow design flexibility and lead to improved occupant restraint systems.

American Motors Corporation (AMC) stated that the exemption for load-limiting belts should only apply to Type 2 manual belts. The company argued that the only available data relates to the ability of Type 2 load-limiting belts to reduce certain head and upper-torso injuries. AMC stated that torso injury is not a function of lap belt loads and that no similar correlation has been made between lap belt loads and pelvic fractures. Therefore, the company believes that the exemption from the elongation requirements for Type 1 belts should be postponed until specific injury patterns can be correlated with lap belt loads.

The agency proposed allowing the exemption for both Type 1 and Type 2 belts in order to give manufacturers broader design latitude to use load-limiting features on all belt systems used in conjunction with automatic restraints. AMC is correct in its statement that more data are available regarding the correlation between Type 2 belts and upper-torso injury than is available regarding load-limiting features on Type 1 belts. However, comments received from Rolls-Royce Motors stated that the company has tested manual Type 1 belts incorporating load-limiting features and found that better results are obtained under the injury criteria of Safety Standard No. 208 (49 CFR 571.208) than with Type 1 belts which must comply with the elongation requirements. In light of this information, and the fact that load-limiting Type 1 belts would only be allowed in conjunction with automatic restraint systems complying with the injury criteria of Standard No. 208, the agency has decided to include Type 1 belts in the exemption. This will allow manufacturers to develop innovative designs to maximize the protection provided by its automatic restraint systems. If future data indicate a problem with Type 1 belts that incorporate load-limiting features, the exemption from the elongation requirements can be reconsidered by the agency.

The August 4, 1980, notice proposed to add a new definition to Standard No. 209 to define "load-limiter," and limited the exemption from the elongation requirements to belts incorporating load-limiters and installed in conjunction with automatic restraints. Volvo of America Corporation commented that the definition of "load-limiter" is very broad and could be interpreted to include all existing belt webbing. Volvo stated that the exemption should, therefore, apply to any Type 1 or 2 belt installed in conjunction with an automatic restraint, and not be limited to load-limiting belts.

While the agency understands Volvo's point that the proposed language may be extremely detailed, we believe the language is necessary to clarify the exemption and to avoid confusion for belt manufacturers. Safety Standard No. 209 is an equipment standard rather than a vehicle standard, and each seat belt assembly must be certified by the belt manufacturer. The proposed language was intended to create a clear distinction between belts complying with elongation requirements of Safety Standard No. 209 and those that incorporate load-limiting features that preclude compliance with the elongation requirements. The proposed language explained which belt systems must be labeled as being for use only in vehicles equipped with automatic restraints. The agency believes this language, including the definition of "load-limiter," is necessary at the current time to clarify the requirements for those persons or manufacturers who may not be totally familiar with the requirements of Safety Standard No. 209. Otherwise, it would not be clear from the standard why certain belts are exempted from the elongation requirements of the standard.

In another comment related to this same subject, General Motors Corporation pointed out that the proposed labeling requirement for load-limiting belts could apply to all Type 1 and 2 belts incorporating load-limiting features even if all current 209 requirements are met. General Motors stated that load-limiting belt systems that can, nevertheless, comply with the elongation requirements of the standard should not be limited in their application to vehicles equipped with automatic restraint systems. The agency agrees with this argument, and the language is changed in this amendment accordingly.

General Motors also questioned the need to require any label at all on load-limiting belts. The proposal specified that such belts would have to be permanently marked or labeled to indicate the assembly may only be installed in vehicles in conjunction with an automatic restraint system. General Motors argued that a label is not necessary to control the installation of load-limiting belts in the proper vehicles. Seat belt manufacturers must currently provide appropriate installation instructions for its equipment. General Motors contends that this requirement, coupled with the fact that replacement belts are generally ordered and installed by a repair facility, will ensure that load-limiting belts are only installed in vehicles equipped with automatic restraints. The agency does not agree with this position. As stated earlier, the agency believes that care must be taken to distinguish load-limiting belt systems from other systems. If there is a label on the belt itself, a person making the installation will be aware that the belt should only be installed in conjunction with automatic restraints. This should be made obvious to the person making the installation without reference to the installation instructions. Further, none of the other commenters objected to the proposed labeling requirement. American Motors Corporation specifically stated that a label is necessary.

General Motors is correct in its statement that this warning will also be provided in the installation instructions provided by the belt manufacturer. Paragraphs S4.1(l) of Safety Standard No. 209 provides, in part, that the installation instruction sheet provided by the belt manufacturer shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles. Therefore, belt manufacturers will be required to specify in the installation instructions that load-limiting belts are only to be installed in combination with automatic restraint systems. The agency believes that at the current time these duplicative warnings, in the instruction sheet and on a belt label, are a necessary precaution to ensure that load-limiting belts are only installed in the proper vehicles. After a majority of vehicles on the road are equipped with automatic restraints, such labeling may no longer be necessary.

Volvo of America Corporation commented that some upper limit on belt elongation may be required for Type 1 manual belts incorporating load-limiting features, although no such limit was specified in the proposal. Volvo pointed out that Type 1 belts installed in conjunction with air cushion restraints will also provide roll-over protection for vehicle occupants. The company is concerned that if no upper limit on elongation is specified, such belts may not provide the intended protection in roll-over accidents.

While the agency agrees that this is a legitimate concern, it does not believe it is necessary to specify such an upper limit at the current time. It is not likely that manufacturers will design load-limiting belt systems that will elongate appreciably beyond the limits specified in Standard No. 209. Presumably, load-limiting belts will be designed to provide actual restraint in conjunction with the automatic restraint system, if the vehicle is to comply with the injury criteria of Safety Standard No.

208. If a load-limiting belt design elongates to the extent that it would provide no protection in roll-over accidents, it would also not provide any protection in frontal crashes. Therefore, it is not likely that manufacturers would permit such extensive elongation in their systems. Moreover, the forces generated in frontal crashes are more severe than those that occur in roll-over accidents, so the elongation that would occur even with load-limiting systems would not be as great in roll-over accidents as in frontal accidents. The agency believes that manufacturers should be given broad latitude in the development of load-limiting belt systems to be used in vehicles equipped with automatic restraints. In light of these considerations, no upper limit on belt elongation is specified in this amendment. Manufacturers should be cognizant of the point made by Volvo, however, during the development of their systems.

The comments of Renault USA included general questions regarding automatic seat belts and the relationship between Safety Standard No. 208 and Safety Standard No. 209. Some confusion apparently exists regarding paragraph S4.5.3.4 of Safety Standard No. 208 and agency interpretations regarding that paragraph. The agency has stated in the past that only automatic belts that are installed to meet the frontal crash protection requirements of S5.1 of Standard No. 208 are exempted from the requirements of Standard No. 209. Yet, the agency has also stated that those portions of Standard No. 209 relating to retractors are applicable to all automatic belts. Renault finds these statements inconsistent.

Paragraph S4.5.3.4 of Standard No. 208 is a general provision which exempts certain automatic belts, those meeting the injury criteria of the standard, from the requirements of Standard No. 209. However, paragraph S4.5.3.3(a) of Standard No. 208 specifically provides that automatic belts shall conform to S7.1 of Standard No. 208, and that paragraph relates to the performance requirements for belt retractors specified in Standard No. 209. It is for this reason that the agency has stated that all automatic belts must comply with the retractor requirements, notwithstanding the general exemption specified in S4.5.3.4.

Renault contends that paragraph S4.5.3.4 is also inconsistent by its own terms since, Renault states, an automatic belt system must always comply with the injury criteria of S5.1 of Standard No. 208. This incorrect Paragraph S4.5.3 of Safety Standard No. 208 specifies that 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. Therefore, prior to the effective date of the automatic restraint requirements of the standard, automatic belts could be used to satisfy the third option of section S4—the seat belt option. Automatic belts installed under the third option would not be required to comply with the injury criteria of S5.1, since the injury criteria is only specified as a requirement under option 1 and option 2. Manufacturers are permitted, however, to install automatic belts in satisfaction of either option 1 or option 2 and to certify to the injury criteria, if they desire. In summary, automatic belts installed in passenger cars in compliance with the injury criteria of Safety Standard No. 208 are only required to comply with the provisions of Safety Standard No. 209 relating to retractors. They are not required to comply with any other provision in Standard No. 209. Automatic belts installed in passenger cars that are not certified as being in compliance with the injury criteria of Standard No. 208, i.e., those installed under the third option of the standard, are required to comply with all provisions of Standard No. 209. Manual seat belts having load-limiters, installed in vehicles in conjunction with automatic restraints meeting the injury criteria of Standard No. 208, are required to comply with all provisions of Standard No. 209 except the elongation requirements (by this amendment).

The agency has determined that this amendment is not a significant regulation under Executive Order 12221, "Improving Government Regulations," and the Departmental guidelines implementing that Order. Therefore, a regulatory analysis is not required. The exemption specified in this amendment provides manufacturers with broader design alternatives and should have little if any economic or environmental impact. Consequently, the agency has also determined that a regulatory evaluation is not required.

The engineer and lawyer primarily responsible for the development of this rule are William Smith and Hugh Oates, respectively.

Issued on January 5, 1981.

Joan Claybrook
Administrator
46 F.R. 2618
January 12, 1981

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 209

Federal Motor Vehicle Safety Standards; Seat Belt Assemblies

[Docket No. 82-15; Notice 2]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 209, *Seat Belt Assemblies*, which incorporates by reference a number of recommended practices and test procedures developed by voluntary standards organizations. This amendment updates those references by incorporating the most recent version of the recommended practices and procedures. This amendment is intended to keep the standard in pace with the technological changes and improvements in the industry.

DATE: This amendment is effective July 30, 1983.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard No. 209, *Seat Belt Assemblies* (49 CFR 571.209), specifies performance requirements for seat belts used in passenger cars, trucks, buses and multipurpose passenger vehicles (both as original and aftermarket equipment). Several of the performance requirements of the standard incorporate recommended practices developed by voluntary standards organizations and associations. In addition, the standard specifies that certain, long-established industry test procedures be used in determining whether the seat belts meet those performance requirements. Because of the lengthy and technical nature of the recommended practices and test procedures, the standard incorporates those specifications by reference rather than setting out full texts in Standard No. 209.

Since Standard No. 209 was first issued, along with the incorporated material, some of the referenced practices and procedures have been modified in some respects by the standards organizations, because of technological changes and advancements. In light of these modifications, the agency conducted a review of all the materials incorporated by reference within Standard No. 209 to determine which materials needed to be changed so that their most recent version is incorporated in the standard. That review led to the issuance of a proposal to amend the standard to update all materials incorporated by reference (47 FR 31712, July 22, 1982). Interested persons should consult that notice of proposed rulemaking which sets out in detail the specific sections of the standard that include incorporated material, along with the proposed updated version of that material. As noted in the proposal, the incorporated material was developed by such voluntary standards associations as the American Association of Textile Chemists and Colorists (AATCC), the American Society for Testing and Materials (ASTM) and the Society of Automotive Engineers (SAE).

Nine comments were submitted to the agency in response to the notice of proposed rulemaking, all of which supported the proposed update of materials incorporated by reference in the standard. There were only a few recommended changes in the proposed revisions.

In addition to incorporating the new ASTM corrosion resistance test procedure (paragraph S5.2(a) of the standard), the agency proposed a minor change in the procedure. The ASTM procedure specifies that the seat belt hardware is to be "suitably cleaned" prior to testing. To clarify the extent of cleaning necessary, the agency proposed to specify that any temporary coating placed on the seat belt hardware shall be removed prior to testing. The purpose of the proposed change was to prevent the use of a coating material on the hardware during the corrosion resistance test that would aid the hardware in meeting the requirement, but which would not be found on the hardware when it is in actual vehicle use. Coatings which are applied permanently to the hardware would not have to be removed. The language proposed was as follows:

"Any surface coating or material not intended for permanent retention on the metal parts during service life shall be removed prior to preparation of the test specimen for testing."

Both Ford Motor Company and the Motor Vehicle Manufacturers Association requested changes in this language. Ford argued that the phrases "intended for permanent retention" and "during service life" are unduly restrictive because some anti-corrosion coatings are applied to component parts to inhibit their corrosion during shipment to assembly plants and are intended to remain on those parts after assembly of the vehicle and its delivery to the first retail purchaser. Ford noted that such oil coatings may, however, disappear (e.g., dry up) during the service life of the vehicle. (MVMA's concern appeared to be identical to Ford's.)

The agency proposed to clarify the cleaning instructions in the corrosion test procedure because a testing laboratory brought a potential problem to the agency's attention. The laboratory reported that certain seat belt components had been delivered to it for corrosion testing which had been coated with wax. Obviously, such a coating would preclude a true testing of the components' corrosion resistance and the coating would not likely be present throughout the service life of the vehicle (and might in fact be removed during vehicle assembly). While the agency understands the point raised by Ford and MVMA (that oil coatings are intended to remain on the components upon delivery), as Ford pointed out, these coatings will likely dry up during the service life of the vehicle. Therefore, it is the agency's opinion that wax, oil or other coatings that are not permanent should be removed prior to testing since they can skew the test results and misrepresent the corrosion resistance of component parts during actual vehicle use. Consequently, the proposed language is being maintained in this amendment. It should be noted, however, that this test requirement is in no way intended to preclude manufacturers from placing any coatings, either temporary or permanent, on their seat belt assembly components.

Section S5.1(e) of Standard No. 209 specifies the test procedures for measuring the resistance to light of seat belt assemblies. In May 1980, the agency proposed to alter the test apparatus used for these requirements in light of new dacron materials being used in belt assemblies (45 FR 29102). As a part of that action, the agency proposed to update the one ASTM recommended practice (E42-64) already incorporated in the standard and to add a reference to another ASTM practice (G24-66). The proposal preceding this amendment noted that the agency is awaiting the completion of additional testing before taking final action on the May 1980 proposal and that, if an amendment were adopted, the agency would incorporate the most recent version of both the ASTM recommended practices.

Volkswagen of America pointed out that ASTM G24-66 is not the most recent version of that standard and cited instead G24-73. The Motor Vehicle Manufacturers Association stated that its member companies had not yet had a chance to evaluate the new ASTM procedures and indicated that they could involve significant changes. Both commenters requested that a new proposal be issued before a final amendment involving the resistance to light requirements is issued. The agency realizes that the new ASTM procedures may involve substantial changes in the test procedures and does intend to issue an additional proposal prior to updating that aspect of the Standard No. 209 test procedures (pending completion of additional testing, as noted in the notice of proposed rulemaking).

Two commenters, American Motors Corporation and Ms. Patricia Hill, pointed out a discrepancy between the Occupant Weight and Dimension Charts referenced in S4.1(g)(3) of Standard No. 209 and in S7.1.3 of Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208). The hip breadth (sitting) for the 95th percentile adult male is listed as 16.4 inches in the former and as 16.5 inches in the latter. To remove this discrepancy, this notice amends the chart in Standard No. 209 to agree with the chart in Standard No. 208 (i.e., to read 16.5 inches). (Originally, the chart in Standard No. 208 also listed the hip breadth as 16.4 inches. This was amended January 8, 1981, to be consistent with the dimensions of the Part 572 test dummy (46 FR 2064)).

The American Seat Belt Council noted that a more recent version of AATCC Test Method 30 (30-81), Resistance to Microorganisms, has been issued than was noted in the proposal (which referenced 30-79). The agency has reviewed this latest version and determined that the only difference between 30-79 and 30-81 is the optional addition of glucose to the test culture used in Test III. The agency agrees with this option and therefore is incorporating AATCC Method 30-81 in this amendment.

The notice of proposed rulemaking preceding this amendment also solicited comments, information and data from the public concerning any current requirements of Standard No. 209 which possibly impose a regulatory burden and have a negligible or inconsequential impact on safety. The agency solicited this information as part of its regulatory review of all existing regulations. All comments to the proposal included suggested changes or revisions to reduce burdens, clarify requirements or to harmonize Standard No. 209 with European standards. These comments are currently being reviewed by the agency under its Regulatory Reform program and may lead to additional rulemaking to reduce or eliminate regulatory burdens imposed by Standard No. 209. (Persons interested in the recommended changes should consult comments to the proposal: Docket 82-15; Notice 1.)

In addition to the amendments discussed earlier, this notice also amends 49 CFR Part 571.5, Matter Incorporated by Reference, to list the address of the American Association of Textile Chemists and Colorists (AATCC). This amendment will assist interested parties in obtaining copies of the AATCC test procedures which are incorporated by reference in Standard No. 209.

The amendments included in this notice are to become effective 30 days after the date of this publication. The Administrator has determined that there is good cause for an effective date sooner than 180 days because this amendment only updates material incorporated by reference and makes no real substantive changes in the standard. Consequently, the burdens on manufacturers will in no way be increased.

Executive Order 12291

The agency has evaluated the economic and other impacts of this final rule and determined that they are neither major as defined by Executive Order 12291 nor significant as defined by the Department of Transportation's regulatory policies and procedures. The final rule only updates references to recommended practices and test methods already incorporated by reference in Standard No. 209. Because the economic and other effects of this proposal are so minimal, a full regulatory evaluation has not been prepared.

Regulatory Flexibility Act

In accordance with the Regulatory Flexibility Act, the agency has evaluated the effects of this action on small entities. Based on that evaluation, I certify that the final rule will not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared.

Only a few of the vehicle and parts manufacturers required to comply with Standard No. 209 are small businesses as defined by the Regulatory Flexibility Act. Small organizations and governmental jurisdictions which purchase fleets of motor vehicles would not be significantly affected by the amendments. The final rule merely updates references to test methods and recommended practices incorporated by reference in Standard No. 209. These updates should not impose any costs or other burdens.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

In consideration of the foregoing, the following amendments are made to Title 49, Chapter V, § 571.209, *Seat Belt Assemblies*, and § 571.5, Matter incorporated by reference:

§ 571.209 [Amended]

1. The first sentence of S4.1(f) is revised to read as follows:

* * * * *

S4.1 * * *

(f) *Attachment hardware.* A seat belt assembly shall include all hardware necessary for installation in a motor vehicle in accordance with Society of Automotive Engineers Recommended Practice J800c, "Motor Vehicle Seat Belt Installation," November 1973. * * *

* * * * *

2. The chart included in S4.1(g)(3) is amended so that the dimension for hip breadth (sitting) for the 95th percentile adult male reads as follows:

S4.1(g) * * *

(3) * * *

Hip breadth (sitting).... 12.8 in. .... 16.5 in.

3. The last sentence of S4.1(k) is revised to read as follows:

* * * * *

S4.1 * * *

(k) *Installation instructions.* * * * The installation instructions shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles, and shall include at least those items specified in SAE Recommended Practice J800c, "Motor Vehicle Seat Belt Installations," November 1973.

* * * * *

4. The second sentence of S4.3(a)(1) is revised to read as follows:

* * * * *

S4.3 * * *

(a) *Corrosion resistance. (1)* * * * Alternatively, such hardware at or near the floor shall be protected against corrosion by at least an electrodeposited coating of nickel, or copper and nickel with at least a service condition number of SC2, and other attachment hardware shall be protected by an electrodeposited coating of nickel, or copper and nickel with a service condition number of SC1, in accordance with American Society for Testing and Materials B456-79, "Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium," but such hardware shall not be racked for electroplating in locations subjected to maximum stress.

* * * * *

5. The first sentence of S5.1(b) is revised to read as follows:

* * * * *

S5.1 * * *

(b) *Breaking strength.* Webbing from three seat belt assemblies shall be conditioned in accordance with paragraph (a) of this section and tested for breaking strength in a testing machine of capacity verified to have an error of not more than one percent in the range of the breaking strength of the webbing in accordance with American Society for Testing and Materials E4-79, "Standard Methods of Load Verification of Testing Machines."

* * * * *

6. The first sentence of S5.1(f) is revised to read as follows:

* * * * *

S5.1 * * *

(f) *Resistance to microorganisms.* Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall first be preconditioned in accordance with Appendix A(1) and (2) of American Association of Textile Chemists and Colorists Test Method 30-81, "Fungicides Evaluation on Textiles; Mildew and Rot Resistance of Textiles," and then subjected to Test I, "Soil Burial Test" of that test method.

* * * * *

7. Paragraph (g) of S5.1 is revised to read as follows:

* * * * *

S5.1 * * *

(g) *Colorfastness to crocking.* Webbing from three seat belt assemblies shall be tested by the procedure specified in American Association of Textile Chemists and Colorists Standard Test Method 8-181, "Colorfastness to Crocking: AATCC Crockmeter Method."

* * * * *

8. Paragraph (h) of S5.1 is revised to read as follows:

* * * * *

S5.1 * * *

(h) *Colorfastness to staining.* Webbing from three seat belt assemblies shall be tested by the procedure specified in American Association of Textile Chemists and Colorists (AATCC) Standard Test Method 107-1981, "Colorfastness to Water," except that the testing shall use (1) distilled water, (2) the AATCC perspiration tester, (3) a drying time of four hours, specified in section 7.4 of the AATCC procedure, and (4) section 9 of the AATCC test procedures to determine the colorfastness to staining on the AATCC Chromatic Transference Scale.

* * * * *

9. The first sentence of S5.2(a) is revised and a new sentence is added after the first sentence so that the two sentences read as follows:

S5.2 Hardware.—

(a) *Corrosion Resistance.* Three seat belt assemblies shall be tested in accordance with American Society for Testing and Materials B117-73, "Standard Method of Salt Spray (Fog) Testing." Any surface coating or material not intended for permanent retention on the metal parts during service life shall be removed prior to preparation of the test specimens for testing. * * *

* * * * *

10. The first sentence of S5.2(b) is revised to read as follows:

S5.2 *Hardware.*

* * * * *

(b) *Temperature resistance.* Three seat belt assemblies having plastic or nonmetallic hardware or having retractors shall be subjected to the conditions prescribed in Procedure D of American Society for Testing and Materials D756-78, "Standard Practice for Determination of Weight and Shape Changes of Plastics under Accelerated Service Conditions." * * *

* * * * *

11. The eighth sentence of S5.2(k) is revised to read as follows:

* * * * *

S5.2 * * *

(k) * * * Then, the retractor and webbing shall be subjected to dust in a chamber similar to one illustrated in Figure 8 containing about 2 pounds or 0.9 kilogram of coarse grade dust conforming to the specification given in Society of Automotive Engineering Recommended Practice J726, "Air Cleaner Test Code" Sept. 1979. * * *

In § 571.5, paragraph (b)(5) is redesignated (b)(6) and a new paragraph (b)(5) is added to read as follows:

§ 571.5 *Matter incorporated by reference.*

* * * * *

(b) * * *

(5) *Test methods of the American Association of Textile Chemists and Colorists.* They are published by the American Association of Textile Chemists and Colorists. Information and copies can be obtained by writing to: American Association of Textile Chemists and Colorists, Post Office Box 886, Durham, NC.

(6) * * *

Issued on June 22, 1983

Diane K. Steed,
Acting Administrator.

48 F.R. 30138
June 30, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies
[Docket No. 80-06; Notice 3]

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 209, *Seat Belt Assemblies*, to alter the test procedure specified under the "resistance to light" requirements of the standard. This amendment is intended to establish an equivalent strength test for both nylon and polyester webbing materials used in seat belt assemblies. This amendment changes the test apparatus for polyester fibers by replacing the currently specified "Corex D" filter with a chemically strengthened or tempered soda-lime glass filter. The "Corex D" filter would still be utilized in testing nylon webbing, since it offers the best correlation with actual outdoor results when dealing with nylon webbing material.

EFFECTIVE DATE: September 18, 1985.

SUPPLEMENTARY INFORMATION: Under Safety Standard No. 209, *Seat Belt Assemblies* (49 CFR 571.209), seat belts must pass a "resistance to light" test (paragraph S4.2(e)). This test measures the strength and durability of the seat belt webbing material after exposure to sunlight. The "resistance to light" test represents an accelerated determination of outdoor exposure or aging. A rapid form of testing is needed so that webbing may be certified in accordance with Standard No. 209 and automotive companies' specifications prior to shipment.

On May 1, 1980, a Notice of Proposed Rulemaking (45 FR 29102) was issued, proposing an amendment to the procedure to be used in "resistance to light" tests. The original standard called for a "Corex D" filter in testing webbing material. The "Corex D" filter was an adequate test apparatus prior to the introduction of polyester webbing material for seat belts. Research had shown that although the specified test apparatus of a carbon arc light source combined with a "Corex D" filter, in general, was an effective method of simulating the effects of sunlight, it did result in the emission of certain radiations that were unrepresentative of the actual effects of natural sunlight. These peculiar radiations, which destroyed polyester but not nylon fibers, made the "Corex D" test procedure inappropriate for measuring the "resistance to light" requirements of seat belts containing polyester webbing material.

The proposed procedure replaced the required "Corex D" filter with a plain soda-lime glass filter in an attempt to create a similar, adequate testing for both nylon and polyester webbing material used in seat belt assemblies. Responses to that notice indicated that the proposed plain soda-lime glass filters were cracking either during the test cycle, due to the intense heat emitted during the 100 hours of test time, or after the test period, during the cool down of the equipment.

The Narrow Fabrics Institute, Inc. requested a delay in the rulemaking process in order to locate a less heat sensitive substitute. On September 16, 1980, the agency informed the Narrow Fabrics Institute, Inc. that the rulemaking process would be delayed until the development of a filter more resistant to thermal shock.

Upon completion of a 2-year search and a 1-year period of evaluation, the Narrow Fabrics Institue submitted a revised test apparatus. The improved filter was a chemically strengthened or tempered soda-lime glass. Testing done by the agency under Contract No. DTNH-22-83-P-02016 confirmed that the new filter maintained the same light transmittance characteristics of the untreated soda-lime glass filter originally proposed, but was free of the previous thermal shock problems. The treated soda-lime glass filter produces an excellent correlation with actual outdoor results, for the proper accelerated degradation of polyester webbing, without the prior breakage difficulties.

A careful evaluation of data compiled over the past few years demonstrates that as to nylon webbing material, the "Corex D" filter still affords the best correlation with actual outdoor results. In light of these various findings, the agency proposed on November 28, 1983 (48 FR 53583) to amend the test procedure to reflect these results.

Four of the five commenters to the docket supported the proposed amendment to Standard No. 209. The other commenter, Renault, made two objections. First, it argued that the carbon arc light used in Standard No. 209 is unrepresentative of real use conditions. It urges the use of an xenon lamp. As stated previously, the use of the carbon arc light with the appropriate filters produces excellent correlation with actual outdoors test of the resistance to light capability of seat belts. The agency, therefore, does not believe it is necessary to propose an amendment to allow the use of an xenon lamp.

Renault also said that Standard No. 209 should not use different test procedures for different materials. It recommended that the agency not require the use of different filters, but instead specify the transmission band and spectral distribution of the radiation used in the test. Finally, Renault said that if the agency decides to require a filter, it should provide a more specific definition of the filter to be used in the testing. In particular, Renault asked that the agency specify the wave length of the light being used.

The agency disagrees with Renault concerning the use of different filters in the resistance to light test. The carbon arc test equipment used in the resistance to light test is a well-established test procedure that has been long used by the motor vehicle and seat belt industries. Tests conducted by the Narrow Fabrics Institute show that the carbon arc test equipment, when used with the appropriate filters, produces results comparable to actual outdoor resistance to light tests. Although the agency has decided to retain the use of the filters, it agrees with Renault that the specific characteristics of the new soda-lime filter need to be more precisely defined. The agency has obtained information on the transmittance of chemically strengthened soda-lime glass from the principal manufacturer of that device. Based on that information, the agency is amending the standard to specify the transmittance of the soda-lime glass to be used in the resistance to light test of polyester belts.

Update References

In the November 1983 notice, the agency proposed to update one of the American Society for Testing and Materials recommended practices incorporated by reference in the standard. The proposal to incorporate ASTM G23-81 was not opposed by the commenters and is therefore adopted.

PART 571—[AMENDED]

In consideration of the foregoing, paragraph S5.1(e) of Safety Standard No. 209, *Seat Belt Assemblies* (49 CFR 571.209), is amended by revising paragraph (e) to read as follows:

§571.209 Standard No. 209; seat belt assemblies.

S5.1 * * *

(e) *Resistance to Light.* Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23-81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wave lengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanameters. The apparatus shall be operated without water spray at an air temperature of 60 ± 2 degrees Celsius or 140 ± 3.6 degrees Fahrenheit measured at a point 1.0 ± 0.2 inch or 25 ± 5 millimeters outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to light from the carbon-arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. The colorfastness of the exposed and conditioned specimens shall be determined on the Geometric Gray

Scale issued by the American Association of Textile Chemists and Colorists. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

Issued on August 31, 1984.

Diane K. Steed
Administrator

49 FR 36507
September 18, 1984

MOTOR VEHICLE SAFETY STANDARD NO. 209

Seat Belt Assemblies

(Docket No. 69-23)

S1. Purpose and Scope.

This standard specifies requirements for seat belt assemblies.

S2. Application.

This standard applies to seat belt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks, and buses.

S3. Definitions.

"Seat belt assembly" means any strap, webbing, or similar device designed to secure a person in a motor vehicle in order to mitigate the results of any accident, including all necessary buckles and other fasteners, and all hardware designed for installing such seat belt assembly in a motor vehicle.

"Pelvic restraint" means a seat belt assembly or portion thereof intended to restrain movement of the pelvis.

"Upper torso restraint" means a portion of a seat belt assembly intended to restrain movement of the chest and shoulder regions.

"Hardware" means any metal or rigid plastic part of a seat belt assembly.

"Buckle" means a quick release connector which fastens a person in a seat belt assembly.

"Attachment hardware" means any or all hardware designed for securing the webbing of a seat belt assembly to a motor vehicle.

"Adjustment hardware" means any or all hardware designed for adjusting the size of a seat belt assembly to fit the user, including such hardware that may be integral with a buckle, attachment hardware, or retractor.

"Retractor" means a device for storing part or all of the webbing in a seat belt assembly.

"Nonlocking retractor" means a retractor from which the webbing is extended to essentially its full length by a small external force, which provides no adjustment for assembly length, and which may or may not be capable of sustaining restraint forces at maximum webbing extension.

"Automatic-locking retractor" means a retractor incorporating adjustment hardware by means of a positive self-locking mechanism which is capable when locked of withstanding restraint forces.

"Emergency-locking retractor" means a retractor incorporating adjustment hardware by means of a locking mechanism that is activated by vehicle acceleration, webbing movement relative to the vehicle, or other automatic action during an emergency and is capable when locked of withstanding restraint forces.

"Seat back retainer" means the portion of some seat belt assemblies designed to restrict forward movement of a seat back.

"Webbing" means a narrow fabric woven with continuous filling yarns and finished selvages.

"Strap" means a narrow non-woven material used in a seat belt assembly in place of webbing.

"Type 1 seat belt assembly" is a lap belt for pelvic restraint.

"Type 2 seat belt assembly" is a combination of pelvic and upper-torso restraints.

"Type 2a shoulder belt" is an upper-torso restraint for use only in conjunction with a lap belt as a Type 2 seat belt assembly.

"Load-limiter" means 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.

S4. Requirements.

S4.1 (a) *Single occupancy.* A seat belt assembly shall be designed for use by one, and only one, person at any one time.

(b) *Pelvic restraint.* A seat belt assembly shall provide pelvic restraint whether or not upper torso restraint is provided, and the pelvic restraint shall be designed to remain on the pelvis under all conditions , including collision or roll-over of the motor vehicle. Pelvic restraint of a Type 2 seat belt assembly that can be used without upper torso restraint shall comply with requirements for Type 1 seat belt assembly in S4.1 to S4.4.

(c) *Upper torso restraint.* A Type 2 seat belt assembly shall provide upper-torso restraint without shifting the pelvic restraint into the abdominal region. An upper-torso restraint shall be designed to minimize vertical forces on the shoulders and spine. Hardware for upper-torso restraint shall be so designed and located in the seat belt assembly that the possibility of injury to the occupant is minimized.

A Type 2a shoulder belt shall comply with applicable requirements for a Type 2 seat belt assembly in S4.1 to S4.4, inclusive.

(d) *Hardware.* All hardware parts which contact under normal usage a person, clothing, or webbing shall be free from burrs and sharp edges.

(e) *Release.* A Type 1 or Type 2 seat belt assembly shall be provided with a buckle or buckles readily acccessible to the occupant to permit his easy and rapid removal from the assembly. Buckle release mechanism shall be designed to minimize the possibility of accidental release. A buckle with release mechanism in the latched position shall have only one opening in which the tongue can be inserted on the end of the buckle designed to receive and latch the tongue.

(f) *Attachment hardware.* [A seat belt assembly shall include all hardware necessary for installation in a motor vehicle in accordance with Society of Automotive Engineers Recommended Practice J800c, "Motor Vehicle Seat Belt Installation," Novemmber 1973. (48 F.R. 30138—June 30, 1983. Effective: July 30, 1983)] However, seat belt assemblies designed for installation in motor vehicles equipped with seat belt assembly anchorages that do not require anchorage nuts, plates, or washers, need not have such hardware, but shall have 7/16–20 UNF–2A or 1/2–13 UNC–2A attachment bolts or equivalent hardware. The hardware shall be designed to prevent attachment bolts and other parts from becoming disengaged from the vehicle while in service. Reinforcing plates or washers furnished for universal floor installations shall be of steel, free from burrs and sharp edges on the peripheral edges adjacent to the vehicle, at least 0.06 inch in thickness and at least 4 square inches in projected area. The distance between any edge of the plate and the edge of the bolt hole shall be at least 0.6 inch. Any corner shall be rounded to a radius of not less than 0.25 inch or cut so that no corner angle is less than 135° and no side is less than 0.25 inch in length.

(g) *Adjustment.*

(1) A Type 1 or Type 2 seat belt assembly shall be capable of adjustment to fit occupants whose dimensions and weight range from those of a 5th-percentile adult female to those of a 95th-percentile adult male. The seat belt assembly shall have either an automatic-locking retractor, an emergency-locking retractor, or an adjusting device that is within the reach of the occupant.

(2) A Type 1 or Type 2 seat belt assembly for use in a vehicle having seats that are adjustable shall conform to the requirements of S4.1(g) (1) regardless of seat position. However, if a seat has a back that is separately adjustable, the requirements of S4.1(g) (1) need be met only with the seat back in the manufacturer's nominal design riding position.

(3) The adult occupants referred to in S4.1(g) (1) shall have the following measurements:

	5th-percentile adult female	95th-percentile adult male
Weight	102 pounds	215 pounds.
Erect sitting height	30.9 inches	38 inches.
Hip breadth (sitting)	12.8 inches	16.5 inches.
Hip circumference (sitting)	36.4 inches	47.2 inches.
Waist circumference (sitting)	23.6 inches	42.5 inches.
Chest depth	7.5 inches	10.5 inches.
Chest circumference:		
(nipple)	30.5 inches	44.5 inches.
(upper)	29.8 inches	
(lower)	26.6 inches	

(h) *Webbing.* The ends of webbing in a seat belt assembly shall be protected or treated to prevent raveling. The end of webbing in a seat belt assembly having a metal-to-metal buckle that is used by the occupant to adjust the size of the assembly shall not pull out of the adjustment hardware at maximum size adjustment. Provision shall be made for essentially unimpeded movement of webbing routed between a seat back and seat cushion and attached to a retractor located behind the seat.

(i) *Strap.* A strap used in a seat belt assembly to sustain restraint forces shall comply with the requirements for webbing in S4.2, and if the strap is made from a rigid material, it shall comply with applicable requirements in S4.2, S4.3 and S4.4.

(j) *Marking.* Each seat belt assembly shall be permanently and legibly marked or labeled with year of manufacture, model, and name or trademark of manufacturer or distributor, or of importer if manufactured outside the United States. A model shall consist of a single combination of webbing having a specific type of fiber weave and construction, and hardware having a specific design. Webbings of various colors may be included under the same model, but webbing of each color shall comply with the requirements for webbing in S4.2.

(k) *Installation instructions.* A seat belt assembly or retractor shall be accompanied by an instruction sheet providing sufficient information for installing the assembly in a motor vehicle except for a seat belt assembly installed in a motor vehicle by an automobile manufacturer. [The installation instructions shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles, and shall include at least those items specified in SAE Recommended Practice J800c, "Motor Vehicle Seat Belt Installations," November 1973. (48 F.R. 30138—June 30, 1983. Effective: July 30, 1983)]

(l) *Usage and maintenance instructions.* A seat belt assembly or retractor shall be accompanied by written instructions for the proper use of the assembly, stressing particularly the importance of wearing the assembly snugly and properly located on the body, and on the maintenance of the assembly and periodic inspection of all components. The instructions shall show the proper manner of threading webbing in the hardware of seat belt assemblies in which the webbing is not permanently fastened. Instructions for a nonlocking retractor shall include a caution that the webbing must be fully extended from the retractor during use of the seat belt assembly unless the retractor is attached to the free end of webbing which is not subjected to any tension during restraint of an occupant by the assembly. Instructions for Type 2a shoulder belt shall include a warning that the shoulder belt is not to be used without a lap belt.

(m) *Workmanship.* Seat belt assemblies shall have good workmanship in accordance with good commercial practice.

S4.2 Requirements for webbing.

(a) *Width.* The width of the webbing in a seat belt assembly shall be not less than 1.8 inches, except for portions that do not touch a 95th-percentile adult male with the seat in any adjustment position and the seat back in the manufacturer's nominal design riding position when measured under the conditions prescribed in S5.1(a).

(b) *Breaking strength.* The webbing in a seat belt assembly shall have not less than the following breaking strength when tested by the procedures specified in S5.1(b): Type 1 seat belt assembly—6,000 pounds or 2,720 kilograms; Type 2 seat belt assembly—5,000 pounds or 2,270 kilograms for webbing in pelvic restraint and 4,000 pounds or 1,810 kilograms for webbing in upper-torso restraint.

(c) *Elongation.* Except as provided in S4.5, the webbing in a seat belt assembly shall not be extended to more than the following elongations when subjected to the specified forces in accordance with the procedure specified in S5.1(c): Type 1 seat belt assembly— 20 percent at 2,500 pounds or 1,130 kilograms; Type 2 seat belt assembly—30 percent at 2,500 pounds or 1,130 kilograms for webbing in pelvic restraint and 40 percent at 2,500 pounds or 1,130 kilograms for webbing in upper-torso restraint.

(d) *Resistance to abrasion.* The webbing of a seat belt assembly, after being subjected to abrasion as specified in S5.1(d) or S5.3(c), shall have a breaking strength of not less than 75 percent of the breaking strength listed in S4.2(b) for that type of belt assembly.

(e) *Resistance to light.* The webbing in a seat belt assembly after exposure to the light of a carbon arc and tested by the procedure specified in S5.1(e) shall have a breaking strength not less than 60 percent of the strength before exposure to the carbon arc and shall have a color retention not less than No. 2 on the Geometric Gray Scale published by the American Association of Textile Chemists and Colorists, Post Office Box 886, Durham, N.C.

(f) *Resistance to micro-organisms.* The webbing in a seat belt assembly after being subjected to micro-organisms and tested by the procedures specified in S5.1(f) shall have a breaking strength not less than 85 percent of the strength before subjection to micro-organisms.

(g) *Colorfastness to crocking.* The webbing in a seat belt assembly shall not transfer color to a crock cloth either wet or dry to a greater degree than class 3 on the AATCC Chart for Measuring Transference of Color published by the American Association of Textile Chemists and Colorists, when tested by the procedure specified in S5.1(g).

(h) *Colorfastness to staining.* The webbing in a seat belt assembly shall not stain to a greater degree than class 3 on the AATCC Chart for Measuring Transference of Color published by the American Association of Textile Chemists and Colorists, when tested by the procedure specified in S5.1(h).

S4.3 Requirements for hardware.

(a) *Corrosion resistance.*

(1) Attachment hardware of a seat belt assembly after being subjected to the conditions specified in S5.2(a) shall be free of ferrous corrosion on significant surfaces except for permissible ferrous corrosion at peripheral edges or edges of holes on underfloor reinforcing plates and washers. [Alternatively, such hardware at or near the floor shall be protected against corrosion by at least an electrodeposited coating of nickel, or copper and nickel with at least a service condition number of SC2, and other attachment hardware shall be protected by an electrodeposited coating of nickel, or copper and nickel with a service condition number of SC1, in accordance with American Society for Testing and Materials B456–79, "Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium," but such hardware shall not be racked for electroplating in locations subjected to maximum stress. (48 F.R. 30138—June 30, 1983. Effective: July 30, 1983)]

(2) Surfaces of buckles, retractors and metallic parts, other than attachment hardware, of a seat belt assembly after subjection to the conditions specified in S5.2(a) shall be free of ferrous or nonferrous corrosion which may be transferred, either directly or by means of the webbing, to the occupant or his clothing when the assembly is worn. After test, buckles shall conform to applicable requirements in paragraphs (d) to (g) of this section.

(b) *Temperature resistance.* Plastic or other nonmetallic hardware parts of a seat belt assembly when subjected to the conditions specified in S5.2(b) shall not warp or otherwise deteriorate to cause the assembly to operate improperly or fail to comply with applicable requirements in this section and S4.4.

(c) *Attachment hardware.*

(1) Eye bolts, shoulder bolts, or other bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall withstand a force of 9,000 pounds or 4,080 kilograms when tested by the procedure specified in S5.2(c) (1), except that attachment bolts of a seat belt assembly designed for installation in specific models of motor vehicles in which the ends of two or more seat belt assemblies can not be attached to the vehicle by a single bolt shall have a breaking strength of not less than 5,000 pounds or 2,270 kilograms.

(2) Other attachment hardware designed to receive the ends of two seat belt assemblies shall withstand a tensile force of at least 6,000 pounds or 2,720 kilograms without fracture of any section when tested by the procedure specified in S5.2(c) (2).

(3) A seat belt assembly having single attachment hooks of the quick-disconnect type for connecting webbing to an eye bolt shall be provided with a retaining latch or keeper which shall not move more than 0.08 inch or 2 millimeters in either the vertical or horizontal direction when tested by the procedure specified in S5.2(c) (3).

(d) *Buckle release.*

(1) The buckle of a Type 1 or Type 2 seat belt assembly shall release when a force of not more than 30 pounds or 14 kilograms is applied.

(2) A buckle designed for pushbutton application of buckle release force shall have a minimum area of 0.7 square inch or 4.5 square centimeters with a minimum linear dimension of 0.4 inch or 10 millimeters for applying the release force, or a buckle designed for lever application of a buckle release force shall permit the insertion of a cylinder 0.4 inch or 10 millimeters in diameter and 1.5 inches or 38 millimeters in length to at least the midpoint of the cylinder along the cylinder's entire length in the actuation portion of the buckle release. A buckle having other design for release shall have adequate access for two or more fingers to actuate release.

(3) The buckle of a Type 1 or Type 2 seat belt assembly shall not release under a compressive force of 400 pounds applied as prescribed in paragraph S5.2(d) (3). The buckle shall be operable and shall meet the applicable requirements of paragraph S4.4 after the compressive force has been removed.

(e) *Adjustment force.* The force required to decrease the size of a seat belt assembly shall not exceed 11 pounds or 5 kilograms when measured by the procedure specified in S5.2(e).

(f) *Tilt-lock adjustment.* The buckle of a seat belt assembly having tilt-lock adjustment shall lock the webbing when tested by the procedure specified in S5.2(f) at an angle of not less than 30 degrees between the base of the buckle and the anchor webbing.

(g) *Buckle latch.* The buckle latch of a seat belt assembly when tested by the procedure specified in S5.2(g) shall not fail, nor gall or wear to an extent that normal latching and unlatching is impaired, and a metal-to-metal buckle shall separate when in any position of partial engagement by a force of not more than 5 pounds or 2.3 kilograms.

(h) *Nonlocking retractor.* The webbing of a seat belt assembly shall extend from a nonlocking retractor within 0.25 inch or 6 millimeters of maximum length when a tension is applied as prescribed in S5.2(h). A nonlocking retractor on upper-torso restraint shall be attached to the nonadjustable end of the assembly, the reel of the retractor shall be easily visible to an occupant while wearing the assembly, and the maximum retraction force shall not exceed 1.1 pounds or 0.5 kilogram in any strap or webbing that contacts the shoulder when measured by the procedure specified in S5.2(h), unless the retractor is attached to the free end of webbing which is not subjected to any tension during restraint of an occupant by the assembly.

(i) *Automatic-locking retractor.* The webbing of a seat belt assembly equipped with an automatic-locking retractor, when tested by the procedure specified in S5.2(i), shall not move more than 1 inch or 25 millimeters between locking positions of the retractor, and shall be retracted with a force under zero acceleration of not less than 0.6 pound or 0.27 kilogram when attached to pelvic restraint, and not less than 0.45 pound or 0.2 kilogram nor more than 1.1 pounds or 0.5 kilogram in any strap or webbing that contacts the shoulder of an occupant when the retractor is attached to upper-torso restraint. An automatic-locking retractor attached to upper-torso restraint shall not increase the restraint on the occupant of the seat belt assembly during use in a vehicle traveling over rough roads as prescribed in S5.2(i).

(j) *Emergency-locking retractor.* An emergency-locking retractor of a Type 1 or Type 2 seat belt assembly, when tested in accordance with the procedures specified in paragraph S5.2(j)—

(1) Shall lock before the webbing extends 1 inch when the retractor is subjected to an acceleration of 0.7g;

(2) Shall not lock, if the retractor is sensitive to webbing withdrawal, before the webbing extends 2 inches when the retractor is subjected to an acceleration of 0.3g or less;

(3) Shall not lock, if the retractor is sensitive to vehicle acceleration, when the retractor is rotated in any direction to any angle of 15° or less from its orientation in the vehicle;

(4) Shall exert a retroactive force of at least 0.6 pound under zero acceleration when attached only to the pelvic restraint;

(5) Shall exert a retractive force of not less than 0.2 pound and not more than 1.1 pounds under zero acceleration when attached only to an upper-torso restraint;

(6) Shall exert a retractive force of not less than 0.2 pound and not more than 1.5 pounds under zero acceleration when attached to a strap or webbing that restrains both the upper torso and the pelvis.

(k) *Performance of retractor.* A retractor used on a seat belt assembly after subjection to the tests specified in S5.2(k) shall comply with applicable requirements in paragraphs (h) to (j) of this section and S4.4, except that the retraction force shall be not less than 50 percent of its original retraction force.

S4.4 Requirements for assembly performance.

(a) *Type 1 seat belt assembly.* Except as provided in S4.5, the complete seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedures specified in S5.3(a):

(1) The assembly loop shall withstand a force of not less than 5,000 pounds or 2,270 kilograms;

that is, each structural component of the assembly shall withstand a force of not less than 2,500 pounds or 1,130 kilograms.

(2) The assembly loop shall extend not more than 7 inches or 18 centimeters when subjected to a force of 5,000 pounds or 2,270 kilograms; that is, the length of the assembly between anchorages shall not increase more than 14 inches or 36 centimeters.

(3) Any webbing cut by the hardware during test shall have a breaking strength at the cut of not less than 4,200 pounds or 1,910 kilograms.

(4) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

(b) *Type 2 seat belt assembly.* Except as provided in S4.5, the components of a Type 2 seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedure specified in S5.3(b):

(1) The structural components in the pelvic restraint shall withstand a force of not less than 2,500 pounds or 1,139 kilograms.

(2) The structural components in the upper torso restraint shall withstand a force of not less than 1,500 pounds or 680 kilograms.

(3) The structural components in the assembly that are common to pelvic and upper torso restraints shall withstand a force of not less than 3,000 pounds or 1,360 kilograms.

(4) The length of the pelvic restraint between anchorages shall not increase more than 20 inches or 50 centimeters when subjected to a force of 2,500 pounds or 1,130 kilograms.

(5) The length of the upper torso restraint between anchorages shall not increase more than 20 inches or 50 centimeters when subjected to a force of 1,500 pounds or 680 kilograms.

(6) Any webbing cut by the hardware during test shall have a breaking strength of not less than 3,500 pounds or 1,590 kilograms at a cut in webbing of the pelvic restraint, or not less than 2,800 pounds or 1,270 kilograms at a cut in webbing of the upper-torso restraint.

(7) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

S4.5 Load-limiter.

(a) A Type 1 or Type 2 seat belt assembly that includes a load-limiter is not required to comply with the elongation requirements of S4.2(c), S4.4(a) (2), S4.4(b) (4) or S4.4(b) (5).

(b) A Type 1 or Type 2 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 only in conjunction with an automatic restraint system as part of a total occupant restraint system.

(c) In addition to the marking requirements specified in S4.1(k), a Type 1 or Type 2 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 words:

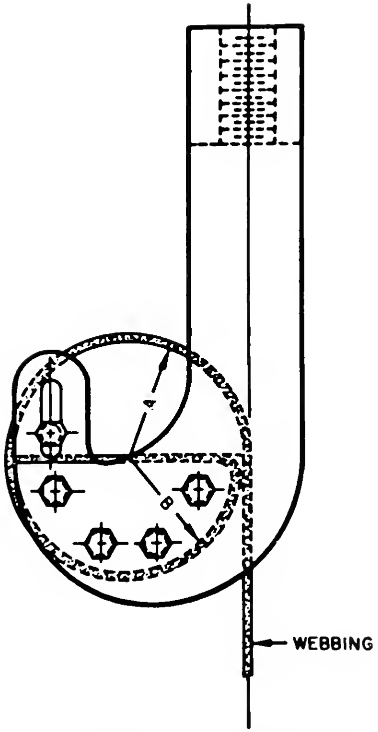
"This seat belt assembly may only be installed in vehicles in combination with an automatic restraint system such as an air cushion or an automatic belt."

S5. Demonstration Procedures.

S5.1 Webbing.

(a) *Width.* The width of webbing from three seat belt assemblies shall be measured after conditioning for at least 24 hours in an atmosphere having relative humidity between 48 and 67 percent and a temperature of $23° \pm 2°$ or $73.4° \pm 3.6°$. The tension during measurement of width shall be not more than 5 pounds or 2 kilograms on webbing from a Type 1 or Type 3 seat belt assembly, and $2,200 \pm 100$ pounds or $1,000 \pm 50$ kilograms on webbing from a Type 2 seat belt assembly. The width of webbing from a Type 2 seat belt assembly may be measured during the breaking strength test described in paragraph (b) of this section.

(b) *Breaking strength.* [Webbing from three seat belt assemblies shall be conditioned in accordance with paragraph (a) of this section and tested for breaking strength in a testing machine of capacity verified to have an error of not more than one percent in the range of the breaking strength of the webbing in accordance with American Society for Testing and Materials E4-79, "Standard Methods of Load Verification of Testing Machines." (48 F.R. 30138—June 30, 1983. Effective: July 30, 1983)]



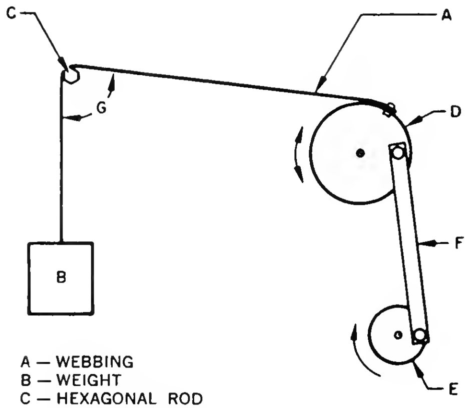
A 1 TO 2 INCHES OR 2.5 TO 5 CENTIMETERS
B A MINUS 0.06 INCH 0.15 CENTIMETER

FIGURE 1

The machine shall be equipped with split drum grips illustrated in Figure 1, having a diameter between 2 and 4 inches or 5 and 10 centimeters. The rate of grip separation shall be between 2 and 4 inches per minute or 5 and 10 centimeters per minute. The distance between the centers of the grips at the start of the test shall be between 4 and 10 inches or 10 and 25 centimeters. After placing the specimen in the grips, the webbing shall be stretched continuously at a uniform rate to failure. Each value shall be not less than the applicable breaking strength requirement in S4.2(b), but the median value shall be used for determining the retention of breaking strength in paragraphs (d), (e), and (f) of this section.

(c) *Elongation.* Elongation shall be measured during the breaking strength test described in paragraph (b) of this section by the following procedure: A preload between 44 and 55 pounds or 20 and 25 kilograms shall be placed on the webbing mounted in the grips of the testing machine and the needle points of an extensometer, in which the points remain parallel during test, are inserted in the center of the specimen. Initially the points shall be set at a known distance apart between 4 and 8 inches or 10 and 20 centimeters. When the force on the webbing reaches the value specified in S4.2(c), the increase in separation of the points of the extensometer shall be measured and the percent elongation shall be calculated to the nearest 0.5 percent. Each value shall be not more than the appropriate elongation requirement in S4.2(c).

(d) *Resistance to abrasion.* The webbing from three seat belt assemblies shall be tested for resistance to abrasion by rubbing over the hexagon bar prescribed in Figure 2 in the following manner:



A — WEBBING
B — WEIGHT
C — HEXAGONAL ROD
STEEL — SAE 51416
ROCKWELL HARDNESS — B-97 TO B-101
SURFACE — COLD DRAWN FINISH
SIZE — 0.250 ± 0.001 INCH OR
6.35 ± 0.03 MILLIMETER
RADIUS ON EDGES — 0.020 ± 0.004 INCH OR
0.5 ± 0.1 MILLIMETER
D — DRUM DIAMETER — 16 INCHES OR
40 CENTIMETERS
E — CRANK
F — CRANK ARM
G — ANGLE BETWEEN WEBBING — 85 ± 2 DEGS.

FIGURE 2

The webbing shall be mounted in the apparatus shown schematically in Figure 2. One end of the webbing (A) shall be attached to a weight (B) which has a mass of 5.2 ± 0.1 pounds or 2.35 ± 0.05 kilograms, except that a mass of 3.3 ± 0.1 pounds or 1.50 ± 0.05 kilograms shall be used for webbing in pelvic and upper-torso restraints of a belt assembly used in a child restraint system. The webbing shall be passed over the two new abrading edges of the hexagon bar (C) and the other end attached to an oscillating drum (D) which has a stroke of 13 inches or 33 centimeters. Suitable guides shall be used to prevent movement of the webbing along the axis of hexagonal bar C. Drum D shall be oscillated for 5,000 strokes or 2,500 cycles at a rate of 60 ± 2 strokes per minute or 30 ± 1 cycles per minute. The abraded webbing shall be conditioned as prescribed in paragraph (a) of this section and tested for breaking strength by the procedure described in paragraph (b) of this section. The median values for the breaking strengths determined on abraded and unabraded specimens shall be used to calculate the percentage of braking strength retained.

(e) *Resistance to light.* [Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, ASTM Designation: G23-81, published by the American Society for Testing and Materials, except that the filter used for 100 percent polyester yarns shall be chemically strengthened soda-lime glass with a transmittance of less than 5 percent for wave lengths equal to or less than 305 nanometers and 90 percent or greater transmittance for wave lengths of 375 to 800 nanometers. The apparatus shall be operated without water spray at an air temperature of $60° \pm 2$ degrees Celsius or $140° \pm 3.6$ degrees Fahrenheit measured at a point 1.0 ± 0.2 inch or 25 ± 5 millimeters outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to light from the carbon arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. The colorfastness of the exposed and conditioned specimens shall be determined on the Geometric Gray Scale issued by the American Association of Textile Chemists and Colorists. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained. (49 F.R. 36507—September 18, 1984. Effective: September 18, 1985)]

(f) *Resistance to micro-organisms.* Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall first be preconditioned in accordance with Appendix A(1) and (2) of American Association of Textile Chemists and Colorists Test Method 30-81, "Fungicides Evaluation on Textiles; Mildew and Rot Resistance of Textiles," and then subjected to Test I, "Soil Burial Test" of that test method. After soil-burial for a period of 2 weeks, the specimen shall be washed in water, dried and conditioned as prescribed in paragraph (a) of this section. The breaking strengths of the specimens shall be determined by the procedure prescribed in paragraph (b) of thissection. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

NOTE.—This test shall not be required on webbing made from material which is inherently resistant to micro-organisms.

(g) *Colorfastness to crocking.* Webbing from three seat belt assemblies shall be tested by the procedure specified in American Association of Textile Chemists and Colorists Standard Test Method 8—181, "Colorfastness to Crocking: AATCC Crockmeter Method."

(h) *Colorfastness to staining.* Webbing from three seat belt assemblies shall be tested by the procedure specified in American Association of Textile Chemists and Colorists (AATCC) Standard Test Method 107-1981, "Colorfastness to Water," except that the testing shall use (1) distilled water, (2) the AATCC perspiration tester, (3) a drying time of four hours, specified in section 7.4 of the AATCC procedure, and (4) section 9 of the AATCC test procedures to determine the colorfastness to staining on the AATCC Chromatic Transference Scale.

S5.2 Hardware.

(a) *Corrosion resistance.* Three seat belt assemblies shall be tested in accordance with American Society for Testing and Materials

B117-73, "Standard Method of Salt Spray (Fog) Testing." Any surface coating or material not intended for permanent retention on the metal parts during service life shall be removed prior to preparation of the test specimens for testing. The period of test shall be 50 hours for all attachment hardware at or near the floor, consisting of two periods of 24 hours exposure to salt spray followed by 1 hour drying and 25 hours for all other hardware, consisting of one period of 24 hours exposure to salt spray followed by 1 hour drying. In the salt spray test chamber, the parts from the three assemblies shall be oriented differently, selecting those orientations most likely to develop corrosion on the larger areas. At the end of test, the seat belt assembly shall be washed thoroughly with water to remove the salt. After drying for at least 24 hours under standard laboratory conditions specified in S5.1(a) attachment hardware shall be examined for ferrous corrosion on significant surfaces, that is, all surfaces that can be contacted by a sphere 0.75 inch or 2 centimeters in diameter, and other hardware shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the hardware.

NOTE.—When attachment and other hardware are permanently fastened, by sewing or other means, to the same piece of webbing, separate assemblies shall be used to test the two types of hardware. The test for corrosion resistance shall not be required for attachment hardware made from corrosion-resistant steel containing at least 11.5 percent chromium or for attachment hardware protected with an electro-deposited coating of nickel, or copper and nickel, as prescribed in S4.3(a). The assembly that has been used to test the corrosion resistance of the buckle shall be used to measure adjustment force, tilt-lock adjustment, and buckle latch in paragraphs (e), (f) and (g), respectively, of this section, assembly performance in S5.3 and buckle release force in paragraph (d) of this section.

(b) *Temperature resistance.* Three seat belt assemblies having plastic or nonmetallic hardware or having retractors shall be subjected to the conditions prescribed in Procedure D of American Society for Testing and Materials D756-78, "Standard Practice for Determination of Weight and Shape Changes of Plastics under Accelerated Service Conditions." The dimension and weight measurement shall be omitted. Buckles shall be unlatched and retractors shall be fully retracted during conditioning. The hardware parts after conditioning shall be used for all applicable tests in S4.3 and S4.4.

(c) *Attachment hardware.*

(1) Attachment bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall be tested in a manner similar to that shown in Figure 3. The load shall be applied at an angle of 45 degrees to the axis of the bolt through attachment hardware from the seat belt assembly, or through a special fixture which simulates the loading applied by the attachment hardware. The attachment hardware or simulated fixture shall be fastened by the bolt to the anchor-

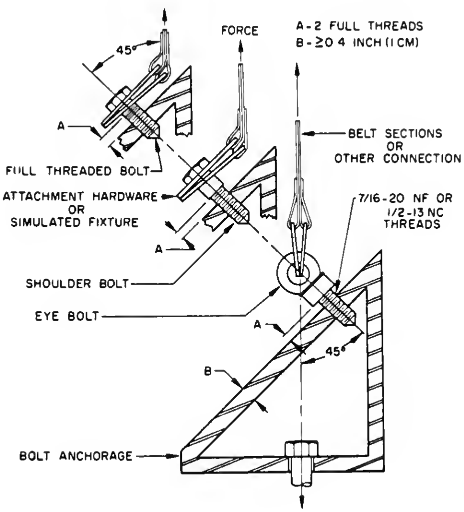


FIGURE 3

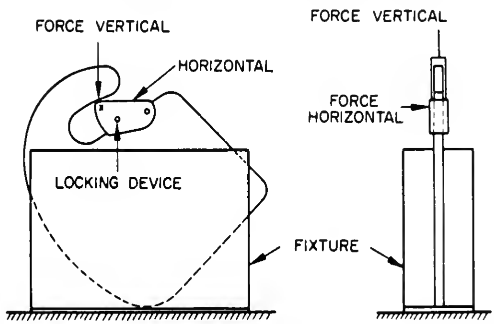


FIGURE 4
SINGLE ATTACHMENT HOOK

age shown in Figure 3, which has a standard 7/16–20 UNF–2B or 1/2–13 UNC–2B threaded hole in a hardened steel plate at least 0.4 inch or 1 centimeter in thickness. The bolt shall be installed with two full threads exposed from the fully seated position. The appropriate force required by S4.3(c) shall be applied. A bolt from each of three seat belt assemblies shall be tested.

(2) Attachment hardware, other than bolts, designed to receive the ends of two seat belt assemblies shall be subjected to a tensile force of 6,000 pounds or 2,720 kilograms in a manner simulating use. The hardware shall be examined for fracture after the force is released. Attachment hardware from three seat belt assemblies shall be tested.

(3) Single attachment hook for connecting webbing to any eye bolt shall be tested in the following manner: The hook shall be held rigidly so that the retainer latch or keeper, with cotter pin or other locking device in place, is in a horizontal position as shown in Figure 4. A force of 150 ± 2 pounds or 68 ± 1 kilograms shall be applied vertically as near as possible to the free end of the retainer latch, and the movement of the latch by this force at the point of application shall be measured. The vertical force shall be released, and a force of 150 ± 2 pounds or 68 ± 1 kilograms shall be applied horizontally as near as possible to the free end of the retainer latch. The movement of the latch by this force at the point of load application shall be measured. Alternatively, the hook may be held in other positions, provided the forces are applied and the movements of the latch are measured at the points indicated in Figure 4. A single attachment hook from each of three seat belt assemblies shall be tested.

(d) *Buckle release.*

(1) Three seat belt assemblies shall be tested to determine compliance with the maximum buckle release force requirements, following the assembly test in S5.3. After subjection to the force applicable for the assembly being tested, the force shall be reduced and maintained at 150 pounds on the assembly loop of a Type 1 seat belt assembly, 75 pounds on the components of a Type 2 seat belt assembly, or 45 pounds on a Type 3 seat belt assembly. The buckle release force shall be measured by applying a force on the buckle in a manner and direction typical of those which would be employed by a seat belt occupant. For pushbutton-release buckles, the force shall be applied at least 0.125 inch from the edge of the push-button access opening of the buckle in a direction that produces maximum releasing effect. For lever-release buckles, the force shall be applied on the centerline of the buckle level or finger tab in a direction that produces maximum releasing effect.

(2) The area for application of release force on pushbutton actuated buckle shall be measured to the nearest 0.05 square inch or 0.3 square centimeter. The cylinder specified in S4.3(d) shall be inserted in the actuation portion of a lever release buckle for determination of compliance with the requirement. A buckle with other release actuation shall be examined for access of release by fingers.

(3) The buckle of a Type 1 or Type 2 seat belt assembly shall be subjected to a compressive force of 400 pounds applied anywhere on a test line that is coincident with the centerline of the belt extended through the buckle or on any line that extends over the center of the release mechanism and intersects the extended centerline of the belt at an angle of 60°. The load shall be applied by using a curved cylindrical bar having a cross section diameter of 0.75 inch and a radius of curvature of 6 inches, placed with its longitudinal centerline along the test line and its center directly above the point on the buckle to which the load will be applied. The buckle shall be latched, and a tensile force of 75 pounds shall be applied to the connected webbing during the application of the compressive force. Buckles from three seat belt assemblies shall be tested to determine compliance with paragraph S4.3(d) (3).

(e) *Adjustment force.* Three seat belt assemblies shall be tested for adjustment force on the webbing at the buckle, or other manual adjusting device normally used to adjust the size of the assembly. With no load on the anchor end, the webbing shall be drawn through the adjusting device at a rate of 20 ± 2 inches per minute or 50 ± 5 centimeters per minute and the maximum force shall be measured to the nearest 0.25 pound or 0.1 kilogram after the first 1.0 inch or 25 millimeters of webbing movement. The webbing shall be precycled 10 times prior to measurement.

(f) *Tilt-lock adjustment.* This test shall be made on buckles or other manual adjusting devices having tilt-lock adjustment normally used to adjust the size of the assembly. Three buckles or devices shall be tested. The base of the adjustment mechanism and the anchor end of the webbing shall be oriented in planes normal to each other. The webbing shall be drawn through the adjustment mechanism in a direction to increase belt length at a rate of 20 ± 2 inches per minute or 50 ± 5 centimeters per minute while the plane of the base is slowly rotated in a direction to lock the webbing. Rotation shall be stopped when the webbing locks, but the pull on the webbing shall be continued until there is a resistance of at least 20 pounds or 9 kilograms. The locking angle between the anchor end of the webbing and the base of the adjustment mechanism shall be measured to the nearest degree. The webbing shall be precycled 10 times prior to measurement.

(g) *Buckle latch.* The buckles from three seat belt assemblies shall be opened fully and closed at least 10 times. [Then the buckles shall be clamped or firmly held against a flat surface so as to permit normal movement of buckle parts, but with the metal mating plate (metal-to-metal buckles) or webbing end (metal-to-webbing buckles) withdrawnfrom the buckle. (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)] The release mechanism shall be moved 200 times through the maximum possible travel against its stop with a force of 30 ± 3 pounds or 14 ± 1 kilograms at a rate not to exceed 30 cycles per minute. The buckle shall be examined to determine compliance with the performance requirements of S4.3(g). A metal-to-metal buckle shall be examined to determine whether partial engagement is possible by means of any technique representative of actual use. If partial engagement is possible, the maximum force of separation when in such partial engagement shall be determined.

(h) *Nonlocking retractor.* After the retractor is cycled 10 times by full extension and retraction of the webbing, the retractor and webbing shall be suspended vertically and a force of 4 pounds or 1.8 kilograms shall be applied to extend the webbing from the retractor. The force shall be reduced to 3 pounds or 1.4 kilograms when attached to a pelvic restraint, or to 1.1 pounds or 0.5 kilogram per strap or webbing that contacts the shoulder of an occupant when retractor is attached to an upper-torso restraint. The residual extension of the webbing shall be measured by manual rotation of the retractor drum or by disengaging the retraction mechanism. Measurements shall be made on three retractors. The location of the retractor attached to upper-torso restraint shall be examined for visibility of reel during use of seat belt assembly in a vehicle.

NOTE.—This test shall not be required on a nonlocking retractor attached to the free-end of webbing which is not subjected to any tension during restraint of an occupant by the assembly.

(i) *Automatic-locking retractor.* Three retractors shall be tested in a manner to permit the retraction force to be determined exclusive of the gravitational forces on hardware or webbing being retracted. The webbing shall be fully extended from the retractor. While the webbing is being retracted, the average force of retraction within plus or minus 2 inches or 5 centimeters of 75 percent extension (25-percent retraction) shall be determined and the webbing movement between adjacent locking segments shall be measured in the same region of extension. A seat belt assembly with automatic locking retractor in upper torso restraint shall be tested in a vehicle in a manner prescribed by the installation and usage instructions. The retraction force on the occupant of the seat belt assembly shall be determined before and after traveling for 10 minutes at a speed of 15 miles per hour or 24 kilometers per hour or more over a rough road (e.g., Belgian block road) where the occupant is subjected to displacement with respect to the vehicle in both horizontal and vertical directions. Measurements shall be made with the vehicle stopped and the occupant in the normal seated position.

(j) *Emergency-locking retractor.* A retractor shall be tested in a manner that permits the retraction force to be determined exclusive of the gravitational forces on hardware or webbing being retracted. The webbing shall be fully extended from the retractor, passing over or through any hardware or other material specified in the installation instructions. While the webbing is being retracted, the lowest force of retraction within plus or minus 2 inches of 75 percent extension shall be determined. A retractor that is sensitive to webbing withdrawal shall be subjected to an acceleration of 0.3g within a period of 50 milliseconds while the webbing is at 75-percent extension, to determine compliance with S4.3(j) (2). The retractor shall be subjected to an acceleration of 0.7g within a period of 50 milliseconds, while the webbing is at 75-percent extension, and the webbing movement before locking shall be measured under the following conditions: For a retractor sensitive to webbing withdrawal, the retractor shall be accelerated in the direction of webbing retraction while the retractor drum's central axis is oriented horizontally and at angles of 45°, 90°, 135°, and 180° to the horizontal plane. For a retractor sensitive to vehicle acceleration, the retractor shall be—

(1) accelerated in the horizontal plane in two directions normal to each other, while the retractor drum's central axis is oriented at the angle at which it is installed in the vehicle; and,

(2) accelerated in three directions normal to each other while the retractor drum's central axis is oriented at angles of 45°, 90°, 135° and 180° from the angle at which it is installed in the vehicle, unless the retractor locks by gravitational force when tilted in any direction to any angle greater than 45° from the angle at which it is installed in the vehicle.

(k) *Performance of retractor.* After completion of the corrosion-resistance test described in paragraph (a) of this section, the webbing shall be fully extended and allowed to dry for at least 24 hours under standard laboratory conditions specified in S5.1(a). [Then, the retractor and webbing shall be subjected to dust in a chamber similar to one illustrated in Figure 8 containing about 2 pounds or 0.9 kilogram of coarse grade dust conforming to the specification given in Society of Automotive Engineering Recommended Practice J726, "Air Cleaner Test Code" Sept. 1979. (48 F.R. 30138—June 30, 1983. Effective: July 30, 1983)] The webbing shall be withdrawn manually and allowed to retract for 25 cycles. The retractor shall be mounted in an apparatus capable of extending the webbing fully, applying a force of 20 pounds or 9 kilograms at full extension, and allowing the webbing to retract freely and completely. The webbing shall be withdrawn from the retractor and allowed to retract repeatedly in this apparatus until 2,500 cycles are completed. The retractor and webbing shall then be subjected to the temperature resistance test prescribed in paragraph (b) of this section. The retractor shall be subjected to 2,500 additional cycles of webbing withdrawal and retraction. Then, the retractor and webbing shall be subjected to dust in a chamber similar to one illustrated in Figure 6 containing about 2 pounds or 0.9 kilogram of coarse grade dust conforming to the specification given in SAE Recommended Practice, Air Cleaner Test Code—SAE J726a, published by the Society of Automotive Engineers. The dust shall be agitated every 20 minutes for 5 seconds by compressed air, free of oil and moisture, at a gauge pressure of 80 ± 8 pounds per square inch or 5.6 ± 0.6 kilograms per square centimeter entering through an orifice 0.060 ± 0.004 inch or 1.5 ± 0.1 millimeters in diameter. The webbing shall be extended to the top of the chamber and kept exended at all times except that the webbing shall be subjected to 10 cycles of complete retraction and extension within 1 to 2 minutes after each agitation of the dust. At the end of 5 hours, the assembly shall be removed from the chamber. The webbing shall be fully withdrawn from the retractor manually and allowed to retract completely for 25 cycles. An automatic-locking retractor or a nonlocking retractor attached to pelvic restraint shall be subjected to 5,000 additional cycles of webbing withdrawal and retraction. An emergency-locking retractor or a nonlocking retractor attached to upper-torso restraint shall be subjected to 45,000 additional cycles of webbing withdrawal and retraction between 50 and 100 percent extension. The locking mechanism of an emergency-lock-

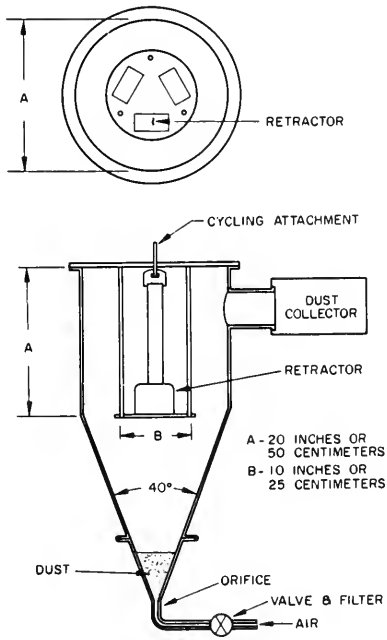


FIGURE 6

ing retractor shall be actuated at least 10,000 times within 50 to 100 percent extension of webbing during the 50,000 cycles. At the end of test, compliance of the retractors with applicable requirements in S4.3(h), (i), and (j) shall be determined. Three retractors shall be tested for performance.

S5.3 Assembly Performance.

(a) *Type 1 seat belt assembly.* Three complete seat belt assemblies, including webbing, straps, buckles, adjustment and attachment hardware, and retractors, arranged in the form of a loop as shown in Figure 5, shall be tested in the following manner:

(1) The testing machine shall conform to the requirements specified in S5.1(b). A double-roller block shall be attached to one head of the testing machine. This block shall consist of 2 rollers 4 inches or 10 centimeters in diameter and sufficiently long so that no part of the seat belt assembly touches parts of the block other than the rollers during test. The rollers shall be mounted on anti-friction bearings and spaced 12 inches or 30 centimeters between centers, and shall have sufficient capacity so that there is no brinelling, bending or other distortion of parts which may affect the results. An anchorage bar shall be fastened to the other head of the testing machine.

(2) The attachment hardware furnished with the seat belt assembly shall be attached to the anchorage bar. The anchor points shall be spaced so that the webbing is parallel in the two sides of the loop. The attaching bolts shall be parallel to, or at an angle of 45 or 90 degrees to the webbing, whichever results in an angle nearest to 90 degrees between webbing and attachment hardware except that eye bolts shall be vertical, and attaching bolts or nonthreaded anchorages of a seat belt assembly designed for use in specific models of motor vehicles shall be installed to produce the maximum angle in use indicated by the installation instructions, utilizing special fixtures if ne^essary to simulate installation in the motor vehicle. Rigid adapters between anchorage bar and attachment hardware shall be used if necessary to locate and orient the adjustment hardware. The adapters shall have a flat support face perpendicular to the threaded hole for the attaching bolt and adequate in area to provide full support for the base of the attachment hardware connected to the webbing. If necessary, a washer shall be used under a swivel plate or other attachment hardware to prevent the webbing from being damaged as the attaching bolt is tightened.

(3) The length of the assembly loop from attaching bolt to attaching bolt shall be adjusted to about 51 inches or 130 centimeters, or as near thereto as possible. A force of 55 pounds or 25 kilograms shall be applied to the loop to remove any slack in webbing at hardware. The force shall be removed and the heads of the testing machine shall be adjusted for an assembly loop between 48 and 50 inches or 122 and 127 centimeters in length. The length of the assembly loop shall then be adjusted by applying a force between 20 and 22 pounds or 9 and 10 kilograms to the free end of the webbing at the buckle, or by the retraction force of an automatic-locking or emergency-locking retractor. A seat belt assem-

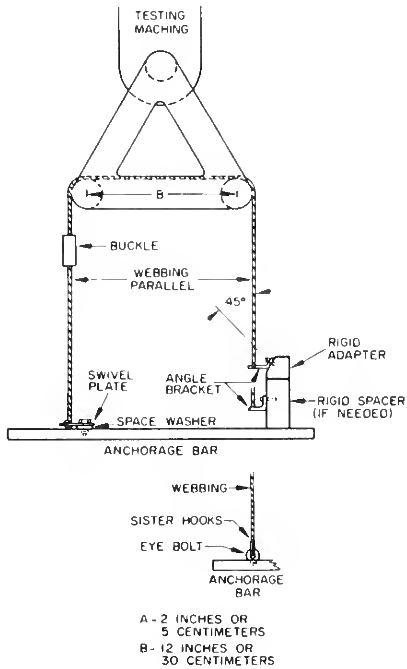


FIGURE 5

bly that cannot be adjusted to this length shall be adjusted as closely as possible. An automatic-locking or emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The buckle shall be in a location so that it does not touch the rollers during test, but to facilitate making the buckle release test in S5.2(d) the buckle should be between the rollers or near a roller in one leg.

(4) The heads of the testing machine shall be separated at a rate between 2 and 4 inches per minute or 5 and 10 centimeters per minute until a force of 5,000 ± 50 pounds or 2,270 ± 20 kilograms is applied to the assembly loop. The extension of the loop shall be determined from measurements of head separation before and after the force is applied. The force shall be decreased to 150 ± 10 pounds or 68 ± 4 kilograms and the buckle release force measured as prescribed in S5.2(d).

(5) After the buckle is released, the webbing shall be examined for cutting by the hardware. If the yarns are partially or completely severed in a line for a distance of 10 percent or more of the webbing width, the cut webbing shall be tested for breaking strength as specified in S5.1(b) locating the cut in the free length between grips. If there is insufficient webbing on either side of the cut to make such a test for breaking strength, another seat belt assembly shall be used with the webbing repositioned in the hardware. A tensile force of 2,500 ± 25 pounds or 1,135 ± 10 kilograms shall be applied to the components or a force of 5,000 ± 50 pounds or 2,270 ± 20 kilograms shall be applied to an assembly loop. After the force is removed, the breaking strength of the cut webbing shall be determined as prescribed above.

(6) If a Type 1 seat belt assembly includes an automatic-locking retractor or an emergency-locking retractor, the webbing and retractor shall be subjected to a tensile force of 2,500 ± 25 pounds or 1,135 ± 10 kilograms with the webbing fully extended from the retractor.

(7) If a seat belt assembly has a buckle in which the tongue is capable of inverted insertion, one of the three assemblies shall be tested with the tongue inverted.

(b) *Type 2 seat belt assembly.* Components of three seat belt assemblies shall be tested in the following manner:

(1) The pelvic restraint between anchorages shall be adjusted to a length between 48 and 50 inches or 122 and 127 centimeters, or as near this length as possible if the design of the pelvic restraint does not permit its adjustment to this length. An automatic-locking or emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The attachment hardware shall be oriented to the webbing as specified in paragraph (a)(2) of this section and illustrated in Figure 5. A tensile force of 2,500 ± 25 pounds or 1,135 ± 10 kilograms shall be applied on the components in any convenient manner and the extension between anchorages under this force shall be measured. The force shall be reduced to 75 ± 5 pounds

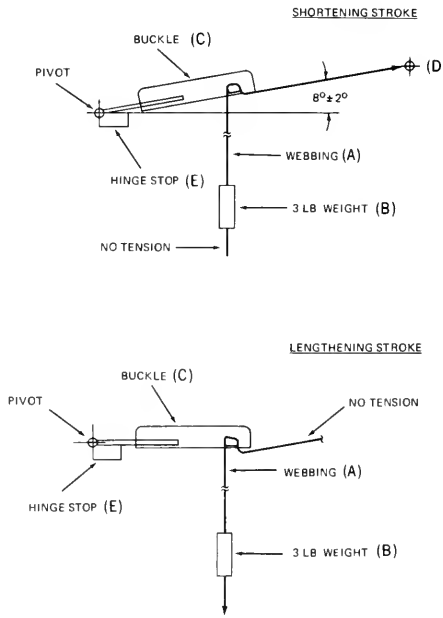


FIGURE 7

or 34 ± 2 kilograms and the buckle release force measured as prescribed in S5.2(d).

(2) The components of the upper-torso restraint shall be subjected to a tensile force of $1{,}500 \pm 15$ pounds or 680 ± 5 kilograms following the procedure prescribed above for testing pelvic restraint and the extension between anchorages under this force shall be measured. If the testing apparatus permits, the pelvic and upper-torso restraints may be tested simultaneously. The force shall be reduced to 75 ± 5 pounds or 34 ± 2 kilograms and the buckle release force measured as prescribed in S5.2(d).

(3) Any component of the seat belt assembly common to both pelvic and upper-torso restraint shall be subjected to a tensile force of $3{,}000 \pm 30$ pounds or $1{,}360 \pm 15$ kilograms.

(4) After the buckle is released in tests of pelvic and upper-torso restraints, the webbing shall be examined for cutting by the hardware. If the yarns are partially or completely severed in a line for a distance of 10 percent or more of the webbing width, the cut webbing shall be tested for breaking strength as specified in S5.1(b) locating the cut in the free length between grips. If there is insufficient webbing on either side of the cut to make such a test for breaking strength, another seat belt assembly shall be used with the webbing repositioned in the hardware. The force applied shall be $2{,}500 \pm 25$ pounds or $1{,}135 \pm 10$ kilograms for components of pelvic restraint, and $1{,}500 \pm 15$ pounds or 680 ± 5 kilograms for components of upper-torso restraint. After the force is removed, the breaking strength of the cut webbing shall be determined as prescribed above.

(5) If a Type 2 seat belt assembly includes an automatic-locking retractor or an emergency-locking retractor, the webbing and retractor shall be subjected to a tensile force of $2{,}500 \pm 25$ pounds or $1{,}135 \pm 10$ kilograms with the webbing fully extended from the retractor, or to a tensile force of $1{,}500 \pm 15$ pounds or 680 ± 5 kilograms with the webbing fully extended from the retractor if the design of the assembly permits only upper-torso restraint forces on the retractor.

(6) If a seat belt assembly has a buckle in which the tongue is capable of inverted insertion, one of the three assemblies shall be tested with the tongue inverted.

(c) *Resistance to buckle abrasion.* Seatbelt assemblies shall be tested for resistance to abrasion by each buckle or manual adjusting device normally used to adjust the size of the assembly. The webbing of the assembly to be used in this test shall be exposed for 4 hours to an atmosphere having relative humidity of 65 percent and temperature of 70° F. The webbing shall be pulled back and forth through the buckle or manual adjusting device as shown schematically in Figure 7. The anchor end of the webbing (A) shall be attached to a weight (B) of 3 pounds. The webbing shall pass through the buckle (C), and the other end (D) shall be attached to a reciprocating device so that the webbing forms an angle of 8° with the hinge stop (E). The reciprocating device shall be operated for 2,500 cycles at a rate of 18 cycles per minute with a stroke length of 8 inches. The abraded webbing shall be tested for breaking strength by the procedure described in paragraph S5.1(b).

44 F.R. 72131
December 13, 1979

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 210

Seat Belt Assembly Anchorages—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 2–14; Notice No. 4)

An amendment to Motor Vehicle Safety Standard No. 210, Seat Belt Assembly Anchorages, was published on October 1, 1970 (35 F.R. 15293). Thereafter, pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119), petitions for reconsideration were filed by Rolls Royce, Ltd., International Harvester Co., Chrysler Corp., Ford Motor Co., General Motors Corp., the Automobile Manufacturers Association, Toyota Motor Co., Ltd., American Motors, Jeep Corp., Chrysler United Kingdom, Ltd., and Checker Motors Corp.

In response to information contained in the petitions, and other considerations, certain requirements of the standard are hereby amended and the effective date of the standard with respect to passenger cars is postponed until January 1, 1972. The petitions for relief from certain other requirements of the standard are denied.

1. The effective date of the amended standard with respect to passenger cars was to have been January 1, 1971. Each petitioner claimed to be unable to produce vehicles conforming to the amended standard by that date. Those who provided lead time information indicated that several months would be needed, with estimates ranging from March 31, 1971, for Rolls Royce, to January 1, 1972, for a number of manufacturers. A January 1972 effective date would have the advantage of coinciding with the effective date proposed for the closely related interim standard on occupant crash protection (Docket 69–7, Notice 6, 35 F.R. 14941). Since the amendments with respect to passenger cars are intended primarily to enhance the enforceability of the standard rather than to provide new levels of safety, it has been determined that good cause has been shown for establishing an effective date for passenger cars of January 1, 1972.

With a single exception, the requests for postponement of the effective date of the standard with respect to multipurpose passenger vehicles, trucks, and buses, are denied. One of the primary reasons for amending the standard was to extend the protection afforded by seat belts to occupants of these types of vehicles. A postponement of effective date would leave these vehicles completely without anchorage requirements for an additional 6 months. Although manufacturers who have been installing anchorages may find it necessary to reexamine the strength and location of their anchorages, this is not considered a sufficient ground for postponing the effective date.

International Harvester requested a postponement until January 1, 1972, in the date on which upper torso restraint anchorages will be required on seats other than front seats in multipurpose passenger vehicles. On consideration of the lead time difficulties that have been demonstrated by this manufacturer, the Director regards the request as reasonable and has decided to grant the requested postponement.

2. A number of petitions requested reconsideration of the sections dealing with anchorage location. Section S4.3.1.4 of the standard states that "Anchorages for an individual seat belt assembly shall be located at least 13.75 inches apart laterally for outboard seats and at least 6.75 inches apart laterally for other seats."

General Motors stated that several of its vehicles have anchorages for the center seating position that are 6.50 inches apart, that some of the anchorages for outboard seats are less than 13.75 inches apart, and that there is no basis either for setting a minimum spacing, or for setting different minimum spacings for different seating positions. Similar comments were made by AMA, Chrysler, Ford and American Motors.

As originally issued, Standard No. 210 had required anchorages to be "as near as practicable, 15 inches apart laterally." To make the standard more precise and more easily enforceable, the notice of September 20, 1969 (34 F.R. 14658), proposed to delete the qualifying language and to require that anchorages be 15 inches apart laterally. The comments indicated that anchorages for center seating positions, particularly the front positions, would require complete relocation. The available data on the effects of anchorage spacing were not regarded as conclusive enough to justify imposing this burden on the manufacturers, and the spacing for anchorages for inboard locations was accordingly reduced to 6.75 inches in the amended standard. Without clearer biomechanical data, the intent was to adopt the prevailing industry minimum as the standard. The same rationale applied to outboard seating position, where the 15-inch spacing was reduced to 13.75 inches.

It now appears that both spacing employed in the amended standard failed to reflect prevailing locations. The Director is accordingly amending section S4.3.1.4 to establish a minimum spacing of 6.50 inches.

A further problem with the spacing requirement arises from the use of "anchorage" as the reference point for measurement. As long as the standard used the qualifying language "as near as practicable," there was no difficulty. Removal of that phrase by the notice of September 20, 1969, created a problem of interpretation that escaped comment until after issuance of the amended standard. Several petitioners commented that they do not know what point to use for measurement. The director concedes the deficiency, and accordingly amends section S4.3.1.4 to specify that the spacing is "measured between the vertical centerlines of the bolt holes."

In conjunction with its request for a reduction of the spacing requirement, General Motors stated that where structural members between the anchorage and the seating position have the effect of spreading the seat belt loop apart, the spacing should be measured between the widest contact points on the structure. Since the strength of these structural members is not regulated, there is no assurance that their performance in a crash will be equal to that of properly spaced anchorages. The request offers no improvement in occupant crash protection, and may, in fact, diminish such protection. The request is therefore denied.

3. The amended standard's other location requirements concern the placement of anchorages to achieve desirable seat belt angles. Sections S4.3.1.1 and S4.3.1.3 each use the "nearest belt contact point on the anchorage" as the lower point defining the line whose angle is to be measured. Several petitions expressed uncertainty as to the point described, and on reconsideration the Director agrees that clarification is needed.

In the notice of proposed rule making that preceded the amended standard (34 F.R. 14658, Sept. 20, 1969) the line had been run to the "anchorage". This usage lacked precision, as stated by several comments. In an attempt to define a line that would closely approximate the actual belt angle, the language in question was adopted. The problem lies in the use of the word "anchorage", since in most installations the belt does not actually contact the anchorage. The point intended was, in fact, the nearest contact point of the belt webbing with the hardware that attaches it to the anchorage. In the typical installation, this point would be on an angle plate bolted to the anchorage. Sections S4.3.1.1 and S4.3.1.3 are accordingly amended to use the phrase "the nearest contact point of the belt with the hardware attaching it to the anchorage."

4. The test procedures of S5.1 and S5.2 were the subject of several requests for reconsideration. Most petitioners stated that the test was not representative of crash conditions, and several suggested that it should be displaced by a dynamic test. Times suggested for such a dynamic test ranged from 0.1 second to 1.0 second, and were said to be the tests used by the petitioners, or by one or another of the international standards organizations. The requirement for a 10-second hold period at maximum

load attracted the most strongly adverse comment.

From its inception, Standard No. 210 has contemplated a static test. The notice of proposed rule making of September 20, 1969, proposed a test that was clearly static, in that it involved a slow rate of load application (2 to 4 inches per minute). In response to comments that the rate was too slow, and to avoid problems of interpretation as to where the rate of pull was to be measured, the procedures were amended to specify the rate of load application in time rather than distance, with the full load reached in a period of from 0.1 to 30 seconds. It should be noted that the vehicle must be capable of meeting the requirements when tested at any rate within this range. To insure that the basic strength of the structure would be measured whatever the shape of the load application curve, a hold period of 10 seconds was specified. The procedures of the amended standard do no more than give more specific form to the test contemplated in the original standard.

The postponement of the effective date of the amended standard will provide additional time for passenger car manufacturers to assure themselves of compliance with the standard. After consideration of the issues raised in the petitions for reconsideration, the Director has concluded that the tests prescribed by the standard are reasonable, practicable, and appropriate for the affected motor vehicles. The petitions for reconsideration of sections S5.1 and S5.2 are therefore denied.

5. Two petitioners, Rolls Royce and General Motors, stated that it was not practicable to use the "seat back" in determining the angle of the torso line in S4.3.2, in that the seat back angle may vary according to which of its surfaces is measured. Although there may be instances where the angle of the seat back is difficult to determine, questions arising from such instances can be resolved, if necessary, by administrative interpretation, and it has been decided to retain the reference to "seat back" in section S4.3.2.

6. Several petitioners stated that the substitution of the word "device" for "provision" in the definition of seat belt anchorage appeared to change the meaning of that term. No substantive change was intended, and since the rewording has caused some misunderstanding, the Director has decided to return to the original wording.

7. General Motors also petitioned to reinstate the provision in section S4.3.2 that would allow the upper torso restraint angle to be measured from the shoulder to the anchorage "or to a structure between the shoulder point and the anchorage". The phrase rendered uncertain the effective angle of the belt under stress. The quoted language was deleted in the notice of September 20, 1969, and no sufficient reason has been given for reinstating it. The request is therefore denied.

8. Toyota Motor Co. requested that sections S5.1 and S5.2 be amended to allow use of body blocks equivalent to those specified. Although the standard provides that an anchorage must meet the strength requirements when tested with the specified blocks, manufacturers may use whatever methods they wish to ascertain that their products meet these requirements when so tested, as long as their methods constitute due care. If the Toyota procedures are, in fact, equivalent, there is no need to amend the standard to accommodate them. The request is therefore denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 210, in § 571.21 of Title 49, Code of Federal Regulations is amended. . . .

Effective date. For the reasons given above, it has been determined that the effective date of the amended standard shall be January 1, 1972, for passenger cars. The effective date for multipurpose passenger vehicles, trucks, and buses shall be July 1, 1971, except that the effective date for installation of anchorages for upper torso restraints for seating positions other than front outboard designated seating positions shall be January 1, 1972.

Issued on November 20, 1970.

Charles H. Hartman,
Acting Director.

35 F.R. 18116
Nov. 26, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 210

Seat Belt Assembly Anchorages and Seat Belt Installations; Reconsideration and Amendment

(Docket No. 2–14; Notice No. 4)

The purpose of this notice is to amend Motor Vehicle Safety Standards No. 208 and 210, with respect to the installation of shoulder belts in multipurpose passenger vehicles exceeding 10,000 pounds GVWR and the provision of anchorages for shoulder belts in vehicles other than passenger cars.

The seat belt installation standard was amended on September 30, 1970, to require installation of seat belts in multipurpose passenger vehicles, trucks, and buses manufactured after July 1, 1971 (35 F.R. 15222). Exemptions from the requirement for shoulder belt installation were provided for certain types and weights of vehicles.

During the course of the subsequent rulemaking activity which led to the issuance of the occupant crash protection standard, it was determined that the larger weight classes of trucks and multipurpose passenger vehicles should not be required to install shoulder belts (35 F.R. 14941, 35 F.R. 16937, 36 F.R. 4600). The standard therefore required lap belts, but not shoulder belts, for vehicles over 10,000 pounds GVWR, effective January 1, 1972. The September 30 amendment, which is to become effective six months earlier than the occupant crash protection rule, had provided a similar exemption for large trucks but not for multipurpose passenger vehicles, with the result that shoulder belts would have been required for many large multipurpose passenger vehicles during the period July 1, 1971–January 1, 1972, but not afterward. To correct this inconsistency, the seat belt installation standard is amended, effective July 1, 1971, to exempt multipurpose passenger vehicles of more than 10,000 pounds GVWR from the shoulder belt requirement.

In accordance with the foregoing, section S3.1 of Standard No. 208, as published September 30, 1970 (35 F.R. 15222) is amended effective July 1, 1971 . . . .

Standard No. 210, *Seat Belt Assembly Anchorages*, presently requires vehicles other than passenger cars to have shoulder belt anchorages installed at front outboard seating positions by July 1, 1971, and at rear outboard seating positions by January 1, 1972 (35 F.R. 15293, 35 F.R. 18116, 36 F.R. 4291). The Recreational Vehicle Institute has petitioned for an amendment of the standard, to delete the requirement for shoulder belt anchorages at positions where shoulder belt installation is not required by Standard No. 208.

It has been found that this petition has merit. The probability of shoulder belt installation by the owners of these vehicles is very small, and the difficulty of anchorage installation, particularly in multipurpose passenger vehicles, is often greater than in passenger cars. The amendment is therefore considered to be in the public interest.

The request by RVI for a postponement of the July 1, 1971, effective date for installation of shoulder belt anchorages has not been found justified, and the petition is in that respect denied.

In accordance with the foregoing, section S4.1.1 of the present Motor Vehicle Safety Standard No. 210 (effective July 1, 1971), and the amended Standard No. 210 as published November 26, 1970 (35 F.R. 18116, effective January 1, 1972), in 49 CFR 571.21, are both amended . . . .

Effective: July 1, 1971
January 1, 1972

The effective dates of the amendments made by this notice are as indicated above. Because the amendments relieve restrictions and impose no additional burden on any person, notice and request for comments on such notice are found to be unnecessary, and it is found, for good cause shown, that an effective date earlier than 180 days after issuance is in the public interest.

36 F.R. 9869
May 29, 1971

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 210

Seat Belt Anchorages

(Docket No. 72–23; Notice 3)

This notice amends Safety Standard No. 210, *Seat Belt Assembly Anchorages*, to eliminate the "buckle cutout" as an optional configuration of the body block test device used for testing the strength of lap-shoulder belt anchorages, and to clarify the illustration (Figure 2) of body blocks used for testing lap belt anchorages. The optional configuration is being deleted because it unnecessarily complicates the test of the anchorages and is no longer being used by manufacturers.

Effective Date: May 18, 1978.

For Further Information Contact:

William E. Smith, Division of Crashworthiness, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–2242).

Supplementary Information: Standard No. 210 (49 CFR 571.210) requires seat belt anchorages in motor vehicles to comply with specified strength requirements. The procedure for strength testing is set forth in paragraph S5 of the standard. The tests involve the attachment of a seat belt to the anchorage, followed by the application of force to the seat belt which is thereby transferred to the anchorage itself. Force is applied to Type 1 and Type 2 seat belt assemblies through body blocks that simulate the human torso. The body blocks are illustrated in Figures 2 and 3 of the standard. This notice modifies Figures 2 and 3 in accordance with the notice of proposed rulemaking issued December 16, 1976 (41 F.R. 54050).

Figure 2 describes the body block used for lap belt anchorage testing, and there has been some confusion concerning certain minor specifications in the Figure. This amendment modifies the drawing in Figure 2 to clarify the description of the body block. The change does not affect the substantive requirements of the standard in any way.

Figure 3 describes the body block used for combination shoulder and lap belt anchorage testing. An optional "buckle cutout" is shown on the surface of the body block in Figure 3, permitting a manufacturer to make an indentation in the face of the body block to accommodate buckle hardware. NHTSA compliance test experience with the cutout demonstrates that the edge of the cutout causes additional stress on the belt webbing and interferes with its movement, thereby interfering with the test of the underlying anchorage. Comments to the proposal favored deletion of the "buckle cutout" option since it is disadvantageous to manufacturers and is no longer being utilized. This amendment, therefore, deletes the optional cutout from Figure 3.

General Motors' comment recommended additional modifications of the drawing in Figure 2. The agency has determined, however, that the suggestion to add shading to define the area of the body block to be covered by foam padding does not significantly alter the clarity of the drawing. General Motors also recommended a substitute test device for the lap-shoulder belt body block. This recommendation will possibly be considered in future rulemaking.

The engineer and lawyer primarily responsible for the development of this notice are William Smith and Hugh Oates, respectively.

Since this amendment does not make any substantive change in the requirements of the standard, it is found that an immediate effective date is in the public interest.

In consideration of the foregoing, Standard No. 210, 49 CFR 571.210, 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 15, 1978.

Joan Claybrook
Administrator

43 F.R. 21892
May 23, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE STANDARD NO. 210

Seat Belt Assembly Anchorages

(Docket No. 72–23; Notice 5)

Action: Final rule.

Summary: This notice amends Safety Standard No. 210, *Seat Belt Assembly Anchorages*, to eliminate the anchorage location requirements for passive seat belt assemblies that meet the frontal crash protection requirements of Safety Standard No. 208. The purpose of the amendment is to give manufacturers wider latitude in passive belt design in order to facilitate the early introduction of passive restraints in existing passenger car designs. The amendment will allow manufacturers to experiment with various passive belt designs to help determine the optimum relationship between anchorage location and passive belt effectiveness in a variety of crash modes and their comfort and convenience. Anchorage location would still be indirectly controlled by the necessity for passive belts to comply with the Standard No. 208 requirements.

Effective date: November 16, 1978.

Addresses: 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, S.W., Washington, D.C. 20590.

For further information contact:

William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202) 426–2242.

Supplementary information: Safety Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR 571.210), specifies zones and acceptable ranges within which seat belt anchorages must be located to ensure that the anchorages are in the proper location for effective occupant restraint and specifies strength requirements to reduce the likelihood of their failure in a crash. In response to a petition from General Motors Corporation, the NHTSA issued a proposal to delete these anchorage location requirements for passive belt systems that meet the dynamic frontal crash protection requirements of Safety Standard No. 208 (43 FR 22419, May 25, 1978).

The proposal noted that General Motors would like to use a passive belt design whose anchorages, in some vehicles, would lie outside the parameters specified in the standard. GM stated that the anchorage locations of this design are intended to ensure the comfort and convenience of the passive belt so that it will not be disconnected by vehicle users who find current active belts lacking in these qualities. General Motors wanted to introduce this passive belt design prior to the effective date of the passive restraint requirements issued July 5, 1977 (42 FR 34289). As stated in the preamble of the proposal, the agency has determined manufacturers should be given wide latitude in passive belt design in order to facilitate the early introduction of passive systems, since they should save many lives and prevent hundreds to thousands of injuries. Although the current anchorage location requirements were developed primarily for active belt systems, passive belt systems such as the one used on the Volkswagen Rabbit have successfully complied with the anchorage location requirements and met the frontal injury criteria of Standard No. 208 as well. Nonetheless, manufacturers have said they can develop more effective and comfortable passive systems to comply with Standard 208. The agency thinks they should be given the opportunity. Nevertheless, it is the agency's view that research should be conducted to determine the optimum anchorage locations for the various passive belt designs in terms of both passive belt effectiveness and of comfort and convenience for vehicle occupants. Accordingly, the earlier notice proposed the deletion of the anchorage requirements for passive belts until appropriate requirements for these systems can be developed and incorporated in the standard.

Comments in support of the proposed change were received from Chrysler, British Leyland, American Motors, Ford, Volkswagen, General Motors, and the Association Peugeot-Renault. These commenters argued that manufacturers should not be restricted in passive belt design, so that manufacturers can determine which designs are the most effective and at the same time acceptable to the public. The Center for Auto Safety argued against the proposal, however, stating that elimination of the anchorage location requirements may degrade available occupant protection.

The Center for Auto Safety agreed that manufacturers should be allowed flexibility in passive belt design to facilitate the early introduction of passive restraints. However, it argued that elimination of the forward boundary for upper torso belt anchorages may "(1) seriously degrade occupant protection available by allowing the anchorages to be installed in areas likely to be struck by the occupant in a side impact and (2) may result in systems that do not sufficiently restrain the occupant from submarining or moving laterally under the belt." The Center's first concern is that side-impact head injuries will increase if passive belt retractors, buckles, and other hardware are permitted in areas likely to be struck by the occupant's head in a side collision. The comment noted that vehicles equipped with passive belts are not required to meet the lateral impact requirements of Standard No. 208 and that manufacturers would, therefore, have no incentive to design anchorages and other hardware to avoid injuries in non-frontal collisions.

The Center's second concern is that elimination of the anchorage location requirements will allow passive belt designs that lead to more lateral occupant movement and "submarining" in side crashes, thereby increasing side impact injuries. The Center also argued that it should be the responsibility of General Motors to demonstrate the safety consequences of moving passive belt anchorages outside the current range requirements, before the agency eliminates the requirements for passive belts. Finally, the Center is concerned that once the exemption is allowed, it might be years before new location requirements for passive belts are specified.

Regarding the Center's first concern, the present requirements do not prohibit the placement of hardware in areas where they could be struck by an occupant's head in a side collision. While manufacturers may not be constrained by present standards from placing hardware where it poses a danger to occupants in side impacts, all manufacturers are on notice that the agency is preparing to propose a side impact standard as delineated in the agency's rulemaking plan. Thus, in anticipation of the upgraded side impact requirements, manufacturers should design their passive belt systems in such a way that they will not compromise side impact protection.

The Center's concern about the potential for increased lateral movement and submarining in side crashes was not supported by any data. The NHTSA is also concerned about side impact injuries. However, the existing location requirements for belt anchorages were not specifically designed to address the problem of lateral occupant motion in non-frontal collisions where the occupant is restrained by a single, diagonal passive upper torso restraint used with a knee bolster.

The notice of proposed rulemaking explicitly stated that the NHTSA intends to issue separate anchorage location requirements for passive belts following research to determine the optimum locations for passive belt effectiveness, comfort and convenience, and that the proposed exemption from the current requirements is only an interim measure. The NHTSA intends to conduct studies to look at the change in injury data resulting from displacement of the upper anchorage point of a single diagonal belt for various sizes of occupants. The research program includes testing that will investigate the "submarining" problem and, during frontal oblique impact simulations, the likelihood of excessive lateral movement. The agency will consider simulated side impact testing during this research program to evaluate potential degradation of occupant protection in this crash mode. The agency will also consider anchorage location during the upgrading of side impact protection requirements. As stated in the recent "Five Year Rulemaking Plan," the improvement of occupant protection in side impacts is one of the NHTSA's highest priorities.

The Center's suggestion that GM demonstrate the safety consequences of passive belt anchorages should be addressed by the NHTSA's intention to look with great care at manufacturers' compliance testing of all passive belt designs to assure that these new systems will, in fact, provide at least the level of overall protection now afforded by conventional restraint systems.

Finally, regarding the Center's concern that new location requirements for passive belt anchorages will not be specified for many years, the notice of proposed rulemaking and this notice make it clear that the exemption is only an interim measure to allow improvements in passive belt designs. It is consistent, however, with the attempt to make FMVSS 208 a performance standard to the greatest extent possible. Nevertheless, should any manufacturer produce passive belt hardware or systems that cause or exacerbate injuries that would not occur with active systems currently in production, the NHTSA's safety defect authority would permit the agency to investigate such systems for possible recall and correction. Manufacturers are hereby put on notice of that fact.

In summary, the NHTSA has concluded that manufacturers should be given wide latitude in passive belt design in order to aid the early introduction of passive restraints and to aid the development of optimum designs in terms of both effectiveness and comfort and convenience. The agency agrees that anchorage location requirements are important for passive belts, but believes that more effective requirements can be developed following further research specifically involving passive belts. To ensure that safe and effective systems are being developed, the agency will be testing many of the new passive systems that will come on the market prior to the 1982 model year. In addition, the agency intends to ask manufacturers to supply data concerning the performance of passive systems in both compliance crash testing and in sled and crash testing in other modes.

The NHTSA has determined that this amendment will have no economic or environmental consequences.

The engineer and lawyer primarily responsible for the development of this notice are William Smith and Hugh Oates, respectively.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR 571.210), is amended . . . .

AUTHORITY: (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 3, 1978.

Joan Claybrook
Administrator

43 F.R. 53440
November 16, 1978

MOTOR VEHICLE SAFETY STANDARD NO. 210

Seat Belt Assembly Anchorages—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

Docket No. 2-14; Notice No. 4)

S1. Purpose and scope. This standard establishes requirements for seat belt assembly anchorages to insure their proper location for effective occupant restraint and to reduce the likelihood of their failure.

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

S3. Definition. "Seat belt anchorage" means the provision for transferring seat belt assembly loads to the vehicle structure.

S4. Requirements.

S4.1 Type.

S4.1.1 Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each foward-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 car.

S4.1.2 Seat belt anchorages for a Type 1 or a Type 2 seat belt assembly shall be installed for each designated seating position, except a passenger seat in a bus or a designated seating position for which seat belt anchorages for a Type 2 seat belt assembly are required by S4.1.1.

S4.2 Strength.

S4.2.1 Except for side-facing seats, the anchorage for a Type 1 seat belt assembly or the pelvic portion of a Type 2 seat belt assembly shall withstand a 5,000-pound force when tested in accordance with S5.1.

S4.2.2 The anchorage for a Type 2 seat belt assembly shall withstand 3,000-pound forces when tested in accordance with S5.2.

S4.2.3 Permanent deformation or rupture of a seat belt anchorage or its surrounding area is not considered to be a failure, if the required force is sustained for the specified time.

S4.2.4 Except for common seat belt anchorages for forward-facing and rearward-facing seats, floor-mounted seat belt anchorages for adjacent designated seating positions shall be tested by simultaneously loading the seat belt assemblies attached to those anchorages.

S4.3 Location. As used in this section, "forward" means in the direction in which the seat faces, and other directional references are to be interpreted accordingly.

S4.3.1 Seat belt anchorages for Type 1 seat belt assemblies and the pelvic portion of Type 2 seat belt assemblies.

S4.3.1.1 In an installation in which the seat belt does not bear upon the seat frame, a line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage for a nonadjustable seat, or from a point 2.50 inches forward of and 0.375 inch above the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage for an adjustable seat in its rearmost position, shall extend forward from the anchorage at an angle with the horizontal of not less than 20° and not more than 75°.

S4.3.1.2 In an installation in which the belt bears upon the seat frame, the seat belt anchorage, if not on the seat structure, shall be aft of the rearmost belt contact point on the seat frame with the seat in the rearmost position. The line from the seating reference point to the nearest belt contact point on the seat frame shall extend forward from that contact point at an angle with the horizontal of not less than 20° and not more than 75°.

S4.3.1.3 In an installation in which the seat belt anchorage is on the seat structure, the line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from that contact point at an angle with the horizontal of not less than 20° and not more than 75°.

S4.3.1.4 Anchorages for an individual seat belt assembly shall be located at least 6.50 inches apart laterally, measured between the vertical centerlines of the bolt holes.

S4.3.2 Seat belt anchorages for the upper torso portion of Type 2 seat belt assemblies. With the seat in its full rearward and downward position and the seat back in its most upright position, the seat belt anchorage for the upper end of the upper torso restraint shall be located within the acceptable range shown in Figure 1, with reference to a two-dimensional manikin described in SAE Standard J826 (November 1962) whose "H" point is at the seating reference point and whose torso line is at the same angle from the vertical as the seat back.

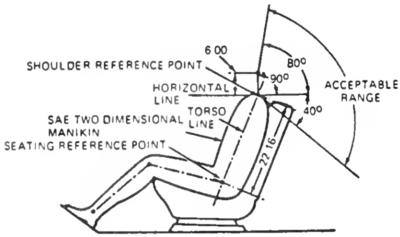


FIGURE 1 LOCATION OF ANCHORAGE FOR UPPER TORSO RESTRAINT

S5. Test procedures. Each vehicle shall meet the requirements of S4.2 when tested according to the following procedures. Where a range of values is specified, the vehicle shall be able to meet the requirements at all points within the range.

S5.1 Seats with Type 1 or Type 2 seat belt anchorages. With the seat in its rearmost position, apply a force of 5,000 pounds in the direction in which the seat faces to a pelvic body block as described in Figure 2, restrained by a Type 1 or the pelvic portion of a Type 2 seat belt assembly, as applicable, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5° nor more than 15° above the horizontal. Apply the force at the onset rate of not more than 50,000 pounds per second. Attain the 5,000-pound force in not more than 30 seconds and maintain it for 10 seconds.

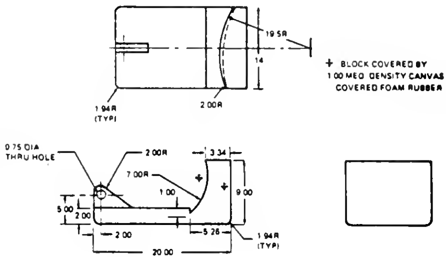


FIGURE 2 BODY BLOCK FOR LAP BELT ANCHORAGE

S5.2 Seats with Type 2 seat belt anchorages. With the seat in its rearmost position, apply forces of 3,000 pounds in the direction in which the seat faces simultaneously to pelvic and upper torso body blocks as described in Figures 2 and 3, restrained by a Type 2 seat belt assembly, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5° nor more than 15° above the horizontal. Apply the forces at the onset rate of not more than 30,000 pounds per second. Attain the 3,000-pound forces in not more than 30 seconds and maintain them for 10 seconds.

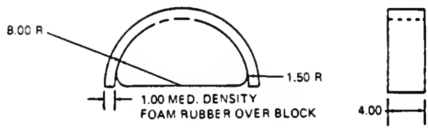


FIGURE 3 - BODY BLOCK FOR COMBINATION SHOULDER AND LAP BELT ANCHORAGE

35 F.R. 18116
November 26, 1970

MOTOR VEHICLE SAFETY STANDARD NO. 211

Wheel Nuts, Wheel Discs, and Hub Caps—Passenger Cars and Multipurpose Passenger Vehicles

S1. Purpose and scope. This standard precludes the use of wheel nuts, wheel discs, and hub caps that constitute a hazard to pedestrians and cyclists.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, and passenger cars and multipurpose passenger vehicle equipment.

S3. Requirements. Wheel nuts, hub caps, and wheel discs for use on passenger cars and multipurpose passenger vehicles shall not incorporate winged projections.

INTERPRETATION

A clarification of the term "wheel nut" as used in the requirements section S3 of Standard No. 211 has been requested. This section states that "wheel nuts, hub caps, and wheel discs for use on passenger cars and multipurpose passenger vehicles shall not incorporate winged projections." A "wheel nut" is an exposed nut that is mounted at the center or hub of a wheel, and not the ordinary small hexagonal nut, one of several which secures a wheel to an axle, and which is normally covered by a hub cap or wheel disc.

Issued on July 22, 1969.

F. C. Turner
Federal Highway Administrator

32 F.R. 2416
February 3, 1967

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 212

Windshield Mounting—Passenger Cars

A proposal to amend Part 371 of the Federal Motor Vehicle Safety Standards by adding a Standard No. 212, Windshield Mounting—Passenger Cars, was published as an advance notice of proposed rule making an October 14, 1967 (32 F.R. 14281) and a notice of proposed rule making on December 28, 1967 (32 F.R. 20866).

Interested persons have been given the opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

This new standard requires that, when tested as prescribed, each passenger car windshield mounting must retain either: (1) not less than 75% of the windshield periphery; or (2) not less than 50% of that portion of the windshield periphery on each side of the vehicle longitudinal centerline, if an unrestrained 95th percentile adult male manikin is seated in each outboard front seating position.

Several comments objected to the proposed standard and in some cases urged that more research should be done before any type of windshield mounting is required. The standard, is however, part of an integrated program aimed at accomplishing the widely accepted safety goal of keeping occupants within the confines of the passenger compartment during a crash. One major step in this program is the utilization of the laminated glazing material prescribed in Federal motor vehicle safety standard No. 205, which has resulted in a marked reduction in serious head injury to occupants known to have struck the windshield. The windshield mounting retention requirement prescribed in this standard takes advantage of this improved glazing material and will further minimize the likelihood of occupants being thrown from the vehicle during a crash.

Several comments requested reduction of the 75% retention requirement to 50%. The Administrator concludes that, as an alternative, 50% retention is acceptable if: (1) an unrestrained 95% percentile adult male manikin is seated in each outboard front seating position when the test procedure is performed, and (2) at least 50% of that portion of the windshield periphery on each side of the vehicle longitudinal centerline is retained.

Several comments requested that the phrase "or approved equivalent" be added to the "Demonstration procedures" provision. § 371.11 of the Federal motor vehicle safety standards provides that "an approved equivalent may be substituted for any required destructive demonstration procedure." Consequently, inclusion of the phrase requested is not necessary.

In consideration of the foregoing, § 371.21, of Part 371 of the Federal motor vehicle safety standards is amended by adding Standard No. 212, "Windshield Mounting—Passenger Cars," as set forth below, effective January 1, 1970.

This rule-making action is taken under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (P.L. 89-563, 15 U.S.C. §§ 1392 and 1407) and the delegation of authority contained in Part 1 of the Regulations of the Office of the Secretary of Transportation (49 CFR Part 1).

Issued in Washington, D.C. on August 13, 1968.

John R. Jamieson, Deputy
Federal Highway Administrator

33 F.R. 11652
August 16, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 212

Windshield Mounting

(Docket No. 69–29; Notice 5)

This notice amends Motor Vehicle Safety Standard No. 212, 49 CFR 571.212, *Windshield Mounting*, to extend its applicability to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating (GVWR) of 10,000 pounds or less, except for forward control vehicles and open-body type vehicles with folding or removable windshields, and to coordinate its test procedures with those of Standard No. 208, 49 CFR 571.208, *Occupant Crash Protection*.

An advance notice of proposal rulemaking was published September 16, 1969 (34 FR 14438), followed by notices of proposed rulemaking published on August 23, 1972 (37 FR 16979) and January 18, 1974 (39 FR 2274). This notice is based on the latter notice of proposed rulemaking, and responds to the comments submitted thereto.

The final rule retains the proposed rule's extension to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating (GVWR) of 10,000 pounds or less. However, forward control vehicles and open-body vehicles with fold-down windshields are excluded from the application of the standard because of the impracticability of complying with the requirements.

Many manufacturers objected to the requirement in the proposal that the dummies used in the test vehicle not be restrained by active restraint systems. Upon impact in a crash test, unrestrained dummies tend to fly about the passenger compartment, damaging the dummies.

In 1972 the NHTSA proposed the amendment of Standard No. 212 (37 FR 16979) to specify a 75 percent retention requirement using restrained dummies. The purpose of the proposal was to eliminate optional retention requirements and to permit dynamic testing consistent with other safety standards. In 1974 another approach was taken with the NHTSA proposing (39 FR 2274) a 50 percent retention requirement using unrestrained dummies, in anticipation of the passive restraint requirements that were to be included in Standard No. 208. Having the benefit of a large number of comments on both proposals the NHTSA has determined that both are suitable, the 1972 approach for vehicles equipped with active restraints, where dummy damage would be great if the dummy were unrestrained, and the 1974 approach for vehicles equipped with passive restraints, since the dummy would not contact the windshield.

The frontal barrier crash test conditions specified in the final rule are substantially similar to those of Standard No. 208, *Occupant Crash Protection*, Standard No. 219, *Windshield Zone Intrusion*, and Standard No. 301, *Fuel System Integrity*. This will allow compliance testing for these standards in one crash test under certain circumstances. In this way, much of the expense associated with crash testing can be reduced.

Most of the manufacturers who commented on the proposal objected to the requirement that the vehicle be tested at a temperature range of 15° F to 110° F. Some manufacturers objected that the higher temperatures would damage sensitive instrumentation. Others argued that the range should be coordinated with that of Standard No. 301 (49 CFR 571.301) or with ISO regulations. Some asserted that they would have to build expensive test facilities in order to conduct tests at the temperature extremes. The NHTSA has determined that testing over the specified range is necessary, in light of the fact that windshield moldings have significantly different retention capabilities at different temperatures. The NHTSA recognizes that certain additional expenses may be entailed in testing over the specified temperature range. However, the safety need to ensure adequate windshield retention justifies the additional expense.

In consideration of the foregoing, Standard No. 212, 49 CFR 571.212, is amended to read as set forth below.

Effective date: September 1, 1977.

(Sec. 103, 119, Pub. L. 89563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on: August 23, 1976.

John W. Snow
Administrator

41 F.R. 36493
August 30, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 212

Windshield Mounting

(Docket No. 69–29; Notice 6)

This notice responds to nine petitions for reconsideration of a recent amendment (41 FR 36493, August 30, 1976) of Safety Standard No. 212, *Windshield Mounting*, by extending the effective date of the amendment from September 1, 1977, to September 1, 1978, and by excluding "walk-in van-type" vehicles from the standard's applicability. Other aspects of the petitions for reconsideration are denied.

Dates: The amendment of August 30, 1976, will be effective September 1, 1978. The change in the effective date and the amendment to exclude "walk-in van-type" vehicles from the standard's applicability should be changed in the text of the Code of Federal Regulations, effective August 4, 1977.

For Further Information Contact:

Robert Nelson
National Highway Traffic Safety Administration
Washington, D.C. 20590
(202 426–2802)

Supplementary Information: Safety Standard No. 212, *Windshield Mounting* (49 CFR Part 571.212), was amended August 30, 1976, to modify the performance requirements and test procedures of the standard and to extend the standard's applicability to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating of 10,000 pounds or less. Petitions for reconsideration were received from International Harvester (IH), Jeep Corporation, American Motors Corporation (AMC), Volvo of America Corporation, Toyo Kogyo Co., General Motors Corporation (GM), Rolls Royce Motors, Nissan Motor Co. Ltd., and Leyland Cars.

Requests from some of these petitioners that the new provisions of Standard No. 212 (49 CFR 571.212) be withdrawn entirely are hereby denied, but several modifications are undertaken by the National Highway Traffic Safety Administration (NHTSA), based on a review of the information and arguments submitted.

Nearly all of the petitioners requested that the effective date of the new provisions be changed from September 1, 1977, to September 1, 1978. Petitioners argued that a lead time of one year will be insufficient to accomplish design changes and retooling necessary to adapt passenger-car windshield technology to other vehicle types. Petitioners also pointed out that the specification of a temperature range in the test conditions will require manufacturers to undertake more extensive certification testing than in the past.

The NHTSA has determined that the requests for additional lead time are justified in light of the information submitted regarding design changes that some manufacturers will undertake. The petitions are, therefore, granted in part and the effective date of the new provisions is postponed to September 1, 1978.

In conformity with the agency's 1972 and 1974 proposals (37 FR 16979, August 23, 1972) (39 FR 2274, January 18, 1974), an optional means of meeting the retention requirement (that exists in the present provisions) was eliminated by the August 30, 1976, amendments. This was done to reduce the amount of necessary compliance testing and to encourage "simultaneous" certification testing of separate standards where practicable. As proposed in 1972, the "75-percent alternative" (retention of 75 percent of the windshield periphery—dummies properly restrained) was made mandatory for al vehicles not equipped with passive restraints. In this way, windshield retention tests could be performed at the same time as tests already required for fuel system integrity (49 CFR 571.301–75) that specify restrained dummies.

While some additional weight is added to the vehicle by the required dummies, it is the minimum necessary to permit "simultaneous" testing, and the dummies are restrained so that there is only incidental, if any, contact with the windshield. Thus, the "75-percent alternative" specified in the amendments is, basically, a continuation of the existing requirement that manufacturers have been meeting for years.

The 1974 proposal to adopt the "50-percent option" (retention of 50 percent of the windshield periphery on each side of the windshield—dummies unrestrained) was vigorously objected to by manufacturers because of the damage that could occur to dummies during impact with the windshield. Also, the fuel system integrity standard was made final in a form that required restraining the dummies by safety belts if provided. It was apparent that the "50-percent option" should only become mandatory as proposed for vehicles equipped with passive restraint systems that could protect the dummy against impact damage. In the case of air cushion restraint systems, of course, some contact with the windshield by the cushion or incidental contact by the dummy is expected during the crash test. For this reason, the somewhat less stringent "50-percent option" was made final for vehicles equipped with passive restraints.

AMC argued that this distinction between vehicles is unjustified. The only reason put forward by AMC was that "dummy impact is not a critical factor in determining windshield retention." This reason does not, however, support the AMC request for a reduction in retention performance from the 75-percent level presently being met. Rather, it argues for an increase in the 50-percent level established for those vehicles in which the NHTSA estimated that dummy and restraint contact could affect results. If AMC believes that the distinction is not justified, the agency will review further evidence to increase the 50-percent requirement (for passive-equipped vehicles) to the 75-percent level presently being met in most of today's passenger cars.

Several commenters objected that the final rule differed in some respects from the 1972 and 1974 proposals to amend Standard No. 212, taken separately. AMC, Volvo, and Jeep petitioned to revoke the separate retention requirements for vehicles with different restraint systems, on the grounds that such a distinction had never been proposed. Jeep Corporation also objected to extension of the standard's applicability to MPV's, trucks, and buses because of variations in language from the proposals.

As earlier noted, the requirement for 75-percent retention conforms to the 1972 proposal. The only variation from the 1972 proposal was to implement the performance levels proposed in 1974 for the vehicles that might be equipped with passive restraints. It is the agency's view that "a description of the subjects and issues involved" in the rulemaking action was published in the Federal Register as required by the Administrative Procedure Act (the Act) (5 U.S.C. § 553(b)(2)), permitting opportunity for comment by interested persons. A reading of the cases on this provision of the Act supports the agency's view.

Volvo's petition objected to the fact that the amendments specify the use of restrained dummies in the test procedures. Volvo stated that unrestrained dummies should be used because in actual crash conditions it is the head of an unrestrained occupant that is most likely to impact and substantially load the windshield, since the head of a restrained occupant would not normally contact the windshield.

While Volvo's statement is true, it must be understood that test procedures specified in the standards cannot simulate every element of actual crash conditions. Rather, the procedures are based on a variety of considerations, including test expense and degree of complexity. There were many comments to the prior notices proposing the amendments in question that urged the use of restrained dummies, due to the possibility of damage to the expensive dummies during the barrier crash tests. These comments were taken into consideration prior to issuance of the final rule. Also, the NHTSA concluded that the vehicle deceleration forces are the primary forces affecting windshield retention and not the impact of occupants with the windshield. The restrained dummies are required, primarily, for purposes of permitting simultaneous testing. The NHTSA concludes that the retention requirements and test procedures specified in the amendments will ensure that vehicles are equipped with windshields that provide the needed protection for occupant safety.

Volvo's petition also argued that Standard No. 212 "must include a measurement procedure that weights the various segments of the windshield periphery in a technically accurate maner." Volso points to tests it has conducted which indicate that "when the unrestrained occupant's head impacts and substantially loads the windshield, the loading will most likely occur in the windshield's upper regions and *not* uniformly throughout the windshield."

While it is recognized that the degree of dislodging of the windshield from its mounting may vary at different locations around the periphery of the windshield, sufficient information is not available on which to base varying retention requirements (for different areas of the windshield). Further, the specification of retention requirements in the terms suggested by Volvo was not proposed by the agency in 1972 or 1974. This aspect of Volvo's petition is therefore denied.

Several petitioners objected to the specification of a temperature range in the test conditions and asked that this provision be withdrawn. Rolls Royce Motors argued that the amendment will require additional tests to determine the most critical temperature for windshield retention and stated that this would greatly increase the burden on low-volume manufacturers. General Motors and Jeep Corporation stated that the expansion of the test requirements over a wide temperature range adds to the stringency of the standard without any evidence of a safety need. American Motors petitioned to remove the 15°F to 110°F temperature range from the barrier test conditions on the basis that "it was not specified as a barrier test condition in the proposal for rulemaking," and on the basis that there are laboratory tests that can serve the same purpose.

The NHTSA denies all petitions to withdraw the temperature range from the standard. As stated in the preamble to the final rule, testing over the specified range is necessary in light of the fact that windshield moldings have significantly different retention capabilities at different temperatures. This fact was graphically confirmed by NHTSA compliance testing in which windshields retained at low temperatures were dislodged at higher temperatures (in identical vehicles). Concerning the objection of American Motors, the temperature range was proposed in paragraph S4 of the 1974 proposal to amend Standard No. 212 (39 FR 2274).

General Motors recommended that the temperature range be revised to specify 66°F to 78°F limits, to coordinate the Standard 212 test with the calibration conditions for the Part 572 dummy. General Motors argued that this would reduce the number of barrier crash tests that would be required.

The NHTSA rejects this recommendation. The Part 572 dummies are conditioned in the 66°F–78°F temperature range for calibration purposes in those standards in which the dynamic dummy response is part of the requirements of the standard. Since the response of the dummy is not directly involved in the performance requirements of Standard No. 212, the temperature of the dummies is not significant. Therefore, it is not necessary to restrict the temperature range of Standard No. 212 to correspond to the calibration temperature range of the Part 572 dummies. For purposes of simultaneous testing, manufacturers could devise a means to control the immediate environment of the test dummy within the 66°F–78°F calibration temperature range, independent of the temperature range specified in Standard No. 212.

General Motors also argued that there could be considerable variation in vehicles condition and test results, depending on when and where the vehicle is tested, since there could be an air temperature of 110°F while windshield components are at a much higher temperature due to "sun load." General Motors, therefore, requested that the temperature requirement be clarified to specify that the temperature of the entire vehicle be stabilized between 15°F and 110°F prior to the test.

The NHTSA does not intend that vehicles be tested with the windshield components at temperatures higher than 110°F. For purposes of clarification, paragraph S6.5 of the new provisions is revised to specify that the windshield mounting material, and all vehicle components in direct contact with the mounting material are to be at any temperature between 15°F and 110°F. Presumably this could be accomplished by localized heating or cooling of the vehicle components or by any other method chosen, in the exercise of due care, by a manufacturer.

The August 1976 amendments to Standard No. 212 modified the application section to include multipurpose passenger vehicles, trucks and buses having a gross weight rating of 10,000 pounds or less. "Open-body type" vehicles and "forward control" vehicles were excluded because of the impracticability of applying the barrier crash test to these vehicles. General Motors has pointed out that the NHTSA failed to exclude "walk-in van-type" vehicles, which have essentially the same configuration and amount of front-end crush space as forward control vehicles.

The NHTSA recently addressed this same issue in connection with Standard No. 219, *Windshield Zone Intrusion*, and, in the absence of any objections, amend that standard to exclude walk-in van-type vehicles (41 FR 54945, December 16, 1976). On reconsideration of the extended applicability of Standard No. 212 to these vehicles, the agency concludes that the same rationale applies. Accordingly, applicability of Standard No. 212 to walk-in van-type vehicles is withdrawn.

In consideration of the foregoing, the effective date of the amendment to Standard No. 212 (49 CFR 571.212) published August 30, 1976 (41 FR 36493) is changed from September 1, 1977, to September 1, 1978, and paragraphs S3 and S6.5 of that text are modified. . . .

(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 29, 1977.

Joan Claybrook
Administrator

42 F.R. 34288
July 5, 1977

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 212

Windshield Mounting; Windshield Zone Intrusion

(Docket No. 79-14; Notice 02)

ACTION: Final Rule.

SUMMARY: This notice amends two safety standards, Standard No. 212, *Windshield Mounting,* and Standard No. 219, *Windshield Zone Intrusion,* to limit the maximum unloaded vehicle weight at which vehicles must be tested for compliance with these standards. This action is being taken in response to petitions from the Truck Body and Equipment Association and the National Truck Equipment Association asking the agency to amend the standards to provide relief from some of the test requirements for final-stage manufacturers. Many of these small manufacturers do not have the sophisticated test devices of major vehicle manufacturers. The agency concludes that the weights at which vehicles are tested can be lessened while providing an adequate level of safety for vehicles such as light trucks and while ensuring that compliance with these standards does not increase their aggressivity with respect to smaller vehicles.

EFFECTIVE DATE: Since this amendment relieves a restriction by easing the existing test procedure and will not impose any additional burdens upon any manufacturer, it is effective (upon publication).

FOR FURTHER INFORMATION CONTACT:

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

SUPPLEMENTARY INFORMATION:

On August 2, 1979, the National Highway Traffic Safety Administration published a notice of proposed rulemaking (44 FR 45426) relating to two safety standards: Standard Nos. 212, *Windshield Mounting,* and 219 *Windshield Zone Intrusion.* That notice proposed two options for amending the test procedures of the standards that were designed to ease the compliance burdens of small final-stage manufacturers.

The agency issued the proposal after learning that final-stage manufacturers were frequently unable to certify certain vehicles in compliance with these two safety standards. The problem arises because of weight and center of gravity restrictions imposed upon the final-stage manufacturer by the incomplete vehicle manufacturer. (The final-stage manufacturer typically purchases an incomplete vehicle from an incomplete vehicle manufacturer, usually Ford, General Motors or Chrysler.) The incomplete vehicle usually includes the windshield and mounting but does not include any body or work-performing equipment. Since the incomplete vehicle manufacturer installs the windshield, it represents to the final-stage manufacturer that the windshield will comply with the two subject safety standards. In making this representation, however, the incomplete vehicle manufacturer states that the representation is contingent on the final-stage manufacturer's adherence to certain restrictions. Any final-stage manufacturer that does not adhere to the restrictions imposed by the incomplete vehicle manufacturer must recertify the vehicle based upon its own information, analysis, or tests. The major restrictions imposed by the incomplete vehicle manufacturers on the final-stage manufacturer involve weight and center of gravity limitation. In many instances, these limitations have made it impossible for final-stage manufacturers either to rely on the incomplete vehicle manufacturer's certification or to complete vehicles on the same chassis that they were accustomed to using (prior to the extension of the two safety standards to these vehicle types). As a result, the final-stage manufacturer is faced either with buying the same chassis as before and recertifying them or with buying more expensive chassis with higher GVWR's and less stringent weight and center of gravity limitations.

The agency has tried several different ways to alleviate this problem for the final-stage manufacturer. The NHTSA has met with representatives of the major incomplete vehicle manufacturers to encourage them to respond voluntarily by strengthening their windshield structures and reducing the restrictions that they currently impose upon final-stage manufacturers. The agency also discussed the possibility of its mandating these actions by upgrading Standards Nos. 212 and 219. Ford and General Motors indicated that the making of any major changes in these standards could lead to their deciding to discontinue offering chassis for use in the manufacturing of multi-stage vehicles. They said that such chassis were a very small percentage of their light truck sales and that, therefore, they would not consider it worth the cost to them to make any extensive modifications in their vehicles. NHTSA also asked the incomplete vehicle manufacturers to be sure that they have properly certified their existing vehicles and that they are not imposing unnecessarily restrictive limitations upon final-stage manufacturers. To this agency's knowledge, these vehicle manufacturers have neither undertaken any strengthening of their vehicles' windshield structures nor lessened any of their restrictions.

At the same time that the agency was made aware of the final-stage manufacturers' problems of certifying to these standards, the agency was becoming concerned about the possibility that compliance of some light trucks and vans with these standards might have made the vehicles more aggressive with respect to smaller passenger cars that they might impact. According to agency information, if these standards require a substantial strengthening of vehicle frames, the aggressivity of the vehicles is increased. Therefore, as a result of the agency's concern about aggressivity and its desire to address the certification problems of final-stage manufacturers in a manner that would not lead to a cessation of a chassis sales to those manufacturers, the agency issued the August 1979 proposal. The agency hoped that the proposal would allow and encourage incomplete vehicle manufacturers to reduce their weight and center of gravity restrictions, thereby easing or eliminating the compliance test burdens of final-stage manufacturers. The agency believed that this could occur using either option, because either would result in vehicles being tested at lower weights. Currently vehicles are tested under both standards at their unloaded vehicle weights plus 300 pounds.

The first option would have required some vehicles whose unloaded vehicle weights exceeded 4,000 pounds to be tested by being impacted with a 4,000 pound moving barrier. The second option proposed by the agency would have required vehicles to be tested at their unloaded vehicle weight up to a maximum unloaded vehicle weight of 5,500 pounds. This option was suggested to the agency by several manufacturers and manufacturer representatives.

Comments on Notice

In response to the agency's notice, nine manufacturers and manufacturer representatives submitted comments. All of the commenters supported some action in response to the problems of final-stage manufacturers. Most of the commenters also suggested that the agency's second alternative solution was more likely to achieve reductions in the restrictions being imposed by incomplete vehicle manufacturers. The first option would have created a new, unproven test procedure, and manufacturers would have been cautious in easing center of gravity or weight restrictions based upon this test procedure. Accordingly, most commenters were not sure that the first option would achieve the desired results. The consensus was, therefore, that the second option should be adopted.

Some manufacturers recommended that both options be permitted allowing the manufacturer to decide how to test its vehicles. The agency does not agree with this recommendation. Not only would it be more difficult and expensive to enforce a standard that has alternative test procedures, but most manufacturers prefer the 5,500 pound weight limit option. The NHTSA concludes that as a result of the comments supporting the 5,500 pound maximum test weight, that this is an acceptable procedure for testing compliance with these two standards. Therefore, the standards are amended to incorporate this procedure.

The major incomplete vehicle manufacturers commenting on the notice suggested that testing vehicles at a maximum weight of 5,500 pounds might provide some immediate relief. None of the major incomplete vehicle manufacturers provided any information concerning how substantial that relief might be. Ford indicated that any relief might be limited.

The agency believes that the incomplete vehicle manufacturers must accept the responsibility for establishing reasonable restrictions upon their incomplete vehicles. The NHTSA has not been provided with sufficient evidence substantiating the statements of the incomplete vehicle manufacturers that their existing restrictions are reasonable. In fact, some evidence indicates that unnecessarily stringent restrictions are being imposed because incomplete vehicle manufacturers do not want to conduct the necessary testing to establish the appropriate weight and center of gravity restrictions. Since this amendment should reduce the severity of the test procedures, the agency concludes that incomplete vehicle manufacturers should immediately review their certification test procedures and reduce the restrictions being passed on to final-stage manufacturers.

Due to changes in the light truck market, there is reason to believe that the incomplete vehicle manufacturers will be more cooperative than when the agency spoke to them before beginning this rulemaking. At that time, light truck sales were still running well. Now that these sales are down, these manufacturers may be more solicitous of the needs of the final-stage manufacturers. If relief is not provided by the incomplete vehicle manufacturers, then the agency will consider taking additional steps, including the upgrading of Standards Nos. 212 and 219 as they apply to all light trucks.

General Motors (GM) questioned one of the agency's rationales for issuing the notice of proposed rulemaking. GM stated that the agency concludes that this action will provide a more appropriate level of safety for the affected vehicles while the initial extension of these standards to the affected vehicles provides, in GM's view, only a slight increase in the level of safety of the vehicles. GM indicates that since the application of these standards to the affected vehicles provides only slight benefits and since this amendment will reduce those benefits, the standards should not apply to light trucks and vans. The agency disagrees with this suggestion.

The agency is currently reviewing the applicability of many of its safety standards to determine whether they ought to be extended to light trucks and other vehicles. Accident data clearly indicate the benefits that have resulted from the implementation of safety standards to cars. The fatality rate for passenger cars has decreased substantially since the implementation of a broad range of safety standards to those vehicles. On the other hand, light trucks and vans have not had a corresponding reduction in fatality rates over the years. The agency attributes much of this to the fact that many safety standards have not been applied to those vehicles. Since those vehicles are becoming increasingly popular as passenger vehicles, the agency concludes that safety standards must apply to them.

In response to GM's comment that this reduction in the test requirements for Standard Nos. 212 and 219 will remove all benefits derived by having the standards apply to those vehicles, the agency concludes that GM has misinterpreted the effects of this amendment. This amendment will reduce somewhat the compliance test requirements for those light trucks and vans with unloaded vehicle weights in excess of 5,500 pounds. It will not affect light trucks with unloaded vehicle weights below 5,500 pounds. According to agency information, approximately 25 percent of the light trucks have unloaded vehicle weights in excess of 5,500 while the remainder fall below that weight. As a result of weight reduction to improve fuel economy, it is likely that even more light trucks will fall below the 5,500 pound maximum test weight in the future. Therefore, this amendment will have no impact upon most light trucks and vans. In light of the small proportion of light trucks and vans affected by this amendment and considering the potential benefits of applying these standards to all light trucks and vans, the agency declines to adopt GM's suggestion that the standards be made inapplicable to these vehicles.

With respect to GM's question about the appropriate level of safety for light trucks, the agency's statement in the notice of proposed rulemaking was intended to show that the safety of light trucks and vans cannot be viewed without considering the relative safety of lighter vehicles that they may impact. Accordingly, the level of safety that the agency seeks to achieve by this and other safety standards is determined by balancing the interests of the occupants of passenger cars and heavier vehicles.

GM also questioned the agency's statement that vehicle aggressivity may be increased by imposing too severe requirements on these vehicles. GM suggested that no evidence exists that vehicle aggressivity is increased as a result of complying with these standards.

The agency stated in the proposal that it was concerned that compliance with the standards as they now exist might have increased the aggressivity of the vehicles, thereby harming the occupants of passenger cars that are impacted by these larger, more rigid vehicles. The agency is now beginning to examine the full range of vehicle aggressivity problems. The docket for this notice contains a paper recently presented by a member of our staff to the Society of Automotive Engineers on this subject. The agency tentatively concludes, based upon the initial results of our research and analysis, that vehicle aggressivity could be a safety problem and that the agency considers that possibility in issuing its safety standards. The NHTSA notes that Volkswagen applauds the agency's recognition of the vehicle aggressivity factor in safety.

As to GM's argument that compliance with the standards may not have increased vehicle aggressivity, our information on this point came from the manufacturers. The manufacturers indicated that compliance with Standards 212 and 219 requires strengthening the vehicle frame. This makes a vehicle more rigid. Our analysis indicates that making a vehicle more rigid may also make it more aggressive. Therefore, the agency concludes partially on the basis of the manufacturer's information, that compliance with the safety standards as they are written may have increased the aggressivity of the vehicles.

Ford Motor Company suggested that, rather than change these two particular standards, the agency should amend the certification regulation (Part 568) to state that any vehicle that is barrier tested would be required only to comply to an unloaded vehicle weight of 5,500 pounds or less. Ford suggested that this would standardize all of the tests and provide uniformity.

The agency is unable to accept Ford's recommendation for several reasons. First, the certification regulation is an inappropriate place to put a test requirement applicable to several standards. The tests' requirements of the standards should be found in each standard. Second, the Ford recommendation would result in a reduction of the level of safety currently imposed by Standard No. 301, *Fuel System Integrity.*

As we stated earlier and in several other notices, the agency is legislatively forbidden to modify Standard No. 301 in a way that would reduce the level of safety now required by that standard. Even without this legislative mandate, the agency would not be likely to relieve the burdens imposed by Standard No. 301. That standard is extremely important for the prevention of fires during crashes. Compliance of a vehicle with this standard not only protects the occupants of the vehicle that is in compliance but also protects the occupants of vehicles that it impacts. The agency concludes that the standard now provides a satisfactory level of safety in vehicles, and NHTSA would not be likely to amend it to reduce these safety benefits even if such an amendment were possible.

With respect to fuel system integrity, several manufacturers suggested that the agency had underestimated the impact of that standard upon weight and center of gravity restrictions. These commenters indicated that compliance with that standard requires more than merely adding shielding to the fuel systems of the vehicles. The agency is aware that compliance with that standard in certain instances has imposed restrictions upon manufacturers. Nonetheless, the agency continues to believe that as a result of this amendment, the chassis manufacturers will be able to reduce their weight and center of gravity restrictions while still maintaining the compliance of their vehicles with Standard No. 301.

Chrysler commented that the agency should consider including the new test procedure in Standard No. 204 and all other standards that require barrier testing. The agency has issued a notice on Standard No. 204 (44 FR 68470) stating that it was considering a similar test provision for that standard. The agency also is aware that any barrier test requirement imposed upon vehicles subject to substantial modifications by final-stage manufacturers will create problems for the final-stage manufacturers. Accordingly, the agency will consider the special problems of these manufacturers prior to the the issuance of standards that might affect them and will attempt to make the test requirements of the various standards consistent wherever possible.

The agency has reviewed this amendment in accordance with Executive Order 12044 and concludes that it will have no significant economic or other impact. Since the regulation relieves some testing requirements, it may slightly reduce costs associated with some vehicles. Accordingly, the agency concludes that this is not a significant amendment and a regulatory analysis is not required.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations Part 571 is amended by adding the following sentence to the end of paragraph S6.1(b) of Standard No. 212 (49 CFR 571.212) and paragraph S7.7(b) of Standard No. 219 (49 CFR 571.219).

Vehicles are tested to a maximum unloaded vehicle weight of 5,500 pounds.

The authors of this notice are William Smith of the Crashworthiness Division and Roger Tilton of the Office of Chief Counsel.

Issued on March 28, 1980.

Joan Claybrook
Administrator

45 F.R. 22044
April 3, 1980

MOTOR VEHICLE SAFETY STANDARD NO. 212

Windshield Mounting

S1. Scope. This standard establishes windshield retention requirements for motor vehicles during crashes.

S2. Purpose. The purpose of this standard is to reduce crash injuries and fatalities by providing for retention of the vehicle windshield during a crash, thereby utilizing fully the penetration-resistance and injury-avoidance properties of the windshield glazing material and preventing the ejection of occupants from the vehicle.

S3. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating of 10,000 pounds or less. However, it does not apply to forward control vehicles, walk-in van-type vehicles, or to open-body-type vehicles with fold-down or removable windshields.

S4. Definition. "Passive restraint system" means a system meeting the occupant crash protection requirements of S5 of Standard No. 208 by means that require no action by vehicle occupants.

S5. Requirements. When the vehicle traveling longitudinally forward at any speed up to and including 30 mph impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, under the conditions of S6, the windshield mounting of the vehicle shall retain not less than the minimum portion of the windshield periphery specified in S5.1 and S5.2.

S5.1 Vehicles equipped with passive restraints. Vehicles equipped with passive restraint systems shall retain not less than 50 percent of the portion of the windshield periphery on each side of the vehicle longitudinal centerline.

S5.2 Vehicles not equipped with passive restraints. Vehicles not equipped with passive restraint systems shall retain not less than 75 percent of the windshield periphery.

S6. Test conditions. The requirements of S5 shall be met under the following conditions:

S6.1 The vehicle, including test devices and instrumentation, is loaded as follows:

(a) Except as specified in S6.2, a passenger car is loaded to its unloaded vehicle weight plus its cargo and luggage capacity weight, secured in the luggage area, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position.

(b) Except as specified in S6.2, a multipurpose passenger vehicle, truck, or bus is loaded to its unloaded vehicle weight plus 300 pounds or its rated cargo and luggage capacity, whichever is less, secured to the vehicle, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position. The load is distributed so that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR. If the weight on any axle when the vehicle is loaded to its unloaded vehicle weight plus dummy weight exceeds the axle's proportional share of the test weight, the remaining weight is placed so that the weight on that axle remains the same. For the purposes of this section, unloaded vehicle weight does not include the weight of workperforming accessories. Vehicles are tested to a maximum unloaded vehicle weight of 5,500 pounds.

S6.2 The fuel tank is filled to any level from 90 to 95 percent of capacity.

S6.3 The parking brake is disengaged and the transmission is in neutral.

S6.4 Tires are inflated to the vehicle manufacturer's specifications.

S6.5 The windshield mounting material and all vehicle components in direct contact with the mounting material are at any temperature between 15°F and 110°F.

41 F.R. 36493
August 30, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 213

Child Restraint Systems, Seat Belt Assemblies, and Anchorages

(Docket No. 74-9; Notice 6)

ACTION: Final rule.

SUMMARY: This rule establishes a new Standard No. 213, *Child Restraint Systems,* which applies to all types of child restraints used in motor vehicles. It also upgrades existing child restraint performance requirements by setting new performance criteria and by replacing the current static tests with dynamic sled tests that simulate vehicle crashes and use anthropomorphic child test dummies. The new standard would reduce the number of children under 5 years of age killed or injured in motor vehicle accidents.

DATES: On June 1, 1980, compliance with the requirements of this standard will become mandatory. The current Standard No. 213 is amended to permit, at the manufacturer's option, compliance during the interim period either with the requirements of existing Standard No. 213, Child Seating Systems, or the new Standard No. 213, Child Restraint Systems.

ADDRESSES: 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. Vladislav Radovich, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C.20590 (202-426-2264)

SUPPLEMENTARY INFORMATION:

This notice establishes a new Standard No. 213, *Child Restraint Systems.* A notice of proposed rulemaking was published on May 18, 1978 (43 FR 21470) proposing to upgrade and extend the applicability of the existing Standard No. 213, *Child Seating Systems.* The existing standard does not regulate car beds and infant carriers and uses static testing to assess the effectiveness of child restraint systems. The new standard covers all types of child restraint systems and evaluates their performance in dynamic sled tests with anthropomorphic test dummies. On May 18, 1978, NHTSA also published a companion notice of proposed rulemaking proposing to amend Part 572, *Anthropomorphic Test Dummies,* by specifying requirements for two anthropomorphic test dummies representing 3 year and 6 month old children (43 FR 21490) for use in compliance testing under proposed Standard No. 213. The comment closing date for both notices was December 1, 1978.

At the request of the Juvenile Product Manufacturers Association, NHTSA extended the comment closing date until January 5, 1979, for the portions of both proposals dealing with testing with the child test dummies. This extension was granted because manufacturers were reportedly having problems obtaining the proposed test dummies to conduct their own evaluations.

Consumers, public health organizations, child restraint manufacturers and others submitted comments on the proposed standard. The final rule is based on a thorough evaluation of all data obtained in NHTSA testing, data submitted in the comments, and data obtained from other pertinent documents and test reports. Significant comments submitted to the docket are addressed below. The agency will soon issue a final rule on the anthropomorphic test dummy proposal.

Summary of the Final Rule Provisions

The significant portions of the new standard are as follows:

1. The performance of the child restraint system is evaluated in dynamic tests under conditions

simulating a frontal crash of an average automobile at 30 mph. The restraint system is anchored with a lap belt and, if provided with the restraint, a supplementary anchorage belt (tether strap). An additional frontal impact test at 20 mph is conducted for restraints equipped with tether straps or arm rests. In that additional test, child restraints with tether straps will be tested with the tether straps detached and child restraints with arm rests will be tested with the arm rest in place but with the child restraint system belts unbuckled. The additional 20 mph tests are intended to ensure a minimum level of safety performance when the restraints are improperly used.

2. To protect the child, limitations are set on the amount of force exerted on the head and chest of the child test dummy during the dynamic testing of restraints specified for children over 20 pounds. Limitations are also set on the amount of frontal head and knee excursions experienced by the test dummy in forward-facing child restraints and harnesses. To prevent a child from being ejected from a rearward-facing restraint, limitations are set on the amount the seat can tip forward and on the amount of excursion experienced by the test dummy during the simulated crash.

3. During the dynamic testing, no load-bearing or other structrual part of any child restraint system shall separate so as to create jagged edges that could injure a child. If the restraint has adjustable positions, it must remain in its pre-test adjusted position during the testing so that the restraint does not shift positions in a crash and possibly injure a child's limbs caught between the shifting parts or allow a child to submarine during the crash (i.e., allow the child's body to slide too far forward and downward, legs first).

4. To prevent injuries to children during crashes from contact with the surface of the restraint, requirements for the size and shape are specified for those surfaces. In addition, protective padding requirements are set for restraints used by children weighing 20 pounds or less.

5. Requirements in Standard No. 209, *Seat Belt Assemblies* (49 CFR 571.209), are applied to the belt restraints used in child restraint systems.

6. The amount of force necessary to open belt buckles and release a child from a restraint system is specified so that children cannot unbuckle themselves, but adults can easily open the buckle.

7. To promote the easy and correct use of all child restraint systems, they are required to attach to the vehicle by means of vehicle seat belts.

8. Warnings for proper use of the restraints must be permanently posted on the restraint so that the warnings are visible when the restraint is installed. Other information, such as the height and weight limits for children using the child restraint, must also be permanently displayed on the restraint but it does not have to be visible when the restraint is installed. The restraint must also have a location for storing an accompanying information booklet or sheet on how to correctly install and use the restraint.

9. A standard seat assembly is used in the dynamic testing to represent the typical vehicle bench seat and thereby aboid the cost of testing child restraints on numerous vehicle seats.

Applicability of Standard No. 213

The provisions of new Standard No. 213 apply to all types of child restraints used in motor vehicles for protection of children weighing up to 50 pounds, such as child seats, infant carriers, child harnesses and car beds. Beginning on June 1, 1980, compliance with the requirements of this standard will become mandatory. The current Standard No. 213 is amended to permit, at the manufacturer's option, compliance during the interim period either with the requirements of existing Standard No. 213, Child Seating Systems, or of the new Standard No. 213, Child Restraint Systems.

Dynamic Testing

The requirements to be met in the dynamic testing of child restraints include: maintaining the structural integrity of the system, retaining the head and knees of the dummy within specified excursion limits (i.e., limits on how far those portions of the body may move forward) and limiting the forces exerted on the dummy by the restraint system. These requirements will reduce the likelihood that the child using a child restraint system will be injured by the collapse or disintegration of the system, or by contact with interior of the vehicle, or by imposition of intolerable forces by the restraint system. As explained below, omission of any of these three requirements would render imcomplete the criteria for the quantitative assessment of the safety of a child restraint system and could very well lead to the design and use of unsafe restraints.

It was suggested in comments by the child restraint manufacturers and their trade association, the Juvenile Products Manufacturers Association (JPMA), that available restraints are performing satisfactorily. According to them, the new standard imposes expensive testing requirements with instrumented dummies which will increase the price of child restraints and discourage the purchasing of child restraints because of their increased costs. Many manufacturers suggested that the agency limit the standard to tests for occupant excursion and restraint system structural integrity in dynamic tests and not require the use of instrumented test dummies to measure crash forces imposed upon a child.

NHTSA recognizes that some child restraints perform relatively well, but the agency's testing has shown that others perform unsatisfactorily. Measuring only the structural integrity of the system and the amount of occupant excursion allowed during the testing does not provide a measurement of the severity of forces imposed on a child during a crash and thus does not provide an accurate assessment of the actual safety of the system. For example, a manufacturer could design a restraint with a surface mounted in front of the child that would allow a small amount of occupant excursion. However, that surface could impose potentially injurious forces on a child. NHTSA believes that the force measurement performance requirements are a crucial and necessary test to adequately judge a restraint system's effectiveness in preventing or reducing injuries. The use of instrumented test dummies and force measurement requirements are crucial elements of Standard No. 208, *Occupant Crash Protection,* which establish performance requirements for automatic restraint systems. NHTSA believes that systems designed specifically for children should have to provide the same high degree of occupant protection.

Several manufacturers (GM, Ford, Questor, and others) and JPMA objected to the proposed head and chest acceleration limits that must not be exceeded in the dynamic testing. They argued that the acceleration limits are based on biomechanical data for adults and there are no data showing their applicability to children. Because of the lack of biomechanical data on children's tolerance to impact forces, NHTSA has conducted tests of child restraints with live primates to serve as surrogates for three-year-old children. Primates are similar in certain respects to children and, have been used by GM, Ford and others as surrogates in child restraint testing to assess protential injuries to children in crashes. In simulated 30 mph crashes conducted for NHTSA, similar to the test prescribed in the proposed standard, the primates either were not injured or sustained only minor injuries. NHTSA has also conducted child restraint tests using instrumented test dummies representing three-year-old children instead of primates. In the tests, the forces measured on the test dummies, which had not been injurious to the primates, did not exceed the head and chest acceleration criteria proposed in the standard. NHTSA is thus confident that the child restraints which do not exceed these performance criteria in the prescribed tests should prevent or reduce injuries to children in crashes.

Use of instrumented test dummies should not unduly raise the price of child restraints. Since many child restraint systems are already close to compliance, the cost per restraint of any needed design and testing costs should be minimal.

The May 1978 notice would have required restraint systems with adjustable positions to meet the performance requirements of the standards in any of its adjusted positions recommended for use in a motor vehicle. The restraint would have had to remain in its adjusted position during testing. International Manufacturing Co. requested the agency to test adjustable restraints in only their extreme up and down positions. If a manufacturer chooses to offer a seat with a number of adjustable positions which it recommends for use in a motor vehicle, it is important that the seat meet the performance requirements of the standard at any of those positions. Therefore, International's request is denied. NHTSA urges manufacturers not to include any adjustment positions for their restraints which are not to be used in a motor vehicle.

Strollee, Questor and Volvo asked NHTSA to allow adjustable position restraints to change positions during the testing, arguing that controlled change of position can be an effective energy-absorbing method. Allowing changes from one adjustment position to another during a crash can cause injuries to children's hands or fingers caught between the structural elements of the restraint as it changes position. Other effective energy-absorbing methods are available which will not pose a risk of injury to children. Thus, NHTSA is not adopting this suggestion.

Child restraint manufacturers and other interested parties, such as Action for Child Transportation Safety (ACTS), American Academy of Pediatrics, Physicians for Automotive Safety, and Michigan's Office of Highway Safety, urged NHTSA to lengthen the 30 inch head and knee excursion requirements for forward-facing restraints. They argued that some child restraint systems which have been effective in real world crashes will exceed the proposed head excursion limit. NHTSA has reviewed its child restraint tests and determined that during the last few inches of excursion the remaining velocity of the head in impacts with padded surfaces is relatively low. Because slightly increasing the head excursion should not increase the forces imposed upon the child's head, the head excursion limit is changed from 30 to 32 inches.

The May 1978 notice proposed limiting the amount of knee excursion in forward-facing child restraints to 30 inches. The purpose of the knee excursion limit is to prevent manufacturers from controlling the amount of head excursion by designing their restraints so that their occupants submarine excessively during a crash (i.e., so that their bodies slide too far downward and forward, legs first). Many child restraint manufacturers and JPMA asked the agency to lengthen the knee excursion limits. They argued that many restraints, particularly reclining child restraints where the occupant's knees will be further forward than a non-reclining child restraint, cannot pass the knee excursion limit, but do not allow the occupants to submarine. They claimed that the reclining feature is a comfort and convenience device which promotes seat usage since it allows a child to sleep in the restraint. They recommended that the agency establish a separate requirement which would prevent the occupant's torso from straightening out and submarining under the belts. NHTSA has tested several child restraints in the reclining position and determined that the knee excursion can be lengthened to 36 inches without allowing submarining if the dummy's torso has rotated at least 15 degrees forward from its initial starting position when the knees have reached their maximum excursion. Thus, the new standard incorporates a 36 inch knee excursion limit and requires the test dummy's torso to have rotated at least 15 degrees forward when the knees have reached their maximum excursion.

For rear-facing child restraints (i.e., infant carriers) the May 1978 notice proposed retaining the dummy's head within the confines of the seat and preventing the back support surface of the restraint from tipping forward far enough to allow the angle between it and the vertical to exceed 60 degrees. If the support surface were allowed to tip more, the infant in the restraint could slide head first out of the shoulder straps. GM and Heinrich Von Wimmersperg pointed out that there is a conflict between the description of the confines of rear-facing restraints contained in the text of the standard and the manner in which the confines are defined in one of the figures incorporated in the standard. The text has been modified to correctly identify the confines of the restraint systems. GM also commented that the text of the standard defined the head confinement requirements in reference to the head target points of the infant dummy, although the infant dummy, unlike the 3 year child test dummy, does not have target points. The revised specifications for the infant test dummy do include head target points and therefore the confinement requirement is retained as originally proposed.

Several child restraint manufacturers objected to limiting the forward tipping of rear-facing restraints to 60 degrees. They argued that rear-facing child restraints can tip as much as 70 degrees forward and still retain the child within the restraint. They also argued that a rear-facing restraint will hit the instrument panel in the front seat, or the back of the front seat if the restraint is used in the rear seat, before the restraint tips 60 degrees. NHTSA is retaining a limit on forward tipping since a child restraint can be used in a vehicle with the vehicle's front seat moved to its extreme forward or rearward position. If the child restraint is used in the front seat and the vehicle seat is in the extreme rearward position, the child restraint can tip forward without striking the instrument panel. Likewise, a child restraint used in the rear seat, where the vehicle's front seat is in its extreme forward position, can tip forward without striking the back of the front seat. However, tests done by NHTSA have shown that a restraint can tip forward as much as 70 degrees while still retaining the child within the confines of the restraint. Therefore, the limitation on forward tipping is being changed to 70 rather than 60 degrees.

One child restraint manufacturer, the American Association for Automotive Medicine and Heinrich Von Wimmersperg commented that manufacturers of rear-facing restraints may attempt to comply with the limitation on forward rotation by designing the normal resting angle of the seat in a very vertical alignment or by adding attachments to prop the seat into a vertical position. Either of those approaches can create an uncomfortable seating position for the child. They recommended that the agency establish a minimum resting angle for rear-facing restraints. The agency is not adopting this suggestion at this time. By increasing the amount of forward rotation allowed, the agency should have removed the temptation for manufacturers to design restraint resting angles which would make it easier to comply with the requirement, but would create uncomfortable seating positions for the child.

The May 1978 notice proposed an additional dynamic test at 20 mph for child restraint systems equipped with tether straps with those straps left unattached. A number of commenters (such as Insurance Institute for Highway Safety, ACTS, University of Tennessee, Questor, Bobby Mac, and Michigan's Office of Highway Safety) commented that many people fail to connect the tether. They recommended that this type of restraint be tested at 30 mph with unattached tethers.

The agency is aware of the benefits and disadvantages of child restraints equipped with tethers, which presently account for over 70 percent of the child restraint sales. The agency's testing has shown that in 30 mph frontal tests child restraints with the tethers attached have less occupant excursion and lower head and chest accelerations than shield-type restraints that do not use tethers. Tethered restraints also allow far less occupant excursion in lateral crashes than shield-type restraints. The available accident data on child restraints, which includes consumer letters and accident investigation reports, is limited since the usage of child restraints is low. It does show, however, that tethered restraints, both properly tethered and untethered, have prevented injuries to children in crashes where other vehicle occupants were severely injured.

Because of the performance of properly tethered child restraints under testing and accident conditions, the agency does not want to eliminate those restraints from the market. At the same time, the agency wants to reduce or eliminate the possibility of people not using the tethers that accompany those restraints. Therefore, the agency is requiring all seats equipped with a tether to have a visible label warning people to correctly fasten the tether. In addition, the agency is considering issuing a proposal to require vehicle manufacturers to provide attachments for tether anchorages in all their vehicles. Having such attachments will enable parents to easily and properly attach tethers. The agency is also striving to promote the increased and proper use of child restraints through educational programs. As a part of this effort, NHTSA has conducted a series of regional seminars aimed at helping grass roots organizations educate parents about the importance of child restraints. A NHTSA-sponsored national conference on child restraint safety is scheduled for December 10–12 in Washington, D.C. to further these educational programs.

To ensure that restraints equipped with tethers provide at least a minimum level of protection if they are misused, the agency will require an additional dynamic test at 20 mph for those restraints. When tested with tethers unattached, the restraints must pass all the dynamic test performance requirements of the standard.

Energy Absorption and Distribution

Several manufacturers (Questor, Strollee, Cosco) and JPMA objected to the proposed height requirements for head restraints used to control the rearward movement of a child's head in a crash. The proposal would have slightly increased the requirements currently set in Standard No. 213. They argued that there was no basis for the change, which would require them to redesign their child restraints. The new requirements are based on anthropometric data on children gathered since the standard was originally adopted. NHTSA proposed the new head restraint height requirements in its earlier March 1974 notice of proposed rulemaking on child restraints and many manufacturers have already redesigned their seats to comply with the requirements. Since the new heights more accurately reflect the seating heights of children than the old requirements, the agency is adopting them as proposed. The notice proposed that the top of the head restraint be 22 inches above the seating surface for restraints used by children weighing more than 40 pounds. Questor requested the upper weight be changed to 43 pounds. Since 40 pounds represents the weight of a 50th percentile 5 year old and 23 inches represents its seating height, the requirement is not changed.

Several manufacturers (Cosco, Strollee, Questor) and JPMA raised objections to the proposed requirement that head restraints of child restraint systems have a width of not less than 8 inches. They pointed out that the minimum head restraint width requirement is intended to prevent a child's head from going beyond the width of a head restraint in a lateral or rear impact. They argued that restraints with side supports or "wings" should not have to meet the 8 inch width requirement since the side supports will prevent an occupant's head from moving laterally outside the restraint system. NHTSA agrees that the side supports should help laterally retain the child's head within the restraint during a side or rear impact and therefore is exempting those restraints from the 8 inch minimim width requirement. However, to ensure that child restraints with side supports have sufficient width to accommodate the heads of the largest child using the restraint, the agency has set a 6 inch minimum width for those restraints. In addition, to ensure that side supports are large enough to retain an occupant's head within the restraint, the agency has set a minimum depth requirement of four inches for those supports. Anthropomorphic data show that the head of a 50th percentile 5 year old child measures 7 inches front to rear and is 6 inches in breadth. Therefore, a four inch support should contact a sufficient area of the child's head to restrain it.

Manufacturers also questioned if the 8 inch width requirements is to be measured in restraints with side support from the surface of the padded side support or from the surface of the underlying structure before the padding is added. The wording of the standard is changed to make clear that the distance is measured from the surface of the padding, since the padded surface must be wide enough to accommodate the child's head.

The notice proposed that the minimum head restraint height requirement would not apply to restraints that use the vehicle's seat back to restrain the head, if the target point on the side of the head of the test dummy representing a 3 year old child is raised above the top of the seat back. Ford said that because of permitted differences in the dimensions of different test dummies and test seats, its child restraint will not consistently meet the requirements. Ford asked that the height requirement be changed or the manufacturers be permitted to restrict their restraints to seats with head restraints or to rear seats which have a flat surface immediately behind the seat. The standard allows a manufacturer to specify in its instruction manual accompanying the restraints which seating locations cannot be used with the child restraint. Therefore, no change is necessary, since Ford is allowed to restrict use of its restraint.

Several manufacturers (Cosco, Strollee, Questor) and JPMA objected to the proposed force distribution requirement set for the sides of child restraint systems. The specifications do not require manufacturers to incorporate side supports in their restraints, they only regulate the surfaces that the manufacturer decides to provide so that they distribute crash forces over the child's torso. The commenters requested that the agency define the term "torso" and explain the reason for setting different side support requirements for systems used by infants weighing less than 20 pounds than for systems used by children weighing 20 pounds or more. In restraints for infants less than 20 pounds, the minimum side surface area requirements are based on anthropometric data for a 6-month-old 50th percentile infant to ensure maximum lateral body contact in a side impact. Since the skeletal structure of an infant is just beginning to develop, it is important to distribute impact forces over as large a surface area of the child as possible, rather than concentrating the potentially injurious forces over a small area. For restraints used by children weighing more than 20 pounds and, therefore, having a more developed skeletal structure the minimum surface area requirement is based on anthropometric data for a 50th percentile 3-year-old child to provide restraint for the shoulder and hip areas of the child.

To enable manufacturers to determine their compliance with the torso support requirement, the standard follows the dictionary definition of "torso" and defines the term as referring to the portion of the body of a seated anthropomorphic test dummy, excluding the thighs, that lies between the top of the seating surface and the top of the shoulders of the test dummy.

Several manufacturers (Cosco, Strollee, Questor) and JPMA questioned the basis for prohibiting surfaces with a radius of curvature of less than 3 inches. They and Hamill also asked if the measurement of the curvature is to be made before or after application of foam padding on the underlying surface. The radius of curvature limitation will prevent sharp surfaces that might concentrate potentially injurious forces on the child. It is based on the performance of systems with such a radius of curvature that have not produced injuries in real world crashes. The standard is changed to require the measurement of the radius of curvature to be made on the underlying structure of the restraint, before application of foam padding. Since foam compresses when impacted in a crash, it is important that the structure under the foam be sufficiently curved so it does not concentrate the crash forces on a limited area of the child's body.

For child restraints used by children weighing less than 20 pounds, the notice proposed that surfaces which can be contacted by the test dummy's head during dynamic testing must be padded with a material that meets certain thickness and static compression requirements. A number of manufacturers (Strollee, Cosco, GM and Questor) and JPMA questioned the specifications set for the padding, arguing that there is no need to change from the current materials and the specification of a minimum thickness is design restrictive. Other commenters (Bobby-Mac, Hamill and American Association for Automotive Medicine) requested that the agency establish a test to measure the energy-absorbing capabilities of the underlying structure of the restraint, as well as of the padding.

NHTSA eventually wants to establish dynamic test requirements using instrumented test dummies for restraints used by children weighing 20 pounds or less. Such testing would measure the total energy absorption capability of the padding and underlying structure. At present, there are no instrumented infant test dummies, so the agency is instead specifying long-established static tests of the padding material.

In response to manufacturer comments, the NHTSA has reevaluated the materials currently used in child restraints and determined that those and other widely available materials can apparently provide sufficient energy absorption if used with a specified thickness. The agency has changed the proposed compression-deflection requirements to allow the use of a wider range of materials which should enable manufacturers to provide protective padding for children without having to increase the price of the restraint.

The proposed ban on components, such as arm rests, directly in front of a child which do not restrain the child was objected to by JPMA, and some manufacturers (Strollee, Century Products, International Manufacturing). They argued that arm restraints should not be banned since they promote usage of a child restraint by giving the child an area to rest against or place a book or other plaything. Other manufacturers (Hamill, Bobby-Mac), Michigan's Office of Highway Safety, and the American Academy of Pediatrics supported the ban arguing that arm rests promote misuse by creating the impression that a child can be adequately restrained by merely placing the arm rest in front of the child. The agency is concerned that parents' mistaken beliefs about the protective capability of arm rests may mislead them into not using the harness systems in the restraints.

Therefore, such arm rests or other components only may be installed if they provide adequate protection to a child when the restraint is misused in a foreseeable way because of the presence of the arm rest (i.e., the child is not buckled into the harness that comes with the child restraint system). To measure the performance of child restraints with arm rests and other devices that flip down in front of the child, those restraints will be tested at 20 mph with the component placed in front of the child, but without the child strapped into the restraint system. The restraint must pass the occupant excursion and other dynamic performance requirements in that condition.

Child Restraint Belt Systems

The May 1978 notice proposed three alternatives for the buckle release force required for the harnesses that restrain a child within the restraint. Many manufacturers favored the alternative based on the current Standard No. 213 which establishes a maximum force of 20 pounds, but does not establish a minimum force. In order to promote international harmonization, Volvo endorsed another alternative proposed by the Economic Commission of Europe which would set a minimum force of 2.25 pounds and a maximum of 13.45 pounds. However, Volvo proposed deviating from the ECE proposal and allowing a maximum release force of 20 pounds. Michigan's Office of Highway Safety and the American Seat Belt Council (ASBC) supported the other alternative which, based on a study by the National Swedish Road and Traffic Institute, would have set a 12 pound minimum force and a 20 pound maximum force. ASBC stated that this alternative should prevent a small child from opening the buckle, but not be too strong to prevent a small adult female from opening the buckle. Other commenters, such as ACTS and Borgess Hospital, recommended that the force be set at a level which children could not manage. Borgess noted that their experience with 400 rental child restraints shows that keeping children from unbuckling their restraints is a common problem. Physicians for Automotive Safety recommended that all buckle types be standardized and the release force be set at a level which can be quickly opened in an emergency.

Based on its review of the comments, NHTSA has decided to require buckles with a minimum release force of 12 pounds and a maximum release force of 20 pounds. The effectiveness of a restraint depends on the child being properly buckled at the time of impact. If a child is capable of releasing the buckle, it can inadvertently or purposely defeat the protection of the harness system. Setting a minimum force of 12 pounds should prevent small children from opening the buckle. Setting a maximum of 20 pounds as the release force will enable parents to easily open the buckle. NHTSA encourages manufacturers of child restraints to use push button buckles, similar to those used in automobile belts, so that people unfamiliar with child restraints can readily unbuckle them in emergencies. The agency will consider further rulemaking to standardize the buckle if manufacturers do not voluntarily adopt this approach.

Likewise, NHTSA has already advised child restraint manufacturers that physicians have informed the agency that some children are burned during the summer by over-heated metal buckles or other metal child restraint hardware. NHTSA will monitor manufacturer efforts to eliminate this problem and determine if additional rulemaking is necessary.

The proposal that the belt systems in child restraints meet many of the belt and buckle requirements of Standard No. 209, *Seat Belt Assemblies*, such as those relating to abrasion, resistance to light, resistance to microorganisms, color fastness and corrosion and temperature resistance was not opposed by any of the commenters and is therefore adopted. The buckle release test in Standard No. 209 for child restraint buckles is deleted, since Standard 213 now sets new performance requirements for buckles. Ford noted that the proposal inadvertently dropped a portion of Standard No. 209's abrasion requirements, which have been reincorporated in the final rule.

To prevent the belts from concentrating crash forces over a narrow area of a child's body, the proposal sets a minimum belt width of 1½ inch for any belt that contacts the test dummy during the testings. Hamill requested that pieces of webbing used to position the principal belts that maintain crash loads be exempt from the minimum width requirements. The agency believes that as long as the test dummy, and thus a child, can contact the belts during a crash the belts should be wide enough to spread the crash forces and therefore Hamill's request is denied.

Methods of Installation

Many commenters, including ACTS, American Academy for Pediatrics, Insurance Institute for Highway Safety, and American Seat Belt Council, said that child restraint systems cannot be used with some automatic belt systems, since they do not have a lap belt to secure the child restraint to the seat. They asked the agency to require all automatic belt systems to include lap belts.

The agency considers the compatibility of child restraints with automatic belt systems to be an important issue. One of the purposes of the agency's December 12, 1979, public meeting on child safety and motor vehicles is to obtain the public's views and information on that and other child passenger safety issues to assist the agency in determining whether to commence rulemaking. One rulemaking option currently being considered by the agency is to require vehicle manufacturers to provide anchorages for lap belts in automatic restraint equipped vehicles so that parents wishing to install lap belts can easily do so.

A number of manufacturers are voluntarily taking steps to make automatic belt systems compatible with child restraint systems. For example, GM provides an additional manual belt with its optional automatic lap-shoulder belt system for the front passenger's seat in the 1980 model Chevrolet Chevette to enable parents to secure child restraint systems.

Many of the commenters also asked the agency to require vehicle manufacturers to install anchorages or provide predrilled holes to attach tether anchorages in all their vehicles. They argued such anchorages or holes will make it easy for parents to attach tether straps correctly. As mentioned earlier in this notice, the agency is considering issuing a proposal to require manufacturers to provide attachments for tether anchorages in all their vehicles.

The May 1978 notice proposed that all child restraints be capable of being secured to the vehicle seat by a lap belt. Volvo and Mercedes once again asked the agency to allow the use of "vehicle specific" child restraints (systems uniquely designed for installation in a particular make and model which do not utilize vehicle seat belts for anchorages). As explained in the May 1978 notice, such systems can easily be misused by being placed in vehicles for which they were not specifically designed. Standardizing all restraints by requiring them to be capable of being attached by a lap belt is an important way to prevent misuse.

However, since vehicle specific child restraints can provide adequate levels of protection when installed correctly, NHTSA is not prohibiting the manufacture of such devices. The new standard requires them to meet the performance requirements of the standard when secured by a vehicle lap belt. As long as child restraints can pass the performance requirements of the standard secured only by a lap belt, a manufacturer is free to specify other "vehicle specific" installation conditions.

Labeling

The requirement for having a visible label permanently mounted to the restraint to encourage proper use of child restraints was supported by many of the commenters, including the Center for Auto Safety, ACTS, Insurance Institute for Highway Safety, and Michigan's Office of Highway Safety. Several manufacturers (Century, Cosco, Questor) objected to having a visible label on child restraints, claming that there is not enough space on some restraints to place all the required information. Other commenters supported the visible labeling requirement but suggested that the visible label only have a single warning telling people to follow the manufacturer's instructions (American Association for Automotive Medicine, Strollee, Hamill). Others suggested placing warnings about the correct use of the restraint on a visible label and placing such information as the height and weight limits for children using the restraint and the manufacturer's certification that it meets all Federal Motor Vehicle Safety Standards on a nonvisible label (GM, PAS).

After reviewing the comments, NHTSA concludes that it is important to have certain warnings in a visible position to serve as a constant reminder on how to correctly use the restraint. Because of the limited space on some restraints, the agency has shortened the labeling requirements to require only those instructions most directly concerned with the safe use of the seat be visible. Thus, depending on its design, the restraint must warn parents to secure the restraint with the vehicle lap belt, snugly adjust all belts provided with the restraint, correctly attach the top tether strap and only use a restraint adjustment position which are intended for use in a motor vehicle.

In response to the agency's request for other instructions that a manufacturer should give parents, several commenters (ACTS, Michigan's Office of Highway Safety, Borgess Hospital) said that a warning on the label is necessary to prevent misuse of infant carriers. They said many people mistakenly place infant carriers in a forward-facing, rather than a rear-facing position. A forward-facing position defeats the purpose of those restraints which are designed to spread the forces of the crash over the infant's back. Because of the importance of preventing this type of misuse, the agency will require the visible label to also remind parents not to use rear-facing infant restraints in any other position.

Information about the height and weight limits of the children for which the restraint is designed, the manufacturer and model of the child restraint, and the month, year and place of manufacture and the certification that the restraint complies with all applicable Federal Motor Vehicle Safety Standards would also have to be provided, but that information does not have to be on a label that is visible when the seat is installed.

Many commenters (GM, Insurance Institute for Highway Safety, Multnomah County Department of Human Services, Physicians for Automotive Safety, Center for Auto Safety, and American Academy of Pediatrics) supported the proposed requirement that manufacturers inform consumers about the primary consequences of not following the manufacturer's warning about the correct use of the restraint. Therefore, the visible label must state the primary consequence of misusing the restraint. The same information would also have to be included in the instruction manual accompanying the restraint.

Ford objected to the requirement that the label have a diagram showing the child restraint installed in a vehicle as specified in the manufacturer's instructions. It said that because of the complexity of the instructions required for proper installation of a restraint with different types of belt systems, it is not practical to place all of the information on a single label. Hamill suggested that because of those same considerations, the agency should only require the diagram to show the proper installation of the restraint at one seating position. Other commenters, such as the American Academy for Pediatrics, supported the use of diagrams on the restraint noting that diagrams can more easily convey information than written instructions.

To promote the correct use of child restraints, NHTSA believes that it is important to have a diagram on the restraint to remind users of the proper method of installation. However, so that the label does not become too unwieldy, the agency will only require manufacturers to provide a diagram showing the restraint correctly installed in the right front seating position with a continuous loop lap/shoulder belt and in the center rear seating position installed with a lap belt. For restraints equipped with top tethers, the diagram must show the tethers correctly attached in both seating positions. It is important to show the correct use of a child restraint with a continuous loop lap/shoulder belt (a type of belt system used on many current cars) since such belts must have a locking clip installed on the belt to safely secure the child restraint.

GM objected to the requirement that the label be in block type, which it said makes the label difficult to read. GM requested that manufacturers be allowed to use 10 point type with either capitals or upper and lower case lettering. GM said that using such type will result in an easier to read label which, in turn, should promote more complete reading of the label by the consumer. Since the type sought by GM should promote the reading of the label, the agency is changing the requirement to allow the use of such type as an option.

Several organizations (ACTS, Center for Auto Safety and Insurance Institute for Highway Safety) asked the agency to establish performance test to accompany the requirement that the label be permanently affixed to the restraint. They pointed out that some current paper labels peel off after the restraint has been used awhile. NHTSA has not conducted the necessary testing to establish such a requirement. NHTSA urges manufacturers, whenever possible, to mold the label into the surface of the restraint rather than use a paper label.

Consumers Union and the Center for Auto Safety suggested that all restraints be graded based on their performance in frontal and lateral crash tests and the grades be posted on all the packaging, labels, and instruction manuals accompanying the child restraint. The grades would indicate the seating position within the vehicle with which the restraint can be safely used. Neither Consumers Union nor the Center suggested any performance requirements for establishing the different grades. Since the proposed grading system is outside of the scope of the proposed rule and the agency has not done the necessary testing to determine the specific tests and performance requirements necessary to establish such grading system, NHTSA will evaluate the suggestion for use in future rulemaking.

Installation Instructions

The May 1978 notice proposed that each restraint be accompanied by instructions for correctly installing the restraint in any passenger seat in motor vehicles. Many commenters (Center for Auto Safety, Borgess and Rainbow Hospitals, University of Tennessee And ACTS) suggested that the requirement for the instructions to accompany the restraint should be more explicit to require the restraint to have a storage location, such as a slot in the restraint or a plastic pouch affixed to the restraint, for permanently storing the instructions. They point out that storing the instructions with the restraint means they will be available for ready reference and will be passed on to subsequent owners of the restraint. NHTSA believes such a requirement would best carry out its intent to require the instructions to be easily available to all users and therefore the suggestion is adopted.

Several manufacturers (Strollee, Cosco) and JPMA objected to the agency's proposed requirement that the instructions state that the center rear seating position is the safest seating position in a vehicle. While not questioning the validity of the accident data showing the center rear seat to be the safest seating position in most vehicles, they argued that the agency should consider the psychological impact of not having the child near the adult. Accident data have consistently shown that the occupants in the rear seat are safer than occupants in the front seat. The same data show that the center rear seating position is the safest seating position in the rear seat. To enable parents to make an informed judgment about how best to protect their children, NHTSA believes that it is important to clearly inform them about the safest seating positions in the vehicle, and is therefore retaining the requirement.

In response to the agency's request for additional suggestions to be included in the instruction manual accompanying the restraint, ACTS suggested that car bed manufacturers informed consumers that the child should be placed with its head near the center of the vehicle. Because orienting a child's head in that way will ensure that it is the maximum distance away from the sides of the vehicle in a side impact, the agency has adopted ACTS suggestion. Tennessee's Office of Urban and Federal Affairs suggested that users should be told to secure child restraints with a vehicle belt when the child restraint is in the vehicle but not in use. Since an unsecured child restraint can become a flying missile in a crash and injure other vehicle occupants, the agency has adopted Tennessee's suggestion.

Test Conditions

The standard specifies requirements for a test assembly representing a vehicle bench seat to be used in the dynamic testing. Bobby-Mac commented that the test seat has a more level seating surface and less support at the forward edge of the seat than the seats in many current cars. These differences mean that a child restraint may experience more excursion on the test seat than on more angled and firmer car seats, Bobby-Mac said. NHTSA agrees that in comparison to some vehicles seats, the test seat may present more demanding test conditions. However, the test seat is representative of many seats used in vehicles currently on the road. Meeting the performance requirement of the standard on the test seat will ensure that child restraints perform adequately on the variety of different seats found in cars on the road.

Several manufacturers (Cosco and Strollee) and JPMA raised questions about the requirement proposed for the crash pulse (i.e., the amount of test sled deceleration required to simulate the crash forces experienced by a car) for the 20 and 30 mph tests. The agency had proposed a range of sled test pulses to allow manufacturers the option of using pneumatic or impact sled testing machines. Since a variety of different sled test pulses would be permitted under the proposal, manufacturers asked the agency to explain what would happen if they and the agency tested a child restraint system using different sled test pulses and produced inconsistent results (i.e., a failure using one pulse and a pass at the other, when both pulses were within the permissible range). JPMA suggested that the agency should consider a restraint as in compliance if the restraint meets all the applicable performance requirements in a test in which the sled test pulse lies entirely within the proposed range.

To provide manufacturers with the certainty they desire, the agency has redefined the sled test pulse requirement to establish a single 20 mph (Figure 3) and a single 30 mph (Figure 2) sled test pulse. Thus, in conducting its compliance testing, NHTSA may not exceed the sled test pulse set for the 20 and 30 mph tests. The sled test pulses chosen by NHTSA are the least severe pulses that meet the acceleration thresholds proposed in the notice of proposed rulemaking. Manufacturers are free to use other sled pulses, as long as the acceleration/time curve of the sled test pulse used is equal to or greater than the acceleration/time curve of the sled test pulse set in the standard.

In response to comments by Ford and others that the durability of the foam used in the standard seat assembly may influence the test results, the agency has changed the standard to specify that the foam in the test seat be changed after each test.

GM pointed out that the instructions for positioning the test dummy within the restraint did not specify when in the positioning sequences any of the restraint's belts should be placed on the test dummy. An appropriate change has been made to specify when the belts should be attached. Ford said that the dummy positioning requirements result in an "unnatural" positioning of the dummy within its Tot-Guard restraint so that the dummy's arms rest on the side of the restraint rather than with its arms on the padded portion of the shield. NHTSA notes that a child in a real-world accident will not necessarily have its arms resting on the shield. Allowing the test dummy's arm to be positioned on the shield may inhibit the dummy's forward movement and make it easier to comply with the limits on test dummy excursion and acceleration set in the standard. Thus, Ford's requested change in the positioning requirements is rejected.

Flammability

The notice proposed requiring child restraints to meet the burn resistance requirements of Standard No. 302, *Flammability of Interior Materials*. The requirement was supported by GM, the American Academy of Pediatrics and the American Seat Belt Council. No commenters opposed the requirement. In supporting the requirement, GM said that the flammability characteristics of child restraints, "which are in close proximity to an occupant," should be "compatible with the flammability characteristics of other parts of the vehicle occupant compartment interior," which already must meet the performance requirements of Standard No. 302. The agency agrees with GM about the desirability of providing all vehicle occupants with the protection of Standard No. 302 and is thus requiring all child restraints to meet the performance requirements of that standard.

Inertial Reels

Several commenters raised questions about the effectiveness of vehicle seat belts equipped with inertial reels in securing child restraints. The American Academy of Pediatrics requested the agency to restrict the use of inertial reels to the driver's seating position. Physicians for Automotive Safety and ACTS pointed out that continuous loop lap/shoulder belts with inertial reels must be used with locking clips to secure a child restraint. They said that the difficulty of installing such clips deters their use.

Agency research has found that use of inertial reels increases the comfort and convenience of seat belts and thus promotes their use by older children and adults. Thus, the agency will continue to require the use of inertial reels in vehicle belt systems. However, to ensure that inertial reels are compatible with child restraints, the agency will soon begin rulemaking on the comfort and convenience of vehicle belt systems to require that the belts used in the front right outboard seating position have a manual locking device. This requirement will mean that continuous loop and other types of inertial reel belt systems can be easily and effectively used with child restraints. Such manual locking devices will also be permitted with belts used in the rear seats. As previously outlined in this notice, the agency has established several labeling and installation instruction requirements which deal specifically with the correct use of locking clips on continuous loop belts with inertial reels. Those requirements should reduce or eliminate problems associated with using child restraint in current vehicles equipped with inertial reels.

Costs and Benefits

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

In the 0 to 5 age group, more than 800 children are killed and more than 100,000 children are injured annually as occupants of motor vehicles. Because of the large difference in effectiveness between restraints that can pass the dynamic test of the new standard and those which have passed only a static test, NHTSA projects that there should be 43 fewer deaths and 6,528 fewer injuries per year. Because many restraints have already been upgraded in response to the agency's prior rulemaking proposal, some of the death and injury prevention benefits of the standard have already been realized.

The projected benefits of this standard are limited by the existing low rate of child restraint use. However, the labeling and instruction requirements of this standard should increase the proper usage of child restraints.

Because of NHTSA's 1974 proposal to upgrade child restraints, many manufacturers have currently designed their restraints to meet dynamic test requirements. Therefore, those restraints are only projected to increase in price by approximately $1.00 in order to meet the other requirements of this standard. Restraints that do not currently pass dynamic tests would have a price increase of $16.00 to meet the new requirements. The average sales weighted price increase is $4.25.

Numerous commenters (including National Safety Council, American Academy of Pediatricians, Tennessee Office of Child Development and North Dakota's Department of Public Health) urged the agency to make the standard effective before the proposed May 1, 1980, effective date. GM and the American Safety Belt Council requested that the effective date be delayed beyond the proposed May 1, 1980. Many manufacturers have already upgraded their restraints to the performance requirements set in this rule. The agency believes that providing six months lead-time, until June 1, 1980, will provide sufficient time for the remaining manufacturers to upgrade their restraints.

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

Issued on December 5, 1979.

Joan Claybrook
Administrator,

44 F.R. 72131
December 13, 1979

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 213

Child Restraint Systems; Seat Belt Assemblies

(Docket No. 74-9; Notice 7)

ACTION: 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 typographic errors are corrected in Standard No. 209, *Seat Belt Assemblies*.

EFFECTIVE DATE: 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
Washington, D.C. 20590 (202-426-2264)

SUPPLEMENTARY INFORMATION: On December 13, 1979, 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, 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 modification 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 restraint can be use 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 three 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 inpact 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 sagittal 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 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 5.2.3 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.

Strollee 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 S.5.2.1.1. 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 (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.

Joan Claybrook
Administrator

45 F.R. 29045
May 1, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213

Child Restraint Systems
(Docket No. 74-09; Notice 8)

ACTION: Correction.

SUMMARY: On May 1, 1980, the agency published a notice in the *Federal Register* responding to petitions for reconsideration concerning Standard No. 213, Child Restraint Systems. In response to a petition from Ford Motor Co., the agency stated in the preamble of the notice that it was eliminating the torso rotation requirement of the standard. However, the notice inadvertently did not amend the standard to delete that requirement. This notice makes the necessary amendment.

DATES: The amendment is effective upon publication in the *Federal Register*, October 6, 1980.

FOR FURTHER INFORMATION CONTACT:
Stephen Oesch, Office of Chief Counsel,
National Highway Traffic Safety
Administration, 400 Seventh Street, S.W.,
Washington, D.C. (202-426-2992)

SUPPLEMENTARY INFORMATION: On May 1, 1980, the agency published a notice responding to several petitions for reconsideration concerning Standard No. 213, Child Restraint Systems (45 FR 29045).

Among the petitions was one from Ford Motor Co. objecting to the requirement that the test dummy's torso rotate at least 15 degrees during the simulated crash test of the child restraint. Ford argued that it is impossible to measure the 15 degree angle on restraints such as its Tot-Guard which enclose the lower torso of the child and thus conceal one of the pivot points used in measuring the dummy's rotation.

In response to the Ford petition, the agency decided to drop the torso rotation requirement. In the May 1 notice, the agency explained that the purpose of the requirement was to prevent manufacturers from controlling the amount of 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). After further reviewing its child restraint test results, the agency concluded that restraints meeting the knee excursion limit of the standard will provide sufficient protection to prevent such submarining.

Section 5.1.3.1 is revised to read as follows:

S5.1.3.1 Child restraint systems other than rear-facing ones and car beds. In the case of each child restraint system other than a rear-facing child restraint system or a car bed, the test dummy's torso shall be retained within the system and no portion of the test dummy's head shall pass through the vertical transverse plane that is 32 inches forward of point z on the standard seat assembly, measured along the center SORL (as illustrated in Figure 1B), and neither knee pivot point shall pass through the vertical transverse plane that is 36 inches forward of point z on the standard seat assembly, measured along the center SORL.

Issued on September 26, 1980.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

45 FR 67095
October 9, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213

Child Restraint Systems (Docket No. 74-09; Notice 9)

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 213, Child Restraint Systems, to allow the use of thinner padding materials in some child restraints. The agency proposed the amendment in response to a petition for rulemaking filed by General Motors Corporation.

DATES: The amendment is effective on December 15, 1980.

ADDRESSES: 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. (Docket hours: 8:00 a.m. to 4:00 p.m.)

FOR FURTHER INFORMATION CONTACT:

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

SUPPLEMENTARY INFORMATION: On December 13, 1979, NHTSA issued Standard No. 213, Child Restraint Systems (44 FR 72131). The standard established new performance requirements for child restraints, including requirements for the padding used in child restraint systems recommended for use by children under 20 pounds (i.e., infant carriers).

The padding requirements provide that surfaces of the infant carrier that can be contacted by the test dummy's head during dynamic testing must be padded with a material that meets certain thickness and static compression-deflection requirements. The standard requires that the padding must have a 25 percent compression-deflection resistance of not less than 0.5 and not more than 10 pounds per square inch (psi). Material with a resistance of between 3 and 10 psi must have a thickness of ½ inch. If the material has a resistance of less than 3 psi, it must have a thickness of at least ¾ inch.

In response to a petition for rulemaking filed by General Motors Corporation (GM), the agency proposed on October 17, 1980 (45 FR 68694) to modify the padding requirements to allow the use of thinner padding. GM's petition said that the compression-deflection resistance of padding is sensitive to the rate at which deflection occurs during the test procedure. As the deflection rate increases during testing, so does the measured resistance of the material. GM said that the padding used in the head impact area of its child seat has a maximum compression-deflection resistance of 3 psi. However, several different deflection rates are permitted by the American Society for Testing and Materials test procedures incorporated into Standard No. 213. GM reported that the measured 25 percent compression-deflection value of the padding it uses can be as low as 1.8 psi.

To accommodate variations attributable to the use of the different deflection rates permitted in the testing, the agency proposed to allow the use of padding with a compression-deflection resistance of 1.8 psi or more to have a minimum thickness of ½ inch.

The notice denied GM's petition to permit the use of padding with a compression-deflection resistance of 0.2 psi and a thickness of ⅜ or ¾ inch.

GM, the only party that commented on the proposal, supported the proposed revision.

GM requested the agency to reconsider its decision to prohibit the use of padding with a compression-deflection resistance of 0.2 psi. GM argued that the field performance of its child restraints shows that current padding material is effective in reducing deaths and injuries.

As explained in the October notice, the agency agrees that child restraints, such as GM's infant carrier, which have an energy-absorbing shell can provide effective protection with padding having a compression-deflection resistance of 0.2 psi. Many infant carriers, however, use rigid plastic shells rather than energy absorbing shells. Manufacturers of the rigid plastic shells currently use padding with a compression-deflection resistance of 0.5 psi. The agency does not want to degrade that level of performance and therefore GM's request is again denied.

COSTS

The agency has assessed the economic and other impacts of the proposed change to the padding requirements and determined that they are not significant within the meaning of Executive Order 12221 and the Department of Transportation's policies and procedures for implementing that order. Based on that assessment, the agency concludes further that the economic and other consequences of this proposal are so minimal that additional regulatory evaluation is not warranted. When Standard No. 213 was published in the *Federal Register* on December 12, 1979, the agency placed in the docket for that rulemaking a regulatory evaluation assessing the effect of the padding requirements set by the standard. The effect of that rule adopted today is to permit the use of some padding materials in a thickness of 1/2 inch rather than 3/4 inches. Such a change will slightly reduce manufacturer padding costs.

The agency finds, for good cause shown, that an immediate effective date for this amendment is in the public interest since it relieves a restriction in the standard that goes into effect on January 1, 1981.

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

For the reasons set out in the preamble, Part 571 of Chapter V of Title 49, Code of Federal Regulations, is amended as set forth below.

§571.213 [Amended]

1. 49 CFR Part 571 is amended by revising paragraph §S5.2.3.2(b) of §571.213 to read as follows:

* * * * *

(b) A thickness of not less than 1/2 inch for materials having a 25 percent compression-deflection resistance of not less than 1.8 and not more than 10 pounds per square inch when tested in accordance with S6.3. Materials having 25 percent compression-deflection resistance of less than 1.8 pounds per square inch shall have a thickness of not less than 3/4 inch.

Issued on December 8, 1980.

Joan Claybrook
Administrator

45 FR 82264
December 15, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213

Child Restraint Systems
(Docket No. 74-09; Notice 11)

ACTION: Technical amendment.

SUMMARY: When the final rule establishing Standard No. 213, *Child Restraint Systems*, was issued, it included a section setting requirements for a diagram to show the proper installation of a child restraint within a vehicle. Although the preamble discussed the installation diagram requirement, the standard inadvertently did not require the diagram to be placed on the restraint. This notice makes the necessary technical amendment to correct the standard.

EFFECTIVE DATE: August 26, 1982.

SUPPLEMENTARY INFORMATION: In May 1978, the agency proposed a substantially upgraded Standard No. 213, *Child Restraint Systems* (43 F.R. 21470). In section 5.5.2(a)-(k) of the standard, the agency proposed requirements for certain warning and installation labaels for child restraints. In particular, section 5.5.2(k) proposed specific requirements for a diagram showing the proper installation of a child restraint in a vehicle. Section 5.5.1 of the standard proposed that all of the labels specified in 5.5.2(a)-(k) would have to be placed permanently on the child restraint.

When the agency issued its final rule, it expanded the labeling requirements for child restraints (44 F.R. 72131). The preamble for the final rule discussed the specifics of the expansion and the reasons for adopting the labeling requirements. Because of the expansion, the installation diagram requirement of section 5.5.2(k) of the proposal was redesignated as section 5.5.2(l) in the final rule. Inadvertently, section 5.5.1 of the standard was not modified to reflect the expansion of the labeling requirements and thus it continued to specify that only the information found in section 5.5.2(a)-(k) be placed on the child restraint.

Most manufacturers recognized the intent of the agency and have placed the correct installation diagram on their restraints. A number of manufacturers apparently have not included such diagrams on their child restraints.

This notice makes the necessary technical amendment to correct the standard to require the installation diagram to be placed on a child restraint. The effective date of this correction is 45 days after the publication of this notice in the *Federal Register.* This will allow time for the few manufacturers that have not included installation diagrams to prepare the needed diagrams for their child restraints.

The agency has determined that there is good cause for not providing additional notice and opportunity to comment on this technical amendment. The public has previously had notice and opportunity to comment on the installation diagram requirement. This technical amendment merely corrects an error arising from the redesignation of the installation diagram requirement during the rulemaking process.

Issued on July 2, 1982.

Courtney M. Price
Associate Administrator
for Rulemaking

47 F.R. 30077
July 12, 1982

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213

Child Restraint Systems for Use in Motor Vehicles and Aircraft
[Docket No. 74-09; Notice 14]

ACTION: Final rule.

SUMMARY: This final rule amends Federal Motor Vehicle Safety Standard No. 213, *Child Restraint Systems*, so that child restraint systems can be certified for use in motor vehicles, or for use in both motor vehicles and aircraft. The requirements for certifying child restraints for use in aircraft were formerly specified in the Federal Aviation Administration's (FAA) Technical Standard Order (TSO) C100, which required that in order for child restraint systems to be certified for use in aircraft, they must first be certified for use in motor vehicles and then pass three additional performance tests. Simultaneously with the effective date of this rule, FAA will rescind the requirements of TSO C100 and take action to permit child restraints certified under the requirements of this rule to be used in aircraft.

The notice of proposed rulemaking which preceded this final rule proposed to add the three performance requirements of the TSO and one additional performance requirement for restraints with tether straps to Standard No. 213. This rule adopts one of the three performance requirements of the TSO, the inversion test, and requires that child restraint manufacturers wishing to certify their products for use in both motor vehicles and aircraft certify that the product complies with the requirements of that test. The other performance requirements proposed in the notice are not incorporated in this rule because a joint testing program conducted by FAA and NHTSA last year showed these requirements to be redundant. Child restraints which passed the existing higher performance requirements in Standard No. 213 easily passed the requirements of the TSO, which indicates that those TSO requirements are unnecessary to establish that child restraints are effective in the differing environment of the aircraft interior. Accordingly, compliance with those requirements is no longer required to certify child restraints for use in aircraft.

Child restraints which are certified for use in both motor vehicles and aircraft will be required to be labeled in red with the phrase "THIS RESTRAINT IS CERTIFIED FOR USE IN MOTOR VEHICLES AND AIRCRAFT". Child restraints certified only for use in motor vehicles will not be required to change the information currently required by Standard 213 on their labels.

By combining and simplifying the requirements for certifying child restraints for use in motor vehicles and aircraft, FAA and NHTSA hope to encourage more child restraint manufacturers to certify their products for use in both modes of transportation. The ultimate goal of seeking more models of child restraints to be certified for use in both motor vehicles and aircraft is to encourage families traveling by air to use child restraints for their children before, during, and after the air travel portion of their trips.

EFFECTIVE DATE: This rule becomes effective March 30, 1985.

SUPPLEMENTARY INFORMATION: This rule amends Standard No. 213, Child Restraint Systems (49 CFR §571.213), so that child restraint systems can be certified for use in both motor vehicles and aircraft, or simply for use in motor vehicles. These amendments are intended to encourage families traveling by air to use child restraints to protect their children before, during, and after the air travel portion of their trips.

Background

Need for Increased Use of Child Restraints. Parents cannot adequately protect their very young children against the risk of death and injury while riding in motor vehicles or aircraft either by holding them in their lap or by fastening a lap belt around them. The forces generated during sudden stops even at speeds as low as 10-15 miles per hour (mph) make it physically impossible for a parent to hold and protect a child in his or her arms. Using a lap belt is better, but it is still inadequate for this purpose (particularly for children under the age of 1 year) because of the physical dimensions, bone structure, and weight distribution of young children.

The most effective protection that can be afforded these young children are special supplementary seating devices, which are attached to and secured by the lap belt in the vehicle or aircraft. These devices, generically referred to as child restraints, are specifically designed to take into account the physiological differences between young children and older children and adults, and to offer the appropriate protection for these young children exposed to the large energy levels inherent in vehicle crashes.

Efforts to Promote Increased Use of Child Restraints. The NHTSA has been working hard to promote the use of child restraints by more parents. The agency has been advising the various States on the drafting of mandatory child restraint use laws. Such laws have now been enacted in 49 States and the District of Columbia. These laws have significantly increased the sales and use of child restraints, and increased the pubiic awareness of the safety consequences of allowing children to travel unrestrained in motor vehicles.

In addition, the NHTSA has been working to educate the public on the benefits of child restraints. Working with medical professionals, childbrith educational programs and others, the agency has provided information to pediatricians and prospective parents on ways to protect their children in motor vehicles. Further, the agency has developed manuals on how to develop a child restraint loaner program that can assist parents unable to afford their own child restraints.

All of these factors have succeeded in greatly increasing the use of child restraints for children riding in motor vehicles. Currently, restraint uage for infants less than 1 year old is about 68 percent; and for children ages 1 to 4 the rate is 44 percent; based on the agency's continuing survey of restraint usage in 19 cities.

Impediments to Increased Use of Child Restraints. This heightened use and awareness, combined with the limited number of child restraint models which can be used in both motor vehicles and aircraft, caused confusion and frustration for families traveling by air and car. Both NHTSA and FAA have standards for child restraints. Until recently, of the 42 models of child restraints certified under NHTSA's Standard No. 213 for use in motor vehicles, only five models were also approved under the FAA's standard for use in aircraft. If a family tried to take one of the remaining 37 models of child restraints, they were usually required to check the restraint along with the rest of their luggage. This discouraged families from traveling with the unapproved child restraints, and resulted in the child not having the benefit of the safety seat not only during the takeoff and landing of the aircraft, but also when the family was driving in a motor vehicle on the ground portions of the trip.

From a safety viewpoint, data on injuries and fatalities show that travel by air is much safer than by motor vehicle. For children up to 4 years of age, approximately one fatality and 10 injuries occur yearly during commercial air travel vs. over 600 fatalities and 70,000 injuries to motor vehicle occupants. Consequently, the main benefits from the use of child restraints will be derived from the motor vehicle portion of the trip.

The NHTSA Child Restraint Standard

As an initial step toward ensuring that child restraint systems would offer adequate portection to their occupants, NHTSA issued Standard No. 213 in 1970. That standard, which was issued under the authority granted in the National Traffic and Motor Vehicle Safety Act of 1966, as amended (hereinafter "the Safety Act"; 15 U.S.C. 1381 *et seq.*), became effective in 1971. As then drafted, it specified various static tests to ensure the safe performance of child restraints. However, subsequent data showed that child restraints which passed these static tests might not prove effective at protecting a child in certain vehicle crash situations.

Under the current standard, which became effective January 1, 1981, the performance of child restraint systems is evaluated in dynamic tests under conditions simulating a frontal crash of an average car at 30 mph. The restraint is anchored by a lap belt and, if provided with the restraint, by a supplemental anchorage belt (known as a tether strap). An additional frontal impact test at 20 mph is conducted for restraints equipped with either tether straps or internal harnes and a restraint surface. In that additional test, child restraints with tether straps are tested with the straps detached and child restraints with a restraint surface (e.g., a padded shield) are tested with the restraint surface in place but with the child restraint system's internal harness unbuckled. The additional 20 mph tests are intended to ensure a minimum level of safety performance when the restraints are improperly used. Thus, child restraints with tethers or with a restraint surface are tested at both 20 and 30 mph, while those without tethers or such a surface are tested at 30 mph only. Both the 20 mph and the 30 mph tests are conducted with the child restraint fastened to a seat representing the typical motor vehicle bench seat.

To protect the child, limits are set on the amount of force exerted on the head and chest of a child test dummy during the dynamic testing of restraints specified for children over 20 pounds. Limits are also set on the amount of frontal head and knee excursions experienced by the test dummy in forward-facing child restraints. To prevent a small child from being ejected from a rearward-facing restraint, limits are set on the amount that the seat can tip forward and on the amount of excursion experienced by the test dummy during the simulated crash.

Compliance of child restraints with Standard No. 213 is assured by the requirement in the Safety Act that manufacturers certify compliance for each child restraint. The agency may review the basis for that certification and conduct testing to assure compliance. The Safety Act provides for the assessment of civil penalties for failures to comply with applicable safety standards, and for certifications which the manufacturer in the exercise of due care has reason to know are false or misleading in a material respect.

The FAA Child Restraint Standard

In May 1982, the FAA issued its own child restraint standard, Technical Standard Order (TSO) C100. One of the key factors underlying the development of TSO C100 was child restraint testing conducted by the Civil Aeromedical Institute in 1974. The results of that testing appeared in FAA test report "Child Restraint Systems for Civil Aircraft" (FAA-AM-78-12, March 1978). Another factor was the FAA's determination that differences in the environments of aircraft and motor vehicles necessitated its establishing performance requirements to address the special safety risks posed to young children traveling in aircraft. One of these differences is the tendency of the seat back of aircraft seats to fold forward with the application of a very low force. The FAA determined that there was a need to control the interaction between the young child, especially those facing rearward in a child restraint, and the seat back to ensure that the seat back does not apply unacceptable levels of force onto the child. The FAA also determined that there was a need to address the danger that in-flight turbulence (especially in the upward direction) might throw a child out of his or her child restraint.

Accordingly, the FAA drafted TSO C100 so that it requires each child restraint to meet the requirements of NHTSA's Standard No. 213 and four additional requirements. First, while attached to an aircraft passenger seat with a free-folding seat back by an aircraft safety belt, and occupied by a test dummy, each child restraint must provide protection in an impact producing a 20 mph velocity change. There is no double testing of child restraints with tethers as under Standard No. 213. Such restraints are tested only once in an impact and with their tethers unattached. Second, each child restraint must retain its occupant during an inversion test. Third, each child restraint must withstand the static forces specified in Federal Aviation Regulations §25.561 (14 CFR §25.561), with each of the forces acting separately. Fourth, TSO C100 specifies requirements for marking child restraints with assembly and usage instructions, providing a copy of such instruction to child restraint users and submitting a copy of these instructions and various technical information and test results to the FAA. In addition, the TSO procedures require the establishment and maintenance of a manufacturer quality control system. The quality control system is intended to assure that seats are manufactured in such a way as to meet the standard's performance requirements.

For a child restraint to be approved for use in aircraft, the manufacturer must submit specified information to the FAA along with a certifying statement that the restraint meets the requirements of TSO C100. After the FAA approval is issued, if airlines permit, the restraint can be used for infants or young children during all phases of flight, including takeoff and landing. Once the FAA approved a particular model of child restraint, that agency followed a policy of accepting child restraints of that model that were manufactured prior to the date of approval for use in aircraft during all phases of flight, provided that those earlier child restraints were substantially identical to the approved one and were properly identified as to make and model by a Standard No. 213 certification label.

The result of these differing requirements was that only a few of the child restraints certified for use in motor vehicles were also certified for use in aircraft. In 1983, the National Transportation Safety Board (NTSB) considered the safety problems facing young children traveling in motor vehicles and aircraft and urged that a variety of actions be taken to promote the use of child restraints. It urged that all States adopt laws requiring that infants and young children be placed in child restraints when riding in motor vehicles. It also recommended that the DOT simplify its standards specifying performance requirements for child restraints by combining all technical requirements into a single standard (NTSB Safety Recommendations A-83-1, issued February 24, 1983).

After considering the benefits which would result from the increased use of child restraints, the FAA and the NHTSA jointly concluded that the process of certifying child restraints for use in both motor vehicles and aircraft could and should be simplified and expedited. By combining the separate NHTSA and FAA standards into a single standard under the jurisdiction of a single agency, child restraint manufacturers could avoid the difficulties of dealing with different standards, methods of certification, and testing procedures promulgated by the two agencies. Accordingly, a notice of proposed rulemaking (NPRM) was published at 48 FR 36849, August, 1983.

Details of the NPRM

The NPRM proposed that the NHTSA would be the sole agency responsible for enforcing the new Standard No. 213, which would be applicable to child restraint systems designed for use in both motor vehicles and aircraft. In essence, the NPRM proposed that the requirements in both agencies standards for child restraints be unchanged and simply combined into an expanded Standard No. 213, with one further performance test added for child restraints to be certified for use in aircraft. This would avoid the problems inherent in dealing with the differing certification procedures of the two agencies and consolidate all of the requirements into one standard.

Under the proposal, manufacturers which elected to certify their child restraints for use on aircraft would have to certify that these restraints could pass those four additional tests. Those manufacturers which did not elect to certify their restraints for use on aircraft would not have to make that certification. The existing requirements in Standard No. 213 applicable to child restraints certified for use in motor vehicles were not proposed to be changed in any way by the NPRM. What was proposed was simply an option for manufacturers to subject their restraints to some additional testing if they wanted to certify those restraints for use on aircraft.

Three of the four additional performance tests proposed to be added to Standard No. 213 for child restraints certified for use on aircraft were drawn almost verbatim from the FAA's child restraint standard. These additional tests were proposed to be required to ensure that child restraints certified for use in aircraft would offer adequate protection to young children in the unique interior environment of aircraft.

The first additional test proposed in the NPRM was a dynamic impact test at 20 mph for all restraints not equipped with a tether strap. The child restraint would be attached to a representative aircraft seat only by the aircraft seat belt attached to the aircraft seat. The child restraint would not be permitted to fail or deform in a manner that could seriously injure or prevent subsequent extrication of the occupant. This test was taken almost verbatim from paragraph (a)(2)(i) of TSO C100.

The second additional test proposed in the NPRM would apply only to child restraints equipped with a tether strap. These restraints would be tested under the same procedures as untethered restraints, except that the impact would be at 30 mph with the tether strap unattached. The same criteria for determining satisfactory performance specified above for untethered restraints would again be used. This requirement was not drawn from TSO C100. However, NHTSA decided to include the requirement because the FAA believed that, since aircraft seats have no place to which the tether strap could be anchored, it was necessary to subject such restraints to a more stringent performance test to ensure that these restraints would offer adequate aircraft safety.

The third test proposed in the NPRM was an inversion test. Its purpose is to ensure that the child restraint could protect the child from air turbulence. The test, drawn directly from the language of paragraph (a)(2)(ii) of TSO C100, would have required the combination of a child restraint, test dummy, and aircraft passenger seat to be rotated to an inverted position and held there without any failure or deformation of the child restraint that would seriously injure or prevent the subsequent removal of the occupant.

The fourth additional test proposed in the NPRM would have required each child restraint to withstand the ultimate inertia forces specified in 14 CFR §25.561, with each of those forces acting separately. This requirement was specified in paragraph (a)(2)(iii) of TSO C100. Engineering analysis would have been acceptable in lieu of actual testing to establish compliance with this proposed requirement.

The procedures to be followed in conducting these tests or analyses were drawn from paragraph (a)(2)(iv) of TSO C100. They provided for the testing or analysis of child restraints to determine their adequacy for protecting the weight and stature of child for which the restraint is designed. The test dummies to be used were those specified in section S7 of Standard No. 213. Other procedural provisions related to the placing of the test dummy in the restraint, the attaching of the restraint to the aircraft seat, and the design of the aircraft seat.

As noted above, the NPRM gave child restraint manufacturers an option either to certify their restraints for use in both motor vehicles and aircraft or to certify the restraints only for use in motor vehicles. Those electing the latter option would have been required by the NPRM to include the statement, "THIS RESTRAINT IS NOT CERTIFIED FOR USE IN AIRCRAFT", on the certification label and operating instructions for the child restraint. This labeling requirement was proposed to ensure that parents seeking to buy restraints for use in both modes of transportation and airline flight attendants would easily ascertain whether a particular child restraint was not certified for use in aircraft.

The NPRM also announced that FAA and NHTSA would jointly test many models of child restraints for compliance with the TSO C100 requirements. The test results generated by this program were made available to the manufacturers of the tested restraints to assist them to certify their child restraints for use in both modes of transportation.

FAA-NHTSA Testing of Child Restraints

The testing program evaluated all 42 models of child restraints currently manufactured and certified as meeting the requirements of Standard No. 213 to determine whether they complied also with the existing requirements of TSO C100. (See DOT HS-806-413) There was some preliminary difficulty in determining how to establish whether a child restraint system had "failed or deformed in a manner that could seriously injure or prevent subsequent extrication of a child occupant," the criterion for determining compliance with the tests in TSO C100. The two agencies agreed to use the performance requirements specified in section S5 of Standard No. 213, but to exclude the head and chest acceleration requirements set forth in section S5.1.2.

All 42 models of child restraints, including the 11 which have tether straps, were subjected to the 20 mph dynamic test while attached to a representative aircraft seat, and all passed by a considerable margin. Similarly, the three tethered child seats and eight tethered booster seats were subjected to a 30 mph impact with the tether unattached, and all again passed by a considerable margin. The performance of the three tethered child seats was not appreciably different than was registered by them in the 20 mph impact test, and the head and knee excursions measured in this test were well under those recorded for the restraints in the Standard No. 213 tests. All 42 models were subjected to the TSO C100 inversion test, and all 42 were deemed to have passed those requirements. Additionally, all 42 models were subjected to the static loading tests at the levels specified in TSO C100, and all 42 passed the test.

All 42 models were also tested to the requirements of "old" Standard No. 213, which required the restraint to withstand inertia loads approximately 3 times greater than those specified in TSO C100. Standard No. 213 was upgraded from these old requirements primarily because of the structural failures which occurred in 30 mph dynamic tests of restraints which met the static load requirements under the old version of the standard. NHTSA believed that any of the restraints which could satisfy the dynamic testing requirements of the new Standard No. 213 would also satisfy the static loading requirements of the old standard. Since the loads required under the old standard were approximately 3 times the level required by the TSO, any devices which could satisfy the old standard would *ipso facto* satisfy the TSO requirements.

In this testing to the levels prescribed under the old standard, 40 of 42 models of child restraints passed. The two restraints which failed the tests did so in only one direction, and at load levels 2½ times those required in the TSO.

The joint testing program made it possible for the manufacturers of every model of child restraint currently produced to seek prompt FAA approval for the restraints under TSO C100. This has expedited the process for certifying current models of child restraints for both aircraft and motor vehicle use. At present 36 models have received TSO approval.

However, the Department of Transportation still believes that it is necessary to proceed with a final rule in this area. As a practical matter, new child restraints will be introduced into the market, and those models would face the same obstacles which were confronted by current models before the completion of the joint testing program. It is poor regulatory policy to subject manufacturers to needless and repetitious testing of the identical product to satisfy slightly differing requirements of two different agencies. These considerations impel FAA and NHTSA to proceed to a final rule at this time, so that the situation which existed prior to the joint testing program does not recur at some future date.

Comments

Most of the more than 20 commenters on the NPRM endorsed the concept of combining the FAA and NHTSA standards into one standard. Some of the commenters expressed qualified support for the concept, but reserved final judgment until the results of the joint testing program were made available to the public.

Only one commenter opposed the basic concept of combining the two standards, and that opposition was based on the belief that NHTSA was neither competent nor properly equipped to regulate items related to avaiation and the aircraft industry. First, NHTSA believes it should be emphasized that this rule was developed with the cooperation and support of the FAA, which certainly has the necessary expertise regarding the aviation industry. Further, child restraints are not items which are uniquely related to aviation and the aircraft industry; most of the lifesaving benefits of child restraints accrue while the young child is riding in a motor vehicle. Finally, both NHTSA and FAA gained new knowledge about the interplay of the aircraft seat, child restraint, and child during a sudden deceleration during the recently completed joint testing program. For these reasons, the agencies believe it is appropriate to go forward with this rulemaking.

Several comments raised issues outside the scope of this rulemaking. These included permissible seat positions for approved child restraints in aircraft, retroactive certification for aircraft use of models recently approved for such use, the extent to which individual airlines must examine the restraint's certification to determine its validity, differences in the various airlines' policies permitting the use of child restraints, and so forth. This rulemaking is addressing only the steps child restraint manufacturers must take to certify their products for use in motor vehicles and aircraft. The procedures regulating the actual use of the restraints in aircraft are not being addressed herein; such procedures will be decided solely by the FAA. These and other questions on the procedures should be addressed to that agency.

The commenters made several objections to each of the four proposed additional requirements, to which compliance would have to be certified if a manufacturer wanted to certify its child restraint for use in aircraft. Regarding the first proposed additional test that child restraints without tether straps be tested in an aircraft seat at a 20 mph impact, these commenters argued that all child restraints certified as complying with Standard No. 213 are already subjected to a 30 mph impact in the more severe environment of a car seat. Accordingly, this argument continued, the proposal to require a lower speed test in a less severe environment would simply add to the testing burden for child restraint manufacturers, without ensuring any higher degree of safety.

One of the child restraint manufacturers correctly noted in its comments that the reason for proposing the 20 mph test in the aircraft seat was the concern that the more flexible back of such a seat could snap forward on impact and hit the child restraint and/or child with additional crash forces and that those additional forces would not be considered in the 30 mph test with the restraint attached to a car seat. This commenter suggested that their own testing and some NHTSA tests in 1982 showed that the back of the aircraft seat does not exert significant forces relative to the crash forces. The commenter concluded that NHTSA should delete this proposed requirement unless the joint testing program showed some evidence that significant forces were actually exerted.

The joint testing program showed that the forces to which the test dummy and restraint are subjected in the 20 mph dynamic test in the aircraft seat were 1/3 to 1/2 less than those to which they were subjected in the 30 mph dynamic test in the car seat. This finding was hardly significant or surprising, given the lower speed at impact.

A far more significant finding was made regarding the amount of the loading imposed by the flexible aircraft seat back on the restrained dummy. For this testing, the aircraft seat back was instrumented with a triaxial accelerometer so that quantitative assessments of the produced forces could be made. Inspection of the acceleration-time histories and the loads measured on the aircraft seat belts revealed that in every test the maximum forces generated by the child restraints (as measured by the test dummy and including the peak head and chest accelerations and the peak belt loads) occurred some 25-40 milliseconds before the occurrence of the peak acceleration of the seat back. Also, the magnitude of the head and chest accelerations imparted to the child seat occupant by the restraining action of child seats were much higher than those imparted later on by the action of the aircraft seat back. These facts indicate that the loads imparted when the seat back struck the child restraint and its occupant are relatively insignificant when compared with the loads imparted by the crash. Confirmation of this was found in the fact that the seat back acceleration had no significant influence on the head and chest accelerations measured in the test dummies. However, the loads measured on the aircraft seat belt were increased during the seat back acceleration. This finding suggests that the load exerted by the acceleration of the seat back is transferred directly through the structure of the child restraint to the seat belt. This fact would again confirm the view that the seat back acceleration poses no threat to the occupant of a child restraint.

Based on these results, which occurred in each test, NHTSA believes that it has been established that seat back acceleration poses an inconsequential threat to occupants of child restraints, and that any restraint which protects its occupant against the crash forces will adequately protect its occupant against the forces generated by the seat back acceleration. Given these conclusions, it is unnecessary to test child restraints for their ability to protect a child against the threat of the folding aircraft seat back. Accordingly, the agency has deleted the requirement that child restraints be certified for use in aircraft capable of protecting a restrained child in a 20 mph impact when attached to an aircraft seat.

Many of the commenters objected to the requirement that tethered restraints be subjected to a 30 mph crash in an aircraft seat with the tether unattached. The rationale for these objections was perhaps best summed up in the NTSB comment. The NTSB stated that it could understand subjecting restraints with tethers to the same test as restraints without tethers, and not permitting the restraints with tethers to have their tether strap attached during the test. Such a proposal would ensure that these restraints could pass the same requirements as other child restraints, and that they could do so under the conditions present in aircraft; i.e., with their tether straps unattached. However, the NTSB continued, it was not justifiable to require these restraints to undergo a more severe test than other restraints. One child restraint manufacturer commented that this 30 mph test requirement would not ensure any higher level of safety on aircraft since the aircraft seats themselves would not withstand a 30 mph impact. This commenter went on to say that in an actual crash at 30 mph, there is as much potential of injury to the child from the failure of the aircraft seat itself as from the failure of the child restraint.

As indicated above in the section summarizing the joint testing program, the tests conducted on child restraints with tethers showed that all of those restraints easily passed this 30 mph crash test requirement, that the results were not much higher than were those measured in the 20 mph tests, and that the results showed an appreciably lower force level for the restraints in this test than were obtained in the Standard No. 213 misuse test. Given the conclusion that the seat back acceleration does not transmit any significant forces to the occupant of the child restraint and the fact that this test imposes lower crash forces than the Standard No. 213 tests, it seems unnecessary to require the child restraint manufacturers to certify compliance with this test. The points made in the comments on this proposal also are convincing, so it has been determined not to incorporate this test in the final rule.

The third proposed additional test was an inversion test whose purpose is to ensure that the child restraints certified for use in aircraft could adequately protect the child against the dangers posed by sudden air turbulence. The commenters who addressed this issue seemed to generally agree that this was a hazard which child restraints for use in aircraft should protect against and that restraints which passed the requirements of Standard No. 213 would not necessarily pass this test. NHTSA also believes that the inversion test was not shown to be redundant of existing test procedures, and has determined that this test should be incorporated in this final rule. The requirements for this inversion test are adopted verbatim from those proposed in the NPRM. Several commenters questioned some of the inversion test procedures and offered suggested alternatives. The agency agrees that some refinements could be made. However, it is necessary first to issue a new NPRM. The NPRM, which proposes to amend the requirements for the inversion test adopted in this rule, discusses these comments further.

The fourth additional test proposed in the NPRM was a static load test. Several commenters questioned the need for the relatively low inertial loads of that test to be applied to the restraints, considering the much greater loads to which the child restraint is subjected in the testing for Standard No. 213. This fact, together with the joint testing results which showed that all currently produced child restraints can withstand loads at least 2½ times greater than those specified in this proposed test, leads NHTSA to conclude that this test is redundant and does not ensure any higher level of safety. Accordingly, it is not adopted in this final rule.

Several commenters addressed the criteria used to determine if a child retraint has passed the two simulated crash tests and the inversion test applicable to restraints for aircraft use. These criteria were that the child restraint system "may not fail nor deform in a manner that could seriously injure or prevent subsequent extrication of a child occupant." Some of the child retraint manufacturers asked precisely how one determines if a restraint has failed or deformed in such a manner. Another commenter opined that those criteria "are so vague and subjective as to be of no substantive value whatsoever."

NHTSA agrees with these commenters' judgment that the criteria for determining compliance could be made more objective. However, the Administrative Procedure Act requires that interested persons be given notice of proposed rulemaking and an opportunity to comment thereon prior to an agency's adopting changed requirements as a final rule (5 U.S.C. 553). This provision of the law prevents the agency from adopting these more objective criteria in this final rule, because the interested persons would not have had an opportunity to comment on those criteria. Accordingly, NHTSA is today publishing a notice of proposed rulemaking to incorporate more objective criteria for the inversion test. This notice has a 45-day comment period, to provide any interested persons with the chance to comment on the changes while allowing the agency to move promptly to incorporate more objective criteria.

Most of the commenters addressed the issues raised by the language proposed to be labeled on child restraints which were certified only for use in motor vehicles. The NPRM proposed that such child restraints have the statement "THIS RESTRAINT IS NOT CERTIFIED FOR USE IN AN AIRCRAFT." A number of commenters opposed this "negative" labeling because it could give consumers the impression that such a restraint was not as safe for motor vehicle use as a restraint which was certified for use in both aircraft and motor vehicles. In fact, both restraints would have been certified as passing the same dynamic tests for use in motor vehicles. Other problems alleged to exist with this labeling scheme were that consumers would not be sure whether a child restraint not bearing such a label could be used safely in aircraft, and that this "negative" labeling could result in older, unlabeled and uncertified seats being used on aircraft. Further, the proposed labeling could make it difficult for flight attendants to determine which restraints were actually approved for use in aircraft, causing delays and frustration for parents wishing to use child restraints on flights. These commenters all requested that the "negative" labeling proposed in the NPRM be replaced with a simple positive statement in the final rule.

NHTSA agrees with these comments. The informational purposes of the labeling requirement would be better served by simple positive declarations. The labeling requirement adopted in the final rule specifies that child restraints certified for use only in motor vehicles recite the same certification that is currently required, with no additional statements, and those restraints certified for use in both motor vehicles and aircraft simply add a statement of that dual certification.

Finally, a child restraint manufacturer asked that the final rule clarify the standard aircraft seat assembly to be used for testing the child restraint. The NPRM stated in section S7.3(b) that a "representative aircraft passenger seat" be used. The term "representative aircraft passenger seat" was defined S5 of the NPRM as either a production seat approved by the FAA or a simulated seat conforming to Drawing Package SAS-100-2000. NHTSA believes this definition is clear, and will result in consistent test results. No further changes to this definition have been made in this final rule.

OMB Clearance

The labeling requirements for child restraints are considered to be information collection requirements, as that term is defined by the Office of Management and Budget (OMB) in 5 CFR Part 1320. OMB has approved the labeling requirements for child restraints certified for use in motor vehicles (CMB No. 2127-0511), but has not approved the labeling requirements for child restraints certified for use in motor vehicles and aircraft. Accordingly, those labeling requirements have been submitted to the OMB for its approval, pursuant to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). A notice will be published in the *Federal Register* when OMB approves this information collection.

Impacts

NHTSA has analyzed the impacts of this rule and determined that the rule is not "major" within the meaning of Executive Order 12291, but is "significant" within the meaning of the Department of Transportation regulatory policies and procedures. The rule simplifies and combines the requirements of two existing government regulatios into one regulation. It would not impose any new burdens upon any manufacturer. If a child restraint manufacturer wishes to continue certifying one of its child restraint models for use in motor vehicles only, the requirements for doing so are unchanged and the testing costs would remain at about $3,500. If a child restraint manufacturer wishes to certify a model for use in motor vehicles and aircraft, its testing costs under Standard No. 213 would increase by about $1,500 to a total of about $5,000. However, the total testing costs for certifying a model to this combined Standard No. 213 will be less than the total testing costs for certifying compliance with Standard No. 213 and TSO C100 (estimated at about $8,000). Further, this cost reduction and the need to certify to only one agency's regulation, instead of two agencies' regulations, should provide a slightly reduced cost of compliance for those child restraint manufacturers that choose to certify their products for use in motor vehicles and aircraft. Although these impacts are minimal, a regulatory evaluation has been prepared.

In consideration of the foregoing, the following amendments are made to section 571.213, *Child Restraint Systems*, of Title 49 of the Code of *Federal Regulations*.

1. Section S1 is amended to read as follows:

S1. *Scope*. This standard specifies requirements for child restraint systems used in motor vehicles and aircraft.

2. Section S2 is amended to read as follows:

S2. *Purpose*. The purpose of this standard is to reduce the number of children killed or injured in motor vehicle crashes and in aircraft.

3. Section S3 is amended to read as follows:

S3. *Application*. This standard applies to child restraint systems for use in motor vehicles and aircraft.

4. The definition of "Child restraint system" in section S4 is amended to read as follows:

"Child restraint system" means any device except Type I or Type II seat belts, designed for use in a motor vehicle or aircraft to restrain, seat, or position children who weigh 50 pounds or less.

5. Section S4 is amended by adding the following new definitions in alphabetical order:

"Representative aircraft passenger seat" means either a Federal Aviation Administration approved production aircraft passenger seat or a simulated aircraft passenger seat conforming to Drawing Package SAS-100-2000.

6. Section S5 is amended to read as follows:

S5. *Requirements for child restraint systems certified for use in motor vehicles.* Each child restraint certified for use in motor vehicles shall meet the requirements in this section when, as specified, tested in accordance with S6.1.

7. Section S5.5.2 is revised by the addition of a new paragraph (m) which reads as follows:

(m) Child restraints that are certified as complying with the provisions of section S8 shall be labeled with the statement "THIS RESTRAINT IS CERTIFIED FOR USE IN MOTOR VEHICLES AND AIRCRAFT". This statement shall be in red lettering, and shall be placed after the certification statement required by paragraph (e) of this section.

8. Section S7.3 is revised to read as follows:

S7.3 *Standard seat assemblies.* The standard seat assemblies used in testing under this standard are:

(a) For testing for motor vehicle use, a simulated vehicle use, a simulated vehicle bench seat, with three seating positions, which is described in Drawing Package SAS-100-1000 (consisting of drawings and a bill of materials); and seat.

9. A new section S8 is added to the standard to read as follows:

S8. *Requirements, test conditions, and procedures for child restraint systems manufactured for use in an aircraft.* Each child restraint system manufactured for use in both motor vehicles and aircraft must comply with all of the applicable test requirements specified in section S5 and, when tested in accordance with the conditions and procedures of S8.2, the additional requirements specified in section S8.1.

S8.1 Child containment for conditions of in-flight turbulence must be determined by inversion tests. The combination of a representative aircraft passenger seat, child restraint system, and appropriate test dummy must be rotated from the normal unright position to an inverted position. The combination must remain inverted for at least 3 seconds with neither failure nor deformation that could seriously injure or prevent subsequent extrication of a child occupant. Child containment must be demonstrated for rotation in the forward direction and a sideward direction.

S8.2 Each configuration and mode of installation must be tested for protection of a child of a weight and stature for which the child restraint system is designed. The child occupant must be simulated with an appropriate test dummy as specified in paragraph S7. Placement of each restraint system in a representative aircraft passenger seat and placement of the test dummy must be in accordance with the manufacturer's instructions. Each child restraint system must be attached to the seat by means of an aircraft safety belt without supplementary anchorage belts or tether straps; FAA Technical Standard Order approved safety belt extensions may be used. The representative aircraft passenger seat used in each test must have a seat back that is completely free to fold over.

Issued on August 24, 1984

Diane K. Steed
Administrator

49 FR 34357
August 30, 1984

FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213

Child Restraint Systems, Seat Belt Assemblies, and Anchorages
(Docket No. 74-9; Notice 6)

[**S1. Scope.** This standard specifies requirements for child restraint systems used in motor vehicles and aircraft.

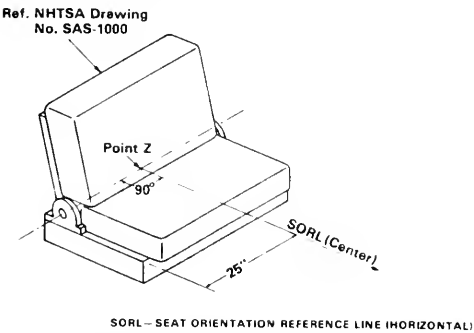
S2. Purpose. The purpose of this standard is to reduce the number of children killed or injured in motor vehicle crashes and in aircraft.

S3. Application. This standard applies to child restraint systems for use in motor vehicles and aircraft. (49 F.R. 34357—August 30, 1984. Effective: March 30, 1985)]

S4. Definitions. "Car bed" means a child restraint system designed to restrain or position a child in the supine or prone position on a continuous flat surface.

["Child restraint system" means any device, except Type I or Type II seat belts, designed for use in a motor vehicle or aircraft to restrain, seat, or position children who weigh 50 pounds or less. (49 F.R. 34357—August 30, 1984. Effective: March 30, 1985)]

"Contactable surface" means any child restraint system surface (other than that of a belt, belt buckle, or belt adjustment hardware) that may contact any part of the head or torso of the appropriate test dummy, specified in S7, when a child restraint system is tested in accordance with S6.1.



SORL Location on the Standard Seat

FIGURE 1A

["Representative aircraft passenger seat" means either a Federal Aviation Administration approved production aircraft passenger seat or a simulated aircraft passenger seat conforming to Drawing Package SAS-100-2000. (49 F.R. 34357—August 30, 1984. Effective: March 30, 1985)]

"Seat orientation reference line" or "SORL" means the horizontal line through Point Z as illustrated in Figure 1A.

"Torso" means the portion of the body of a seated anthropomorphic test dummy, excluding the thighs, that lies between the top of the child restraint system seating surface and the top of the shoulders of the test dummy.

S5. [Requirements for child restraint systems certified for use in motor vehicles. Each child restraint certified for use in motor vehicles shall meet the requirements in this section when, as specified, tested in accordance with S6.1. (49 F.R. 34357—August 30, 1984. Effective: March 30, 1985)]

S5.1 Dynamic performance.

S5.1.1 Child restraint system integrity. When tested in accordance with S6.1, each child restraint system shall:

(a) Exhibit no complete separation of any load bearing structural element and no partial separation exposing either surfaces with a radius of less than 1/4 inch or surfaces with protrusions greater than 3/8 inch above the immediate adjacent surrounding contactable surface of any structural element of the system;

(b) If adjustable to different positions, remain in the same adjustment position during the testing as it was immediately before the testing; and

(c) If a front facing child restraint system, not allow the angle between the system's back support surfaces for the child and the system's seating surface to be less than 45 degrees at the completion of the test.

S5.1.2 Injury criteria. When tested in accordance with S6.1, each child restraint system that, in accordance with S5.5.2(f), is recommended for use by children weighing more than 20 pounds, shall—

(a) Limit the resultant acceleration at the location of the accelerometer mounted in the test dummy head as specified in Part 572 such that the expression:

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a\,dt \right]^{2.5} (t_2 - t_1)$$

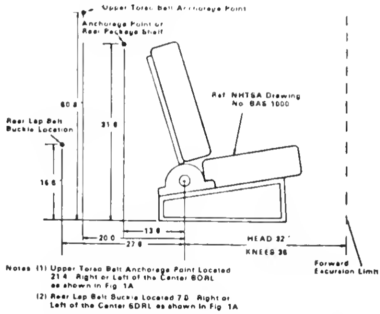
shall not exceed 1,000, where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2, are any two moments during the impacts.

(b) Limit the resultant acceleration at the location of the accelerometer mounted in the test dummy upper thorax as specified in Part 572 to not more than 60 g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S5.1.3 Occupant excursion. When tested in accordance with S6.1 and adjusted in any position which the manufacturer has not, in accordance with S5.5.2(i), specifically warned against using in motor vehicles, each child restraint system shall meet the applicable excursion limit requirements specified in S5.1.3.1—S5.1.3.3.

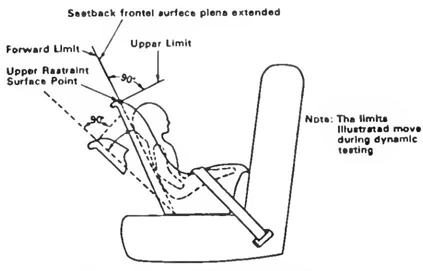
[S5.1.3.1 Child restraint systems other than rear-facing ones and car beds. In the case of each child restraint system other than a rear-facing child restraint system or a car bed, the test dummy's torso shall be retained within the system and no portion of the test dummy's head shall pass through the vertical transverse plane that is 32 inches forward of point Z on the standard seat assembly, measured along the center SORL (as illustrated in Figure 1B), and neither knee pivot point shall pass through the vertical transverse plane that is 36 inches forward of point Z on the standard seat assembly, measured along the center SORL. (45 F.R. 67095—October 9, 1980. Effective: 10/7/80)**]**

S5.1.3.2 Rear-facing child restraint systems. In the case of each rear-facing child restraint system, all portions of the test dummy's torso shall be retained within the system and no portion of the target point on either side of the dummy's head shall pass through the transverse orthogonal planes whose intersection contains the forward-most and top-most points on the child restraint system surfaces (illustrated in Figure 1C).



Locations of Additional Belt Anchorage Points and Forward Excursion Limit
FIGURE 1B

S5.1.3.3 Car beds. In the case of car beds, all portions of the test dummy's head and torso shall be retained within the confines of the car bed.



Rear Facing Child Restraint
Forward and Upper Head Excursion Limits
FIGURE 1C

S5.1.4 Back support angle. When a rear-facing child restraint system is tested in accordance with S6.1, the angle between the system's back support surface for the child and the vertical shall not exceed 70 degrees.

S5.2 Force distribution.

S5.2.1 Minimum head support surface—child restraints other than car beds.

S5.2.1.1 Except as provided in S5.2.1.2, each child restraint system other than a car bed shall provide restraint against rearward movement of the head of the child (rearward in relation to the child) by means of a continuous seat back which is an integral part of the system and which—

(a) Has a height, measured along the system seat back surface for the child in the vertical longitudinal plane passing through the longitudinal centerline of the child restraint systems from the lowest point on the system seating surface that is contacted by the buttocks of the seated dummy, as follows:

Weight [1] (in pounds)	Height [2] (in inches)
Less than 20 lb	18
20 lb or more, but not more than 40 lb	20
More than 40 lb	22

[1] When a child restraint system is recommended under S5.5 (f) for use by children of the above weights.

[2] The height of the portion of the system seat back providing head restraint shall not be less than the above.

(b) Has a width of not less than 8 inches, measured in the horizonal plane at the height specified in paragraph (a) of this section. Except that a child restraint system with side supports extending at least 4 inches forward from the padded surface of the portion of the restraint system provided for support of the child's head may have a width of not less than 6 inches, measured in the horizontal plane of the height specified in paragraph (a) of this section.

(c) Limits the rearward rotation of the test dummy head so that the angle between the head and torso of the dummy specified in S7 when tested in accordance with S6.1 is not more than 45 degrees greater than the angle between the head and torso after the dummy has been placed in the system in accordance with S6.1.2.3 and before the system is tested in accordance with S6.1.

S5.2.1.2 A front facing child restraint system is not required to comply with S5.2.1.1 if the target point on either side of the dummy's head is below a horizontal plane tangent to the top of the standard seat assembly when the dummy is positioned in the system and the system is installed on the assembly in accordance with S6.1.2.

S5.2.2 Torso impact protection. Each child restraint system other than a car bed shall comply with the applicable requirements of S5.2.2.1 and S5.2.2.2.

S5.2.2.1 (a) The system surface provided for the support of the child's back shall be flat or concave and have a continuous surface area of not less than 85 square inches.

(b) Each system surface provided for support of the side of the child's torso shall be flat or concave and have a continuous surface of not less than 24 square inches for systems recommended for children weighing 20 pounds or more, or 48 square inches for systems recommended for children weighing less than 20 pounds.

(c) Each horizontal cross section of each system surface designed to restrain forward movement of the child's torso shall be flat or concave and each vertical longitudinal cross section shall be flat or convex with a radius of curvature of the underlying structure of not less than 2 inches.

S5.2.2.2 Each forward facing child restraint system shall have no fixed or movable surface directly forward of the dummy and intersected by a horizontal line parallel to the SORL and passing through any portion of the dummy, except for surfaces which restrain the dummy when the system is tested in accordance with S6.1.2.1.2 so that the child restraint system shall conform to the requirements of S5.1.2 and S5.1.3.1.

S5.2.3 Head impact protection.

S5.2.3.1 Each child restraint system, other than a child harness, which is recommended under S5.5.2 (f) for children weighing less than 20 pounds shall comply with S5.2.3.2.

[S5.2.3.2 Each system surface, except for protrusions that comply with S5.2.4, which is contactable by the dummy head when the system is tested in accordance with S6.1 shall be covered with slow recovery, energy absorbing material with the following characteristics:

(a) A 25 percent compression-deflection resistance of not less than 0.5 and not more than 10 pounds per square inch when tested in accordance with S6.3. (45 F.R. 29045. Effective: 5/1/80)]

[(b) A thickness of not less than ½ inch for material having a 25 percent compression-deflection resistance of not less than 1.8 and not more than 10 pounds per square inch when tested in accordance with S6.3. Materials having a 25 percent compression-deflection resistance of less than 1.8 pounds per square inch shall have a thickness of not less than ¾ inch. (45 F.R. 82264—December 15, 1980. Effective: 12/15/80)]

S5.2.4 Protrusion limitation. Any portion of a rigid structural component within or underlying a contactable surface, or any portion of a child restraint system surface that is subject to the requirements of S5.2.3 shall, with any padding or other flexible overlay material removed, have a height above any immediately adjacent restraint system surface of not more than ⅜ inch and no exposed edge with a radius of less than ¼ inch.

S5.3 Installation.

S5.3.1 Each child restraint system shall have no means designed for attaching the system to vehicle seat cushion or vehicle seat back and no component (except belts) that is designed to be inserted between the vehicle seat cushion and vehicle seat back.

S5.3.2 When installed on a vehicle seat, each child restraint system, other than child harnesses, shall be capable of being restrained against forward movement solely by means of a Type I seat belt assembly (defined in S571.209) that meets Standard No. 208 (S571.208), or by means of a Type I seat belt assembly plus one additional anchorage strap that is supplied with the system and conforms to S5.4.

S5.3.3 Car beds. Each car bed shall be designed to be installed on a vehicle seat so that the car bed's longitudinal axis is perpendicular to a vertical longitudinal plane through the longitudinal axis of the vehicle.

S5.4 Belts, belt buckles, and belt webbing.

S5.4.1 Performance requirements. The webbing of belts provided with a child restraint system and used to attach the system to the vehicle or to restrain the child within the system shall—

[(a) After being subjected to abrasion as specified in § 5.1(d) or 5.3(c) of FMVSS No. 209 (§ 571.209), have a breaking strength of not less than 75 percent of the strength of the unabraided webbing when tested in accordance with S5.1(b) of FMVSS No. 209. (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)]

(b) Meet the requirements of S4.3 (e) through (h) of FMVSS No. 209 (S571.209); and

(c) If contactable by the test dummy torso when the system is tested in accordance with S6.1, have a width of not less than 1½ inches when measured in accordance with S5.4.1.1.

S5.4.1.1 Width test procedure. Condition the webbing for 24 hours in an atmosphere of any relative humidity between 48 and 67 percent, and any ambient temperature between 70° and 77° F. Measure belt webbing width under a tension of 5 pounds applied lengthwise.

S5.4.2 Belt buckles and belt adjustment hardware. Each belt buckle and item of belt adjustment hardware used in a child restraint system shall conform to the requirements of S4.3 (a) and S4.3 (b) of FMVSS No. 209 (S571.209).

S5.4.3 Belt Restraint.

S5.4.3.1 General. Each belt that is part of a child restraint system and that is designed to restrain a child using the system shall be adjustable to snugly fit any child whose height and weight are within the ranges recommended in accordance with S5.5.2 (f) and who is positioned in the system in accordance with the instructions required by S5.6.

S5.4.3.2 Direct restraint. Each belt that is part of a child restraint system and that is designed to restrain a child using the system and to attach the system to the vehicle shall, when tested in accordance with S6.1, impose no loads on the child that result from the mass of the system or the mass of the seat back of the standard seat assembly specified in S7.3.

S5.4.3.3 Seating systems. Except for child restraint systems subject to S5.4.3.4, each child restraint system that is designed for use by a child in a seated position and that has belts designed to restrain the child shall, with the test dummy specified in S7 positioned in the system in accordance with S6.1.2.3, provide:

(a) upper torso restraint in the form of:

(i) belts passing over each shoulder of the child; or

(ii) a fixed or movable surface that complies with S5.2.2.1(c), and

(b) lower torso restraint in the form of:

(i) a lap belt assembly making an angle between 45° and 90° with the child restraint seating surface at the lap belt attachment points, or

(ii) a fixed or movable surface that complies with S5.2.2.1(c), and

(c) in the case of each seating system recommended for children over 20 pounds, crotch restraint in the form of:

(i) a crotch belt connectable to the lap belt or other device used to restrain the lower torso, or

(ii) a fixed or movable surface that complies with S5.2.2.1(c).

S5.4.3.4 Harnesses. Each child harness shall:

(a) Provide upper torso restraint, including belts passing over each shoulder of the child;

(b) Provide lower torso restraint by means of lap and crotch belt; and

(c) Prevent a child of any height for which the restraint is recommended for use pursuant to S5.5.2 (f) from standing upright on the vehicle seat when the child is placed in the device in accordance with the instructions required by S5.6.

S5.4.3.5 Buckle Release. Any buckle in a child restraint system belt assembly designed to restrain a child using the system shall, when tested in accordance with S6.2, not release when a force of not more than 12 pounds is applied before the test specified in S6.1, and (b) release when a force of not more than 20 pounds is applied after the test specified in S6.1.

S5.5 Labeling.

S5.5.1 Each child restraint system shall be permanently labeled with the information specified in S5.5.2 (a) through (l).

S5.5.2 The information specified in paragraphs (a)-(l) of this section shall be stated in the English language and lettered in letters and numbers that are not smaller than 10 point type and are on a contrasting background.

(a) The model name or number of the system.

(b) The manufacturer's name. A distributor's name may be used instead if the distributor assumes responsibility for all duties and liabilities imposed on the manufacturer with respect to the system by the National Traffic and Motor Vehicle Safety Act, as amended

(c) The statement: "Manufactured in ——," inserting the month and year of manufacture.

(d) The place of manufacture (city and State, or foreign country). However, if the manufacturer uses the name of the distributor, then it shall state the location (city and State, or foreign country) of the principal offices of the distributor.

(e) The statement: "This child restraint system conforms to all applicable Federal motor vehicle safety standards."

(f) One of the following statements, inserting the manufacturer's recommendations for the maximum weight and height of children who can safely occupy the system:

(i) This infant restraint is designed for use by children who weigh ________ pounds or less and whose height is ________ inches or less; or

(ii) This child restraint is designed for use only by children who weigh between ________ and ________ pounds and whose height is ________ inches or less and who are capable of sitting upright alone; or

(iii) This child restraint is designed for use only by children who weigh between ________ and ________ pounds and are between ________ and ________ inches in height.

(g) The following statement, inserting the location of the manufacturer's installation instruction booklet or sheet on the restraint:

WARNING! FAILURE TO FOLLOW EACH OF THE FOLLOWING INSTRUCTIONS CAN RESULT IN YOUR CHILD STRIKING THE VEHICLE'S INTERIOR DURING A SUDDEN STOP OR CRASH.

SECURE THIS CHILD RESTRAINT WITH A VEHICLE BELT AS SPECIFIED IN THE MANUFACTURER'S INSTRUCTIONS LOCATED ________________.

(h) In the case of each child restraint system that has belts designed to restrain children using them:

SNUGLY ADJUST THE BELTS PROVIDED WITH THIS CHILD RESTRAINT AROUND YOUR CHILD.

(i) In the case of each child restraint system which is not intended for use in motor vehicles at certain adjustment positions, the following statement, inserting the manufacturer's adjustment restrictions.

DO NOT USE THE ______________ ADJUSTMENT POSITION(S) OF THIS CHILD RESTRAINT IN A MOTOR VEHICLE.

(j) In the case of each child restraint system equipped with an anchorage strap, the statement: SECURE THE TOP ANCHORAGE STRAP PROVIDED WITH THIS CHILD RESTRAINT AS SPECIFIED IN THE MANUFACTURER'S INSTRUCTIONS.

(k) In the case of each child restraint system which can be used in a rear-facing position, one of the following statements:

(i) PLACE THIS CHILD RESTRAINT IN A REAR-FACING POSITION WHEN USING IT WITH AN INFANT; or

(ii) PLACE THIS INFANT RESTRAINT IN A REAR-FACING POSITION WHEN USING IT IN THE VEHICLE.

(l) An installation diagram showing the child restraint system installed in the right front outboard seating position equipped with a continuous-loop lap/shoulder belt and in the center rear seating position as specified in the manufacturer's instructions.

[(m) Child restraints that are certified as complying with the provisions of section 58 shall be labeled with the statement "THIS RESTRAINT IS CERTIFIED FOR USE IN MOTOR VEHICLES AND AIRCRAFT". This statement shall be in red lettering, and shall be placed after the certification statement required by paragraph (e) of this section. (49 F.R. 34357—August 30, 1984. Effective: March 30, 1985)]

S5.5.3 The information specified in S5.5.2 (g)-(k) shall be located on the child restraint system so that it is visible when the system is installed as specified in S5.6.

S5.6 Installation instructions. Each child restraint system shall be accompanied by printed instructions in the English language that provide a step-by-step procedure, including diagrams, for installing the system in motor vehicles, securing the system in the vehicles, positioning a child in the system, and adjusting the system to fit the child.

S5.6.1 The instructions shall state that the rear center seating position is the safest seating position in most vehicles for installing a child restraint system.

S5.6.2 The instructions shall specify in general terms the types of vehicles, seating positions, and vehicle lap belts with which the system can or cannot be used.

S5.6.3 The instructions shall explain the primary consequences of noting following the warnings required to be labeled on the child restraint system in accordance with S5.5.2 (g)-(k).

S5.6.4 The instructions for each car bed shall explain that the car bed should position in such a way that the child's head is near the center of the vehicle.

S5.6.5 The instructions shall state that child restraint systems should be securely belted to the vehicle, even when they are not occupied, since in a crash an unsecured child restraint system may injure other occupants.

S5.6.6 Each child restraint system shall have a location on the restraint for storing the manufacturer's instructions.

S5.7 Flammability. Each material used in a child restraint system shall conform to the requirements of S4 of FMVSS No. 302 (S571.302).

S6. Test Conditions and Procedures.

S6.1 Dynamic Systems Test.

S6.1.1 Test Conditions.

S6.1.1.1 The test device is the standard seat assembly specified in S7.3. It is mounted on a dynamic test platform so that the center SORL of the seat is parallel to the direction of the test platform travel and so that movement between the base of the assembly and the platform is prevented. The platform is instrumented with an accelerometer and data processing system having a frequency response of 60Hz channel class as specified in Society of Automotive Engineers Recommended Practice J211a, "Instrumentation for Impact Tests." The accelerometer sensitive axis is parallel to the direction of the test platform travel.

ACCELERATION FUNCTION FOR ΔV = 30MPH

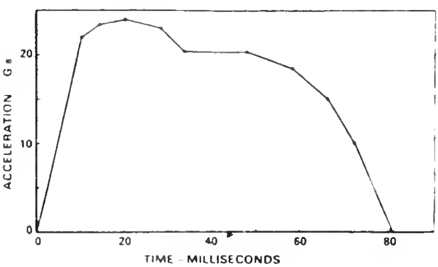


FIGURE 2

S6.1.1.2 The tests are frontal barrier impact simulations and for—

(a) Test configuration I specified in S6.1.2.1.1, are at a velocity change of 30 mph with the acceleration of the test platform entirely within the curve shown in Figure 2.

(b) Test configuration II specified in S6.1.2.1.2, are at a velocity change of 20 mph with the acceleration of the test platform entirely within the curve shown in Figure 3.

ACCELERATION FUNCTION FOR ΔV = 20MPH.

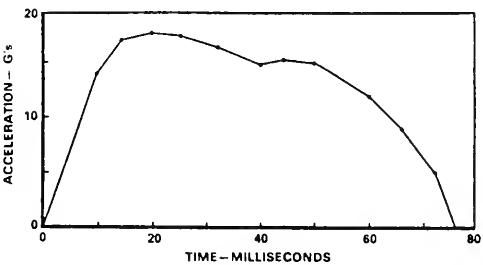


FIGURE 3

S6.1.1.3 Type I seat belt assemblies meeting the requirements of Standard No. 209 (S571.209) and having webbing with a width of not more than 2 inches are attached, without the use of retractors or reels of any kind, to the seat belt anchorage points (illustrated in Figure 1B) provided on the standard seat assembly.

S6.1.1.4 Performance tests under S6.1 are conducted at any ambient temperature from 66° to 78° F and at any relative humidity from 10 percent to 70 percent.

S6.1.2 Dynamic Test Procedure.

S6.1.2.1 Test Configuration.

S6.1.2.1.1 Test Configuration I. In the case of each child restraint system, install a new child restraint system at the center seat position of the standard seat assembly in accordance with the manufacturer's instructions provided in accordance with S5.6 with the system.

S6.1.2.1.2 Test Configuration II. In the case of each child restraint system, other than a child harness, which is equipped with an anchorage belt or a fixed or movable surface described in S5.2.2.2, install a new child restraint system at the center seat position of the standard seat assembly using only the standard seat lap belt to secure the system to the standard seat.

S6.1.2.2 Tighten all belts used to attach the child restraint system to the standard seat assembly to a tension of not less than 12 pounds and not more than 15 pounds, as measured by a load cell used on the webbing portion of the belt.

S6.1.2.3 Place in the child restraint any dummy specified in S7 for testing systems for use by children of the heights and weights for which the system is recommended in accordance with S5.6.

S6.1.2.3.1 When placing the 3-year-old test dummy in child restraint systems other than car beds, position the test dummy according to the instructions for child positioning provided by the manufacturer with the system in accordance with S5.6 while conforming to the following:

(a) Place the test dummy in the seated position within the system with the midsagittal plane of the test dummy head coincident with the center SORL of the standard seating assembly, holding the torso upright until it contacts the system's design seating surface.

(b) Extend the arms of the test dummy as far as possible in the upward vertical direction. Extend the legs of the dummy as far as possible in the forward horizontal direction, with the dummy feet perpendicular to the centerline of the lower legs.

(c) Using a flat square surface with an area of 4 square inches, apply a force of 40 pounds, perpendicular to the plane of the back of the standard seat assembly, first against the dummy crotch and then at the dummy thorax in the midsagittal plane of the dummy. For a child restraint system with a fixed or movable surface described in S5.2.2.2 which is being tested under the conditions of test configuration II, do not attach any of the child restraint belts unless they are an integral part of the fixed or movable surface. For all other child restraint systems and for a child restraint system with a fixed or movable surface which is being tested under the conditions of test configuration I, attach all appropriate child restraint belts and tighten them as specified in S6.1.2.4. Attach all appropriate vehicle belts and tighten them as specified in S6.1.2.2. Position each movable surface in accordance with the manufacturer's instructions provided in accordance with S5.6.

(d) After the steps specified in paragraph (c) of this section, rotate each dummy limb downwards in the plane parallel to its midsagittal plane until the limb contacts a surface of the child restraint system or the standard seat. Position the limbs, if necessary, so that limb placement does not inhibit torso or head movement in tests conducted under S6.

S6.1.2.3.2 When placing the 6-month-old dummy in child restraint systems other than car beds, position the test dummy according to the instructions for child positioning provided with the system by the manufacturer in accordance with S5.6 while conforming to the following:

(a) With the dummy in the supine position on a horizontal surface, and while preventing movement of the dummy torso by placing a hand on the center of the torso, rotate the dummy legs upward by lifting the feet until the legs contact the upper torso and the feet touch the head, and then slowly release the legs but do not return them to the flat surface.

(b) Place the dummy in the child restraint system so that the back of the dummy torso contacts the back support surface of the system. For a child restraint system with a fixed or movable surface described in S5.2.2.2 which is being tested under the conditions of test configuration II, do not attach any of the child restraint belts unless they are an integral part of the fixed or movable surface. For all other child restraint systems and for a child restraint system with a fixed or movable surface which is being tested under the conditions of test configuration I, attach all appropriate child restraint belts and tighten them as specified in S6.1.2.4. Attach all appropriate vehicle belts and tighten them as specified in S6.1.2.2. Position each movable surface in accordance with the manufacturer's instructions provided in accordance with S5.6. If the dummy's head does not remain in the proper position, it shall be taped against the front of the seat back surface of the system by means of a single thickness of 1/4-inch-wide paper masking tape placed across the center of the dummy face.

(c) Position the dummy arms vertically upwards and then rotate each arm downward toward the dummy's lower body until it contacts a surface of the child restraint system or the standard seat assembly, ensuring that no arm is restrained from movement in other than the downward direction, by any part of the system or the belts used to anchor the system to the standard seat assembly.

S6.1.2.3.3 When placing the 6-month-old dummy or 3-year-old dummy in a car bed, place the dummy in the car bed in the supine position with its midsagittal plane perpendicular to the center SORL of the standard seat assembly and position the dummy within the car bed in accordance with instructions for child positioning provided with the car bed by its manufacturer in accordance with S5.6.

S6.1.2.4 If provided, shoulder and pelvic belts that directly restrain the dummy shall be adjusted as follows:

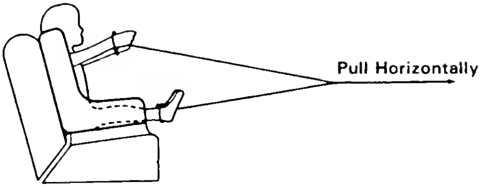
Tighten the belts until a 2-pound force applied (as illustrated in Figure 5) to the webbing at the top of each dummy shoulder and to the pelvic webbing two inches on either side of the torso midsagittal plane pulls the webbing 1/4 inch from the dummy.

S6.1.2.5 Accelerate the test platform to simulate frontal impact in accordance with S6.1.1.2 (a) or S6.1.1.2. (b), as appropriate.

S6.1.2.6 Measure dummy excursion and determine conformance to the requirements specified in S5.1 as appropriate.

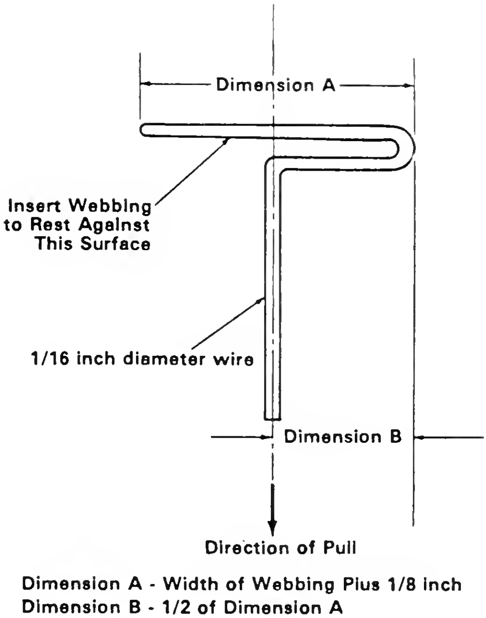
S6.2 Buckle release test procedure. The buckles on the belts of each child restraint system equipped with buckled belts shall be tested in accordance with S6.2.1 through S6.2.5.

S6.2.1 Install the child restraint system on a standard seat assembly and place the appropriate test dummy in the system in accordance with S6.1.2.1 through S6.1.2.4.



Buckle Release Test

FIGURE 4



Webbing Tension Pull Device

FIGURE 5

S6.2.2 Tie a self-adjusting sling to each ankle and wrist of the dummy in the manner illustrated in Figure 4.

S6.2.3 Pull the sling horizontally in the manner illustrated in Figure 4 and parallel to the center SORL of the seat assembly and apply a force of 20 pounds in the case of a system tested with a 6 month-old dummy and 45 pounds in the case of a system tested with a 3 year-old dummy.

S6.2.4 While applying the force specified in S6.2.3, operate the buckle release mechanism in the manner specified in S5.2 (d) of Standard No. 209 (S571.209).

S6.2.5 Measure the force required to release the buckle.

S6.3 Head impact protection—energy absorbing material test procedure.

S6.3.1 Prepare and test specimens of the energy absorbing material used to comply with S5.2.3 in accordance with the applicable 25 percent compression-deflection test described in the American Society for Testing and Materials (ASTM) Standard D1056-73, "Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber", or D1564-71. "Standard Method of Testing Flexible Cellular Materials—Slab Urethane Foam" or D1565-76 "Standard Specification for Flexible Cellular Materials—Vinyl Chloride Polymer and Copolymer open-cell foams.

S7 Test dummies.

S7.1 Six-month-old dummy. An unclothed "Six-month-old Size Manikin" conforming to Subpart D of Part 572 of this chapter is used for testing a child restraint system that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing not more than 20 pounds

S7.2 Three-year-old dummy. A three-year-old dummy conforming to Subpart C of Part 572 of this chapter is used for testing a child restraint that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing more than 20 pounds.

S7.2.1 Before being used in testing under this standard, the dummy is conditioned at any ambient temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent for at least 4 hours.

S7.2.2 When used in testing under this standard, the dummy is clothed in thermal knit waffle-weave polyester and cotton underwear, a size 4 long-sleeved shirt weighing 0.2 pounds, a size 4 pair of long pants weighing 0.2 pounds and cut off just far enough above the knee to allow the knee target to be visible, and size 7M sneakers with rubber toe caps, uppers of dacron and cotton or nylon and a total weight of 1 pound. Clothing other than the shoes is machine-washed in 160° F to 180° F water and machine dryed at 120° F to 140° F for 30 minutes.

[**S7.3 Standard seat assembly.** The standard seat assembly used in testing under this standard are:

(a) For testing for motor vehicle use, a simulated vehicle bench seat, with three seating positions, which is described in Drawing Package SAS-100-1000 (consisting of drawings and a bill of materials); and

(b) For testing for aircraft use, a representative aircraft passenger seat.

S8. Requirements, test conditions, and procedures for child restraint systems manufactured for use in an aircraft. Each child restraint system manufactured for use in both motor vehicles and aircraft must comply with all of the applicable test requirements specified in section S5 and, when tested in accordance with the conditions and procedures of S8.2, the additional requirements specified in section S8.1.

S8.1 Child containment for conditions of inflight turbulence must be determined by inversion tests. The combination of a representative aircraft passenger seat, child restraint system, and appropriate test dummy must be rotated from the normal upright position to an inverted position. The combination must remain inverted for at least 3 seconds with neither failure nor deformation that could seriously injure or prevent subsequent extrication of a child occupant. Child containment must be demonstrated for rotation in the forward direction and a sideward direction.

S8.2 Each configuration and mode of installation must be tested for protection of a child of a weight and stature for which the child restraint system is designed. The child occupant must be simulated with an appropriate test dummy as specified in paragraph S7. Placement of each restraint system in a representative aircraft passenger seat and placement of the test dummy must be in accordance with the manufacturer's instructions. Each child retraint system must be attached to the seat by means of an aircraft safety belt without supplementary anchorage belts or tether straps; FAA Technical Standard Order approved safety belt extensions may be used. The representative aircraft passenger seat used in each test must have a seat back that is completely free to fold over. (49 F.R. 34357—August 30, 1984. Effective: March 30, 1985)]

44 F.R. 72131
December 13, 1979

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 214

Side Door Strength—Passenger Cars

(Docket No. 2–6; Notice No. 3)

The purpose of this amendment to §571.21 of Title 49, Code of Federal Regulations, is to add a new motor vehicle safety standard that sets minimum strength requirements for side doors of passenger cars. The standard differs in only a few details from the notice of proposed rulemaking published on April 23, 1970 (35 F.R. 6512).

As noted in the proposal of April 23, the percentage of dangerous and fatal injuries in side collisions increases sharply as a maximum depth of penetration increases. With this in mind, the notice of proposed rulemaking stressed the need for a door that offers substantal resistance to intrusion as soon as an object strikes it. The proposal required a door to provide an average crush resistance of 2,500 pounds during the first 6 inches of crush. One comment stated that equivalent protection can be provided by structures further to the interior of the door and that the proper measure of protection is the force needed to deflect the inner door panel rather than that needed to deflect the outer panel. Although inboard mounted structures may be effective in preventing intrusion if the door has a large cross section, with a correspondingly large distance between the protective structure and the inner panel, the standard as issued reflects the determination that doors afford the greatest protection if the crush resisting elements are as close to the outer panel as possible. It follows from this determination that the surface whose crush is to be measured must be the outer panel rather than the inner one. The value specified for the initial crush resistance has, however, been reduced from 2,500 pounds to 2,250 pounds, a value that has been determined to be more appropriate, particularly for lighter vehicles.

Two comments suggested that the crush distance should be the distance traveled by the loading device after an initial outer panel distortion caused by a "pre-load." This suggestion is without merit, in that it would permit use of needlessly light outer panel materials and thereby diminish the distance between the protective elements of the door and the occupants.

The comments revealed a considerable difference of opinion concerning the value and validity of the concept of "equivalent crush resistance." The equivalent crush resistance was to be derived by adding ¼ (3000–W) to the average force required to crush the door 12 inches. It had been thought that the resulting bias against heavier vehicles was necessary in that their greater mass would cause them to move sideways less in a collision than lighter vehicles, with more of the impacting force being absorbed by the door. Recent studies, however, show that occupants of heavier vehicles involved in side collisions generally suffer a lower proportion of serious injuries and fatalities than persons in lighter vehicles. In light of these studies and other information, the standard retains the basic crush resistance requirement, but deletes the weight correction factor. Since it is no longer appropriate to use the term "equivalent crush resistance," in its place the standard employs the phrase "intermediate crush resistance." The slightly lower figure of 3,500 pounds has been substituted for the 3,750 pound force proposed in the notice. The effect of the change is to increase slightly the crush resistance required for vehicles having curb weight less than 1,800 pounds, and to decrease it slightly for vehicles weighing more than 1,800 pounds.

Similar reasoning lies behind a change in the requirement for peak crush resistance. The available information does not support a peak crush requirement that increases indefinitely with increasing vehicle curb weight. The standard therefore sets a ceiling of 7,000 pounds to the requirement that the door have a peak crush resistance of twice the vehicle's curb weight. In effect, the requirement is unchanged from the proposal for vehicles weighing less than 3,500 pounds, and is diminished for vehicles exceeding that weight.

Several comments suggested that the vehicle should be tested with all seats in place, since the seats may provide protection against intrusion in side impacts. It is recognized that proper seat design can contribute to occupant safety. The retention of the seat would, however, introduce a variable into the test procedue whose bearing on safety is not objectively measurable at this time. For this reason, the standard adopts the proposed requirement that the vehicle be tested with its seats removed.

It was suggested that the location of force application should be changed. The location has been designated to approximate the weakest section of that part of the door structure likely to be struck by another vehicle. The area designated has been found the most approriate for the bulk of the automobile population.

Effective date: January 1, 1973.

The majority of comments stated that an effective date of September 1, 1971, as initially proposed, would not be feasible. 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 woud be unable to meet the standard if the September 1, 1971, effective date were retained. It has been decided that there is good cause for establishing an effective date more than 1 year after issuance of the rule.

In consideration of the above, Standard No. 214 is adopted as set forth below.

Issued on October 22, 1970.

Douglas W. Toms,
Director.

35 F.R. 16801
October 30, 1970

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 214

Side Door Strength

(Docket No. 2-6; Notice No. 6)

ACTION: Final Rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 214, *Side Door Strength,* to allow manufacturers the option of leaving the seats in a vehicle while its ability to resist external forces pressing inward on its door is tested. This amendment was proposed by the NHTSA in response to a petition for rulemaking from Volvo of America Corporation (44 FR 33444, June 11, 1979). The change is intended to give manufacturers broader design capabilities for improving the safety of vehicle occupants involved in side impact collisions. The performance levels for the alternative requirements are lower than those specified in the notice of proposed rulemaking, due to the agency's consideration of public comments on that notice.

EFFECTIVE DATE: The amendment made by this notice becomes effective upon publication in the FEDERAL REGISTER.

ADDRESSES: Any petitions for reconsideration of this rule should refer to the docket number and notice number and be submitted to the National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William Brubaker, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration. (202-426-2242).

SUPPLEMENTARY INFORMATION:

Safety Standard No. 214, *Side Door Strength* (49 CFR 571.214), specifies performance requirements for the side doors of passenger cars to minimize the life-threatening forces caused by intrusion of objects such as other vehicles, poles and tree trunks into the occupant compartment in side-impact accidents. The standard currently specifies three static crush tests (initial, intermediate and peak) to measure the crush resistance of the side doors. The basis for these tests is that early studies concerning side impact protection demonstrated that, in fatal side collisions, most occupants die because of the door structures collapsing inward on them. The static crush tests are intended to ensure that there are strong door structures to limit this intrusion. Under the peak crush test of the standard, the vehicle door may not be deformed more than 18 inches inward when the door is subjected to a force of 7,000 pounds, or two times the curb weight of the vehicle, whichever, is less.

The existing test procedures of the standard specify that the vehicle seats are to be removed during the crush tests. Although it was recognized when the standard was originally promulgated that proper seat design can also reduce the amount of intrusion of side door structures into the occupant compartment, it was determined that this standard should measure the integrity of door structures alone.

Manufacturers have generally incorporated various types of beams in the outer door panels to provide crush resistance in compliance with the standard. Last year, however, Volvo of America Corporation petitioned the agency to allow vehicle seats to remain in the automobile during the crush resistance tests. Volvo stated that it has developed an advanced side impact protection system that incorporates the vehicle seats as an essential component and dispenses with door beams. Test data indicate that the Volvo design provides side impact protection that is equal to or greater than that provided by current production designs.

In response to Volvo's petition, the agency issued a notice of proposed rulemaking to allow manufacturers to adopt this option (44 FR 33444, June 11, 1979). The notice stated that manufacturers should be encouraged to develop innovative designs for improving side impact protection, particularly designs that will improve vehicle fuel economy because of reduced weight. Although not included in Volvo's petition, the proposal specified higher crush resistance levels for vehicles tested with their seats intact (a 16,000-pound peak force).

The criteria were set at levels intended to assure an equivalent or greater level of protection compared to the existing requirements. Agency data show that the seats of some current models contribute 4 to 5 thousand pounds of crush resistance in addition to the crush resistance provided by the doors themselves. Therefore, the higher performance levels were proposed to ensure that the current level of crush resistance that is being obtained by strong door beams will not be degraded.

Nearly all of the twelve comments received in response to the notice supported the proposal to give manufacturers the option of testing with seats installed in the vehicle. A majority of the commenters objected to the higher crush resistance levels for the alternative procedure, however. Only Volkswagen Corporation stated that the standard should not be amended to allow the option. Following is a discussion of these comments.

The Insurance Institute for Highway Safety stated that the proposed amendment would give auto manufacturers a broader range of design alternatives than they currently have to reduce the likelihood of injuries to occupants of vehicles struck in the side. Most commenters made similar statements. Mercedes-Benz of North America noted that manufacturers would be afforded greater latitude in selecting designs to comply with the standard, without sacrificing occupancy protection, and at the same time could reduce vehicle weight.

While agreeing with the concept of the proposed alternative requirement, a large number of commenters felt the proposed performance criteria were too stringent. Peugeot, as well as the Motor Vehicle Manufacturers Association, stated that the current performance levels should apply whether the seats are left in the vehicle during testing or not. American Motors Corporation argued that the proposed crush resistance levels for the alternative procedure are significantly more stringent than existing 214 requirements, and that the NHTSA has not identified any safety need to justify this higher level of performance.

The agency does not agree that the performance levels of the standard should be the same whether the seats are left in the vehicle or are removed. As noted in the proposal, current vehicle seat designs often provide four to five thousand pounds of additional crush resistance above that required by the standard. Further, the standard was originally only intended to test the crush resistance of the doors alone. Therefore, if the performance criteria were the same with and without the seats in the vehicle during the test, manufacturers could reduce the current protection provided by their doors without upgrading their vehicles in other areas. Given the large number of fatalities in side impact accidents, the agency is very concerned that such a degradation of vehicle performance not occur under the alternative test procedure. Therefore, it is the agency's position that there is a substantial safety need to assure that the level of protection provided under the alternative procedure is equivalent to or greater than that provided under the existing test procedure.

Several commenters argued that the data and test results relied upon by the agency to establish the crush resistance levels for the alternative procedure are too limited, and that research should be expanded to include tests of other models prior to establishing the criteria. General Motors stated, for example, that the two vehicles used in NHTSA tests may not be representative of other vehicle designs which could exhibit differing door-to-seat interaction.

The agency disagrees with these contentions. Volvo and Ford Motor Company provided the NHTSA with data from tests they conducted with seats and without seats installed in some of their production vehicles. The agency conducted comparable tests on a Plymouth Volare, and the tests included both bench seats and bucket seats. This and other information substantiate that vehicle seats can and do provide much additional resistance to side door intrusion. These data demonstrate that crush resistance levels should be higher if vehicle seats are left installed during the testing in order to maintain the level of protection currently being provided.

Ford Motor Company argued that the proposed higher performance levels were based on limited tests of current production models, and that the higher performance results achieved in those tests represent built-in reserves by manufacturers above the minimum performance requirements of the standard. Ford stated that the crush resistance criteria of the proposed alternative should not be set at this upper level of performance. Other commenters, including Volvo, also argued that the proposed criteria were too high to allow for production variances. General Motors stated that the proposal does not really remove inhibitions to design innovation due to the increased performance requirements of the proposed alternative procedure. Finally, Rolls-Royce Motors urged that the performance criteria be set low enough that the potential weight savings offered by the proposal can be realized in practice.

After considering these comments, the agency has determined that the crush resistance levels for vehicles tested with their seats intact should be somewhat lower than those specified in the proposal. This will allow for production variances and enable manufacturers to build in a margin of protection above the minimum performance requirements specified in the standard.

In its comments, Volvo Corporation suggested that the intermediate crush resistance level should be set at 4,375 pounds (the proposal specified 7,000 pounds) and that peak crush resistance should be set at 12,000 pounds (the proposal specified 16,000 pounds). Volvo stated that tests of its current production cars that have door beams indicate a spread in intermediate crush resistance of approximately 2,000 pounds. The company noted that an intermediate crush resistance level that is twenty-five percent above the existing requirement would compensate for the addition of seats during testing and at the same time allow manufacturers a sufficient margin to comply with the standard. Volvo also stated that since the seats of some current cars add approximately 4,000 to 5,000 pounds of peak of crush resistance, this should be the amount of increase above the existing requirements, i.e., from 7,000 pounds to 12,000 pounds. Although Volvo's preliminary testing of its advanced side impact protection system indicates that the 16,000-pound requirement could be met, the company feels that the margin is not sufficient to allow for production variances.

The agency agrees with Volvo's suggested crush resistance levels, since they should ensure that the level of protection provided under the alternative requirement is at least equivalent to that provided currently. Therefore, these criteria are adopted in this amendment. While it is encouraging that Volvo's advanced system can meet the 16,000-pound peak force specified in the proposal, this may be too high for other manufacturers at the present time, and the agency's primary concern in allowing the alternative test procedure is to avoid any degradation of the protection being provided under the current requirement. The high performance of Volvo's advanced system will be considered very seriously, however, during the planned rulemaking to upgrade side impact protection (an advance notice of proposed rulemaking concerning improving side impact protection was recently issued: 44 FR 70204, December 6, 1979).

As noted above, data indicate that current seat designs contribute approximately 5,000 pounds to the crush resistance capacity of vehicle side structures. Therefore, the 12,000-pound peak force level specified in this amendment will assure the side impact protection is not degraded, but will also allow manufacturers to develop new designs to meet the requirements. As demonstrated by Volvo, manufacturers will be able to develop new side structures and seat designs that will provide over 12,000 pounds of crush resistance without the use of heavy door beams.

Mercedes-Benz of North America commented that the "initial" crush resistance requirement of the proposed alternative should be deleted (paragraph S3.2.1 of the proposal). Mercedes argued that the three-stage static crush tests assign too much significance to the first stage (initial crush resistance), since door reinforcement is necessary primarily to ensure compliance with this initial test. According to Mercedes, the initial resistance is achieved within the first six inches of crush depth (measured at the outer surface of the door), but that this is not more than one-ninth of the total energy absorption when testing without the vehicle seats. When testing with the seats, according to Mercedes, the percentage of energy absorption at the outer surface of the door panel is meaningless with respect to the total energy management and occupant protection.

The agency does not agree with this rationale. The initial crush resistance stage is necessary to ensure that vehicle doors have at least a minimum of structural integrity. This is particularly important because of the risk of occupant ejection if door hinges and latches separate during an accident, allowing the door to fly open. Although seat design can ameliorate intrusion into the occupant compartment to a certain extent, it is important to coordinate door structure and seat design to achieve the optimum occupant protection. Because of the initial crush resistance requirements, manufacturers may not be able to delete door beams altogether in some models. However, manufacturers will be able to use much lighter beams than are currently being used, without a reduction in overall performance.

Several commenters addressed the seat location specified in the proposed alternative requirement. The proposal provided that vehicles must be able to meet the specified crush resistance levels with the vehicle seats located in any position and at any seat back angle in which they are designed to be adjusted. Volvo's petition had requested that the mid, horizontal seat adjustment position be specified. Volkswagen of America stated that the new proposed test procedure, with the seat in any position of its adjustment range, potentially increases the test effort. Volkswagen argued that manufacturers would have the obligation to determine, by a test series, the most adverse test positions of the seat, and that this would be much more costly than the existing requirement.

While it may be true that requiring a vehicle to comply with the seat in any position to which it can be adjusted will require more effort by manufacturers, the agency has determined that this is a necessary aspect of the new procedure. If the vehicle seats are to be used as an integral part of the side impact protection system, it is important that the protection is provided regardless of where the seat is located along its adjustment range.

General Motors stated in its comments that it is reasonable to require demonstrated performance to assure that the occupant seat will assist in limiting side crush in any normal driving position. However, General Motors stated that the same rationale should not apply to seat back angle, and that the normal riding or driving angle established by the manufacturer should be used for compliance purposes. Volvo's comments agreed with General Motors regarding seat back angle.

The agency does not see a distinction between horizontal seat adjustment and seat back angle adjustment. If a particular seat is designed to be adjusted through a range of seat back angles, the vehicle should be able to comply with the requirement of the standard with the seat back at any of its adjustment angles, for the same reasons as noted above for horizontal adjustment. Further, the agency does not believe that the cost of testing will be substantially different if manufacturers are responsible for compliance with the seat in any adjustment position. Manufacturers, in some cases, may be able to determine the "worst case" position for seat location by engineering judgment and analysis prior to testing the vehicle. If a manufacturer has designed the vehicle seat to be an integral part of the side impact protection system, the manufacturer will likely know which position provides the most support and resistance to intrusion (and which provides the least support).

Of the commenters on the proposal, only Volkswagen Corporation was opposed to the proposed alternative test procedure. Volkswagen stated that the proposed requirement is not in keeping with the original purpose of the standard—to prevent intrusion. The company argued that there is a potential for reduced occupant protection in the case of oblique angle or "side-swipe" crashes since a vehicle with a door structure of inferior strength, as compared to current designs, runs the possible risk of door destruction or separation. Volkswagen noted that this could expose vehicle occupants to the risk of ejection.

While the agency shares Volkswagen's concern that the occupant protection being afforded by current vehicle doors not be lessened, it does not believe that the optional test procedure will result in reduced performance. The higher crush resistance requirements for vehicles tested with their seats installed should ensure that the overall protection currently provided is maintained. Moreover, since the initial crush resistance stage is included in the alternative procedure, in spite of comments that it should be deleted, door structures will have to maintain a certain amount of structural integrity. The 2,250-pound initial crush resistance level will ensure that door hinges and latches are of sufficient strength to preclude separation in most cases. Therefore, the agency does not believe that the alternative procedure will lead to increased ejections. The agency does believe, however, that both the current requirement and the alternative requirement should be upgraded. As noted earlier, the agency is presently involved in rulemaking regarding such an upgrade of the standard. The agency does not agree with Volkswagen's contention that the proposed test procedure is not aligned with the original purpose of the standard, since it has been demonstrated that effective seat design can substantially reduce intrusion into the occupant compartment.

The notice proposing this amendment specifically requested comments concerning the effect modifications to side door structures (i.e., lighter door beams or deletion of door beams, altogether) might have on vehicle integrity in frontal and front-angular crashes. In response to this request, Rolls-Royce Motors commented that the door beams used in its vehicles have had a negligible effect on vehicle integrity in frontal crashes. The company added that the requirements of Safety Standard No. 208, *Occupant Crash Protection,* will ensure that manufacturers maintain sufficient structural integrity for front-end crashes even with sophisticated vehicle designs achieving the maximum savings in weight.

American Motors Corporation also stated that the various safety standards requiring frontal impact tests will maintain frontal integrity regardless of modifications to side door structures. Volvo provided data from off-set crash tests involving vehicles both with and without door beams. Both vehicles showed deformation characteristics (damage to vehicle structure) that are within the variances found for current production cars. In light of this information and the fact that there are other safety standards to ensure vehicle integrity in frontal impacts, the agency has concluded that the alternative test procedure set forth in this amendment will have no adverse effect on frontal occupant crash protection.

The agency has reviewed this amendment in accordance with the specifications of Executive Order 12044, "Improving Government Regulations," and the Departmental guidelines implementing that order and determined it has no significant environmental impact and that its economic impact is so minimal as not to require a regulatory evaluation. The amendment will merely provide manufacturers an alternative test procedure for determining compliance with an existing standard. For this reason, also, the agency has determined that an immediate effective date for this amendment is in order.

The engineer and lawyer primarily responsible for the development of this rule are William Brubaker and Hugh Oates, respectively.

In consideration of the foregoing, Safety Standard No. 214 (49 CFR 571.241) is amended as set forth below.

Section S3 (S3 through S3.3) is amended to read as follows and the first sentence of subparagraph S4(a) is deleted.

§ 571.214 Standard No. 214; Side door strength.

* * * * *

S3 *Requirements.* Each vehicle shall be able to meet the requirements of either, at the manufacturer's option, S3.1 or S3.2 when any of its side doors that can be used for occupant egress are tested according to S4.

S3.1 With any seats that may affect load upon or deflection of the side of the vehicle removed from the vehicle, each vehicle must be able to meet the requirements of S3.1.1 through S3.1.3.

S3.1.1 *Initial Crush Resistance.* The initial crush resistance shall not be less than 2,250 pounds.

S3.1.2 *Intermediate Crush Resistance.* The intermediate crush resistance shall not be less than 3,500 pounds.

S3.1.3 *Peak Crush Resistance.* The peak crush resistance shall not be less than two times the curb weight of the vehicle or 7,000 pounds, whichever is less.

S3.2 With seats installed in the vehicle, and located in any horizontal or vertical position to which they can be adjusted and at any seat back angle to which they can be adjusted, each vehicle must be able to meet the requirements of S3.2.1 through S3.2.2.

S3.2.1 *Initial Crush Resistance.* The initial crush resistance shall not be less than 2,250 pounds.

S3.2.2 *Intermediate Crush Resistance.* The intermediate crush resistance shall not be less than 4,375 pounds.

S3.2.3 *Peak Crush Resistance.* The peak crush resistance shall not be less than three and one half times the curb weight of the vehicle or 12,000 pounds, whichever is less.

Issued on March 11, 1980.

Joan Claybrook
Administrator

45 F.R. 17015
March 17, 1980

MOTOR VEHICLE SAFETY STANDARD NO. 214

Side Door Strength—Passenger Cars
(Docket No. 2-6; Notice No. 3)

S1. Purpose and scope. This standard specifies strength requirements for side doors of a motor vehicle to minimize the safety hazard caused by intrusion into the passenger compartment in a side impact accident.

S2. Application. This standard applies to passenger cars.

S3. Requirements. Each vehicle shall be able to meet the requirements of either, at the manufacturer's option, S3.1 or S3.2 when any of its side doors that can be used for occupant egress are tested according to S4.

S3.1 With any seats that may affect load upon or deflection of the side of the vehicle removed from the vehicle, each vehicle must be able to meet the requirements of S3.1.1 through S3.1.3.

S3.1.1 Initial Crush Resistance. The initial crush resistance shall be not less than 2,250 pounds.

S3.1.2 Intermediate Crush Resistance. The intermediate crush resistance shall not be less than 3,500 pounds.

S3.1.3 Peak crush resistance. The peak crush resistance shall not be less than two times the curb weight of the vehicle or 7,000 pounds, whichever is less.

S3.2 With seats installed in the vehicle, and located in any horizontal or vertical position to which they can be adjusted and at any seat back angle to which they can be adjusted, each vehicle must be able to meet the requirements of S3.2.1 through S3.2.2.

S3.2.1 Initial Crush Resistance. The initial crush resistance shall not be less than 2,250 pounds.

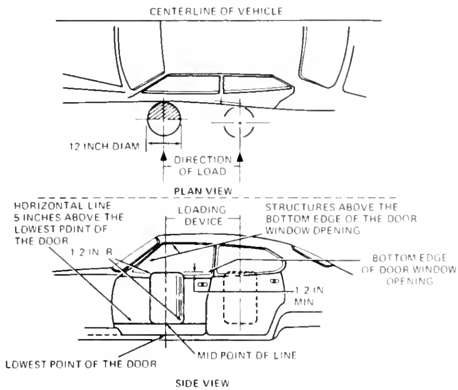
S3.2.2 Intermediate Crush Resistance. The intermediate crush resistance shall not be less than 4,375 pounds.

S3.2.3 Peak Crush Resistance. The peak crush resistance shall not be less than three and one half times the curb weight of the vehicle or 12,000 pounds, whichever is less.

S4. Test procedures. The following procedures apply to determining compliance with section S3:

(a) Place side windows in their uppermost position and all doors in locked position. Place the sill of the side of the vehicle opposite to the side being tested against a rigid unyielding vertical surface. Fix the vehicle rigidly in position by means of tiedown attachments located at or forward of the front wheel centerline and at or rearward of the rear wheel centerline.

(b) Prepare a loading device consisting of a rigid steel cylinder or semi-cylinder 12 inches in diameter with an edge radius of one-half inch. The length of the loading device shall be such that the top surface



LOADING DEVICE LOCATION AND APPLICATION TO THE DOOR

FIGURE I

of the loading device is at least one-half inch above the bottom edge of the door window opening but not of a length that will cause contact with any structure above the bottom edge of the door window opening during the test.

(c) Locate the loading device as shown in Figure I (side view) of this section so that:

(1) Its longitudinal axis is vertical;

(2) Its longitudinal axis is laterally opposite the midpoint of a horizontal line drawn across the outer surface of the door 5 inches above the lowest point of the door;

(3) Its bottom surface is in the same horizontal plane as the horizontal line described in subdivision (2) of this subparagraph; and

(4) The cylindrical face of the device is in contact with the outer surface of the door.

(d) Using the loading device, apply a load to the outer surface of the door in an inboard direction normal to a vertical plane along the vehicle's longitudinal centerline. Apply the load continuously such that the loading device travel rate does not exceed one-half inch per second until the loading device travels 18 inches. Guide the loading device to prevent it from being rotated or displaced from its direction of travel. The test must be completed within 120 seconds.

(e) Record applied load versus displacement of the loading device, either continuously or in increments of not more than 1 inch or 200 pounds for the entire crush distance of 18 inches.

(f) Determine the initial crush resistance, intermediate crush resistance, and peak crush resistance as follows:

(1) From the results recorded in subparagraph (e) of this paragraph, plot a curve of load versus displacement and obtain the integral of the applied load with respect to the crush distances specified in subdivisions (2) and (3) of this paragraph. These quantities, expressed in inch-pounds and divided by the specified crush distances, represent the average forces in pounds required to deflect the door those distances.

(2) The initial crush resistance is the average force required to deform the door over the initial 6 inches of crush.

(3) The intermediate crush resistance is the average force required to deform the door over the initial 12 inches of crush.

(4) The peak crush resistance is the largest force recorded over the entire 18-inch crush distance.

October 30, 1970
35 F.R. 16801

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 216

Roof Crush Resistance—Passenger Cars

(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 that 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 requirement."

2. A new § 571.216, Standard No. 216 *Roof Crush Resistance*, is added. . . .

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. 216

Roof Crush Resistance

(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

MOTOR VEHICLE SAFETY STANDARD NO. 216

Roof Crush Resistance—Passenger Cars

S1. Scope. This standard establishes strength requirements for the passenger compartment roof.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries due to the crushing of the roof into the passenger compartment in rollover accidents.

S3. Application. This standard applies to passenger cars. However, it does not apply to vehicles that conform to the rollover test requirements (S5.3) of Standard 208 (§ 571.208) by means that require no action by vehicle occupants. It also does not apply to convertibles, except for optional compliance with the standard as an alternative to the rollover test requirements in S5.3 of Standard 208.

S4. Requirements. A test device as described in S5 shall not move more than 5 inches, measured in accordance with S6.4, when it is used to apply a force of 1½ times the unloaded vehicle weight of the vehicle of 5,000 pounds, whichever is less, to either side or the forward edge of a vehicle's roof in accordance with the procedures of S6. Both the left and right front portions of the vehicle's roof structure shall be capable of meeting the requirements, but a particular vehicle need not meet further requirements after being tested at one location.

S5. Test Device. The test device is a rigid unyielding block with its lower surface formed as a flat rectangle 30 inches × 72 inches.

S6. Test Procedure. Each vehicle shall be capable of meeting the requirements of S4 when tested in accordance with the following procedure.

S6.1. Place the sills or the chassis frame of the vehicle on a rigid horizontal surface, fix the vehicle rigidly in position, close all windows, close and lock all doors, and secure any convertible top or removable roof structure in place over the passenger compartment.

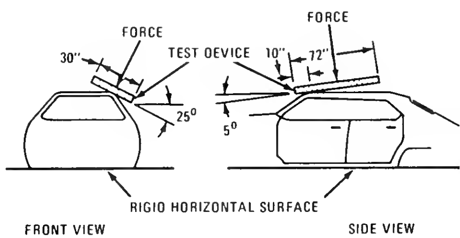
S6.2 Orient the test device as shown in Figure 1, so that—

(a) Its longitudinal axis is at a forward angle (side view) of 5° below the horizontal, and is parallel to the vertical plane through the vehicle's longitudinal centerline;

(b) Its lateral axis is at a lateral outboard angle, in the front view projection, 25° below the horizodntal;

(c) Its lower surface is tangent to the surface of the vehicle; and

(d) The initial contact point, or center of the initial contact area, is on the longitudinal centerline of the lower surface of the test device and 10 inches from the forwardmost point of that centerline.



TEST DEVICE LOCATION AND APPLICATION TO THE ROOF

Figure 1

S6.3. Apply force in a downward direction perpendicular to the lower surface of the test device at a rate of not more than one-half inch per second until reaching a force of 1½ times the unloaded vehicle weight of the tested vehicle or 5,000 pounds, whichever is less. Complete the test within 120 seconds. Guide the test device so that throughout the test it moves, without rotation, in a straight line with its lower surface oriented as specified in S6.2(a) through S6.2(d).

S6.4 Measure the distance that the test device moves, *i.e.*, the distance between the original location of the lower surface of the test device and its location as the force level specified in S6.3 is reached.

36 F.R. 23299
December 8, 1971

MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

(Docket No. 2–10; Notice 3)

The purpose of this amendment to § 571.21 of Title 49, Code of Federal Regulations, is to add a new motor vehicle safety standard that establishes minimum requirements for bus window retention and release to reduce the likelihood of passenger ejection in accidents and enhance passenger exit in emergencies.

A notice of proposed rulemaking on this subject was published on August 15, 1970 (35 F.R. 13025). The comments received in response to the notice have been considered in this issuance of a final rule.

For reasons of clarification, the requirements paragraph has been reorganized and the demonstration procedures paragraph has been replaced by a test conditions paragraph. Some of the specifications of the demonstration procedures paragraph are incorporated under the requirements paragraph, and the remainder are retained under the test conditions paragraph. With the exception of the changes discussed below, the reorganization does not affect the substance of the standard.

In altering the window retention requirements, the final rule lowers the force application limit, provides more precise glazing breakage and glazing yield limits, and exempts small windows. With respect to the emergency exit requirements, the standard permits devices other than push-out windows to be used for emergency exits, permits buses with a GVWR of 10,000 pounds or less to utilize devices other than emergency exits for emergency egress, and permits an alternate roof exit when the bus configuration precludes provision of a rear emergency exit. It also raises the force limits for release and extension of emergency exits, deletes the inertial load requirement for the release mechanism, and requires that emergency exit location markings be located within each occupant space adjacent to an exit.

A few changes have been made in the diagram accompanying the standard. Figure 1, "Adjacent Designated Seating Position, Occupant Spaces, and Push-Out Window Relationship," has been deleted from the final rule because the relationship is sufficiently described in the text of the standard. Accordingly, Figures 2 and 3 have been renumbered as Figures 1 and 2, respectively. A new Figure 3, indicating access regions for emergency exits which do not have adjacent seats, has been added. For reasons of clarification, Figures 2a and 2b and Figures 3a and 3b in the proposed rule have been placed beside each other to form Figures 1 and 2 respectively.

The torque in Figures 2a and 2b of the proposed rule has been transferred to the text and has been explained to indicate that the force used to obtain the torque shall not be more than 20 pounds. In addition, the clearance specifications in Figures 1 and 2 have been clarified in the text to require that the lower edge of the force envelope shall be located 5 inches above the seat, or 2 inches above the armrest, if any, whichever is higher. In several instances, minor changes have been made in the labeling without altering the substance of the diagrams.

A number of comments sought changes in the window retention requirements. Two comments requested an exemption for intra-city buses because the probability of rollover accidents would be minimal in slow-speed operation. Urban transit buses are subjected to risks of rollover accidents within the city when they travel at moderate to high speed on intra-urban expressways, and should therefore be covered by the standard. Accordingly, the request for this exemption is denied.

Several comments requested an exemption for small windows. Since there is little likelihood of passenger ejection or protrusion from window openings whose minimum surface dimension measured through the center of the area is less than eight inches, an exemption for windows of this size has been granted.

Two comments asked that the 2,000 pound force application limit in the window retention requirement be lowered. The data indicates that a 1,200-pound limit would be more compatible with the glazing strength. Accordingly, the 2,000-pound force application limit has been lowered to 1,200 pounds.

Several manufacturers stated that they encountered difficulties in ascertaining when the proposed head form penetration limit of the window retention requirement had been reached. After observation of window retention testing, the NHTSA has concluded that the penetration limit as specified in the notice of proposed rulemaking is difficult to determine. For this reason the head form penetration limit has been rephrased in terms of the development of cracks in the glazing and the amount of depression of the glazing surface in relation to its original position.

A number of comments objected to the requirement that at least 75% of the glazing be retained in the window mounting during window retention testing. The NHTSA has determined that the intent of this requirement is already accomplished by the requirement that each window be retained during testing by its surrounding structure in a manner which would prevent passage of a 4-inch sphere, and the requirement is accordingly deleted from the final rule.

With respect to the emergency exit requirements, the standard permits devices other than push-out windows to be used for emergency exits. Upon review of the requirements, it has been determined that devices such as panels and doors which meet the emergency exit requirements would be as effective as push-out windows for emergency egress. Because the Administration has concluded that passenger egress is enhanced when several emergency exits are provided, the standard requires that in computing whether a bus meets the unobstructed openings area requirements, no emergency exit, regardless of its area, shall be credited with more than 520 square inches of the total area requirement.

A number of motor vehicle manufacturers sought exemption from the emergency exit requirements for smaller vehicles weighing 10,000 pounds or less GVWR, such as limousines and station wagons, which are designed to carry more than 10 persons and are therefore considered to be buses under NHTSA regulations (49 CFR 571.3). Such vehicles are usually provided with numerous doors and windows which provide sufficient unobstructed openings for emergency exit. Therefore the Administration has concluded that the configuration of these vehicles satisfies the intent of the standard with respect to provision of emergency exits, and they are exempted from the emergency exit openings requirements.

The emergency exit requirements have been changed to permit installation of an alternate roof exit when the bus configuration precludes provision of a rear exit, provided that the roof exit meets the release, extension, and identification requirements. The NHTSA has established this alternative in order to allow design flexibility while providing for emergency egress in rollover situations.

A number of comments expressed concern that the proposed maximum force level for release and extension of emergency exits in Figures 2a and b and 3a and b were too low to inhibit inadvertent operation by passengers and suggested that the required maximum force level be raised. After consideration of the goals of facilitating emergency egress and preserving the integrity of the passenger compartment under normal operation, it has been determined that the maximum force levels should be raised from 10 and 30 pounds to 20 and 60 pounds respectively.

One comment submitted the results of testing which indicated that the 30g inertial load requirement for the release mechanism was unnecessarily high. The testing also revealed that the engineering concepts upon which the inertial load requirement is based are not generally applied in the industry and that the requirement would be impracticable. Moreover, an increase in maximum force levels for emergency exit operation in the rule should improve latch integrity. For these reasons, the requirement has been deleted.

The standard requires emergency exit location markings to be placed in certain occupant spaces because of a possible contradiction under the proposed standard between the requirement that the identification markings be located within 6 inches of the point of operation and the requirement that the markings be visible to a seated occupant. The NHTSA has concluded that emergency egress could be hindered if the passenger has difficulty in finding the marking, and that location of the marking outside of an occupant space containing an adjacent seat, which would be permitted under the proposed standard, could create this problem. At the same time it is desirable for the identification and instructions to be located near the point of release. Therefore the final rule requires that when a release mechanism is not located within an occupant space containing an adjacent seat, a label indicating the location of the nearest release mechanism shall be placed within that occupant space.

The temperature condition has been reworded to make it clear, in light of the explanation of usage in § 571.4, that the vehicle must be capable of meeting the performance requirements at any temperature from 70° F. to 85° F.

Effective date: September 1, 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 will require an effective date of at least fifteen months after issuance. It is therefore found, for good cause shown, that an effective date more than one year from the date of issuance is in the public interest.

In consideration of the above, Standard No. 217, Bus Window Retention and Release, is added to § 571.21 of Title 49, Code of Federal Regulations, as set forth below.

This rule is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1401, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on May 3, 1972.

Douglas W. Toms
Administrator

37 F.R. 9394
May 10, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

(Docket 2-10; Notice 4)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 217, Bus Window Retention and Release, in § 571.217 of Title 49, Code of Federal Regulations. The standard was issued on May 10, 1972 (37 F.R. 9394).

International Harvester stated that it manufactures an 18-passenger airport limousine, the "Stageway Coach Conversion", weighing 10,700 pounds GVWR and requested that it be exempted from the requirements of S5.2.1, "Buses with GVWR of more than 10,000 pounds." They emphasized that the 18-passenger model is equipped with 10 side doors, two more than is provided by a 15-passenger, 10,000-pound, version of a similar airport limousine vehicle which they manufacture. The NHTSA has concluded that vehicles which provide at least one door for each three passenger seating positions afford sufficient means of emergency egress regardless of their weight. S5.2.1 has accordingly been amended to provide that buses with a GVWR of more than 10,000 pounds may alternatively meet the unobstructed openings requirement of S5.2 by providing at least one door for each three passenger spaces in the vehicle. The "Stageway Coach Conversion" falls into the category of vehicles covered by this amendment and thus International Harvester's request is granted.

International Harvester, General Motors, and Chrysler all requested a clarification of the S5.1 window retention requirements because they felt it was possible to interpret the paragraph as prohibiting the use of tempered glass for window glazing. Ford also submitted a request for exemption from the window retention requirements for buses under 10,000 pounds GVWR based on its interpretation of S5.1 as precluding the use of tempered glass. The petitioners stated that tempered glass would shatter under the application of pressure required, and were not certain whether S5.1(b), describing the development of cracks in the glazing, would cover this occurrence. The NHTSA did not intend to prohibit the use of tempered glass, and in order to correct this possible ambiguity, S5.1(b) has been amended to include shattering of the window glazing.

General Motors also requested an interpretation of the method of measuring whether 80 percent of the glazing thickness has developed cracks as described in S5.1(b). The paragraph refers to a measurement through the thickness of glass and not a measurement of the glazing surface area, as GM suggests it could mean. GM also doubted that the percentage of glazing thickness which develops cracks could be measured. The NHTSA has determined that the intent of the language is clear and that performance of this measurement is within the state of the art, so that no change in the language is necessary. The request is therefore denied.

General Motors requested a clarification of the term "minimum surface dimension" in paragraph S5.1(c). The NHTSA agrees that a clarification is necessary to prevent interpretations which may not meet the intent of this standard, and the paragraph has been accordingly amended to specify that the dimension is to be measured through the center of the area of the sheet of glazing.

General Motors stated that it interpreted the head form travel rate specified in S5.1.1 of two inches per minute as a "nominal value" requirement, since no tolerances are given in the standard. The test conditions in a safety standard represent the performance levels that the product must be *capable* of meeting. They are not instructions either to the manufacturers' or the government's test laboratories, or a requirement that the product should be tested at "exactly" those levels. The manufacturers' tests in this case should be designed to demonstrate that the vehicle would meet the stated requirements *if* tested at two inches per minute. If that is what General Motors means by a "nominal value", its interpretation is correct.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 217, Bus Window Retention and Release, 49 CFR 571.217, is amended....

Effective date: September 1, 1973.

This notice is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1401, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on August 30, 1972.

Douglas W. Toms
Administrator

37 F.R. 18034
September 6, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

(Docket No. 2–10; Notice 5)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 217, Bus Window Retention and Release, 49 CFR § 571.217, in response to petitions received. Several minor amendments for purposes of clarification have also been made. The standard was published initially on May 10, 1972, (37 F.R. 9394), and amended September 6, 1972 (37 F.R. 18034).

Wayne Corporation has petitioned that the torque limit of 20 inch-pounds for the actuation of rotary emergency exit releases in S5.3.2(a)(3) of the standard is impractical. The Blue Bird Body Company also objected to the requirement, requesting that the limit be raised to 225 inch-pounds in order to avoid inadvertent openings. The NHTSA has decided, based on these petitions, that a maximum torque requirement is redudant, since the force magnitude generally is limited in S5.3.2 to not more than twenty pounds. Accordingly the torque requirement is deleted from the rule.

Blue Bird also requested that Figure 3A, which depicts access region for roof and side emergency exits without adjacent seats in both an upright and overturned bus, be made more explicit.

In response to this request, Figure 3A is being replaced by two figures, one of which depicts a side emergency exit (Figure 3A), and the other a roof emergency exit (Figure 3B). Existing Figure 3B, depicting access regions for a rear exit with a rear shelf or other obstruction behind the rearmost seat, becomes Figure 3C. A new Figure 3D is added to depict rear seat access regions in buses not having a rear shelf or other obstruction behind the rearmost seat, a configuration common to school buses. Paragraph S5.2.1, regarding provision of emergency exits, is amended to make it clear that a required rear exit must meet the requirements of S5.3 through S5.5 when the bust is overturned on either side, with the occupant standing facing the exit, as well as when the bus is upright.

In consideration of the above, Standard No. 217, Bus Window Retention and Release, 49 CFR 571.217, is amended . . . .

Effective date: September 1, 1973.

(Sec. 103, 112, 119, P.L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on February 28, 1973.

Douglas W. Toms
Administrator

38 F.R. 6070
March 6, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

(Docket No. 2–10; Notice 7)

This notice amends Federal Motor Vehicle Safety Standard No. 217, "Bus Window Retention and Release" (49 CFR § 571.217), to exempt from the standard buses manufactured for the purpose of transporting persons under physical restraint. The amendment is based on a notice of proposed rulemaking published October 1, 1973 (38 F.R. 27227), following petitions received from the Bureau of Prisons, United States Department of Justice.

The comments received in response to the proposal agreed that buses manufactured for the specified purpose should not be provided with the emergency exits required by Standard No. 217. The standard specifies that buses contain emergency exits operable by bus occupants, requirements which the NHTSA considers obviously incompatible with the need to transport prison inmates. The National Transportation Safety Board (NTSB) commented, however, that compensatory measures should be taken to minimize the likelihood of fire in prison buses, since the probability of safely evacuating a prison bus is less than that of any other type of bus. The NTSB urged that the exemption be limited to diesel-fueled buses, since diesel fuel is less likely to ignite than gasoline.

The NHTSA recognizes the desirability of minimizing the likelihood of fire in buses. However, at the present time it is not practical to expect that all newly manufactured prison buses be equipped with diesel engines, given the apparent immediate need for the exemption. Appropriate rulemaking action can be taken in the future if it appears necessary to mitigate from a safety standpoint the loss of emergency exits in prison buses.

In light of the above, paragraph S3 of section 571.217, Title 49, Code of Federal Regulations (Motor Vehicle Safety Standard No. 217), is amended. . . .

Effective date: June 3, 1974. This amendment imposes no additional burdens on any person and relieves restrictions found to be unwarranted. Accordingly, good cause exists and is hereby found for an effective date less than 180 days from the day of issuance.

(Secs. 103, 112, and 119, Pub. L. 89–563; 80 Stat. 718; 15 U.S.C. 1392, 1491, 1407; delegations of authority at 49 CFR 1.51.)

Issued on April 26, 1974.

James B. Gregory
Administrator

39 F.R. 15274
May 2, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

(Docket No. 75-6; Notice 2)

This notice amends Federal Motor Vehicle Safety Standard No. 217, *Bus Window Retention and Release*, 49 CFR 571.217, to clarify the marking requirements for emergency exits on buses. The amendment requires certain markings on all bus emergency exits except manually-operated windows of sufficient size and doors in buses with a GVWR of 10,000 pounds or less.

The amendment was proposed in a notice published April 18, 1975 (40 FR 17266). Comments were received from Chrysler Corporation and General Motors. Chrysler concurred with the proposal. GM, while also concurring, suggested that the wording of the amendment be modified somewhat. The amendment has been reworded to reflect more clearly the intent of this amendment, distinguishing between emergency exits that require markings and those that do not. The NHTSA has determined that special emergency exit markings are unnecessary for doors and manually-operated windows in buses with a GVWR of 10,000 pounds or less. This amendment does not exempt buses with a GVWR of 10,000 pounds or less from complying with the unobstructed openings requirements of S5.2. It only provides that the openings do not have to be marked as emergency exits. However, specially-installed emergency exits in such buses, such as push-out windows, are not exempted from the marking requirements.

The amendment also allows bus manufacturers the option of designating an emergency door as "Emergency Door" or "Emergency Exit." This will bring Standard No. 217 into conformity with current NHTSA interpretations of the emergency exit marking requirements. However, any emergency exit other than a door must have the designation "Emergency Exit."

Accordingly, S5.5.1 of 49 CFR 571.217, *Bus Window Retention and Release*, is amended . . . .

Effective date: October 16, 1975.

(Secs. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407); delegations of authority at 49 CFR 1.51).

Issued on October 8, 1975.

Gene G. Mannella
Acting Administrator

40 F.R. 48512
October 16, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

(Docket NO. 75–3; Notice 2)

This notice amends Federal Motor Vehicle Safety Standard No. 217, *Bus Window Retention and Release*, 49 CFR 571.217, to specify requirements for emergency doors for school buses pursuant to the provisions of section 202 of the Motor Vehicle and Schoolbus Safety Amendments of 1974 (Public Law 93–492, 88 Stat. 1484, 15 U.S.C. 1392). It responds to the congressional mandate to establish standards concerning school bus emergency exits (15 U.S.C. § 1392(i) (1) (A) (i)).

Section 202 requires that certain school bus safety standards be published within 15 months of the passage of the 1974 amendments on October 27, 1974. In addition, these statutory provisions remove the otherwise discretionary authority of the NHTSA to establish lead times for compliance under the general rulemaking provisions of the National Traffic and Motor Vehicle Safety Act by specifying an effective date for the amendment of 9 months from the date of publication of this notice (15 U.S.C. § 1392(i) (1) (B)). The proposed amendments upon which this notice is based were published on February 28, 1975 (40 F.R. 8569).

Many comments were received in response to the proposal to require either one rear emergency door or two side emergency doors in the rear half of the bus passenger compartment. Many objected that the proposal provided for too few emergency doors, and requested requirements for additional side doors and roof exits. Some commenters suggested that push-out windows and the "California" rear exit be required. The agency does not discourage the inclusion of additional emergency exits in school buses so long as they comply with the requirements applicable to non-school bus emergency exits. The NHTSA believes that "California" rear window emergency exits may be preferable in certain circumstances and proposes in this issue of the Federal Register to amend this rule to permit the use of the "California" rear window along with a side door emergency exit in place of the rear door emergency exit. In the alternative, it is proposed to allow this option only on rear-engine-powered school buses. Under either proposal the requirements of the standard would not be met by providing two sidedoor emergency exits. In addition, the subject of roof exits is being considered and could be the subject of future rulemaking. However, roof exit requirements cannot be included in this rulemaking action because of the statutorily imposed deadline on promulgation of these amendments.

A number of comments were received opposing the proposed interlock requirement on the ground that it would prevent restarting the engine after the school bus stalls in a dangerous intersection or a railroad crossing and panicky passengers jam the release mechinism. The intent of this requirement is to prevent the initial starting of the bus engine until the doors have been unlocked, by a key, combination, or the operation of a remote switch at the beginning of the day. The deletion of the phrase "or otherwise inoperable" excludes inadvertent jamming of the door release mechanism from the requirement. The word "locked" has been defined for this purpose as not releasable at the door except by a key or combination. It would include doors openable by a remote switch.

Six comments supported the proposal to reqiure an audible alarm when the ignition is on and the release mechanism of any emergency door is not closed. Five of these, however, objected that an alarm at each door in addition to one in the driver's compartment would be unnecessary and unduly costly. The NHTSA does not agree. The purpose of audible alarms at each door is to indicate which release mechanism is not closed. This is especially critical while the vehicle is in motion, as it will serve to warn the passengers in the area of the possibility that an emergency door could open. In addition, it will serve as a deterrent to tampering by children with the emergency door release mechanisms. Therefore, the requirement that an audible alarm be positioned at each emergency door and at the driver's position has been retained.

Objectives were received to the requirement that the magnitude of force required to activate the emergency door release mechanism be not more than 40 pounds. The NHTSA does not consider that the 40 pound force limit is too high in light of the location and access requirements of this standard. If the maximum force level were substantially lowered, there would be a significant likelihood that emergency door release mechanisms would be inadvertently activated by a passenger.

In addition, the NHTSA has noted the possibility of ambiguity with respect to the wording of paragraph S5.4 of the old standard and S5.4.2 of the proposal. The intent of these paragraphs is to specify conditions applicable to the opening of the exit *after* the release mechanism has been activated. Accordingly, the wording of the two paragraphs has been modified to clearly reflect this intent.

Many school districts and manufacturers objected to the parallelepiped clearance requirement for the emergency doors because of the number of seats that would be eliminated and the costs of redesigning van-type school buses to meet the clearance requirements. In addition, many commenters pointed out that the 12-inch aisle in most school buses precludes effective use of a large exit meeting the proposed requirements.

The NHTSA has determined that these arguments have merit. As a result, the proposed paralellepiped requirements have been modified by reducing the height from 48 inches to 45 inches, reducing the depth from 24 to 12 inches for rear exits in buses over 10,000 lbs GVWR, and to 6 inches for rear exits in buses under 10,000 lbs GVWR. For side exits the depth has been eliminated altogether. Additionally, the forward edge of the side door now coincides with a vertical transverse plane tangent to the rearmost point of the adjacent seat, thus permitting simultaneous exiting of two occupants, between the seat backs and over the seat cushion.

In light of the above, 49 CFR § 571.217, *Bus Window Retention and Release*, is amended . . . .

Effective date: October 26, 1976.

(Secs. 103, 112, 119, Pub. L. 89–563, 80 Stat. 718; Sec. 202, Pub. L. 93-492, 88 Stat. 1484 (15 U.S.C. 1392, 1401, 1407); delegation of authority at 49 CFR 1.50.)

Issued on January 22, 1976.

Howard J. Dugoff
Acting Administrator

41 F.R. 3871
January 27, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

(Docket No. 75-3; Notice 4)

This notice amends Standard No. 217, *Bus Window Retention and Release*, to modify the emergency exit requirements of the standard in response to a petition for reconsideration of recent amendments and after consideration of comments on the agency's proposal to specify new performance options and labeling for emergency exits.

PETITION FOR RECONSIDERATION OF NOTICE 2

The National Highway Traffic Safety Administration (NHTSA) recently amended Standard No. 217 (49 CFR 571.217) to provide emergency exit requirements for school buses (41 FR 3871, January 27, 1976 (Notice 2)). Section S5.2.3.1 of the standard (as it becomes effective for school buses on October 26, 1976) specifies that a rear emergency door shall be hinged on the right side. Chrysler Corporation has petitioned for reconsideration of this provision, asking that a manufacturer option be provided so that the rear emergency door or doors on van-type school buses may be hinged on the right or left.

The purpose of specifying that the rear emergency door hinge to the right is based on the NHTSA finding that school buses often operate on rural highways that are bordered by drainage ditches, and that a school bus that leaves the highway and rolls over is likely to come to rest in the right-hand ditch on its right side. When a bus comes to a rest on its side, the emergency door on the rear of the bus is easier to operate, particularly by small children, if it is hinged so that its operation is assisted by gravity.

Chrysler pointed out that the rear emergency door on van-type school buses is often used routinely for loading and unloading passengers. For this reason, Chrysler offers a single rear door that hinges at the left side, so that the door swings out of the way to safely accommodate curb-side loading. In the case of larger buses, routine loading and unloading does not occur through the rear emergency door.

The NHTSA agrees with Chrysler that the common practice of curb-side loading through the rear door of van-type school buses justifies a manufacturer option in selecting the side of the door which should be hinged. On balance, the agency considers that the increase in safety for routine curb-side loading through a left-hinged door would outweight any potential loss of safety benefit for emergency evacuation from a van-type bus that comes to rest on its right side. Accordingly, S5.2.3.1 of the standard is appropriately amended. The agency also takes the opportunity to correct an inadvertent reference to emergency "exit" in S5.2.3.2 when the requirements are actually intended to apply only to an emergency "door."

In a matter unrelated to the Chrysler petition, some uncertainty has arisen over the form of S5.4 as it was revised in Notice 2 to become effective October 26, 1976. Also, the division between buses with a GVWR of 10,000 pounds or less and those with a greater GVWR was imperfectly stated in amending S5.4. For this reason, the amendment of S5.4 is republished in the correct form in this notice. No substantive changes are made in this republication of S5.4.

EMERGENCY EXIT AND LABELING PROPOSAL—NOTICE 3

At the time the amendments just discussed were published, the NHTSA published a proposal to clarify certain emergency exit labeling for all buses, and to replace the established option for school bus emergency exits with a new option (41 FR 3878, January 27, 1976; Notice 3). Comments were received from the Lanai Road Elementary School Parent-Teachers Association, Gillig Brothers (Gillig), Chrysler Corporation, Mr. Allen Braslow, Crown Coach Corporation (Crown), and International Harvester (IH). No comment was received from manufacturers of transit or intercity buses, or from the manufacturers of body-on-chassis school buses. The National Motor Vehicle Safety Council did not comment on this proposal.

With regard to emergency exit labeling, Mr. Braslow suggested two labeling changes intended to assist bus occupants, as well as a requirement for regular testing of emergency exits in buses in highway service. While the latter suggestion lies beyond the authority of the agency under the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1391, et seq.), the agency will consider for future action the suggestion to label all bus exits in the same manner as school bus exits, as well as the suggestion to develop a universal emergency exit insignia with diagramatic instructions. For the moment, the agency is limited by the extent of its proposal, and accordingly, makes final the changes as proposed.

Standard No. 217 requires (effective October 26, 1976) school buses to provide either a rear emergency door or two side emergency doors in satisfaction of the emergency exit requirements. In Notice 3, the agency proposed to modify this option to require either provision of a rear emergency door or, at the option of the manufacturer, provision of a left-side emergency door and a "California rear window" exit at the rear of the bus. This type of rear window exit provides a large (16 by 48 inch) opening which is more easily utilized than a side emergency door if a bus has rolled onto its side. In the alternative, the agency proposed that the option to use a rear window exit only be allowed in rear-engine buses.

The two manufacturers of transit-type school buses supported the new option, but objected to the alternative proposal that would limit use of the option to rear-engine buses. Both Gillig and Crown build mid-engine school buses with essentially the same configuration as rear-engine buses and consider the rear window exit equally useful in these buses. The agency has considered the mid-engine design and agrees with the argument made by Crown and Gillig. Accordingly, the agency amends the standard as proposed to apply the option to all school buses. Crown Coach pointed out that the NHTSA proposal to limit rear-window-exit release mechanisms to a single release would necessitate a change in existing hardware. The NHTSA has investigated the available hardware (consisting in all cases of two release mechanisms that are located within 36 inches of each other) and concludes that the only significant safety hazard in some of the designs is that some require simultaneous operation for release. For this reason, the agency will allow not more than two release mechanisms, provided that the two mechanisms do not have to operate simultaneously to effect release. If new designs present a problem of any nature, further rulemaking will be undertaken.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16201, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this proposal on the public and private sectors, including possible loss of safety benefits. The option to hinge some rear emergency doors on the right or left, and the option to use a "California rear window" do not involve additional expenditures. The agency estimates that these additional exit arrangements will not significantly reduce the level of safety provided in the affected bus categories. The new requirements for more specific operating instructions for school bus emergency exits are calculated to involve annual costs of about $67,000. Although the agency is unable to quantify the benefit of clearer exit labeling, it is estimated that better instructions will serve to reduce the possibility of death and injury involved in an attempt to use the emergency exits. Therefore, the agency concludes that the amendments should issue as set forth in this notice.

For the benefit of interested persons, it is noted that Docket 75-6 concerning labeling of bus emergency exits is related to this rulemaking.

In consideration of the foregoing, Standard No. 217 (49 CFR 571.217) as it is amended to become effective for school buses on October 26, 1976, is revised. . . .

Effective date: October 26, 1976. The effective date of the amendments numbered 1, 2, 3 and 5 is established as 9 months after the date of issuance of the amendments on which they are based, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492, section 202 (15 U.S.C. 1397(i)(1)(A)). The effective date of the amendment numbered 4 is also established as October 26, 1976, although a manufacturer can meet the requirements at an earlier date if the manufacturer so chooses.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on May 25, 1976.

James B. Gregory
Administrator

41 F.R. 22356
June 3, 1976

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release
(Docket No. 75-03; Notice 7)

ACTION: Final rule.

SUMMARY: This notice makes permanent an interim final rule that modified the agency's school bus emergency exit standard. The interim final rule, which was issued in February 1979, was implemented immediately to increase the availability of passenger vans for use as small school buses at reasonable costs. The interim rule slightly altered several emergency exit requirements in a manner that made it easier to mass produce small buses without significantly affecting the level of safety achieved by those vehicles. Concurrent with the issuance of the interim final rule, the agency solicited comments on the amendments to the standard. This notice responds to the comments and makes the interim rule permanent.

EFFECTIVE DATE: Since this notice makes permanent an existing interim final rule, it is effective immediately.

SUPPLEMENTARY INFORMATION: On February 8, 1979, the agency published an interim final rule and a proposal (44 F.R. 7961) to modify the school bus emergency exit safety standard, Standard No. 217, *Bus Window Retention and Release*. In that notice, the agency made effective immediately some modifications to the school bus emergency exit standard to increase the supply of reasonably priced vehicles suitable for school bus conversion. Among the changes implemented by the interim final rule were a slight decrease in the size of rear emergency exits for vehicles (typically passenger vans) with gross vehicle weight ratings (GVWR) less than 10,000 pounds, and increased flexibility in the location requirements for release mechanisms on the emergency exits of small school buses. The agency concluded at the time the interim rule was issued that the level of safety achieved by small buses would not be diminished by these changes and that the changes would allow more small buses to be mass produced, thereby lowering their prices. The agency also asked in the interim final rule for comments on the advisability of these changes.

In response to the agency's request, Ford, Chrysler, the Center for Auto Safety, and the California Highway Patrol (CHP) submitted comments. The two manufacturers, Ford and Chrysler, both supported the agency's action. The Center and the CHP both opposed the action.

The Center and the CHP both argued that the rear emergency exit in small school buses (passenger vans which have GVWR's less than 10,000 pounds and are used as school buses) should not be reduced in size. The Center stated that the exit should be broad enough for two students to exit simultaneously in case of an emergency. The CHP stressed that reducing the size of the exit would make it too small to permit the exiting of children in wheelchairs.

With respect to the argument that the size of the rear exit should allow room to exit students two abreast, the agency stated in the proposal that this argument, while valid for larger school buses, is not meritorious for school vehicles with GVWR's less than 10,000 pounds. Larger school buses frequently transport 60 or more school children. Accordingly, rapid evacuation of those vehicles in an emergency requires that the students be able to exit two abreast. In order to accomplish this, the agency has required that some space be provided behind the rearmost seat in these buses so that students exiting through the narrow center aisles will have room at the exits to get out two abreast.

In small school buses where the number of students carried frequently is 16 or less, the need for exiting two abreast to achieve rapid evacuation is significantly reduced. In recognition of this factor, the agency has never required bus manufacturers to provide space behind the rear seat of small buses that would allow students to exit two abreast. As a result, the rear seats of small buses are frequently quite near or are against the rear bus wall. Students exiting down a bus aisle, which is normally around 12 inches in width, reach an exit where no space is provided to exit two abreast. Accordingly, any requirement that an exit in small buses be large enough to facilitate exiting two abreast would not accomplish that goal. Small bus manufacturers would need to redesign their bus seat plans in some fashion to provide space behind the rear seat in order to allow exiting two abreast. Such a redesign would significantly decrease the available seating in small buses. Given the fact that evacuating small buses has not been a safety problem, the agency concludes that the cost resulting from the reduced vehicle seating that would be required to accomplish the Center's objectives would far outweigh the benefits. Accordingly, the agency concludes that a broader rear exit is not needed in small school buses.

The CHP objected to the same requirement stating that the new exit door would be too narrow for wheelchairs. The CHP further stated that California has always required wider exits so that wheelchairs can be used in the vehicles.

The agency's new exit requirement is a minimum size requirement for standard school buses. In special instances in which larger exits are desired, such as in buses for carrying the handicapped, the States may require that their buses have such exits. The agency deems that approach to be preferable to its requiring larger exits in all vehicles. The situation with respect to rear door size is analogous to that involving seat back height. The agency requires a minimum seat back height. New York mandates a seat back height greater than the Federal specification. The NHTSA has no objection to the New York requirement and will not object to requirements by other States for wider rear emergency exits. The agency also notes that buses designed for the handicapped constitute a small portion of all buses and usually are equipped with special doors and larger aisles.

The Center also objected to the agency's interpretation that the parallelipiped device used for measuring rear door size could be lifted up to 1-inch to overcome small protrusions near the floor. The agency issued an interpretation permitting this at the time of the implementation of the standard. This interpretation simply reflects real-world conditions. Many doors in vehicles have small door sills or other minor protrusions that sometimes serve necessary functions in the proper operation of the door. These minor protrusions play no significant role in the ability of students to exit from a vehicle in an emergency. Therefore, the agency will not reconsider its interpretation.

The Center objected to the agency's removal of exit release mechanism location and force application requirements for small school buses. The Center agreed that the existing requirements are more appropriate for larger buses, but it insisted that the agency should develop another set of location requirements for smaller buses instead of abandoning the requirements entirely.

The agency is sympathetic to the Center's concerns about this issue. The location of the release mechanism for small school buses in an easily accessible location is important for the rapid evacuation of these vehicles in an emergency. However, the mere setting of location requirements would not ensure that the release mechanisms would be accessible. Due to the limited space in the rear of small buses and the variability of design in those areas, the agency could not readily specify a location which would provide the necessary accessibility. The agency believes that allowing manufacturers the option of locating the release mechanism in any easily accessible location on or near the exit will be more beneficial to achieving the intended safety results than any rigid inflexible location requirement. NHTSA anticipates that product liability concerns and the agency's authority to declare inaccessible release mechanisms to be safety-related defects will suffice to induce the manufacturers to select accessible locations. The agency will closely monitor the location and accessibility of the release mechanisms and, if necessary, use both its defects and rulemaking authority to take corrective action.

Finally, the Center objected to the fact that the agency permitted pull-type release mechanisms.

The Center stated that release mechanism standardization is helpful in assuring the safe evacuation of vehicles.

While the agency agrees that standardization has value in this instance, there are competing ways for achieving standardization in the case of small school buses. One way is to require that small school buses have releases that operate with an upward motion as in larger school buses. Another way is to permit small school buses (which, as noted before, are passenger vans) to have the same pull-type releases that are found in other vans and some cars. The agency doesn't believe that either basis for standardization is clearly superior from a safety standpoint to the other. Further, permitting the use of the pull-type releases will enable the manufacturers to achieve cost savings. Accordingly, the agency declines to adopt the Center's recommendation.

Since this notice makes permanent an existing amendment, it is effective immediately. The agency has reviewed the amendment in accordance with E.O. 12291 and concludes that the rule is not significant under the Department of Transportation's regulatory procedures. In fact, by permitting these changes, more buses can be mass produced, which may result in a small decrease in the cost of complying with the standard. Since the economic impact of this rule is minimal, a regulatory evaluation is not required for this amendment.

The agency has also considered the effect of this rule in relation to the Regulatory Flexibility Act and certifies that it would not have a significant economic impact on a substantial number of small entities. The only economic impact might be a reduction in bus prices. There would similarly be no significant impact on a substantial number of small government jurisdictions and small organizations.

Finally the agency has analyzed this rule for purposes of the National Environmental Policy Act and has determined that it would have no significant impact on the human environment.

Issued on February 10, 1982.

Diane K. Steed
Acting Administrator

47 F.R. 7255
February 18, 1982

MOTOR VEHICLE SAFETY STANDARD NO. 217

Bus Window Retention and Release

S1. Scope. This standard establishes requirements for the retention of windows other than windshields in buses, and establishes operating forces, opening dimensions, and markings for push-out bus windows and other emergency exits.

S2. Purpose. The purpose of this standard is to minimize the likelihood of occupants being thrown from the bus and to provide a means of readily accessible emergency egress.

S3. Application. This standard applies to buses, except buses manufactured for the purpose of transporting persons under physical restraint.

S4. Definitions.

"Push-out window" means a vehicle window designed to open outward to provide for emergency egress.

"Adjacent seat" means a designated seating position located so that some portion of its occupant space is not more than 10 inches from an emergency exit, for a distance of at least 15 inches measured horizontally and parallel to the exit.

"Occupant space" means the space directly above the seat and footwell, bounded vertically by the ceiling and horizontally by the normally positioned seat back and the nearest obstruction of occupant motion in the direction the seat faces.

S5. Requirements.

S5.1 Window Retention. Except as provided in S5.1.2, each piece of window glazing and each surrounding window frame, when tested in accordance with the procedure in S5.1.1 under the conditions of S6.1 through S6.3, shall be retained by its surrounding structure in a manner that prevents the formation of any opening large enough to admit the passage of a 4-inch diameter sphere under a force, including the weight of the sphere, of 5 pounds until any one of the following events occurs:

(a) A force of 1200 pounds is reached.

(b) At least 80% of the glazing thickness has developed cracks running from the load contact region to the periphery at two or more points, or shattering of the glazing occurs.

(c) The inner surface of the glazing at the center of force application has moved relative to the window frame, along a line perpendicular to the undisturbed inner surface, a distance equal to one-half of the square root of the minimum surface dimension measured through the center of the area of the entire sheet of window glazing.

S5.1.1 An increasing force shall be applied to the window glazing through the head form specified in Figure 4, outward and perpendicular to the undisturbed inside surface at the center of the area of each sheet of window glazing, with a head form travel of 2 inches per minute.

S5.1.2 The requirements of this standard do not apply to a window whose minimum surface dimension measured through the center of its area is less than 8 inches.

S5.2 Provision of Emergency Exits. Buses other than school buses shall provide unobstructed openings for emergency exit which collectively amount, in total square inches, to at least 67 times the number of designated seating positions on the bus. At least 40 percent of the total required area of unobstructed openings, computed in the above manner, shall be provided on each side of a bus. However, in determining the total unobstructed openings provided by a bus, no emergency exit, regardless of its area, shall be credited with more than 536 square inches of the total area requirement. School buses shall provide openings for emergency exits that conform to S5.2.3.

S5.2.1 Buses with GVWR of more than 10,000 pounds. Except as provided in S5.2.1.1, buses with a GVWR of more than 10,000 pounds shall meet the unobstructed openings requirements by providing side exits and at least one rear exit that conforms to S5.3 through S5.5. The rear exit shall meet the requirements when the bus is upright and when the bus is overturned on either side, with the occupant standing facing the exit. When the bus configuration precludes installation of an accessible rear exit, a roof exit that meets the requirements of S5.3 through S5.5 when the bus is overturned on either side, with the occupant standing facing the exit, shall be provided in the rear half of the bus.

S5.2.1.1 A bus with GVWR of more than 10,000 pounds may satisfy the unobstructed openings requirement by providing at least one side door for each three passenger seating positions in the vehicle.

S5.2.2 Buses with a GVWR of 10,000 pounds or less. Buses with a GVWR of 10,000 pounds or less may meet the unobstructed openings requirement by providing:

(a) Devices that meet the requirements of S5.3 through S5.5 without using remote controls or central power systems;

(b) Windows that can be opened manually to a position that provides an opening large enough to admit unobstructed passage, keeping a major axis horizontal at all times, of an ellipsoid generated by rotating about its minor axis an ellipse having a major axis of 20 inches and a minor axis of 13 inches; or

(c) Doors.

S5.2.3 School buses.

S5.2.3.1 Each school bus shall comply with either one of the following minimum emergency exit provisions, chosen at the option of the manufacturer:

(a) One rear emergency door that opens outward and is hinged on the right side (either side in the case of a bus with a GVWR of 10,000 pounds or less); or

(b) One emergency door on the vehicle's left side that is in the rear half of the bus passenger compartment and is hinged on its forward side, and a push-out rear window that provides a minimum opening clearance 16 inches high and 48 inches wide. This window shall be releasable by operation of not more than two mechanisms which are located in the high force access region as shown in Figure 3C, and which do not have to be operated simultaneously. Release and opening of the window shall require force applications, not to exceed 40 pounds, in the directions specified in S5.3.2.

S5.2.3.2 The engine starting system of a school bus shall not operate if any emergency door is locked from either inside or outside the bus. For purposes of this requirement, "locked" means that the release mechanism cannot be activated by a person at the door without a special device such as a key or special information such as a combination.

S5.3 Emergency exit release.

S5.3.1 Each push-out window or other emergency exit not required by S5.2.3 shall be releasable by operating one or two mechanisms located within the regions specified in Figure 1, Figure 2, or Figure 3. The lower edge of the region in Figure 1, and Region B in Figure 2, shall be located 5 inches above the adjacent seat, or 2 inches above the armrest, if any, whichever is higher.

S5.3.2 When tested under the conditions of S6, both before and after the window retention test required by S5.1, each emergency exit not required by S5.2.3 shall allow manual release of the exit by a single occupant using force applications each of which conforms, at the option of the manufacturer, either to (a) or (b). The release mechanism or mechanisms shall require for release one or two force applications, at least one of which differs by 90 to 180° from the direction of the initial push-out motion of the emergency exit (outward and perpendicular to the exit surface).

(a) Low-force application.

Location: As shown in Figure 1 or Figure 3.

Type of Motion: Rotary or straight.

Magnitude: Nor more than 20 pounds.

(b) High force application.

Location: As shown in Figure 2 or Figure 3.

Type of Motion: Straight, perpendicular to the undisturbed exit surface.

Magnitude: Not more than 60 pounds.

S5.3.3 When tested under the conditions of S6., both before and after the window retention test required by S5.1, each school bus emergency door shall allow manual release of the door by a single person, from both inside and outside the bus passenger compartment, using a force application that conforms to paragraphs (a) through (c) [except a school bus with a GVWR of 10,000 pounds or less does not have to conform to paragraph (a). (47 F.R. 7255—February 18, 1982. Effective: February 18, 1982).] Each release mechanism shall operate without the use of remote controls or tools, and notwithstanding any failure of the vehicle's power system. When the release mechanism is not in the closed position and the vehicle ignition is in the "on" position, a continuous warning sound shall be audible at the driver's seating position and in the vicinity of the emergency door having the unclosed mechanism.

(a) Location: Within the high force access region shown in Figure 3A for a side emergency door, and in Figure 3D for a rear emergency door.

(b) Type of motion: Upward from inside the bus; at the discretion of the manufacturer from outside the bus. [Buses with a GVWR of 10,000 pounds or less shall provide interior release mechanisms that operate by either an upward or pull-type motion. The pull-type motion shall be used only when the release mechanism is recessed in such a manner that the handle, lever, or other activating device does not protrude beyond the rim of the recessed receptacle. (47 F.R. 7255—February 18, 1982. Effective: February 18, 1982)]

(c) Magnitude of force: Not more than 40 pounds.

The present S5.4 is renumbered S5.4.1, and the phrase "Each push-out window or other emergency exit shall, after the release mechanism has been operated," is replaced by the phrase "After the release mechanism has been operated, each push-out window or other emergency exit not required by S5.2.3," at the beginning of the paragraph.

S5.4 Emergency exit extension.

S5.4.1 After the release mechanism has been operated, each push-out window or other emergency exit not required by S5.2.3 shall, under the conditions of S6, before and after the window retention test required by S5.1, using the reach distances and corresponding force levels specified in S5.3.2, be manually extendable by a single occupant to a position that provides an opening large enough to admit unobstructed passage, keeping a major axis horizontal at all times, of an ellipsoid generated by rotating about its minor axis an ellipse having a major axis of 20 inches and a minor axis of 13 inches.

S5.4.2 School bus emergency exit extension.

S5.4.2.1 School bus with a GVWR of more than 10,000 pounds. After the release mechanism has been operated, the emergency door of a school bus with a GVWR of more than 10,000 pounds shall, under the conditions of S6, before and after the window retention test required by S5.1, using the force levels specified in S5.3.3, be manually extendable by a single person to a position that permits—

(a) In the case of rear emergency door, an opening large enough to permit unobstructed passage of a rectangular parallelepiped 45 inches high, 24 inches wide, and 12 inches deep, keeping the 45-inch dimension vertical, the 24-inch dimension parallel to the opening, and the lower surface in contact with the floor of the bus at all times; and

(b) In the case of a side emergency door, an opening at least 45 inches high and 24 inches wide. A vertical transverse plane tangent to the rearmost point of a seat back shall pass through the forward edge of a side emergency door.

S5.4.2.1 School Buses Less Than 10,000 Pounds or Less. A school bus with a GVWR of 10,000 pounds or less shall conform to all the provisions of S5.4.2 except that the parallelepiped dimension for the opening of the rear emergency door or doors shall be 45 inches high, 22 inches wide, and 6 inches deep.

S5.5 Emergency exit identification.

S5.5.1 In buses other than school buses, except for windows serving as emergency exits in accordance with S5.2.2(b) and doors in buses with a GVWR of 10,000 pounds or less, each emergency door shall have the designation "Emergency Door" or "Emergency Exit" and each push-out window or other emergency exit shall have the designation "Emergency Exit" followed by concise operating instructions describing each motion necessary to unlatch and open the exit, located within 6 inches of the release mechanism.

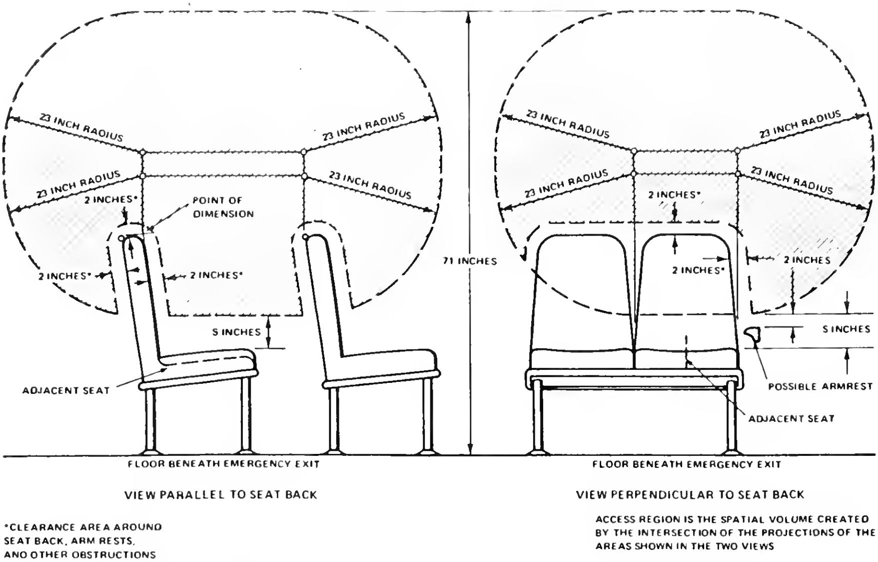


FIGURE 1 LOW-FORCE ACCESS REGION FOR EMERGENCY EXITS HAVING ADJACENT SEATS

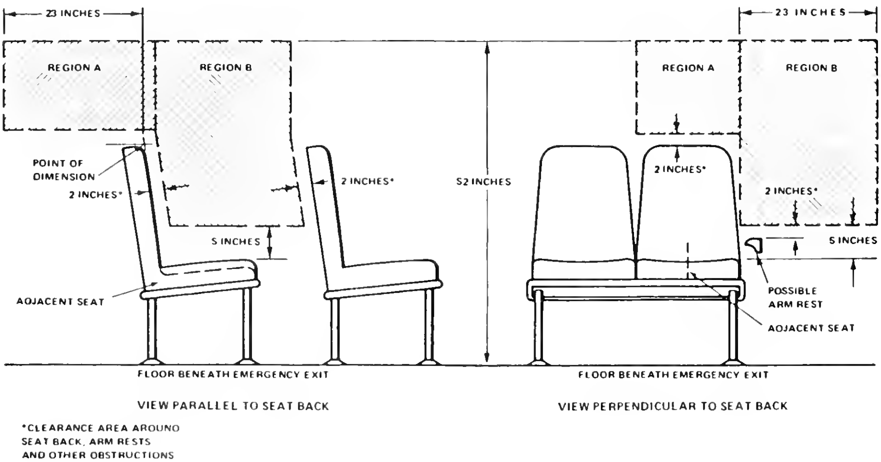
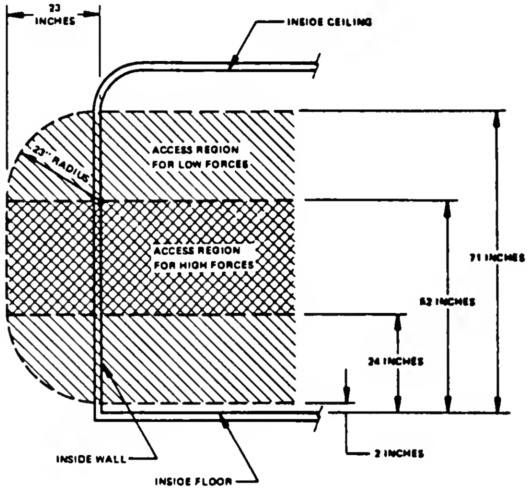
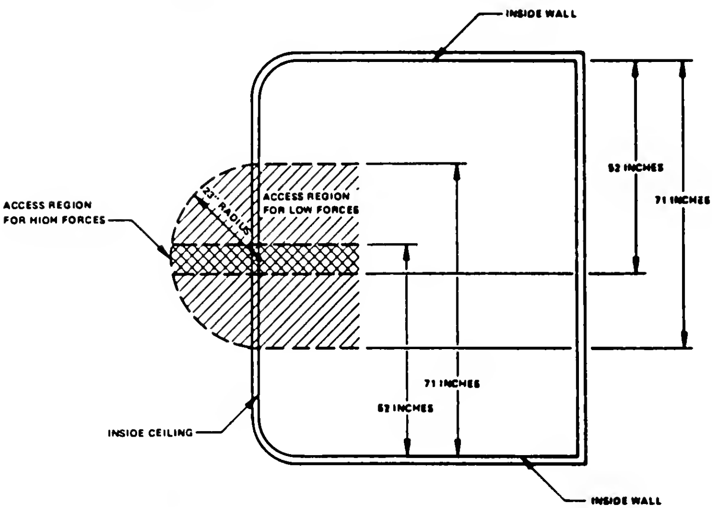


FIGURE 2 HIGH-FORCE ACCESS REGIONS FOR EMERGENCY EXITS HAVING ADJACENT SEATS

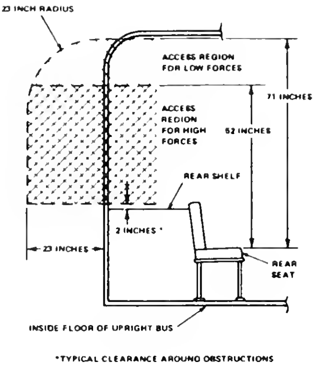
LOW AND HIGH-FORCE ACCESS REGIONS FOR EMERGENCY EXITS WITHOUT ADJACENT SEATS



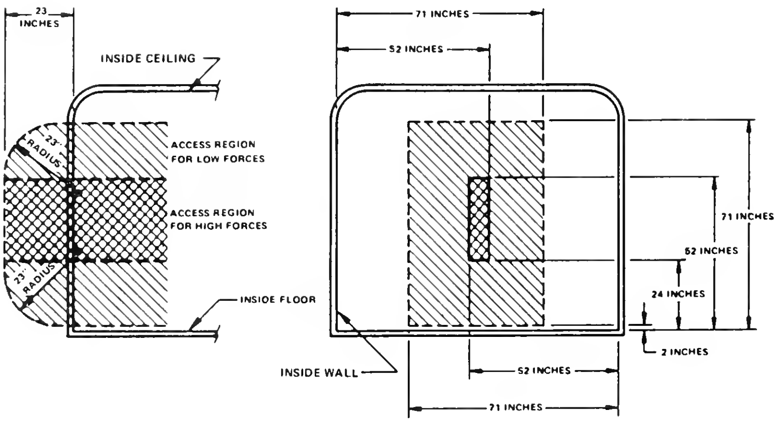
3A. SIDE EMERGENCY EXIT



3B. ROOF EMERGENCY EXIT



3C. REAR EMERGENCY EXIT WITH REAR OBSTRUCTION



3D. REAR EMERGENCY EXIT WITHOUT REAR OBSTRUCTION

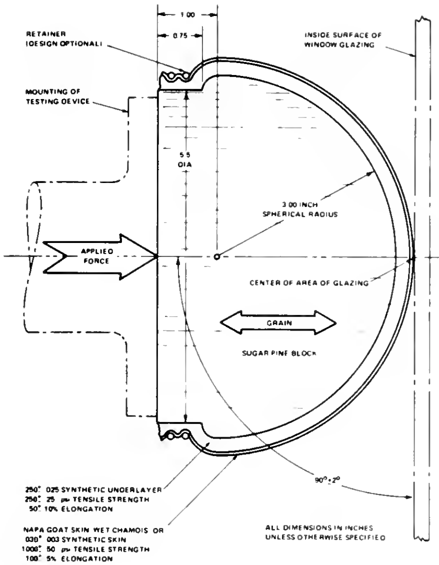


FIGURE 4 HEAD FORM

Examples: (1) Lift to Unlatch
Push to Open

(2) Lift Handle and
Push out to Open

When a release mechanism is not located within an occupant space of an adjacent seat, a label meeting the requirements of S5.5.2 that indicates the location of the nearest release mechanism shall be placed within the occupant space.

Example: Emergency exit instructions located next to seat ahead.

S5.5.2 In buses other than school buses, except as provided in S5.5.2.1, each marking shall be legible, when the only source of light is the normal night-time illumination of the bus interior, to occupants having corrected visual acuity of 20/40 (Snellen ratio) seated in the adjacent seat, seated in the seat directly adjoining the adjacent seat, and standing in the aisle location that is closest to that adjacent seat. The marking shall be legible from each of these locations when the other two corresponding locations are occupied.

S5.5.2.1 If the exit has no adjacent seat, the marking must meet the legibility requirements of S5.5.2 for occupants standing in the aisle location nearest to the emergency exit, except for a roof exit, which must meet the legibility requirements for occupants positioned with their backs against the floor opposite the roof exit.

S5.5.3 School Bus. Each school bus emergency exit provided in accordance with S5.2.3.1 shall have the designation "Emergency Door" or "Emergency Exit," as appropriate, in letters at least 2 inches high, of a color that contrasts with its background, located at the top of or directly above the emergency exit on both the inside and outside surfaces of the bus. Concise operating instructions describing the motions necessary to unlatch and open the emergency exit, in letters at least three-eights of an inch high, of a color that contrasts with its background, shall be located within 6 inches of the release mechanism on the inside surface of the bus.

Example: (1) Lift to Unlatch
Push to Open

(2) Lift Handle
Push Out to Open.

S6. Test conditions.

S6.1 The vehicle is on a flat, horizontal surface.

S6.2 The inside of the vehicle and the outside environment are kept at any temperature from 70° to 85° Fahrenheit for 4 hours immediately preceding the tests, and during the tests.

S6.3 For the window retention test, windows are installed, closed, and latched (where latches are provided) in the condition intended for normal bus operation.

S6.4 For the emergency exit release and extension tests, windows are installed as in S6.3, seats, armrests, and interior objects near the windows are installed as for normal use, and seats are in the upright position.

37 F.R. 9394
May 10, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 218

Motorcycle Helmets

(Docket No. 72–6; Notice 2)

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard No. 218, Motorcycle Helmets, 49 CFR § 571.218, that establishes minimum performance requirements for motorcycle helmets manufactured for use by motorcyclists and other motor vehicle users.

A notice of proposed rulemaking on this subject was published on May 19, 1972 (37 F.R. 10097). The comments received in response to the notice have been carefully considered in this issuance of a final rule.

In the previous notice, the NHTSA proposed that, effective September 1, 1974, the performance levels for the impact attenuation requirements be upgraded to that of the Head Injury Criterion (HIC) required by Motor Vehicle Safety Standard No. 208. A number of comments on this subject sought to defer a final determination until further research and additional tests could be conducted. The agency has carefully reviewed the issues raised by these comments and has determined that technical data presently being generated on this matter by several investigations should be considered in upgrading the impact attenuation requirements. Accordingly, a decision on the upgrading will be deferred until after this research has been completed and the results evaluated, and after any appropriate data have been reviewed.

Comments to the docket on the initial impact attenuation requirement ranged from abolishing the time duration criteria of 2.0 milliseconds and 4.0 milliseconds at the 200g and 150g levels, respectively, to increasing these criteria to 2.8 milliseconds at the 200g level and 5.6 milliseconds at the 150g level. One approach taken in regard to this requirement contends that the available test data are insufficient for quantifying time limits for the relatively short duration accelerations which are involved in helmet testing. Several comments questioned the validity of the proposed time duration limits, since these limits were based on the optional swing-away (as opposed to fixed anvil) test of the American National Standards Institute (ANSI) Standard Z90.1–1966, which was omitted from the most recent issues of the Z90.1 Standard (1971 and 1973) and was not contained in the proposed motorcycle helmet standard. An additional comment points out that helmets designed to meet higher energy impacts than the initial impact attenuation requirement occasionally have difficulty meeting a 2.0 millisecond requirement at the 200g level.

A review of available biomechanical data indicates that the head impact exposure allowed by the 2.0 and 4.0 millisecond limits at the 200g and 150g levels, respectively, is greater than that allowed by other measures of head injury potential. It is the agency's view, moreover, that the best evidence indicates that an increase in the time duration criteria would permit a substantial reduction in the protection provided to the helmet wearer. Since the comments to the docket did not provide any new data or sufficiently compelling arguments which would justify relaxing the proposed limits for tolerable head impact exposure, the 2.0 and 4.0 millisecond criteria are retained as part of the initial impact attenuation criteria.

In response to comments recommending that the allowable weight of the supporting assembly for the impact attenuation drop test be changed to 20% instead of the proposed 10% of the weight of the drop assembly, the NHTSA has determined that such a change would enable more durable testing equipment to be used without any significant effect on test results. Accordingly, this weight limitation has been raised to 20%.

Several comments expressed concern that the proposed 0.04-inch indentation limit included under the penetration test would create problems of measurement. The agency has determined that the intent of this 0.04-inch indentation limit is sufficiently accomplished by the requirement that the striker not contact the surface of the test headform, and the 0.04-inch indentation limit is therefore deleted from the final rule. Further, in consideration of the need to readily detect any contact by the striker, the agency has determined that the contactable surfaces of the penetration test headforms should be constructed of a metal or metallic alloy which will insure detection. Several minor changes in the test conditions for the penetration test have also been made, without altering the substance of those conditions.

A number of comments recommended that where the retention system consists of components which can be independently fastened without securing the complete assembly, such components should not have to individually meet the retention test requirements. Since helmets have a tendency to be thrown off by a crash and motorcyclists sometimes only partially fasten the retention system where such an option exists, the agency has concluded that retention components as well as the entire assembly should meet the test requirements in every fastening mode as specified in the notice of proposed rulemaking.

A number of comments requested that the 105° minimum peripheral vision clearance to each side of the midsagittal plane be increased to 120°. The 105° minimum requirement was proposed because it satisfies a demand by the public for the availability of some helmets which provide added protection to the temporal areas in exchange for a minimal reduction in peripheral vision capability without compromising the safe limits of peripheral vision clearance. A review of available field-of-vision studies and the lack of any evidence to the contrary indicate that 105° minimum clearance to each side of the midsagittal plane provides ample peripheral vision capability. Since the requests for increasing the minimum clearance to 120° were not accompanied by any supporting data or arguments, the agency has concluded that the standard should allow the additional protection which the 105° minimum clearance would permit and, accordingly, this requirement is retained.

With respect to providing important safety information in the form of labeling, one comment recommended that, due to possible label deterioration, both the manufacturer's identification and the helmet model designation should be permanently marked by etching, branding, stamping, embossing, or molding on the exterior of the helmet shell or on a permanently attached component so as to be visible when the helmet is in use. The NHTSA has determined that the practical effect of this recommendation is accomplished by requiring each helmet to be permanently and legibly labeled. The method to be used to permanently and legibly affix a label for each helmet is therefore left to the discretion of the manufacturer. However, in order that there may be some external, visual evidence of conformity to the standard, the labeling requirement has been further modified to require manufacturer certification in the form of the DOT symbol to appear in permanent form on the exterior of the helmet shell.

One comment recommended that the preliminary test procedures include the application of a 10-pound static test load to the apex of a helmet after it is placed on the reference headform and before the "test line" is drawn to insure that the reference marking will be relatively uniform, thus reducing variances in test results of identical helmets. The agency concurs in this recommendation and it has been included in the standard.

A number of comments objected to the location of the test line. With respect to the proposed requirement that the test line on the anterior portion of a helmet coincide with the reference plane of its corresponding reference headform, it was pointed out that the helmet's brow area would have to be excessively thick in order to meet the impact attenuation criteria at any point less than approximately 1 inch from the brow opening. The data indicate that this objection is valid, and the location of the anterior test line has been modified by placing it 1 inch above and parallel to the reference plane.

A number of comments objected to the proposed requirement that the test line on the posterior portion of a helmet coincide with the basic plane of its corresponding reference headform. The principal objection expressed concern that, by extending the posterior test line to the basic plane, the resulting increase in the posterior surface of a helmet could cause the helmet to impact the wearer's neck where rearward rotation of the head occurs, thereby increasing the potential for injury in certain cases. After further consideration of this aspect of helmet safety, the agency has determined that the location of the test line on the posterior portion of a helmet should be modified by placing it 1 inch below and parallel to the reference plane.

Several comments questioned the sufficiency of the anatomical dimensions and diagrams provided for the reference headforms in the Appendix of the notice of proposed rulemaking. Of these comments, two proposed adopting the dimensional specifications of the existing ANSI Z90.1 headform, while a third recommended the inclusion of an additional reference headform to accommodate their smallest child helmet. The agency has concluded that, in order to promote greater uniformity in testing and more repeatable results, one of the reference headforms should have the dimensional specifications of the readily available Z90.1 headform, the others being scaled proportionally, and that a reference headform for smaller child helmets should be added. Accordingly, the Appendix has been revised to reflect these changes.

Effective date: March 1, 1974.

In consideration of the foregoing, a new Motor Vehicle Safety Standard No. 218, Motorcycle Helmets, is added as § 571.218 of Title 49, Code of Federal Regulations, as set forth below.

(Secs. 103, 112, 119, Public Law 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 9, 1973.

James B. Gregory
Administrator

38 F.R. 22390
August 20, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 218

Motorcycle Helmets

(Docket No. 72–6; Notice 3)

The purpose of this notice is to respond to petitions for reconsideration and petitions for rulemaking to amend Motor Vehicle Safety Standard No. 218, *Motorcycle Helmets* (49 CFR 571.218).

Standard No. 218, published on August 20, 1973, (38 F.R. 22390), established minimum performance requirements for helmets manufactured for use by motorcyclists and other motor vehicle users. Pursuant to 49 CFR 553.35, petitions for reconsideration were filed by the Safety Helmet Council of America (SHCA) and Lear-Siegler, Inc., Bon-Aire Division. Additionally, pursuant to 49 CFR 553.31, petitions to amend the standard were filed by the Z–90 Committee of the American National Standards Institute, Midwest Plastics Corp., Approved Engineering Test Laboratories, Bell-Toptex, Inc., Premier Seat and Accessory Co., Safetech Co., Sterling Products Co., Inc., Lanco Division of Roper Corp., American Safety Equipment Corp., and Electofilm, Inc.

In response to information contained in both the petitions for reconsideration and the petitions for rulemaking, the standard is being amended in some minor respects, and its effectiveness is temporarily suspended for helmets that must be tested on headform sizes A, B, and D. Requested changes in other requirements of the standard are denied.

1. *Effective date.* The NHTSA received comments from Royal Industries/Grant Division, Jefferson Helmets, Inc., and Rebcor, Inc., urging that the March 1, 1974, effective date be reaffirmed and stating that they either have already produced or could produce helmets by that date which meet the standard's requirements. The NHTSA commends these manufacturers for their outstanding efforts and their positive attitude toward producing safer products.

The parties who submitted petitions, however, all requested some postponement of the standard's effective date. The postponement requests ranged from an indefinite extension to a delay until the manufacturers are able to test helmets to the required headforms, and were sought on the following three grounds: (1) additional time in order to obtain headforms required for reference marking and testing; (2) alleged inadequacy of the headform diagrams provided in the final rule; and (3) inability to find a supplier or forge for the K–1A magnesium alloy required for the impact attenuation test headforms.

As explained in the preamble to the standard, the headforms provided in the Appendix of the notice of proposed rulemaking (May 19, 1972, 37 F.R. 10097), were changed by the agency in order to utilize the readily available Z90.1 headform and to promote greater uniformity in testing and more repeatable results. In view of the fact that the size C headform of the final rule is identical to the Z90.1 headform, is readily available in test laboratories, is used for several ongoing certification programs, and that the other headforms are scaled proportionally, the NHTSA anticipated that competition would motivate both the manufacturers and the test laboratories to take the initiative either to obtain or to produce the other required headforms. It now appears that the problem of finding a supplier or forge for the K–1A magnesium alloy required for the A, B, and D impact attentuation test headforms is substantial enough to justify the requests for a postponement of the standard's effective date for helmets that must be tested on headform sizes A, B, and D.

Because the NHTSA determined that the size C headform would be identical to the Z90.1 headform, the low resonance magnesium alloy (K–1A) specified for making the Z90.1 headform also was specified for headforms required by the standard. Statements that it might be difficult to find suppliers or forges for the material were first made in the petitions on the standard. The NHTSA has determined that other low-resonance magnesium alloys can be substituted for the K–1A type without causing significant variances in the results of any of the helmet tests, so that manufacturers can determine compliance without undue cost penalties even where the K–1A alloy is in short supply. Accordingly, the K–1A alloy is retained as the basic headform material for the standard.

In view of the foregoing considerations with particular emphasis on the fact that testing services through commercial testing laboratories have been readily available for several years for the ANSI Z90.1 Standard headform, which is the size C headform of the standard, the requests for postponing the standard's effective date are denied with respect to helmets that fit headform C.

The petitions for a postponement of the effective date are granted, however, with respect to helmets that must be tested on headforms A, B, and D. A sentence is being added to the Application section of the standard, excepting from its coverage helmets that must be tested on these headform sizes. The second sentence in S6.1.1 of the standard relating to the selection of a reference headform to be used for reference marking should be disregarded until the standard is made effective for helmets that must be tested on headform sizes A, B, and D. To facilitate both the production and availability of headforms, the NHTSA has contracted with the Snell Memorial Foundation to monitor the preparation of detail drawings and model headforms consistent with the requirements of the standard. The drawings and headforms will be included in the docket for public examination upon their completion. A review of the leadtime information provided by the comments to the docket indicates that approximately 8 months of manufacturer leadtime will be needed after the detail dimensional drawings of the A, B, and D headforms become available. When the drawings are available, notice to that effect will be published in the Federal Register. The planned effective date for the A, B, and D-size helmets is 8 months from the date of the publication of that notice.

2. *Time duration criteria for impact attenuation test.* Petitions on the impact attenuation test time duration criteria of paragraphs S5.1(b) ranged from eliminating the time duration criteria of 2.0 milliseconds and 4.0 milliseconds at the 200g and 150g levels, respectively, to increasing these criteria to 3.0 milliseconds at the 200g level and 6.0 milliseconds at the 150g level. None of these petitions raised any issues or submitted any data different from those already considered by the NHTSA. The available biomechanical data indicate that the head impact protection provided to the helmet user by the standard's time duration criteria is greater than that which would result from the proposed changes, and the 2.0 and 4.0 millisecond criteria are retained.

3. *Conditioning period.* One petitioner requested that the 24-hour conditioning requirement for each of the four impact tests in paragraph S6.3 be modified to "4 to 24 hours," consistent with the requirements of ANSI Z90.1, arguing that 4 hours is sufficient to condition a helmet to the various environmental conditions required for the respective tests without compromising the intent of the standard. Upon further study of this matter, the NHTSA has concluded that, although 4 hours would not be sufficient as a general condition, changing the conditioning period to 12 hours would facilitate product testing without compromising the intent of the standard. Accordingly, paragraph S6.3, "Conditioning," is revised by changing the "24-hour" conditioning requirement to "12 hours" in each place the 24-hour requirement appears.

4. *Low temperature conditioning requirement.* Three petitioners objected to the −20° F. low temperature conditioning requirement in paragraph S6.3(b) on the basis that the requirement is overly severe. On review of available information, this agency has determined that precise data on the best low temperature requirements for testing are not available. Pending receipt of more specific information, therefore, the cold

temperature requirement of 14° F. that has been used up to now by the American National Standards Institute appears to be the most appropriate. Accordingly, paragraph S6.3(b), "Low temperature," is revised by changing the "−20° F." conditioning requirement to "14° F.".

5. *Projections.* One petitioner requested that paragraph S5.5, "Projections," be changed to permit a maximum rigid projection inside the helmet shell of 0.080 in. with a minimum diameter of 0.150 in. The basis for this request is to allow for the use of eyelets and rivets for attachment of snaps for face shields and retention systems. The NHTSA is concerned that due care be exercised with regard to minimizing the injury producing potential of such fasteners. Eyelets and rivets for the attachment of snaps should be designed to form a portion of the continuous surface of the inside of the helmet shell. Where they are so designed, such attachments would not be "rigid projections." Accordingly, no revision to this requirement is necessary.

6. *Labeling.* One petitioner recommended that the labeling requirements in paragraph S5.6 be clarified with the help of manufacturers and other interested parties. Since the petitioner did not specify the points requiring clarification and because no other comments were received on this subject, the NHTSA has determined that no sufficient reasons have been given to change the labeling requirements.

In consideration of the foregoing, 49 CFR 571.218, Motor Vehicle Safety Standard No. 218, *Motorcycle Helmets*, is amended. . . .

Effective date: March 1, 1974.

(Secs. 103, 112, 119, Public Law 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 23, 1974.

James B. Gregory
Administrator
39 F.R. 3554
January 28, 1974

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 218

Motorcycle Helmets

(Docket No. 72-6; Notice 06)

ACTION: Final Rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 218, *Motorcycle Helmets,* to extend application of the current requirements to all helmets that can be placed on the size "C" headform. The amendment is an interim rule requiring the certification of all large-size and many small-size helmets, and will be in effect until test headform sizes "A" and "D" have been developed and incorporated in the standard. This extended application of the standard will establish a minimum level of performance for a large number of helmets that are currently not being tested and certified by manufacturers, but which are suitable for testing on the size "C" headform.

EFFECTIVE DATE: May 1, 1980.

ADDRESSES: Any petitions for reconsideration should refer to the docket number and notice number and be submitted to: National Highway Traffic Safety Administration, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William J. J. Liu, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202–426–2264)

SUPPLEMENTARY INFORMATION: For reasons discussed below, on September 27, 1979, the NHTSA published a notice of proposed rulemaking to require, as an interim measure, the testing and certification of all motorcycle helmets that can be placed on the size "C" headform as described in Safety Standard No. 218 (44 FR 55612). Only one comment was received in response to that notice, supporting the proposal.

Safety Standard No. 218, *Motorcycle Helmets* (49 CFR 571.218), specifies minimum performance requirements for helmets designed for use by motorcyclists and other motor vehicle users. Currently, the standard is only applicable to a portion of the annual helmet production. Paragraph S3 of the standard provides:

> * * * The requirements of this standard apply to helmets that fit headform size C, manufactured on or after March 1, 1974. Helmets that do not fit headform size C will not be covered by this standard until it is extended to those sizes by further amendments.

"Fitting" is intended to mean something that is neither too small nor too large. It excludes not only helmets that are too small to be placed on the size "C" headform, but also helmets so large that they could be placed on the size "D" headform were it available. As explained below, that headform size is not currently available.

The standard references and describes in its appendix four test headform sizes ("A", "B", "C", and "D"). Currently only test headform size "C" has been developed, and it is identical to the American National Standard specifications for Protective Headgear for Vehicular Users, ANSI Z90.1-1971. The other test headforms are to be scaled proportionately from the ANSI Z90 (size "C") headform. The performance requirements of the standard for helmets fitting other than size C headforms were held in abeyance until these additional headform sizes could be developed (39 FR 3554, January 28, 1974). Because of problems with prototype headforms supplied to NHTSA under contract (the headforms did not meet dimensional tolerances considered acceptable), development of these additional headforms has been delayed over the past years. However, the agency now anticipates that the standard will include requirements for headform sizes "A" and "D" effective April 1, 1982 (size "B" will be deleted from the standard).

Last year, the Safety Helmet Council of America (SHCA) recommended that the agency require certification of all adult-size helmets on the size "C" headform. The SHCA stated that the delay in development of the additional headform sizes has led to confusion and unfair practices since many helmets are reportedly being improperly certified and many other helmets are not being certified that are required to comply with the standard. The agency has stated in the past that only helmets that are subject to compliance with Standard No. 218 should be certified and labeled with the "DOT" symbol. Apparently, some manufacturers have used the "DOT" label on untested helmets for competitive purposes. The SHCA stated that these practices have placed considerable burdens on the integrity of manufacturers of high quality helmets. The organization pointed out that under the ANSI standard only one headform (size "C") was used to test all helmets except child-size helmets, and that approximately 95 percent of current helmet production could and should be tested on the size "C" headform and certified for compliance with Standard No. 218.

The NHTSA Office of Vehicle Safety Standards has investigated the current labeling and certification practices of helmet manufacturers. It was found that most manufacturers currently test only "medium" size helmets on the size "C" headform, yet there is considerable variation among manufacturers as to which helmets are considered medium. Further, the agency found that the percentage of helmets subject to certification under the current applicability of the standard is substantially greater than the 40 percent that manufacturers are now testing on the size "C" headform. (Data from the investigation have been placed in the NHTSA docket under the docket number of this notice.)

As stated earlier, under the existing applicability requirements of the standard, only helmets that "fit" headform size "C" must be certified. Apparently, interpretation of the term "fit" by manufacturers has led to some mislabelings and failures to certify. Under the existing requirements, "helmets that fit headform size C" should be all helmets other than those that must be tested on the other headform sizes. To determine which helmets must be tested on a particular headform size, one follows the procedures of paragraph S6.1.1 of the standard. That paragraph provides in part:

> * * * Place the complete helmet to be tested on the reference headform of the largest size specified in the Appendix whose circumference is not greater than the internal circumference of the headband when adjusted to its largest setting, or if no headband is provided to the corresponding interior surface of the helmet.

Using the procedure of paragraph S6.1.1, manufacturers currently need only concern themselves with headform sizes "C" and "D", since small, child-size helmets that could not physically be placed on the size "C" headform would not have to be tested. As to the other helmet sizes, helmets that "fit headform size C" means any helmet that can be placed on the size "C" headform, except those helmets which the manufacturer can demonstrate could be placed on a size "D" headform. To make that demonstration, the manufacturers would have to show that the internal circumference of the helmet headband or the corresponding interior surface of the helmet is larger than the circumference of the size "D" headform. Even though the size "D" headform is not currently available, the dimensions of the headform are specified in the appendix of the standard, from which the manufacturer can make its determination. Regarding small, child-size helmets, the determination whether or not a particular helmet can be placed on the size "C" headform should be based on normal fitting procedures. This means, for example, that undue force should not be applied to forcibly push the headform into the helmet. However, efforts necessary for the ordinary wearing of the helmet should be employed, such as expanding the lower portions of a flexible-shell, full-face helmet. Apparently, many manufacturers have failed to use these procedures for determining which of their helmets "fit" headform size "C" and must be certified.

In light of the improper certification and the noncertification, the unavailability of the additional headform sizes at the present time, the need to ensure the safe performance of the large helmets and the apparent sufficiency of the size "C" headform for testing large helmets, the agency has concluded that the recommendations of the Safety Helmet Council of America have merit. Therefore, this notice amends Safety Standard No. 218 to require all motorcycle helmets that can be placed on the size "C" headform to be certified in accordance with the requirements of the standard. "Placed" is a broader term than "fit" primarily in that the former term does not imply any upper limit on helmet size.

Under these interim requirements, more than 90 percent of current helmet production will be tested on the size "C" headform. Only small, child-size helmets (size "A") will be excluded since they cannot physically be placed on the size "C" headform. As noted in the procedures discussed above, normal fitting procedures are used to determine if a particular helmet can be placed on the size "C" headform, without the use of undue force.

During its investigation, the NHTSA contacted manufacturers whose collective market share exceeds 80 percent of current annual helmet production. All of these manufacturers indicated that 90 percent or more of their helmet production could be placed and tested on the size "C" headform. Many of the manufacturers indicated that they are already testing the majority of their helmets on the size "C" headform for quality-control purposes, even though not required by the standard. Also, it was found that helmet shells and performance characteristics of a particular manufacturer's helmets do not generally vary significantly over the various size ranges of helmets produced.

This amendment is only an interim measure to establish a minimum level of performance for the large number of helmets that are currently not being certified for compliance with Standard No. 218. Testing extra-large helmets on the size "D" headform would require a higher level of performance for those helmets, since the weight of the size "D" headform is greater than that of the size "C" headform. Therefore, development of the size "A" and size "D" headforms has continued, and incorporation of requirements in the standard for these headforms will occur after development is completed. However, until this is accomplished, the agency believes that the performance level that will be required by testing on the size "C" headform is preferable to an absence of any requirements whatsoever. As stated earlier, the ANSI standard for helmets specifies only one headform size ("C") for testing all helmets. The additional headform sizes were originally specified in Standard No. 218 in response to suggestions from some manufacturers that requirements be more "fine-tuned" for the various helmet sizes.

The agency has concluded that the new requirements will preclude the great majority of unsafe helmets currently on the road. Further, with all adult helmets certified, retailers and consumers will no longer be confused or misled concerning the DOT certification labels found in their helmets, and NHTSA's enforcement activities will become more effective and uniform.

Under these new requirements, extra-large helmets should be tested on the size "C" headform without the use of "shims" or other devices to obtain a secure fit of the helmet on the headform. Agency tests involving extra-large helmets on the size "C" headform show results that correlate well with tests of medium-size helmets on the size "C" headform. (Data from these tests have been placed in the NHTSA docket). Therefore, the agency has concluded that repeatable results can be obtained under the existing procedures with the size "C" headform.

The effective date for extending the applicability of Standard No. 218 to all helmets that can be placed on the size "C" headform is May 1, 1980. The agency's past position has been that it would be "false and misleading," within the meaning of the statute (15 U.S.C. 1397(C)), for a "DOT" symbol to appear without qualification on helmets manufactured before the effective date of the standard. However, since the standard is currently effective for helmets that fit size "C" headforms, and since there is such a widespread variation among manufacturers as to which helmets they consider to fit the size "C" headform, the agency will allow voluntary certification and labeling of helmets prior to May 1, 1980. This, of course, would only apply to helmets that can be placed on the size "C" headform. Small helmets that could not be placed on the headform could not be certified with the "DOT" symbol until after the standard has been amended to include specifications for the size "A" headform. Also, helmets certified and labeled with the "DOT" symbol prior to the May 1, 1980, effective date will be subject to the general enforcement provisions of the National Traffic and Motor Vehicle Safety Act. Therefore, manufacturers will have to exercise "due care" to assure that any helmet they certify in fact complies with the performance requirements of Standard No. 218.

The agency has determined that this amendment does not qualify as a significant regulation under Executive Order 12044, "Improving Government Regulations." A final regulatory evaluation of this amendment has been placed in the docket for the benefit of all interested persons.

The engineer and lawyer primarily responsible for the development of this notice are William J. J. Liu and Hugh Oates, respectively.

In consideration of the above, paragraph S3 of Safety Standard No. 218, *Motorcycle Helmets* (49 CFR 571.218), is amended to read as follows:

§ 571.218 *Standard No. 218; motorcycle helmets.*

*　*　*　*　*

S3. *Application.* This standard applies to helmets designed for use by motorcyclists and other motor vehicle users. The requirements of this standard apply to all helmets that can be placed on the size C headform using normal fitting procedures. Helmets that cannot be placed on the size C headform will not be covered by this standard until it is extended to those sizes by further amendment.

*　*　*　*　*

(The second sentence in S6.1.1 of the standard relating to the selection of a reference headform should be disregarded until the standard is made effective for helmets that must be tested on headform sizes A and D.)

Issued on February 29, 1980.

Joan Claybrook
Administrator

45 F.R. 15179
March 10, 1980

MOTOR VEHICLE SAFETY STANDARD NUMBER 218

Motorcycle Helmets

(Docket No. 72-6; Notice 2)

S1. Scope. This standard establishes minimum performance requirements for helmets designed for use by motorcyclists and other motor vehicle users.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries to motorcyclists and other motor vehicle users resulting from head impacts.

S3. Application. This standard applies to helmets designed for use by motorcyclists and other motor vehicle users. The requirements of this standard apply to all helmets that can be placed on the size C headform using normal fitting procedures. Helmets that cannot be placed on the size C headform will not be covered by this standard until it is extended to those sizes by further amendment.

S4. Definitions.

"Basic plane" means a plane through the centers of the right and left external ear openings and the lower edge of the eye sockets (Figure 1) of a reference headform (Figure 2) or test headform.

"Midsagittal plane" means a longitudinal plane through the apex of a reference headform or test headform that is perpendicular to the basic plane (Figure 3).

"Reference plane" means a plane above and parallel to the basic plane on a reference head-

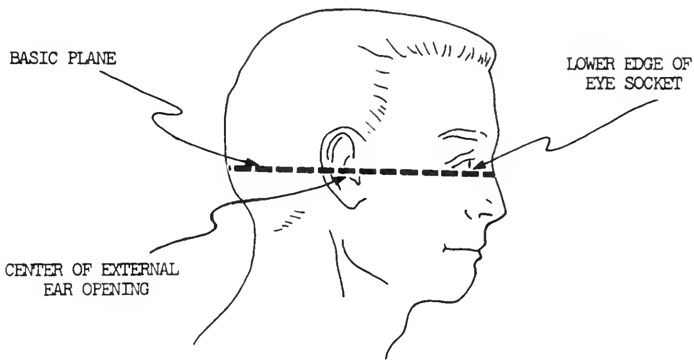


Figure 1

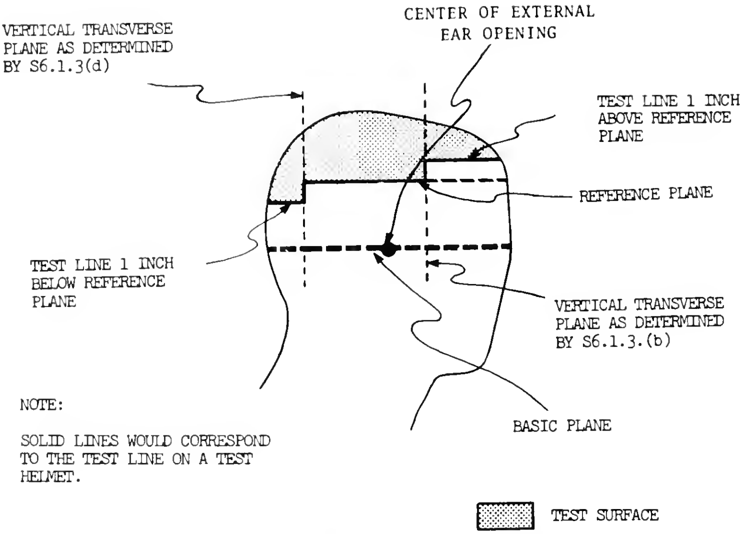


Figure 2

form or test headform (Figure 2) at the distance indicated in the Appendix.

"Reference headform" means a measuring device contoured to the dimensions of one of the four headforms described in the Appendix, with surface markings indicating the locations of the basic, midsagittal, and reference planes, and the centers of the external ear openings.

"Test headform" means a test device contoured to the dimensions of one of the four reference headforms described in the Appendix for all surface areas that contact the helmet, with surface markings indicating the locations of the basic, midsagittal, and reference planes.

"Retention system" means the complete assembly by which the helmet is retained in position on the head during use.

"Helmet positioning index" means the distance in inches, as specified by the manufacturer, from the lowest point of the brow opening at the lateral midpoint of the helmet to the basic plane of a reference headform, when the helmet is

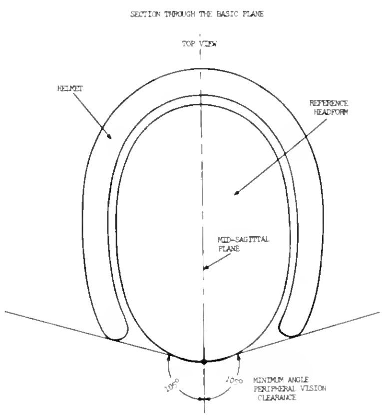
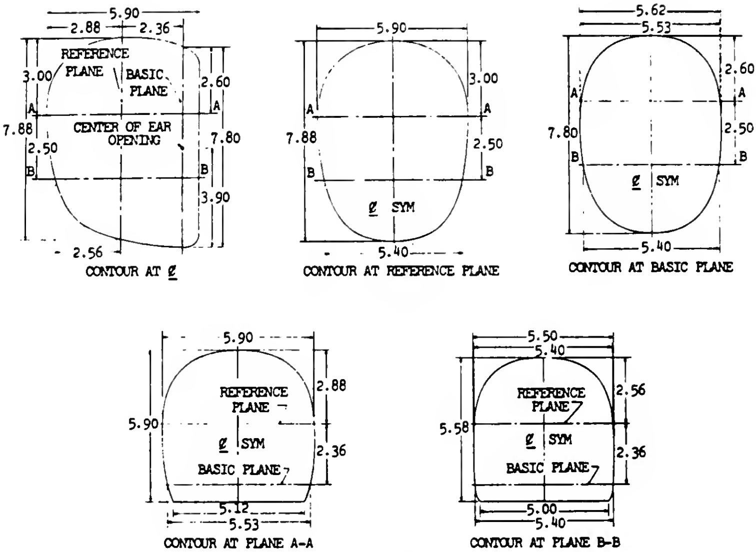
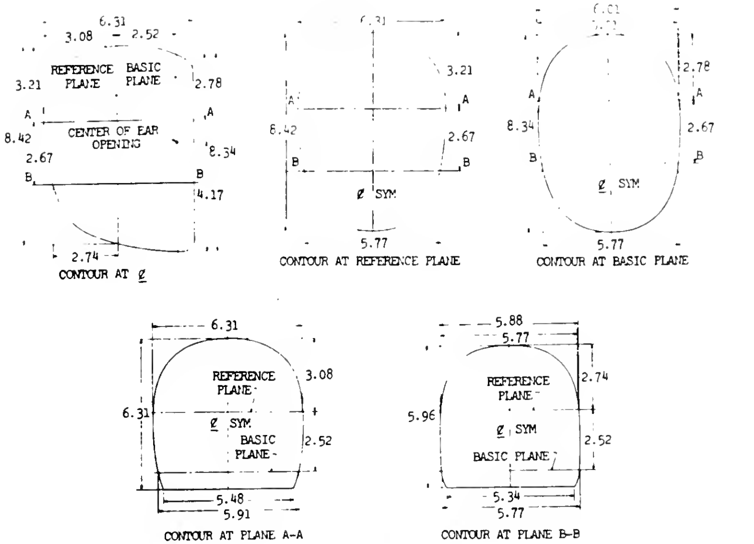


Figure 3



HEADFORM C

ALL DIMENSIONS IN INCHES



HEADFORM D

38 F.R. 22390
August 20, 1973

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 219

Windshield Zone Intrusion

(Docket No. 74–21; Notice 2)

This notice establishes a new Motor Vehicle Safety Standard No. 219, 49 CFR 571.219, that regulates the intrusion of vehicle parts from outside the occupant compartment into a defined zone in front of the windshield during a frontal barrier crash test.

The notice of proposed rulemaking on which this issuance is based was issued on May 20, 1974 (39 F.R. 17768). An earlier notice had been issued on August 31, 1972 (37 F.R. 17763), proposing a standard that would prohibit penetration of the protected zone by any part of a vehicle outside of the occupant compartment during a 30-mph frontal impact into a fixed barrier. After further study and an analysis of comments submitted in response to that notice, the NHTSA determined that the initial rule was unnecessarily stringent since its near-total ban on intrusion had the effect of prohibiting entrance into the protected zone or contact with the windshield by small particles such as paint chips and glass which do not represent a danger to the vehicle occupants if they enter the zone and impact the windshield opening with a limited amount of force.

Consequently, in the notice published on May 20, 1974, the proposed standard on windshield zone intrusion was amended to permit penetration by particles, to a depth of no more than one-quarter inch into a styrofoam template in the shape of the protected zone and affixed to the windshield, during a 30-mph frontal barrier crash.

In addition, the amended proposal published May 20, 1974, provided that contact by vehicle parts with the windshield opening in the area below the protected zone, during a 30-mph barrier crash test, would not be prohibited provided that the inner surface of that portion of the windshield is not penetrated. The procedure for determining the lower edge of the protected zone was also revised.

Standard No. 219, *Windshield Zone Intrusion*, reflects some minor changes incorporated for clarification following publication of the proposed rule on May 20, 1974. First, open-body-type vehicles with fold-down or removable windshields have been added to forward control vehicles as vehicle types to which the standard does not apply. A structurally unsupported windshield, essential to the utility of this vehicle type, typically does not remain in place during a 30-mph frontal barrier crash test, hence the test is impracticable for this type of vehicle.

In addition, the standard provides that its prohibitions against penetration by particles to a depth of more than one-quarter inch into the styrofoam template and penetration of the inner surface of the portion of the windshield below the protected zone do not apply to windshield molding and other components designed to be normally in contact with the windshield. This provision was contained in the proposed standard published August 31, 1972 but omitted from the proposal published May 20, 1974.

The standard as adopted also specifies that the 6.5-inch-diameter rigid sphere employed to determine the lower edge of the protected zone shall weigh 15 pounds, the approximate weight of the head and neck of an average driver or passenger.

Comments submitted by Wayne Corporation and Sheller-Globe Corporation, manufacturers of funeral coaches and ambulances, urged that the standard for windshield zone intrusion contain an exception for such vehicles in view of the low incidence of accidents involving funeral coaches and ambulances, the low volume of production of such vehicles, and the high cost of barrier crash testing. The NHTSA has determined that these arguments are without merit. The manufacturers have presented no evidence to support the contention that funeral coaches and ambulances are involved in fewer accidents in proportion to their numbers than other vehicles. Furthermore, several comments criticizing the allegedly prohibitive costs of compliance with the standard appear to have erroneously assumed that every manufacturer must conduct barrier crash tests. The performance requirement for windshield zone intrusion is set out in S5. of the standard. A manufacturer of funeral coaches and ambulances may, for example, assure itself that the requirement is met by barrier crashing the conventional chassis which is a component of the special vehicle, modified to simulate the dynamic characteristics of the funeral coach or ambulance. Or, the manufacturer may use the design characteristic of the vehicle taking into account the modifications it makes, or information supplied by the chassis manufacturer.

Low volume of production is not an appropriate basis for an exemption. As the NHTSA has maintained in past proceedings where the same argument was advanced, the appropriate means to avoid application of a standard on hardship grounds is a temporary exemption under 49 CFR Part 555.

Finally, the NHTSA is continuing to promote compatibility and economy in barrier crash testing by adopting vehicle loading and dummy restraint requirements in Standard No. 219 identical to those set out in proposed amendments to Standard No. 301, *Fuel System Integrity*, 49 CFR 571.301 (40 F.R. 17036, April 16, 1975). It has therefore required that 50th-percentile test dummies be placed in the seating positions whose restraint system is required to be tested by a dummy under Standard No. 208, *Occupant Crash Protection*, 49 CFR 571.208, and that they may be restrained only by the means that are installed in the vehicle at the respective seating positions.

In consideration of the foregoing, 49 CFR Part 571 is amended by the addition of a new Standard No. 219, 49 CFR 571.219, *Windshield Zone Intrusion*. . . .

Effective date: September 1, 1976.

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

Issued on June 9, 1975.

James B. Gregory
Administrator

40 F.R. 25462
June 16, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 219

Windshield Zone Intrusion

(Docket No. 74-21; Notice 3)

This notice responds to four petitions for reconsideration of the notice published June 16, 1975 (40 FR 25462), which established a new Motor Vehicle Safety Standard No. 219, *Windshield Zone Intrusion*, 49 CFR 571.219, regulating the intrusion of vehicle parts from outside the occupant compartment into a defined zone in front of the windshield during a frontal barrier crash test. The National Highway Traffic Safety Administration (NHTSA) hereby amends Standard No. 219 on the basis of the information and arguments presented by some of the petitioners.

Petitions for reconsideration were received from the Motor Vehicle Manufacturers Association (MVMA), General Motors, Ford, and Jeep. MVMA, General Motors, and Ford requested substitution of the term "daylight opening" for "windshield opening," and General Motors and Jeep requested a change in the effective date of Standard No. 219 from September 1, 1976 to September 1, 1977. In addition, Jeep requested that Standard No. 219 not become applicable until final issuance of Standard No. 212, *Windshield Mounting*, 49 CFR 571.212.

The NHTSA has determined that the petitions of MVMA, General Motors, and Ford requesting substitution of the term "daylight opening" for "windshield opening" have merit, and they are therefore granted. These petitioners requested that the term "windshield opening" be replaced by the term "daylight opening", which is defined in paragraph 2.3.12 of section E, Ground Vehicle Practice, SAE Aerospace-Automotive Drawing Standards, September, 1963. The part of the windshield below the daylight opening is protected by the cowling and instrument panel. There is little likelihood that in a frontal crash any vehicle component will penetrate the cowling and instrument panel with sufficient force to pose a threat to the vehicle occupants. Therefore, the zone intrusion requirements of Standard No. 219 should only apply to the area of the windshield susceptible to actual penetration by vehicle components in a crash. Accordingly, the term "windshield opening" as it is used in Standard No. 219, is replaced by "daylight opening." The SAE definition of "daylight opening" has been slightly modified to reflect the particular characteristics of Standard No. 219.

The NHTSA has concluded that the petitions of General Motors and Jeep requesting a change in the effective date of Standard No. 219 should be granted in part and denied in part. The economic considerations involved in coordinating the effective date of Standard No. 219 with that of Standard No. 212, *Windshield Mounting*, justify postponement of the effective date to September 1, 1977, for application of Standard No. 219 to all vehicles except passenger cars. However, the effective date of September 1, 1976, will be retained for passenger cars because of their greater susceptibility to the intrusion of vehicle parts against which this standard is designed to protect. This postponement of effective dates also grants in part Jeep's petition requesting that the applicability of Standard No. 219 be postponed until final issuance of Standard No. 212.

In consideration of the foregoing, § 571.219 is amended by revising S4., S5., and S6.1(d) of Standard No. 219, *Windshield Zone Intrusion*, to read as follows:

Effective date: September 1, 1976, for passenger cars; September 1, 1977, for multipurpose passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less.

(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 November 10, 1975.

James B. Gregory
Administrator

40 F.R. 53033
November 14, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 219

Windshield Zone Intrusion

(Docket No. 74–21; Notice 5)

This notice amends Standard No. 219, *Windshield Zone Intrusion*, to exclude walk-in van-type vehicles from the requirements of the standard.

The National Highway Traffic Safety Administration (NHTSA) proposed to exclude walk-in van-type vehicles from the applicability of Standard No. 219 (49 CFR 571.219) in a notice published March 11, 1976 (41 FR 10451). No opposition was registered in response to the proposed rulemaking. The National Motor Vehicle Safety Advisory Council did not take a position on the proposal.

The NHTSA, therefore, amends Standard No. 219 in accordance with the proposal. For the information of all interested persons, the NHTSA considers a "walk-in van-type" vehicle to be only the "step van" city delivery type of vehicle that permits a person to enter the vehicle without stooping.

It has been determined that this amendment will have a negligible economic and environmental impact, since it creates an exemption from existing requirements that is expected to affect relatively few vehicles.

In consideration of the foregoing, paragraph S3 of Standard No. 219 (49 CFR 571.219) is amended . . . .

Effective date: December 16, 1976. Because this amendment relieves a restriction and does not create additional obligations for any person and because it permits the resumption of manufacture of a vehicle type not intended to be covered by the standard, it is found 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 1.50.)

Issued on December 10, 1976.

Charles E. Duke
Acting Administrator

41 FR 54945
December 16, 1976

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 219

Windshield Zone Intrusion

(Docket No. 79-14; Notice 2)

ACTION: Final Rule.

SUMMARY: This notice amends two safety standards, Standard No. 212, *Windshield Mounting,* and Standard No. 219, *Windshield Zone Intrusion,* to limit the maximum unloaded vehicle weight at which vehicles must be tested for compliance with these standards. This action is being taken in response to petitions from the Truck Body and Equipment Association and the National Truck Equipment Association asking the agency to amend the standards to provide relief from some of the test requirements for final-stage manufacturers. Many of these small manufacturers do not have the sophisticated test devices of major vehicle manufacturers. The agency concludes that the weights at which vehicles are tested can be lessened while providing an adequate level of safety for vehicles such as light trucks and while ensuring that compliance with these standards does not increase their aggressivity with respect to smaller vehicles.

EFFECTIVE DATE: Since this amendment relieves a restriction by easing the existing test procedure and will not impose any additional burdens upon any manufacturer, it is effective (upon publication).

FOR FURTHER INFORMATION CONTACT:

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

SUPPLEMENTARY INFORMATION:

On August 2, 1979, the National Highway Traffic Safety Administration published a notice of proposed rulemaking (44 FR 45426) relating to two safety standards: Standard Nos. 212, *Windshield Mounting,* and 219 *Windshield Zone Intrusion.* That notice proposed two options for amending the test procedures of the standards that were designed to ease the compliance burdens of small final-stage manufacturers.

The agency issued the proposal after learning that final-stage manufacturers were frequently unable to certify certain vehicles in compliance with these two safety standards. The problem arises because of weight and center of gravity restrictions imposed upon the final-stage manufacturer by the incomplete vehicle manufacturer. (The final-stage manufacturer typically purchases an incomplete vehicle from an incomplete vehicle manufacturer, usually Ford, General Motors or Chrysler.) The incomplete vehicle usually includes the windshield and mounting but does not include any body or work-performing equipment. Since the incomplete vehicle manufacturer installs the windshield, it represents to the final-stage manufacturer that the windshield will comply with the two subject safety standards. In making this representation, however, the incomplete vehicle manufacturer states that the representation is contingent on the final-stage manufacturer's adherence to certain restrictions. Any final-stage manufacturer that does not adhere to the restrictions imposed by the incomplete vehicle manufacturer must recertify the vehicle based upon its own information, analysis, or tests. The major restrictions imposed by the incomplete vehicle manufacturers on the final-stage manufacturer involve weight and center of gravity limitation. In many instances, these limitations have made it impossible for final-stage manufacturers either to rely on the incomplete vehicle manufacturer's certification or to complete vehicles on the same chassis that they were accustomed to using (prior to the extension of the two safety standards to these vehicle types). As a result, the final-stage manufacturer is faced either with buying the same chassis as before and recertifying them or with buying more expensive chassis with higher GVWR's and less stringent weight and center of gravity limitations.

The agency has tried several different ways to alleviate this problem for the final-stage manufacturer. The NHTSA has met with representatives of the major incomplete vehicle manufacturers to encourage them to respond voluntarily by strengthening their windshield structures and reducing the restrictions that they currently impose upon final-stage manufacturers. The agency also discussed the possibility of its mandating these actions by upgrading Standards Nos. 212 and 219. Ford and General Motors indicated that the making of any major changes in these standards could lead to their deciding to discontinue offering chassis for use in the manufacturing of multi-stage vehicles. They said that such chassis were a very small percentage of their light truck sales and that, therefore, they would not consider it worth the cost to them to make any extensive modifications in their vehicles. NHTSA also asked the incomplete vehicle manufacturers to be sure that they have properly certified their existing vehicles and that they are not imposing unnecessarily restrictive limitations upon final-stage manufacturers. To this agency's knowledge, these vehicle manufacturers have neither undertaken any strengthening of their vehicles' windshield structures nor lessened any of their restrictions.

At the same time that the agency was made aware of the final-stage manufacturers' problems of certifying to these standards, the agency was becoming concerned about the possibility that compliance of some light trucks and vans with these standards might have made the vehicles more aggressive with respect to smaller passenger cars that they might impact. According to agency information, if these standards require a substantial strengthening of vehicle frames, the aggressivity of the vehicles is increased. Therefore, as a result of the agency's concern about aggressivity and its desire to address the certification problems of final-stage manufacturers in a manner that would not lead to a cessation of a chassis sales to those manufacturers, the agency issued the August 1979 proposal. The agency hoped that the proposal would allow and encourage incomplete vehicle manufacturers to reduce their weight and center of gravity restrictions, thereby easing or eliminating the compliance test burdens of final-stage manufacturers. The agency believed that this could occur using either option, because either would result in vehicles being tested at lower weights. Currently vehicles are tested under both standards at their unloaded vehicle weights plus 300 pounds.

The first option would have required some vehicles whose unloaded vehicle weights exceeded 4,000 pounds to be tested by being impacted with a 4,000 pound moving barrier. The second option proposed by the agency would have required vehicles to be tested at their unloaded vehicle weight up to a maximum unloaded vehicle weight of 5,500 pounds. This option was suggested to the agency by several manufacturers and manufacturer representatives.

Comments on Notice

In response to the agency's notice, nine manufacturers and manufacturer representatives submitted comments. All of the commenters supported some action in response to the problems of final-stage manufacturers. Most of the commenters also suggested that the agency's second alternative solution was more likely to achieve reductions in the restrictions being imposed by incomplete vehicle manufacturers. The first option would have created a new, unproven test procedure, and manufacturers would have been cautious in easing center of gravity or weight restrictions based upon this test procedure. Accordingly, most commenters were not sure that the first option would achieve the desired results. The consensus was, therefore, that the second option should be adopted.

Some manufacturers recommended that both options be permitted allowing the manufacturer to decide how to test its vehicles. The agency does not agree with this recommendation. Not only would it be more difficult and expensive to enforce a standard that has alternative test procedures, but most manufacturers prefer the 5,500 pound weight limit option. The NHTSA concludes that as a result of the comments supporting the 5,500 pound maximum test weight, that this is an acceptable procedure for testing compliance with these two standards. Therefore, the standards are amended to incorporate this procedure.

The major incomplete vehicle manufacturers commenting on the notice suggested that testing vehicles at a maximum weight of 5,500 pounds might provide some immediate relief. None of the major incomplete vehicle manufacturers provided any information concerning how substantial that relief might be. Ford indicated that any relief might be limited.

The agency believes that the incomplete vehicle manufacturers must accept the responsibility for establishing reasonable restrictions upon their incomplete vehicles. The NHTSA has not been provided with sufficient evidence substantiating the statements of the incomplete vehicle manufacturers that their existing restrictions are reasonable. In fact, some evidence indicates that unnecessarily stringent restrictions are being imposed because incomplete vehicle manufacturers do not want to conduct the necessary testing to establish the appropriate weight and center of gravity restrictions. Since this amendment should reduce the severity of the test procedures, the agency concludes that incomplete vehicle manufacturers should immediately review their certification test procedures and reduce the restrictions being passed on to final-stage manufacturers.

Due to changes in the light truck market, there is reason to believe that the incomplete vehicle manufacturers will be more cooperative than when the agency spoke to them before beginning this rulemaking. At that time, light truck sales were still running well. Now that these sales are down, these manufacturers may be more solicitous of the needs of the final-stage manufacturers. If relief is not provided by the incomplete vehicle manufacturers, then the agency will consider taking additional steps, including the upgrading of Standards Nos. 212 and 219 as they apply to all light trucks.

General Motors (GM) questioned one of the agency's rationales for issuing the notice of proposed rulemaking. GM stated that the agency concludes that this action will provide a more appropriate level of safety for the affected vehicles while the initial extension of these standards to the affected vehicles provides, in GM's view, only a slight increase in the level of safety of the vehicles. GM indicates that since the application of these standards to the affected vehicles provides only slight benefits and since this amendment will reduce those benefits, the standards should not apply to light trucks and vans. The agency disagrees with this suggestion.

The agency is currently reviewing the applicability of many of its safety standards to determine whether they ought to be extended to light trucks and other vehicles. Accident data clearly indicate the benefits that have resulted from the implementation of safety standards to cars. The fatality rate for passenger cars has decreased substantially since the implementation of a broad range of safety standards to those vehicles. On the other hand, light trucks and vans have not had a corresponding reduction in fatality rates over the years. The agency attributes much of this to the fact that many safety standards have not been applied to those vehicles. Since those vehicles are becoming increasingly popular as passenger vehicles, the agency concludes that safety standards must apply to them.

In response to GM's comment that this reduction in the test requirements for Standard Nos. 212 and 219 will remove all benefits derived by having the standards apply to those vehicles, the agency concludes that GM has misinterpreted the effects of this amendment. This amendment will reduce somewhat the compliance test requirements for those light trucks and vans with unloaded vehicle weights in excess of 5,500 pounds. It will not affect light trucks with unloaded vehicle weights below 5,500 pounds. According to agency information, approximately 25 percent of the light trucks have unloaded vehicle weights in excess of 5,500 while the remainder fall below that weight. As a result of weight reduction to improve fuel economy, it is likely that even more light trucks will fall below the 5,500 pound maximum test weight in the future. Therefore, this amendment will have no impact upon most light trucks and vans. In light of the small proportion of light trucks and vans affected by this amendment and considering the potential benefits of applying these standards to all light trucks and vans, the agency declines to adopt GM's suggestion that the standards be made inapplicable to these vehicles.

With respect to GM's question about the appropriate level of safety for light trucks, the agency's statement in the notice of proposed rulemaking was intended to show that the safety of light trucks and vans cannot be viewed without considering the relative safety of lighter vehicles that they may impact. Accordingly, the level of safety that the agency seeks to achieve by this and other safety standards is determined by balancing the interests of the occupants of passenger cars and heavier vehicles.

GM also questioned the agency's statement that vehicle aggressivity may be increased by imposing too severe requirements on these vehicles. GM suggested that no evidence exists that vehicle aggressivity is increased as a result of complying with these standards.

The agency stated in the proposal that it was concerned that compliance with the standards as they now exist might have increased the aggressivity of the vehicles, thereby harming the occupants of passenger cars that are impacted by these larger, more rigid vehicles. The agency is now beginning to examine the full range of vehicle aggressivity problems. The docket for this notice contains a paper recently presented by a member of our staff to the Society of Automotive Engineers on this subject. The agency tentatively concludes, based upon the initial results of our research and analysis, that vehicle aggressivity could be a safety problem and that the agency considers that possibility in issuing its safety standards. The NHTSA notes that Volkswagen applauds the agency's recognition of the vehicle aggressivity factor in safety.

As to GM's argument that compliance with the standards may not have increased vehicle aggressivity, our information on this point came from the manufacturers. The manufacturers indicated that compliance with Standards 212 and 219 requires strengthening the vehicle frame. This makes a vehicle more rigid. Our analysis indicates that making a vehicle more rigid may also make it more aggressive. Therefore, the agency concludes partially on the basis of the manufacturer's information, that compliance with the safety standards as they are written may have increased the aggressivity of the vehicles.

Ford Motor Company suggested that, rather than change these two particular standards, the agency should amend the certification regulation (Part 568) to state that any vehicle that is barrier tested would be required only to comply to an unloaded vehicle weight of 5,500 pounds or less. Ford suggested that this would standardize all of the tests and provide uniformity.

The agency is unable to accept Ford's recommendation for several reasons. First, the certification regulation is an inappropriate place to put a test requirement applicable to several standards. The tests' requirements of the standards should be found in each standard. Second, the Ford recommendation would result in a reduction of the level of safety currently imposed by Standard No. 301, *Fuel System Integrity.*

As we stated earlier and in several other notices, the agency is legislatively forbidden to modify Standard No. 301 in a way that would reduce the level of safety now required by that standard. Even without this legislative mandate, the agency would not be likely to relieve the burdens imposed by Standard No. 301. That standard is extremely important for the prevention of fires during crashes. Compliance of a vehicle with this standard not only protects the occupants of the vehicle that is in compliance but also protects the occupants of vehicles that it impacts. The agency concludes that the standard now provides a satisfactory level of safety in vehicles, and NHTSA would not be likely to amend it to reduce these safety benefits even if such an amendment were possible.

With respect to fuel system integrity, several manufacturers suggested that the agency had underestimated the impact of that standard upon weight and center of gravity restrictions. These commenters indicated that compliance with that standard requires more than merely adding shielding to the fuel systems of the vehicles. The agency is aware that compliance with that standard in certain instances has imposed restrictions upon manufacturers. Nonetheless, the agency continues to believe that as a result of this amendment, the chassis manufacturers will be able to reduce their weight and center of gravity restrictions while still maintaining the compliance of their vehicles with Standard No. 301.

Chrysler commented that the agency should consider including the new test procedure in Standard No. 204 and all other standards that require barrier testing. The agency has issued a notice on Standard No. 204 (44 FR 68470) stating that it was considering a similar test provision for that standard. The agency also is aware that any barrier test requirement imposed upon vehicles subject to substantial modifications by final-stage manufacturers will create problems for the final-stage manufacturers. Accordingly, the agency will consider the special problems of these manufacturers prior to the the issuance of standards that might affect them and will attempt to make the test requirements of the various standards consistent wherever possible.

The agency has reviewed this amendment in accordance with Executive Order 12044 and concludes that it will have no significant economic or other impact. Since the regulation relieves some testing requirements, it may slightly reduce costs associated with some vehicles. Accordingly, the agency concludes that this is not a significant amendment and a regulatory analysis is not required.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations Part 571 is amended by adding the following sentence to the end of paragraph S6.1(b) of Standard No. 212 (49 CFR 571.212) and paragraph S7.7(b) of Standard No. 219 (49 CFR 571.219).

Vehicles are tested to a maximum unloaded vehicle weight of 5,500 pounds.

The authors of this notice are William Smith of the Crashworthiness Division and Roger Tilton of the Office of Chief Counsel.

Issued on March 28, 1980.

Joan Claybrook
Administrator

45 F.R. 22044
April 3, 1980

MOTOR VEHICLE SAFETY STANDARD NO. 219

Windshield Zone Intrusion

S1. Scope. This standard specifies limits for the displacement into the windshield area of motor vehicle components during a crash.

S2. Purpose. The purpose of this standard is to reduce crash injuries and fatalities that result from occupants contacting vehicle components displaced near or through the windshield.

S3. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses of 10,000 pounds or less gross vehicle weight rating. However, it does not apply to forward control vehicles, walk-in van-type vehicles, or to open body-type vehicles with fold-down or removable windshields.

S4. Definitions.

"Daylight Opening" (DLO) means the maximum unobstructed opening through the glazing surface, including reveal or garnish moldings adjoining the surface, as measured parallel to the outer surface of the glazing material.

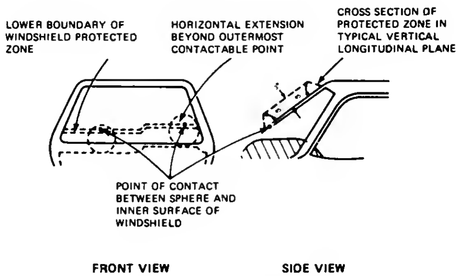
"Windshield opening" means the outer surface of the windshield glazing material.

S5. Requirement. When the vehicle traveling longitudinally forward at any speed up to and including 30 mph impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, under the conditions of S7, no part of the vehicle outside the occupant compartment, except windshield molding and other components designed to be normally in contact with the windshield, shall penetrate the protected zone template, affixed according to S6, to a depth of more than one-quarter inch, and no such part of a vehicle shall penetrate the inner surface of that portion of the windshield, within the DLO, below the protected zone defined in S6.

S6. Protected zone template.

S6.1 The lower edge of the protected zone is determined by the following procedure (see Figure 1).

(a) Place a 6.5-inch diameter rigid sphere, weighing 15 pounds, in a position such that it simultaneously contacts the inner surface of the windshield glazing and the surface of the instrument panel, including padding. If any accessories or equipment such as the steering control system obstruct positioning of the sphere, remove them for the purposes of this procedure.



WINDSHIELD PROTECTED ZONE
Figure 1

(b) Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend the locus line horizontally to the edges of the glazing material.

(c) Draw a line on the inner surface of the windshield below and one-half inch distant from the locus line.

(d) The lower edge of the protected zone is the longitudinal projection onto the outer surface of the windshield of the line determined in S6.1(c).

S6.2 The protected zone is the space enclosed by the following surfaces, as shown in Figure 1:

(a) The outer surface of the windshield in its precrash configuration.

(b) The locus of points 3 inches outward along perpendiculars drawn to each point on the outer surface of the windshield.

(c) The locus of lines forming a 45° angle with the outer surface of the windshield at each point along the top and side edges of the outer surface of the windshield and the lower edge of the protected zone determined in S6.1, in the plane perpendicular to the edge at that point.

S6.3 A template is cut or formed from Styrofoam, type DB, cut cell, to the dimensions of the zone as determined in S6.2. The template is affixed to the windshield so that it delineates the protected zone and remains affixed throughout the crash test.

S7. Test conditions. The requirement of S5 shall be met under the following conditions:

S7.1 The protected zone template is affixed to the windshield in the manner described in S6.

S7.2 The hood, hood latches, and any other hood retention components are engaged prior to the barrier crash.

S7.3 Adjustable cowl tops or other adjustable panels in front of the windshield are in the position used under normal operating conditions when windshield wiping systems are not in use.

S7.4 The parking brake is disengaged and the transmission is in neutral.

S7.5 Tires are inflated to the vehicle manufacturer's specifications.

S7.6 The fuel tank is filled to any level from 90 to 95 percent of capacity.

S7.7 The vehicle, including test devices and instrumentation, is loaded as follows:

(a) Except as specified in S7.6, a passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position.

(b) Except as specified in S7.6, a multipurpose passenger vehicle, truck or bus is loaded to its unloaded vehicle weight, plus 300 pounds or its rated cargo and luggage capacity, whichever is less, secured to the vehicle, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position. The load is distributed so that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR. If the weight on any axle when the vehicle is loaded to its unloaded vehicle weight plus dummy weight exceeds the axle's proportional share of the test weight, the remaining weight is placed so that the weight on that axle remains the same. For the purposes of this section, unloaded vehicle weight does not include the weight of work-performing accessories.

40 F.R. 25462
June 16, 1975

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 220

School Bus Rollover Protection

(Docket No. 75-2; Notice 2)

This notice establishes a new motor vehicle safety Standard No. 220, *School Bus Rollover Protection*, 49 CFR 571.220, specifying performance requirements for the structural integrity of the passenger compartment of school buses when subjected to forces that can be encountered in rollovers.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) mandate the issuance of Federal motor vehicle safety standards for several aspects of school bus performance, including crashworthiness of the vehicle body and frame. Pub. L. 93-942, section 202 (15 U.S.C. 1392(i)(1)(A)). Based on this mandate and on bus body crashworthiness research (DOT-HS-046-3-694), the NHTSA proposed rollover protection requirements for school buses (40 F.R. 8570, February 28, 1975). Citing statistics on the safety record of school bus operation, several manufacturers questioned whether any standard for school bus rollover protection could be justified.

The Act reflects a need, evidenced in correspondence to the NHTSA from the public, to protect the children who ride in school buses. They and their parents have little direct control over the types of vehicles in which they ride to school, and are not in a position to determine the safety of the vehicles. It is for this reason that the school bus standards must be effective and meaningful.

At the same time, the safety history of school buses does not demonstrate that radical modification of school bus structure would substantially decrease occupant death and injury. As noted in the "School Bus Safety Improvement Program" contract conducted by Ultrasystems, Inc., (DOT-HS-046-3-694) for the NHTSA:

"School buses are a relatively safe mode of human transportation. School bus accident rates and injury/fatality rates on a per-vehicle, per-vehicle-mile, per-passenger-mile, or per-passenger basis are significantly less than for other passenger vehicles. Accidents to school children while enroute to and from school occur primarily in modes other than as school bus passengers. However, school bus safety can and should be improved."

As a practical matter, the amount of structural modification called for in this standard is also limited as a result of the 9-month lead time available to implement the provisions of each school bus standard after its promulgation. The various new requirements imposed in response to the mandate of the Act will require considerable effort by school bus manufacturers to bring their products into conformity in the 9-month period.

The Physicians for Automotive Safety, The National Transportation Safety Board, the Home Insurance Company and other commenters suggested that the NHTSA had ignored the recommendations of the report submitted by Ultrasystems on school bus improvement. The report concluded that the improved school bus design tested by Ultrasystems could withstand a significantly greater load for the same amount of roof crush than existing school bus designs.

In fact, the NHTSA evaluated the test results and Ultrasystem's recommendations carefully. While the percentage of reduction of roof crush would be substantial as a result of the recommended design change, no relationship of this decrease in deflection to improved safety for occupants was established. Ultrasystems reported that increases of $500 in cost and 530 pounds were incurred to achieve several improvements, including those of the vertical roof crush test.

The recommendations also implied increased structural rigidity but did not evaluate its effect on the amount of energy absorbed by vehicle occupants in a crash. Also, Ultrasystems, did not consider the problems of lead time and retooling costs in making its recommendations. The NHTSA continues to consider that its proposal of $5\frac{1}{8}$ inches of maximum roof crush under a load equal to $1\frac{1}{2}$ times the vehicle's unloaded weight provides a satisfactory level of occupant crash protection. Available data do not support the conclusion that a 2- or 3-inch reduction of this crush would significantly improve the level of passenger safety in school buses. It is the intention of the NHTSA to continually review accident statistics relating to school bus safety. Accordingly, future upgrading of the standard will be considered should such action be warranted based upon availability of appropriate data.

In response to inquiries from the Motor Vehicle Manufacturers Association and General Motors as to the origin of the $5\frac{1}{8}$-inch requirement, the limit is drawn from the existing School Bus Manufacturers Institute requirement for school bus structural integrity (Static Load Test Code for School Bus Body Structure, issued by the School Bus Manufacturers Institute).

In adopting the $5\frac{1}{8}$-inch limit found in the present industry standard, the NHTSA is not merely preserving the status quo. While a manufacturer may have designed its products to meet the industry standard in the past, certain of its products presumably performed either better or worse than the nominal design. Conformity to NHTSA standards, in contrast, requires that every vehicle be capable of meeting the $5\frac{1}{8}$-inch limit. This means that the manufacturer must design its vehicles to meet a higher level of performance, to provide a compliance margin for those of its products which fall below the nominal design level. Of course, the manufacturer can reduce the compliance-margin problem without redesign by improving the consistency of its manufacturing processes.

The standard requires that, upon the application of vertical downward force to the bus roof equal to $1\frac{1}{2}$ times the vehicle's unloaded weight, the vehicle roof shall not crush more than $5\frac{1}{8}$ inches, and the emergency exits shall be capable of being opened, with the weight applied, and after its release. The National Transportation Safety Board, the Vehicle Equipment Safety Commission (VESC), Mercedes-Benz, and the Action for Child Transportation Safety organization suggested other methods for evaluation of crashworthiness. The NHTSA has considered these, but concludes that the static test specified in this standard provides a reasonable means to determine crashworthiness without unnecessary testing expense.

Based on submitted comments, the standard varies in some respects from the proposal. The sizes of the force application plates used to apply force and the method of application have been revised to simplify the test procedures and equipment, and to spread the force over larger areas of the vehicle roofs of large and small vehicles. The proposal specified a rigid, rectangular force application plate 36 inches wide and 20 inches shorter than the vehicle roof, preventing reliance on the roof end structures for rollover protection in typical body-on-chassis construction. Commenters pointed out that the end structures of the roof are almost certain to bear the weight of a rollover and should be included in a test of a vehicle's crashworthiness. Several manufacturers and other commenters recommended an increase in the size of the force application plate, in order to permit the foremost and rearmost roof "bows" of their buses to absorb a portion of the test load. Ford Motor Company stated it had performed the test as proposed and asserted that the roof of its van-type vehicle, as presently designed could not meet the requirement without an increase in the size of the force application plate to distribute the load over the entire vehicle roof. Chrysler Corporation stated it would find it necessary to discontinue production of small school buses because of redesign costs if the requirements were adopted as proposed.

With a view to the safety record of school buses and the 9-month lead time, the NHTSA concludes that the force application plate can be modified so that an additional "bow" or "bows" bear part of the applied force. It is the NHTSA's view that a change to permit both roof end structures to fully contribute to support of the applied force in the case of buses of more than 10,000 pounds would be a relaxation of current industry practices. Accordingly, the extent of change recommended by the industry is not adopted. The NHTSA concludes that an 8-inch increase in the length of the force application plate is sufficient to allow some portion of the applied force to be absorbed by the end bows of the roof while maintaining adequate crash protection. Therefore, for these buses the width of the plate remains as proposed while the length of the plate is increased 8 inches.

In the case of lighter buses, which are generally of the van type, the NHTSA has increased both the width and length of the plate to encompass the entire roof.

The procedure for applying force through the plate has also been modified in some respects. Many comments objected that the procedure required an expensive, complex hydraulic mechanism that would increase the costs of compliance without justification. The proposal specified an "evenly-distributed vertical force in a downward direction through the force application plate", starting with the plate horizontal. Commenters interpreted these specifications to mean that the vehicle would be required to absorb the energy in evenly-distributed fashion and that the horizontal attitude of the plate must be maintained.

Actually these specifications were included in the proposed method to advise manufacturers of the precise procedures to be employed in compliance testing of their products. Understanding that some manufacturers may choose to achieve the required force application by applying weights evenly over the surface of the plate, the standard specified an "evenly-distributed force" to eliminate other methods (such as a concentrated force at one end of the plate) that could unfairly test the vehicle structure. The horizontal attitude of the plate was also intended to establish a beginning point for testing on which a manufacturer can rely. While these specifications establish the exact circumstances under which vehicles can be tested, a manufacturer can depart from them as long as it can be shown that the vehicle would comply if tested exactly as specified. In place of the perfectly rigid plate called for in the standard, for example, a manufacturer could employ a plate of sufficient stiffness to ensure that the test results are not affected by the lack of rigidity.

Some modification of the test procedures has been made for simplification and clarity. To permit placement of the plate on the roof to begin testing without a suspension mechanism. the specification for horizontal attitude is modified to permit the plate to depart from the horizontal in the fore and aft direction only. Some manufacturers considered the initial application of force as an unnecessary complication. However, the initial force application of 500 pounds has been retained in order to permit elimination of inconsequential deformation of the roof structure prior to measurement of the permissible 5⅛ inches of deflection. In instances where the force application plate weighs more than 500 pounds, some type of suspension mechanism could be used temporarily to constrain the load level to the initial value, if the manufacturer decides to conduct his testing exactly as specified in the standard's procedures.

The requirement that force be applied "through the plate" has been changed to "to the plate" in order to avoid a misunderstanding that the vehicle must absorb energy evenly over the surface of its roof.

As proposed by several commenters, the rate of application in pounds per minute has been changed to inches per second, specifically "at any rate not more than ½ inch per second." Manufacturers should understand that "any" in this context is defined by the NHTSA (49 CFR § 571.4) to mean that the vehicle roof must satisfy the requirement at every rate of application within the stated range. General Motors reports that as a practical matter, the effect of speed in rate of application for tests of this nature is not significant in the range of 0.12 inches per second to 1 inch per second.

The requirement that movement "at any point" on the plate not exceed 5⅛ inches has not been modified despite some objections. The NHTSA considers it reasonable that excessive crush not be permitted at the extremities of the plate. Measurement of movement only at the center of the plate, for example, would permit total collapse of the structure in any direction as long as one point on the bus maintained its integrity.

The preparation of the vehicle for the application of force has been modified to specify replacement of non-rigid body mounts with equivalent rigid mounts. The compression of deformable body mounts is unrelated to crashworthiness of the structure and can therefore be eliminated to permit testing of the structure itself.

Accessories or components which extend upward from the vehicle's roof (such as school bus lights) are removed for test purposes. It is also noted that the vehicle's transverse frame members or body sills are supported for test purposes. In response to a question from Blue Bird Body Company, a frame simulator may be used along with any other variations as long as the manufacturer assures himself that the vehicle would conform if tested precisely as specified in the standard.

The vehicle's emergency exits must also be capable of opening when the required force is applied, and following release of the force. As noted in comments, this requirement simulates the use of the exits after a rollover, whether or not the vehicle comes to rest on its roof. The proposed requirement of ability to close these exits is eliminated because such a capability is unnecessary in an emergency evacuation of the bus. For this reason, the requirement has been modified so that a particular test specimen (*i.e.*, a particular bus) will not be required to meet requirements for emergency exits which open following release of force, if the exits have already been tested while the application force is maintained.

With regard to the requirements as a whole, Crown Coach and other manufacturers argued that the application of 1½ times the vehicle's unloaded weight unfairly discriminates against buses with a higher vehicle weight-to-passenger ratio. The NHTSA disagrees, and notes that the relevant consideration in rollover is the weight of the vehicle itself in determining the energy to be absorbed by the structure. In a related area, one manufacturer suggested that the increased weight of the NHTSA's contemplated new standards for school buses would increase unloaded vehicle weight to the point where redesign would be required to meet the rollover standard. The NHTSA has considered this issue and estimates that the only significant new weight would be for improved seating. This weight increase would not substantially increase the severity of the rollover standard.

The State of California suggested consolidation of the rollover standard with the joint strength. While such a consolidation would appear logical for school buses alone, the NHTSA prefers the flexibility of separate standards with a view to their use independently in the future for other vehicle types. For example, the application of vertical force to the vehicle structure may be appropriate in a vehicle for which the joint strength requirement would not be appropriate.

The State of Georgia requested that transit systems transporting school children be exempted from Standard No. 220. This commenter apparently misunderstood the applicability of the standard. It only applies to newly-manufactured vehicles and does not require modification of existing fleets, whether or not operated by a transit authority.

Interested persons should note that the NHTSA has issued a proposal to modify the definition of "school bus" (40 F.R. 40854, September 1, 1975) and that if that definition is adopted the requirements of this standard will apply to all vehicles that fall within the definition, whether or not they fall within the present definition.

In consideration of the foregoing, a new motor vehicle safety standard No. 220, *School Bus Rollover Protection*, is added as § 571.220 of Part 571 of Title 49, Code of Federal Regulations. . . .

Effective date: October 26, 1976.

The effective date of this standard is established as 9 months after the date of its issuance, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492, section 202 (15 U.S.C. 1397(i)(1)(A)).

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); § 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.51)

Issued on January 22, 1976.

Howard J. Dugoff
Acting Administrator
41 F.R. 3874
January 27, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 220

School Bus Rollover Protection

(Docket No. 73–3; Notice 7)
(Docket No. 73–20; Notice 10)
(Docket No. 73–34; Notice 4)
(Docket No. 75–2; Notice 3)
(Docket No. 75–3; Notice 5)
(Docket No. 75–7; Notice 3)
(Docket No. 75–24; Notice 3)

This notice announces that the effective dates of the redefinition of "school bus" and of six Federal motor vehicle safety standards as they apply to school buses are changed to April 1, 1977, from the previously established effective dates. This notice also makes a minor amendment to Standard No. 220, *School Bus Rollover Protection*, and adds a figure to Standard No. 221, *School Bus Body Joint Strength*.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) mandated the issuance of Federal motor vehicle safety standards for several aspects of school bus performance, Pub. L. 93–492, § 202 (15 U.S.C. § 1392 (i)(1)(A)). These amendments included a definition of school bus that necessitated a revision of the existing definition used by the NHTSA in establishing safety requirements. The Act also specified that the new requirements "apply to each school bus and item of school bus equipment which is manufactured . . . on or after the expiration of the 9-month period which begins on the date of promulgation of such safety standards." (15 U.S.C. § 1392(i)(1)(B)).

Pursuant to the Act, amendments were made to the following standards: Standard No. 301–75, *Fuel System Integrity* (49 CFR 571.301–75), effective July 15, 1976, for school buses not already covered by the standard (40 FR 483521, October 15, 1975); Standard No. 105–75, *Hydraulic Brake Systems* (49 CFR 571.105–75), effective October 12, 1976 (41 FR 2391, January 16, 1976); and Standard No. 217, *Bus Window Retention and Release* (49 CFR 571.217), effective for school buses on October 26, 1976 (41 FR 3871, January 27, 1976).

In addition, the following new standards were added to Part 571 of Title 49 of the Code of Federal Regulations, effective October 26, 1976: Standard No. 220, *School Bus Rollover Protection* (41 F.R. 3874, January 27, 1976); Standard No. 221, *School Bus Body Joint Strength* (41 F.R. 3872, January 26, 1976); and Standard No. 222, *School Bus Passenger Seating and Crash Protection* (41 F.R. 4016, January 28, 1976). Also, the existing definition of "school bus" was amended, effective October 27, 1976, in line with the date set by the Act for issuance of the standards.

The Act was recently amended by Public Law 94–346 (July 8, 1976) to change the effective dates of the school bus standards to April 1, 1977 (15 U.S.C. § 1392(i)(1)(B)). This notice is intended to advise interested persons of these changes of effective dates. In the case of Standard No. 301–75, the change of effective date is reflected in a conforming amendment to S5.4 of that standard. A similar amendment is made in S3 of Standard No. 105–75.

The agency concludes that the October 27, 1976, effective date for the redefinition of "school bus" should be postponed to April 1, 1977, to conform to the new effective dates for the upcoming requirements. If this were not done, the new classes of school buses would be required to meet existing standards that apply to school buses (e.g., Standard No. 108 (49 CFR 571.108)) before being required to meet the new standards. This would result in two stages of compliance, and would complicate the redesign efforts that Congress sought to relieve.

This notice also amends Standard No. 220 in response to an interpretation request by Blue Bird Body Company, and Sheller-Globe Corporation's petition for reconsideration of the standard. Both companies request confirmation that the standard's requirement to operate emergency exits during the application of force to the vehicle roof (S4(b)) does not apply to roof exits which are covered by the force application plate. The agency did not intend to require the operation of roof exits while the force application plate is in place on the vehicle. Accordingly, an appropriate amendment has been made to S4(b) of the standard.

With regard to Standard No. 220, Sheller-Globe also requested confirmation that, in testing its school buses that have a gross vehicle weight rating (GVWR) of 10,000 pounds or less, it may test with a force application plate with dimensions other than those specified in the standard. The standard does not prohibit a manufacturer from using a different dimension from that specified, in view of the NHTSA's expressed position on the legal effect of its regulations. To certify compliance, a manufacturer is free to choose any means, in the exercise of due care, to show that a vehicle (or item of motor vehicle equipment) would comply if tested by the NHTSA as specified in the standard. Thus the force application plate used by the NHTSA need not be duplicated by each manufacturer or compliance test facility. Sheller-Globe, or example, is free to use a force application plate of any width as long as it can certify its vehicle would comply if tested by the NHTSA according to the standard.

In a separate area, the agency corrects the inadvertent omission of an illustration from Standard No. 221 as it was issued January 26, 1976 (41 F.R. 3872). The figure does not differ from that proposed and, in that form, it received no adverse comment.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 F.R. 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The changes in effective dates for the school bus standards are not evaluated because they were accomplished by law and not by regulatory action.

The change of effective date for the redefinition of "school bus" will result in savings to manufacturers who will not be required to meet existing school bus standards between October 27, 1976, and April 1, 1977. The agency calculates that the only standard that would not be met would be the requirement in Standard No. 108 for school bus marker lamps. In view of the agency's existing provision for the marking of light school buses in Pupil Transportation Standard No. 17 (23 CFR 1204), it is concluded that the absence of this equipment until April 1, 1977, will not have a significant adverse impact on safety.

The interpretative amendment of Standard No. 220 and the addition of a figure to Standard No. 221 are not expected to affect the manufacture or operation of school buses.

In consideration of the foregoing, Part 571 of Title 49 of the Code of Federal Regulations is amended. . . .

Effective dates:

1. Because the listed amendments do not impose additional requirements of any person, the National Highway Traffic Safety Administration finds that an immediate effective date of August 26, 1976 is in the public interest.

2. The effective date of the redefinition of "school bus" in 49 CFR Part 571.3 that was published in the issue of December 31, 1976 (40 F.R. 60033) is changed to April 1, 1977.

3. The effective dates of Standard Nos. 105-75, 217, 301-75, 220, 221, and 222 (as they apply to school buses) are April 1, 1977, in accordance with Public Law 94-346.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Pub. L. 94–346, Stat. (15 U.S.C. § 1392(i)(1)(B)); delegation of authority at 49 CFR 1.50.)

Issued on August 17, 1976.

John W. Snow
Administrator

41 F.R. 36027
August 26, 1976

MOTOR VEHICLE SAFETY STANDARD NO. 220

School Bus Rollover Protection

S1. Scope. This standard establishes performance requirements for school bus rollover protection.

S2. Purpose. The purpose of this standard is to reduce the number of deaths and the severity of injuries that result from failure of the school bus body structure to withstand forces encountered in rollover crashes.

S3. Applicability. This standard applies to school buses.

S4. Requirements. When a force equal to 1½ times the unloaded vehicle weight is applied to the roof of the vehicle's body structure through a force application plate as specified in S5., Test procedures—

(a) The downward vertical movement at any point on the application plate shall not exceed 5⅛ inches; and

(b) Each emergency exit of the vehicle provided in accordance with Standard No. 217 (§ 571.217) shall be capable of opening as specified in that standard during the full application of the force and after release of the force, except that an emergency exit located in the roof of the vehicle is not required to be capable of being opened during the application of the force. A particular vehicle (*i.e.*, test specimen) need not meet the emergency opening requirement after release of force if it is subjected to the emergency exit opening requirements during the full application of the force.

S5. Test procedures. Each vehicle shall be capable of meeting the requirements of S4. when tested in accordance with the procedures set forth below.

S5.1 With any non-rigid chassis-to-body mounts replaced with equivalent rigid mounts, place the vehicle on a rigid horizontal surface so that the vehicle is entirely supported by means of the vehicle frame. If the vehicle is constructed without a frame, place the vehicle on its body sills. Remove any components which extend upward from the vehicle roof.

S5.2 Use a flat, rigid, rectangular force application plate that is measured with respect to the vehicle roof longitudinal and lateral centerlines;

(a) In the case of a vehicle with a GVWR of more than 10,000 pounds, 12 inches shorter than the vehicle roof and 36 inches wide; and

(b) In the case of a vehicle with a GVWR of 10,000 pounds or less, 5 inches longer and 5 inches wider than the vehicle roof. For purposes of these measurements, the vehicle roof is that structure, seen in the top projected view, that coincides with the passenger and driver compartment of the vehicle.

S5.3 Position the force application plate on the vehicle roof so that its rigid surface is perpendicular to a vertical longitudinal plane and it contacts the roof at not less than two points, and so that, in the top projected view, its longitudinal centerline coincides with the longitudinal centerline of the vehicle, and its front and rear edges are an equal distance inside the front and rear edges of the vehicle roof at the centerline.

S5.4 Apply an evenly-distributed vertical force in the downward direction to the force application plate at any rate not more than 0.5 inch per second, until a force of 500 pounds has been applied.

S5.5 Apply additional vertical force in the downward direction to the force application plate at a rate of not more than 0.5 inch per second until the force specified in S4 has been applied, and maintain this application of force.

S5.6 Measure the downward movement of any point on the force application plate which occurred during the application of force in accordance with S5.5.

S5.7 To test the capability of the vehicle's emergency exits to open in accordance with S4(b)—

(a) In the case of testing under the full application of force, open the emergency exits as specified in S4(b) while maintaining the force applied in accordance with S5.4 and S5.5; and

(b) In the case of testing after the release of all force, release all downward force applied to the force application plate and open the emergency exits as specified in S4(b).

S6. Test conditions. The following conditions apply to the requirements specified in S4.

S6.1 Temperature. The ambient temperature is any level between 32° F. and 90° F.

S6.2 Windows and doors. Vehicle windows, doors, and emergency exits are in fully-closed position, and latched but not locked.

41 F.R. 3874
January 27, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 221

School Bus Body Joint Strength

(Docket No. 73–34; Notice 3)

This notice establishes a new motor vehicle safety standard, No. 221; *School Bus Body Joint Strength*, 49 CFR 571.221, specifying a minimum performance level for school bus body panel joints.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (Pub. L. 93–492, 88 Stat. 1470, herein, the Act) require the issuance of minimum requirements for school bus body and frame crashworthiness. This rulemaking is pursuant to authority vested in the Secretary of Transportation by the Act and delegated to the Administrator of the NHTSA, and is preceded by notices of proposed rulemaking issued January 29, 1974 (39 F.R. 2490) and March 13, 1975 (40 F.R. 11738).

One of the significant injury-producing characteristics of school bus accidents, exposure to sharp metal edges, occurs when body panels become separated from the structural components to which they have been fastened. In an accident severe lacerations may result if the occupants of the bus are tossed against these edges. Moreover, if panel separation is great the component may be ejected from the vehicle, greatly increasing the possibility of serious injury.

This standard is intended to lessen the likelihood of these modes of injury by requiring that body joints on school buses have a tensile strength equal to 60 percent of the tensile strength of the weakest joined body panel, as suggested by the Vehicle Equipment Safety Commission (VESC). The NHTSA has determined that this is an appropriate level of performance for body joints and that its application to school buses is both reasonable and practicable. Furthermore, the NHTSA believes that adoption of this standard will provide an effective and meaningful solution to the body panel problem.

It is anticipated that this rule will burden manufacturers only to the extent of requiring the installation of more rivets than are currently used. The NHTSA has reviewed the economic and environmental impact of this proposal and determined that neither will be significant.

In their response to the two NHTSA proposals on this subject, several of the commenters suggested that the standard could be met by reducing the strength of the panel rather than increasing the strength of the joint, and that a minimum joint strength should be required. For several reasons the NHTSA does not believe that a minimum absolute joint strength is desirable at this time. While this standard will tend to increase the overall strength of buses, it is not designed to set minimum body panel strength requirements. Its purpose is to prevent panels from separating at the joint in the event of an accident. In order to deal with the problem of laceration, this regulation must be applicable to both exterior and interior joints. An absolute minimum joint strength requirement would be constrained by the level of performance appropriate for the relatively thin interior panels. Thus, the overall level of performance could not be defined in a meaningful fashion without severely and unnecessarily limiting the manufacturer's flexibility in designing his product. The NHTSA School Bus Rollover Protection Standard (49 CFR 571.220), which specifies requirements for the structural integrity of school bus bodies, should result in a practical lower limit on panel strength and thereby set a practical absolute minimum joint strength.

The NHTSA has no evidence that the mode of failure found in the larger traditional school buses also occurs in smaller, van-type school buses currently manufactured by automobile manufacturers for use as 11- to 17-passenger school buses. Ford Motor Company commented that the mode of injury sought to be prevented by this standard does not occur in accidents involving school buses converted from multipurpose passenger vehicles (vans). Chrysler Corporation suggested that the proposed requirement is inappropriate when applied to vans with "coach" joint construction. Based on these comments, the NHTSA has determined that until information to the contrary appears or is developed these vehicles should not be covered by the requirement. Accordingly, the application of the standard has been limited to school buses with a gross vehicle weight rating over 10,000 pounds.

Several commenters suggested that certain types of joints might not be susceptible of testing in the manner specified in this regulation. Up to this time the NHTSA has not found sufficient evidence in support of that position to justify amending the standard. If information is received indicating that different test methods are required for certain applications, appropriate action will be initiated.

In consideration of the foregoing, a new motor vehicle safety standard, No. 221, *School Bus Body Joint Strength*, is added as § 571.221 of Part 571 of Title 49, Code of Federal Regulations, as set forth below.

Effective date: October 26, 1976.

The effective date of this standard is 9 months after the date of issuance, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93–492, section 202 (15 U.S.C. 1397(i)(1)(A)).

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); § 202, Pub. L. 93–492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on January 22, 1976.

Howard J. Dugoff
Acting Administrator

41 F.R. 3872
January 27, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 221

School Bus Body Joint Strength

(Docket No. 73–3; Notice 7)
(Docket No. 73–20; Notice 10)
(Docket No. 73–34; Notice 4)
(Docket No. 75–2; Notice 3)
(Docket No. 75–3; Notice 5)
(Docket No. 75–7; Notice 3)
(Docket No. 75–24; Notice 3)

This notice announces that the effective dates of the redefinition of "school bus" and of six Federal motor vehicle safety standards as they apply to school buses are changed to April 1, 1977, from the previously established effective dates. This notice also makes a minor amendment to Standard No. 220, *School Bus Rollover Protection*, and adds a figure to Standard No. 221, *School Bus Body Joint Strength.*

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) mandated the issuance of Federal motor vehicle safety standards for several aspects of school bus performance, Pub. L. 93–492, § 202 (15 U.S.C. § 1392(i)(1)(A)). These amendments included a definition of school bus that necessitated a revision of the existing definition used by the NHTSA in establishing safety requirements. The Act also specified that the new requirements "apply to each schoolbus and item of schoolbus equipment which is manufactured . . . on or after the expiration of the 9-month period which begins on the date of promulgation of such safety standards." (15 U.S.C. § 1392(i)(1)(B)).

Pursuant to the Act, amendments were made to the following standards: Standard No. 301–75, *Fuel System Integrity* (49 CFR 571.301–75), effective July 15, 1976, for school buses not already covered by the standard, (40 F.R. 483521, October 15, 1975); Standard No. 105–75, *Hydraulic Brake Systems* (49 CFR 571.105–75), effective October 12, 1976 (41 F.R. 2391, January 16, 1976); and Standard No. 217, *Bus Window Retention and Release* (49 CFR 571.217), effective for school buses on October 26, 1976 (41 F.R. 3871, January 27, 1976).

In addition, the following new standards were added to Part 571 of Title 49 of the Code of Federal Regulations, effective October 26, 1976: Standard No. 220, *School Bus Rollover Protection* (41 F.R. 3874, January 27, 1976); Standard No. 221, *School Bus Body Joint Strength* (41 F.R. 3872, January 26, 1976); and Standard No. 222, *School Bus Passenger Seating and Crash Protection* (41 F.R. 4016, January 28, 1976). Also, the existing definition of "school bus" was amended, effective October 27, 1976, in line with the date set by the Act for issuance of the standards.

The Act was recently amended by Public Law 94–346 (July 8, 1976) to change the effective dates of the school bus standards to April 1, 1977 (15 U.S.C. § 1392(i)(1)(B)). This notice is intended to advise interested persons of these changes of effective dates. In the case of Standard No. 301–75, the change of effective date is reflected in a conforming amendment to S5.4 of that standard. A similar amendment is made in S3 of Standard No. 105–75.

The agency concludes that the October 27, 1976, effective date for the redefinition of "school bus" should be postponed to April 1, 1977, to conform to the new effective dates for the upcoming requirements. If this were not done, the new classes of school buses would be required to meet existing standards that apply to school buses (e.g., Standard No. 108 (49 CFR 571.108)) before being required to meet the new standards. This would result in two stages of compilance, and would complicate the redesign efforts that Congress sought to relieve.

This notice also amends Standard No. 220 in response to an interpretation request by Blue Bird Body Company, and Sheller-Globe Corporation's petition for reconsideration of the standard. Both companies request confirmation that the standard's requirement to operate emergency exits during the application of force to the vehicle roof (S4(b)) does not apply to roof exits which are covered by the force application plate. The agency did not intend to require the operation of roof exits while the force application plate is in place on the vehicle. Accordingly, an appropriate amendment has been made to S4(b) of the standard.

With regard to Standard No. 220, Sheller-Globe also requested confirmation that, in testing its school buses that have a gross vehicle weight rating (GVWR) of 10,000 pounds or less, it may test with a force application plate with dimensions other than those specified in the standard. The standard does not prohibit a manufacturer from using a different dimension from that specified, in view of the NHTSA's expressed position on the legal effect of its regulations. To certify compliance, a manufacturer is free to choose any means, in the exercise of due care, to show that a vehicle (or item of motor vehicle equipment) would comply if tested by the NHTSA as specified in the standard. Thus the force application plate used by the NHTSA need not be duplicated by each manufacturer or compliance test facility. Sheller-Globe, for example, is free to use a force application plate of any width as long as it can certify its vehicle would comply if tested by the NHTSA according to the standard.

In a separate area, the agency corrects the inadvertent omission of an illustration from Standard No. 221 as it was issued January 26, 1976 (41 F.R. 3872). The figure does not differ from that proposed and, in that form, it received no adverse comment.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 F.R. 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The changes in effective dates for the school bus standards are not evaluated because they were accomplished by law and not by regulatory action.

The change of effective date for the redefinition of "school bus" will result in savings to manufacturers who will not be required to meet existing school bus standards between October 27, 1976, and April 1, 1977. The agency calculates that the only standard that would not be met would be the requirement in Standard No. 108 for school bus marker lamps. In view of the agency's existing provision for the marking of light school buses in Pupil Transportation Standard No. 17 (23 CFR 1204), it is concluded that the absence of this equipment until April 1, 1977, will not have a significant adverse impact on safety.

The interpretative amendment of Standard No. 220 and the addition of a figure to Standard No. 221 are not expected to affect the manufacture or operation of school buses.

In consideration of the foregoing, Part 571 of Title 49 of the Code of Federal Regulations is amended. . . .

Effective dates:

1. Because the listed amendments do not impose additional requirements of any person, the National Highway Traffic Safety Administration finds that an immediate effective date of August 26, 1976 is in the public interest.

2. The effective date of the redefinition of "school bus" in 49 CFR Part 571.3 that was published in the issue of December 31, 1976 (40 F.R. 60033) is changed to April 1, 1977.

3. The effective dates of Standard Nos. 105-75, 217, 301-75, 220, 221, and 222 (as they apply to school buses) are April 1, 1977, in accordance with Public Law 94-346.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Pub. L. 94-346, Stat. (15 U.S.C. § 1392(i)(1)(B)); delegation of authority at 49 CFR 1.50).

Issued on August 17, 1976.

John W. Snow
Administrator

41 F.R. 36027
August 26, 1976

MOTOR VEHICLE SAFETY STANDARD NO. 221

School Bus Body Joint Strength

S1. Scope. This standard establishes requirements for the strength of body panel joints in school bus bodies.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries resulting from the structural collapse of school bus bodies during crashes.

S3. Application. This standard applies to school buses with gross vehicle weight ratings of more than 10,000 pounds.

S4. Definitions.

"Body component" means a part of a bus body made from a single piece of homogeneous material or from a single piece of composite material such as plywood.

"Body panel" means a body component used on the exterior or interior surface to enclose the bus' occupant space.

"Body panel joint" means the area of contact or close proximity between the edges of a body panel and another body component, excluding spaces designed for ventilation or another functional purpose, and excluding doors, windows, and maintenance access panels.

"Bus body" means the portion of a bus that encloses the bus' occupant space, exclusive of the bumpers, the chassis frame, and any structure forward of the forwardmost point of the windshield mounting.

S5. Requirement. When tested in accordance with the procedure of S6, each body panel joint shall be capable of holding the body panel to the member to which it is joined when subjected to a force of 60% of the tensile strength of the weakest joined body panel determined pursuant to S6.2.

S6. Procedure.

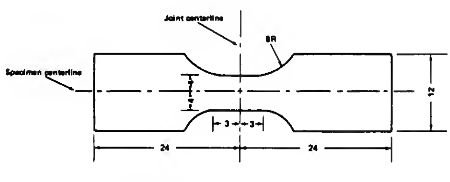
S6.1 Preparation of the test specimen.

S6.1.1 If a body panel joint is 8 inches long or longer, cut a test specimen that consists of any randomly selected 8-inch segment of the joint, together with a portion of the bus body whose dimensions, to the extent permitted by the size of the joined parts, are those specified in Figure 1, so that the specimen's centerline is perpendicular to the joint at the midpoint of the joint segment. Where the body panel is not fastened continuously, select the segment so that it does not bisect a spot weld or a discrete fastener.

S6.1.2 If a joint is less than 8 inches long, cut a test specimen with enough of the adjacent material to permit it to be held in the tension testing machine specified in S6.3.

S6.1.3 Prepare the test specimen in accordance with the preparation procedures specified in the 1973 edition of the Annual Book of ASTM Standards, published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

FIGURE 1



All dimensions in inches

S6.2 Determination of minimum allowable strength. For purposes of determining the minimum allowable joint strength, determine the tensile strengths of the joined body components as follows:

(a) If the mechanical properties of a material are specified by the American Society for Testing and Materials, the relative tensile strength for such a material is the minimum tensile strength specified for that material in the 1973 edition of the Annual Book of ASTM Standards.

(b) If the mechanical properties of a material are not specified by the American Society for Testing and Materials, determine its tensile strength by cutting a specimen from the bus body outside the area of the joint and by testing it in accordance with S6.3.

S6.3 Strength test.

S6.3.1 Grip the joint specimen on opposite sites of the joint in a tension testing machine calibrated in accordance with Method E4, Verification of Testing Machines, of the American Society for Testing and Materials (1973 Annual Book of ASTM Standards).

S6.3.2 Adjust the testing machine grips so that the joint, under load, will be in stress approximately perpendicular to the joint.

S6.3.3 Apply a tensile force to the specimen by separating the heads of the testing machine at any uniform rate not less than ⅛ inch and not more than ⅜ inch per minute until the specimen separates.

41 F.R. 3872
January 27, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 222

School Bus Seating and Crash Protection

(Docket No. 73–3; Notice 5)

This notice establishes a new motor vehicle safety Standard No. 222, *School Bus Seating and Crash Protection*, that specifies seating, restraining barrier, and impact zone requirements for school buses.

The Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93–492, directed the issuance of a school bus seating systems performance standard (and other standards in seven areas of vehicle performance). The NHTSA had already issued two proposals for school bus seating systems prior to enactment of the 1974 Safety Amendments (the Act) (38 F.R. 4776, February 22, 1973) (39 F.R. 27585, July 30, 1974) and subsequently published two additional proposals (40 F.R. 17855, April 23, 1975) (40 F.R. 47141, October 8, 1975). Each aspect of the requirements was fully considered in the course of this rulemaking activity. Comments received in response to the most recent proposal were limited to a few aspects of the Standard.

The largest number of comments were received on the requirement that school bus passenger seats be equipped with seat belt anchorages at each seating position. The standard relies on compartmentalization between well-padded and well-constructed seats to provide occupant protection on school buses (other than van-type buses). At the same time, seat belt anchorages were proposed so that a greater measure of protection could be gained if a particular user chose to use the anchorages by installation of seat belts together with a system to assure that seat belts would be worn, properly adjusted, and not misused.

Bus operators strongly expressed the view that the presence of seat belt anchorages would encourage the installation of seat belts by school districts without providing the necessary supervision of their use. This association of school bus operators (National School Transportation Association) also questioned the benefits that would be derived from anchorage installation as long as their utilization is not required. In view of these factors, and the indications that in any event only a small fraction of school buses would have belts installed and properly used, the NHTSA concludes that the proposed seat belt anchorage requirement should not be included in this initial school bus seating standard. Further study of the extent to which belts would be installed and properly used should permit more certainty as the basis for any future action.

NHTSA calculations demonstrate that the strength characteristics of the seat specified by the standard to provide the correct amount of compartmentalization also provide the strength necessary to absorb seat belt loads. This means that an operator or school district may safely attach seat belts to the seat frame, even where anchorages are not installed as original equipment. The seat is strong enough to take the force of occupants against the seat back if no belts are utilized, or the force of occupants against seat belts if occupants are restrained by belts attached to the seat frame through the anchorages provided.

The Physicians for Automotive Safety (PAS) requested that lap belts be required in addition to the compartmentalization offered by the seating systems. The agency concluded earlier in this rulemaking procedure that compartmentalization provides satisfactory protection and that a requirement for belts without the assurance of proper supervision of their use would not be an effective means of providing occupant protection.

PAS has not provided data or arguments that would modify this conclusion, and its request is therefore denied.

PAS, relying on testing undertaken at the University of California at Los Angeles in 1967 and 1969, argued that a vertical seat back height of 24 inches above the seating reference point (SRP) is necessary to afford adequate protection against occupant injury. The NHTSA, as noted in its fourth notice of school bus crash protection, based its 20-inch requirement on newer data generated in dynamic and static testing by AMF Corporation of prototype seats designed to meet the proposed requirements of the standard ("Development of a Unitized School Bus", DOT-HS-400969). While the NHTSA does not dispute that a properly constructed, higher seat back provides more protection than a lower seat back, the data support the agency's determination that the 20-inch seat back provides a reasonable level of protection. School bus accident data do not provide substantial evidence of a whiplash injury experience that could justify a 4-inch increase in seat back height. For this reason, the seat back height is made final as proposed.

Several commenters objected to applicability of the standard to school buses with a gross vehicle weight rating (GVWR) of 10,000 pounds or less (light school buses), asserting that the special requirements of the standard for those buses were inappropriate, or unachievable within the 9-month leadtime for compliance mandated by the Act.

Chrysler Corporation requested exclusion of light school buses from this standard for an indefinite period, and Ford Motor Company requested that essentially the same package of standards as already are provided in its van-type multi-purpose passenger vehicles and school bus models be required in the future, with no additional protection. Both companies believe that the relatively small numbers of their vehicles sold as school buses would have to be withdrawn from the market because of the expense of tooling new seating that offers more crash protection than present seating. Wayne Corporation manufactures a light school bus that is not based on a van-type vehicle, and requested that seats used in its larger models be permitted in smaller models, along with seat belts that comply with Standard No. 209.

The Congressional direction to issue standards for school bus seating systems (15 U.S.C. § 1392(i)(1)(A)(iv)) implies that existing seating and occupant crash protection standards are insufficient for vehicles that carry school children. The NHTSA has proposed a combination of requirements for light school buses that differ from those for heavier buses, because the crash pulse experienced by smaller vehicles is more severe than that of larger vehicles in similar collisions. The standard also specifies adequate numbers of seat belts for the children that the vehicle would carry, because such restraints are necessary to provide adequate crash protection in small vehicles. The requirements applicable to light school buses are considered reasonable, and are therefore included in the final rule as proposed.

In Wayne's case, it is not clear why the seat it has developed for heavier school buses will not serve in its smaller school buses. Seat belts may need to be attached to the floor to support the force specified by Standard No. 210 for anchorages. Also, some interior padding may be necessary to meet the vehicle impact zone requirements of S5.3.1.1(a).

Sheller-Globe Corporation (Sheller) and Wayne considered unreasonable the standard's limitation on maximum distance between a seat's SRP and the rear surface of the seat or restraining barrier forward of the SRP (S5.2). The limitation exists to minimize the distance an occupant travels before forward motion is arrested by the padded structure that compartmentalizes the occupant. The two bus manufacturers contend that they must also comply with State requirements for a minimum distance between seats that results in only 1 inch of tolerance in seating placement.

Section 103(d) of the National Traffic and Motor Vehicle Safety Act provides in part:

> (d) Whenever a Federal motor vehicle safety standard . . . is in effect, no State or political subdivision of a State shall have any authority either to establish or continue in effect, with respect to any motor vehicle or item of motor vehicle equipment any safety standard appli-

cable to the same aspect of performance of such vehicle or item of equipment which is not identical to the Federal standard.

It is the opinion of the NHTSA that any State requirement relating to seat spacing, other than one identical to the Federal requirement for maximum spacing of 20 inches from the SRP, is preempted under § 103(d), 15 U.S.C. § 1392(d).

Sheller advocated wider seat spacing for activity buses, because seats are occupied for longer periods of time on road trips. The NHTSA, noting that activity buses are often used on the open highway at high speeds for long periods of time, requests comments on the advisability of specifying a seat belt requirement in place of the seat spacing requirement in the case of these buses.

Much of Sheller and Wayne's concern over tolerances may stem from a misunderstanding of the meaning of "seating reference point" (SRP). As defined by the NHTSA (49 CFR 571.3), the SRP is essentially the manufacturer's design reference point which simulates the pivot center of the human torso and thigh, located in accordance with the SAE Standard J826. Thus the manufacturer calculates, on its seat design seen in side projected view, the pivot center of the human torso and thigh of the potential seat occupant, and then establishes a design reference point that simulates the location of the actual pivot center. The NHTSA has interpreted that this design reference point may be fixed by the manufacturer with reference to the seating structure to simplify calculation of its location in a bus for purposes of measurement and compliance.

Sheller also requested that the "seat performance forward" testing be simplified by eliminating the 8-inch range of locations at which the lower loading bar can be applied against the seat back. As noted in the preamble to Notice 4 of this docket in response to a similar request from Blue Bird Body Company, the NHTSA declines to make this restriction, to discourage the addition of a narrow 2-inch wide structural member at this point simply to meet the requirement. This reasoning remains valid and Sheller's request is denied.

Sheller also asked that the requirement for forward-facing seats be eliminated from the standard, in view of the practice of installing side-facing seats in some buses for handicapped students. The NHTSA designed the seating system in this standard for protection from fore and aft crash forces, and considers it necessary that the seats be forward-facing to achieve the objective of occupant protection. Comments are solicited on whether the provision of this protection in special vehicles is impractical.

The Vehicle Equipment and Safety Commission (VESC) asked for a minimum seat width of 13 inches for each designated seating position, noting that the standard's formula permits seating of 12.67 inches in width. The agency does not believe its standard will encourage seats narrower than those presently provided in school buses, but will watch for any indication that that is occurring. Action can be taken in the future if it appears that seating is being designed to be narrower than at present.

In consideration of the foregoing, a new motor vehicle safety Standard No. 222, *School Bus Seating and Crash Protection*, is added as § 571.222, of Part 571 of Title 49, Code of Federal Regulations. . . .

Effective date: October 26, 1976. The effective date of this standard is established as 9 months after the date of its issuance, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93–492, section 202 (15 U.S.C. 1397(i)(1)(A)).

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); § 202, Pub. L. 93–492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50).

Issued on January 22, 1976.

Howard J. Dugoff
Acting Administrator

41 F.R. 4016
January 28, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222

School Bus Seating and Crash Protection

(Docket No. 73-3; Notice 6)

This notice responds to two petitions for reconsideration of Standard No. 222, *School Bus Passenger Seating and Crash Protection*, as it was issued January 22, 1976.

Standard No. 222 (49 CFR 571.222 was issued January 22, 1976 (41 F.R. 4016, January 28, 1976), in accordance with § 202 of the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492 (15 U.S.C. § 1392(i)(1)) and goes into effect on October 26, 1976. The standard provides for compartmentalization of bus passengers between well-padded and well-constructed seats in the event of collision. Petitions for reconsideration of the standard were received from Sheller-Globe Corporation and from the Physicians for Automotive Safety (PAS), which also represented the views of Action for Child Transportation Safety, several adult individuals, and several school bus riders.

PAS expressed dissatisfaction with several aspects of the standard. The organization objected most strongly to the agency's decision that seat belts should not be mandated in school buses. PAS disagreed with the agency conclusion (39 F.R. 27585, July 30, 1974) that, whatever the potential benefits of safety belts in motor vehicle collisions, the possibility of their non-use or misuse in the hands of children makes them impractical in school buses without adequate supervision. In support of safety belt installation, PAS cited statistics indicating that 23 percent of reported school bus accidents involve a side impact or rollover of the bus.

While safety belts presumably would be beneficial in these situations, PAS failed to provide evidence that the belts, if provided, would be properly utilized by school-age children. The agency will continue to evaluate the wisdom of its decision not to mandate belts, based on any evidence showing that significant numbers of school districts intend to provide the supervision that should accompany belt use. In view of the absence of evidence to date, however, the agency maintains its position that requiring the installation of safety belts on school bus passenger seats is not appropriate and denies the PAS petition for reconsideration. The agency continues to consider the reduced hostility of improved seating to be the best reasonable form of protection against injury.

PAS asked that a separate standard for seat belt assembly anchorages be issued. They disagree with the agency's conclusion (41 F.R. 4016) that seat belt anchorages should not be required because of indications that only a small fraction of school buses would have belts installed and properly used. However, PAS failed to produce evidence that a substantial number of school buses would be equipped with safety belts, or that steps would be taken to assure the proper use of such belts. In the absence of such information, the agency maintains its position that a seat belt anchorage requirement should not be included in the standard at this time, and denies the PAS petition for reconsideration.

The NHTSA does find merit in the PAS concern that in the absence of additional guidance, improper safety belt installation may occur. The Administration is considering rulemaking to establish performance requirements for safety belt anchorages and assemblies when such systems are installed on school bus passenger seats.

PAS also requested that the seat back height be raised from the 20-inch level specified by the standard to a 24-inch level. In support of this position, the organization set forth a "common sense" argument that whiplash must be occurring to school bus passengers in rear impact. However, the agency has not been able to locate any quantified evidence that there is a significant whiplash problem in school buses. The crash forces imparted to a school bus occupant in rear impact are typically far lower than those imparted in a car-to-car impact because of the greater weight of the school bus. The new and higher seating required by the standard specifies energy absorption characteristics for the seat back under rear-impact conditions, and the agency considers that these improvements over earlier seating designs wil reduce the number of injuries that occur in rear impact. For lack of evidence of a significant whiplash problem, the PAS petition for a 24-inch seat back is denied.

PAS believed that the States and localities that specify a 24-inch seat back height would be precluded from doing so in the future by the preemptive effect of Standard No. 222 under § 103(f) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1392(f)):

§ 103 * * * * *

(d) Whenever a Federal motor vehicle safety standard under this subchapter is in effect, no State or political subdivision of a State shall have any authority either to establish, or to continue in effect, with respect to any motor vehicle or item of motor vehicle equipment any safety standard applicable to the same aspect of performance of such vehicle or item of equipment which is not identical to the Federal standard. Nothing in this section shall be construed to prevent the Federal Government or the government of any State or political subdivision thereof from establishing a safety requirement applicable to motor vehicle equipment procured for its own use if such requirement imposes a higher standard of performance than that required to comply with the otherwise applicable Federal standard.

Standard No. 222 specifies a minimum seat back height (S5.1.2) which manufactures may exceed as long as their product conforms to all other requirements of the standards applicable to school buses. It is the NHTSA's opinion that any State standard of general applicability concerning seat back height of school bus seating would also have to specify a minimum height identical to the Federal requirement. Manufacturers would not be required to exceed this minimum. Thus, the PAS petition to state seat back height as a minimum is unnecessary and has already been satisfied, although it does not have the effect desired by the PAS.

With regard to the PAS concern that the States' seat height requirements would be preempted, the second sentence of § 103(d) clarifies that the limitation on safety regulations of general applicability does not prevent governmental entities from specifying additional safety features in vehicles purchased for their own use. Thus, a State or its political subdivisions could specify a seat back height higher than 20 inches in the case of public school buses. The second sentence does not permit these governmental entities to specify safety features that prevent the vehicle or equipment from complying with applicable safety standards.

With regard to which school buses qualify as "public school buses" that may be fitted with additional features, it is noted that the agency includes in this category those buses that are owned and operated by a private contractor under contract with a State to provide transportation for students to and from public schools.

Sheller-Globe Corporation (Sheller) petitioned for exclusion from the seating requirements for seating that is designed for handicapped or convalescent students who are unable to utilize conventional forward-facing seats. Typically, side-facing seats are installed to improve entry and egress since knee room is limited in forward-facing seats, or spaces on the bus are specifically designed to accommodate wheelchairs. The standard presently requires that bus passenger seating be forward-facing (S5.1) and conform to requirements appropriate for forward-facing seats. Blue Bird Body Company noted in a March 29, 1976, letter that it also considered the standard's requirements inappropriate for special seating.

The agency has considered the limited circumstances in which this seating would be offered in school buses and concludes that the seat-spacing requirement (S5.2) and the fore-and-aft seat performance requirements (S5.1.3, S5.1.4) are not appropriate for side-facing seats designed solely for handicapped or convalescent students. Occupant crash protection is, of course, as important for these students as others, and the agency intends to establish requirements suited to these specialized seating arrangements. At this time, however, insufficient time remains before the effective date of this standard to establish different requirements for the seating involved. Therefore, the NHTSA has decided to modify its rule by the exclusion of side-facing seating installed to accommodate handicapped or convalescent passengers.

School bus manufacturers should note that the limited exclusion does not relieve them from providing a restraining barrier in front of any forward-facing seat that has a side-facing seat or wheelchair position in front of it .

Sheller also petitioned for a modification of the head protection zone (S5.3.1.1) that describes the space in front of a seating position where an occupant's head would impact in a crash. The outer edge of this zone is described as a vertical longitudinal plane 3.25 inches inboard of the outboard edge of the seat.

Sheller pointed out that van-type school buses utilize "tumble home" in the side of the vehicle that brings the bus body side panels and glazing into the head protection zone. As Sheller noted, the agency has never intended to include body side panels and glazing in the protection zone. The roof structure and overhead projections from the interior are included in this area of the zone. To clarify this distinction and account for the "tumble home," the description of the head impact zone in S5.3.1.1 is appropriately modified.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 F.R. 16201; April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The decision to withdraw requirements for side-facing seats used by handicapped or convalescent students will result in cost savings to manufacturers and purchasers. The action may encourage production of specialized buses that would otherwise not be built if the seating were subject to the standard. Because the requirements are not appropriate to the orientation of this seating, it is estimated that no significant loss of safety benefits will occur as a result of the amendment. The exclusion of sidewall, window or door structure from the head protection zone is simply a clarification of the agency's longstanding intent that these components not be subject to the requirements. Therefore no new consequences are anticipated as a result of this amendment.

In an area unrelated to the petitions for reconsideration, the Automobile Club of Southern California petitioned for specification of a vandalism resistance specification for the upholstery that is installed in school buses in compliance with Standard No. 222. Data were submitted on experience with crash pads installed in school buses operated in California. Vandalism damage was experienced, and its cost quantified in the submitted data.

The Automobile Club made no argument that the damage to the upholstery presents a significant safety problem. While it is conceivable that removal of all padding from a seat back could occur and expose the rigid seat frame, the agency estimates that this would occur rarely and presumably would result in replacement of the seat. Because the agency's authority under the National Traffic and Motor Vehicle Safety Act is limited to the issuance of standards that meet the need for motor vehicle safety (15 U.S.C. § 1392(a)), the agency concludes that a vandalism resistance requirement is not appropriate for inclusion in Standard No. 222.

In light of the foregoing, Standard No. 222 (49 CFR 571.222) is amended. . . .

Effective date: October 26, 1976. Because the standard becomes effective on October 26, 1976, it is found to be in the public interest that an effective date sooner than 180 days is in the public interest. Changes in the text of the Code of Federal Regulations should be made immediately.

(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 July 7, 1976.

James B. Gregory
Administrator

41 F.R. 28506
July 12, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222

School Bus Seating and Crash Protection

(Docket No. 73–3; Notice 8)

This notice amends Standard No. 222, *School Bus Passenger Seating and Crash Protection*, to delay the effective date for maximum rearward deflection of seats from April 1, 1977, to April 1, 1978.

Standard No. 222 (49 CFR 571.222), as published January 28, 1976 (41 F.R. 4016), established October 27, 1976, as the effective date of the standard, as mandated by the Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) (Pub. L. 93–492). Congress subsequently amended the Act by Public Law 94–346 (July 8, 1976) to extend the effective date for the implementation of school bus standards to April 1, 1977.

The NHTSA has promulgated regulations on several aspects of performance mandated by Congress in the Act. These regulations become effective on April 1, 1977. The agency concludes, however, that compliance with one provision of Standard No. 222 by the April 1, 1977, effective date would be impracticable, would result in substantial economic waste, and would not be in the public interest.

Since publication of Standard No. 222, a misunderstanding has arisen within the industry concerning the definition of the term "absorbed" when used in connection with the requirements in sections S5.1.3.4 and S5.1.4.2. The NHTSA explained the term "absorbed" in an interpretation to Thomas Built Buses (July 30, 1976) to mean "receive without recoil." This interpretation requires that returned energy be subtracted from total energy applied to the seat back to calculate energy "absorbed" by the seat back.

School bus manufacturers tested their seats in accordance with the NHTSA definition of "absorbed" and found that the seats continued to comply with the requirements of Standard No. 222 when tested for forward performance (S5.1.3), but these same seats were marginally below the NHTSA requirements for rearward seat deflection. Based upon these test data, petitions have been received from Thomas Built Buses, Blue Bird Body Company, Carpenter Body Works, Wayne Corporation, and Ward School Bus Manufacturing, all requesting a change in rearward performance requirements.

The NHTSA has examined the data submitted by the manufacturers and concludes that the seats upon which the tests were made demonstrate a high probability of meeting most of the requirements of Standard No. 222. Further, the agency concludes that to mandate full compliance with the rearward performance requirements of Standard No. 222 would require extensive retooling and redesign. This could result in substantial economic waste of seats now in production and severe economic hardship for manufacturers.

The NHTSA is particularly concerned that to require full compliance with the rearward performance requirements at this late date might mean that manufacturers would be unable to redesign their seats in time to commence manufacture of completed buses on April 1, 1977. Since single-stage buses produced after April 1, 1977, must meet NHTSA safety requirements in all other respects, they will be substantially safer than buses currently in use. Therefore, the agency finds that it is in the interest of safety to ensure that these safer buses will be available on April 1, 1977, to replace older less safe models. To ensure that safer buses can be marketed without delay, the NHTSA extends the effective date of requirements for maximum rearward deflection of seats to April 1, 1978. It is emphasized that the numerous other requirements for school bus seating, including all other rearward performance requirements, remain in effect, which ensures adequate interior protection as of April 1, 1977, as mandated by Congress. A proposal for minor modification of S5.1.4 (to be published shortly) will permit reinstitution of rearward deflection requirements following the 1-year delay.

Because of the imminent effective date of the school bus safety standards and the lead time required to modify seat design, the NHTSA for gool cause finds that notice and public procedure on this amendment are impracticable and contrary to the public interest.

In consideration of the foregoing, S5.1.4(b) of Standard No. 222 (49 CFR 571.222) is amended by the addition, at the beginning of the first sentence, of the following phrase: "In the case of a school bus manufactured on or after April 1, 1978,".

Effective date: December 16, 1976. Because this amendment relieves a restriction and does not impose requirements on any person, 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); Sec. 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on December 10, 1976.

Acting Administrator
Charles E. Duke

41 F.R. 54945
December 16, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222

(Docket No. 73–3; Notice 12)

This notice amends Standard No. 222, *School Bus Passenger Seating and Crash Protection*, increasing the allowable rearward deflection of seats from 8 to 10 inches. The action is taken in response to petitions that indicated the current rearward deflection requirement is unnecessarily restrictive in that it would require costly retooling of school bus seats with no measurable safety advantage over a somewhat greater deflection distance that would not entail significant retooling. Additionally, a minor modification of the standard is made clarifying the meaning of "absorbed energy" consistent with an agency interpretation of that term.

Effective Date: April 1, 1978.

For further information contact:

Mr. Timothy Hoyt, Crashworthiness Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–2264).

Supplementary Information: On November 10, 1977, the NHTSA published a notice proposing to amend the rearward deflection requirement of Standard No. 222, *School Bus Passenger Seating and Crash Protection*. The impetus for that proposal came from several petitions from school bus manufacturers claiming that the rearward deflection requirement was unnecessarily restrictive since it would require significant retooling of school bus seats which would not be measurably superior, in terms of safety, to seats designed to meet a slightly greater deflection distance. They stated that seats produced in compliance with a somewhat greater rearward deflection requirement, as opposed to the currently specified 8-inch requirement, would not require retooling. The NHTSA agreed with the petitioners and, accordingly, proposed to increase the allowable rearward deflection of seats from 8 to 10 inches. By the same notice, the NHTSA proposed a minor modification of the standard clarifying the agency's meaning of absorbed energy.

Only one comment was received in response to that notice of proposed rulemaking. The Vehicle Equipment Safety Commission did not submit comments.

The only commenter, Blue Bird Body Company, took issue with the agency's proposed method for limiting rearward seat deflection. It asserted that the requirement expressed in S5.1.4 (c) of the standard should be the only limitation on rearward seat deflection. That section provides that a seat shall not, when tested, come within 4 inches of any portion of another passenger seat.

Blue Bird's comment is not persuasive. The requirement of S5.1.4(c) addresses an entirely separate safety concern than the requirement of S5.1.4(b). Section S5.1.4(b) limits the rearward deflection of a seat, by this notice, to a maximum of 10 inches. That requirement functions as part of the compartmentalization scheme of Standard 222. Limiting the degree of seat back deflection helps to contain a child within the seat structures in the event of an accident. This requirement should be distinguished from that contained in S5.1.4(c), which is intended to ensure that a minimum amount of space remains between seats following an accident so that a child does not become trapped. Since both requirements are necessary to maintain the safety level considered necessary for school buses, Blue Bird's request is denied.

Blue Bird stated in its comments a preference for specifying maximum rearward seat deflection in terms of inches rather than angle. This comment suggests that Blue Bird misinterpreted the statements in the notice of proposed rulemaking as indicating that the NHTSA was contemplating an amendment that would limit the angle of seat deflection. The reference in the notice to a 40° seat angle was made only to justify the proposed 10-inch maximum seat deflection. A 40° seat angle roughly translates to 10 inches of rearward seat deflection. There was no intention to suggest that an angle limitation was under consideration. In fact, the preamble stated that the NHTSA had abandoned, in earlier rulemaking, attempts to adopt an angular measurement owing to the difficulty of making such a measurement.

The agency concludes that the extension of the allowable rearward deflection of seats from 8 to 10 inches assures passenger safety while minimizing the cost impact of compliance with the school bus regulations. Since this amendment relieves a restriction, it should result in no increase in costs.

In consideration of the foregoing, Part 571, of Title 49, CFR, is amended. . . .

The principal authors of this proposal are Timothy Hoyt of the Crashworthiness Division and Roger Tilton of the Office of Chief Counsel.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 203, Pub. L. 93–492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on March 1, 1978.

Joan Claybrook
Administrator

43 F.R. 9149
March 6, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222

School Bus Seating and Crash Protection

(Docket No. 73–3; Notice 13)

Action: Final rule.

Summary: This notice makes final an existing interim amendment to Standard No. 222, *School Bus Seating and Crash Protection*, increasing the maximum allowable seat spacing in school buses from 20 to 21 inches. In issuing the original standard, the agency intended that the seats be spaced approximately 20 inches apart (S5.2). However, because of manufacturing tolerances, some school bus manufacturers were spacing their seats at distances less than 20 inches to ensure that the spacing does not exceed the prescribed maximum. A seat spacing specification of 21 inches permits 20-inch spacing of seats by taking manufacturing tolerances into fuller account. This spacing will accommodate large high school students while still ensuring a safe level of school bus seat performance.

Effective date: Since this amendment merely makes final an existing interim rule, it is effective March 29, 1979.

For further information contact:

Mr. Robert Williams, Crashworthiness Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202) 426-2264.

Supplementary information: On December 22, 1977, the National Highway Traffic Safety Administration issued a proposal to increase the allowable seat spacing in school buses from 20 to 21 inches (42 FR 64136). Concurrently with that proposal, the NHTSA issued an interim final rule permitting buses to be constructed immediately with the increased seat spacing (42 FR 64119). This action was taken to provide the amount of seat spacing in school buses originally intended by the agency and to relieve immediately problems created by the unnecessarily limited seat spacing in buses then being built. The action resulted from numerous complaints by school bus users relating to seat spacing. The proposal and interim final rule responded to petitions from the Wisconsin School Bus Association and the National School Transportation Association asking for increased seat spacing.

The agency received many comments in response to its December 1977 proposal. Most comments favored some extension in the seat spacing allowance in school buses. Commenters differed as to the amount of seat spacing needed to accommodate fully the larger school children. Some commenters suggested that the agency provide still more seat spacing than proposed in the December 22 notice. Other commenters supported the agency's suggested modification.

The agency has reviewed all of the comments and the petitions concerning this issue and has concluded that the proposal and interim rule provide sufficient seat spacing in school buses for all school children. To provide greater seat spacing, as suggested by some commenters, might necessitate changing the seat structures to absorb more energy. See the December proposal for further discussion of this point. The NHTSA does not believe that such a costly change is warranted at this time. The agency notes that as a result of the interim rule seat spacing in buses has become adequate to meet the needs for pupil transportation to and from school. The agency continues, however, to research the proper seating for activity buses and will address that issue in a separate notice as soon as all of the research and analysis is completed.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations, Part 571, Standard No. 222, *School Bus Seating and Crash Protection*, is amended . . . .

The principal authors of this notice are Robert Williams of the Crashworthiness Division and Roger Tilton of the Office of Chief Counsel.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 203, Pub. L. 93–492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on March 21, 1979.

Joan Claybrook
Administrator

44 F.R. 18674–18675
March 29, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 222

Federal Motor Vehicle Safety Standards; School Bus Passenger Seating and Crash Protection

[Docket No. 73-3; Notice 15]

ACTION: Final rule.

SUMMARY: This notice amends the agency's school bus seating standard to increase seat spacing from 21 to 24 inches. This amendment is being issued to resolve problems experienced by users, i.e., school districts and contract carriers, to the effect that mandatory seat spacing at the prior level inhibited some necessary uses. The agency finds that an additional space seating option will not inhibit safety.

DATE: This amendment is effective March 24, 1983.

SUPPLEMENTARY INFORMATION: Standard No. 222, *School Bus Passenger Seating and Crash Protection*, was one of several standards implemented pursuant to the Motor Vehicle and School Bus Safety Amendments of 1974 (Pub. L. 93-492). The standard regulates the performance aspects of school bus seats. One portion of the standard limits the longitudinal spacing between seats in buses with gross vehicle weight ratings (GVWR) of more than 10,000 pounds. No seat may be positioned more than 21 inches from the seat immediately to the front, measured from the seating reference point to the seat back or restraining barrier located in front of the seat.

The initial version of Standard 222 which became effective on April 1, 1977, limited school bus seat spacing to 20 inches. Soon after school buses began to be produced in compliance with this requirement, users began to experience problems of inadequate spacing. Because of quality control and other production problems affecting seat spacing, manufacturers wer[e] spacing seats significantly less than the 20 inche[s] permitted by the standard to ensure complianc[e]. As manufacturers improved their productio[n] techniques, seat spacing was extended.

The agency upon examination of its the[n] existing data concluded later that same year tha[t] it could extend seat spacing to 21 inches withou[t] adversely affecting the compartmentalizatio[n] concept that was the key to protecting children i[n] the buses. Compartmentalization attempts t[o] protect children between well padded hig[h] backed seats. The agency amended the rul[e] accordingly (42 F.R. 64119, December 22, 197[7]) and undertook to study further th[e] appropriateness of the required seat spacing.

Both the amendment and improve[d] manufacturer production methods reduced th[e] number of spacing problems significantly. Som[e] problems continue to exist, however, especiall[y] concerning buses used to transport children lon[g] distances to and from school, or to and fro[m] school related events which may be located fa[r] from the school itself. The agency has conducte[d] tests to see whether it could improve seat spacin[g] to respond to these continuing problems, withou[t] compromise of safety. The tests, which ar[e] available in the Technical Reference Section o[f] the agency under H73-3 "School Bus Passenge[r] Seat and Lap Belt Sled Tests," DOT-HS-80498[5] December 1978, show that seat spacing could b[e] increased up to 24 inches without impairing th[e] concept of compartmentalization. An increase i[n] seat spacing beyond 24 inches might impair th[e] ability of the seats to absorb energy in th[e] manner required by the standard. Accordingly on February 25, 1982, the agency proposed a further increase in seat spacing to 24 inches (47 F.R. 8231).

The agency received numerous comments in response to the notice of proposed rulemaking. Virtually all of those comments supported the agency's action. In accordance with the comments and the existing agency information, the agency, by this notice, makes final the increased seat spacing to 24 inches.

Three school districts out of the more than 140 commenters on the February notice objected to the increased seat spacing. It appears that these commenters were afraid that the increased seat spacing was mandatory and that this would in turn reduce the seating capacity in their vehicles resulting in the need to purchase additional buses or realign school routes. This understanding is not accurate. The increased seat spacing is merely optional. If a school chooses to have additional spacing in some or all of its buses, up to 24 inches, this would be permitted. Otherwise, schools may continue to purchase buses with seats spaced as they are today. Seat spacing less than 24 inches is completely within the discretion of the school that is purchasing the vehicles.

Commenters to the February notice raised another issue that is somewhat related to seat spacing. They requested more comfortable seats and additional leg room for long distance school buses. These are the vehicles that frequently have been involved in transporting children to and from activities or, in some instances, carry children over long distances to schools in some of the Western States. The commenters in general would prefer to have recliner seats or some other seating system that would be more comfortable for these uses.

The agency has explored the possibility of establishing another optional seating mode in school vehicles that would accommodate the concerns of these commenters. The agency concludes that recliner seats could not provide the same level of safety as provided by existing seat requirements in school buses. Accordingly, the agency declines to adopt this suggestion. NHTSA believes that the seat spacing extension being made today should address adequately the problem of comfort in buses used for school activities.

This amendment is being made effective immediately. It relieves a restriction, and is completely optional, and does not require any manufacturer or purchaser to alter present practices. Further, the agency has learned that many companies and purchasers are waiting for this amendment before purchasing new vehicles. Therefore, an immediate effective date is in the public interest.

Issued on March 17, 1983.

Raymond A Peck, Jr.
Administrator
48 F.R. 12384
March 24, 1983

MOTOR VEHICLE SAFETY STANDARD NO. 222

School Bus Seating and Crash Protection

S1. Scope. This standard establishes occupant protection requirements for school bus passenger seating and restraining barriers.

S2. Purpose. The purpose of this standard is to reduce the number of deaths and the severity of injuries that result from the impact of school bus occupants against structures within the vehicle during crashes and sudden driving maneuvers.

S3. Application. This standard applies to school buses.

S4. Definitions. "Contactable surface" means any surface within the zone specified in S5.3.1.1 that is contactable from any direction by the test device described in S6.6, except any surface on the front of a seat back or restraining barrier 3 inches or more below the top of the seat back or restraining barrier.

"School bus passenger seat" means a seat in a school bus, other than the driver's seat or a seat installed to accommodate handicapped or convalescent passengers as evidenced by orientation of the seat in a direction that is more than 45 degrees to the left or right of the longitudinal centerline of the vehicle.

S4.1 The number of seating positions considered to be in a bench seat is expressed by the symbol W, and calculated as the bench width in inches divided by 15 and rounded to the nearest whole number.

S5. Requirements. (a) Each vehicle with a gross vehicle weight rating of more than 10,000 pounds shall be capable of meeting any of the requirements set forth under this heading when tested under the conditions of S6. However, a particular school bus passenger seat (i.e., test specimen) in that weight class need not meet further requirements after having met S5.1.2 and S5.1.5, or having been subjected to either S5.1.3, S5.1.4, or S5.3.

(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) The requirements of §§ 571.208, 571.209, and 571.210 (Standard Nos. 208, 209, and 210) as they apply to multipurpose passenger vehicles; 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 Standard Nos. 208 and 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 having been subjected to either S5.1.3, S5.1.4, S5.3, or § 571.210 (Standard No. 210).

S5.1 Seating requirements. School bus passenger seats shall be forward facing.

S5.1.1 [Reserved]

S5.1.2 Seat back height and surface area. Each school bus passenger seat shall be equipped with a seat back that, in the front projected view, has a front surface area above the horizontal plane that passes through the seating reference point, and below the horizontal plane 20 inches above the seating reference point, of not less than 90 percent of the seat bench width in inches multiplied by 20.

S5.1.3 Seat performance forward. When a school bus passenger seat that has another seat behind it is subjected to the application of force as specified in S5.1.3.1 and S5.1.3.2, and subsequently, the application of additional force to the seat back as specified in S5.1.3.3 and S5.1.3.4:

(a) The seat-back force/deflection curve shall fall within the zone specified in Figure 1;

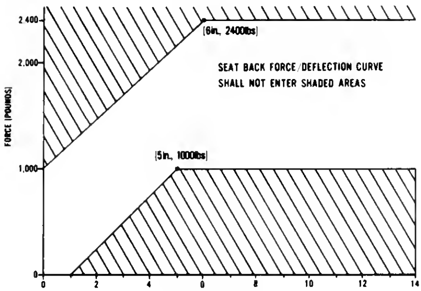


FIGURE 1 - FORCE/DEFLECTION ZONE

(b) Seat back deflection shall not exceed 14 inches; (for determination of (a) and (b) the force/deflection curve describes only the force applied through the upper loading bar, and only the forward travel of the pivot attachment point of the upper loading bar, measured from the point at which the initial application of 10 pounds of force is attained.)

(c) The seat shall not deflect by an amount such that any part of the seat moves to within 4 inches of any part of another school bus passenger seat or restraining barrier in its originally installed psition;

(d) The seat shall not separate from the vehicle at any attachment point; and

(d) Seat components shall not separate at any attachment point.

S5.1.3.1 Position the loading bar specified in S6.5 so that it is laterally centered behind the seat back with the bar's longitudinal axis in a transverse plane of the vehicle and in any horizontal plane between 4 inches above and 4 inches below the seating reference point of the school bus passenger seat behind the test specimen.

S5.1.3.2 Apply a force of 700W pounds horizontally in the forward direction through the loading bar at the pivot attachment point. Reach the specified load in not less than 5 nor more than 30 seconds.

S5.1.3.3 No sooner than 1.0 second after attaining the required force, reduce that force to 350W pounds and, while maintaining the pivot point position of the first loading bar at the position where the 350W pounds is attained, position a second loading bar described in S6.5 so that it is laterally centered behind the seat back with the bar's longitudinal axis in a transverse plane of the vehicle and in the horizontal plane 16 inches above the seating reference point of the school bus passenger seat behind the test specimen, and move the bar forward against the seat back until a force of 10 pounds has been applied.

S5.1.3.4 Apply additional force horizontally in the forward direction through the upper bar until 4,000W inch-pounds of energy have been absorbed in deflecting the seat back (or restraining barrier). Apply the additional load in not less than 5 seconds nor more than 30 seconds. Maintain the pivot attachment point in the maximum forward travel position for not less than 5 seconds nor more than 10 seconds and release the load in not less than 5 nor more than 30 seconds. (For the determination of S5.1.3.4 the force/deflection curve describes only the force applied through the upper loading bar, and the forward and rearward travel distance of the upper loading bar pivot attachment point measured from the position at which the initial application of 10 pounds of force is attained.)

S5.1.4 Seat performance rearward. When a school bus passenger seat that has another seat behind it is subjected to the application of force as specified in S5.1.4.1 and S5.1.4.2:

(a) Seat back force shall not exceed 2,200 pounds;

(b) In the case of a school bus manufactured on or after April 1, 1978, seat back deflection shall not exceed 10 inches; (For determination of (a) and (b) the force/deflection curve describes only the force applied through the loading bar, and only the rearward travel of the pivot attachment point of the loading bar, measured from the point at which the initial application of 50 pounds of force is attained.

(c) The seat shall not deflect by an amount such that any part of the seat moves to within 4 inches of any part of another passenger seat in its originally installed position;

(d) The seat shall not separate from the vehicle at any attachment point; and

(e) Seat components shall not separate at any attachment point.

S5.1.4.1 Position the loading bar described in S6.5 so that it is laterally centered forward of the seat back with the bar's longitudinal axis in a transverse plane of the vehicle and in the horizontal plane 13.5 inches above the seating reference point of the test specimen, and move the loading bar rearward against the seat back until a force of 50 pounds has been applied.

S5.1.4.2 Apply additional force horizontally rearward through the loading bar until 2,800W inch-pounds of energy have been absorbed in deflecting the seat back. Apply the additional load in not less than 5 seconds nor more than 30 seconds. Maintain the pivot attachment point in the maximum rearward travel position for not less than 5 seconds nor more than 10 seconds and release the load in not less than 5 seconds nor more than 30 seconds. (For determination of S5.1.4.2 the force/deflection curve describes the force applied through the loading bar and the rearward and forward travel distance of the loading bar pivot attachment point measured from the position at which the initial application of 50 pounds of force is attained.)

S5.1.5 Seat cushion retention. In the case of school bus passenger seats equipped with seat cushions, with all manual attachment devices between the seat and the seat cushion in the manufacturer's designed position for attachment, the seat cushion shall not separate from the seat at any attachment point when subjected to an upward force of five times the seat cushion weight, applied in any period of not less than 1 nor more than 5 seconds, and maintained for 5 seconds.

S5.2 Restraining barrier requirements. Each vehicle shall be equipped with a restraining barrier forward of any designated seating position that does not have the rear surface of another school bus passenger seat within 24 inches of its seating reference point, measured along a horizontal longitudinal line through the seating reference point in the forward direction.

S5.2.1 Barrier-seat separation. The horizontal distance between the restraining barrier's rear surface and the seating reference point of the seat in front of which it is required shall be not more than 24 inches, measured along a horizontal longitudinal line through the seating reference point in the forward direction.

S5.2.2 Barrier position and rear surface area. The position and rear surface area of the restraining barrier shall be such that, in a front projected view of the bus, each point of the barrier's perimeter coincides with or lies outside of the perimeter of the seat back of the seat for which it is required.

S5.2.3 Barrier performance forward. When force is applied to the restraining barrier in the same manner as specified in S5.1.3.1 through S5.1.3.4 for seating performance tests:

(a) The restraining barrier force/deflection curve shall fall within the zone specified in Figure 1;

(b) Restraining barrier deflection shall not exceed 14 inches; (For computation of (a) and (b) the force/deflection curve describes only the force applied through the upper loading bar, and only the forward travel of the pivot attachment point of the loading bar, measured from the point at which the initial application of 10 pounds of force is attained.)

(c) Restraining barrier deflection shall not interfere with normal door operation;

(d) The restraining barrier shall not separate from the vehicle at any attachment point; and

(e) Restraining barrier components shall not separate at any attachment point.

S5.3 Impact zone requirements.

S5.3.1 Head protection zone. Any contactable surface of the vehicle within any zone specified in S5.3.1.1 shall meet the requirements of S5.3.1.2 and S5.3.1.3. However, a surface area that has been contacted pursuant to an impact test need not meet further requirements contained in S5.3.

S5.3.1.1 The head protection zones in each vehicle are the spaces in front of each school bus passenger seat which are not occupied by bus sidewall, window, or door structure and which, in relation to that seat and its seating reference point, are enclosed by the following planes;

(a) Horizontal planes 12 inches and 40 inches above the seating reference point;

(b) A vertical longitudinal plane tangent to the inboard (aisle side) edge of the seat;

(c) A vertical longitudinal plane 3.25 inches inboard of the outboard edge of the seat, and

(d) Vertical transverse planes through and 30 inches forward of the reference point.

S5.3.1.2 Head form impact requirement. When any contactable surface of the vehicle within the zones specified in S5.3.1.1 is impacted from any direction at 22 feet per second by the head form described in S6.6, the axial acceleration at the center of gravity of the head form shall be such that the expression

shall not exceed 1,000 where a is the axial acceleration expressed as a multiple of g (the acceleration due to gravity), and t_1 and t_2 are any two points in time during the impact.

S5.3.1.3 Head form force distribution. When any contactable surface of the vehicle within the zones specified in S5.3.1.1 is impacted from any direction at 22 feet per second by the head form

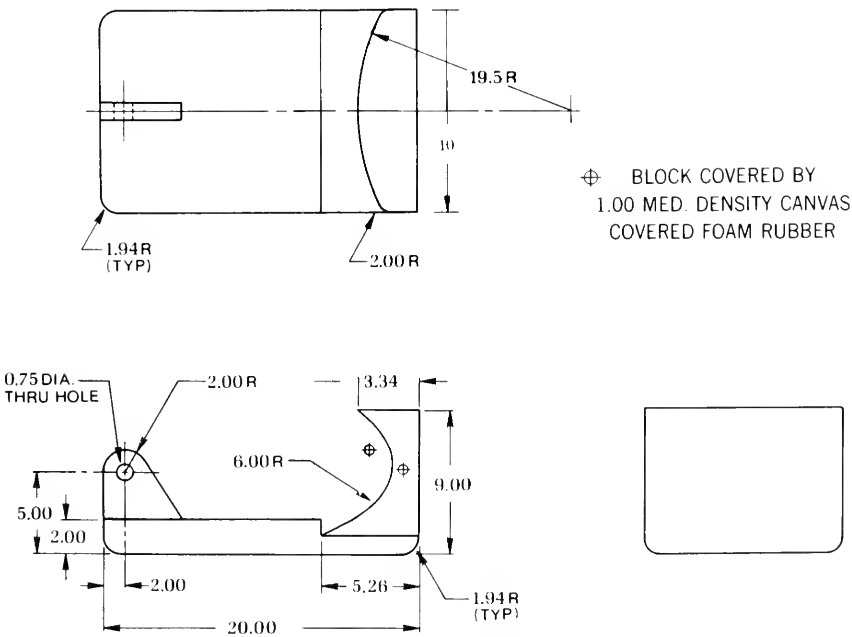


FIGURE 2 – BODY BLOCK FOR LAP BELT

described in S6.6, the energy necessary to deflect the impacted material shall be not less than 40 inch-pounds before the force level on the head form exceeds 150 pounds. When any contactable surface within such zones is impacted by the head form from any direction at 5 feet per second, the contact area on the head form surface shall be not less than 3 square inches.

S5.3.2 Leg protection zone. Any part of the seat backs or restraining barriers in the vehicle within any zone specified in S5.3.2.1 shall meet the requirements of S5.3.2.2.

S5.3.2.1. The leg protection zones of each vehicle are those parts of the school bus passenger seat backs and restraining barriers bounded by horizontal planes 12 inches above and 4 inches below the seating reference point of the school bus passenger seat immediately behind the seat back or restraining barrier.

S5.3.2.2. When any point on the rear surface of that part of a seat back or restraining barrier within any zone specified in S5.3.2.1 is impacted from any direction at 16 feet per second by the knee form specified in S6.7, the resisting force of the impacted material shall not exceed 600 pounds and the contact area on the knee form surface shall not be less than 3 square inches.

S6. Test conditions. The following conditions apply to the requirements specified in S5.

S6.1 Test surface. The bus is at rest on a level surface.

S6.2 Tires. Tires are inflated to the pressure specified by the manufacturer for the gross vehicle weight rating.

6.3 Temperature. The ambient temperature is any level between 32 degrees F. and 90 degrees F.

S6.4 Seat back position. If adjustable, a seat back is adjusted to its most upright position.

S6.5 Loading bar. The loading bar is a rigid cylinder with an outside diameter of 6 inches that has hemispherical ends with radii of 3 inches and with a surface roughness that does not exceed 63 micro-inches, root mean square. Then length of the loading bar is 4 inches less than the width of the seat back in each test. The stroking mechanism applies force through a pivot attachment at the centerpoint of the loading bar which allows the loading bar to rotate in a horizontal plane 30 degrees in either direction from the transverse position.

S6.5.1 A vertical or lateral force of 4,000 pounds applied externally through the pivot attachment point of the loading bar at any position reached during a test specified in this standard shall not deflect that point more than 1 inch.

S6.6 Head form. The head form for the measurement of acceleration is a rigid surface comprised of two hemispherical shapes, with total equivalent weight of 11.5 pounds. The first of the two hemispherical shapes has a diameter of 6.5 inches. The second of the two hemispherical shapes has a 2 inch diameter and is centered as shown in Figure 3 to protrude from the outer surface of the first hemispherical shape. The surface roughness of the hemispherical shapes does not exceed 63 micro-inches, root mean square.

S6.6.1 The direction of travel of the head form is coincidental with the straight line connecting the centerpoints of the two spherical outer surfaces which constitute the head form shape.

S6.6.2 The head form is instrumented with an acceleration sensing device whose output is recorded in a data channel that conforms to the requirements for a 1,000 Hz channel class as specified in SAE Recommended Practice J211a, December 1971. The head form exhibits no resonant frequency below three times the frequency of the channel class. The axis of the acceleration sensing device coincides with the straight line connecting the centerpoints of the two hemispherical outer surfaces which constitute the head form shape.

S6.6.3 The head form is guided by a stroking device so that the direction of travel of the head form is not affected by impact with the surface being tested at the levels called for in the standard.

BIHEMISPHERICAL HEAD FORM RADII

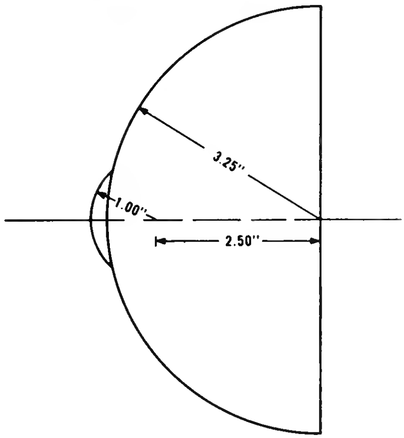


FIGURE 3

S6.7 Knee form. The knee form for measurement of force is a rigid 3-inch-diameter cylinder, with an equivalent weight of 10 pounds, that has one rigid hemispherical end with a 1½ inch radius forming the contact surface of the knee form. The hemispherical surface roughness does not exceed 63 micro-inches, root mean square.

S6.7.1 The direction of travel of the knee form is coincidental with the centerline of the rigid cylinder.

S6.7.2 The knee form is instrumented with an acceleration sensing device whose output is recorded in a data channel that conforms to the requirements of a 600 Hz channel class as specified in the SAE Recommended Practice J211a, December 1971. The knee form exhibits no resonant frequency below three times the frequency of the channel class. The axis of the acceleration sensing device is aligned to measure acceleration along the centerline of the cylindrical knee form.

S6.7.3 The knee form is guided by a stroking device so that the direction of travel of the knee form is not affected by impact with the surface being tested at the levels called for in the standard.

S6.8 The head form, knee form, and contactable surfaces are clean and dry during impact testing.

41 F.R. 4016
January 28, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301

Fuel System Integrity

(Docket No. 70-20; Notice 2)

This notice amends Motor Vehicle Safety Standard No. 301 on fuel system integrity to specify static rollover requirements applicable to passenger cars on September 1, 1975, and to extend applicability of the standard to multipurpose passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less on September 1, 1976.

The NHTSA proposed amending 49 CFR 571.301, *Fuel Tanks, Fuel Tank Filler Pipes, and Fuel Tank Connections*, on August 29, 1970, (35 F.R. 13799). Under the proposal the standard would be extended to all vehicles with a GVWR of 10,000 pounds or less. No fuel spillage would be permitted during the standard's tests. As proposed, these would include a spike stop from 60 mph, and a 30 mph frontal barrier crash. Additional tests for vehicles with a GVWR of 6,000 pounds or less would include a rear-end collision with a fixed barrier at 30 mph, and a static rollover test following the frontal barrier crash. With respect to the proposal: the frontal impact and static rollover tests are adopted but with an allowance of fuel spillage of 1 ounce per minute; the spike stop test is not adopted; and the rear-end fixed barrier collision test is being reproposed in a separate rule making action published today to substitute a moving barrier.

The proposal that there be zero fuel spillage was almost universally opposed for cost/benefit reasons. The NHTSA has concluded that the requirement adopted, limiting fuel spillage to 1 ounce per minute, will have much the san effect as a zero-loss requirement. The standa will effectively require motor vehicles to be d signed for complete fuel containment, since any spillage allowed by design in the aftermath of testing could well exceed the limit of the standard. At the same time, the 1-ounce allowance would eliminate concern over a few drops of spillage that in a functioning system may be unavoidable.

Fuel loss will be measured for a 15-minute period for both impact and rollover tests.

The NHTSA proposed a panic-braking stop from 60 mph to demonstrate fuel system integrity. Many commented that this appeared superfluous, increasing testing costs with no performance improvements, since the proposed front and rear impact tests represented considerably higher deceleration loadings than could be achieved in braking. The NHTSA concurs, and has not adopted the panic stop test. The frontal barrier crash at 30 mph has been retained for passenger cars, and extended to multipurpose passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less as of September 1, 1976.

The static rollover test was adopted as proposed. It applies to passenger cars as of September 1, 1975, and to multipurpose passenger vehicles, trucks, and buses with a GVWR of 6,000 pounds or less, as of September 1, 1976. The rollover test follows the front barrier crash, and consists of a vehicle being rotated on its longitudinal axis at successive increments of 90°. A condition of the test is that rotation between increments occurs in not less than 1 minute and not more than 3 minutes. After reaching a 90° increment, the vehicle is held in that position for 5 minutes.

The proposed rear-end crash test incorporated a fixed collision barrier. Manufacturers generally favored a moving barrier impact as a closer simulation of real world conditions. The NHTSA concurs and is not adopting a rear end fixed barrier test. Instead, it is proposing a rear-end moving barrier collision test as part of the notice of proposed rulemaking published today.

Under the proposal the vehicle would be loaded to its GVWR with the fuel tank filled to any level between 90 and 100 percent of capacity. Many commenters objected on the grounds that full loading of a vehicle represents an unrealistic condition in terms of actual crash experience. The NHTSA does not agree. Although full loading of a vehicle is not the condition most frequently encountered, it certainly occurs frequently enough that the vehicle should be designed to give basic protection in that condition. The vehicle test weight condition has been adopted as proposed. It should be noted that, in the parallel notice of proposed rulemaking issued today, vehicles would be tested under the weight conditions specified in Standard No. 208, effective September 1, 1975.

In consideration of the foregoing, 49 CFR Part 571.301, Motor Vehicle Safety Standard No. 301, is amended . . . .

Effective date: September 1, 1975. Because of the necessity to allow manufacturers sufficient production leadtime it is found for good cause shown that an effective date later than 1 year after issuance of this rule 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 15, 1973.

James B. Gregory
Administrator

38 F.R. 22397
August 20, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301

Fuel System Integrity

(Docket No. 73-20; Notice 2)

The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 301, *Fuel System Integrity*, to upgrade substantially the requirements of the standard by specifying a rear moving barrier crash, a lateral moving barrier crash, and a frontal barrier crash including impacts at any angle up to 30° in either direction from the perpendicular.

A notice of proposed rulemaking published August 20, 1973 (38 F.R. 22417) proposed the imposition of additional testing requirements designed to ameliorate the dangers associated with fuel spillage following motor vehicle accidents. In an amendment to Standard No. 301, published on the same day as the proposal, a frontal barrier crash and a static rollover test were specified. In order to ensure the safety of fuel systems in any possible collision situation, the NHTSA finds it essential to incorporate additional proposed test requirements into the present standard and to make these requirements applicable to all vehicle types with a GVWR of 10,000 pounds or less.

Comments in response to the proposal were received from 29 commenters. Any suggestions for changes of the proposal not specifically mentioned herein are denied, on the basis of all the information presently available to this agency. A number of the issues raised in the comments have been dealt with by the agency in its response to the petitions for reconsideration of the final rule issued on August 20, 1973. In its notice responding to the petitions, the NHTSA considered objections to the use of actual fuel during testing, the specified fuel fill level, the application of the standard to vehicles using diesel fuel, the fuel spillage measuring requirement, and the allegedly more stringent loading requirements applicable to passenger cars. The type of fuel subject to the standard was also clarified.

Objections were registered by 13 commenters to the proposed inclusion of a dynamic rollover test in the fuel system integrity standard. As proposed, the requirement calls for a measurement of the fuel loss while the vehicle is in motion. Commenters pointed out the exceptional difficulty in measuring or even ascertaining a leakage when the vehicle is rolling over at 30 mph. The NHTSA has decided that the objections have merit, and has deleted the dynamic rollover test. The results of the dynamic rollover do not provide sufficiently unique data with regard to the fuel system's integrity to justify the cost of developing techniques for accurately measuring spillage during such a test, and of conducting the test itself. The NHTSA has concluded that the severity of the other required tests, when conducted in the specified sequence, is sufficient to assure the level of fuel system integrity intended by the agency.

Triumph Motors objected to the use of a 4,000-pound barrier during the moving barrier impacts, asserting that such large barriers discriminate against small vehicles. Triumph requested that the weight of the barrier be the curb weight of the vehicle being tested in order to alleviate the burden on small vehicles. The NHTSA has concluded that no justification exists for this change. The moving barrier is intended to represent another vehicle with which the test vehicle must collide. The use of a 4,000-pound moving barrier is entirely reasonable since vehicles in use are often over 4,000 pounds in weight and a small vehicle is as likely to collide with a vehicle of that size as one smaller. The NHTSA considers it important that vehicle fuel systems be designed in such a way as to withstand impacts from vehicles they are exposed to on the road, regardless of the differences in their sizes.

Jeep and American Motors objected to the effective dates of the proposed requirements and asked that they be extended. Jeep favors an effective date not earlier than September 1, 1979, and American Motors favors a September 1, 1978, effective date. The NHTSA denies these requests. It has found that the time period provided for development of conforming fuel systems is reasonable and should be strictly adhered to considering the urgent need for strong and resilient fuel systems.

Several commenters expressed concern over the impact of the prescribed testing procedures on manufacturers of low-volume specialty vehicles. The NHTSA appreciates the expense of conducting crash tests on low-production vehicles, realizing that the burden on the manufacturer is related to the number of vehicles he manufactures. However, there are means by which the small-volume manufacturer can minimize the costs of testing. He can concentrate test efforts on the vehicle(s) in his line that he finds most difficult to produce in conformity with the standard. These manufacturers should also be aware that an exemption from application of the standard is available where fewer than 10,000 vehicles per year are produced and compliance would subject him to substantial financial hardship.

In responding to the petitions for reconsideration of the amendment to Standard No. 301, published August 20, 1973, the NHTSA revised the fuel system loading requirement to specify Stoddard solvent as the fuel to be used during testing. In accordance with that amendment, the proposed requirement that the engine be idling during the testing sequence is deleted. However, electrically driven fuel pumps that normally run when the electrical system in the vehicle is activated shall be operating during the barrier crash tests.

In order to fulfill the intention expressed in the preamble to the proposal, that simultaneous testing under Standards Nos. 208 and 301 be possible, language has been added to subparagraph S7.1.5 of Standard No. 301 specifying the same method of restraint as that required in Standard No. 208. In its response to petitions for reconsideration of Standard No. 301 (39 F.R. 10586) the NHTSA amended the standard by requiring that each dummy be restrained during testing only by means that are installed in the vehicle for protection at its seating position and that require no action by the vehicle occupant.

Suggestions by several commenters that the application of certain crash tests should be limited to passenger cars in order to maintain complete conformance to the requirements of Standard No. 208 are found to be without merit. Enabling simultaneous testing under several standards, although desirable, is not the most important objective of the safety standards. The NHTSA is aware of the burden of testing costs, and therefore has sought to ease that burden where possible by structuring certain of its standards to allow concurrent testing for compliance. It must be emphasized, however, that the testing requirements specified in a standard are geared toward a particular safety need. Application of the tests proposed for Standard No. 301 to all vehicle types with a GVWR of 10,000 pounds or less is vital to the accomplishment of the degree of fuel system integrity necessary to protect the occupants of vehicles involved in accidents.

No major objections were raised concerning the proposed angular frontal barrier crash, lateral barrier crash, or rear moving barrier crash. On the basis of all information available to this agency, it has been determined that these proposed crash tests should be adopted as proposed.

In consideration of the foregoing, 49 CFR 571.301, Motor Vehicle Safety Standard No. 301, is amended to read as set forth below.

Effective date: September 1, 1975, with additional requirements effective September 1, 1976, and September 1, 1977, as indicated.

(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 March 18, 1974.

James B. Gregory
Administrator

39 F.R. 10588
March 21, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301–75

Fuel System Integrity

(Docket No. 73–20; Notice 3)

This notice responds to petitions for reconsideration of the two recent Federal Register notices amending and upgrading Standard No. 301 (39 F.R. 10586; 39 F.R. 10588) and amends the standard in several respects.

On March 21, 1974 two notices were published pertaining to Standard No. 301, *Fuel System Integrity*. One notice (39 F.R. 10586) responded to petitions for reconsideration of an earlier amendment to the standard (38 F.R. 22397), while the other (39 F.R. 10588) substantially upgraded the standard's performance requirements. It was the intention of the NHTSA that the notice upgrading the standard be considered as the final rule and supersede the notice responding to petitions. Hereafter, the notice responding to petitions will be referred to as Notice 1, while the notice upgrading the standard will be referred to as Notice 2.

On October 27, 1974, the Motor Vehicle and Schoolbus Safety Amendments of 1974 (P.L. 93–492) were signed into law. These amendments to the National Traffic and Motor Vehicle Safety Act incorporate Standard No. 301 as it was published in Notice 2 on March 21, 1974. According to the amendment the technical errors which appeared in Notice 2 may be corrected, while future amendments are prohibited from diminishing the level of motor vehicle safety which was established in the notice. The changes contained in this notice conform to these statutory requirements.

Due to an oversight, Notice 2 failed to include two provisions which appeared in Notice 1. The limitation of the standard's application to vehicles which use fuel with a boiling point above 32°F was inadvertently omitted in Notice 2 and is hereby reinstated. Notice 2 also failed to include a provision specifying that vehicles not be altered during the testing sequences. It was the intent of the NHTSA that damage or other alteration of the vehicle incurred during the barrier crashes not be corrected prior to the static rollover tests. The test requirements are therefore amended to prohibit the alteration of vehicles following each of the specified test impacts.

In order to clarify the manner in which the load is to be distributed during testing of multipurpose passenger vehicles, trucks, and buses, S7.1.5(b) is amended to require that when the weight on one of the axles exceeds its proportional share of the loaded vehicle weight, when the vehicle is loaded only with dummies, the remainder of the required test weight shall be placed on the other axle, so that the weight on the first axle remains the same. The loading specification did not specifically address this contingency.

The requirement that the load be located in the load carrying area of multipurpose passenger vehicles, trucks, and buses during testing is deleted since the agency has determined that such a limitation is consistent with the provision specifying distribution of weight in proportion with the vehicle's gross axle weight ratings.

Petitions for reconsideration were received from eleven petitioners. Although only those comments raising issues found to be significant have been discussed, due consideration has been given to all requests. Any requests not specifically discussed herein are denied.

A substantial number of petitioners objected to the requirement that dummies used during testing be restrained only by passive means installed at the seating positions. Petitioners pointed out that mandatory passive restraint systems proposed in Standard No. 208 have a proposed effective date of September 1, 1976; one year after the September 1, 1975 effective date set for implementation of Standard 301. This would leave a period of time when most dummies would be involved in testing while totally unrestrained. Renault, Jeep, American Motors, Mercedes-Benz, General Motors, and Ford requested that the dummies be restrained during testing by whatever means, active or passive, are installed at the particular seating positions. To provide otherwise, they argued, would unnecessarily expose the dummies to costly damage when subjected to impacts in an unrestrained condition.

The NHTSA finds petitioners' objections meritorious. Although this agency has determined that reliable test results can be best obtained when occupant weight is included in the vehicle during crash testing, the manner in which that weight is installed is subject to additional considerations. The NHTSA has made clear its desire to enable simultaneous testing under more than one standard where the test requirements are compatible. Standards 301 and 208 both require frontal and lateral barrier crash tests which can be conducted concurrently if the vehicles are loaded uniformly. Since Standard 208 provides for crash testing with dummies in vehicles with passive restraint systems, Standard 301 testing of these same vehicles should be conducted with dummies installed in the seating positions provided under Standard 208. The presence of the passive restraints will protect the dummies from unnecessary damage and the required testing for compliance with both standards can be accomplished simultaneously. Where a vehicle is not equipped with passive restraints, and Standard 208 testing is not mandated, weight equal to that of a 50th percentile test dummy should be secured to the floor pan at the front outboard designated seating positions in the vehicles being tested.

Further concern over the damage to which test dummies might be exposed was manifested by Jeep and American Motors. They petitioned for the removal of the dummies prior to the static rollover tests, arguing that their presence serves no safety-related purpose. The NHTSA has granted the request, on the basis of its determination that the dummies would have little or no effect on the fuel system's integrity during the rollover segment of the test procedure.

Jeep and American Motors further suggested that the standard specify that hardware and instrumentation be removed prior to the static rollover test in order to prevent its damage. This request is denied as unnecessary. Standard No. 301 contains no specification for the inclusion of instrumentation during testing. Any instrumentation present in the vehicle is there by decision of the manufacturer to assist him in monitoring the behavior of the fuel system during testing, and must be installed and utilized in such a manner as not to affect the test results. Therefore, as long as the loading requirements of the standard are met, manufacturers may deal with their instrumentation in any fashion they wish, as long as the test results are unaffected.

Volkswagen urged that unrestrained dummies not be required during the rear moving impact test, citing the absence of such a test in Standard 208 and alleging that the integrity of vehicle fuel systems would not be greatly affected by the presence of dummies. This request is denied. The rear moving barrier crash specified in proposed Standard 207, *Seating Systems*, provides for the installation of dummies in the same seating positions as required for Standard 301, thus permitting simultaneous conduct of the rear barrier crashes required by both standards. In order to obtain realistic and reliable test results, occupant weight must be in vehicles during Standard 301 crash testing. The NHTSA has determined that unrestrained dummies would have, at most, slight vulnerability to damage during rear barrier crash tests, since the impact is such that the seats themselves serve as protective restraint mechanisms. It has therefore been concluded that the best method for including occupant weight during rear barrier crash testing is with test dummies.

Notice 2 specified that the parking brake be engaged during the rear moving barrier crash test. Ford requested in its petition for reconsideration that this requirement be changed in order to enable simultaneous rear barrier crash testing with Standard 207 which provides for disengagement of the parking brake in its recent proposal. The NHTSA has decided to grant Ford's request. The condition of the parking brake during this test sequence would not so significantly affect the test results as to warrant retention of a requirement that would prevent simultaneous testing.

The Recreational Vehicle Institute objected to the standard, arguing that it was not cost-effective as applied to motor homes. RVI requested that different test procedures be developed for motor home manufacturers. Specifically it objected to what it suggested was a requirement for unnecessary double testing in situations where the incomplete vehicle has already been tested before the motor home manufacturer receives it. RVI expressed the view that the motor home manufacturer should not have to concern himself with compliance to the extent that he must test the entire vehicle in accordance with the standard's test procedures.

The NHTSA has found the requirements of Standard 301 to be reasonable in that they enforce a level of safety that has been determined necessary and provide adequate lead time for manufacturers to develop methods and means of compliance. The National Traffic and Motor Vehicle Safety Act does not require a manufacturer to test vehicles by any particular method. It does require that he exercise due care in assuring himself that his vehicles are capable of satisfying the performance requirements of applicable standards when tested in the manner prescribed. This may be accomplished, however, by whatever means the manufacturer reasonably determines to be reliable. If the final stage manufacturer of a motor home concludes that additional testing by him of the entire vehicle for compliance is unnecessary, and he has exercised due care in completing the vehicle in a manner that continues its conformity to applicable standards, he is under no obligation to repeat the procedures of the standards.

RVI further pressed its contention that the standard is not cost-beneficial by arguing that the agency has not provided specific data indicating a frequency of fuel system fires in motor homes that would justify the costs imposed by the standard.

Sufficient record evidence has been found to support the conclusion that fuel spillage in the types of crashes with which the standard deals is a major safety hazard. The only basis upon which motor home manufacturers could justify the exception of their vehicles from Standard 301's requirements would be an inherent immunity from gasoline spillage. The standard establishes a reasonable test of a vehicle's ability to withstand impacts without experiencing fuel loss. If a motor home is designed in such a way as to preclude the spillage of fuel during the prescribed test impacts, compliance with the standard should present no significant hardship.

Volkswagen challenged the cost-benefit rationale of the more extensive performance requirements contained in Notice 2, and proposed that only the rear barrier crash be retained, if sufficient data exists to support its inclusion. The agency has carefully considered the issues raised in the Volkswagen petition. As discussed earlier, Standard 301 has been designed to allow testing for its requirements with some of the same barrier crash tests that are required by other standards: 208, 204, 212, and 207. This should reduce substantially the costs of testing to Standard 301, especially when viewed on a cost-per-vehicle basis. The NHTSA has concluded that the changes necessary for vehicles to comply with the standard are practicable and that the need for such increased fuel system integrity is sufficient to justify the costs.

The Recreational Vehicle Institute also urged that the effective date for motor homes be delayed 1 year beyond the date set for application of the standard to other vehicles. RVI contends that a uniform effective date for all manufacturers will create serious problems for the motor home manufacturer who will not have complying incomplete vehicles available to him until the effective date of the standard.

The NHTSA finds RVI's argument lacking in merit. Adequate lead time has been provided in Standard 301 to allow final stage manufacturers of multistage vehicles to become familiar with the requirements and to assure themselves that chassis and other vehicle components are available sufficiently in advance of the effective date to enable timely compliance. The availability of complying incomplete vehicles is a situation that should properly be resolved in the commercial dealings between motor home manufacturers and their suppliers. If the motor home manufacturer is unable to obtain complying incomplete vehicles far enough in advance of the standard's effective date, he might, for example, work out an arrangement with his supplier whereby the supplier will provide information relating to the manner in which the incomplete vehicle must be completed in order to remain in compliance with all applicable safety standards. The lead time provided in the standards is planned to take into account the needs of persons at each stage of the manufacturing process, including final stage manufacturers.

Jeep, American Motors, and Toyota urged delays in the implementation of various aspects of the standard. Jeep suggested a new schedule for application of the standard's requirements to multipurpose passenger vehicles, trucks, and buses, stating that the current lead time is insufficient to enable completion of necessary design changes and compliance testing. American Motors requested a 1-year delay in the effective date for the static rollover test in order to allow satisfactory completion of the required Environmental Protection Agency 50,000 mile durability test. Once vehicles have completed required EPA testing and certification, their fuel system components cannot be altered. AMC says that it cannot make the design changes necessary for Standard 301 compliance in time to utilize them in this year's EPA tests. AMC also desires a 2-year delay in the frontal angular, rear, and lateral impact tests, alleging that that constitutes the minimum time necessary to produce designs that comply. Toyota asked for a delay in the frontal angular crash test for all passenger vehicles until 1978, in order to allow them sufficient time to develop a satisfactory means of compliance with the specified performance level.

All of these requests are denied. The lead time that has been provided for compliance with Standard 301 is found adequate and reasonable. The rollover requirements have been in rule form for over a year, and the more extensive requirements were proposed more than 3 years in advance of their effective dates. Considering the urgent need for stronger and more durable fuel systems, further delay of the effective dates is not justified. On the basis of all information available, the NHTSA has determined that development of complying fuel systems can be attained in the time allowed. In addition, Congress has expressed in the recently enacted amendments to the National Traffic and Motor Vehicle Safety Act its decision that the effective dates specified in Notice 2 should be strictly adhered to.

Toyota requested that the requirements of the rear moving barrier crash not be imposed on vehicles with station wagon or hatch-back bodies, alleging difficulty in relocation of the fuel tank to an invulnerable position. The request is denied as the NHTSA has determined that satisfaction of the rear barrier crash requirements by station wagons and hatch-backs is practicable and necessary.

Volkswagen raised several objections in its petition to the static rollover test, including assertions that the test does not reflect real world accidents, and that the test procedure is unclear since the direction of rotation is unspecified.

The NHTSA does not consider these arguments to be germane. It is true that the static rollover test, like any "static" test, is not designed as a simulation of the actual behavior of a vehicle in a dynamic crash situation. It is intended rather as a laboratory method of quantitatively measuring the vehicle properties that contribute to safety in a range of crash situations. The NHTSA has found that a vehicle's performance in the static rollover test is directly related to the fuel system integrity that is the goal of the standard, and is an appropriate means of measuring that aspect of performance.

With regard to the direction of rotation, the NHTSA has stipulated that only a cetrain amount of fuel may escape during a 360° rotation of a vehicle on its longitudinal axis. The vehicle must be capable of meeting this performance level regardless of the direction of its rotation.

British Leyland (in a petition for rulemaking) and Volkswagen requested revision of the aspect of the barrier crash requirement limiting the amount of fuel spillage taking place from impact until motion of the vehicle has ceased. They stated that the current 1-ounce limitation is too difficult to measure in the period while the vehicle is moving and suggested that fuel spillage be averaged over the period from impact until 5 minutes following the cessation of motion.

The NHTSA must deny this request. The purpose of the current limitation on the spillage of fuel during the impact and post-impact motion is to prohibit the sudden loss of several ounces of fuel which might occur, as an example, by the displacement of the filler cap. Simultaneous loss of several ounces of fuel during the impact and subsequent vehicle motion could have a fire-causing potential, because of sparks that are likely to be given off during a skid or metal contact between vehicles.

Chrysler petitioned to have the requirement specifying that the moving barrier be guided during the entire impact sequence deleted in favor of a requirement that would allow the termination of guidance of the barrier immediately prior to impact. They argued that their suggested procedure is more representative of real world impacts.

The request is denied. The condition that there be no transverse or rotational movement of the barrier, which has been in effect since January 1, 1972, eliminates random variations between different tests and therefore makes the standard more repeatable and objective as required by the statute.

Jeep requested clarification that a given vehicle is only required to be subjected to one of the specified barrier impacts followed by a static rollover. This request is granted as it follows the agency's intent and the standard is not specific on that point. Section S6. is amended to require that a single vehicle need only be capable of meeting a single crash test followed by a static rollover.

American Motors submitted a request that the agency finds repetitious of previous petitions, urging that vehicle fluids be stabilized at ambient temperatures prior to testing. In responding to earlier petitions for reconsideration from MVMA and GM in Notice 1, the NHTSA denied a request for temperature specification, stating that it intended that the full spectrum of temperatures encountered on the road be reflected in the test procedure. That continues to be this agency's position.

In light of the foregoing S3., S6., S6.1, S6.3, S7.1.4, and S7.1.5 of Standard No. 301, *Fuel System Integrity*, (49 CFR 571.301) are amended . . .

Effective date: September 1, 1975, with additional requirements effective September 1, 1976 and September 1, 1977, as indicated.

(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 November 15, 1974.

James B. Gregory
Administrator

39 F.R. 40857
November 21, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75

Fuel System Integrity

(Docket No. 73-20; Notice 6)

This notice amends Standard No. 301, *Fuel System Integrity* (49 CFR 571.301), to specify new loading conditions and to establish a 30-minute fuel spillage measurement period following barrier crash tests.

On April 16, 1975, the NHTSA published a notice (40 F.R. 17036) proposing a revision of the loading conditions and fuel spillage measurement period requirement in Standard 301. The NHTSA also proposed in that notice an extension of the applicability of Standard 301 to school buses with a GVWR in excess of 10,000 pounds. At the request of several Members of Congress, the due date for comments on the school bus proposal was extended to June 26, 1975, and final rulemaking action on it will appear in a later Federal Register notice.

It was proposed that the current 15-minute fuel spillage measurement period be extended to 30 minutes in order to allow more time for leaks to be located and rates of flow to be established. Measurement of fuel loss during only a 15 minute time period is difficult because fuel may be escaping from various parts of the vehicle where it is not readily detectable. Chrysler, American Motors, and General Motors objected to the proposed change and asked that it either not be adopted or that adoption be delayed for one year until September 1, 1976.

The commenters argued that the revision was unnecessary and would involve a change in their testing methods. The NHTSA has fully considered these arguments and does not consider the amendment to prescribe a higher level of performance. It concludes that the 30-minute measurement period is necessary to achieve accurate measurement of fuel loss and assessment of vehicle compliance and accordingly amends Standard 301 to prescribe the longer period for measurement.

The April 16, 1975, notice also proposed a change in the Standard 301 loading conditions to specify that 50th percentile test dummies be placed in specified seating positions during the frontal and lateral barrier crash tests, and that they be restrained by means installed in the vehicle for protection at the particular seating position. Currently the standard requires (during the frontal and lateral barrier crash tests) ballast weight secured at the specified designated seating positions in vehicles not equipped with passive restraint systems. In vehicles equipped with passive restraints, 50th percentile test dummies are to be placed in the specified seating positions during testing.

In petitions for reconsideration of this amendment to Standard No. 301 (39 F.R. 40857) various motor vehicle manufacturers stated that attachment of such ballast weight to the vehicle floor pans during the barrier crashes would exert unrealistic stresses on the vehicle structure which would not exist in an actual crash. The NHTSA found merit in petitioners' arguments, and its proposed revision of the loading conditions is intended to make the crash tests more representative of real-life situations.

Only Mazda objected to the proposal. It argued that curb weight be prescribed as the loading condition so that it could conduct Standard 301 compliance testing concurrently with testing for Standards No. 212 and 204. The NHTSA does not find merit in Mazda's request as the Standard 301 loading condition is considered necessary to assure an adequate level of fuel system integrity. Since the proposed loading conditions are more stringent than a curb weight condition, manufacturers could conduct compliance testing for Standards 301, 212, and 204 simultaneously. If the vehicle complied with the requirements of Standards 212 and 204 when loaded according to 301 specifications, the manufacturer presumably could certify the capability of the vehicles to comply with the performance requirements of 212 and 204 when loaded to curb weight. It should be noted that the NHTSA is considering amending Standards 212 and 204 to specify the same loading conditions as proposed for Standard 301.

All other commenters supported immediate adoption of the proposed loading conditions. Therefore, the NHTSA adopts the loading conditions as they were proposed in the April 16, 1975, notice.

In consideration of the foregoing, S5.5 and S7.1.6 of Motor Vehicle Safety Standard No. 301, *Fuel System Integrity* (49 CFR 571.301), are amended to read as follows:

Effective date: Because this amendment revises certain requirements that are part of 49 CFR 571.301-75, Motor Vehicle Safety Standard 301-75, effective September 1, 1975, and creates no additional burden upon any person, it is found for good cause shown that an effective date of less than 180 days after 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 August 1, 1975.

Robert L. Carter
Acting Administrator

40 F.R. 33036
August 6, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301–75

Fuel System Integrity

(Docket No. 73–20; Notice 7)

This notice responds to a petition for reconsideration of the notice published August 6, 1975 (40 FR 33036), which amended Standard No. 301, *Fuel System Integrity* (49 CFR 571.301), to specify new loading conditions and establish a 30-minute fuel spillage measurement period following a barrier crash test.

American Motors Corporation (AMC) has petitioned for reconsideration of the amendment to S5.5 of Standard No. 301 insofar as it establishes an effective date of September 1, 1975, for the 30-minute fuel spillage requirement. AMC requests that the effective date for the 30-minute fuel spillage measurement time be delayed for 180 days from the date of publication of the rule.

The NHTSA has determined that AMC's petition has merit. AMC argues that the imposition of an effective date 25 days after the publication of the rule is burdensome because the 30-minute spillage requirement is a more stringent requirement than the previous 15-minute requirement and therefore requires additional testing to determine compliance. The NHTSA agrees that 25 days is not enough time to complete the additional testing. However, the effective date will be postponed 12 months instead of the 6 months requested by AMC so that manufacturers will not have to conduct compliance testing for 1976 model vehicles already certified under the old 15-minute spillage requirement. For these reasons the petition of American Motors Corporation is granted.

In S5.5 of Standard No. 301, *Fuel System Integrity*, (49 CFR 571.301), the amendment of August 6, 1975 (40 FR 33036), changing the term "10-minute period" to "25-minute period" effective September 1, 1975, is hereby made effective September 1, 1976.

(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 October 3, 1975.

Gene G. Mannella
Acting Administrator

40 F.R. 47790
October 10, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75

Fuel System Integrity

(Docket No. 73-20; Notice 8)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 301, *Fuel System Integrity* (49 CFR 571.301) to extend the applicability of the standard to school buses with a GVWR in excess of 10,000 pounds. The amendment specifies conditions for a moving contoured barrier crash for school buses in order to determine the amount of fuel spillage following impact.

On October 27, 1974, the Motor Vehicle and Schoolbus Safety Amendments of 1974, amending the National Traffic and Motor Vehicle Safety Act, were signed into law (Pub. L. 93-492, 88 Stat. 1470). Section 103(i)(1)(A) of the Act, as amended, orders the promulgation of a safety standard establishing minimum requirements for the fuel system integrity of school buses. Standard No. 301 currently contains requirements for school buses with a GVWR of 10,000 pounds or less which will become effective beginning September 1, 1976. Larger school buses, which comprise approximately 90 percent of the school bus population, will be included in Standard No. 301 by this amendment.

A proposal to amend Standard No. 301 with respect to school buses, loading conditions, and spillage measurement time was published on April 16, 1975 (40 FR 17036). An amendment to the Standard specifying certain loading conditions and establishing a 30-minute fuel spillage measurement period was published on August 6, 1975 (40 FR 33036). At the request of several members of Congress, the period for comments on the school bus proposals was extended. This notice responds to the comments received with respect to the inclusion of school buses within the requirements of the standard.

Seven manufacturers opposed the requirement of a single impact test by a moving contoured barrier at any point on the school bus body, arguing that such a requirement would necessitate a proliferation of expensive tests in order to ensure compliance at every conceivable point of impact. The NHTSA does not agree. Although not specifying a particular impact point, the test condition allows for testing at the few most vulnerable points of each kind of school bus fuel system configuration. Therefore, only impacts at those points are necessary to determine compliance. On the basis of its knowledge of the bus design, a manufacturer should be able to make at least an approximate determination of the most vulnerable points on the bus body.

Two school bus body manufacturers requested a requirement that the manufacturer who installs the fuel system be responsible for compliance testing, while one chassis manufacturer argued that responsibility for compliance should rest with the final manufacturer. In most cases, if the basic fuel system components are included in the chassis as delivered by its manufacturer, the multistage vehicle regulations of 49 CFR Part 568 require the chassis manufacturer at least to describe the conditions under which the completed vehicle will conform, since it could not truthfully state that the design of the chassis has no substantial determining effect on conformity. Beyond that, however, the NHTSA position is that the decision as to who should perform the tests and who should take the responsibility is best not regulated by the government. The effect of Part 568 is to allow the final-stage manufacturer to avoid primary responsibility for conformity to a standard if it completes the vehicle in accordance with the conditions or instructions furnished with the incomplete vehicle by its manufacturer. Whether it does so is a decision it must make in light of all the circumstances.

This notice extends the proposed exclusion for vehicles that use fuel with a boiling point below 32° F. to school buses having a GVWR greater than 10,000 pounds. Fuel systems using gaseous fuels are not subject to the spillage problems against which this standard is directed.

The Vehicle Equipment Safety Commission requested that school buses be required to undergo static rollover tests and that the engine be running during the tests. Upon consideration, the NHTSA finds that a static rollover test for school buses is impractical in light of the expensive test facility that would be required. A requirement that the engine be running during the impact test would make little difference in the resulting fuel spillage. Since the standard requires that the fuel tank be filled with Stoddard solvent during the impact test, the test vehicle would have to be equipped with an auxiliary fuel system for the engine. The expense of modifying the test vehicle to allow the engine to run during the test would not justify the minimal benefits resulting from a requirement that the engine be running. However, the fuel system integrity of school buses will be continually monitored and analyzed by the NHSTA. Therefore, suggestions such as these may be the subject of future rulemaking.

One school bus body manufacturer cited the infrequency of school bus fires resulting from collisions as a reason for ameliorating or eliminating altogether fuel system integrity requirements for school buses. In promulgating these amendments to Standard No. 301, the NHTSA is acting under the statutory mandate to develop regulations concerning school bus fuel systems. This statute reflects the need, evidently strongly felt by the public, to protect the children who ride in the school buses. They and their parents have little direct control over the types of vehicles in which they ride to school, and are therefore not in a position to determine the safety of the vehicles. Considering the high regard expressed by the public for the safety of its children, the NHTSA finds it important that the school bus standards be effective and meaningful.

The California Highway Patrol expressed the concern that these amendments would preempt State regulations to the extent that the State would be precluded from specifying the location of fuel tanks, fillers, vents, and drain openings in school buses. The standard will unavoidably have that effect, by the operation of section 103(d) of the National Traffic and Motor Vehicle Safety Act. However, although a State may not have regulations of general applicability that bear on these aspects of performance, the second sentence of the same section makes it clear that a State or political subdivision may specify higher standards of performance for vehicles purchased for its own use, although of course the Federal standards must be met in any case.

In addition to provisions directly relating to school buses, this notice clarifies the loading condition amendments in the notice of August 6, 1975, by amending S6.1 to provide for testing with 50th percentile dummies. The wording of S6.1 is identical to that of the proposal.

In light of the foregoing, 49 CFR 571.301, Motor Vehicle Safety Standard No. 301, is amended. . . .

Effective date: July 15, 1976, in conformity with the schedule mandated by the 1974 Amendments to the Traffic Safety Act. However, the effective date of the amendment of S6.1 is October 15, 1975. Because the amendment to that paragraph clarifies the revision of certain requirements which became effective September 1, 1975, it is found for good cause shown that an effective date for the amendment of S6.1 less than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 202, Pub. L. 93–492, 88 Stat. 1470 (15 U.S.C. 1392); delegations of authority at 49 CFR 1.51 and 501.8).

Issued on October 8, 1975.

Gene G. Mannella
Acting Administrator

40 F.R. 48352
October 15, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75

Fuel System Integrity

(Docket No. 73-20; Notice 9)

This notice clarifies the effective date of the change in Standard No. 301-75 (49 CFR 571.301-75) from a 15-minute to a 30-minute fuel spillage measurement period following cessation of motion in barrier crash tests.

Until August 1975, S5.4 of Standard No. 301-75 specified a 15-minute fuel spillage measurement period for the barrier crash test requirements that would become effective September 1, 1975. To allow more time for leaks to be located and rates of flow to be established, that period was extended to 30 minutes in Notice 6 (40 FR 33036, August 6, 1975; correction of section numbers at 40 FR 37042, August 25, 1975). Notice 6 set the effective date of the change as September 1, 1975.

In response to a petition for reconsideration filed by American Motors Corporation, the NHTSA in Notice 7 (40 FR 47790; October 10, 1975) delayed for 1 year the effective date of that change, thereby establishing the following scheme: a 15-minute period would be used in applying the standard to vehicles manufactured before September 1, 1976, while a 30-minute measurement period would be used for vehicles manufactured after that date.

In Notice 8, which was published on October 15, 1975 (40 FR 48352), the loading conditions of S6.1 were revised, effective immediately, and the standard was extended to apply to school buses with a GVWR in excess of 10,000 pounds, effective July 15, 1976. Because these amendments were made by republishing the entire text of the standard, it appeared that the effective date of the change from a 15-minute measurement period to a 30-minute measurement period had been advanced from September 1, 1976, to July 15, 1976, for all vehicles. The NHTSA did not intend such an advancement, and this notice amends the standard to reestablish the September 1, 1976, effective date for vehicles other than school buses with a GVWR greater than 10,000 pounds.

The following corrections of Notice 8 are also made: the standard is designated as "Standard No. 301-75" and typographical errors in S6.4 and S7.5.2 are corrected.

In consideration of the foregoing, § 571.301 of 49 CFR Part 571 (Standard No. 301, *Fuel System Integrity*), as published in the issue of October 15, 1975 (40 FR 48352), is redesignated as § 571.301-75 and amended. . . .

Effective dates: As set forth in the standard. Changes indicated in the text of the Code of Federal Regulations should be made immediately.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 108, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392 note); delegation of authority at 49 CFR 1.50.)

Issued on February 25, 1976.

James B. Gregory
Administrator

41 F.R. 9350
March 4, 1976

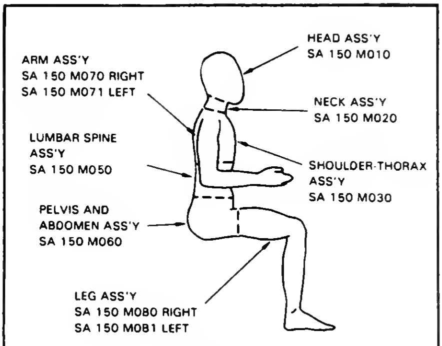


FIGURE NO. 1

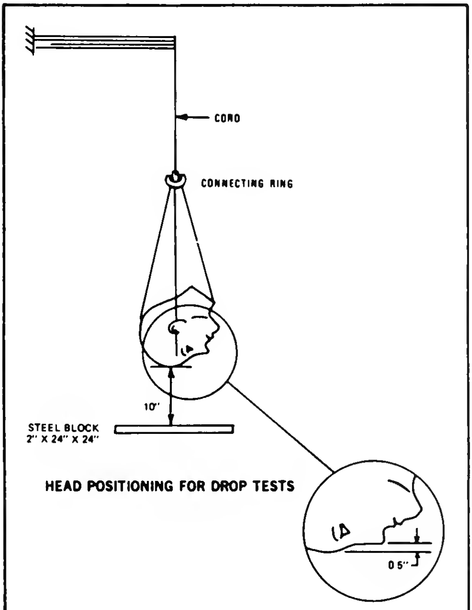


FIGURE NO. 2

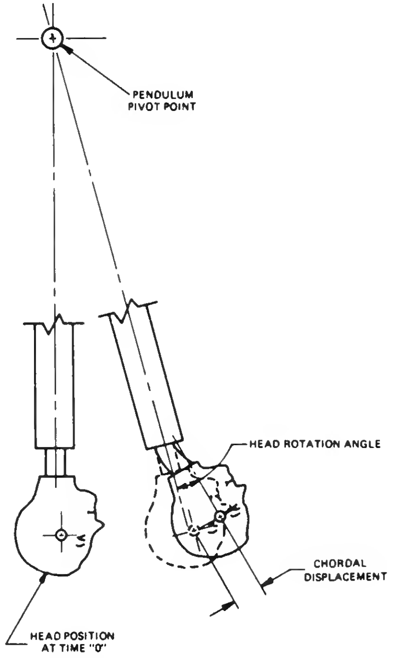


FIGURE NO. 3

NECK COMPONENT TEST

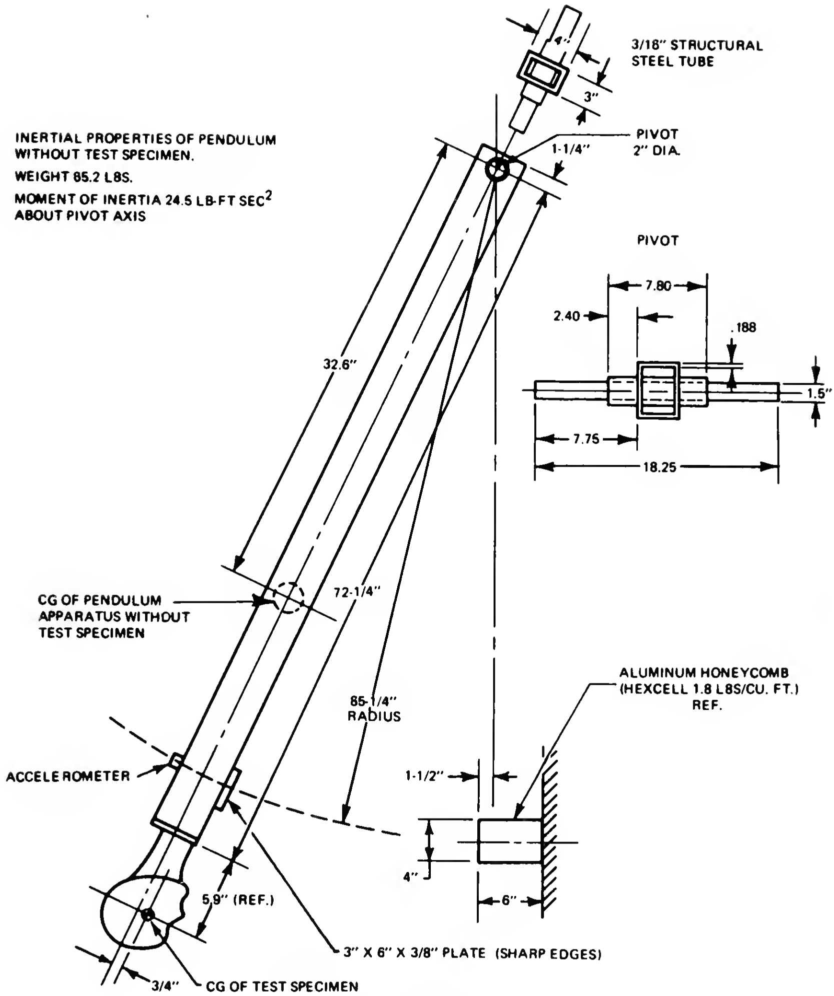


FIGURE NO. 4

NECK COMPONENT TEST

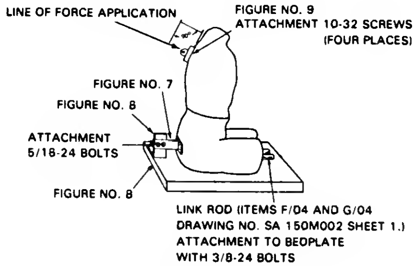


FIGURE NO. 5
LUMBAR FLEXION TEST

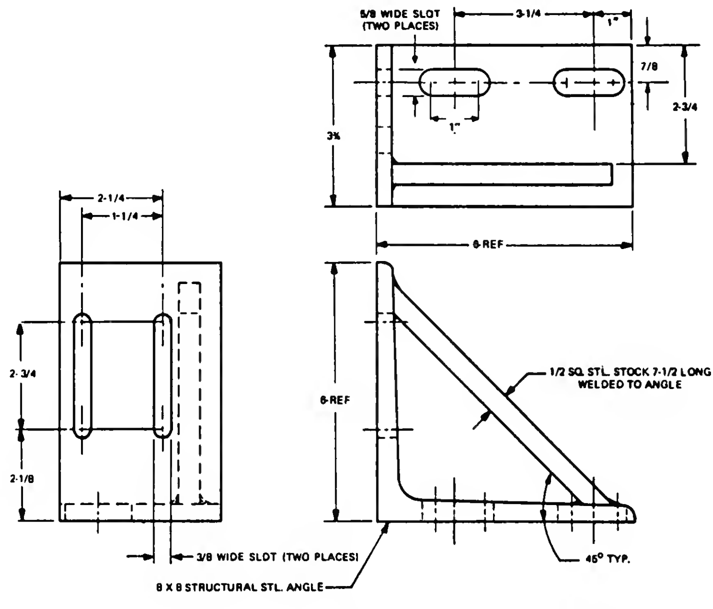
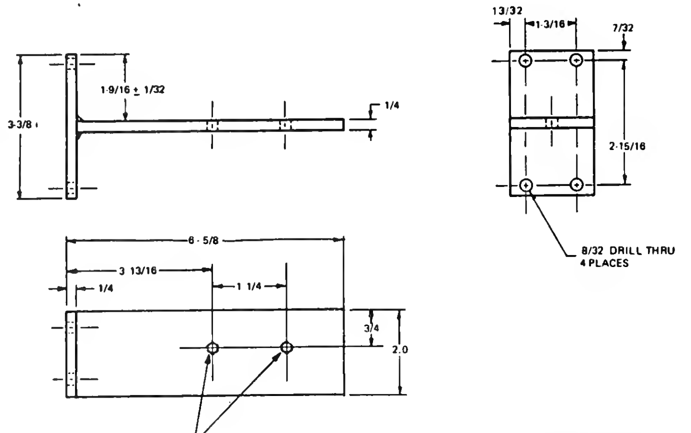


FIGURE NO. 6

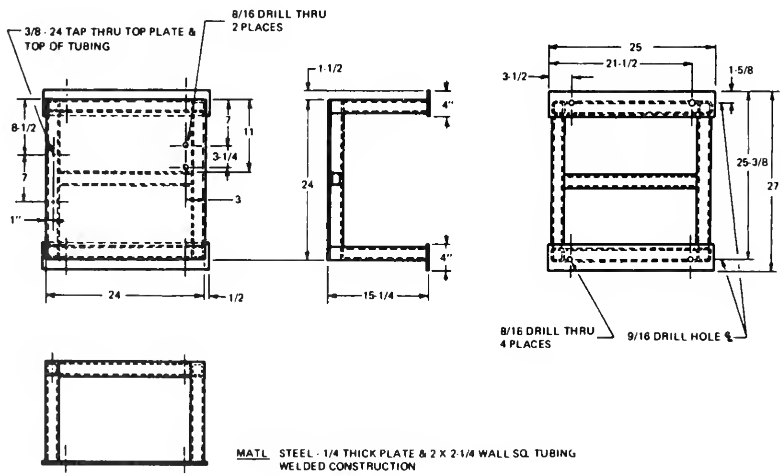
SUPPORT BRACKET
LUMBAR TEST FIXTURE



TOLERANCE ± 1/64"
MATERIAL: STEEL
WELDED CONSTRUCTION

FIGURE NO. 7

MOUNTING BRACKET-LUMBAR TEST FIXTURE



MATL STEEL - 1/4 THICK PLATE & 2 X 2-1/4 WALL SQ. TUBING
WELDED CONSTRUCTION

TOLERANCE ± 1/32"

FIGURE NO 8
BEDPLATE LUMBAR TEST FIXTURE

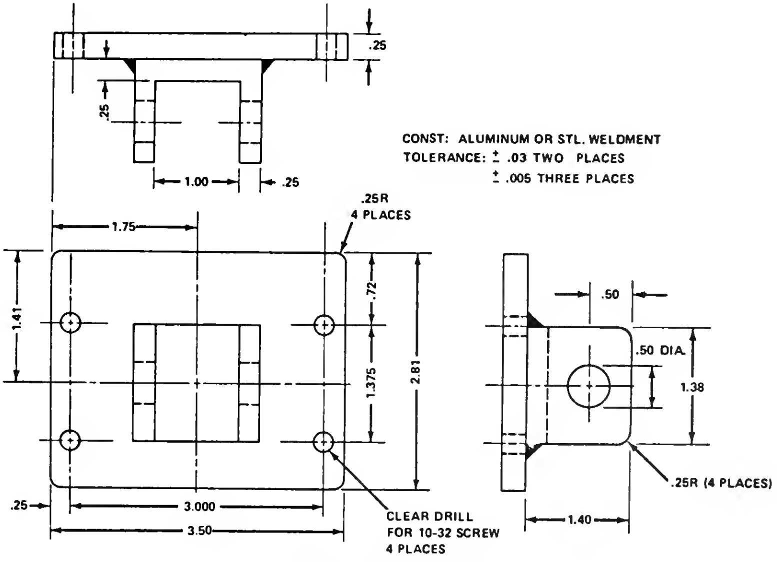


FIGURE 9
Loading Plate- Lumbar Test Fixture

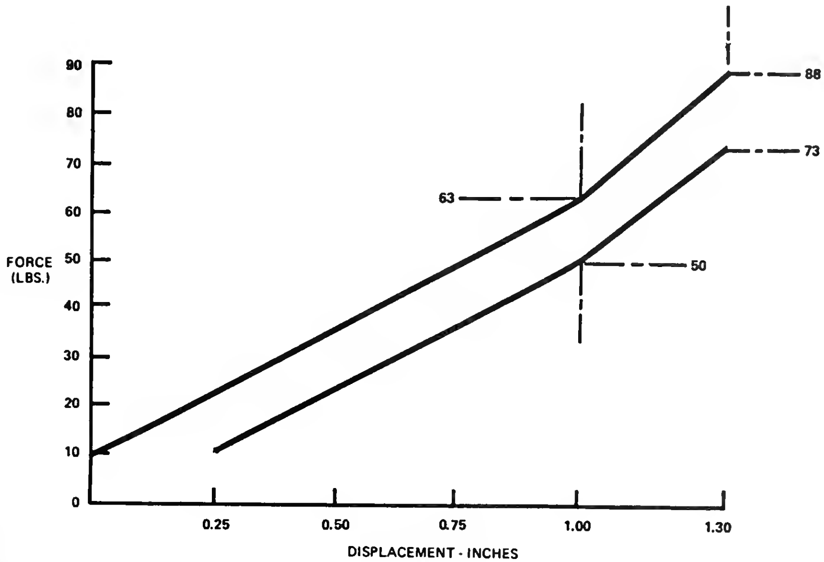


FIGURE NO. 10

ABDOMEN COMPONENT TEST

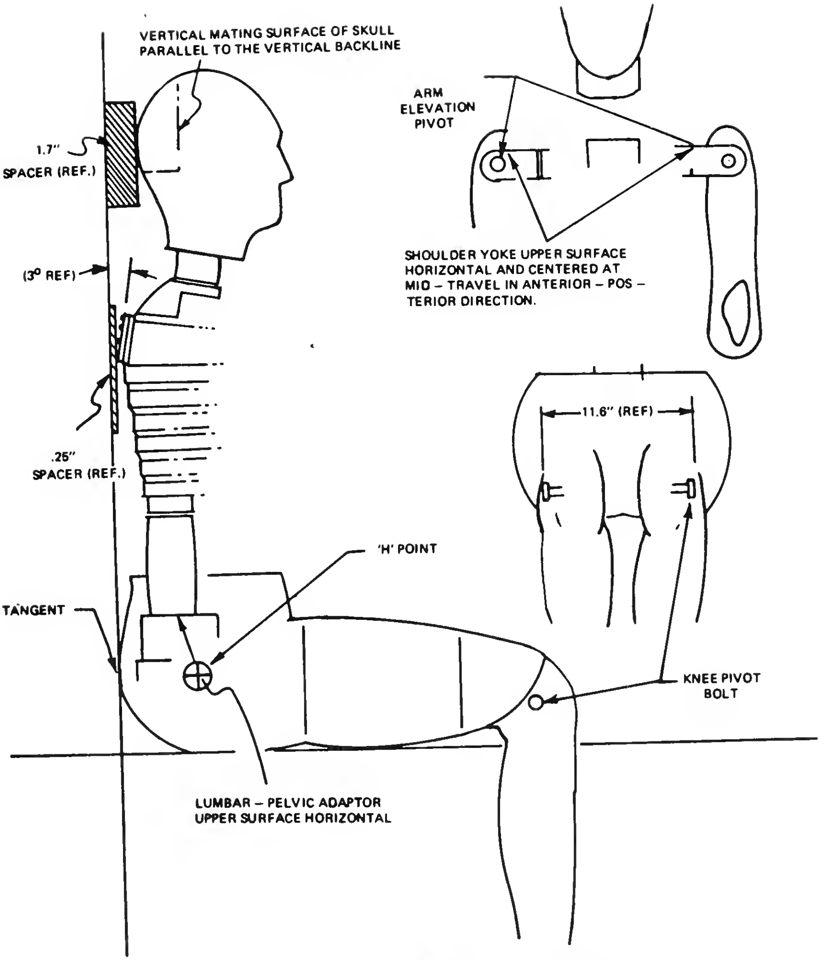


FIGURE No. 11

UPRIGHT SEATED POSITION FOR LINEAR MEASUREMENTS

Space for figures 12 thru 14
reserved for future use.

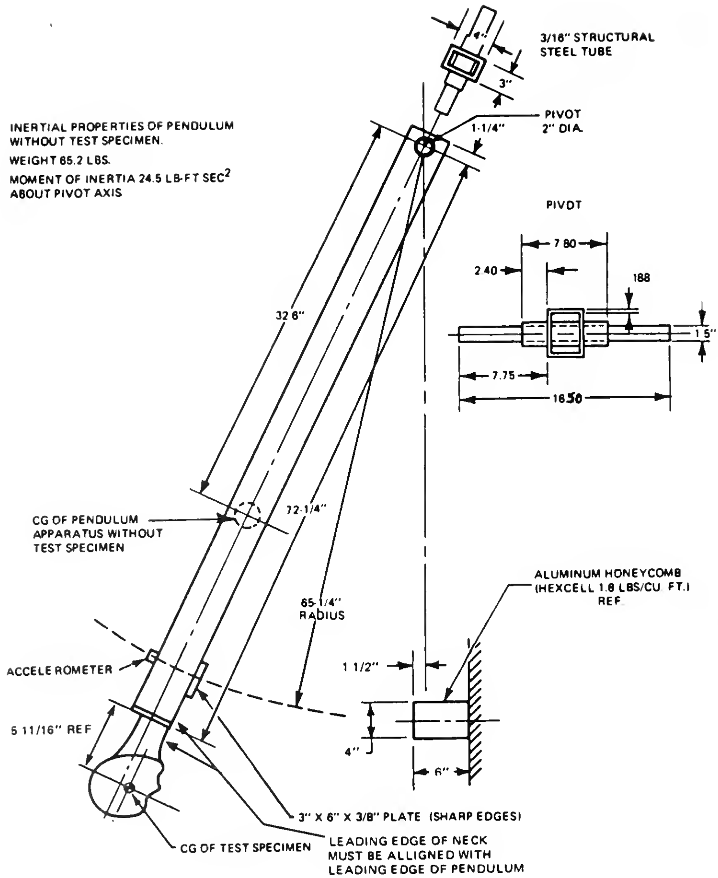


FIGURE NO. 15
NECK COMPONENT TEST

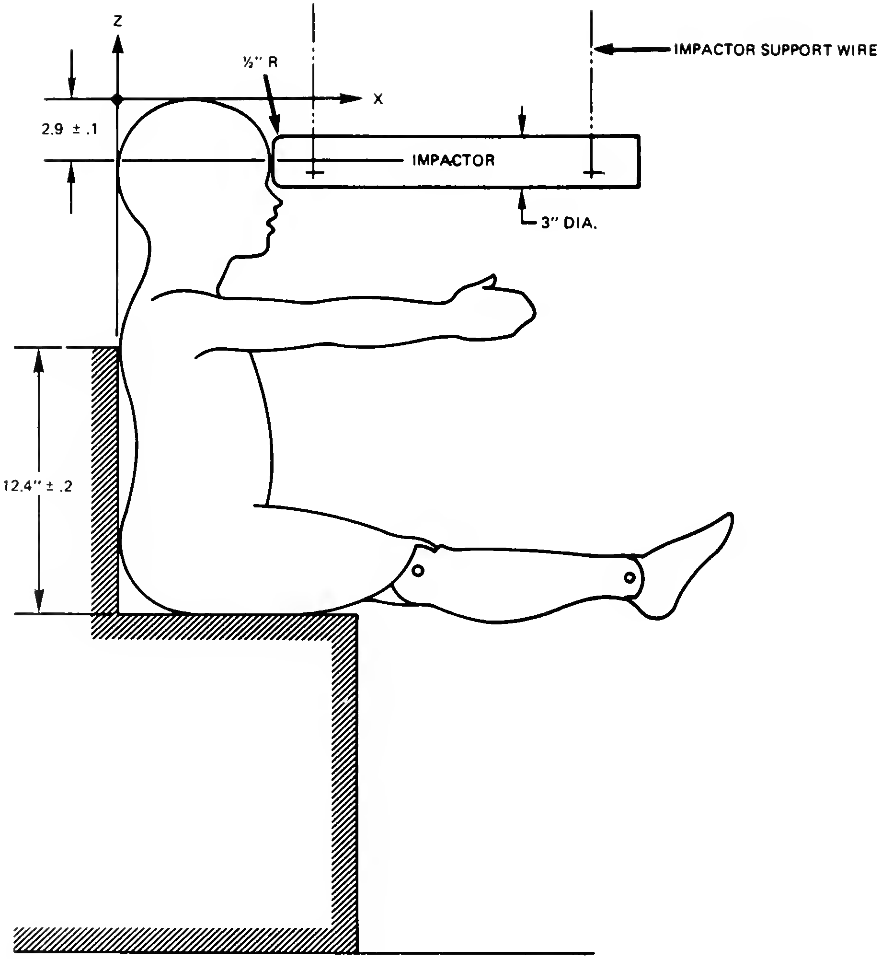


FIGURE NO. 16
HEAD IMPACT TEST

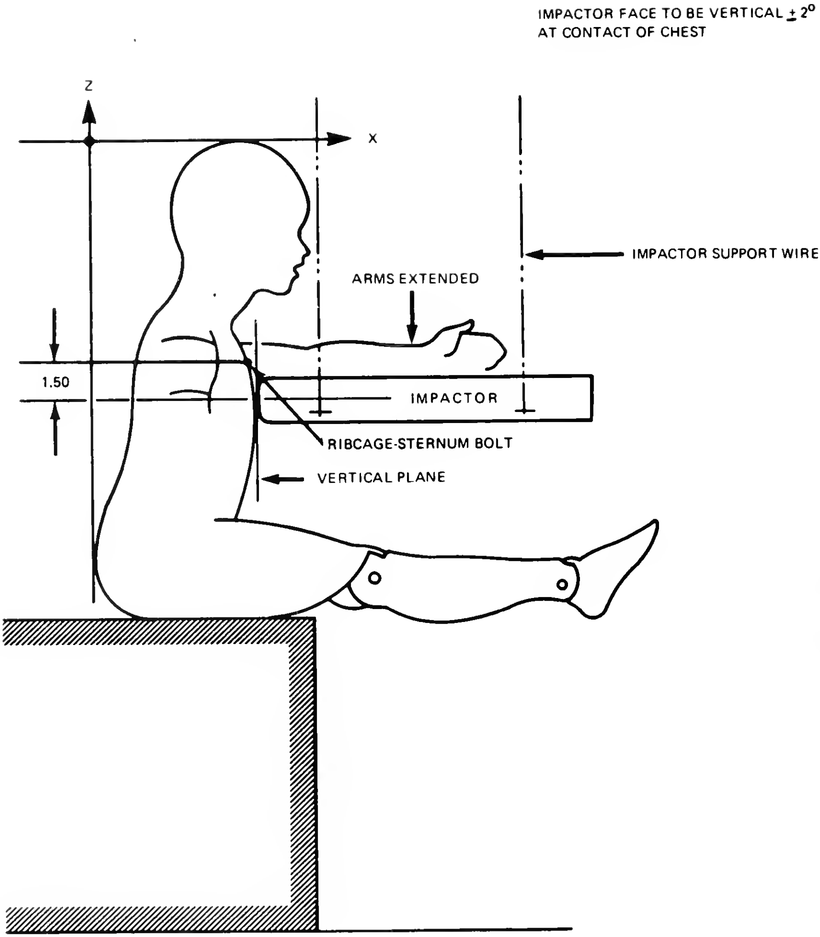


FIGURE NO. 17
CHEST IMPACT TEST

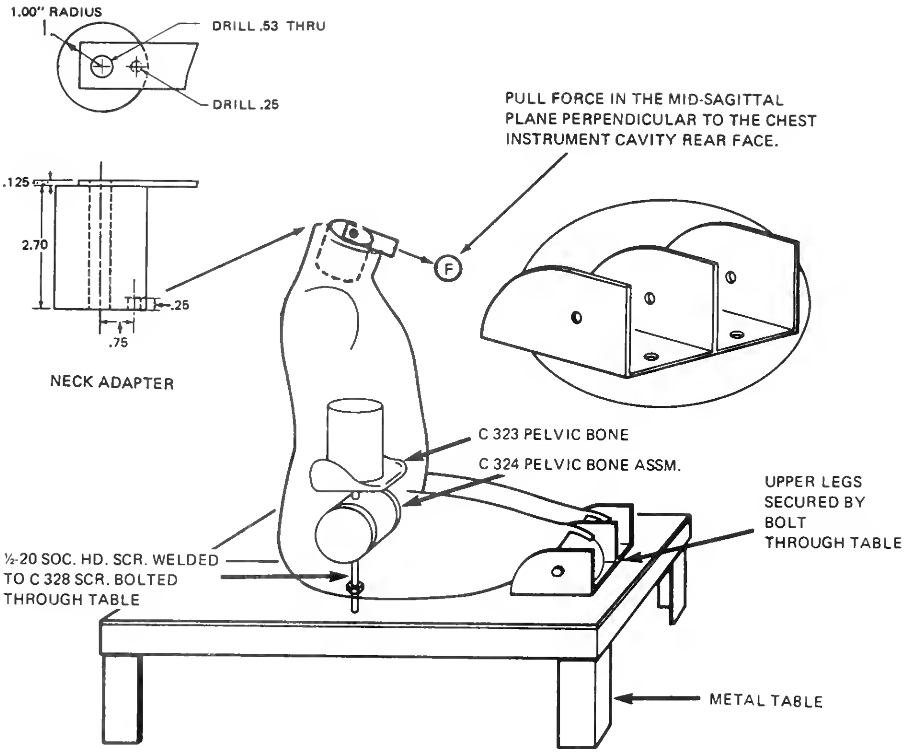


FIGURE NO. 18

LUMBAR-SPINE FLEXION TEST

PREAMBLE TO PART 573—DEFECT REPORTS

(Docket No. 69–31; Notice No. 2)

On December 24, 1969, a notice of proposed rulemaking entitled, "Defect Reports", was published in the *Federal Register* (34 F.R. 20212). The notice proposed requirements for reports and information regarding defects in motor vehicles, to be submitted to the National Highway Traffic Safety Administration by manufacturers of motor vehicles pursuant to sections 112, 113, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1401, 1402, and 1407).

The notice requested comments on the proposed requirements. All comments received have been considered and some are discussed below.

Several comments asked whether both the fabricating manufacturer and the importer of imported vehicles were required to comply with all the proposed requirements. A similar question was asked in regard to manufacturers of incomplete vehicles and subsequent manufacturers of the same vehicles. In response to the comments, § 573.3 provides that in the case of imported vehicles, compliance by either the fabricating manufacturer or the importer of the imported vehicle with §§ 573.4 and 573.5 of this part, with respect to a particular defect, shall be considered compliance by both. In the case of vehicles manufactured in two or more stages, compliance by either the manufacturer of the incomplete vehicle or one of the subsequent manufacturers of the vehicle with §§ 573.4 and 573.5 of this part, with respect to a particular defect, shall be considered compliance by both the incomplete vehicle manufacturer and the subsequent manufacturers.

Many comments requested that the time for the initial filing of the direct information report be increased to allow opportunity for the extensive and complex testing often necessary to determine whether a defect is safety-related. As proposed, the time for initially filing the report was within 5 days after the discovery of a defect that the manufacturer subsequently determined to be safety-related. In response to these comments, § 573.4(b) provides that the report shall be submitted by the manufacturer not more than 5 days after he or the Administrator has determined that a defect in the manufacturer's vehicles relates to motor vehicle safety.

Several comments requested the deletion of one or more items of information proposed for inclusion in the defect information report. Objections to providing an evaluation of the risk of accident due to the defect, a list of all incidents related to the defect, and an analysis of the cause of the defect were based on the ground that the information would be inherently speculative. The proposed requirements for these three items of information have been deleted. In place of the list of incidents, § 573.4(c)(6) requires a chronology of all principal events that were the basis for the determination of the existence of a safety-related defect. In accordance with the deletion of the list of incidents, the provision in the proposal requiring quarterly reports to contain information concerning previously unreported incidents has also been deleted.

Several comments stated that the requirement in the proposal for the submission of a copy of all communications sent to dealers and purchasers concerning a safety-related defect would create an unreasonable burden on the manufacturers. The comments reported that the manufacturers would be required to submit to the Administration a large volume of useless correspondence between the manufacturers and individual dealers or purchasers. To mitigate this problem, § 573.4(c)(8) provides that the manufacturers shall submit to the Administration only those communications that are sent to more than one dealer or purchaser. For the same reason, the requirement in § 573.7 that a manufacturer submit a copy of all communications, other than those required under § 573.4(c)(8), regarding any defect, whether or not safety-related, in his vehicles, is also limited to communications sent to more than one person.

Many comments requested that a regular schedule for submitting quarterly reports be established. They suggested that this be accomplished by requiring that the first quarter for submitting a quarterly report with respect to a particular defect be the calendar quarter in which the defect information report for the defect is initially submitted. As proposed, the first quarter began on the date on which the defect information report was initially submitted. Several of these comments also objected to the proposed requirements for submitting both quarterly reports and annual defect summaries on the ground that the latter would be partially redundant. In response to these comments, the proposed requirement for filing a separate series of quarterly reports for each defect notification campaign has been deleted. Instead, § 573.5(a) requires that each manufacturer submit a quarterly report not more than 25 working days after the close of each calendar quarter. The information specified in § 573.5(c) is required to be provided with respect to each notification campaign, beginning with the quarter in which the campaign was initiated. Unless otherwise directed by the Administration, the information for each campaign is to be included in the quarterly reports for six consecutive quarters or until corrective action has been completed on all defective vehicles involved in the campaign, whichever occurs sooner.

The proposed requirement for filing annual summaries has been deleted. Instead, § 573.5(d) requires that the figures provided in the quarterly reports under paragraph (c) (5), (6), (7), and (8) of § 573.5 be cumulative. In addition, § 573.5(b) requires that each quarterly report contain the total number of vehicles produced during the quarter for which the report is submitted.

Several changes have been made for the purpose of clarification, § 573.4(c)(8) requires that manufacturers submit three copies of the communications specified in that section. In response to questions concerning the use of computers for maintaining owner lists, a reference to computer information storage devices and card files has been added to § 573.6 to indicate that they are suitable. A reference to first purchasers and subsequent purchasers to whom a warranty has been transferred, and any other owners known to the manufacturer, has been added to the same section to make clear that the owner list is required to include both types of purchasers as well as other known owners.

Effective date: October 1, 1971.

Issued on February 10, 1971.

Douglas W. Toms,
Acting Administrator, National Highway Traffic Safety Administration.

36 F.R. 3064
February 17, 1971

PREAMBLE TO AMENDMENT TO PART 573—DEFECT REPORTS

(Docket No. 69-31; Notice 5)

This notice amends the Defect Reports regulation (49 CFR Part 573) to require manufacturers to submit vehicle identification numbers as part of the information furnished by them to the NHTSA. A notice of proposed rulemaking regarding this subject was published November 7, 1972 (37 F.R. 23650).

The purpose of including VIN's in defect reports would be to improve the notification of owners of vehicles involved in safety defect notification campaigns. The State Farm Insurance Company had suggested, for example, that insurance companies could use VIN's to identify vehicles which they insure, and to themselves notify owners of record. The Center for Auto Safety also requested the inclusion of VIN's in defect reports, so it could more readily inform persons who inquire whether particular vehicles were subject to campaigns. Other possible uses, it was noted, would be that State and local inspection facilities could determine, as part of inspection programs, whether particular vehicles had been subjected to campaigns, and if so, whether they had been repaired.

The proposal would have required the submission in the "defect information report" (§ 573.4), within five days of the defect determination, of the vehicle identification number for each vehicle potentially affected by the defect. It also proposed to substitute "line" for "model" as one of the identifying classifications describing potentially affected vehicles.

The comments demonstrated that the vehicle identification number is a useful tool for locating second and later owners of vehicles. In a study conducted by the Ford Motor Company and the State Farm Insurance Company, a fairly significant percentage of owners who either had not received or responded to the initial notification mailed by the manufacturer did respond to subsequent letters sent on the basis of the VIN.

As a result of comments received, however, the NHTSA has decided that vehicle identification numbers should only be required to be supplied in the second "quarterly report", approximately six months after a campaign is initiated, rather than in the defect information report as proposed. Only the VIN's for vehicles not repaired by that date are required to be provided. The NHTSA believes this approach will provide the safety benefits to be derived from having publicly available lists of defective vehicle VIN's and will also reduce duplication and facilitate the agency's efforts to compile and report the information.

The NHTSA requests that vehicle identification numbers be submitted in a form suitable for automatic data processing (magnetic tape, discs, punched cards, etc.) when more than 500 numbers are reported for any single campaign. While not required by this notice, the use of automatic data processing for large campaigns will facilitate the dissemination of the information for the agency. The agency may include specific requirements in this regard at a later time.

The comments argued that the benefits of having VIN's available during the initial stages of a campaign are limited, and that the compilation of identification numbers for every vehicle in a campaign would create significant problems for manufacturers related to conducting campaigns. The NHTSA believes these comments to have merit. It is clear that the chief use of VIN's will be to notify other than first purchasers, *i.e.*, owners of older vehicles, as the names of these owners will not be available to manufacturers. By delaying the furnishing of VIN's until the filing of the second quarterly report, the VIN's reported will represent to a greater degree the names and addresses of second and later owners. The later reporting will also reduce the possibility that first purchasers will receive duplicate notices.

Many comments challenged generally the utility of the VIN in notification campaigns. Other comments complained that insurance companies might abuse the information; for example, by cancelling policies on defective vehicles. Still others believed VIN's to be privileged proprietary information, both taken separately and when combined with other information submitted pursuant to Part 573.

While it is true that the effectiveness of the requirement will depend to an extent upon the voluntary activities of third parties, the NHTSA does not view this as a reason not to issue the requirement. The offers of insurance companies and other groups to participate in notification campaigns appear to be reasonable and properly motivated. There has been no evidence brought to the NHTSA's attention to support the allegations of possible misuse of the information by insurance companies.

The agency also cannot agree that information identifying defective vehicles is or relates to proprietary information. The comments on this point seem to equate what may be embarrassing information with notions of confidentiality. There is no basis under existing statutory definitions of confidentiality for including within them VIN's or other information identifying defective vehicles.

The proposed substitution of "line" for "model" in the descriptive information for vehicles was opposed in one comment because the term "line" is apparently more suited for passenger cars than other vehicle types. The comment indicated that "model" is a more appropriate term for trucks. In light of this comment, the terms are specified as alternatives in the regulation.

In light of the above, Part 573 of Title 49, Code of Federal Regulations, "Defect Reports," is amended. . . .

Effective date: May 6, 1974.

(Sections 103, 112, 113, and 119, Pub. L. 89–563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1402, 1407, and the delegation of authority at 49 CFR 1.51 Office of Management and Budget Approved 04–R5628.)

Issued on January 30, 1974.

James B. Gregory
Administrator

39 F.R. 4578
February 5, 1974

PREAMBLE TO AMENDMENT TO PART 573—DEFECT REPORTS

(Docket No. 69-31; Notice 6)

This notice responds to petitions for reconsideration of the amendment of 49 CFR Part 573, "Defect Reports," requiring the submission to NHTSA of the vehicle identification numbers (VIN) of motor vehicles found to contain safety related defects. The amendment was published February 5, 1974 (39 F.R. 4578). Except insofar as granted by this notice, the requests of the petitioners are denied.

Two petitions for reconsideration, one from General Motors Corporation and the other from Chrysler Corporation, were received. Both petitions objected to the requirement that VIN's be reported in the second quarterly report filed subsequent to the initiation of the defect notification campaign. Both pointed out that the NHTSA had stated in the amendment published February 5, 1974, that it was desirable to defer reporting VIN's until six months had passed from the time a notification campaign had begun. Both petitioners argued that the time for filing the second quarterly report is frequently less than six months, and suggested that the third quarterly report rather than the second was the more appropriate quarterly report to contain vehicle identification numbers. General Motors indicated that the average elapsed time from the initiation of a notification campaign to the filing of the second quarterly report is four and one-half months, while the elapsed time until the filing of the third quarterly report is, on the average, seven and one-half months. The NHTSA still believes it reasonable to allow a six-month period from the initiation of the campaign to elapse before VIN's are submitted. Accordingly, the NHTSA has granted the petitions insofar as they request that VIN's be reported in the third quarterly report submitted to NHTSA by the manufacturer.

Chrysler objected to the VIN reporting requirement generally, on the basis that it is unnecessary and will not produce the desired results. It is requested that an evaluation of the usefulness of the requirement be conducted after it is in effect, and that appropriate modifications be made if the requirement fails to achieve the desired results. General Motors requested that NHTSA maintain a public record of requests for VIN's so that future consideration can be given to the extent that the data is useful, and to whom it is useful. The NHTSA believes that public availability of VIN's will facilitate locating and repairing defective vehicles no longer in the hands of first purchasers. At the same time it agrees to conduct an evaluation of the efficacy of the requirement once it is in effect. The extent of usage is a relevant aspect of an evaluation of this type, and the NHTSA sees no prohibition against maintaining a public record of requests for the information.

The amended regulation will be effective August 6, 1974, and as such will require all third quarterly reports submitted to NHTSA on or after that date to contain appropriate vehicle identification numbers. The effective date has been changed from May 6, 1974, as a result of the change requiring the third rather than the second quarterly report to contain VIN's. As a practical matter, VIN's will be required to be reported in the third quarterly report for all defect notification campaigns initiated on or after January 1, 1974 (NHTSA campaign numbers 74-0001 and subsequent campaigns).

In light of the above, 49 CFR Part 573, Defect Reports, is amended by revising § 573.5(e) . . . .

Effective date: August 6, 1974.

(Secs. 103, 112, 113, and 119, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1402, 1407, and the delegation of authority at 49 CFR 1.51; Office of Management and Budget approved 04-R5628.)

Issued on May 6, 1974.

Gene G. Mannella
Acting Administrator

39 F.R. 16469
May 9, 1974

PREAMBLE TO AMENDMENT TO PART 573—DEFECT REPORTS

(Docket No. 74-7; Notice 2)

This notice amends Part 573—"Defect Reports" by revoking the requirement that manufacturers of motor vehicles report quarterly to the National Highway Traffic Safety Administration production figures for vehicles manufactured or imported during the calendar quarter. A notice of proposed rulemaking in which this amendment was proposed was published January 15, 1974 (39 FR 1863).

The NHTSA is revoking the requirement for the reporting of quarterly production figures because it has found that the value of the information has not justified the burden on manufacturers of providing it. This amendment will eliminate the need for manufacturers to file quarterly reports unless they are conducting notification campaigns during the calendar quarter.

The notice of proposed rulemaking of January 15, 1974, proposed to extend the applicability of the Defect Reports regulations to include manufacturers of motor vehicle equipment, and to modify the information required to be reported. Since the issuance of this proposal, Congress has amended sections of the National Traffic and Motor Vehicle Safety Act which deal with manufacturers' responsibilities for safety related defects in motor vehicles and motor vehicle equipment. (Pub. L. 93-492, Oct. 27, 1974) These amendments to the Safety Act in part enlarge the responsibilities of manufacturers of motor vehicle equipment for safety related defects. Ultimately the Defect Reports regulations will reflect completely the expanded scope of the statutory amendments. While the language of the proposed rule of January 15, 1974, is in most cases sufficiently broad to reflect these statutory changes, the scope of the proposal under the previous language of the Safety Act is materially different. Consequently, the NHTSA has decided to issue a further notice, with opportunity for public comment, that specifically reflects the expanded scope of the statutory amendments. This notice will be issued at some time following the effective date (December 26, 1974) of the statutory amendments.

The NHTSA has determined, however, that relief from the production-figures reporting requirements should not be further deferred, and by this notice deletes those requirements from the Defect Reports regulation.

In light of the above, 49 CFR Part 573, Defect Reports, is amended by revoking and reserving paragraph (b) of section 573.5 ("Quarterly reports").

Effective date: December 10, 1974. This amendment relieves a restriction and imposes no additional burden on any person. Consequently good cause exists and is hereby found for an effective date less than 30 days from publication.

(Secs. 108, 112, 113, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1397, 1401, 1402, 1408; delegation of authority at 49 CFR 1.51)

Issued on December 4, 1974.

James B. Gregory
Administrator

39 F.R. 43075
December 10, 1974

PREAMBLE TO AMENDMENT TO PART 573—DEFECT AND NONCOMPLIANCE REPORTS

(Docket No. 74–7; Notice 4)

This notice amends Part 573, *Defect and Noncompliance Reports*, by adding reporting requirements for equipment manufacturers and altering somewhat the requirements for vehicle manufacturers as authorized by the 1974 Motor Vehicle and Schoolbus Safety Amendments. The amended regulation requires the submission of reports to the agency concerning defects and noncompliance with safety standards and specifies the information to be included in those reports.

Effective date: January 25, 1979.

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

For further information contact:

Mr. James Murray, Office of Defects Investigation, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–2840)

Supplementary information:

This notice amends Part 573, *Defect and Noncompliance Reports.* A notice of proposed rulemaking was published on September 19, 1975 (40 F.R. 43227), proposing new requirements for vehicle and equipment manufacturers regarding submittal to the NHTSA of defect and noncompliance reports as authorized by the Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Amendments) (Pub. L. 93–492).

Sections 151 to 160, or Part B of the Amendments alter the defect notification requirements of the National Traffic and Motor Vehicle Safety Act of 1966 ("the Act") (15 U.S.C. 1381 *et seq.*). These Amendments require manufacturers of motor vehicle replacement equipment to notify purchasers and to remedy any defects or noncompliances following the manufacturer's or the Administrator's determination that the equipment contains either a defect which relates to motor vehicle safety or a noncompliance with an applicable Federal motor vehicle safety standard. Prior to the enactment of these provisions, manufacturers of motor vehicle equipment were responsible under the Act for notification of defects or noncompliances only following a determination by the National Highway Traffic Safety Administrator that the item of equipment contained a safety-related defect or failed to comply (Sec. 113(e), Pub. L. 89–563, 15 U.S.C. 1402).

Comments on the proposal were received from manufacturers, safety organizations, and manufacturer representatives. The Vehicle Equipment Safety Commission did not submit comments. All comments were considered and the most significant ones are discussed below.

I. Scope.

Several manufacturers objected to the scope of the regulation indicating that it exceeded the agency's authority to regulate vehicle and equipment manufacturers. For example, manufacturers alleged that the agency only has authority over safety-related defects and accordingly should restrict the defects mentioned in this section to safety-related defects. Further, many equipment manufacturers apparently thought that they would be required to retain purchaser and owner lists of all vehicles containing items of their equipment.

The intent of this regulation is not to impose upon equipment manufacturers recordkeeping requirements for all equipment that they manufacture. This regulation merely imposes limited recordkeeping requirements for that equipment which is determined to be defective or in noncompliance. In other words, an equipment manufacturer, after discovery of a defect or noncompliance, would ascertain from a vehicle manufacturer the identity of the vehicles and vehicle owners possessing the affected equipment. Notification would then be sent to those owners. The NHTSA would require that the equipment manufacturer retain the records of those sent notice of the defect.

Several manufacturers requested that the agency limit the applicability of this regulation to safety-related defects. They argued that the NHTSA has no authority to require information pertaining to non-safety-related defects. Section 158 of the Act specifically authorizes the agency to require information on any defect, whether or not safety-related, in order to enable it to undertake defect investigations which permit a determination regarding the safety-related nature of the defect. Much of this regulation pertains only to safety-related defects and each section indicates whether it applies to all defects or only those that are safety related.

II. Application.

Many manufacturers complained about the use of the term "direct control" in Section 573.3(a). Some manufacturers contended that the use of the term was unnecessary. Importers contended that they should not be required to submit reports where a defect is identified before the vehicles leave their direct control since the Act considers them to be manufacturers and they would be in direct control of vehicles being imported. The Center for Auto Safety would have the agency drop the term and replace it with "beyond their place of final manufacture."

In the notice of proposed rulemaking, the NHTSA indicated the reasoning for excluding vehicles and equipment within the "direct control" of the manufacturer from the reporting requirements. Vehicles and equipment within the direct control of manufacturers are virtually assured of remedy of any defect or noncompliance, because they are still within the physical possession of the manufacturer. In the NPRM it was noted that direct control does not include in the possession of a dealer or distributor. For vehicles and equipment possessed by those entities, reports concerning defects or noncompliance would be required to be submitted to the agency. The agency declines to adopt the suggestion of the Center for Auto Safety for reasons explained in the NPRM. The phrase "beyond the place of final manufacture" is not broad enough to handle all instances where vehicles are still within the direct control of the manufacturer. For example, vehicles might be stored on a manufacturer's lot far removed from the place of manufacture. Nonetheless, these vehicles are still within the direct control of the manufacturer. Therefore, the agency concludes that the term "direct control" best accomplishes the objective of providing a limited exclusion from the reporting requirements. The agency agrees with importers that since they are considered manufacturers under the Act, vehicles that manifest defects while they are within their direct control are excluded from the reporting requirements.

Some manufacturers apparently misunderstood the requirements of Section 573.3(d). Manufacturers indicated that reports should be required to be filed either by the brand name owner or the manufacturer, not by both. The section as written permits this. Compliance with the reporting requirements by the brand name owner shall be considered compliance by the manufacturer. Either one is permitted to submit the required reports. The Act treats tire brand name owners as manufacturers. Therefore, the wording of this section has been changed to reflect the responsibility of tire brand name owners.

Several commenters requested that the name of fabricating manufacturers not be submitted since this might cause competitive disadvantage to the brand name or trademark owner. The NHTSA finds it a legitimate need to know the actual manufacturer of a product. That manufacturer could, for example, be manufacturing the same or similar components for other brand name or trademark owners. The agency would need this information to ensure that all potentially defective or noncomplying equipment is remedied.

Many manufacturers complained of the requirements in Section 573.3(f) that reports be filed both by the equipment manufacturer and the vehicle manufacturer where an equipment manufacturer's equipment has been used by more than one vehicle manufacturer. Manufacturers stated that this requirement is duplicative and costly, providing identical information from both sources. The NHTSA stated in the NPRM that this issue had been thoroughly considered prior to the issuance of the NPRM. It has again been explored by the agency in response to these comments and the agency concludes that the dual reporting requirement for the 573.5 report is necessary. Reports submitted by equipment and vehicle manufacturers will have different information in them. In both cases, the information is of importance to the agency in pursuing its defects and noncompliance obligations. Therefore, this requirement has been retained. It should be reaffirmed for clarity that where an equipment manufacturer's equipment is used in vehicles of only one vehicle manufacturer, reports need only be submitted by that vehicle manufacturer.

On a related matter, the NHTSA agrees that reports required under Section 573.6 need not be filed by both vehicle and equipment manufacturers. These reports need only be filed by the manufacturer undertaking the recall. Section 573.3(f) has been amended to reflect this change.

Other commenters on this section indicated their disapproval of the shared responsibility for remedying defects and noncompliance between vehicle and equipment manufacturers. Section 573.3 places certain reporting responsibilities upon both equipment and vehicle manufacturers, depending upon the nature of the defect. For the most part, vehicle manufacturers are responsible for reports relating to defects or noncompliance in their vehicles while equipment manufacturers are responsible for reports on their defective or noncomplying equipment. In those instances where a defect or noncompliance is discovered in equipment installed in the vehicles of more than one vehicle manufacturer, both the equipment and vehicle manufacturers must report. Equipment manufacturers suggested that vehicle manufacturers should be responsible for defects and noncompliance reports while vehicle manufacturers want to place the burdens upon equipment manufacturers. The NHTSA adopted the present scheme of shared responsibility between vehicle and equipment manufacturers for compliance with agency regulations in response to the 1974 Amendments. Congress indicated in those amendments that equipment and vehicle manufacturers should share the burden of remedying defects in their equipment and vehicles. The NHTSA concludes that the reporting requirements outlined in this regulation implement the basic intent of those Amendments.

III. Definitions.

Many commenters objected to the definitions of original and replacement equipment. Further, some of these commenters indicated that the NHTSA had little, if any, authority to place responsibility on an original equipment manufacturer, since Section 159 of the Act makes the vehicle manufacturers responsible for original equipment. The NHTSA has deleted the definitions of original and replacement equipment from Part 573 since both terms are defined in Part 579. The NHTSA notes that with respect to the authority to place responsibility for defects or noncompliance upon original equipment manufacturers rather than the vehicle manufacturer, Section 159 states that the Act's defect and noncompliance scheme of responsibility shall be controlling unless otherwise provided by regulation. Therefore, the NHTSA does have the authority to shift the responsibility from the vehicle manufacturer to the equipment manufacturer if it determines that such alteration will advance the efficiency of enforcement actions. Part 579, *Defect and Noncompliance Responsibility*, outlines the responsibilities of the various manufacturers and defines "replacement" and "original" equipment.

Commenters also requested that the agency define the term "safety-related defect" so as to clarify the agency's intent in this area. The NHTSA has in the past rejected requests to establish a specific definition of safety-related defect. Whether or not a defect is safety-related depends upon a variety of factors and must be ascertained based upon the circumstances of each separate case. Thus, a specific definition cannot feasibly be created.

Ford Motor Company argued that the agency's preambular discussion tended to indicate that the definition of "first purchaser for purposes other than resale" would include the dealer or distributor. This was not the intent of the regulation. "First purchaser" is based on a similar statutory term and has been used by the agency for years with a specific meaning. The first purchase occurs where the purchaser does not buy the vehicle with the purpose of reselling it. Obviously, sale of a vehicle to a dealer presupposes that the dealer intends to resell the vehicle to the ultimate consumer or purchaser. Therefore, sale to a dealer would not constitute the sale to the first purchaser for purposes other than resale. The use of the term first-purchaser list in the preamble of the proposal in reference to the lists required to be retained by equipment manufacturers was a colloquial use of the term rather than its more precise meaning under the Act.

IV. Defect and noncompliance information reports.

Prestolite Company interpreted the requirements of Section 573.5(a) to mean that they would be required to file a report with the NHTSA every time a defective piece of equipment was brought to their attention, since there is no specific definition of safety-related defect. This they suggested would be a burdensome requirement. Such a requirement is not the intent of this regulation. A manufacturer submits a report to the NHTSA when either it or the agency makes a determination under Section 151 or 152 of the Act that a defect related to motor vehicle safety in fact exists. A failure of a single piece of equipment may not occasion the finding of a safety-related defect. Further, some equipment failures might have no adverse safety effects. Therefore, every failure of equipment will not necessarily require a report to the NHTSA. It is incumbent upon the agency and each manufacturer to make a good faith determination concerning the safety relatedness of any defect before a report under this paragraph is filed.

International Harvester (IH) suggested that a manufacturer should not have to file a report if it intends to file a petition for inconsequentiality. The NHTSA does not agree with this position. The agency needs to know of potential safety-related defects or noncompliances at the earliest possible time. If a manufacturer intends to file a petition for inconsequentiality, it should indicate such in the report as part of the information supplied in accordance with subparagraph (c)(8).

Many manufacturers objected to the 5-day requirement in Section 573.5(b) under which information must be submitted within 5 working days after a safety-related defect or noncompliance has been discovered. Manufacturers suggested increasing the number of working days and changing the word "submitted" to "mailed." Ford requested that the 5-day period not begin until written notification is received from the NHTSA for agency-initiated determinations.

The agency does not find persuasive arguments for altering the existing 5-working day requirement. The NHTSA needs this information as rapidly as possible to aid expeditious notification and recall. Not all information need be supplied within the 5 working days if some of it is unavailable. The regulation clearly states that any unavailable information would be submitted later as it becomes available. The NHTSA also considers it unnecessary to change the word "submitted" to "mailed." The term "submitted" is broader than "mailed." Information may be submitted by mailing it or delivering it to the agency in person. If mailed, it must be mailed within 5 working days.

With respect to the alleged insufficient time to prepare information in 5 working days, the NHTSA notes that this requirement has existed in Part 573 for several years. Since the requirement has operated smoothly for that period of time, the agency declines to adopt recommendations that would change it.

The NHTSA declines to adopt Ford's recommendation concerning agency-initiated determinations. Agency initiated defect or noncompliance determinations are made after thorough investigations conducted by the NHTSA. A manufacturer is aware of these ongoing investigations, and therefore, it should not be unnecessarily burdened or surprised when the NHTSA makes a determination. Since the need for expeditious action exists after an agency determination and the manufacturer is aware of a pending agency decision, the NHTSA considers it adequate that a manufacturer submit the report in 5 working days after receipt of either written or oral agency notification.

Several equipment manufacturers contended that the requirements of paragraph (c)(2) would impose additional burdens upon them to mark the equipment that they manufacture. Paragraph (c)(2) requires defect and noncompliance reports to contain certain information that identifies the defective or noncomplying equipment. For example, they argued that the requirements for the date of manufacture of the affected equipment would be burdensome since much of their equipment is not dated according to time of manufacture. Therefore, they suggested that the NHTSA only require date of manufacture information when it is known.

It is important to remember that Part 573 is for the most part a reporting regulation. It is not a recordkeeping or labeling regulation. A manufacturer, under the regulation, only supplies to the NHTSA that information which is available to it. In the case of date of manufacture of equipment, the equipment manufacturer in most instances need not label its equipment in such a manner as to identify its date of manufacture. The regulation merely directs a manufacturer to supply such information to the NHTSA in its reports. Obviously, if a manufacturer does not know the dates of manufacture, it would be unable to supply them to the agency. However, a manufacturer must supply the approximate dates of manufacture if that information is available.

Manufacturers should note that the manufacturing date requirement is included in the regulation for the benefit of the equipment manufacturer. If that manufacturer knows the approximate dates when a defective piece of equipment was produced, then its recall can be limited to equipment manufactured during those dates. On the other hand, a manufacturer without such information might be required to undertake a more extensive recall of its equipment to ensure that all defective products are recalled.

The Center for Auto Safety requested that the NHTSA require motor vehicle manufacturers to submit the vehicle identification numbers (VIN) of vehicles involved in any recall activity. The NHTSA does not require this information in the Part 573.5 reports because the agency normally has no need at the time of the reports issuance for such information. The agency does require the VIN's to be submitted in the Part 573.6 reports for those vehicles that are uncorrected in a manufacturer's recall. In these instances, the agency uses the information to supplement a manufacturer's recall efforts. Until such time as a manufacturer determines that some vehicles are uncorrected however, the agency usually has little use for VIN information on all recalled vehicles. In those limited instances when VIN information is necessary at the time of submission of the Part 573.5 report, the agency has the ability to request it from a manufacturer.

In regard to paragraph (c)(3), several manufacturers objected to the requirement that the precise number of vehicles or equipment in each category be reported. These manufacturers stated that often this information is not known. The NHTSA agrees and therefore modifies the section to require the submittal of this information when it is known. Chrysler suggested that the agency require the numbers of affected vehicles to be submitted by GVWR breakdown rather than by model. The agency disagrees with this recommendation since it usually undertakes recalls based upon model classification, not upon GVWR categories. Therefore, the submission of information based upon a GVWR classification would not be as useful as a classification based upon vehicle model.

Atlas Supply Company suggested that the agency not require the information specified in paragraph (c)(4) since, for tire manufacturers, tires are destroyed, making the required calculations difficult. Paragraph (c)(4) requires the provision of information that estimates the percentage of defective or noncomplying equipment on vehicles. The NHTSA considers estimates of the amount of affected vehicles or equipment to be necessary to obtain an idea of the scope of the defect or noncompliance problem. Since the section merely requires an estimate, the agency does not consider this to place a difficult burden upon manufacturers.

Many manufacturers complained about the requirements of paragraph (c)(6) which requires the submission of information upon which the determination was made that a safety-related defect exists. These manufacturers indicated that it would impose unreasonable burdens upon manufacturers by requiring them to retrieve a large amount of information in a short period of time and to retain vast amounts of data. The intent of this section is to provide a summary to the NHTSA of the information upon which a manufacturer based his defect determination. This information, since it has been used by a manufacturer for its determination of a defect, should be readily available to it. The NHTSA notes that the submission of summary information is intended to reduce a manufacturer's burdens. However, the specificity and clarity of information must be maintained, and the agency might require further information if the summary information is inadequate. The NHTSA has reworded the paragraph somewhat to indicate that it is only necessary to submit a summary of the information upon which the determination was based.

Several manufacturers suggested that the requirement for submission of noncompliance test data in paragraph (c)(7) would require them to conduct tests and submit details of test procedures to the agency. This paragraph requires only that manufacturers supply the results and data of tests, if any are conducted, upon which a noncompliance determination was based. Test procedures need not be submitted. If a noncompliance determination is made on information other than tests, then that information would be submitted.

Manufacturers claimed that they would be unable to submit a plan for remedy as required by paragraph (c)(8) in the required 5 working days. The NHTSA needs to have an indication of a manufacturer's plan for remedy as soon as possible. Like all of the information required by this section, the plan need not be extensively detailed in the initial 5-working day period and is subject to modification if subsequent circumstances warrant a change. In other words, a manufacturer is not binding itself to only those items established in the plan submitted during the first 5 days after a defect or noncompliance has been determined to exist. The NHTSA has amended the wording of this paragraph somewhat to indicate that a copy of a manufacturer's plan for remedying a defect or noncompliance will be made public in the NHTSA docket.

The Center for Auto Safety argued that paragraph (c)(9) should require actual copies of the defect or noncompliance notice bulletins or communications, not representative copies. The reason the NHTSA used the terminology contained in the notice is that in some instances a manufacturer has a multiple mailing of one communication. To require actual copies of multiple mailings would require copies of each of these identical communications. Therefore, the agency allows a representative copy (e.g., one actual copy) of such information. The NHTSA concludes that this requirement fulfills the agency's need for accurate copies.

V. Quarterly defect reports.

Many manufacturers disagreed with the agency's scheme for quarterly defect reports outlined in Section 576.6. Equipment manufacturers suggested that vehicle manufacturers should be responsible for these reports, while vehicle manufacturers asserted that the equipment manufacturers are better able to accomplish the reporting requirements. The NHTSA requires any manufacturer, either vehicle or equipment, undertaking a recall to comply with the quarterly reporting requirement. This report tells the agency the status of recalls, and therefore, is best accomplished by the party conducting the recall. The NHTSA declines to adopt suggestions that would change this scheme.

Subparagraph (b)(6) requires the submission of information on the number of vehicles or equipment that is determined to be unreachable. Several manufacturers argued for deletion of this information suggesting that it was impossible to ascertain why certain vehicles or equipment are unreachable. The manufacturer need only give the reasons why vehicles are unreachable when such information is available to him. This information aids the agency in understanding the effectiveness of a recall. The agency can determine from this data the number of vehicles still in use that were not corrected by a manufacturer and why.

VI. Purchaser and owner lists.

The intent of this section was misunderstood by a number of commenters. Many manufacturers, both equipment and vehicle, indicated that this requirement burdened them with new recordkeeping requirements far beyond those currently in existence. This is not the case. For example, Part 573.7(a) requires vehicle manufacturers to maintain lists of owners of vehicles involved in a notification campaign, not all vehicles produced. General recordkeeping requirements for vehicle and equipment manufacturers are found in the Act and in the agency's regulations in Part 576. These general recordkeeping requirements are not affected by this regulation.

Equipment manufacturers strenuously objected to paragraph (c) as placing huge recordkeeping burdens upon them while achieving little in the way of benefits. The agency does not find these arguments persuasive. The recordkeeping requirement in this paragraph is limited. The agency has reworded this section to clarify an equipment manufacturer's recordkeeping requirements. This requirement does not mandate an equipment manufacturer to make and retain a list of all purchasers of its equipment as the equipment is sold. Equipment manufacturers will be required to retain a list of individuals, dealers, distributors and manufacturers determined by the manufacturer or the agency to be in possession of potentially defective or noncomplying equipment. This limited requirement is within the authority granted by Section 112(b) of the Act. The list would be compiled during the course of a defect or noncompliance campaign. If an equipment manufacturer is unable to find those in possession of its equipment, no list is required to be retained. The burden imposed by this requirement is minimal since it merely requires that manufacturers retain some information that will, by necessity, be generated should they be required to conduct either a defect or noncompliance campaign.

With respect to paragraph (b), tire manufacturers indicated that each tire does not have a different identification number and therefore the paragraph should be amended somewhat to reflect this. The agency agrees and has modified the language accordingly.

VII. Notices, bulletins, and other communications.

Many manufacturers objected to the requirements in Section 573.8 as being too broad and beyond the scope of the NHTSA's authority. This section requires the submission of information concerning defects in equipment and vehicles. Further, the manufacturers recommended that the parentheticals be deleted from the section and that the term "defect" be changed to "safety-related defect." The agency does not agree with these comments.

First, the agency needs information concerning any defect in a manufacturer's product, not just those defects that a manufacturer deems to be safety-related. The Act contemplates a two-pronged approach to defects determinations. Either a manufacturer or the agency can make such a determination. For the agency to carry out its half of that responsibility, it needs information pertaining to all defects so that it can then judge for itself whether a defect is in fact safety related. To require only information pertaining to manufacturer-determined safety-related defects, would in effect mean that manufacturers would not be required to submit defect information to the agency until such time as that manufacturer had made a safety-related defect determination. This would stymie the agency's ability to make independent judgments concerning defects that is necessary for proper enforcement of the Act. In the past year, the NHTSA has made several safety-related defect determinations on the basis of information routinely submitted by manufacturers concerning defects that they had not considered safety-related. For example, some Airstream Trailers and White Trucks were recalled when the agency discovered safety-related problems that were mentioned in those companies' technical bulletins. Therefore, the agency needs all types of defect information, not just information that manufacturers determine to be safety-related.

Second, the parentheticals were added to this section to help clarify the type of information intended to be covered by its requirements. These lists are not all-inclusive. The NHTSA concludes, however, that they do clarify the type of information the agency seeks to obtain from a manufacturer, and therefore, they will be retained in the regulation.

The agency has deleted from Section 573.8 all references to noncompliances. All noncompliances must be reported to the agency under Part 573.5 (c)(9). Therefore, it is unnecessary to include references to noncompliances in this paragraph.

In response to the allegations that the agency has no authority to require submittal of defect information, whether or not safety related, Section 158 of the Act specifically grants the agency that authority.

VIII. Address for submitting required reports and other information.

The address listed in Part 573.9 has been altered to reflect the new agency organization and authority for enforcement actions.

In accordance with agency policy, the NHTSA has considered the costs and benefits of this requirement. The agency concludes that the regulation will help enforcement of defect and noncompliance cases by ensuring that adequate information is submitted to the NHTSA. The costs to both industry and government of the regulation will be less than $5 million annually.

The principal authors of this notice are James Murray of the Office of Defects Investigation and Roger Tilton of the Office of Chief Counsel.

In consideration of the foregoing, Part 573, *Defect and Noncompliance Reports*, of Volume 49 of the Code of Federal Regulations is amended. . . .

(Secs. 108, 112, 119, Pub. L. 89-563, 80 Stat. 718; Secs. 102, 103, 104, Pub. L. 93-492; 88 Stat. 1470; 15 U.S.C. 1397, 1401, 1408, 1411-1420; delegation of authority at 49 CFR 1.50.)

Issued on December 18, 1978.

Joan Claybrook
Administrator

43 F.R. 60165-60169
December 26, 1978

PART 572—ANTHROPOMORPHIC TEST DUMMIES

Subpart A—General

§ 572.1 Scope. This part describes the anthropomorphic test dummies that are to be used for compliance testing of motor vehicles and motor vehicle equipment with motor vehicle safety standards.

§ 572.2 Purpose. The design and performance criteria specified in this part are intended to describe measuring tools with sufficient precision to give repetitive and correlative results under similar test conditions and to reflect adequately the protective performance of a vehicle, or item or motor vehicle equipment, with respect to human occupants.

§ 572.3 Application. This part does not in itself impose duties or liabilities on any person. It is a description of tools that measure the performance of occupant protection systems required by the safety standards that incorporate it. It is designed to be referenced by, and become a part of, the test procedures specified in motor vehicle safety standards such as Standard No. 208, Occupant Crash Protection.

§ 572.4 Terminology.

(a) The term "dummy," when used in this Subpart A, refers to any test device described by this part. The term "dummy," when used in any other subpart of this part, refers to the particular dummy described in that part.

(b) Terms describing parts of the dummy, such as "nead," are the same as names for corresponding parts of the human body.

(c) The term "upright position" means the position of the dummy when it is seated in accordance with the procedures of 572.11(i).

Subpart B—50th Percentile Male

§ 572.5 General description.

(a) The dummy consists of the component assemblies specified in Figure 1, which are described in their entirety by means of approximately 250 drawings and specifications that are grouped by component assembly under the following nine headings:

SA 150 M070	right arm assembly
SA 150 M071	left arm assembly
SA 150 M050	lumbar spine assembly
SA 150 M060	pelvis and abdomen assembly
SA 150 M080	right leg assembly
SA 150 M081	left leg assembly
SA 150 M010	head assembly
SA 150 M020	neck assembly
SA 150 M030	shoulder-thorax assembly

The drawings and specifications are incorporated in this Part by reference to the nine headings, and are available for examination in Docket 73-8, Room 5109, 400 Seventh Street, S.W., Washington, D.C. Copies may be obtained from Keuffel and Esser Company, 1521 North Danville Street, Arlington, Virginia 22201. The drawings and specifications are subject to change, but any amendment will be accomplished by appropriate administrative procedures and noted by publication in the *Federal Register*, and be available for examination and copying as noted in this paragraph.

The drawings and specifications are on file in the reference library of the *Federal Register*, National Archives and Records Service, General Services Administration, Washington, D.C.

(b) 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.

(c) 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 tests specified in Standard No. 208 (§ 571.208).

A specimen of the dummy is available for surface measurements, and access can be arranged through: Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

§ 572.6 Head.

(a) The head consists of the assembly shown as number SA 150 M010 in Figure 1 and conforms to each of the drawings subtended by number SA 150 M010.

(b) When the head is dropped from a height of 10 inches in accordance with paragraph (c) of this section, the peak resultant accelerations at the location of the accelerometers mounted in the head form in accordance with § 572.11(b) shall be not less than 210g, and not more than 260g. The acceleration/time curve for the test shall be unimodal and shall lie at or above the 100g level for an interval not less than 0.9 milliseconds and not more than 1.5 milliseconds. The lateral acceleration vector shall not exceed 10g.

(c) Test procedure:

(1) Suspend the head as shown in Figure 2, 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.

(2) Drop the head from the specified height by a means that ensures instant release onto a rigidly supported flat horizontal steel plate, 2 inches thick and 2 feet square, which has a clean, dry surface and any microfinish of not less than 8 microinches (rms) and not more than 80 microinches (rms).

(3) Allow a time period of at least 2 hours between successive tests on the same head.

§ 572.7 Neck.

(a) The neck consists of the assembly shown as number SA 150 M020 in Figure 1 and conforms to each of the drawings subtended by number SA 150 M020.

(b) When the neck is tested with the head in accordance with paragraph (c) of this section, the head shall rotate in reference to the pendulum's longitudinal centerline a total of 68° ±5° about its center of gravity, rotating to the extent specified in the following table at each indicated point in time, measured from impact, with a chordal displacement measured at its center of gravity that is within the limits specified. The chordal displacement at time T is defined as the straight line distance between (1) the position relative to the pendulum arm of the head center of gravity at time zero, and (2) the position relative to the pendulum arm of the head center of gravity at time T as illustrated by Figure 3. The peak resultant acceleration recorded at the location of the accelerometers mounted in the head form in accordance with § 572.11(b) shall not exceed 26g. The pendulum shall not reverse direction until the head's center of gravity returns to the original zero time position relative to the pendulum arm.

Rotation (degrees)	Time (ms) ± (2 + .08T)	Chordal Displacement (inches ± 0.5)
0	0	0.0
30	30	2.6
60	46	4.8
Maximum	60	5.5
60	75	4.8
30	95	2.6
0	112	0.0

(c) Test procedure:

(1) Mount the head and neck on a rigid pendulum as specified in Figure 4, so that the head's midsagittal plane is vertical and coincides with the plane of motion of the pendulum's longitudinal centerline. Mount the neck directly to the pendulum as shown in Figure 4.

(2) Release the pendulum and allow it to fall freely from a height such that the velocity at impact is 23.5 ±2.0 feet per second (fps), measured at the center of the accelerometer specified in Figure 4.

(3) Decelerate the pendulum to a stop with an acceleration-time pulse described as follows:

(i) Establish 5g and 20g levels on the a – t curve.

(ii) Establish t_1 at the point where the rising a – t curve first crosses the 5g level, t_2 at the point where the rising a – t curve first crosses the 20g level, t_3 at the point where the decaying a – t curve last crosses the 20g level, and t_4 at the point where the decaying a – t curve first crosses the 5g level.

(iii) $t_2 - t_1$ shall be not more than 3 milliseconds.

(iv) $t_3 - t_2$ shall be not less than 25 milliseconds and not more than 30 milliseconds.

(v) $t_4 - t_3$ shall be not more than 10 milliseconds.

(vi) The average deceleration between t_2 and t_3 shall be not less than 20g and not more than 24g.

(vii) Allow the neck to flex without impact of the head or neck with any object other than the pendulum arm.

§ 572.8 Thorax.

(a) The thorax consists of the assembly shown as number SA 150 M030 in Figure 1, and conforms to each of the drawings subtended by number SA 150 M030.

(b) The thorax contains enough unobstructed interior space behind the rib cage to permit the midpoint of the sternum to be depressed 2 inches without contact between the rib cage and other parts of the dummy or its instrumentation, except for instruments specified in subparagraph (d) (7) of this section.

(c) When impacted by a test probe conforming to § 572.11(a) at 14 fps and at 22 fps in accordance with paragraph (d) of this section, the thorax shall resist with forces measured by the test probe of not more than 1450 pounds and 2250 pounds, respectively, and shall deflect by amounts not greater than 1.1 inches and 1.7 inches, respectively. The internal hysteresis in each impact shall not be less than 50 percent and not more than 70 percent.

(d) Test Procedure:

(1) With the dummy seated without back support on a surface as specified in § 572.11(i) and in the orientation specified in § 572.11(i), adjust the dummy arms and legs until they are extended horizontally forward parallel to the midsagittal plane.

(2) Place the longitudinal center line of the test probe so that it is 17.7 ±0.1 inches above the seating surface at impact.

(3) Align the test probe specified in § 572.11 (a) so that at impact its longitudinal centerline coincides within 2 degrees of a horizontal line in the dummy's midsagittal plane.

(4) Adjust the dummy so that the surface area on the thorax immediately adjacent to the projected longitudinal center line of the test probe is vertical. Limb support, as needed to achieve and maintain this orientation, may be provided by placement of a steel rod of any diameter not less than one-quarter of an inch and not more than three-eighths of an inch, with hemispherical ends, vertically under the limb at its projected geometric center.

(5) Impact the thorax with the test probe so that its longitudinal centerline falls within 2 degrees of a horizontal line in the dummy's 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 mounted inside the sternum.

(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.

§ 572.9 Lumbar spine, abdomen, and pelvis.

(a) The lumbar spine, abdomen, and pelvis consist of the assemblies designated as numbers SA 150 M050 and SA 150 M060 in Figure 1 and conform to the drawings subtended by these numbers.

(b) When subjected to continuously applied force in accordance with paragraph (c) of this section, the lumbar spine assembly shall flex by an amount that permits the rigid thoracic spine to rotate from its initial position in accordance with Figure 11 by the number of degrees shown below at each specified force level, and straighten upon removal of the force to within 12 degrees of its initial position in accordance with Figure 11.

Flexion (degrees)	*Force (±6 pounds)*
0	0
20	28
30	40
40	52

(c) Test procedure:

(1) Assemble the thorax, lumbar spine, pelvic, and upper leg assemblies (above the femur force transducers), ensuring that all component surfaces are clean, dry, and untreated unless otherwise specified, and attach them to the horizontal fixture shown in Figure 5 at the two link rod pins and with the mounting brackets for the lumbar test fixtures illustrated in Figure 6 to 9.

(2) Attach the rear mounting of the pelvis to the pelvic instrument cavity rear face at the four ¼" cap screw holes and attach the front mounting at the femur axial rotation joint. Tighten the mountings so that the pelvic-lumbar adapter is horizontal and adjust the femur friction plungers at each hip socket joint to 240 inch-pounds torque.

(3) Flex the thorax forward 50° and then rearward as necessary to return it to its initial position in accordance with Figure 11 unsupported by external means.

(4) Apply a forward force perpendicular to the thorax instrument cavity rear face in the midsagittal plane 15 inches above the top surface of the pelvic-lumbar adapter. Apply the force at any torso deflection rate between .5 and 1.5 degrees per second up to 40° of flexion but no further, continue to apply for 10 seconds that force necessary to maintain 40° of flexion, and record the force with an instrument mounted to the thorax as shown in Figure 5. Release all force as rapidly as possible and measure the return angle 3 minutes after the release.

(d) When the abdomen is subjected to continuously applied force in accordance with paragraph (e) of this section, the abdominal force-deflection curve shall be within the two curves plotted in Figure 10.

(e) Test procedure:

(1) Place the assembled thorax, lumbar spine, and pelvic assemblies in a supine position on a flat, rigid, smooth, dry, clean horizontal surface, ensuring that all component surfaces are clean, dry, and untreated unless otherwise specified.

(2) Place a rigid cylinder 6 inches in diameter and 18 inches long transversely across the abdomen, so that the cylinder is symmetrical about the midsagittal plane, with its longitudinal centerline horizontal and perpendicular to the midsagittal plane at a point 9.2 inches above the bottom line of the buttocks, measured with the dummy positioned in accordance with Figure 11.

(3) Establish the zero deflection point as the point at which a force of 10 pounds has been reached.

(4) Apply a vertical downward force through the cylinder at any rate between 0.25 and 0.35 inches per second.

(5) Guide the cylinder so that it moves without significant lateral or rotational movement.

§ 572.10 Limbs.

(a) The limbs consist of the assemblies shown as numbers SA 150 M070, SA 150 M071, SA 150 M080, and SA 150 M081 in Figure 1 and conform to the drawings subtended by these numbers.

(b) When each knee is impacted at 6.9 ft/sec. in accordance with paragraph (c) of this section, the maximum force on the femur shall be not more than 2500 pounds and not less than 1850 pounds, with a duration above 1000 pounds of not less than 1.7 milliseconds.

(c) Test procedure:

(1) Seat the dummy without back support on a surface as specified in § 572.11(i) that is 17.3 ± 0.2 inches above a horizontal surface, oriented as specified in § 572.11(i), and with the hip joint adjustment at any setting between 1g and 2g. Place the dummy legs in planes parallel to its midsagittal plane (knee pivot centerline perpendicular to the midsagittal plane) and with the feet flat on the horizontal surface. Adjust the feet and lower legs until the lines between the midpoints of the knee pivots and the ankle pivots are at any angle not less than 2 degrees and not more than 4 degrees rear of the vertical, measured at the centerline of the knee pivots.

(2) Reposition the dummy if necessary so that the rearmost point of the lower legs at the level one inch below the seating surface remains at any distance not less than 5 inches and not more than 6 inches forward of the forward edge of the seat.

(3) Align the test probe specified in § 572.11(a) so that at impact its longitudinal centerline coincides within ±2° with the longitudinal centerline of the femur.

(4) Impact the knee with the test probe moving horizontally and parallel to the midsagittal plane at the specified velocity.

(5) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

§ 572.11 Test conditions and instrumentation.

(a) The test probe used for thoracic and knee impact tests is a cylinder 6 inches in diameter that weighs 51.5 pounds including instrumentation. Its impacting end has a flat right face that is rigid and that has an edge radius of 0.5 inches.

(b) Accelerometers are mounted in the head on the horizontal transverse bulkhead shown in the drawings subreferenced under assembly No. SA 150 M010 in Figure 1, so that their sensitive axes intersect at a point in the midsagittal plane 0.5 inches above the horizontal bulkhead and 1.9 inches ventral of the vertical mating surface of the skull with the skull cover. One accelerometer is aligned with its sensitive axis perpendicular to the horizonal bulkhead in the midsagittal plane and with its seismic mass center at any distance up to 0.3 inches superior to the axial intersection point. Another accelerometer is aligned with its sensitive axis parallel to the horizontal bulkhead and perpendicular to the midsagittal plane, and with its seismic mass center at any distance up to 1.3 inches to the left of the axial intersection point (left side of dummy is the same as that of man). A third accelerometer is aligned with its sensitive axis parallel to the horizontal bulkhead in the midsagittal plane, and with its seismic mass center at any distance up to 1.3 inches dorsal to the axial intersection point.

(c) Accelerometers are mounted in the thorax by means of a bracket attached to the rear vertical surface (hereafter "attachment surface") of the thoracic spine so that their sensitive axes intersect at a point in the midsagittal plane 0.8 inches below the upper surface of the plate to which the neck mounting bracket is attached and 3.2 inches perpendicularly forward of the surface to which the accelerometer bracket is attached. One accelerometer has its sensitive axis oriented parallel to the attachment surface in the midsagittal plane, with its seismic mass center at any distance up to 1.3 inches inferior to the intersection of the sensitive axes specified above. Another accelerometer has its sensitive axis oriented parallel to the attachment surface and perpendicular to the midsagittal plane, with its seismic mass center at any distance up to 0.2 inches to the right of the intersection of the sensitive axes specified above. A third accelerometer has its sensitive axis oriented perpendicular to the attachment surface in the midsagittal plane, with its seismic mass center at any distance up to 1.3 inches dorsal to the intersection of the sensitive axes specified above. Accelerometers are oriented with the dummy in the position specified in § 572.11(i).

(d) A force-sensing device is mounted axially in each femur shaft so that the transverse centerline of the sensing element is 4.25 inches from the knee's center of rotation.

(e) The outputs of acceleration and forcesensing 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 J211a, December 1971, with channel classes as follows:

(1) Head acceleration—Class 1000.
(2) Pendulum acceleration—Class 60.
(3) Thorax acceleration—Class 180.
(4) Thorax compression—Class 180.
(5) Femur force—Class 600.

(f) The mountings for sensing devices have no resonance frequency within a range of 3 times the frequency range of the applicable channel class.

(g) Limb joints are set at 1g, barely restraining the weight of the limb when it is extended horizontally. The force required to move a limb segment does not exceed 2g throughout the range of limb motion.

(h) Performance tests are conducted at any temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent after exposure of the dummy to these conditions for a period of not less than 4 hours.

(i) For the performances tests specified in §§ 572.8, 572.9, and 572.10, the dummy is positioned in accordance with Figure 11 as follows:

(1) The dummy is placed on a flat, rigid, smooth, clean, dry, horizontal, steel test surface whose length and width dimensions are not less than 16 inches, so that the dummy's midsagittal plane is vertical and centered on the test surface and the rearmost points on its lower legs at the level of the test surface are at any distance not less than 5 inches and not more than 6 inches forward of the forward edge of the test surface.

(2) The pelvis is adjusted so that the upper surface of the lumbar-pelvic adapter is horizontal.

(3) The shoulder yokes are adjusted so that they are at the midpoint of their anterior posterior travel with their upper surfaces horizontal.

(4) The dummy is adjusted so that the rear surfaces of the shoulders and buttocks are tangent to a transverse vertical plane.

(5) The upper legs are positioned symmetrically about the midsagittal plane so that the distance between the knee pivot bolt heads is 11.6 inches.

(6) The lower legs are positioned in planes parallel to the midsagittal plane so that the lines between the midpoint of the knee pivots and the ankle pivots are vertical.

(j) The dummy's dimensions, as specified in drawing number SA 150 M002, are determined as follows:

(1) With the dummy seated as specified in paragraph (i), the head is adjusted and secured so that its occiput is 1.7 inches forward of the transverse vertical plane with the vertical mating surface of the skull with its cover parallel to the transverse vertical plane.

(2) The thorax is adjusted and secured so that the rear surface of the chest accelerometer mounting cavity is inclined 3° forward of vertical.

(3) Chest and waist circumference and chest depth measurements are taken with the dummy positioned in accordance with paragraph (i), (1) and (2) of this section.

(4) The chest skin and abdominal sac are removed and all following measurements are made without them.

(5) Seated height is measured from the seating surface to the uppermost point on the head-skin surface.

(6) Shoulder pivot height is measured from the seating surface to the center of the arm elevation pivot.

(7) H-point locations are measured from the seating surface to the center of the holes in the pelvis flesh covering in line with the hip motion ball.

(8) Knee pivot distance from the backline is measured to the center of the knee pivot bolt head.

(9) Knee pivot distance from floor is measured from the center of the knee pivot bolt head to the bottom of the heel when the foot is horizontal and pointing forward.

(10) Shoulder width measurement is taken at arm elevation pivot center height with the centerlines between the elbow pivots and the shoulder pivots vertical.

(11) Hip width measurement is taken at widest point of pelvic section.

(k) 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.

(l) Surfaces of dummy components are not painted except as specified in this part or in drawings subtended by this part.

Subpart C—Three Year Old Child

Sec.

Subpart C—Three Year Old Child

§ 572.15 General description.

(a)(1) The dummy consists of the component assemblies specified in drawing SA 103C 001, which are described in their entirety by means of approximately 122 drawings and specifications grouped by component assemblies under the following headings:

SA 103C 010	Head Assembly
SA 103C 020	Neck Assembly
SA 103C 030	Torso Assembly
SA 103C 041	Upper Arm Assembly Left
SA 103C 042	Upper Arm Assembly Right
SA 103C 051	Forearm Hand Assembly Left
SA 103C 052	Forearm Hand Assembly Right
SA 103C 061	Upper Leg Assembly Left
SA 103C 062	Upper Leg Assembly Right
SA 103C 071	Lower Leg Assembly Left
SA 103C 072	Lower Leg Assembly Right
SA 103C 081	Foot Assembly Left
SA 103C 082	Foot Assembly Right

The drawings and specifications are incorporated in this part by reference to the thirteen headings and are available for examination in Docket 78-09, Room 5109, 400 Seventh Street S.W., Washington, D.C. 20590. Copies may be obtained from Keuffel & Esser Co., 1521 North Danville Street, Arlington, Va. 22201.

(2) The patterns of all cast and molded parts for reproduction of the molds needed in manufacturing of the dummies are incorporated in this part by reference. A set of the patterns can be obtained on a loan basis by manufacturers of the test dummies, or others if need is shown, from the Office of Vehicle Safety Standards, NHTSA, 400 Seventh Street S.W., Washington, D.C. 20590.

(3) An Operation and Maintenance Manual with instructions for the use and maintenance of the test dummies dated May 28, 1976, Contract No. DOT-HS-6-01294 is incorporated in the part by reference. Copies of the manual can be obtained from the Keuffel & Esser Co. All provisions of this manual are valid unless modified by this regulation. This document is available for examination in Docket 78-09.

(4) The drawings, specifications and the manual are subject to changes, but any change will be accomplished by appropriate administrative procedures and announced by publication in the Federal Register and be available for examination and copying as indicated in this paragraph.

(5) The drawings, specifications, patterns, and manual are on file in the reference library of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D.C.

(b) Adjacent segments are joined in a manner such that throughout the range of motion and also under simulated crash-impact conditions, there is no contact between metallic elements except for contacts that exist under static conditions.

(c) 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 tests specified by Standard No. 213, Child Restraint Systems (§ 571.213).

§ 572.16 Head.

(a) The head consists of the assembly shown in drawing SA 103C 001 by number SA 103C 010, and conforms to each of the drawings listed under this number on drawing SA 103C 002, sheet 8.

(b) When the head is impacted in accordance with paragraph (c) of this section by a test probe conforming to § 572.21(a) at 7 fps., the peak resultant accelerations measured at the location of the accelerometers mounted in the headform in accordance with § 572.21(b) shall be not less than 95g, and not more than 115g. The recorded acceleration-time curve for this test shall be unimodal at, or above the 50g level and shall lie at, or above that level for an interval not less than 2.0 and not more than 3.0 milliseconds. The lateral acceleration vector shall not exceed 7g.

(c) *Test Procedure:*

(1) Seat the dummy on a seating surface having a back support as specified in § 572.21(h) and orient the dummy in accordance with § 572.21(h) and adjust the joints of the limbs at any setting between 1g and 2g, which just supports the limbs' weight when the limbs are extended horizontally forward.

(2) Adjust the test probe so that its longitudinal centerline is at the forehead at the point of orthogonal intersection of the head midsagittal plane and the transverse plane which is perpendicular to the "Z" axis of the head (longitudinal centerline of the skull anchor) and is located $0.6 \pm .1$ inches above the centers of the head center of gravity reference pins and coincides within 2 degrees with the line made by the intersection of horizontal and midsagittal planes passing through this point.

(3) Adjust the dummy so that the surface area on the forehead immediately adjacent to the projected longitudinal centerline of the test probe is vertical.

(4) Impact the head with the test probe so that at the moment of impact the probe's longitudinal centerline falls within 2 degrees of a horizontal line in the dummy's midsagittal plane.

(5) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

(6) Allow a time period of at least 20 minutes between successive tests of the head.

§ 572.17 Neck.

(a) The neck consists of the assembly shown in drawing SA 103C 001 as number SA 103C 020, and conforms to each of the drawings listed under this number on drawing SA 103C 002, sheet 9.

(b) When the head-neck assembly is tested in accordance with paragraph (c) of this section, the head shall rotate in reference to the pendulum's longitudinal centerline a total of 84 degrees ± 8 degrees about its center of gravity, rotating to the extent specified in the following table at each indicated point in time, measured from impact, with the chordal displacement measured at its center of gravity. The chordal displacement at time T is defined as the straight line distance between (1) the position relative to the pendulum arm of the head center of gravity at time zero, and (2) the position relative to the pendulum arm of the head center of gravity at time T as illustrated by Figure 3. The peak resultant acceleration recorded at the location of the accelerometers mounted in the headform in accordance with § 572.21(b) shall not exceed 30g. The pendulum shall not reverse direction until the head's center of gravity returns to the original zero time position relative to the pendulum arm.

Rotation (degrees)	Time (ms) ± (2 + .08T)	Chordal Displacement (inches ±0.8)
0	0	0
30	21	2.2
60	36	4.3
Maximum	62	5.8
60	91	4.3
30	108	2.2
0	123	0

(c) *Test Procedure:*

(1) Mount the head and neck on a rigid pendulum as specified in Figure 4, so that the head's midsagittal plane is vertical and coincides with the plane of motion of the pendulum's longitudinal centerline. Mount the neck directly to the pendulum as shown in Figure 15.

(2) Release the pendulum and allow it to fall freely from a height such that the velocity at impact is 17.00 ± 1.0 feet per second (fps), measured at the center of the accelerometer specified in Figure 4.

(3) Decelerate the pendulum to a stop with an acceleration-time pulse described as follows:

(i) Establish 5g and 20g levels on the a-t curve.

(ii) Establish t_1 at the point where the a-t curve first crosses the 5g level, t_2 at the point where the rising a-t curve first crosses the 20g level, t_3 at the point where the decaying a-t curve last crosses the 20g level, and t_4 at the point where the decaying a-t curve first crosses the 5g level.

(iii) t_2-t_1, shall be not more than 4 milliseconds.

(iv) t_3-t_2, shall be not less than 18 and not more than 21 milliseconds.

(v) t_4-t_3, shall be not more than 5 milliseconds.

(vi) The average deceleration between t_2 and t_3 shall be not less than 20g and not more than 34g.

(4) Allow the neck to flex without contact of the head or neck with any object other than the pendulum arm.

(5) Allow a time period of at least 1 hour between successive tests of the head and neck.

§ 572.18 Thorax.

(a) The thorax consists of the part of the torso shown in assembly drawing SA 103C 001 by number SA 103C 030 and conforms to each of the applicable drawings listed under this number on drawings SA 103C 002, sheets 10 and 11.

(b) When impacted by a test probe conforming to § 572.21(a) at 13 fps. in accordance with paragraph (c) of this section, the peak resultant accelerations at the location of the accelerometers mounted in the chest cavity in accordance with § 572.21(c) shall be not less than 50g and not more than 70g. The acceleration-time curve for the test shall be unimodal at or above the 30g level and shall lie at or above the 30g level for an interval not less than 2.5 milliseconds and not more than 4.0 milliseconds. The lateral acceleration shall not exceed 5g.

(c) *Test Procedure:*

(1) With the dummy seated without back support on a surface as specified in § 572.21(h) and

oriented as specified in § 572.21(h), adjust the dummy arms and legs until they are extended horizontally forward parallel to the midsagittal plane, the joints of the limbs are adjusted at any setting between 1g and 2g, which just supports the limbs' weight when the limbs are extended horizontally forward.

(2) Establish the impact point at the chest midsagittal plane so that it is 1.5 inches below the longitudinal centerline of the bolt that attaches the top of the ribcage sternum to the thoracic spine box.

(3) Adjust the dummy so that the tangent plane at the surface on the thorax immediately adjacent to the designated impact point is vertical and parallel to the face of the test probe.

(4) Place the longitudinal centerline of the test probe to coincide with the designated impact point and align the test probe so that at impact its longitudinal centerline coincides within 2 degrees with the line formed by intersection of the horizontal and midsagittal planes passing through the designated impact point.

(5) Impact the thorax with the test probe so that at the moment of impact the probe's longitudinal centerline falls within 2 degrees of a horizontal line in the dummy midsagittal plane.

(6) Guide the probe during impact so that it moves with no significant lateral, vertical or rotational movement.

(7) Allow a time period of at least 20 minutes between successive tests of the chest.

§ 572.19 Lumbar spine, abdomen and pelvis.

(a) The lumbar spine, abdomen, and pelvis consist of the part of the torso assembly shown by number SA 103C 030 on drawing SA 103C 001 and conform to each of the applicable drawings listed under this number on drawing SA 103C 002, sheets 10 and 11.

(b) When subjected to continuously applied force in accordance with paragraph (c) of this section, the lumbar spine assembly shall flex by an amount that permits the rigid thoracic spine to rotate from its initial position in accordance with Figure 18 of this subpart by 40 degrees at a force level of not less than 34 pounds and not more than 47 pounds, and straighten upon removal of the force to within 5 degrees of its initial position.

(c) *Test Procedure:* (1) The dummy with lower legs removed is positioned in an upright seated position on a seat as indicated in Figure 18, ensuring that all dummy component surfaces are clean, dry and untreated unless otherwise specified.

(2) Attach the pelvis to the seating surface by a bolt C/328, modified as shown in Figure 18, and the upper legs at the knee axial rotation joints by the attachments shown in Figure 18. Tighten the mountings so that the pelvis-lumbar joining surface is horizontal and adjust the femur ball-flange screws at each hip socket joint to 50 inch pounds torque. Remove the head and the neck and install a cylindrical aluminum adapter 2.0 inches in diameter and 2.80 inches long in place of the neck.

(3) Flex the thorax forward 50 degrees and then rearward as necessary to return to its initial position in accordance with Figure 18 unsupported by external means.

(4) Apply a forward pull force in the midsagittal plane at the top of the neck adapter, so that at 40 degrees of the lumbar spine flexion the applied force is perpendicular to the thoracic spine box. Apply the force at any torso deflection rate between 0.5 and 1.5 degrees per second up to 40 degrees of flexion but no further; continue to apply for 10 seconds the force necessary to maintain 40 degrees of flexion, and record the highest applied force at that time. Release all force as rapidly as possible and measure the return angle 3 minutes after the release.

§ 572.20 Limbs.

The limbs consist of the assemblies shown on drawing SA 103C 001 as Nos. SA 103C 041, SA 103C 042, SA 103C 051, SA 103C 052, SA 103C 061, SA 103C 062, SA 103C 071, SA 103C 072, SA 103C 081, SA 103C 082, and conform to each of the applicable drawings listed under their respective numbers of the drawing SA 103C 002, sheets 12 through 21.

§ 572.21 Test conditions and instrumentation.

(a) The test probe used for head and thoracic impact tests is a cylinder 3 inches in diameter, 13.8 inches long and weighs 10 lbs., 6 ozs. Its impacting end has a flat right face that is rigid and that has an edge radius of 0.5 inches.

(b) Accelerometers are mounted in the head on the mounting block (A/310) located on the horizontal transverse bulkhead shown in the drawings subreferenced under assembly SA 103C 010 so that their sensitive axes are orthogonal and their seismic masses are positioned relative to the axial intersection point. Except in the case of tri-axial accelerometers, the sensitive axes shall intersect at the axial intersection point located at the intersection of a line connecting the longitudinal centerlines of the transfer pins in the sides of the dummy head with the midsagittal plane of the dummy head. One accelerometer is aligned with its sensitive axis parallel to the vertical bulkhead and midsagittal plane, and with its seismic mass center at the midsagittal plane at any distance up to 0.3 inches dorsal and 0.1 inches inferior to the axial intersection point. Another accelerometer is aligned with its sensitive axis in the horizontal plane and perpendicular to the midsagittal plane, and with its seismic mass center at any distance up to 0.2 inches inferior to, 0.4 inches to the right of, and 1 inch dorsal to the axial intersection point (right side of dummy is the same as that of child). A third accelerometer is aligned with its sensitive axis parallel to the midsagittal and horizontal planes, and with its seismic mass center at any distance up to 0.2 inches inferior to, 0.6 inches dorsal to, and 0.4 inches to the right of the axial intersection point. In the case of a tri-axial accelerometer, its axes are aligned in the same way that the axes of three separate accelerometers are aligned.

(c) Accelerometers are mounted in the thorax on the mounting plate attached to the vertical transverse bulkhead shown in the drawings subreferenced under assembly No. SA 103C 030 in drawing SA 103C 001 so that their sensitive axes are orthogonal and their seismic masses are positioned relative to the axial intersection point located in the midsagittal plane 3 inches above the top surface of the lumbar spine and 0.3 inches dorsal to the accelerometer mounting plate surface. Except in the case of tri-axial accelerometers, the sensitive axes shall intersect at the axial intersection point. One accelerometer is aligned with its sensitive axis parallel to the vertical bulkhead and midsagittal planes, and with its seismic mass center at any distance up to 0.2 inches to the right, 0.2 inches inferior and 0.1 inches ventral of the axial intersection point. Another accelerometer is aligned with its sensitive axis in the horizontal transverse plane and perpendicular to the midsagittal plane and with its seismic mass center at any distance up to 0.3 inches to the left, 0.2 inches inferior and 0.2 inches ventral to the axial intersection point. A third accelerometer is aligned with its sensitive axis parallel to the midsagittal and horizontal planes and with its seismic mass center at any distance up to 0.3 inches superior, 0.6 inches to the right and 0.1 inches ventral to the axial intersection point. In the case of a tri-axial accelerometer, its axes are aligned in the same way that the axes of three separate accelerometers are aligned.

(d) The outputs of accelerometers installed in the dummy, and of test apparatus specified by this part, are recorded in individual data channels that conform to the requirements of SAE Recommended Practice J211a, December 1971, with channel classes as follows:

(1) Head acceleration—Class 1,000.

(2) Pendulum acceleration—Class 60.

(3) Thorax acceleration—Class 180.

(e) The mountings for accelerometers have no resonance frequency less than 3 times the cut-off frequency of the applicable channel class.

(f) Limb joints are set at the force between 1–2g, which just supports the limbs' weight when the limbs are extended horizontally forward. The force required to move a limb segment does not exceeed 2g throughout the range of limb motion.

(g) Performance tests are conducted at any temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent after exposure of the dummy to these conditions for a period of not less than 4 hours.

(h) For the performance tests specified §§ 572.16, 572.18, and 572.19, the dummy is positioned in accordance with Figures 16, 17, and 18 as follows:

(1) The dummy is placed on a flat, rigid, clean, dry, horizontal surface of teflon sheeting with a smoothness of 40 microinches and whose length and width dimensions are not less than 16 inches, so that the dummy's midsagittal plane is vertical and centered on the test surface. For head tests, the seat has a vertical back support whose top is 12.4 ± 0.2 inches above the seating surface. The rear surfaces of the dummy's shoulders and buttocks are touching the back support as shown in Figure 16. For thorax and lumbar spine tests, the seating surface is without the back support as shown in Figures 17 and 18 respectively.

(2) The shoulder yokes are adjusted so that they are at the midpoint of their anterior-posterior travel with their upper surfaces horizontal.

(3) The dummy is adjusted for head impact and lumbar flexion tests so that the rear surfaces of the shoulders and buttocks are tangent to a transverse vertical plane.

(4) The arms and legs are positioned so that their centerlines are in planes parallel to the mid-sagittal plane.

(i) The dummy's dimensions are specified in drawings No. SA 103C 002, sheets 22 through 26.

(j) Performance tests of the same component, segment, assembly or fully assembled dummy are separated in time by a period of not less than 20 minutes unless otherwise specified.

(k) Surfaces of the dummy components are not painted except as specified in this part or in drawings subtended by this part.

3. A new Subpart D—Six Month Old Infant is added to Part 572 (49 CFR 572) to read as follows:

Subpart D—Six Month Old Infant

Subpart D—Six Month Old Infant

§ 572.25 General Description.

(a) The infant dummy is specified in its entirety by means of 5 drawings (No. SA 100I 001) and a construction manual which describes in detail the materials and the procedures involved in the manufacturing of this dummy. The drawings and the manual are incorporated in this part by reference and are available for examination in Docket 78-09, Room 5108, 400 Seventh Street S.W., Washington, D.C. Copies may be obtained from Keuffel & Esser Co., 1512 North Danville Street, Arlington, Va. 22201. The drawings and the manual are subject to changes, but any change will be accomplished by appropriate administrative procedures and announced by publication in the Federal Register and be available for examination and copying as indicated in this paragraph. The drawings and manual are on file in the reference library of the Federal Register, National Archives and Records Services, General Services Administration, Washington, D.C.

(b) The structural properties and dimensions of the dummy are such that the dummy conforms to this part in every respect, both before and after being used in tests specified by Standard No. 213 (571.213).

38 F.R. 20449
August 1, 1973

PREAMBLE TO PART 582—INSURANCE COST INFORMATION REGULATION

(Docket 74–40; Notice 2)

This notice establishes an insurance cost information regulation pursuant to the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 *et seq.*). The regulation is based upon a notice of proposed rulemaking published November 4, 1974 (39 F.R. 38912) and comments submitted in response to the notice.

The regulation will require automobile dealers to distribute to prospective purchasers information which compares differences in insurance costs for different makes and models of passenger motor vehicles based upon differences in their damage susceptibility and crashworthiness. In the absence of insurance cost information that reflects damageability and crashworthiness, this rule does not, at the present time, have an effect on automobile dealers. Damage susceptibility and crashworthiness studies currently being conducted by the NHTSA are expected to influence the insurance rate structure by providing data which will enable the insurance industry to take these factors into account. As this occurs, the NHTSA will prepare comparative indices for the dealers to distribute to prospective purchasers.

Several comments on the proposed rulemaking discussed the merits of the Motor Vehicle Information and Cost Savings Act and are therefore beyond the scope of this rulemaking. Other comments offered methods for performing the damage susceptibility and crashworthiness studies. These comments have been forwarded to the technical staff performing the studies. Two comments suggested minor changes in the text of the regulation for clarity and to make the proposed regulation more consistent with the purposes of the Act. These suggestions have been adopted in the final regulation. Their effect is that the insurance cost information disseminated by the dealers would be in the form of comparative indices, based on differences in damage susceptibility and crashworthiness, rather than simply the insurance premium rate which is determined by many factors.

One comment expressed the view that providing this information to consumers within 30 days after its publication in the *Federal Register* was an excessive burden upon the dealers. The NHTSA does not believe that sufficient justification for this position has been made in light of the need to provide the information to the consumer in time for it to be of use to him in purchasing an automobile.

Therefore, a new Part 582, *Insurance Cost Information*, is added in Chapter V, Title 49, Code of Federal Regulations, to read as set forth below.

Effective date: Although the final rule is effective February 1, 1975, as specified in the Cost Savings Act, the dates when automobile dealers will be required to distribute insurance cost information are dependent upon NHTSA progress in developing such information and will be published at a later date in the *Federal Register.*

(Sec. 201(c), P. L. 92–513, 86 Stat. 947 (15 U.S.C. 1941(e)); delegation of authority at 49 CFR 1.51).

Issued on January 31, 1975.

James B. Gregory
Administrator

40 F.R. 4918
February 3, 1975