TABLE I.—STRENGTH TEST PLUNGER DIAMETER—Continued

| | Plunger diameter | |
|---|---|---|
| | (mm) | (inches) |
| Tube type: | | |
| Load range F or less | 31.75 | 1¼ |
| Load range over F | 38.10 | 1½ |

TABLE II.—MINIMUM STATIC BREAKING ENERGY (JOULES (J)* AND INCH-POUNDS (INCH-LBS))

| Load range | | | All 12 rim diameter code or smaller rim size | | Light truck 17.5 rim diameter code or smaller rim tubeless | | Tube type | | Tubeless | | Tube type | | Tubeless | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tire characteristic | Motorcycle | | | | | | | | | | | | | |
| Plunger diameter (mm and inches) | 7.94 J | 5/16″ inch-lbs | 19.05 J | ¾″ inch-lbs | 19.05 J | ¾″ inch-lbs | 31.75 J | 1¼″ inch-lbs | J | inch-lbs | 38.10 J | 1½″ inch-lbs | J | inch-lbs |
| A | 16 | 150 | 67 | 600 | 225 | 2,000 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| B | 33 | 300 | 135 | 1,200 | 293 | 2,600 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| C | 45 | 400 | 203 | 1,800 | 361 | 3,200 | 768 | 6,800 | 576 | 5,100 | ..... | ..... | ..... | ..... |
| D | ..... | ..... | 271 | 2,400 | 514 | 4,550 | 892 | 7,900 | 734 | 6,500 | ..... | ..... | ..... | ..... |
| E | ..... | ..... | 338 | 3,000 | 576 | 5,100 | 1,412 | 12,500 | 971 | 8,600 | ..... | ..... | ..... | ..... |
| F | ..... | ..... | 406 | 3,600 | 644 | 5,700 | 1,785 | 15,800 | 1,412 | 12,500 | ..... | ..... | ..... | ..... |
| G | ..... | ..... | ..... | ..... | 711 | 6,300 | ..... | ..... | ..... | ..... | 2,282 | 20,200 | 1,694 | 15,000 |
| H | ..... | ..... | ..... | ..... | 768 | 6,800 | ..... | ..... | ..... | ..... | 2,598 | 23,000 | 2,090 | 18,500 |
| J | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2,824 | 25,000 | 2,203 | 19,500 |
| L | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3,050 | 27,000 | ..... | ..... |
| M | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3,220 | 28,500 | ..... | ..... |
| N | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3,389 | 30,000 | ..... | ..... |

NOTE: For rayon cord tires, applicable energy values are 60 percent of those in table.
*J measurements are rounded down to the nearest whole number.

TABLE III.—ENDURANCE TEST SCHEDULE

| Description | Load range | Test wheel speed (r/m) | Test load: Percent of maximum load rating | | | Total best revolutions (thousands) |
|---|---|---|---|---|---|---|
| | | | I—7 hours | II—16 hours | III—24 hours | |
| Speed restricted service: | | | | | | |
| 88 km/h (55 mph) | | | | | | |
| 80 km/h (50 mph) | All | 125 | 66 | 84 | 101 | 352.0 |
| | C, D | 150 | 75 | 97 | 114 | 432.0 |
| 56 km/h (35 mph) | E, F, G, H, J, L | 100 | 66 | 84 | 101 | 282.5 |
| Motorcycle | All | 75 | 66 | 84 | 101 | 211.0 |
| All other | All | 250 | [1]100 | [2]108 | 117 | 510.0 |
| | A, B, C, D | 250 | 75 | [2]97 | 114 | ..... |
| | E | 200 | 70 | 88 | 106 | 546.0 |
| | F | 200 | 66 | 84 | 101 | 564.0 |
| | G | 175 | 66 | 84 | 101 | 493.5 |
| | H, J, L, N | 150 | 66 | 84 | 101 | 423.5 |

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

**§ 571.120 [Amended]**

9. Section 571.120 is amended by revising ''TRUCK EXAMPLE—SUITABLE TIRE-RIM CHOICE'' at the end of S5.3.2, and before S5.3.3, to read as follows:

S5.3.2. Rims.

* * * * *

TRUCK EXAMPLE—SUITABLE TIRE–RIM CHOICE
GVWR: 7,840 KG (17,289 LB)
GAWR: FRONT—2,850 KG (6,280 LB) WITH 7.50–20(D) TIRES, 20 X 6.00 RIMS AT 520 KPA (75 PSI) COLD SINGLE
GAWR: REAR—4,990 KG (11,000 LB) WITH 7.50–20(D) TIRES, 20 X 6.00 RIMS, AT 450 KPA (65 PSI) COLD DUAL
GVWR: 13,280 KG (29,279 LB)
GAWR: FRONT—4,826 KG (10,640 LB) WITH 10.00–20(F) TIRES, 20 X 7.50 RIMS, AT 620 KPA (90 PSI) COLD SINGLE
GAWR: REAR—8,454 KG (18,639 LB) WITH 10.00–20(F) TIRES, 20 X 2.70 RIMS, AT 550 KPA (80 PSI) COLD DUAL

* * * * *

Issued: May 13, 1998.

**Ricardo Martinez,**

*Administrator.*

[FR Doc. 98–13432 Filed 5–26–98; 8:45 am]

BILLING CODE 4910–59–P

## DEPARTMENT OF TRANSPORTATION

## National Highway Traffic Safety Administration

## 49 CFR Part 571

**[Docket No. NHTSA–98–3836]**

**RIN 2127–AG55**

## Federal Motor Vehicle Safety Standards; Metric Conversion

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), DOT.

**ACTION:** Final rule.

**SUMMARY:** This document revises selected Federal Motor Vehicle Safety Standards (FMVSS) by converting English measurements specified in those standards to metric measurements. This is one of several rulemaking actions that NHTSA is undertaking to implement the Federal policy that the metric system of measurement is the preferred system of weights and measures for United States trade and commerce. The conversions are not intended to make any changes in the stringency of the affected FMVSS. A companion final rule published in today's **Federal Register** converts English measurements in selected safety standards on tires to metric measurements.

**DATES:** This final rule is effective May 27, 1999. Optional early compliance with the changes made in this final rule is permitted beginning May 27, 1998.

**ADDRESSES:** Petitions for reconsideration of this final rule should refer to the docket and notice number cited in the heading of this final rule and be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh St., SW, Washington, DC 20590. It is requested but not required, that 10 copies be submitted.

**FOR FURTHER INFORMATION CONTACT:** Mr. Kevin Cavey, National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington, DC 20590. Mr. Cavey's telephone number is: (202) 366–5271.

**SUPPLEMENTARY INFORMATION:**

## I. Background Information

Section 5164 of the Omnibus Trade and Competitiveness Act (Pub. L. 100–418), makes it United States (U.S.) policy that the metric system of measurement is the preferred system of weights and measures for United States trade and commerce. Executive Order 12770 directs Federal agencies to comply with the Act by adopting a conversion schedule for their programs by September 30, 1992. In a **Federal Register** document of April 21, 1992 (57 FR 14619), the National Highway Traffic Safety Administration (NHTSA) published its plan to use the metric system in NHTSA programs, and included an implementation schedule to convert the Federal Motor Vehicle Safety Standards (FMVSSs) to metric measurements.

In a final rule published on March 14, 1995 (60 FR 13639), NHTSA completed the first phase of metrication, converting English measurements in the following FMVSSs to the metric system: Standard No. 102, *Transmission shift lever sequence, starter interlock, and transmission braking effect;* Standard No. 103, *Windshield defrosting and defogging systems;* Standard No. 104, *Windshield wiping and washing systems;* Standard No. 107, *Reflecting surfaces;* Standard No. 110, *Tire selection and rims;* Standard No. 112, *Headlamp concealment devices;* Standard No. 114, *Theft protection;* Standard No. 115, *Vehicle identification number—basic requirements;* Standard No. 120, *Tire selection and rims for motor vehicles other than passenger cars;* Standard No. 124, *Accelerator control systems;* Standard No. 126, *Truck-camper loading;* Standard No. 205, *Glazing materials;* Standard No. 206, *Door locks and door retention components;* Standard No. 207, *Seating systems;* Standard No. 212, *Windshield mounting,* and Standard No. 216, *Roof crush resistance.*

In the March 14, 1995 final rule, NHTSA established the following principles for converting English system measurements to the metric system:

(1) Equivalent conversions are generally favored, not exact ones;

(2) The term ''mass'' is favored over the term ''weight,'' except when ''weight'' is used as part of a defined term;

(3) Force measurements are converted by specifying in the regulatory language the steps for making the conversion; and

(4) Dual measurements (i.e., both English and metric measurements) are used in a standard when it seems likely that it will be read by persons not fully accustomed to using the metric system. NHTSA stated its intent to follow these principles in future metrication rulemakings.

## II. Notice of Proposed Rulemaking for Second Phase

On April 21, 1997, NHTSA began its second phase of metricating the FMVSSs by publishing a notice of proposed rulemaking to convert English measurements in the following Federal Motor Vehicle Safety Standards to the metric system: Standard No. 101, *Controls and displays;* Standard No. 109, *New pneumatic tires;* Standard No. 111, *Rearview mirrors;* Standard No. 116, *Motor vehicle brake fluids;* Standard No. 117, *Retreaded pneumatic tires;* Standard No. 119, *New pneumatic tires for vehicles other than passenger cars;* Standard No. 123, *Motorcycle controls and displays;* Standard No. 201, *Occupant protection in interior impact;* Standard No. 202, *Head restraints;* Standard No. 203, *Impact protection for the driver from the steering control system;* Standard No. 204, *Steering control rearward displacement;* Standard No. 209, *Seat belt assemblies;* Standard No. 210, *Seat belt assembly anchorages;* Standard No. 219, *Windshield zone intrusion;* Standard No. 220, *School bus rollover protection;* Standard No. 222, *School bus passenger seating and crash protection;* Standard No. 301, *Fuel system integrity;* and Standard No. 302, *Flammability of interior materials.*

The agency raised issues concerning the following proposed conversions: [1]

*A. Exact Versus Equivalent Conversions*—In the NPRM, NHTSA stated that although it generally favors the use of equivalent conversions, it will not use equivalent conversions where there is a specific safety need or other reason to make an exact conversion. For certain proposed conversions (i.e., ones involving requirements that specify the height of lettering, the minimum depth to which the lettering must be impressed, or the maximum height to which it must be embossed), NHTSA proposed exact conversions, to minimize the possibility of manufacturers' having to change molds and materials.

NHTSA also noted that it proposed in the following instances to make exact conversions to avoid a possibility that the standard would become more stringent as a result of the conversion: (1) In making any conversions of gross vehicle weight ratings (GVWRs); and (2) in the specifications for the loading of test vehicles in Standard No. 219, *Windshield zone intrusion,* and Standard No. 301, *Fuel system integrity.* Certain tested vehicles must be loaded to their unloaded vehicle weight plus 300 pounds. In the NPRM, the agency proposed to convert 300 pounds to 136 kilograms, the equivalent conversion. NHTSA proposed conversion to 136 kilograms, instead of 140 kilograms, because a slight increase in the load required for Standards Nos. 219 and 301 testing (resulting from a conversion to 140 kilograms) might result in manufacturers having to conduct a separate crash test for Standard No. 219 and Standard No. 301 certification.

*B. ''Mass'' vs. ''Weight''*—NHTSA stated that in instances in which the safety standards use ''weight'' to mean ''mass'' in describing compliance testing conditions and procedures, or in other instances in which the standards are primarily directed to engineers or other technically trained persons, NHTSA will substitute ''mass'' for ''weight'' in the regulatory text. However, when ''weight'' is part of a term defined at 49 CFR 571.3, such as ''curb weight,''

[1] The issues relating to the other standards addressed in the NPRM are discussed in today's companion notice.

''gross axle weight rating,'' or ''unloaded vehicle weight,'' NHTSA stated it will not make any change.

*C. Force Measurements*—In making the metric conversion of the force measurements in Standard Nos. 220 and 222, NHTSA proposed to specify the steps of the conversion in the regulatory language, to minimize the chance of the wrong metric system conversion being made. For Standard No. 220, NHTSA proposed to amend the force measurement language (in S4) to provide that the roof of the vehicle's body structure shall be subjected to a force in Newtons equal to 1.5 times the unloaded vehicle weight, measured in kilograms and multiplied by 9.8 $m/s^2$. For Standard No. 222, NHTSA proposed to amend the force measurement language (in S5.1.5) to provide that the seat cushion shall not separate from the seat at any attachment point when subjected to an upward force in Newtons of 5 times the mass of the seat cushion in kilograms and multiplied by 9.8 $m/s^2$.

*D. Dual Measurements*—The agency stated its belief that converting some tables so that they contain only metric measurements would not be very informative to American mirror manufacturers or to American tire manufacturers and retreaders, many of whom may be more familiar with English measurements. Therefore, in the case of the mirror and tire standards, NHTSA proposed that the tables and regulatory text provide both the English and metric systems of measurement. Specifically, in Standard No. 111, *Rearview mirrors*, NHTSA proposed to provide both English and metric measurements for radii of curvature specified in Table I—''Conversion Table from Spherometer Dial Reading to Radius of Curvature.'' Proposed changes to the tire standards are discussed in the companion notice published in this **Federal Register** issue.

NHTSA sought public comment on the proposal to use dual measurements for the specified tables and on the period of time after which the English units of measurements should be phased out.

*E. Leadtime*—NHTSA proposed that, if made final, the changes proposed in the NPRM take effect one year after the publication of the final rule, with manufacturers given the option to comply immediately with the amended language.

*F. Other Changes*—NHTSA also proposed to correct typographical and or other nonsubstantive errors in Standard No. 207, *Seating systems*, and Standard No. 210, *Seat belt assembly anchorage*, and to remove outdated language in Standard No. 204, *Steering control rearward displacement*, and Standard No. 210, *Seat belt assembly anchorages*.

## III. Public Comments and NHTSA's Response

In response to the NPRM, NHTSA received comments from eighteen commenters. The following commenters addressed only proposed metric conversions in the tire standards: Japan Automobile Tire Manufacturers Association; Goodyear; Rubber Manufacturers Association; Toyota; and the European Tyre and Rim Technical Organization. Comments on the tire standards are addressed in today's **Federal Register** notice on tire metrication.

The American Society for Testing and Materials (ASTM) sent NHTSA a copy of its 1996 version of ASTM G23 ''Practice for operating light-exposure apparatus (carbon-arc type) with and without water for exposure of nonmetallic materials'' as an example of how it was converting its recommended practices to the metric system. ASTM stated that the 1996 version has many improvements over the 1981 version.

Other commenters either addressed the principles used in making conversions, or suggested changes to specific proposed conversions. The following issues were addressed by commenters, and are followed by NHTSA's response:

*Exact vs. equivalent measurements*—Mr. Bruce Barrow of the Defense Information Systems Agency, on behalf of the Interagency Council on Metric Policy, cautioned NHTSA to ''avoid implying much more precision than is warranted.'' As an example of what it believed to be excess precision, the Council cited the conversion of 10,000 lbs. to 4536 kilograms for gross vehicle weight ratings (GVWRs), recommending instead that the conversion be made to 4500 kg. On the other hand, Thomas Built and Volkswagen recommended that in converting the GVWR of 10,000 lbs, the exact conversion (4536 kg) be used, not the equivalent conversion (4500 kg).

NHTSA has resolved the issue of GVWR conversions in the first round of metrication (see final rule of March 14, 1995; 60 FR 13639) and will not readdress that issue. NHTSA decided to use exact conversions for GVWR measurements because, in some industries such as school bus manufacturing, 36 kilograms (approximately 80 pounds) makes a difference in determining whether a particular school bus must meet the school bus standards for vehicles over 10,000 lbs. GVWR or vehicles under 10,000 lbs.

The California Department of Transportation (CDOT) asked that NHTSA not change references to GVWR until all truck size and weight regulations are converted to the metric system. CDOT's request is consistent with NHTSA's stated approach of not changing ''weight'' to ''mass'' when ''weight'' is part of a term defined at 49 CFR 571.3 such as ''gross vehicle weight rating'' or ''curb weight.'' Mr. Gary Vigen wrote that he favored equivalent conversions, rather than exact conversions. Mr. Vigen did not give a reason for his position.

*''Mass'' vs. ''Weight''*—The Interagency Council on Metric Policy commented that NHTSA should not consider redefining established terms such as ''gross vehicle weight.'' As previously noted, NHTSA agrees with this comment. The Council also recommended that because of confusion regarding the use of the word ''weight'' vs. ''mass'', that each standard include in its preface the statement: ''In this document the word 'weight' is used as a synonym for 'mass.' '' Because adopting this recommendation may make substantive changes in affected standards, NHTSA is not making the suggested change in this final rule. However, in its future metrication efforts, NHTSA will consider including the Council's recommended statement for specific safety standards.

Professor E. A. Mechtly of the University of Illinois, Urbana, commented generally that the NPRM's use of ''pound'' and ''weight'' required correction. However, since he did not specify where the terms should be corrected, NHTSA is not making any changes in response to Professor Mechtly's comments on this issue.

*Force measurements*—The Interagency Council on Metric Policy recommended that in converting force measurements, the seat cushion or unloaded vehicle weight, measured in kilograms, be multiplied by 10 $m/s^2$ rather than 9.8 $m/s^2$. NHTSA is not adopting this comment because, in Standard No. 220, *School bus rollover protection*, and Standard No. 222, *School bus passenger seating and crash protection*, where force measurements are used, using a factor of 10 may have the effect of making the Standards slightly more stringent than under the English measurement system. However, NHTSA notes that use of 9.8 in the Standards would not preclude a manufacturer from using a factor of 10 when conducting its compliance testing with a safety standard.

*Dual Measurements*—Mr. Gary Vigen wrote that he did not favor dual unit tables because ''(i)n the long run, there is less chance for error when only one set of units is used.'' The Interagency Council on Metric Policy recommended that dual measurements be avoided as much as possible. Land Rover questioned the necessity for dual English and metric measurements when ''information is intended to be used by people in the manufacturing industry.''

NHTSA agrees with the commenters that ideally, dual measurements need not be used. However, as stated in the NPRM, NHTSA believes that converting some tables so that they contain only metric measurements may not be very informative for American mirror manufacturers or for American tire manufacturers or retreaders, who may be more familiar with the English system. NHTSA received no comment addressing whether mirror manufacturers are familiar with the metric system and therefore do not need dual measurements. NHTSA is adopting the proposal in the NPRM for using dual measurements in Standard No. 111, *Rearview mirrors.* Dual measurements for the tire standards are addressed in today's companion final rule on metricating the tire standards.

*Other Changes*—Many commenters, including Ford, General Motors, Land Rover, Mitsubishi, Volkswagen, and Transport Canada commented on specific proposed changes to the safety standards. Many of the comments noted typographical errors, or provided the correct abbreviation for a metric measurement. NHTSA is adopting all of these technical comments. In particular, General Motors noted that NHTSA did not propose to convert to metric measurements, Figure 1 to Standard No. 219, *Windshield zone intrusion*. The oversight has been corrected in the final rule.

Land Rover also stated that in part 583, *Automobile Parts Content Labeling*, the ''example provided * * * does not comply with the labeling typeface requirements (block capitals) in the regulation/standard.'' NHTSA does not believe that the ''PARTS CONTENT INFORMATION'' example provided for part 583 requires correction from the existing lower case to upper case because the specified information is correct. NHTSA is therefore not adopting Land Rover's suggestion.

NHTSA is not adopting Professor Mechtly's suggested changes to Standard No. 126, *Truck-camper loading*, because that standard was not proposed to be amended in the April 1997 notice of proposed rulemaking. NHTSA is also not adopting Professor Mechtly's recommended language for Standard No. 220, *Schoolbus rollover protection*, because it believes that adopting the language might result in a substantive change to the standard.

Ford noted that, in Standard No. 111, *Rearview mirrors*, NHTSA did not propose to convert Figure 3. NHTSA notes that Figure 3 ''Camera Locations for School Bus Field-of-View Test'' is already described in both metric and English system measurements.

*Standard No. 201*—In the notice of proposed rulemaking, NHTSA proposed metricating Standard No. 201, *Occupant Protection in Interior Impacts*. However, on April 8, 1997 (62 FR 16718), NHTSA published a final rule metricating Standard No. 201. Since Standard No. 201 has already been metricated, this final rule will not make changes to Standard No. 201.

*Leadtime*—In the NPRM, NHTSA proposed that, if made final, the changes in the NPRM take effect one year after the final rule is published in the **Federal Register**. NHTSA received no comments relating to the leadtime that should be provided for changes to standards for products other than tires. Thus, for the non-tire FMVSSs, the changes in this final rule will take effect one year after the publication of this final rule. Today's companion **Federal Register** notice addressing metric conversions in the tire standards addresses leadtime for the tire standards.

## IV. Regulatory Impacts

### *A. Executive Order 12866 and DOT Regulatory Policies and Procedures*

NHTSA has examined the impact of this rulemaking action under E.O. 12866 and the Department of Transportation's regulatory policies and procedures. This rulemaking document was not reviewed under E. O. 12866, ''Regulatory Planning and Review.'' This action has been determined to be not ''significant'' under DOT's regulatory policies and procedures.

In converting the Federal Motor Vehicle Safety Standards from the English to the metric measurement system, the agency has made conversions in a way that does not substantively change the performance requirements of the FMVSS's. As a result of this rule, manufacturers now providing consumer information (e.g., labeling) may incur minimal additional costs since they would have to change their information to add the metric units. However, the agency believes additional costs would be minuscule, since manufacturers currently label and provide consumer information in English units. The impacts of this action are so minor that a full regulatory evaluation for this proposed rule has not been prepared.

### *B. Regulatory Flexibility Act*

The agency has also considered the effects of this rulemaking action under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*). I certify that this final rule will not have a significant economic impact on a substantial number of small entities. The rationale for this certification is that converting the FMVSS from the English system to the metric system will not substantively change the performance requirements of any of the Federal Motor Vehicle Safety Standards. Manufacturers that qualify as small businesses that have not been labeling their products in metric units or provide consumer information in metric units will incur some costs to include metric information on their labeling. However, the agency believes such costs will be minimal, given these manufacturers are currently labeling and providing the consumer information in English units.

### *C. Environmental Impacts*

In accordance with the National Environmental Policy Act of 1969, the agency has considered the environmental impacts of this rulemaking action and determined that, as a final rule, it will not have a significant impact on the quality of the human environment.

### *D. Federalism*

This action has been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and it has been determined that the final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

### *E. Civil Justice Reform*

This rule will not have a retroactive effect. Under 49 U.S.C. section 30103, whenever a Federal motor vehicle safety standard is in effect, a state may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard. 49 U.S.C. section 30106 sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file suit in court.

**List of Subjects in 49 CFR Part 571**

Imports, Motor vehicle safety, Motor vehicles, Rubber and rubber products, Tires.

In consideration of the foregoing, the Federal Motor Vehicle Safety Standards (49 CFR part 571), are amended as set forth below.

## PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

1. The authority citation for part 571 continues to read as follows:

**Authority:** 49 U.S.C. 322, 30111, 30115, 30117, and 30166; delegation of authority at 49 CFR 1.50.

2. Section 571.101 is amended by revising S5(a) and revising S5.3.5 to read as follows:

**§ 571.101 Standard No. 101, Controls and displays.**

* * * * *

S5. *Requirements.* (a) Except as provided in paragraph (b) of this section, each passenger car, multipurpose passenger vehicle, truck and bus manufactured with any control listed in S5.1 or in column 1 of Table 1, and each passenger car, multipurpose passenger vehicle and truck or bus less than 4,536 kg GVWR with any display listed in S5.1 or in column 1 of Table 2 shall meet the requirements of this standard for the location, identification, and illumination of such control or display.

* * * * *

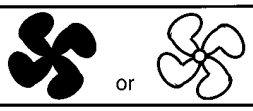
S5.3.5 Any source of illumination within the passenger compartment which is forward of a transverse vertical plane 110 mm rearward of the manikin ''H'' point with the driver's seat in its rearmost driving position, which is not used for the controls and displays regulated by this standard, which is not a telltale, and which is capable of being illuminated while the vehicle is in motion, shall have either (1) light intensity which is manually or automatically adjustable to provide at least two levels of brightness, (2) a single intensity that is barely discernible to a driver who has adapted to dark ambient roadway conditions, or (3) a means of being turned off. This requirement does not apply to buses that are normally operated with the passenger compartment illuminated.

* * * * *

3. Section 571.101 is amended by revising Table 1 and Table 2 that follow S6 to read as follows:

BILLING CODE 4910–59–P

## Table 1
## Identification and Illustration of Controls

| Column 1 | Column 2 | Column 3 | Column 4 |
|---|---|---|---|
| *Hand Operated Controls* | *Identifying Words or Abbreviation* | *Identifying Symbol* | *Illumination* |
| MASTER LIGHTING SWITCH | Lights |  [5] | ——— |
| HEADLAMPS AND TAIL LAMPS | (Manufacturer Option) [2] | (Manufacturer Option) [2] | ——— |
| HORN | Horn |  | ——— |
| TURN SIGNAL | ——— |  [3] [5] | ——— |
| HAZARD WARNING SIGNAL | Hazard |  [5] | Yes |
| WINDSHIELD WIPING SYSTEM | Wiper or Wipe |  | Yes |
| WINDSHIELD WASHING SYSTEM | Washer or Wipe |  | Yes |
| WINDSHIELD WASHING AND WIPING COMBINED | Wash-Wipe or Washer-Wiper |  | Yes |
| HEATING AND OR AIR CONDITIONING FAN | Fan |  or | Yes |
| WINDSHIELD DEFROSTING AND DEFOGGING SYSTEM | Defrost, Defrog or Def. |  | Yes |
| REAR WINDOW DEFROSTING AND DEFOGGING SYSTEM | Rear Defrost, Rear Defog. Rear Def., or R-Def. |  | Yes |
| IDENTIFICATION, SIDE MARKER AND OR CLEARANCE LAMPS | Marker Lamps or MK Lps |  | Yes |
| MANUAL CHOKE | Choke | ——— | ——— |
| ENGINE START | Engine Start[1] | ——— | ——— |
| ENGINE STOP | Engine Stop[1] | ——— | Yes |
| HAND THROTTLE | Throttle | ——— | ——— |
| AUTOMATIC VEHICLE SPEED | (Manufacturer Option) | ——— | Yes |
| HEATING AND AIR CONDITIONING SYSTEM | (Manufacturer Option) | (Manufacturer Option) | Yes |

[1] Use when engine control is separate from the key locking system.

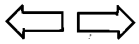
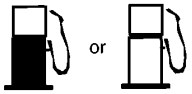
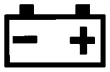
[2] Separate idenfication not required if controlled by master lighting switch.

[3] The pair of arrows is a single symbol. When the controls for left and right turn operate independently, however, the two arrows may be considered separate symbols and be spaced accordingly.

[4] Identification not required for vehicles when a GVWR greater then 10,000 lbs., or or narrow ring-type controls.

[5] Framed areas may be filed.

## Table 2
## Identification and Illustration of Displays

| Column 1 | Column 2 | Column 3 | Column 4 | Column 5 |
|---|---|---|---|---|
| *Display* | *Telltale Color* | *Identifying Words or Abbreviation* | *Identifying Symbol* | *Illumination* |
| TURN SIGNAL Telltale | Green | Also see FMVSS 108 |  [1] [6] | — |
| HAZARD WARNING Telltale | | Also see FMVSS 108 |  [2] [6] | — |
| SEAT BELT Telltale | — [7] | Fasten Belts or Fasten Seat Belts Also see FMVSS 208 |  | — |
| FUEL LEVEL Telltale | | Fuel |  | — |
| Gauge | — | | | Yes |
| OIL PRESSURE Telltale | | Oil |  | — |
| Gauge | — | | | Yes |
| COOLANT TEMPERATURE Telltale | | Temp |  | — |
| Gauge | — | | | Yes |
| ELECTRICAL CHARGE Telltale | | Volts, Charge or Amp |  | — |
| Gauge | — | | | Yes |
| HIGHBEAM Telltale | Blue or Green [4] | Also see FMVSS 108 |  [6] | — |
| Brake System [8] | Red [4] | Brake, Also see FMVSS 105 and 135 | — | — |
| MALFUNCTION IN Anti-Lock or | Yellow | Antilock, Anti-lock, or ABS. Also see FMVSS 105 and 135 | — | — |
| VARIABLE BRAKE PROPORTIONING SYSTEM[8] | Yellow | Brake Propositioning, Also see FMVSS 135 | — | — |
| PARKING BRAKE APPLIED[8] | Red [4] | Park or Parking Brake, Also see FMVSS 105 and 135 | — | — |
| MALFUNCTION IN Anti-Lock or | Yellow | ABS, or Antilock; Trailer ABS, or Trailer Antilock, Also see FMVSS 121 | — | — |
| BRAKE AIR PRESSURE Position Telltale | | Brake Air, Also see FMVSS 121 | — | — |
| SPEEDOMETER | — | MPH km/h [5] | — | Yes |
| ODOMETER | — | — [3] | — | — |
| AUTOMATIC GEAR POSITION | — | Also see FMVSS 102 | — | Yes |

[1] The pair of arrows is a single symbol. When the indicator for left and right turn operate independently, however, the two arrows will be considered separate symbols and may be spaced accordingly.

[2] Not required when arrows of turn signal tell-tales that otherwise operate independently flash simultaneously as hazard warning tell-tale.

[3] If the odometer indicates kilometers, then "KILOMETERS" or "km" shall appear, otherwise, no identification is required.

[4] Red can be red-orange. Blue can be blue-green.

[5] If the speedometer is graduated in miles per hour and in kilometers per hour, the identifying words or abbreviations shall be "MPH and km/h" in any combination of upper or lower case letters.

[6] Framed areas may be filled.

[7] The color of the telltale required by S4.5.3.3 of Standard No 208 is red; the color of the telltale required by S7.3 of Standard No. 208 is not specified.

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4. Section 571.111 is amended by revising S5.1.1; revising S5.1.2; revising S5.2.1; revising S5.4.2; revising S5.4.3; revising S6; revising S6.1; revising S7; revising S7.1; revising S8; revising S8.1; revising S9.2; revising S9.3; revising S10.1; revising S12.2; revising S12.3; revising S12.4; and revising S13.2 to read as follows:

**§ 571.111 Standard No. 111, Rearview mirrors.**

* * * * *

S5.1.1 *Field of view*. Except as provided in S5.3, the mirror shall provide a field of view with an included horizontal angle measured from the projected eye point of at least 20 degrees, and sufficient vertical angle to provide a view of a level road surface extending to the horizon beginning at a point not greater than 60 m to the rear of the vehicle when the vehicle is occupied by the driver and four passengers or the designated occupant capacity, if less, based on an average occupant weight of 68 kg. The line of sight may be partially obscured by seated occupants or by head restraints. The location of the driver's eye reference points shall be those established in Motor Vehicle Safety Standard No. 104 (§ 571.104) or a nominal location appropriate for any 95th percentile male driver.

S5.1.2 *Mounting.* The mirror mounting shall provide a stable support for the mirror, and shall provide for mirror adjustment by tilting in both the horizontal and vertical directions. If the mirror is in the head impact area, the mounting shall deflect, collapse or break away without leaving sharp edges when the reflective surface of the mirror is subjected to a force of 400 N in any forward direction that is not more than 45° from the forward longitudinal direction.

S5.2.1 *Field of view*. Each passenger car shall have an outside mirror of unit magnification. The mirror shall provide the driver a view of a level road surface extending to the horizon from a line, perpendicular to a longitudinal plane tangent to the driver's side of the vehicle at the widest point, extending 2.4 m out from the tangent plane 10.7 m behind the driver's eyes, with the seat in the rearmost position. The line of sight may be partially obscured by rear body or fender contours. The location of the driver's eye reference points shall be those established in Motor Vehicle Safety Standard No. 104 (§ 571.104) or a nominal location appropriate for any 95th percentile male driver.

* * * * *

S5.4.2 Each convex mirror shall have permanently and indelibly marked at the lower edge of the mirror's reflective surface, in letters not less than 4.8 mm nor more than 6.4 mm high the words ''Objects in Mirror Are Closer Than They Appear.''

S5.4.3 The average radius of curvature of each such mirror, as determined by using the procedure in S12., shall be not less than 889 mm and not more than 1,651 mm.

S6. *Requirements for multipurpose passenger vehicles, trucks, and buses, other than school buses, with GVWR of 4,536 kg or less.*

S6.1 Each multipurpose passenger vehicle, truck and bus, other than a school bus, with a GVWR of 4,536 kg or less shall have either—

(a) Mirrors that conform to the requirements of S5.; or

(b) Outside mirrors of unit magnification, each with not less than 126 $cm^2$ of reflective surface, installed with stable supports on both sides of the vehicle, located so as to provide the driver a view to the rear along both sides of the vehicle, and adjustable in both the horizontal and vertical directions to view the rearward scene.

S7. *Requirements for multipurpose passenger vehicles and trucks with a GVWR of more than 4,536 kg and less than 11,340 kg and buses, other than school buses, with a GVWR of more than 4,536 kg.*

S7.1 Each multipurpose passenger vehicle and truck with a GVWR of more than 4,536 kg and less than 11,340 kg and each bus, other than a school bus, with a GVWR of more than 4,536 kg shall have outside mirrors of unit magnification, each with not less than 323 $cm^2$ of reflective surface, installed with stable supports on both sides of the vehicle. The mirrors shall be located so as to provide the driver a view to the rear along both sides of the vehicle and shall be adjustable both in the horizontal and vertical directions to view the rearward scene.

S8. *Requirements for multipurpose passenger vehicles and trucks with a GVWR of 11,340 kg or more.*

S8.1 Each multipurpose passenger vehicle and truck with a GVWR of 11,340 kg or more shall have outside mirrors of unit magnification, each with not less than 323 $cm^2$ of reflective surface, installed with stable supports on both sides of the vehicle. The mirrors shall be located so as to provide the driver a view to the rear along both sides of the vehicle and shall be adjustable both in the horizontal and vertical directions to view the rearward scene.

* * * * *

S9.2 System A shall be located with stable supports so that the portion of the system on the bus's left side, and the portion on its right side, each:

(a) Includes at least one mirror of unit magnification with not less than 323 $cm^2$ of reflective surface; and

(b) Includes one or more mirrors which together provide, at the driver's eye location, a view of:

(1) For the mirror system on the right side of the bus, the entire top surface of cylinder N in Figure 2, and of that area of the ground which extends rearward from the mirror surface not less than 61 meters.

(2) For the mirror system on the left side of the bus, the entire top surface of cylinder M in Figure 2, and of that area of the ground which extends rearward from the mirror surface not less than 61 meters.

S9.3(a) For each of the cylinders A though P whose entire top surface is not directly visible from the driver's eye location, System B shall provide, at that location:

(1) A view of the entire top surface of that cylinder.

(2) A view of the ground that overlaps with the view of the ground provided by System A.

(b) Each mirror installed in compliance with S9.3(a) shall meet the following requirements:

(1) Each mirror shall have a projected area of at least 258 $cm^2$, as measured on a plane at a right angle to the mirror's axis.

(2) Each mirror shall be located such that the distance from the center point of the eye location of a 25th percentile adult female seated in the driver's seat to the center of the mirror shall be at least 95 $cm^2$.

(3) Each mirror shall have no discontinuities in the slope of the surface of the mirror.

(4) Each mirror shall be installed with a stable support.

(c) Each school bus which has a mirror installed in compliance with S9.3(a) that has an average radius of curvature of less than 889 mm, as determined under S12, shall have a label visible to the seated driver. The label shall be printed in a type face and color that are clear and conspicuous. The label shall state the following:

''USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING. IMAGES IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION.''

* * * * *

S10.1 Each motorcycle shall have either a mirror of unit magnification

with not less than 8065 $mm^2$ of reflective surface, or a convex mirror with not less than 6450 $mm^2$ of reflective surface and an average radius of curvature not less than 508 mm and not greater than 1524 mm, installed with a stable support, and mounted so that the horizontal center of the reflective surface is at least 279 mm outward of the longitudinal centerline of the motorcycle. The mirror shall be adjustable by tilting in both the horizontal and vertical directions.

* * * * *

S12.2 The 3-point linear spherometer has two outer fixed legs 38 mm apart and one inner movable leg at the midpoint. The spherometer has a dial indicator with a scale that can be read accurately to .0025 mm, with the zero reading being a flat surface.

S12.3 The 10 test positions on the image display consist of two positions at right angles to each other at each of five locations as shown in Figure 1. The locations are at the center of the mirror, at the left and right ends of a horizontal line that bisects the mirror and at the top and bottom ends of a vertical line that bisects the mirror. None of the readings are within a 6.4 mm border on the edge of the image display.

S12.4 At each position, the spherometer is held perpendicular to the convex mirror-surface and a record is made of the reading on the dial indicator to the nearest .0025 mm.

* * * * *

S13.2 The cylinders are 0.3048 m high and 0.3048 m in diameter, except for cylinder P which is 0.9144 m high and 0.3048 m in diameter.

* * * * *

5. In § 571.111, Table I—''Conversion Table from Spherometer Dial Reading to Radius of Curvature'', following Figure 1 in S12.8, would be revised to read as follows:

TABLE I.—CONVERSION TABLE FROM SPHEROMETER DIAL READING TO RADIUS OF CURVATURE

| Dial reading | Radius of curvature (inches) | Radius of curvature (mm) |
|---|---|---|
| .00330 | 85.2 | 2164.1 |
| .00350 | 80.4 | 2042.2. |
| .00374 | 75.2 | 1910.1 |
| .00402 | 70.0 | 1778.0 |
| .00416 | 67.6 | 1717.0 |
| .00432 | 65.1 | 1653.5 |
| .00450 | 62.5 | 1587.5 |
| .00468 | 60.1 | 1526.5 |
| .00476 | 59.1 | 1501.1 |
| .00484 | 58.1 | 1475.7 |
| .00492 | 57.2 | 1452.9 |
| .00502 | 56.0 | 1422.4 |
| .00512 | 54.9 | 1394.5 |
| .00522 | 53.8 | 1369.1 |
| .00536 | 55.5 | 1333.5 |
| .00544 | 51.7 | 1313.2 |
| .00554 | 50.8 | 1290.3 |
| .00566 | 49.7 | 1262.4 |
| .00580 | 48.5 | 1231.9 |
| .00592 | 47.5 | 1206.5 |
| .00606 | 46.4 | 1178.6 |
| .00622 | 45.2 | 1148.1 |
| .00636 | 44.2 | 1122.7 |
| .00654 | 43.0 | 1092.2 |
| .00668 | 42.1 | 1069.3 |
| .00686 | 41.0 | 1041.1 |
| .00694 | 40.5 | 1028.7 |
| .00720 | 39.1 | 993.1 |
| .00740 | 38.0 | 965.2 |
| .00760 | 37.0 | 939.8 |
| .00780 | 36.1 | 916.9 |
| .00802 | 35.1 | 891.5 |
| .00922 | 34.2 | 868.7 |
| .00850 | 33.1 | 840.7 |
| .00878 | 32.0 | 812.8 |
| .00906 | 31.0 | 787.4 |
| .00922 | 30.5 | 774.7 |
| .00938 | 30.0 | 762.0 |
| .00960 | 29.3 | 744.2 |
| .00980 | 28.7 | 728.9 |
| .01004 | 28.0 | 711.2 |
| .01022 | 27.5 | 698.5 |
| .01042 | 27.0 | 685.8 |
| .01060 | 26.5 | 673.1 |
| .01080 | 26.0 | 660.4 |
| .01110 | 25.3 | 642.6 |
| .01130 | 24.9 | 632.5 |

TABLE I.—CONVERSION TABLE FROM SPHEROMETER DIAL READING TO RADIUS OF CURVATURE—Continued

| Dial reading | Radius of curvature (inches) | Radius of curvature (mm) |
|---|---|---|
| .01170 | 24.0 | 609.6 |
| .01200 | 23.4 | 594.4 |
| .01240 | 22.7 | 576.6 |
| .01280 | 22.0 | 558.8 |
| .01310 | 21.5 | 546.1 |
| .01360 | 20.7 | 525.8 |
| .01400 | 20.1 | 510.5 |
| .01430 | 19.1 | 500.4 |
| .01460 | 19.0 | 482.6 |
| .01540 | 18.3 | 464.8 |
| .01570 | 17.9 | 454.7 |
| .01610 | 17.5 | 444.5 |
| .01650 | 17.1 | 434.3 |
| .01700 | 16.6 | 421.6 |
| .01750 | 16.1 | 408.9 |
| .01800 | 15.6 | 396.2 |
| .01860 | 15.1 | 383.5 |
| .01910 | 14.7 | 373.4 |
| .01980 | 14.2 | 360.7 |
| .02040 | 13.8 | 350.5 |
| .02100 | 13.4 | 340.4 |
| .02160 | 13.0 | 330.2 |
| .02250 | 12.5 | 317.5 |
| .02340 | 12.0 | 304.8 |
| .02450 | 11.5 | 292.1 |
| .02560 | 11.2 | 279.4 |
| .02680 | 10.5 | 266.7 |
| .02810 | 10.0 | 254.0 |
| .02960 | 9.5 | 241.3 |
| .03130 | 9.0 | 228.6 |
| .03310 | 8.5 | 215.9 |

6. In § 571.111, Figure 2 ''Location of Test Cylinders for School Bus Field-of-View Test'', after S13.3(g), is revised to read as follows:

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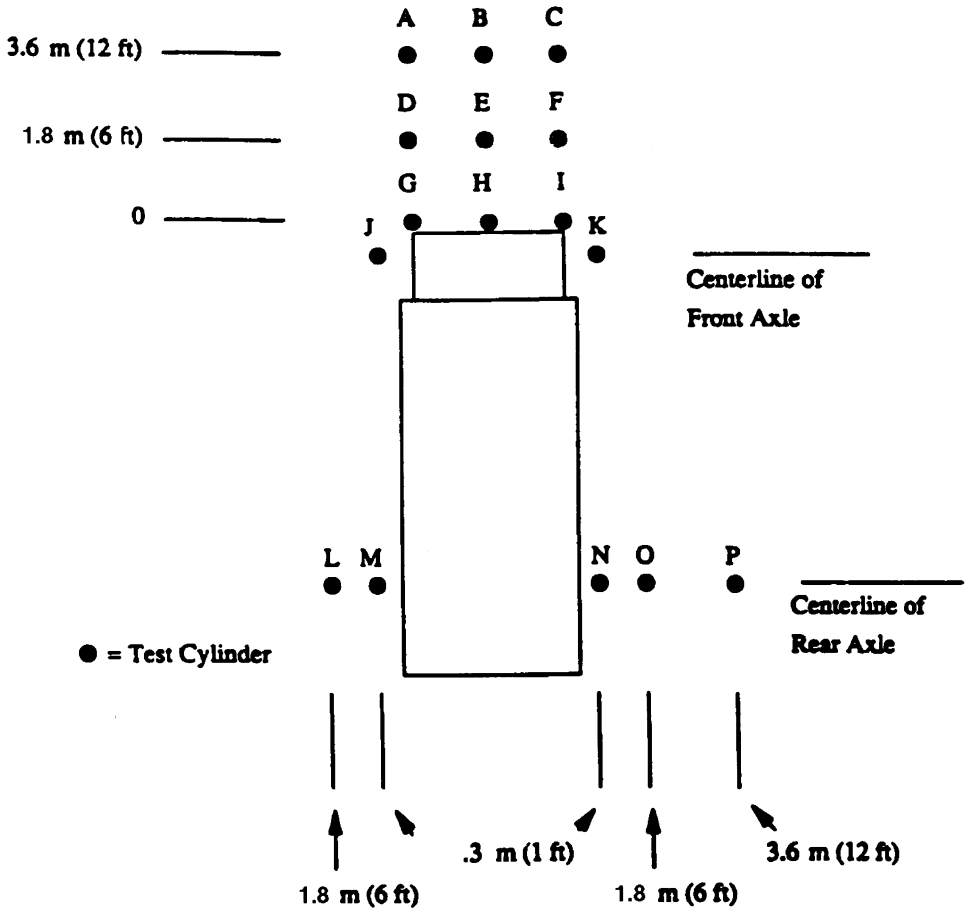


**Figure 2.—Location of Test Cylinders for School Bus Field-of-View Test**
**All Dimensions in Meters (m)**

BILLING CODE 4910–59–C

7. Section 571.116 is amended by revising S5.1.3; revising S5.2.1; revising in S5.2.2.2, the introductory paragraph and paragraph (g)(4); revising in S5.2.2.3, the introductory paragraph, paragraph (d) and paragraph (e)(4); revising S6.3; revising in S6.6.6, paragraph (a); revising S6.8.3; revising in S6.10.3, paragraph (a); revising S6.11.1; revising S6.11.6; revising, in S6.13.2, paragraph (b); revising in S6.13.3, paragraph (b), revising in S6.13.4, paragraph (c)(1); revising S7.4.2; and revising in S7.5.1, paragraph (b), to read as follows:

**§ 571.116 Standard No. 116, Motor vehicle brake fluids.**

* * * * *

S5.1.3. *Kinematic viscosities.* When brake fluid is tested according to S6.3, the kinematic viscosities in square millimeters per second at stated temperatures shall be neither less than 1.5 $mm^2/s$ at 100° C. (212° F.) nor more than the following maximum value for the grade indicated:

(a) DOT 3: 1,500 $mm^2/s$ at minus 40° C. (minus 40° F.).

(b) DOT 4: 1,800 $mm^2/s$ at minus 40° C. (minus 40° F.).

(c) DOT 5: 900 $mm^2/s$ at minus 40° C. (minus 40° F.).

* * * * *

S5.2.1 *Container sealing.* Each brake fluid or hydraulic system mineral oil container with a capacity of 177 mL or more shall be provided with a resealable closure that has an inner seal impervious to the packaged brake fluid. The container closure shall include a tamper-proof feature that will either be destroyed or substantially altered when the container closure is initially opened.

* * * * *

S5.2.2.2 Each packager of brake fluid shall furnish the information specified in paragraphs (a) through (g) of this S5.2.2.2 by clearly marking it on each brake fluid container or on a label (labels) permanently affixed to the container, in any location except a removable part such as a lid. After being subjected to the operations and conditions specified in S6.14, the information required by this section shall be legible to an observer having corrected visual acuity of 20/40 (Snellen ratio) at a distance of 305 mm, and any label affixed to the container in compliance with this section shall not be removable without its being destroyed or defaced.

* * * * *

(g) * * *

(4) *CAUTION:* DO NOT REFILL CONTAINER, AND DO NOT USE FOR OTHER LIQUIDS. (Not required for containers with a capacity in excess of 19 L.)

S5.2.2.3 Each packager of hydraulic system mineral oil shall furnish the information specified in paragraphs (a) through (e) of this S5.2.2.3 by clearly marking it on each brake fluid container or on a label (labels) permanently affixed to the container, in any location except a removable part such as a lid. After being subjected to the operations and conditions specified in S6.14, the information required by this section shall be legible to an observer having corrected visual acuity of 20/40 (Snellen ratio) at a distance of 305 mm and any label affixed to the container in compliance with this section shall not be removable without its being destroyed or defaced.

* * * * *

(d) Designation of the contents as ''HYDRAULIC SYSTEM MINERAL OIL'' in capital letters at least 3 mm high.

(e) The following safety warnings in capital and lowercase letters as indicated:

* * * * *

(4) *CAUTION:* STORE HYDRAULIC SYSTEM MINERAL OIL ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED. DO NOT REFILL CONTAINER OR USE OTHER LIQUIDS. (The last sentence is not required for containers with a capacity in excess of 19 L.)

* * * * *

S6.3 *Kinematic viscosity.* Determine the kinematic viscosity of a brake fluid in $mm^2s$ by the following procedure. Run duplicate samples at each of the specified temperatures, making two timed runs on each sample.

* * * * *

S6.6.6 *Calculation*

(a) Measure the area of each type of test strip to the nearest square centimeter. Divide the average change in mass for each type by the area of that type.

* * * * *

S6.8.3 *Procedure.* Obtain the tare weight of each of the four covered petri dishes to the nearest 0.01 gram. Place 25±1 ml. of brake fluid in each dish, replace proper covers and reweigh. Determine the weight of each brake fluid test specimen by the difference. Place the four dishes, each inside its inverted cover, in the oven at 100°±2° C. (212°±4° F.) for 46±2 hours. (Note: Do not simultaneously heat more than one fluid in the same oven.) Remove the dishes from the oven, allow to cool to 23°±5° C. (73.4°±9° F.), and weigh. Return to the oven for an additional 24±2 hours. If at the end of 72±4 hours the average loss by evaporation is less than 60 percent, discontinue the evaporation procedure and proceed with examination of the residue. Otherwise, continue this procedure either until equilibrium is reached as evidenced by an incremental mass loss of less than 0.25 gram in 24 hours on all individual dishes or for a maximum of 7 days. During the heating and weighing operation, if it is necessary to remove the dishes from the oven for a period of longer than 1 hour, the dishes shall be stored in a desiccator as soon as cooled to room temperature. Calculate the percentage of fluid evaporated from each dish. Examine the residue in the dishes at the end of 1 hour at 23°±5° C. (73.4°±9° F.). Rub any sediment with the fingertip to determine grittiness or abrasiveness. Combine the residues from all four dishes in a 118 mL (4-ounce) oil-sample bottle and store vertically in a cold chamber at minus 5°±1° C. (23°±5° F.) for 60±10 minutes. Quickly remove the bottle and place in the horizontal position. The residue must flow at least 5 mm (0.2 inch) along the tube within 5 seconds.

* * * * *

S6.10.3 *Procedure*

(a) *At low temperature.*

Mix 50±0.5 mL of brake fluid with 50±0.5 mL of SAE RM–66–04 Compatibility Fluid. Pour this mixture into a centrifuge tube and stopper with a clean dry cork. Place tube in the cold chamber maintained at minus 40°±2° C. (minus 40°±4° F). After 24±2 hours, remove tube, quickly wipe with a clean lint-free cloth saturated with ethanol (isopropanol when testing DOT 5 fluids) or acetone. Examine the test specimen for evidence of slugging, sedimentation, or crystallization. Test fluids, except DOT 5 SBBF, shall be examined for stratification.

* * * * *

S6.11.1 *Summary of procedure.*

Brake fluids, except DOT 5 SBBF, are activated with a mixture of approximately 0.2 percent benzoyl peroxide and 5 percent water. DOT 5 SBBF is humidified in accordance with S6.2 eliminating determination of the ERBP, and then approximately 0.2 percent benzoyl peroxide is added. A corrosion test strip assembly consisting of cast iron and an aluminum strip separated by tinfoil squares at each end is then rested on a piece of SBR WC cup positioned so that the test strip is half immersed in the fluid and oven aged at 70° C. (158° F.) for 168 hours. At the end of this period, the metal strips are examined for pitting, etching, and loss of mass.

* * * * *

S6.11.6 *Calculation.* Determine corrosion loss by dividing the change in mass of each metal strip by the total surface area of each strip measured in square millimeters ($mm^2$), to the nearest square millimeter ($mm^2$). Average the results for the two strips of each type of metal, rounding to the nearest 0.05 mg. per 100 square millimeter ($mm^2$). If only one of the duplicates fails for any reason, run a second set of duplicate samples. Both repeat samples shall meet all requirements of S5.1.11.

* * * * *

S6.13.2 *Apparatus and equipment.*

* * * * *

(b) *Braking pressure actuation mechanism.* An actuating mechanism for applying a force to the master cylinder pushrod without side thrust. The amount of force applied by the actuating mechanism shall be adjustable and capable of applying sufficient thrust to the master cylinder to create a pressure of at least 6895 kPa (1,000 p.s.i.) in the simulated brake system. A hydraulic gage or pressure recorder, having a range of at least 0 to 6895 kPa (0 to 1,000 p.s.i), shall be installed between the master cylinder and the brake assemblies and shall be provided with a shutoff valve and with a bleeding valve for removing air from the connecting tubing. The actuating mechanism shall be designed to permit adjustable stroking rates of approximately 1,000 strokes per hour. Use a mechanical or electrical counter to record the total number of strokes.

* * * * *

S6.13.3 *Materials.*

* * * * *

(b) *Steel tubing.* Double wall steel tubing meeting SAE specification J527. A complete replacement of tubing is essential when visual inspection indicates any corrosion or deposits on inner surface of tubing. Tubing from master cylinder to one wheel cylinder shall be replaced for each test (minimum length .9 m.) Uniformity in tubing size is required between master cylinder and wheel cylinder. The standard master cylinder has two outlets for tubing, both of which must be used.

* * * * *

S6.13.4 *Preparation of test apparatus.*

* * * * *

(c) *Assembly and adjustment of test apparatus.*

(1) When using a shoe and drum type apparatus, adjust the brake shoe toe clearances to 1.0±0.1 mm (0.040±0.004 inch). Fill the system with brake fluid, bleeding all wheel cylinders and the pressure gage to remove entrapped air. Operate the actuator manually to apply a pressure greater than the required operating pressure and inspect the system for leaks. Adjust the actuator and/or pressure relief valve to obtain a pressure of 6895 kPa±345 kPa (1,000±50 p.s.i.). A smooth pressure stroke pattern is required when using a shoe and drum type apparatus. The pressure is relatively low during the first part of the stroke and then builds up smoothly to the maximum stroking pressure at the end of the stroke, to permit the primary cup to pass the compensating hole at a relatively low pressure. Using stroking fixtures, adjust the actuator and/or pressure relief valve to obtain a pressure of 6895 kPa±345 kPa (1,000±50 p.s.i.).

* * * * *

S7.4.2 *Procedure.* Make hardness measurements at 23°±2° C. (73.4°±4°F.). Equilibrate the tester and anvils at this temperature prior to use. Center brake cups lip side down on an anvil of appropriate hardness. Following the manufacturer's operating instructions for the hardness tester, make one measurement at each of four points 6 mm from the center of the cup and spaced 90° apart. Average the four values, and round off to the nearest IRHD.

* * * * *

S7.5.1 *Apparatus.*

* * * * *

(b) *Centrifuge.* A centrifuge capable of whirling two or more filled centrifuge tubes at a speed which can be controlled to give a relative centrifugal force (r.c.f.) between 600 and 700 at the tip of the tubes. The revolving head, trunnion rings, and trunnion cups, including the rubber cushion, shall withstand the maximum centrifugal force capable of being delivered by the power source. The trunnion cups and cushions shall firmly support the tubes when the centrifuge is in motion. Calculate the speed of the rotating head using this equation:

$$r.p.m. = 265[\sqrt{25.4 \times r.c.f./d}]$$

Where:

r.c.f. = Relative centrifugal force, and

d = Diameter of swing, in millimeters, measured between tips of opposing tubes when in rotating position.

Table VI shows the relationship between diameter, swing, relative centrifugal force (r.c.f.), and revolutions per minute.

TABLE VI.—ROTATION SPEEDS FOR CENTRIFUGES OF VARIOUS DIAMETERS

| Diameter of swing in millimeters [a] | r.p.m. at 600 r.c.f | r.p.m. at 700 r.c.f. |
|---|---|---|
| 483 | 1490 | 1610 |
| 508 | 1450 | 1570 |
| 533 | 1420 | 1530 |
| 559 | 1390 | 1500 |

[a] Measured in millimeters between tips of opposite tubes when in rotating position.

* * * * *

8. Section 571.123 would be amended by revising S5.2.3 to read as follows:

**§ 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.

(d) The abbreviations ''M.P.H.'', ''km/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.

* * * * *

9. In § 571.123, Table 3 ''Motorcycle Control and Display Identification Requirements'' that follows S5.2.5 and Tables 1 and 2 would be revised to read as follows:

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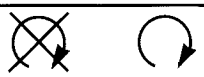
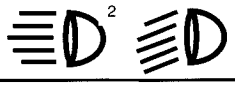
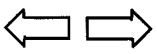
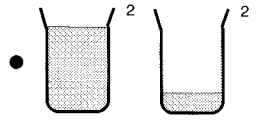
## Table 3
## Motorcycle Control and Display Identification Requirements

| No. | Column 1 | Column 2 | Column 3 | Column 4 |
|---|---|---|---|---|
| | *EQUIPMENT* | *Control and Display Identification Word* | *Control and Display Identification Symbol* | *Identification at Appropriate Position of Control and Display* |
| 1 | IGNITION | Ignition | — | Off |
| 2 | SUPPLEMENTAL ENGINE STOP (OFF, RUN) | Engine Stop |  | Off, Run |
| 3 | MANUAL CHOKE OR MIXTURE ENRICHMENT | Choke or Enricher |  | — |
| 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 | km/h [5] mph | — | km/h [5] mph [4] |
| 9 | NEUTRAL INDICATOR | Neutral | N | Yes |
| 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 filed..

[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 acdordingly.

[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.

[5] If the speedometer is graduated in miles per hour (MPH) and in kilometers per hour (km/h), the identifying words or abbreviation shall be MPH and km/h in any combination of upper or lower case letters.

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10. Section 571.202 is amended by revising S2; revising S4.2; revising S4.3; revising in S5.1, paragraph (c), and revising S5.2 to read as follows:

**§ 571.202 Standard No. 202, Head restraints.**

* * * * *

S2. *Application.* This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks and buses with a GVWR of 4,536 kg or less.

* * * * *

S4.2 Each truck, multipurpose passenger vehicle and bus with a GVWR of 4,536 kg or less, shall comply with S4.3.

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

(a) It shall, when tested in accordance with S5.1, during a forward acceleration of at least 78 $m/s^2$ 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 700 mm above the seating reference point;

(2) When measured either 64 mm below the top of the head restraint or 635 mm above the seating reference point, the lateral width of the head restraint shall be not less than—

(i) 254 mm for use with bench-type seats; and

(ii) 171 mm 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 102 mm perpendicularly rearward of the displaced extended torso reference line during the application of the load specified in S5.2(c); and

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

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

(ii) Application of a load of 890 N.

* * * * *

(c) During forward acceleration applied to the structure supporting the seat as described in this paragraph, measure the maximum rearward angular displacement between the dummy torso reference line and 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 78 $m/s^2$ and a duration of 80 milliseconds and not more than that of a half-sine wave curve having an amplitude of 94 $m/s^2$ and a duration of 96 milliseconds.

S5.2 Compliance with S4.3(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 plan dimensions and torso line (centerline of the head room probe in full back position), of the three dimensional SAE J826 manikin, at the manufacturer's recommended design seated position.

(b) Establish the displaced torso reference line by applying a rearward moment of 373 Nm moment 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 165 mm diameter spherical head form or cylindrical head form having a 165 mm diameter in plan view and a 152 mm height in profile view, apply, perpendicular to the displaced torso reference line, a rearward initial load 64 mm below the top of the head restraint that will produce a 373 Nm moment about the seating reference point.

(d) Gradually increase this initial load to 890 N or until the seat or seat back fails, whichever occurs first.

11. Section 571.203 is amended by revising S2; revising S4; and revising S5.1 to read as follows:

**§ 571.203 Standard No. 203, Impact protection for the driver from the steering control system.**

* * * * *

S2. *Application.* This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a gross vehicle weight rating of 4,536 kg 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.

* * * * *

S4. *Requirements.* Each passenger car and each multipurpose passenger vehicle, truck and bus with a gross vehicle weight rating of 4,536 kg or less manufactured on or after September 1, 1981 shall meet the requirements of S5.1 and S5.2.

S5. *Impact protection requirements.*

S5.1 Except as provided in this paragraph, the steering control system of any vehicle to which this standard applies shall be impacted in accordance with S5.1(a). However, the steering control system of any such vehicle manufactured on or before August 31, 1996, may be impacted in accordance with S5.1(b).

(a) When the steering control system is impacted by a body block in accordance with SAE Recommended Practice J944 JUN80 *Steering Control System—Passenger Car—Laboratory Test Procedure,* at a relative velocity of 24.1 km/h, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 11,110 N, except for intervals whose cumulative duration is not more than 3 milliseconds.

(b) 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 24 km/h, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 11,120 N, except for intervals whose cumulative duration is not more than 3 milliseconds.

* * * * *

12. Section 571.204 is amended by revising S4.2 to read as follows:

**§ 571.204 Standard No. 204, Steering control rearward displacement.**

* * * * *

S4.2 *Vehicles manufactured on or after September 1, 1991.* When a passenger car or a truck, bus or multipurpose passenger vehicle with a gross vehicle weight rating of 4,536 kg or less and an unloaded vehicle weight of 2,495 kg or less is tested under the conditions of S5 in a 48.3 km/h perpendicular impact into a fixed collision barrier, the upper end of the steering column and shaft in the vehicle shall not be displaced more than 127 mm in a horizontal rearward direction parallel to the longitudinal axis of the vehicle. The amount of displacement shall be measured relative to an undisturbed point on the vehicle and shall represent the maximum dynamic movement of the upper end of the steering column and shaft during the crash test.

* * * * *

13. Section 571.207 is amended by revising S5.1.2 to read as follows:

**§ 571.207 Standard No. 207, Seating systems.**

* * * * *

S5.1.2 If the seat back and the seat bench are attached to the vehicle by different attachments, attach to each

component a fixture capable of transmitting a force to that component. Apply forces, in newtons, equal to 20 times the mass of the seat back in kilograms multiplied by 9.8 $m/s^2$ horizontally through the center of gravity of the seat back, as shown in Figure 2 and apply forces, in newtons, equal to 20 times the mass of the seat bench in kilograms multiplied by 9.8 $m/s^2$ horizontally through the center of gravity of the seat bench, as shown in Figure 3.

* * * * *

14. Section 571.209 is amended by revising in S4.1, paragraphs (f) and (g)(3); revising in S4.2, paragraphs (a), (b) and (c); revising in S4.3, paragraphs (c), (d), (e), (g), (h), (i), and (j); revising S4.4; revising in S5.1, paragraphs (a), (b), (c), (d), (e), and (f); revising in S5.2, paragraph (a) except for the NOTE, and paragraphs (c), (d), (e), (f), (g), (h), (i), (j), and (k); and revising in S5.3, paragraphs (a), (b), and (c) to read as follows:

**§ 571.209 Standard No. 209, Seat belt assemblies.**

* * * * *

S4.1 (a) * * *

(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. 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 1/2–13UNC–2A attachment bolts or equivalent metric 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 1.5 mm in thickness and at least 2580 $mm^2$ in projected area. The distance between any edge of the plate and the edge of the bolt hole shall be at least 15 mm. Any corner shall be rounded to a radius of not less than 6 mm or cut so that no corner angle is less than 135° and no side is less than 6 mm in length.

(g) *Adjustment.* * * *

(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 | 46.3 kg | 97.5 kg. |
| Erect sitting height. | 785 mm | 965 mm. |
| Hip breadth (sitting). | 325 mm | 419 mm. |
| Hip circumference (sitting). | 925 mm | 1199 mm. |
| Waist circumference (sitting). | 599 mm | 1080 mm. |
| Chest depth | 190 mm | 267 mm. |
| Chest circumference: | | |
| Nipple | 775 mm | 1130 mm. |
| Upper | 757 mm | 1130 mm. |
| Lower | 676 mm | 1130 mm. |

* * * * *

S4.2 *Requirements for webbing.*

(a) *Width.* The width of the webbing in a seat belt assembly shall be not less than 46 mm, 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—26.7 kN; Type 2 seat belt assembly—22.2 kN for webbing pelvic restraint and 17.8 kN for webbing in upper torso restraint.

(c) *Elongation.* Except as provided in S4.5, the webbing in a seat belt assembly shall not extend to more than the following elongation when subjected to the specified forces in accordance with the procedure specified in S5.1(c): Type 1 seat belt assembly—20 percent at 11,120 N; Type 2 seat belt assembly 30 percent at 11,120 N for webbing in pelvic restraint and 40 percent at 11,120 N for webbing in upper torso restraint.

* * * * *

(c) *Attachment hardware.* (1) Eye bolts, shoulder bolts, or other bolt used to secure the pelvic restraint of seat belt assembly to a motor vehicle shall withstand a force of 40,034 N 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 cannot be attached to the vehicle by a single bolt shall have breaking strength of not less than 22,241 N.

(2) Other attachment hardware designed to receive the ends of two seat belt assemblies shall withstand a tensile force of at least 26,689 N without fracture of a 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 2 mm 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 133 N is applied.

(2) A buckle designed for pushbutton application of buckle release force shall have a minimum area of 452 $mm^2$ with a minimum linear dimension of 10 mm for applying the release force, or a buckle designed for lever application of buckle release force shall permit the insertion of a cylinder 10 mm in diameter and 38 mm 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 1779 N applied as prescribed in paragraph S5.2(d)(3). The buckle shall be operable and shall meet the applicable requirement 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 49 N when measured by the procedure specified in S5.2(e).

* * * * *

(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 22 N.

(h) *Nonlocking retractor.* The webbing of a seat belt assembly shall extend from a nonlocking retractor within 6 mm 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 5 N 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 25 mm between locking positions of the retractor, and shall be retracted with a force under zero acceleration of not less than 3 N when attached to pelvic restraint, and not less that 2 N nor more than 5 N in any strap or webbing that contacts the shoulders 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 25 mm when the retractor is subjected to an acceleration of 7 $m/s^2$;

(2) Shall not lock, if the retractor is sensitive to webbing withdrawal, before the webbing extends 51 mm when the retractor is subjected to an acceleration of 3 $m/s^2$ 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 retractive force of at least 3 N under zero acceleration when attached only to the pelvic restraint;

(5) Shall exert a retractive force of not less than 1 N and not more than 5 N under zero acceleration when attached only to an upper torso restraint;

(6) Shall exert a retractive force of not less than 1 N and not more than 7 N under zero acceleration when attached to a strap or webbing that restrains both the upper torso and the pelvis.

* * * * *

S4.4 *Requirements for assembly performance.*

(a) *Type I 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 22,241 N; that is, each structural component of the assembly shall withstand a force of not less than 1,120 N.

(2) The assembly loop shall extend not more than 7 inches or 178 mm when subjected to a force of 22,241 N; that is, the length of the assembly between anchorages shall not increase more than 356 mm.

(3) Any webbing cut by the hardware during test shall have a breaking strength at the cut of not less than 18,683 N.

(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 11,120 N.

(2) The structural components in the upper torso restraint shall withstand a force of not less than 6,672 N.

(3) The structural components in the assembly that are common to pelvic and upper torso restraints shall withstand a force of not less than 13,345 N.

(4) The length of the pelvic restraint between anchorages shall not increase more than 508 mm when subjected to a force of 11,120 N.

(5) The length of the upper torso restraint between anchorages shall not increase more than 508 mm when subjected to a force of 6,672 N.

(6) Any webbing cut by the hardware during test shall have a breaking strength of not less than 15,569 N at a cut in webbing of the pelvic restraint, or not less than 12,455 N 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.

* * * * *

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° ±2°C. The tension during measurement of width shall be not more than 22 N on webbing from a Type 1 seat belt assembly, and 9786 N ± 450 N 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.'' The machine shall be equipped with split drum grips illustrated in Figure 1, having a diameter between 51 and 102 mm. The rate of grip separation shall be between 51 and 102 mm per minute. The distance between the centers of the grips at the start of the test shall be between 102 and 254 mm. 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 196 N and 245 N 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 102 and 203 mm. 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: The webbing shall be mounted in the apparatus shown schematically in Figure 2. One end of the webbing (A) shall be attached to a mass (B) of 2.35 kg ± .05 kg, except that a mass of 1.5 kg ± .05 kg 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 330 mm. 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 breaking strength retained.

(e) *Resistance to light.* Webbing at least 508 mm in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen track in a Type E carbon-arc light exposure apparatus described in Standard Practice for Generating 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° ± 2° Celsius (°C) measured at a point 25 ± 5 mm 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.

(f) *Resistance to micro-organisms.* Webbing at least 508 millimeters (mm) 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 381, ''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 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.

**Note:** This test shall not be required on webbing made from material which is inherently resistant to micro-organisms.

* * * * *

S5.2 *Hardware.*

(a) *Corrosion resistance.* Three seat belt assemblies shall be tested in accordance with American Society for Testing and Materials B11773, ''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 19 mm 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.

* * * * *

(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° 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 anchorage shown in Figure 3, which has a standard 7/16–20UNF–2B or 1/2-UNF–2B or metric equivalent threaded hole in a hardened steel plate at least 10 mm 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 26,689 N 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 667 N ± 9 N 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 667 N ± 9 N 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 667 N on the assembly loop of a Type 1 seat belt assembly, 334 N the components of a Type 2 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 push button-release buckles, the force shall be applied at least 3 mm 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 lever 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 30 $mm^2$. The cylinder specified in S4.3(d) shall be inserted in the actuation portion of a lever released 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 1779 N applied anywhere on a test line that is coincident with the center line 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 19 mm and a radius of curvature of 152 mm, placed with its longitudinal center line along the test line and its center directly above the point or the buckle to which the load will be applied. The buckle shall be latched, and a tensile force of 334 N 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 508 mm ±5 mm per minute and the maximum force shall be measured to the nearest 1 N after the first 25 mm 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 508 mm ±50 mm 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 89 N. 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 part, but with the metal mating plate (metal-to-metal buckles) or of webbing end (metal-to-webbing buckles) withdrawn from the buckle. The release mechanism shall be moved 200 times through the maximum possible travel against its stop with a force of 133 N ±13 N 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 18 N shall be applied to extend the webbing from the retractor. The force shall be reduced to 13 N when attached to a pelvic restraint, or to 5 N 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 or retraction within plus or minus 51 mm 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 24 kilometers per hour (km/h) 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 51 mm of 75 percent extension shall be determined. A retractor that is sensitive to webbing withdrawal shall be subjected to an acceleration of $3m/s^2$ within a period of 50 milliseconds (ms) 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 $7 m/s^2$ within a period of 50 milliseconds (ms), 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). The retractor 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 retractor, and for ferrous corrosion on significant surfaces if the retractor is part of the attachment hardware. 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 89 N 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 8 containing about 0.9 kg of coarse grade dust conforming to the specification given in Society of Automotive Engineering Recommended Practice J726, ''Air Cleaner Test Code'' Sept. 1979. The dust shall be agitated every 20 minutes for 5 seconds by compressed air, free of oil and moisture, at a gage pressure of 550 ±55 kPa entering through an orifice 1.5 ± 0.1 mm in diameter. The webbing shall be extended to the top of the chamber and kept extended 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 per cent extension. The locking mechanism of an emergency locking 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 two rollers 102 mm 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 antifriction bearings and spaced 305 mm 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° to the webbing, whichever results in an angle nearest to 90° 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 necessary 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 1295 mm, or as near thereto as possible. A force of 245 N 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 1220 and 1270 mm in length. The length of the assembly loop shall then be adjusted by applying a force between 89 and 98 N 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 assembly 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 51 and 102 mm per minute until a force of 22,241 ± 222 N 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 667 ± 45 N 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 11,120 ± 111 N shall be applied to the components or a force of 22,241 ± 222 N shall be applied to the 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 11,120 ± 111 N 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 1220 and 1270 mm, 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 11,120 ± 111 N 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 334 ± 22 N 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 6,672 ± 67 N 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 334 ± 22 N 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 13,344 ± 134 N.

(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 11,120 ± 111 N for components of pelvic restraint, and 6,672 ± 67 N 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 11,120 ± 111 N with the webbing fully extended from the retractor, or to a tensile force of 6,672 ± 67 N 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.* Seat belt 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 per cent and temperature of 18° C. 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 mass (B) of 1.4 kg. 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 203 mm. The abraded webbing shall be tested for breaking strength by the procedure described in paragraph S5.1(b).

* * * * *

15. Section 571.210 is amended by revising in S4.2.1 the introductory paragraph; revising S4.2.2; revising S4.2.4; revising S4.3.1.1; revising S4.3.1.4; removing S4.3.1.5; revising S5.1; revising S5.2; and revising in S6, the introductory sentence, to read as follows:

**§ 571.210 Standard No. 210, Seat belt assembly anchorages.**

* * * * *

S4.2.1 Except as provided in S4.2.5, and except for side-facing seats, the anchorages, attachment hardware, and attachment bolts for any of the following seat belt assemblies shall withstand a 22,241 N force when tested in accordance with S5.1 of this standard:

* * * * *

S4.2.2 Except as provided in S4.2.5, the anchorages, attachment hardware, and attachment bolts for all Type 2 and automatic seat belt assemblies that are installed to comply with Standard No. 208 (49 CFR 571.208) shall withstand 13,345 N forces when tested in accordance with S5.2.

* * * * *

S4.2.4 Anchorages, attachment hardware, and attachment bolts shall be tested by simultaneously loading them in accordance with the applicable procedures set forth in S5 of this standard if the anchorages are either:

(a) For designated seating positions that are common to the same occupant seat and that face in the same direction, or

(b) For laterally adjacent designated seating positions that are not common to the same occupant seat, but that face in the same direction, if the vertical centerline of the bolt hole for at least one of the anchorages for one of those designated seating positions is within 305 mm of the vertical center line of the bolt hole for an anchorage for one of the adjacent seating positions.

* * * * *

S4.3.1.1 In an installation in which the seat belt does not bear upon the seat frame:

(a) If the seat is a nonadjustable seat, then a line from the seating reference point to the nearest contact point of the belt with the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

(b) If the seat is an adjustable seat, then a line from a point 64 mm forward of and 10 mm above the seating reference point to the nearest contact point of the belt with the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

* * * * *

S4.3.1.4 Anchorages for an individual seat belt assembly shall be located at least 165 mm apart laterally, measured between the vertical center line of the bolt holes or, for designs using other means of attachment to the vehicle structure, between the centroid of such means.

S4.3.1.5 [Reserved]

* * * * *

S5.1 *Seats with Type 1 or Type 2 seat belt anchorages.* With the seat in its rearmost position, apply a force of 22,241 N in the direction in which the seat faces to a pelvic body block as described in Figure 2A, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees or more than 15 degrees above the horizontal. Apply the force at the onset rate of not more than 222,411 N

per second. Attain the 22,241 N force in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard.

S5.2 *Seats with Type 2 or automatic seat belt anchorages.* With the seat in its rearmost position, apply forces of 13,345 N in the direction in which the seat faces simultaneously to a pelvic body block, as described in Figure 2A, and an upper torso body block, as described in Figure 3, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. Apply the forces at the onset rate of not more than 133,447 N per second. Attain the 13,345 N force in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard.

* * * * *

S6. *Owner's Manual Information.* The owner's manual in each vehicle with a gross vehicle weight rating of 4,536 kg or less manufactured after September 1, 1987 shall include:

* * * * *

16. In § 571.210, Figure 2 ''Body Block for Lap Belt Anchorage'' would be removed. Figure 2A ''Body Block for Lap Belt Anchorage,'' Figure 2B ''Optional Body Block for Center Seating Positions,'' and Figure 3 ''Body Block for Combination Shoulder and Lap Belt Anchorage'' after S5.2, and preceding S6, would be revised to read as follows:

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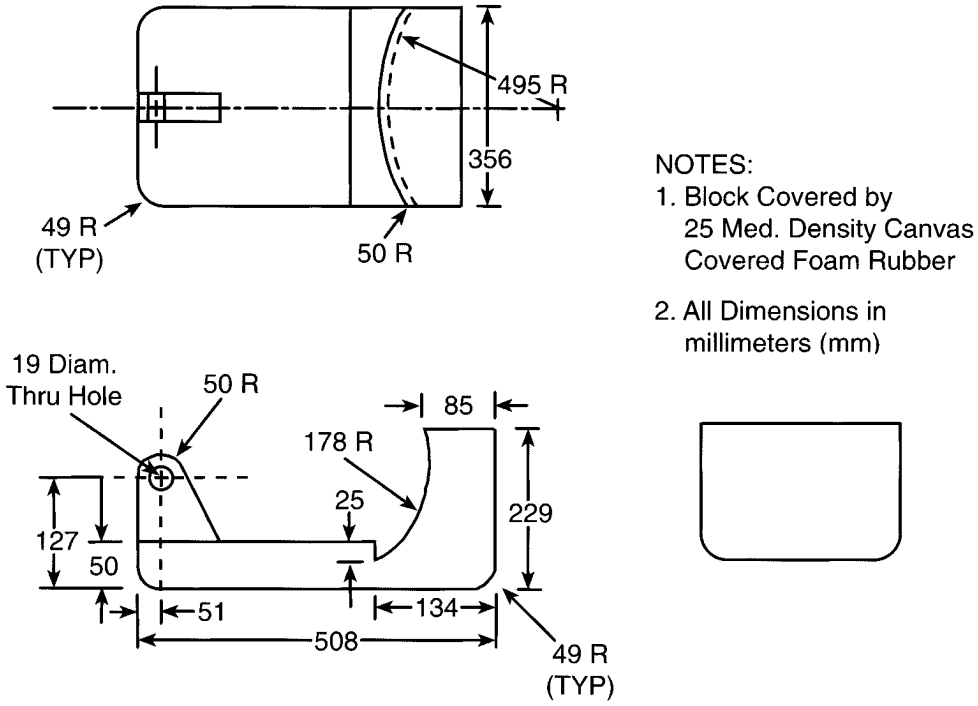


**Figure 2A.—BODY BLOCK FOR LAP BELT ANCHORAGE**

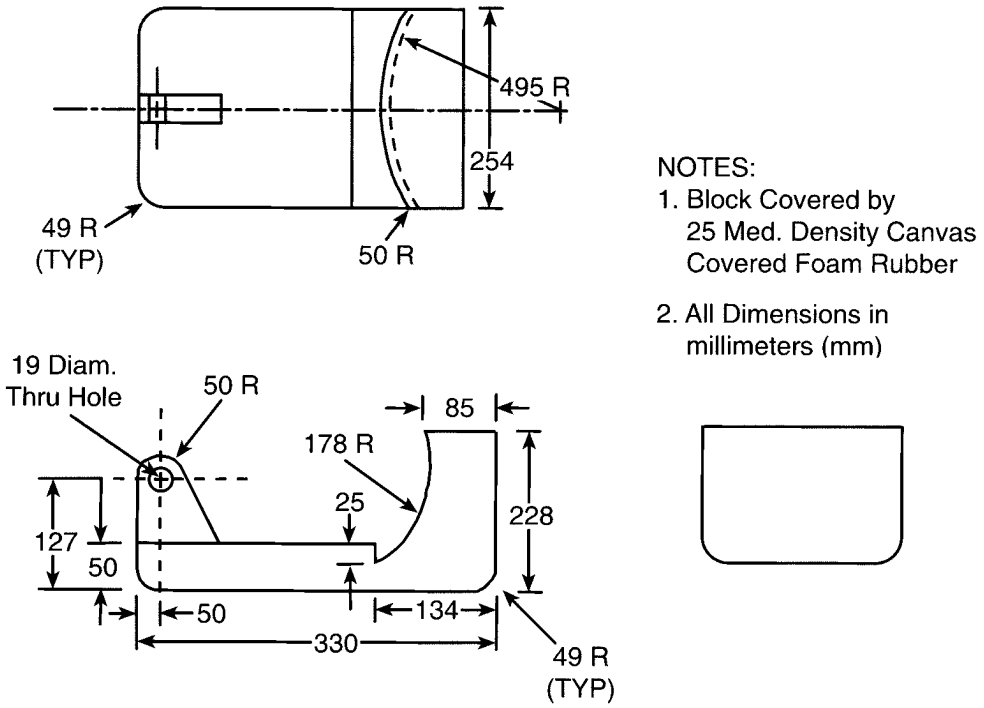


**Figure 2B.—OPTIONAL BODY BLOCK FOR CENTER SEATING POSITIONS**

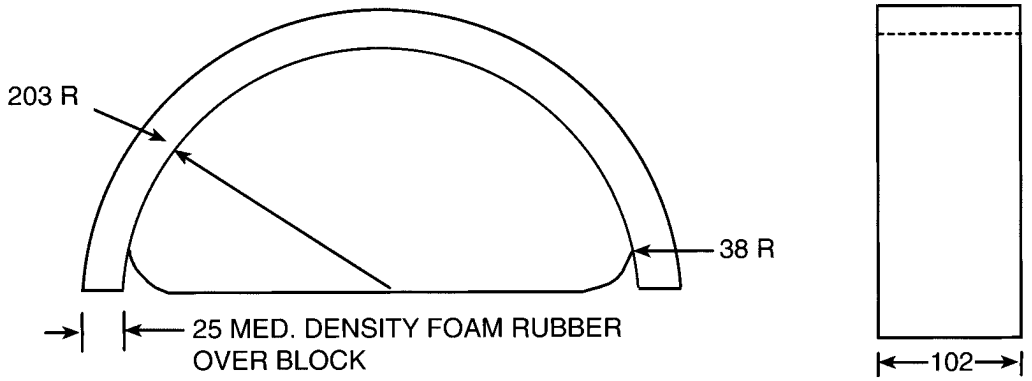


**Figure 3.—BODY BLOCK FOR COMBINATION SHOULDER AND LAP BELT ANCHORAGE**
**All dimensions in millimeters (mm)**

BILLING CODE 4910–59–C

17. Section 571.219 is amended by revising S3; revising S5; revising S6.1; revising S6.2; and revising in S7.7, paragraph (b) to read as follows:

**§ 571.219 Standard No. 219, Windshield zone intrusion.**

* * * * *

S3. *Application.* This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses of 4,536 kilograms 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.

* * * * *

S5. *Requirement.* When the vehicle travelling longitudinally forward at any speed up to and including 48 km/h 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 6 mm, 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 165 mm diameter rigid sphere, with a mass of 6.8 kg 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.

(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 13 mm 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 76 mm 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.

* * * * *

(b) Except as specified in S7.6, a multipurpose passenger vehicle, truck or bus is loaded to its unloaded vehicle weight, plus 136 kg 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 postion 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 mass on each axle as measured at the tire-ground interface is in proportion to its GAWR. If the mass on any axle when the vehicle is loaded to its unloaded vehicle weight plus dummy mass exceeds the axle's proportional share of the test mass, the remaining mass is placed so that the mass on that axle remains the same. For the purposes of this section, unloaded vehicle weight does not include the mass of work-performing accessories. Vehicles are tested to a maximum unloaded vehicle weight of 2,495 kg.

* * * * *

18. Section 571.219 is amended by revising Figure 1 that follows S7.7 to read as follows:

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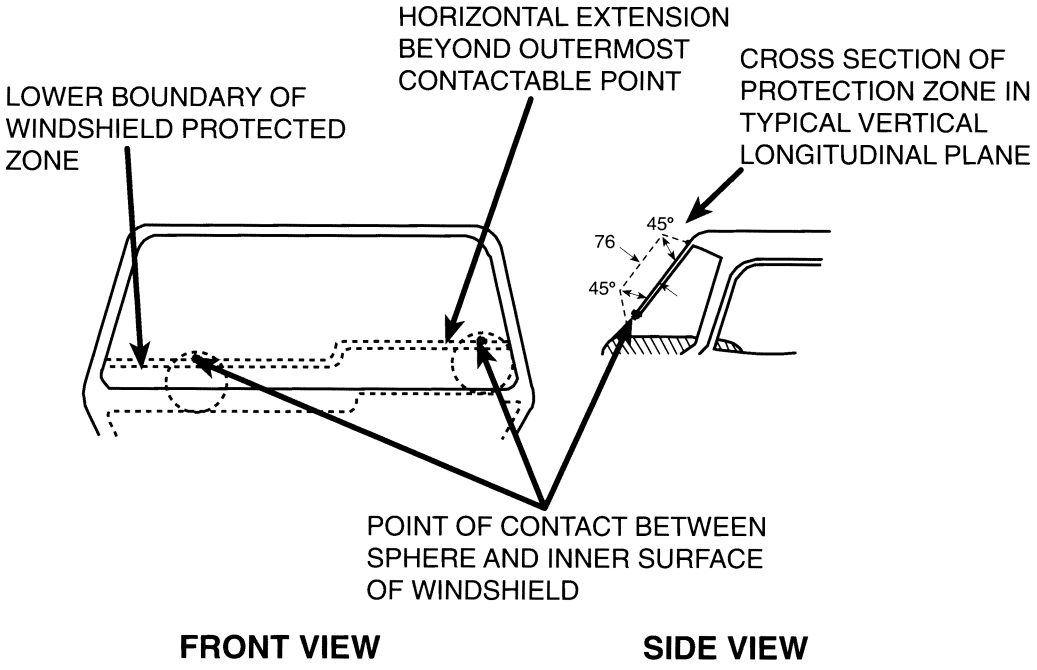


**Figure 1.—WINDSHIELD PROTECTION ZONE**
**All dimensions in millimeters (mm)**

BILLING CODE 4910–59–C

19. Section 571.220 is amended by revising S4; revising S5.2; revising S5.4; revising S5.5; and revising S6.1 to read as follows:

**§ 571.220 Standard No. 220, School bus rollover protection.**

* * * * *

S4. *Requirements.* When a force in Newtons equal to 1½ times the unloaded vehicle weight in kilograms multiplied by 9.8 $m/sec^2$ 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 130 mm 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 exit opening requirement after release of force if it is subjected to the emergency exit opening requirements during the full application of the force.

* * * * *

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 4,536 kg, 305 mm shorter than the vehicle roof and 914 mm wide; and

(b) In the case of a vehicle with a GVWR of 4,536 kg or less, 127 mm longer and 127 mm 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.

* * * * *

S5.4 Apply an evenly-distributed vertical force in the downward direction to the force application plate at any rate not more than 13 mm per second, until a force of 2,224 N 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 13 mm per second until the force specified in S4. has been applied, and maintain this application of force.

* * * * *

S6.1 *Temperature.* The ambient temperature is any level between 0° C and 32° C.

* * * * *

20. Section 571.222 is amended by revising in S4, the definition of ''contactable surface''; revising S4.1; revising in S5., paragraphs (a) and (b); revising S5.1.2; revising S5.1.3; revising S5.1.3.1; revising S5.1.3.2; revising S5.1.3.3; revising S5.1.3.4; revising S5.1.4; revising S5.1.4.1; revising S5.1.4.2; revising S5.1.5; revising S5.2; revising S5.2.1; revising S5.2.3; revising S5.3.1.1; revising S5.3.1.2; revising S5.3.1.3; revising S5.3.2.1; revising S5.3.2.2; revising S6.3; revising S6.5; revising S6.5.1; revising S6.6; and revising S6.7 to read as follows:

**S571.222 Standard No. 222, School bus passenger seating and crash protection.**

* * * * *

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 76 mm or more below the top of the seat back or restraining barrier.

* * * * *

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 millimeters divided by 381 and rounded to the nearest whole number.

S5. *Requirements.* (a) Each vehicle with a gross vehicle weight rating of more than 4,536 kg 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 4,536 kg or less shall be capable of meeting the following requirements at all seating positions other than the driver's seat:

(1)(A) In the case of vehicles manufactured before September 1, 1991, the requirements of §§ 571.208, 571.209, and 571.210 as they apply to multipurpose passenger vehicles; or

(B) In the case of vehicles manufactured on or after September 1, 1991, the requirements of S4.4.3.3 of § 571.208 and the requirements of §§ 571.209 and 571.210 as they apply to school buses with a gross vehicle weight rating of 4,536 kg or less; and

(2) The requirements of S5.1.2, S5.1.3, S5.1.4, S5.1.5, S5.3, and S5.4 of this standard. However, the requirements of §§ 571.208 and 571.210 shall be met at W seating positions in a bench seat using a body block as specified in Figure 2 of this standard, and a particular school bus passenger seat (i.e., a test specimen) in that weight class need not meet further requirements after having met S5.1.2 and S5.1.5, or after having been subjected to either S5.1.3, S5.1.4, or S5.3 of this standard or § 571.210.

* * * * *

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 508 mm above the seating reference point, of not less than 90 percent of the seat bench width in millimeters multiplied by 508.

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;

(b) Seat back deflection shall not exceed 356 mm; (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 44 N of force is attained.)

(c) The seat shall not deflect by an amount such that any part of the seat moves to within 102 mm of any part of another school bus passenger seat or restraining barrier 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.

S5.1.3.1 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 102 mm above and 102 mm below the seating reference point of the school bus passenger seat behind the test specimen.

S5.1.3.2 Apply a force of 3,114W newtons 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 1,557W newtons and, while maintaining the pivot point position of the first loading bar at the position where the 1,557W newtons 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 406 mm 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 44 N has been applied.

S5.1.3.4 Apply additional force horizontally in the forward direction through the upper bar until 452W joules 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 44 N 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 9,786 N;

(b) Seat back deflection shall not exceed 254 mm; (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 222 N is attained.

(c) The seat shall not deflect by an amount such that any part of the seat moves to within 102 mm 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 343 mm above the seating reference point of the test specimen, and move the loading bar rearward against the seat back until a force of 222 N has been applied.

S5.1.4.2 Apply additional force horizontally rearward through the loading bar until 316W joules (J) of energy has 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 222 N 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 designated position for attachment, the seat cushion shall not separate from the seat at any attachment point when subjected to an upward force in newtons of 5 times the mass of the seat cushion in kilograms and multiplied by 9.8 $m/s^2$, 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 610 mm 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 the barrier is required shall not be more than 610 mm measured along a horizontal longitudinal line through the seating reference point in the forward direction.

* * * * *

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 356 mm; (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 44 N 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.

* * * * *

S5.3.1.1 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 305 mm and 1016 mm above the seating reference point;

(b) A vertical longitudinal plane tangent to the inboard (aisle side) edge of the seat; and

(c) A vertical longitudinal plane 83 mm inboard of the outboard edge of the seat;

(d) Vertical transverse planes through and 762 mm 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 6.7 m/s 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

$$\left[\frac{1}{t1-t2}\int_{t1}^{t2} a\,dt\right]^{2.5}(t1-t2)$$

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 6.7 m/s by the head form described in S6.6, the energy necessary to deflect the impacted material shall be not less than 4.5 joules before the force level on the head form exceeds 667 N. When any contactable surface within such zones is impacted by the head form from any direction at 1.5 m/s the contact area on the head

form surface shall be not less than 1,935 $mm^2$.

* * * * *

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 305 mm above and 102 mm 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 4.9 m/s by the knee form specified in S6.7, the resisting force of the impacted material shall not exceed 2,669 N and the contact area on the knee form surface shall not be less than 1,935 $mm^2$.

* * * * *

S6.3 *Temperature.* The ambient temperature is any level between 0 degrees C and 32 degrees C.

* * * * *

S6.5 *Loading bar.* The loading bar is a rigid cylinder with an outside diameter of 152 mm that has hemispherical ends with radii of 76 mm and with a surface roughness that does not exceed 1.6 μm, root mean square. The length of the loading bar is 102 mm less than the width of the seat back in each test. The stroking mechanism applies force through a pivot attachment at the center point 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 17,792 N 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 25 mm.

S6.6 *Head form.* The head form for the measurement of acceleration is a rigid surface comprised of two hemispherical shapes, with total equivalent mass of 5.2 kg. The first of the two hemispherical shapes has a diameter of 166 mm. The second of the two hemispherical shapes has a 50 mm 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 1.6 μm, root mean square.

* * * * *

S6.7 *Knee form.* The knee form for measurement of force is a rigid 76 millimeter-diameter cylinder, with an equivalent weight of 44 N that has one hemispherical end with a 38 mm radius forming a contact surface of the knee form. The hemispherical surface roughness does not exceed 1.6 μm, root mean square.

* * * * *

21. In § 571.222, Figure 1, ''Force/Deflection Zone'', Figure 2, ''Body Block for Lap Belt'', and Figure 3 after S6.8 are revised to read as follows:

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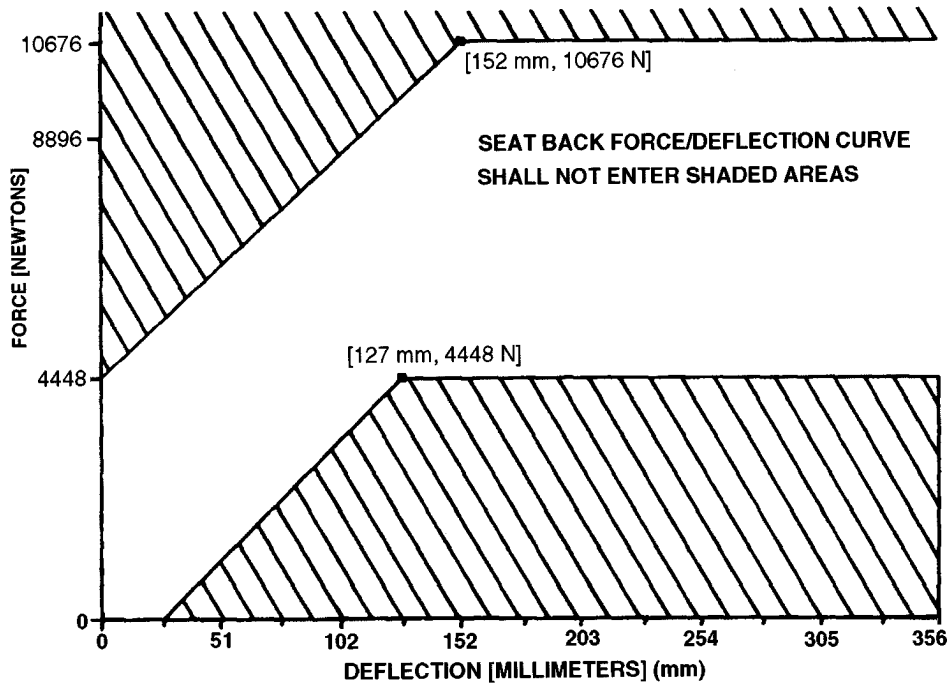


**Figure 1.—Force/Deflection Zone**

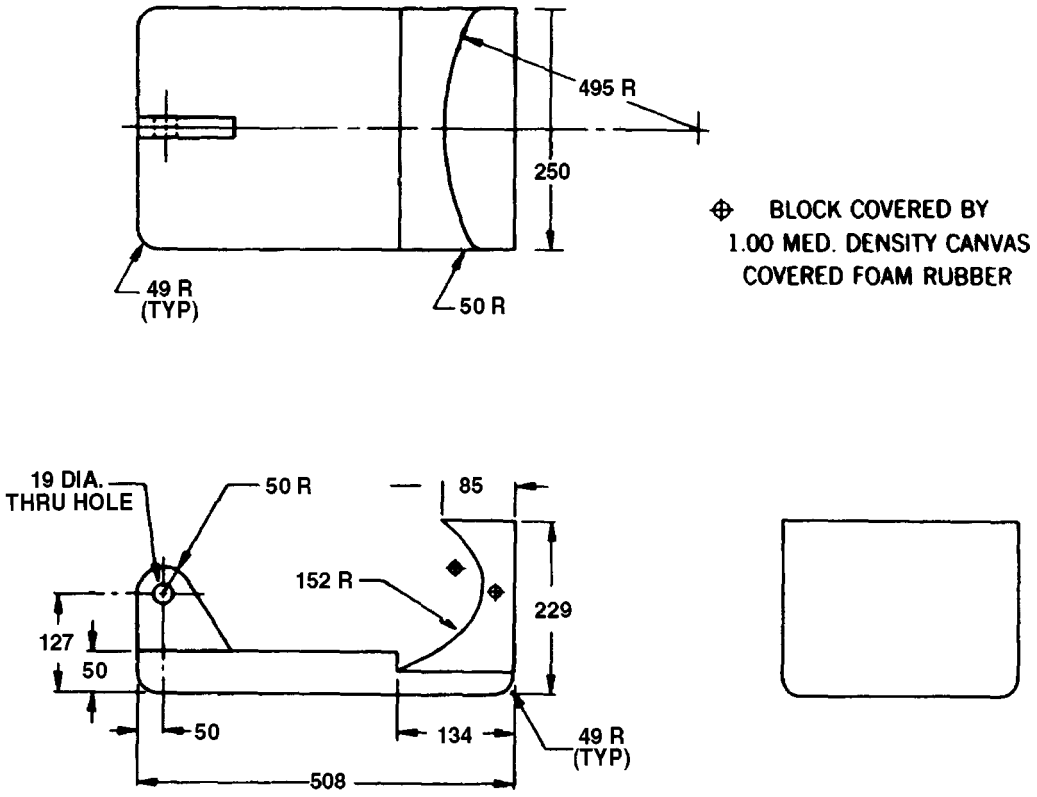


**Figure 2.—Body Block for Lap Belt**
**All Dimensions in Millimeters (mm)**

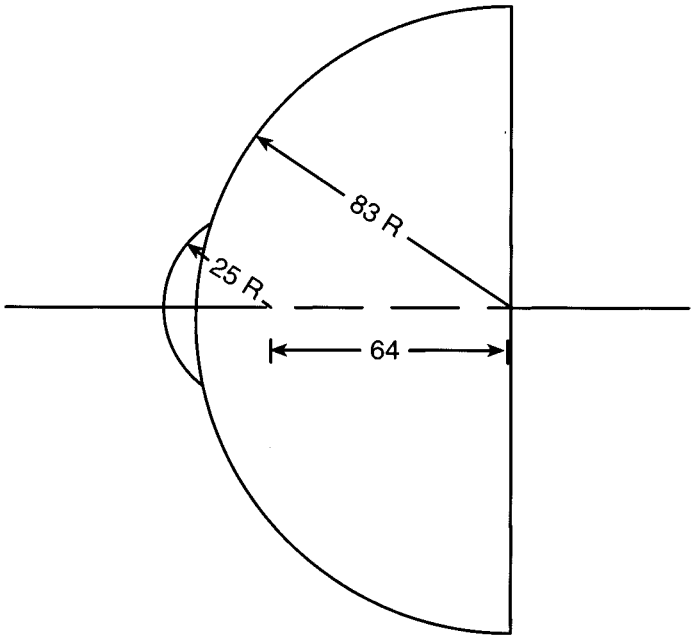


**Figure 3**
**All dimensions in millimeters (mm)**

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22. Section 571.301 is amended by revising S3; revising S5.5; revising S5.6; revising S6; revising S6.1; revising S6.2; revising S6.3; revising S6.5; revising S6.6; revising S7.1.6; revising S7.3; revising S7.5.1; revising S7.5.2; revising S7.5.4; and revising S7.5.5 to read as follows:

**S571.301 Standard No. 301, Fuel system integrity.**

* * * * *

S3. *Application.* This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks and buses that have a GVWR of 4,536 kg or less and use fuel with a boiling point above 0° C, and to school buses that have a GVWR greater than 4,536 kg and use fuel with a boiling point above 0° C.

* * * * *

S5.5 *Fuel spillage; Barrier crash.* Fuel spillage in any fixed or moving barrier crash test shall not exceed 28 g from impact until motion of the vehicle has ceased, and shall not exceed a total of 142 g in the 5-minute period following cessation of motion. For the subsequent 25-minute period, fuel spillage during any 1 minute interval shall not exceed 28 g.

S5.6 *Fuel spillage; rollover.* Fuel spillage in any rollover test, from the onset of rotational motion, shall not exceed a total of 142 g for the first 5 minutes of testing at each successive 90° increment. For the remaining test period, at each increment of 90° fuel spillage during any 1 minute interval shall not exceed 28 g.

* * * * *

S6. *Test requirements.* Each vehicle with a GVWR of 4,536 kg or less shall be capable of meeting the requirements of any applicable barrier crash test followed by a static rollover, without alteration of the vehicle during the test sequence. A particular vehicle need not meet further requirements after having been subjected to a single barrier crash test and a static rollover test.

S6.1 *Frontal barrier crash.* When the vehicle travelling longitudinally forward at any speed up to and including 48 km/h impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30° in either direction from the perpendicular to the line of travel of the vehicle, with 50th-percentile test dummies 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, under the applicable conditions of S7., fuel spillage shall not exceed the limits of S5.5.

S6.2 *Rear moving barrier crash.* When the vehicle is impacted from the rear by a barrier moving at 48 km/h, with test dummies as specified in part 572 of this chapter at each front outboard designated seating position, under the applicable conditions of S7., fuel spillage shall not exceed the limits of S5.5.

S6.3 *Lateral moving barrier crash.* When the vehicle is impacted laterally on either side by a barrier moving at 32 km/h with 50th-percentile test dummies as specified in part 572 of this chapter at positions required for testing to Standard No. 208, under the applicable conditions of S7., fuel spillage shall not exceed the limits of S5.5.

* * * * *

S6.5 *Moving contoured barrier crash.* When the moving contoured barrier assembly traveling longitudinally forward at any speed up to and including 48 km/h impacts the test vehicle (school bus with a GVWR exceeding 4,536 kg) at any point and angle, under the applicable conditions of S7.1 and S7.5, fuel spillage shall not exceed the limits of S5.5.

S6.6 *Anti-siphoning test for alcohol fuel vehicles.* Each vehicle shall have means that prevent any hose made of vinyl plastic or rubber, with a length of not less than 1200 millimeters (mm) and an outside diameter of not less than 5.2 mm, from contacting the level surface of the liquid fuel in the vehicle's fuel tank or fuel system, when the hose is

inserted into the filler neck attached to the fuel tank with the fuel tank filled to any level from 90 to 95 percent of capacity.

* * * * *

S7.1.6 The vehicle, including test devices and instrumentation, is loaded as follows:

(a) Except as specified in S7.1.1, a passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus the necessary test dummies as specified in S6., restrained only by means that are installed in the vehicle for protection at its seating position.

(b) Except as specified in S7.1.1, a multipurpose passenger vehicle, truck, or bus with a GVWR of 4,536 kg or less is loaded to its unloaded vehicle weight, plus the necessary test dummies, as specified in S6., plus 136 kg or its rated cargo and luggage capacity weight, whichever is less, secured to the vehicle and distributed so that the weight on each axle as measured at the tire-ground interface is proportional to its GAWR. If the weight on any axle, when the vehicle is loaded to unloaded vehicle weight plus dummy weight, exceeds the axle's proportional share of the test weight, the remaining weight shall be placed so that the weight on that axle remains the same. Each dummy shall be restrained only by means that are installed in the vehicle for protection at its seating position.

(c) Except as specified in S7.1.1, a school bus with a GVWR greater than 4,536 kg is loaded to its unloaded vehicle weight, plus 54 kg of unsecured mass at each designated seating position.

* * * * *

S7.3 *Rear moving barrier test conditions.* The rear moving barrier test conditions are those specified in S8.2 of Standard No. 208, 49 CFR 571.208, except for the positioning of the barrier and the vehicle. The barrier and test vehicle are positioned so that at impact—

(a) The vehicle is at rest in its normal attitude;

(b) The barrier is traveling at 48 km/h with its face perpendicular to the longitudinal centerline of the vehicle; and

(c) A vertical plane through the geometric center of the barrier impact surface and perpendicular to that surface coincides with the longitudinal centerline of the vehicle.

* * * * *

S7.5.1 The moving barrier, which is mounted on a carriage as specified in Figure 1, is of rigid construction, symmetrical about a vertical longitudinal plane. The contoured impact surface, which is 629 mm high and 1,981 mm wide, conforms to the dimensions shown in Figure 2, and is attached to the carriage as shown in that figure. The ground clearance to the lower edge of the impact surface is 133 mm ± 13 mm. The wheelbase is 3,048 mm ± 50 mm.

S7.5.2 The moving contoured barrier, including the impact surface, supporting structure, and carriage, has a mass of 1,814 kg ± 23 kg with the mass distributed so that 408 kg ± 11 kg is at each rear wheel and 499 kg ± 11 kg is at each front wheel. The center of gravity is located 1,372 mm ± 38 mm rearward of the front wheel axis, in the vertical longitudinal plane of symmetry, 401 mm above the ground. The moment of inertia about the center of gravity is:

$I_x$ = 367 kgm² ± 18.4 kgm²

$I_z$ = 4,711 kgm² ± 236 kgm²

* * * * *

S7.5.4 The moving barrier assembly is equipped with G78–15 pneumatic tires with a tread width of 152 mm ± 25 mm, inflated to 165 kPa.

S7.5.5 The concrete surface upon which the vehicle is tested is level, rigid, and of uniform construction, with a skid number of 75 when measured in accordance with American Society of Testing and Materials Method E: 274–65T at 64 km/h, omitting water delivery as specified in paragraph 7.1 of that method.

* * * * *

23. Section 571.302 is amended by revising S4.2; revising the text of S4.2.2; revising S4.3; revising S5.1; revising S5.1.1; revising S5.1.2; revising S5.1.3; revising S5.1.4; revising S5.2.1; revising S5.2.3; and revising S5.3 to read as follows:

**§ 571.302 Flammability of interior materials.**

* * * * *

S4.2 Any portion of a single or composite material which is within 13 mm of the occupant compartment air space shall meet the requirements of S4.3.

* * * * *

S4.2.2 Any material that adheres to other materials at every point of contact shall meet the requirements of S4.3 when tested as a composite with the other material(s).

* * * * *

Material A has a non-adhering interface with material B and is tested separately. Part of material B is within 13 mm of the occupant compartment air space, and materials B and C adhere at every point of contact; therefore, B and C are tested as a composite. The cut is in material C as shown, to make a specimen 13 mm thick.

S4.3(a) When tested in accordance with S5, material described in S4.1 and S4.2 shall not burn, nor transmit a flame front across its surface, at a rate of more than 102 mm per minute. The requirement concerning transmission of a flame front shall not apply to a surface created by cutting a test specimen for purposes of testing pursuant to S5.

(b) If a material stops burning before it has burned for 60 seconds from the start of timing, and has not burned more than 51 mm from the point where the timing was started, it shall be considered to meet the burn-rate requirement of S4.3(a).

S5.1 *Conditions.*

S5.1.1 The test is conducted in a metal cabinet for protecting the test specimens from drafts. The interior of the cabinet is 381 mm long, 203 mm deep, and 356 mm high. It has a glass observation window in the front, a closable opening to permit insertion of the specimen holder, and a hole to accommodate tubing for a gas burner. For ventilation, it has a 13 mm clearance space around the top of the cabinet, ten holes in the base of the cabinet, each hole 19 mm in diameter and legs to elevate the bottom of the cabinet by 10 mm, all located as shown in Figure 1.

S5.1.2 Prior to testing, each specimen is conditioned for 24 hours at a temperature of 21° C, and a relative humidity of 50 percent, and the test is conducted under those ambient conditions.

S5.1.3 The test specimen is inserted between two matching U-shaped frames of metal stock 25 mm wide and 10 mm high. The interior dimensions of the U-shaped frames are 51 mm wide by 330 mm long. A specimen that softens and bends at the flaming end so as to cause erratic burning is kept horizontal by supports consisting of thin, heat-resistant wires, spanning the width of the U-shaped frame under the specimen at 25 mm intervals. A device that may be used for supporting this type of material is an additional U-shaped frame, wider than the U-shaped frame containing the specimen, spanned by 10-mil wires of heat-resistant composition at 25 mm intervals, inserted over the bottom U-shaped frame.

S5.1.4 A bunsen burner with a tube of 10 mm inside diameter is used. The gas adjusting valve is set to provide a flame, with the tube vertical, of 38 mm in height. The air inlet to the burner is closed.

* * * * *

S5.2.1 Each specimen of material to be tested shall be a rectangle 102 mm wide by 356 mm long, wherever possible. The thickness of the specimen is that of the single or composite material used in the vehicle, except that if the material's thickness exceeds 13 mm, the specimen is cut down to that thickness measured from the surface of the specimen closest to the occupant compartment air space. Where it is not possible to obtain a flat specimen because of surface curvature, the specimen is cut to not more than 13 mm in thickness at any point. The maximum available length or width of a specimen is used where either dimension is less than 356 mm or 102 mm, respectively, unless surrogate testing is required under S4.1.1.

* * * * *

S5.2.3 Material with a napped or tufted surface is placed on a flat surface and combed twice against the nap with a comb having seven to eight smooth, rounded teeth per 25 mm.

S5.3 *Procedure.*

(a) Mount the specimen so that both sides and one end are held by the U-shaped frame, and one end is even with the open end of the frame. Where the maximum available width of a specimen is not more than 51 mm, so that the sides of the specimen cannot be held in the U-shaped frame, place the specimen in position on wire supports as described in S5.1.3, with one end held by the closed end of the U-shaped frame.

(b) Place the mounted specimen in a horizontal position, in the center of the cabinet.

(c) With the flame adjusted according to S5.1.4, position the bunsen burner and specimen so that the center of the burner tip is 19 mm below the center of the bottom edge of the open end of the specimen.

(d) Expose the specimen to the flame for 15 seconds.

(e) Begin timing (without reference to the period of application of the burner flame) when the flame from the burning specimen reaches a point 38 mm from the open end of the specimen.

(f) Measure the time that it takes the flame to progress to a point 38 mm from the clamped end of the specimen. If the flame does not reach the specified end point, time its progress to the point where flaming stops.

(g) Calculate the burn rate from the formula:

$B = 60 \times (D/T)$

Where:

B = Burn rate in millimeters per minute

D = Length the flame travels in millimeters, and

T = Time in seconds for the flame to travel D millimeters.

24. In § 571.302, the Figure named ''Illustrative Example—Occupant Compartment Air Space'' at S4.2.2 after the first sentence, and Figure 1, after S5.1.1 are revised to read as follows:

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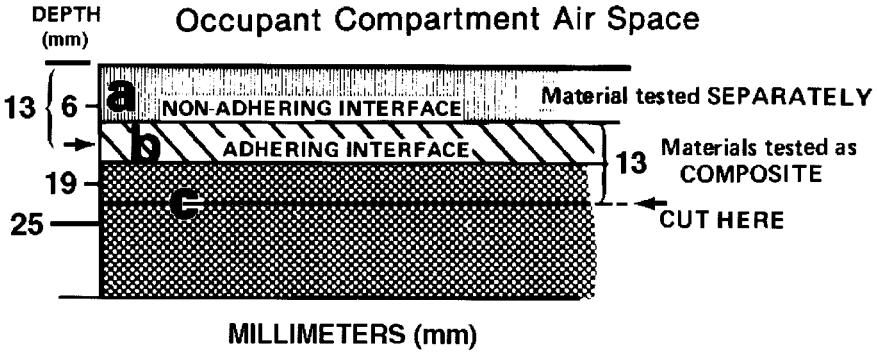


**Occupant Compartment Air Space**
**All Dimensions in Millimeters (mm)**

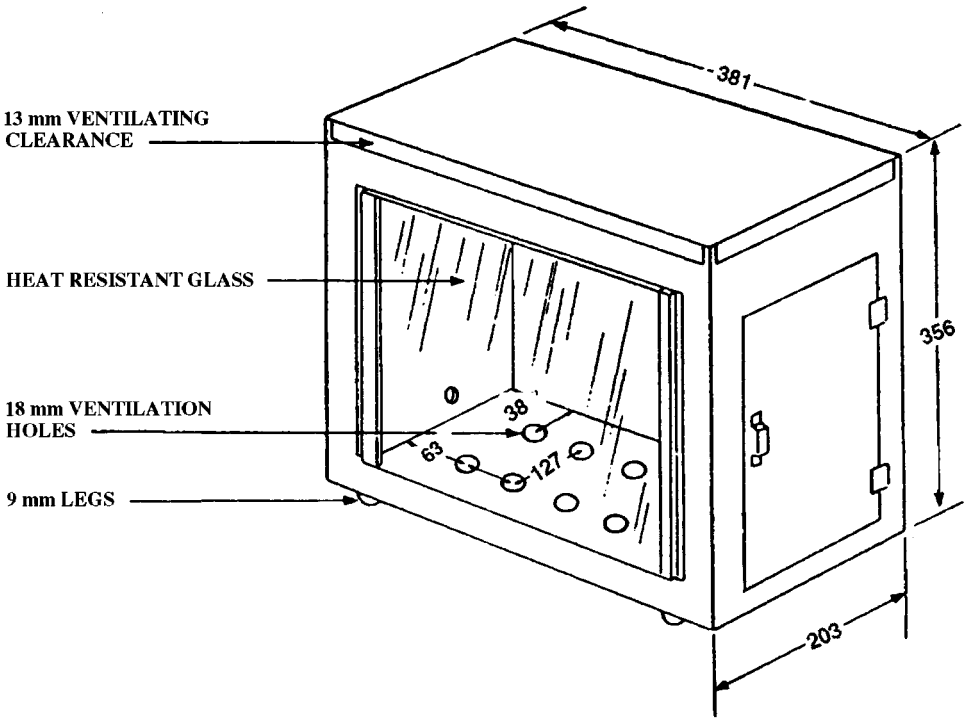


**Figure 1**
**All Dimensions in Millimeters (mm)**

Issued: May 13, 1998.

**Ricardo Martinez,**

*Administrator.*

[FR Doc. 98–13431 Filed 5–26–98; 8:45 am]

BILLING CODE 4910–59–C