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TECHNICAL STANDARDS DOCUMENT No. 220, Revision 0R

Rollover Protection

The text of this document is based on Federal Motor Vehicle Safety Standard No. 220, *School Bus Rollover Protection*, as published in the U.S. *Code of Federal Regulations*, Title 49, Part 571, revised October 1, 2008.

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(Ce document est aussi disponible en français)

Introduction

As defined by section 12 of the *Motor Vehicle Safety Act*, a Technical Standards Document (TSD) is a document that reproduces an enactment of a foreign government (e.g. a Federal Motor Vehicle Safety Standard issued by the U.S. National Highway Traffic Safety Administration). According to the Act, the [*Motor Vehicle Safety Regulations*](#) may alter or override some provisions contained in a TSD or specify additional requirements; consequently, it is advisable to read a TSD in conjunction with the Act and its counterpart Regulation. As a guide, where the corresponding Regulation contains additional requirements, footnotes indicate the amending subsection number.

TSDs are revised from time to time in order to incorporate amendments made to the reference document, at which time a Notice of Revision is published in the *Canada Gazette*, Part I. All TSDs are assigned a revision number, with “Revision 0” designating the original version.

Identification of Changes

In order to facilitate the incorporation of a TSD, certain non-technical changes may be made to the foreign enactment. These may include the deletion of words, phrases, figures, or sections that do not apply under the Act or Regulations, the conversion of imperial to metric units, the deletion of superseded dates, and minor changes of an editorial nature. Additions are underlined, and provisions that do not apply are ~~stroked through~~. Where an entire section has been deleted, it is replaced by: “[CONTENT DELETED]”. Changes are also made where there is a reporting requirement or reference in the foreign enactment that does not apply in Canada. For example, the name and address of the United States Department of Transportation are replaced by those of the Department of Transport.

Effective Date and Mandatory Compliance Date

The effective date of a TSD is the date of publication of its incorporating regulation or of the notice of revision in the *Canada Gazette*, and the date as of which voluntary compliance is permitted. The mandatory compliance date is the date upon which compliance with the requirements of the TSD is obligatory. If the effective date and mandatory compliance date are different, manufacturers may follow the requirements that were in force before the effective date, or those of this TSD, until the mandatory compliance date.

In the case of an initial TSD, or when a TSD is revised and incorporated by reference by an amendment to the Regulations, the mandatory compliance date is as specified in the Regulations, and it may be the same as the effective date. When a TSD is revised with no corresponding changes to the incorporating Regulations, the mandatory compliance date is six months after the effective date.

Official Version of Technical Standards Documents

The PDF version is a replica of the TSD as published by the Department and is to be used for the purposes of legal interpretation and application.

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S1. Scope

This Technical Standards Document (TSD) standard establishes performance requirements for school bus rollover protection.

S2. Purpose

The purpose of this TSD standard is to reduce the number of deaths and the severity of injuries that result from failure of the school bus body structure to withstand forces encountered in rollover crashes.

S3. Applicability

[CONTENT DELETED] For applicability, see Schedule III and subsection 220(1) of Schedule IV to the [Motor Vehicle Safety Regulations](#).

S4. Requirements

When a force in Newtons equal to $1\frac{1}{2}$ 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 section 217 of the Motor Vehicle Safety Regulations Standard No. 217 (Sec. 571.217) shall be capable of opening as specified in that Regulation 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. Test Procedures

Each vehicle shall be capable of meeting the requirements of S4. when tested in accordance with the procedures set forth below.

S5.1 With any non-rigid chassis-to-body mounts replaced with equivalent rigid mounts, place the vehicle on a rigid horizontal surface so that the vehicle is entirely supported by means of the vehicle frame. If the vehicle is constructed without a frame, place the vehicle on its body sills. Remove any components which extend upward from the vehicle roof.

S5.2 Use a flat, rigid, rectangular force application plate that is measured with respect to the vehicle roof longitudinal and lateral centerlines,

- (a) In the case of a vehicle with a GVWR of more than 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.

S5.3 Position the force application plate on the vehicle roof so that its rigid surface is perpendicular to a vertical longitudinal plane and it contacts the roof at not less than two points, and so that, in the top projected view, its longitudinal centerline coincides with the longitudinal centerline of the vehicle, and its front and rear edges are an equal distance inside the front and rear edges of the vehicle roof at the centerline.

S5.4 Apply an evenly-distributed vertical force in the downward direction to the force application plate at any rate not more than 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.

S5.6 Measure the downward movement of any point on the force application plate which occurred during the application of force in accordance with S5.5.

S5.7 To test the capability of the vehicle's emergency exits to open in accordance with S4.(b),

- (a) In the case of testing under the full application of force, open the emergency exits as specified in S4(b) while maintaining the force applied in accordance with S5.4 and S5.5; and
- (b) In the case of testing after the release of all force, release all downward force applied to the force application plate and open the emergency exits as specified in S4(b).

S6. Test Conditions

The following conditions apply to the requirements specified in S4.

S6.1 Temperature

The ambient temperature is any level between 0°C and 32°C.

S6.2 Windows and doors

Vehicle windows, doors, and emergency exits are in the fully-closed position, and latched but not locked.