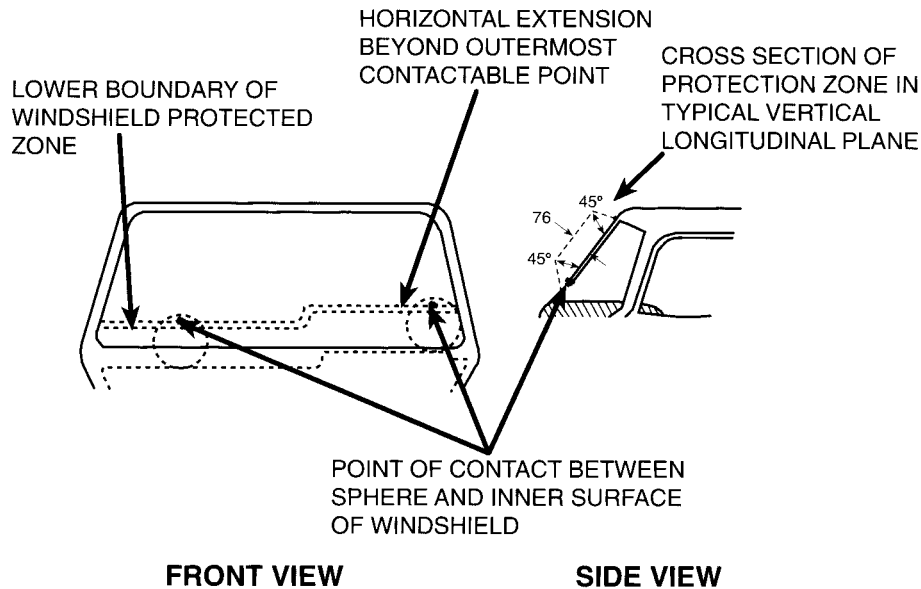


(b) Except as specified in S7.6, a multipurpose passenger vehicle, truck or bus is loaded to its unloaded vehicle weight, plus 136 kg or its rated cargo and luggage capacity, whichever is less, secured to the vehicle, plus a 50th-percentile test dummy as specified in part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating po-

sition. 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.



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

[40 FR 25462, June 16, 1975, as amended at 40 FR 53033, Nov. 14, 1975; 41 FR 54946, Dec. 16, 1976; 45 FR 22046, Apr. 3, 1980; 63 FR 28946, May 27, 1998]

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

S1. *Scope.* This standard establishes performance requirements for school bus rollover protection.

S2. *Purpose.* The purpose of this standard is to reduce the number of

deaths and the severity of injuries that result from failure of the school bus body structure to withstand forces encountered in rollover crashes.

S3. *Applicability.* This standard applies to school buses.

S4. *Requirements.* When a force in Newtons equal to  $1\frac{1}{2}$  times the unloaded vehicle weight in kilograms multiplied by  $9.8 \text{ m/sec}^2$  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. *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  $0^\circ\text{C}$  and  $32^\circ\text{C}$ .

S6.2 *Windows and doors.* Vehicle windows, doors, and emergency exits are in the fully-closed position, and latched but not locked.

[41 FR 3875, Jan. 27, 1976, as amended at 41 FR 36026, 36027, Aug. 26, 1976; 63 FR 28948, May 27, 1998]

#### § 571.221 Standard No. 221; School bus body joint strength.

S1. *Scope.* This standard establishes requirements for the strength of the body panel joints in school bus bodies.