

الهيئة السعودية للمواصفات والمقاييس والجودة

Saudi Standards, Metrology and Quality Org. (SASO)



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School buses - Roof strength

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School buses - Roof strength

1- Scope

This standard specifies the technical requirements and test procedures for the roof strength of school bus.

2- Test conditions

The following conditions apply to the requirements specified in item 3.

2.1 Temperature

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

2.2 Windows and doors

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

3- Technical requirements

When a force (expressed in Newtons) equal to 1 1/2 times the unloaded vehicle weight (in kilograms) multiplied by 9.8 m/sec² is applied to the roof of the bus body structure through a force application plate as specified in test procedures of item 4 it shall meet the following:

3.1 The downward vertical movement at any point on the application plate shall not exceed 130 mm.

3.2 Each emergency exit of the bus shall be capable of opening during the full application of the force and after release of the force, except that an emergency exit located in the roof of the bus.

4- Test procedures

Each school bus shall comply with the requirements of item 3, when tested in accordance with the following procedures:

4.1 Any non-rigid chassis-to-body mounts replaced with equivalent rigid mounts,

4.2 Place the bus on a rigid horizontal surface so that the bus is entirely supported by means of the bus frame, and if the bus is constructed without a frame, place the bus on its body sills.

4.3 Remove any components which extend upward from the bus roof.

4.4 Use a flat, rigid, rectangular force application plate that is measured with respect to the bus roof longitudinal and lateral centerlines, as follows:

4.4.1 In the case of a bus with a gross axle weight rating (GAWR) of more than 4,500 kg, 305 mm shorter than the bus roof and 914 mm wide.

4.4.2 In the case of a bus with a gross axle weight rating (GAWR) of 4,500 kg or less, 127 mm longer and 127 mm wider than the bus roof.

Note: For purposes of these measurements, the bus roof is that structure, seen in the top projected view, which coincides with the passenger and driver compartment of the bus.

4.5 Position the force application plate on the bus 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 bus, and its front and rear edges are an equal distance inside the front and rear edges of the bus roof at the centerline.

4.6 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.

4.7 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 item 3.

5- Result

5.1 Measure the downward movement of any point on the force application plate, which occurred during the application of force in accordance with item 4.7.

5.2 To test the capability of the vehicle's emergency exits to open in accordance with item 3.2.

5.2.1 In the case of testing under the full application of force, open the emergency exits while maintaining the force applied in accordance with item 4.6 and item 4.7.

5.2.2 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.

Bibliography

[1] 49 Subtitle B-Chapter V-Part 571-Subpart B Section 220 (FMVSS 571.220).
(**FMVSS 571.220**) "School bus rollover protection".