



SURFACE VEHICLE RECOMMENDED PRACTICE

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Fixed Rigid Barrier Collision Tests

RATIONALE

This procedure is superseded in the industry by multiple test methods which represent more closely the impact conditions for current vehicles on the road. The document should be Stabilized and retained for its historical reference only.

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1. SCOPE

Fixed rigid barrier collisions can represent severe automotive impacts. Barrier collision tests are conducted on automotive vehicles to obtain information of value in reducing occupant injuries and in evaluating structural integrity. The purpose of this SAE Recommended Practice is to establish sufficient standardization of barrier collision methods so that results of similar tests conducted at different facilities can be compared. The barrier device may be of almost any configuration, such as flat, round, offset, etc.

1.1 Objectives

The primary objective of this standard test method is to provide realistic simulation of the forces which act on vehicles and occupants during collisions with fixed objects. Measurements of structural loads and deflections, determination of occupant dynamics, and photographic and post-collision observations of pertinent special events may be useful in establishing design criteria.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J211/1 Instrumentation for Impact Test—Part 1: Electronic Instrumentation

SAE J211/2 Instrumentation for Impact Test—Part 2: Photographic Instrumentation

2.1.2 FMVSS Publications

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, www.gpoaccess.gov/cfr/retrieve.html.

FMVSS 208 Occupant Crash Protection (49 CFR Part 571.208)

3. CRASH TEST FACILITY

3.1 Test Site, General

The test site should encompass sufficient area to provide accommodations for the barrier, location of various photographic (or video recording) equipment, a protected observer area, and acceleration of the test vehicle to desired speed at impact.

3.1.1 The immediate crash site should be level.

3.1.2 The approach and surface at the impact area should be paved and free from any surface irregularities that could impart vertical accelerations or displacements of the test vehicle. The surface friction coefficient should be representative of typical road surface friction (typically 0.7 to 0.8).

3.1.3 Allowances for precise positioning of photographic (or video) equipment should be made.

3.1.4 A pit may be installed in front of the impacted device to accommodate under-vehicle photography.

3.2 Barrier

A flat barrier suitable for impact testing of passenger cars and light trucks and vans should have the characteristics listed as follows:

3.2.1 The barrier face should be at least 3 m (10 ft) wide and 1.5 m (5 ft) high, but shall be large enough to accommodate the entire frontal crush area of the vehicle.

3.2.2 The barrier face should be normal to the final approach path and shall be faced with 1.9 cm (0.75 in) plywood.

3.2.3 The barrier size and construction should be sufficient to limit barrier face motion to less than 1% of the permanent crush of the vehicle.

3.2.4 The effective mass of the barrier may be achieved with reinforced concrete and compacted fill.

3.2.5 The barrier face may include a load-measuring device provided the combination of the barrier and load-measuring device shall conform to 3.2.1, 3.2.2, and 3.2.3.

3.3 Alternative Impact Barriers

Fixtures may be attached to the barrier or to an equivalent rigid structure to simulate the forces acting on the vehicle and occupants under alternative impact conditions. Typical fixtures include offset barriers, angled barriers, poles, and other roadside devices.

3.3.1 Fixtures may incorporate load-measuring devices provided the combination of the barrier (or rigid structure), the fixture, and the load-measuring device(s) conform to 3.2.3.

3.3.2 Details of the load-measurement techniques will be unique to each application and should be defined.