SAE International

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J2568 JUN2011

Issued 2001-04
Revised 2011-06

Superseding J2568 FEB2003

Intrusion Resistance of Safety Glazing Systems for Road Vehicles

RATIONALE

Every five years each SAE Surface Vehicle Recommended Practice should be reviewed by members of the Glazing Committee. This will ensure both current relevance of the practice and consistency with other practices. Once reviewed and endorsed by the Committee it will be updated and reissued as a current practice.

FOREWORD

Installation of enhanced protective side and rear glazing systems to provide improved intrusion resistance is growing rapidly. With this growth comes an industry need for a standardized intrusion resistance test to insure that vehicle glazing systems provide a defined minimum level of performance.

1. SCOPE

This SAE Recommended Practice specifies an intrusion resistance test method for glazing systems installed in motor vehicles.

Intrusion resistance performance is determined not solely by the glazing but also by the glazing attachment to the vehicle and by the vehicle structure. Therefore, the glazing/ attachment/vehicle structure must be tested as a single unit.

This test determines intrusion resistance only. The test applies to those materials that meet the requirements for use as safety glazing materials as specified in Safety Standard ANSI/SAE Z26.1 or other applicable standards. The test applies to all installation locations.

2. REFERENCES

2.1 Applicable Documents

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

2.1.1 SAE Publication

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.

ANSI/SAE Z26.1 American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways—Safety Standard

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

2.1.2 BSI Publication

Available from British Standards Institution, Customer Services, 389 Chiswick High Road, London W4 4AL United Kingdom, Tel: +44-0-20-8996-9001, www.bsi-global.com.

BS AU 209-4a:1995 Vehicle Security. Specification for security glazing for passenger cars and car derived vehicles. (This version of the procedure is required. Any future versions are not to be followed.)

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 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 Paper No. 1999-01-3159 Intrusion Resistance Test Development for Automotive Glazing, by Esposito

SAE Paper No. 982319 Evaluating the Intrusion Resistance of Installed Motor Vehicle Glazing, by Chlastawa and Horaney

SAE Paper No. 982320 Laminated Sidelights and Asymmetrical Windshields for Cars, by Jourdaine et al

SAE Paper No. 2000-01-2693 System Design Parameters in Determining Automotive Sidelite Glazing Performance, by Smith

3. DEFINITIONS

3.1 INTRUSION RESISTANT GLAZING

Glazing which deters unauthorized entry into or theft of motor vehicles.

3.2 DAYLIGHT OPENING

Aperture in the vehicle through which daylight enters the passenger compartment, usually covered with transparent glazing.

4. TECHNICAL REQUIREMENTS

4.1 Test Apparatus

4.1.1 A spring-loaded center punch or a hammer of about 75 g, each with a point having a radius of curvature of 0.2 mm ± 0.05 mm shall be used for initial fracture test.

4.1.2 A pendulum device as specified in BS AU 209-4a: 1995 (reference 2.1.2) shall be used for the exterior impact testing.

4.1.3 A ram capable of applying and measuring a force of up to at least 400 N at an accuracy of ±5%, with a 76.2 mm ± 3.8 mm radius hemispherical headform and traveling at a rate of 102 mm/min ± 5 mm/min shall be used for the pushout test, pushing from the interior of the vehicle towards the exterior. The ram will be positioned normal to the interior surface of the glazing. The headform will not crush or otherwise significantly deform during the test.

4.2 Test Specimens

All test specimens will be production parts and mounted into the vehicle structure according to the manufacturer's recommendations. They shall be held at laboratory conditions for at least 4 h prior to testing. Tests shall be carried out under the following conditions: temperature: 20 °C ± 5 °C; pressure: 960 mbar ± 100 mbar; relative humidity: 60% ± 20%. All testing will be conducted with specimens installed on a vehicle or a vehicle subsection (such as installed on a door).

4.3 Procedure

The following three-test sequence will be performed on a single test specimen. This test sequence simulates typical attacks on glazing, including: an attempt to shatter the glazing with a sharp-tipped implement; blunt impacts on the exterior of the glazing to penetrate the glazing; an attempt to pull outward on the glazing to remove it from the vehicle (simulated in this test by pushing outward with a ram).

4.3.1 Center punch or hammer attack on exterior of glazing. At location No. 3 (reference 2.1.2), the exterior of the glazing will be subjected to one impact by a spring-loaded center punch or by a hammer.

4.3.2 Five pendulum impacts on the exterior glazing surface, as specified in 2.1.2, will be performed.

4.3.3 Centered on location No. 3, a ram, as specified in 4.1.3, will be traversed in the direction from the interior towards the exterior, normal to the interior surface of the glazing, at a rate of 102 mm/min, until a force of 400 N is applied or until the test specimen fails, whichever occurs first.

4.3.4 For test specimens in which the glazed area is too small to accommodate the entire pendulum impact pattern, first perform the center punch or hammer attack on the exterior of the glazing at a central point. Next, carry out a single pendulum impact on the exterior of the glazing at any point that is further than 100 mm from the daylight opening. Then conduct the ram push-out test at the same location as the pendulum impact. If the glazing area is too small for the pendulum and the ram tests to be conducted, only the center punch or hammer attack will be performed.

4.4 Interpretation of Results

4.4.1 After center punch or hammer attack, there shall be no separation either within the glazing material or between the glazing and the vehicle body which allows free passage of a sphere 40 mm ± 2 mm in diameter.

4.4.2 After the five exterior impacts, there shall be no separation either within the glazing material or between the glazing and the vehicle body which allows free passage of a sphere 40 mm ± 2 mm in diameter.

4.4.3 During the ram test, there shall be no separation either within the glazing material or between the glazing and the vehicle body which allows free passage of a sphere 40 mm ± 2 mm in diameter. Separation shall be measured while the ram is applying a force of 400 N. For a separation within the glazing material located at or near the face of the ram, where passage of the 40 mm sphere will be hindered by the ram, the size of the separation will be measured with calipers. In this case, the measured separation must be less than a circle of 40 mm diameter while the applied force is 400 N.

5. MARKING OF INTRUSION RESISTANT GLAZING SYSTEMS

5.1 Glazing systems which pass the series of three attack tests may be labeled by the car maker as Enhanced Protective Glazing (EPG). Location and nature of the marking will be determined by the car maker.