



Outside Rearview Mirror Glass - Slam Stability Test

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This test evaluates the ability of an Outside Rearview Mirrors (OSRVM) reflective surface to maintain a preset angular position after multiple door slams.

1.2 Applicability. This procedure applies to all passenger cars, light duty trucks, and medium duty trucks having power or manual outside rearview mirrors mounted to the driver and passenger side doors.

1.3 Remarks. This test may also be performed in conjunction with GMW15094 Door System – Pneumatic Interior Slam Durability Test, if it is desired by the requesting engineer.

Note: GMW15804 evaluates mirror stability resulting from road inputs.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14269 GMW15094 GMW15804

2.3 Additional References.

2.3.1 Evaluation Report. CG190 Report Template.

2.3.2 Outside Mirror Stability Technical Specifications.

- Side Closures Subsystem Technical Specification (SSTS)
 - Vehicle Technical Specification (VTS)
- 2.3.3 Release Documentation.** Product Assembly, Orientation, Fit, etc. Specifications.

- Local Process Plans (LPP)
- Master Process Documents (MPD)

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

Note: The following list(s) include fixturing and instrumentation typically used to perform this test. Other equipment may be substituted at the discretion of the testing facility as long as it provides the same data and/or data record, with equivalent accuracy as specified herein or by the requestor.

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3.2.1 Fixturing. A full vehicle is preferred for the most representative data, but this test can also be performed with a door mounted to a body or a body representative fixture. The fixture or body should simulate the body opening by providing points of contact with the door frame (i.e., weatherstrip, overslam bumpers, striker, hinge mounting locations, etc.) On all of the configurations in 3.2.1, it is imperative that proper cable routing is observed for remote operated manual mirror systems.

See 3.3 for correlation to Test Vehicle/Test Piece.

3.2.2 Instrumentation.

3.2.2.1 Mirror angle measuring instrument (Figure A1) or equivalent.

3.2.2.2 Variable Direct Current (VDC) power supply (if testing power mirrors) 0 VDC to 15 VDC.

3.2.2.3 Proper electrical connectors (if applicable).

3.2.2.4 Proper electrical leads (if applicable).

3.2.2.5 Door closing fixture (slam cannon) or equivalent to produce a specified closing energy. See Figure A2.

Note: If higher energy is required than available on the door closing fixture or velocity is required, see procedure GMW15094 for equipment and operation instructions.

3.3 Test Vehicle/Test Piece. Additional information on test required material and its assembly can be found in the Release Documentation (see 2.3).

3.3.1 A full vehicle, body or body representative fixture including weatherstrips, overslam bumpers, and striker.

3.3.2 A fully assembled, trimmed door that has been through the production paint and bake process is required for a remote operated manual mirror system and is preferred for a power mirror system.

3.3.2.1 If a fully trimmed door is not available, the minimum requirements for a power mirror system or a manual mirror system include a door that has been through the production paint and bake process with an assembled mirror system, latch, outside or inside handle and any weatherstrips (if the door is not fully assembled, the mass difference may affect the slam velocity).

3.3.2.2 See 3.2.1 for correlation to fixturing.

3.3.2.3 It is recommended that the test parts/assembly be dimensionally certified before testing is started.

3.4 Test Time. The following is an estimate of the amount of time (work hours) needed to perform this procedure.

Note: These time estimates are approximate averages. Actual times vary considerably depending on early component failures (and subsequent availability of replacement parts), testing to varying multiples of cycle lives, varying requirements for frequency of environmental test conditions, scheduling problems for test facilities, test equipment malfunctions, scheduling of overtime and/or multiple shifts, scheduling of **witnesses** for tests, actual readiness of test samples upon receipt, unique or additional requests for detailed test information, running multiple samples (times shown are for one system), etc.

These times consider preparation and other downtime, actual test, and analysis of data in capturing a total calendar time. Report writing, approval, processing, etc., are not part of these times.

Calendar time: 1 d

Test time: 4 h

Coordination time: 4 h

3.5 Test Required Information.

3.5.1 The requesting engineer is responsible for providing specifications appropriate to the particular vehicle line being tested (reference VTS/SSTS). If applicable, pertinent documentation is included in the Outside Mirror Stability Requirements in the Side Closures SSTS and VTS.

3.5.2 Testing worst case scenarios may uncover some potential problems. Discuss with the requesting engineer if testing should include some worst case scenarios. Depending on which test is being performed and which level of parts or systems is being tested, consider if any of the following may apply: tolerance stack-ups, build variations, misalignment, minimum/maximum fastener torque(s), lubrication, environmental extremes, location of customer representative load application, symmetry (Left Hand vs. Right Hand), color, mold or die source, etc.

Note: Historically, nominal values have been used.

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3.5.3 The following specifications or information are required to run this test:

3.5.3.1 Mirror reflective surface angles - start of test.

3.5.3.2 Mirror reflective surface angles - allowable movement at specified slam energies/velocities.

3.5.3.3 Mirror reflective surface angles - allowable movement for durability slam tests.

3.5.3.4 The specified number of door slams, window positions and corresponding slam energies/velocities to be performed (including specific location of velocity measurement).

3.5.3.5 Specific functional or operational tests to be performed before or after the test.

3.5.3.6 Environmental temperature extremes, number of slams and slam energies/velocities at each temperature (velocities require a specific position of measurement).

3.5.3.7 All specified angles must include a reference to mirror case or horizontal/vertical planes.

Note: This procedure defines mirror positions.

3.5.3.8 Pin-out, wire diagrams for power mirror glass actuators.

3.6 Personnel/Skills. Prior experience in setting up and running similar tests and experience in the use of the referenced test equipment are critical to achieving the estimated times shown in 3.4.

4 Procedure

4.1 Preparation.

4.1.1 Sample Inspection. The test and requesting engineers should inspect the test items to ensure all material listed in 3.3 is of correct design level and assembled properly.

4.1.2 Sample Preparation. This test is normally run on the test subject in an **as received** condition. If it is requested to be run in a specifically adjusted condition, follow the applicable procedure(s).

4.1.2.1 Mark the approximate vertical and horizontal centerlines on the mirror reflective surface using a permanent marker. Extend these lines to the edges of the mirror housing using a permanent marker. These marks will provide a reference for the angle measuring instrument.

4.1.2.2 If the mirror has a remote manual actuator, scribe or draw several lines (approximately every 30 degrees) radiating outward around the perimeter of the actuator base after the initial test position has been set. These lines will help to determine movement of the remote manual actuator after door slams have been performed.

4.1.2.3 For foldaway mirrors, lines should also be scribed between any rotating surfaces of the mirror housing and the mirror base to detect any movement in this area.

4.1.3 Facilities and/or Equipment Preparation. Record the instrumentation information on Data Sheet A1 or an equivalent document.

4.2 Conditions.

4.2.1 Environmental Conditions. Unless otherwise specified in this document's text or by the requesting engineer, the typical environmental conditions for this test are the temperature, humidity and pressure at the major test facility (3.1). Unless otherwise noted, these conditions are typically 22 °C ± 3 °C, relative humidity of 40% ± 20%, and atmospheric pressure equivalent to the local barometric pressure (which is variable during any given day and from day to day).

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Setup Instructions. Perform any functional/operational tests/evaluations as requested or as may be referenced in Data Sheet A2. As applicable, note any irregular sounds or erratic operation indicating a potential problem with design, manufacture, or assembly and verify observations with the requesting engineer.

4.3.1.1 Using the mirror remote actuator (if applicable) and variable DC power supply (for power mirror assemblies), cycle the mirror system through full travel, in all directions, a minimum of five times prior to the start of test to assure proper operation and seating of all system components.

Note any irregular sounds or erratic operation indicating a potential problem with the assembly or design, and verify observations with the requesting engineer.

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