



Outside Rearview Mirror - Performance Test

1 Scope

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. To determine the operating performance characteristics of power and manual, remote control, outside, rearview, mirror systems, mounted on a door.

1.2 Foreword.

1.2.1 Outside, rearview, remote control, power, mirror system operating performance tests evaluate travel time, operating current draw at a supplied voltage, and actuator efforts during mirror travel.

1.2.2 Outside, rearview, remote control, manual mirror system operating performance tests evaluate mirror actuator efforts and mirror reflective surface angular movement in both vertical and horizontal directions.

1.2.3 Outside Rearview Mirror (OSRVM) assemblies are typically validated by the supplier (Level III Supplier Integrated commodity).

1.2.4 This procedure concerns the interface of the mirror assembly actuator attachment to a location on the body (i.e., door trim, instrument panel, console, etc.) This test evaluates efforts applied to the actuator during normal (non-abusive) mirror adjustment modes and the resultant mirror surface response.

1.2.5 Manual remote control mirrors are evaluated for angular displacement because of the cable interface with vehicle hardware and cable routing. Angular displacements of power mirror assemblies are not evaluated in this procedure because there is no interface with other body and/or door system components, which would affect mirror movement.

1.2.6 For abusive tests, reference GMW15792 (Outside Rearview Mirror Cable/Lever Remote Manual Actuator – Strength Test).

1.3 Applicability. This procedure applies to all passenger cars, light duty trucks, and medium duty trucks having any remote control, outside, rearview, mirror systems mounted on a door.

Note: With appropriate revisions, this procedure may also be used for similar mirrors mounted on fenders, windshield pillar, etc.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15792

2.3 Additional References.

- Actuator Part Drawing
- CG190
- OSRVM Global Component Technical Specification (CTS)
- Master Process Documents (MPD), Local Process Plans (LPP)

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- Mirror Electrical Wiring Diagram
- Subsystem Technical Specifications (STS)
- Vehicle Technical Specification (VTS)

3 Resources

3.1 Facilities. The facility should have all of the equipment listed in Section 3.2 and be capable of providing the conditions required in Section 4.2.

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.

3.2.1 Fixturing. A fully assembled door is preferred to provide for proper cable routing (if applicable) and mirror support. A body is recommended if the actuator cable is routed through the body. A mirror holding fixture, using actual body parts at the actuator attachment area, may be used as an alternate.

3.2.2 Instrumentation.

3.2.2.1 Power Mirror Systems.

3.2.2.1.1 Power mirror performance console which includes: power mirror knob/switch actuator, adjustable voltage supply, and a voltage shunt (100 mV = 1 A is recommended).

3.2.2.1.1.1 A power mirror performance console was built in 1991 to evaluate the electrical performance of Outside Rearview Mirror systems. Plots of test operating current draw and operating travel time are obtained (reference Figure A2). Traditionally, supply voltages have been set to 10.5 V and 13.0 V to represent “**Engine Off**” and “**Engine On**” conditions at a mirror motor connector. Requesting engineers should provide the supply voltage requirements necessary to run this test.

3.2.2.1.2 Proper electrical connectors.

3.2.2.1.3 XY plotter with time base.

3.2.2.1.4 Handheld voltmeter.

3.2.2.2 Manual Mirror Voltmeter.

3.2.2.2.1 A handheld force gage with a capacity approximately 1.5x the mirror's performance specification, with appropriate adapters, such as a flat target shape, hook, etc.

3.2.2.2.2 Angle measurement device. See Figure A1.

3.3 Test Vehicle/Test Piece.

3.3.1 One (1) mirror assembly with both sides of wiring harness.

3.3.2 Instrument panel, interior trim, consoles, and related actuator escutcheons and attachments, etc., which may affect actuator mounting.

3.3.3 A fully assembled door is preferred to provide for proper cable routing (if applicable) and mirror support. A body is recommended if the actuator cable is routed through the body (see 3.2.1 for further explanation). A mirror holding fixture using actual body parts at the actuator attachment area may be used as an alternate.

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

3.4 Test Time. The following is an estimate on 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**

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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.

Technician resource: 1 hour

Engineer resource: 2 hours

Total calendar duration: 1 day

3.5 Test Required Information. The requesting engineer is responsible for providing specifications appropriate to the particular vehicle line being tested (reference VTS/SSTS. (This includes 3.2.1.6.9 Efforts - Manual Outside Rearview Mirror, Remote Actuator), of 55.01, the Side Closures SSTS). See 2.3 for other references that may help in setting up the test material (e.g., drawings/diagrams, CTS, MPD, LPP, etc.)

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.

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

3.5.1.1 Point(s) and orientation of load application on the mirror actuator.

3.5.1.2 Specifications for actuator effort.

3.5.1.3 Order of loading (directional mirror travel).

3.5.1.4 Required supply voltage at mirror - power mirror only.

3.5.1.5 Specification for current draw and travel time - power mirror only.

3.5.1.6 Specification for angular range of movement of mirror reflective surface.

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

Prior experience in setting up and running similar tests and experience in the use of the referenced test equipment will minimize potential for accidents and injuries.

4 Procedure

4.1 Preparation.

4.1.1 Sample Inspection. The test and requesting engineers should inspect the test items to insure all material listed in Section 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).

4.1.3 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 Section 2. Cycle the mirror system through full travel in all directions a minimum of five times

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