



Remote Release System (Front Compartment, Rear Compartment and Fuel Door Closure Panels) Strength 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. To evaluate the strength of the closure panel's mechanical, remote release system when subjected to abusive release handle loading.

1.2 Applicability. This standard applies to all passenger cars and light duty trucks having a closure panel, with a mechanical, remote release system, that is operated through the use of a remote handle (typically inside the vehicle).

1.3 Remarks. This test procedure is intended to simulate the abusive loading that a customer might apply to a remote release handle in a case such as; the closure panel does not appear to open on the first attempt. Subsequently, the operator increases the load applied to the handle on the next attempt.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- Component Technical Specifications (CTS)
- Subsystem Technical Specifications (SSTS)
- Vehicle Technical Specifications (VTS)

3 Resources

3.1 Facilities. GM Body Test Laboratory or similarly equipped test facility.

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. The following list(s) include fixturing and instrumentation typically used by the GM Body Test Laboratory 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. Force gage hook accessory to load the remote handle.

Note: In some cases, a piece of flexible wire may be used in conjunction with a force gage hook to load the handle. See Appendix A, Figure A1 through Figure A3.

3.2.2 Instrumentation. Force gage with a minimum capacity of 1.5x the required load.

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3.3 Test Vehicle/Test Piece. Appropriate buck body or vehicle with a design intent closure panel and remote release system.

Note: The closure panel latch and striker should be present due to their effect on the handle check position. 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.

Calendar time: 1 d

Test time: 2 h

Coordination time: 1 h

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 (1) 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 this time.

3.5 Test Required Information. The requesting engineer is responsible for providing specifications appropriate to the particular vehicle line being tested. Reference Vehicle Technical Specifications (VTS), Subsystem Technical Specifications (SSTS) or Component Technical Specifications (CTS) as appropriate.

3.5.1 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 versus right hand), color, mold, or die source, etc.

3.5.1.1 The following specifications or information are required to run this test.

3.5.1.1.1 Location of force application on handle assembly.

3.5.1.1.2 Direction/arc of force application.

3.5.1.1.3 Maximum force to be applied.

3.5.1.1.4 Environmental conditions.

3.5.1.1.5 Rate of load application.

3.5.1.1.6 Posttest inspection items, i.e., handle functions, or operating characteristics.

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).

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

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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 (see 3.1). Unless otherwise noted, these conditions are typically 22 °C +3 °C (72 °F +5 °F), 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.

4.3.1.1 Perform any functional/operational tests/evaluations as requested.

4.3.1.2 Ensure the closure panel is in the closed and latched position. Specifically, cycle the handle assembly five (5) times to ensure proper operation and seating of all system components. The closure panel should be re-latched between trials. As applicable, note any irregular sounds, erratic operation, or clearance concerns indicating a potential problem with design, manufacture, or assembly, and verify observations with requesting engineer.

4.3.1.3 Ensure the closure panel is in the closed and latched position.

Note: In most cases, this should have no effect on system strength but should be carried out for testing consistency.

4.3.1.4 If the handle is a straight pull type, attach a piece of flexible wire around the handle. See Appendix A, Figure A1.

4.3.1.5 When the closure panel is in the closed and latched position, mark the initial position of the handle. After handle loading, a comparison of the initial position with the posttest position will be conducted.

4.3.2 Test Operation Instructions.

4.3.2.1 Position the force gage hook accessory on the handle at the location specified by the requesting engineer. See Appendix A, Figure A2 and Appendix A, Figure A3.

Note: If the handle is a straight pull type, place the force gage hook accessory through the flexible wire. See Appendix A, Figure A1.

4.3.2.2 Apply the required force to the handle in the direction/arc as specified by the requesting engineer. The force is typically applied at a rate of approximately 10 N/s. Record on the Appendix A, Data Sheet A1 the maximum force applied to the remote release handle and any failure modes if the handle did not achieve the required load. If the handle is self-returning, record on Appendix A, Data Sheet A1, whether or not the handle returned to its initial position.

Note: Typically, on a pivoting handle, the force is applied on the end of the handle opposite the pivot. The force is applied perpendicular to the handle and is maintained tangent to the handle swingline throughout travel. On a straight pull type handle, the force is applied in the same direction as the handle shaft axis.

4.3.2.3 Perform any functional tests, operational tests, and evaluations as requested.

4.3.2.4 Return the closure panel to the closed and latched position. Operate the remote release handle and verify that the system still functions properly. Record the results on Appendix A, Data Sheet A1.

4.3.3 Posttest Instructions. Every posttest operation, measurement, and inspection must have a pretest equivalent to have any meaning or significance. A crack detected at the end of the test means nothing unless there is pretest documentation verifying no crack existed prior to start of test.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Not applicable.

5.3 Test Documentation. Fill out information on Appendix A, Data Sheet A1.

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