Fuel Filler and Charge Port Door System Checkload

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. The purpose of this procedure is to determine if a fuel filler or charge port door system meets the checkload requirements of the appropriate Subsystem Technical Specifications (SSTS).

1.2 Applicability. This procedure applies to all cars and trucks which utilize a hinged door to cover the fuel filler or charge port pocket and cap.

1.3 Remarks. The fuel filler or charge port door may undergo checkload testing as part of a durability test (GMW15659).

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15659

2.3 Additional References. The following reference materials (procedures, documents, standards, etc.) may be required to perform this test:

- 532 Fuel Filler Door Module (SSTS).
- 534 Charge Ports (SSTS).
- Release Documentation. This includes Master Process Document (MPD) which shows any product assembly orientation, fit, assembly specifications, etc., for the system being evaluated.
- Vehicle Technical Specifications (VTS).

As of the issue/revision date for this procedure, there was no known, current Federal, State or Local legal requirements that apply to, or affect, the contents of this procedure.

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.

3.1.3 Major Facility. GM Body Test Laboratory or a similarly equipped test facility.

3.1.4 Minor Facility. Designated floor space (slot) for a test cart.

3.2 Equipment.

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Note: The following items include fixtures 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 requesting engineer.

3.2.1 Fixturing.

3.2.1.1 Typically none is required unless the test is to be performed on a cutout section of a body.

3.2.1.2 Paint pen or scribe (to mark fastener locations).

3.2.2 Instrumentation.

3.2.2.1 Torque wrench(es) with a range of approximately 1.5 times the maximum torque specified by the requesting engineer.

3.2.2.2 Force gages and accessories of capacity appropriate to the checkload specifications.

3.2.2.3 Metal rule or scale (150 mm).

3.2.2.4 Protractor or similar angle measurement device to determine fuel filler or charge port door angle.

3.3 Test Vehicle/Test Piece.

3.3.1 Test Vehicle. A vehicle body or body section which surrounds the fuel filler or charge port door assembly, the fuel filler or charge port pocket; all system fasteners, and any other components associated with the system are required for this test. Depending on the system configuration, a fuel filler tube/neck, cap and cap tether may be required to perform this test. It is recommended that the test parts/assembly be dimensionally certified before testing is started. It is also recommended that the fuel filler door or charge port door be subjected to the production-intent assembly, paint, and bake process to ensure representative strength characteristics.

3.3.2 Record on Data Sheet A2 (Appendix A), whether or not the fuel filler or charge port door subsystem has been painted and/or dimensionally checked.

Note: This procedure can be conducted on any level of experimental, production, or prototype material. However, consideration should be given to the effects of build tolerances, different paint processes, and the effect of paint bake ovens on the hinges, springs, and materials utilized in the design. For example: a fuel filler or charge port door spring that has not been exposed to the production paint and bake process may have more output than one that has been exposed.

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

Calendar time:	2 d
Test time:	4 h
Coordination time:	8 h

Note: These time estimates are approximate averages. Actual times vary considerably depending on the following:

- Early component problems.
- 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.

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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:	5 h

3.5 Test Required Information. The requesting engineer is responsible for providing specifications appropriate to the particular vehicle line being tested. (Reference VTS/SSTS paragraph numbers, if applicable. See 2.3).

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 vs. Right Hand).
- Color, mold or die source, etc. (This includes the issue in 3.3.1).

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

3.5.2.1 Checkload. The force that is applied to the fuel filler or charge port door can be found in the SSTS.

3.5.2.2 Checkload Direction. If other than the x-direction.

3.5.2.3 Checkload Application Location. The load shall be applied to:

- The finger cup of the door at the vertical centerline, if present, or
- 15 mm forward of the rear edge of the door at the vertical centerline if there is no finger cup, or
- Alternatively using a convenient feature on the hinge within 25 mm from the rearmost point on the hinge.

3.5.2.4 Torque. Fastener torque specifications.

3.5.2.5 Operating Efforts. The requesting engineer is to provide the opening, closing, and remote release efforts and application locations.

3.5.2.6 Body Clearance. The requesting engineer is to provide the minimum gap required to prevent the fuel filler or charge port door from contacting the surrounding panels during checkload.

3.5.2.7 Angle Requirements. The requesting engineer is to provide angle requirements or limits, before, during, and after checkload.

3.5.2.8 Any other specific operating characteristics to be checked prior to, during, or after checkload.

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 are of correct design level and assembled properly. Thoroughly check for the existence of any flaws, cracks, etc., which could affect the durability results. Record all observations including, **no visible cracks**. See Data Sheet A2 (Appendix A).

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 If necessary, assemble the fuel filler or charge port door into the pocket/quarter panel assembly according to the MPD.

Note: The MPD should be consulted throughout this process for order of assembly, torque specifications, etc.

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