



Cowl Grille Flex Fuel Reservoir Access Cover Durability Test Procedure

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. This requirement ensures that the cowl grille access cover for Flex fuel reservoir will work properly during the vehicle life time, remain locked when closed avoiding noise and other inconvenience during its operation.

1.2 Foreword. This document is the GM Worldwide Air Inlet Panel (AIP) Testing Standard. Its purpose is to establish a common test methodology for AIP Flex Fuel Cover systems to ensure that a high quality world class system is consistently developed and produced. This is a living document and any suggestions or revisions will be reviewed and/or updated annually by the AIP Global Subsystem Leadership Team (GSSLT).

1.3 Applicability. This standard applies to cowl grilles that have the cover to access the cold start reservoir used for flex fuel vehicles. This test is defined to check the durability of the cover on the open/close operation during the vehicle life time. This standard applies to all original equipment and replacement Flex Fuel Cover components for passenger cars, Multipurpose Passenger Vehicles (MPV), and trucks.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3600

2.3 Additional References.

GM Security Guidelines

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. Test equipment must be capable to be fully automatized to perform the open/close operation besides operating inside a climatic chamber.

3.2.1 Thermal Chamber large enough to contain one complete test bucks and capable of -40 °C to +100 °C with controlled humidity.

3.2.2 Flex Fuel Cover Fixture.



Figure 1: Flex Fuel Cover Fixture

3.3 Test Vehicle/Test Piece. Three (3) AIPs with Flex Fuel Cover.

3.3.1 Unless otherwise specified, five samples of components or systems shall be tested.

3.3.2 All components/systems used in testing shall be within drawing specifications and have supporting data prior to start of test.

3.4 Test Time.

Calendar time: 10 days

Test hours: 40 hours

Coordination hours: 4 hours

3.5 Test Required Information.

3.5.1 GM Validation is to be notified of test failures within 24 hour period of occurrence.

3.5.2 Supplier to develop five phase document for all test failures.

3.5.3 Product Security. Security protocol for the test vehicle must be followed per GM Security Guidelines.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation. Not applicable.

4.2 Conditions. The cowl grille must be fixed in a device simulating the car condition of installation (including push-pins, screws, etc.)

4.2.1 Environmental Conditions. The following conditions apply to all tests unless otherwise specified:

- Temperature: $+23\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$.
- Voltage: $V_{\text{NOMINAL}} \pm 0.3\text{ V}$ at motor terminals.
- Humidity 50% to 75% unless otherwise specified.

Each sample should be tested for 2 lives. Each life should be performed according to the environmental conditions and quantity of cycles below:

- 60% (240 cycles) at $23\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$.
- 10% (40 cycles) at $80\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$.
- 10% (40 cycles) at $-30\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ (for South American and Hot countries, use $-15\text{ }^{\circ}\text{C}$, see Deviations).
- 20% (80 cycles) at $38\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$, 95% Relative Humidity (RH) $\pm 5\%$ RH.

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 Unlock the clips simulating the user's fingers (size, direction, velocity and pressure), pull (or push) the cover until it is fully open and close the cover again, applying pressure on its surface simulating the effect of the human hand, until the clips are completely locked.

4.3.2 Keep the test cycles on hold while the temperature of the chamber is changing from one condition to another.

4.3.3 Check for each environmental condition if the locking clips lose their function and if the hinges present deformations.

4.3.4 At the end of the test, the cover must keep the open/close function. The locking clips should be capable of keeping the cover locked by itself when closed.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Not applicable.

5.3 Test Documentation.

5.3.1 Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM department prior to the start of delivery of production level components or materials. Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacture requires a new release of the product. It is the sole responsibility of the supplier to provide the customer, unsolicited, with documentation of any change or modification to the product/process, and to apply for a new release. If not otherwise agreed to, the entire verification test shall be repeated and documented by the supplier prior to start of delivery of the modified or changed product. In some cases, a shorter test can be agreed to between the responsible GM department and the supplier.

5.3.2 Record measurements and results on the data sheet in Appendix A as specified by individual procedures.

5.3.3 Document the test results in a test certificate or report. Test reports shall include all of the following: test equipment serial numbers, calibration information, test data sheets in Appendix A and attached to Appendix B, description of test material (including design revision, lot or batch, options, etc.) test specification date, pertinent setup information, and photographs. The Supplier shall write evaluation reports to document the results of all their validation activities and shall make the test results and evaluation reports available to GM Engineers upon request. See GMW3600. All reports are to be in the English language. Document all test results, parameters and findings.

5.3.4 Photos of the test fixture and test sample.

6 Safety

This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7 Notes

7.1 Glossary.

5-Phase document: Supplier to use current approved 5-phase to be provided by GM Product Engineering. 5-Phase to include at a minimum

1. Issue Description.
2. Root Cause Analysis.
3. Containment.
4. Implementation.
5. Evaluation/Validation.