



Test of Glove Box and Large Compartments with Volume 1 L or Greater

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. Glove box testing according to various performance criteria, such as function, strength, noises, etc.

1.2 Applicability. Valid for all glove boxes.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3059

GMW14117

GMW14264

2.3 Additional References.

CG2160, Statement of Requirements (SOR) Appendix C2

3 Test Preparation and Evaluation

3.1 Resources.

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 Facilities.

3.1.3.1 Climatic Chamber.

3.1.3.2 Durability Test Stand.

3.1.3.3 Hydraulic Vibration Test Stand.

3.1.4 Equipment.

3.1.4.1 Tensile/compression gauge with hook and piston, diameter 20 mm.

3.1.4.2 Steel ruler.

3.1.4.3 Tape measure.

3.1.4.4 Torque wrench.

3.1.4.5 Contactless device for measurement of opening time.

3.1.4.6 A 2 kg weight.

3.1.4.7 Hook for checking the anti-theft protection.

3.1.4.8 Fixture clamp with eyebolt to cycle glove box handle.

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3.1.5 Test Vehicle/Test Piece. Glove boxes, in vehicle installed position.

3.1.6 Test Time. Not applicable.

3.1.7 Test Required Information. Not applicable.

3.1.8 Personnel/Skills. Not applicable.

3.2 Preparation. Not applicable.

3.3 Conditions.

3.3.1 Environmental Conditions. Not applicable.

3.3.2 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.

3.4 Instructions. Not applicable.

3.5 Data. Not applicable.

3.6 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.

3.7 Documentation. 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.

3.7.1 Test Results. The requirements are given in Table A1; deviations of these values are defined in the CG2160 Statement of Requirements (SOR) Appendix C2, if applicable.

3.7.1.1 Subjective evaluation shall be performed according to GMW14264.

3.7.1.2 The results shall be entered in the corresponding Data Sheets A1 thru A5.

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

3.7.2.1 If not defined within GMW14117 Instrument Panel Trim and Floor Console Technical Specification or CG2160, Statement of Requirements (SOR) Appendix C2 (the supplier shall work with the GM Design Responsible Engineer to comprehend this requirement), all performance specifications shall be fulfilled within a temperature range selected in Table 1 for the test.

Table 1: Temperature Ranges

Temperature Profile 1	+23 °C ± 5 °C
Temperature Profile 2	+85 °C ± 5 °C
Temperature Profile 3	-30 °C ± 5 °C
Temperature Profile 4	+40 °C ± 5 °C, Relative Humidity (RH) 95%

4 Requirements and Procedure

4.1 General. The glove box shall be checked for conformance to the current development, drawing or release status before commencement of each test.

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4.1.1 All fasteners shall be present, undamaged and correctly installed. If not, the fasteners shall be supplemented or corrected. Any modifications shall be noted.

4.2 Measurement of Release Force (F1). The tensile/compression gauge with hook shall be used for measuring the release force F1.

4.2.1 The hook shall be applied directly to the glove box release handle and shall release the locking mechanism, causing the glove box lid to open (Figure 1).

4.2.2 Measurement shall be performed individually for the left, right and center perpendicular to the release handle.

4.2.3 The three individual measurement values shall be recorded.

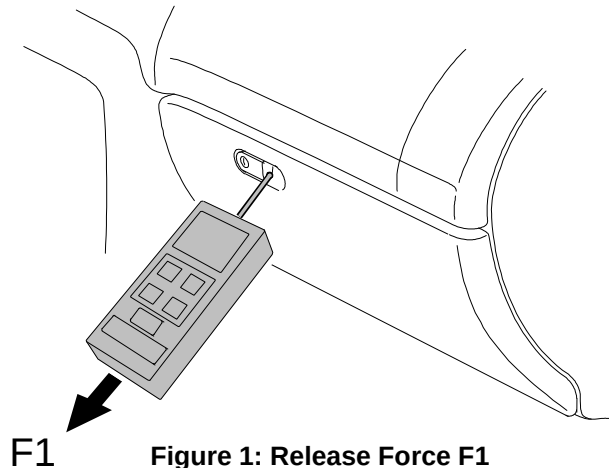


Figure 1: Release Force F1

4.3 Measurement of Closing Force (F2) and/or Latching Force (F3). The tensile/compression gauge with piston diameter of 20 mm shall be used to measure the closing/latching force.

4.3.1 Measurement of the latching force shall be performed at height S1 and should be applied on centerline of the latch assembly (Figure 2) for the left, right and center of the glove box lid.

4.3.2 The piston shall be positioned a distance S1 from the upper edge of glove box and centered, left and right sides. It is applied tangentially to the direction of movement (Figure 2) from the maximum opening position.

4.3.3 Closing Force (F2) designates the maximum force required to move the glove box door from the open position to a point when the latch mechanism contacts the striker. Latching Force (F3) is the maximum force required to actuate the latch from the striker point of contact until the latch is fully engaged. The closing forces (F2) and (F3) are to be measured at three points on the door. Measure the center, furthest left and right points on the door.

4.3.4 Three measurement values shall be recorded for each measurement.

4.4 Measurement of the Key Torque MD1. For lockable glove boxes, the key torque shall be measured with the torque wrench.

4.4.1 The torque wrench shall be applied directly to the key and shall turn it to the opening and closing directions.

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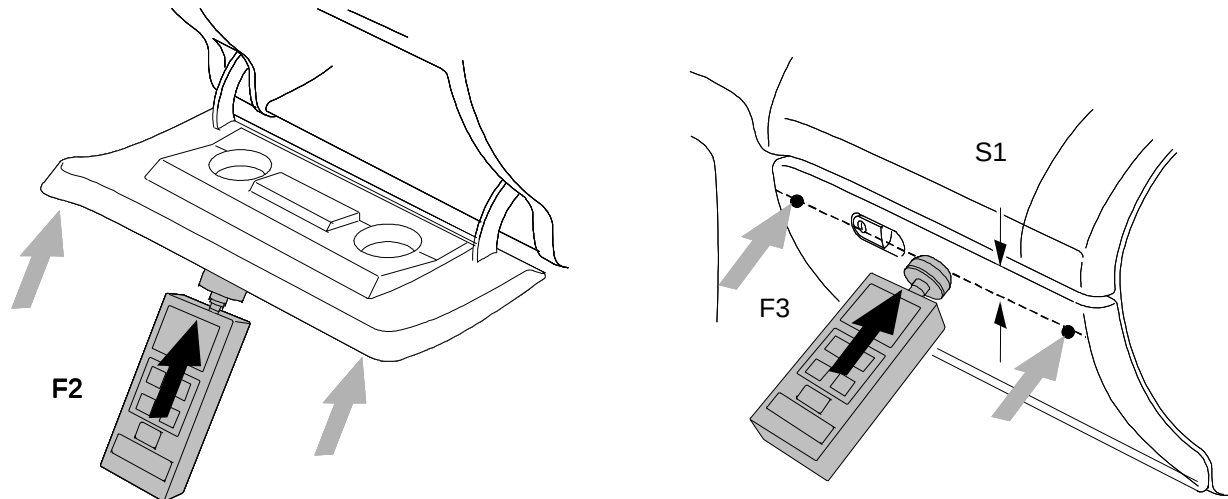


Figure 2: Measurement of Closing Force (F2) and Latching Force (F3)

4.5 Measurement of Opening Time (t) (Version with Lid Brake). The allowed opening time (t) shall be calculated using the required opening speed from Table A1, with use of the arc length as shown per the formula in 4.5.3.

4.5.1 Determine the measured opening time (t) in seconds as follows:

4.5.1.1 Use a contactless automatic stop watch or light barrier. The time measurement starts at the instant the glove box door passes the time measurement device and finishes when the glove box door reaches full-open.

4.5.1.2 It is recommended to deactivate the latch mechanism, hold the door fully closed and start measuring as soon as the door starts to move.

4.5.2 Determine the calculated time (S) in 4.5.3 as follows.

4.5.2.1 Measure the maximum opening angle (α) in degrees of the glove box.

4.5.2.2 Measure the distance (R) in mm from hinge centerline to the centerline of locking rods.

4.5.3 Use the following equation to determine the allowed opening time t_{max} and t_{min} with use of the opening speed (V1) in Table A1.

$$S = \frac{2 \cdot \pi \cdot R}{360} \cdot \alpha \Rightarrow t = \frac{S}{VO} = \frac{2 \cdot \pi \cdot R \cdot \alpha}{360 \cdot VO}$$

Where:

t_{max} = time maximum in seconds

t_{min} = time minimum in seconds

4.5.3.1 The opening time (and the opening speed) is temperature dependent and it shall be measured for all ranges specified in Table A1.

4.5.4 The measured opening time shall be within the calculated t_{max} and t_{min} range.

4.6 Measurement of Load Test Glove Box Shelf (F_D). A tensile/compression gauge with piston diameter of 20 mm shall be used to measure the glove box shelf deflection and rigidity. The load shall be applied in the middle of the glove box shelf, 20 mm from the rearward in vehicle edge.

4.6.1 The deformation on that point is measured with the help of a dial gauge, which is positioned on the lower side of the shelf (Figure 3).

4.6.2 The values shall be documented.

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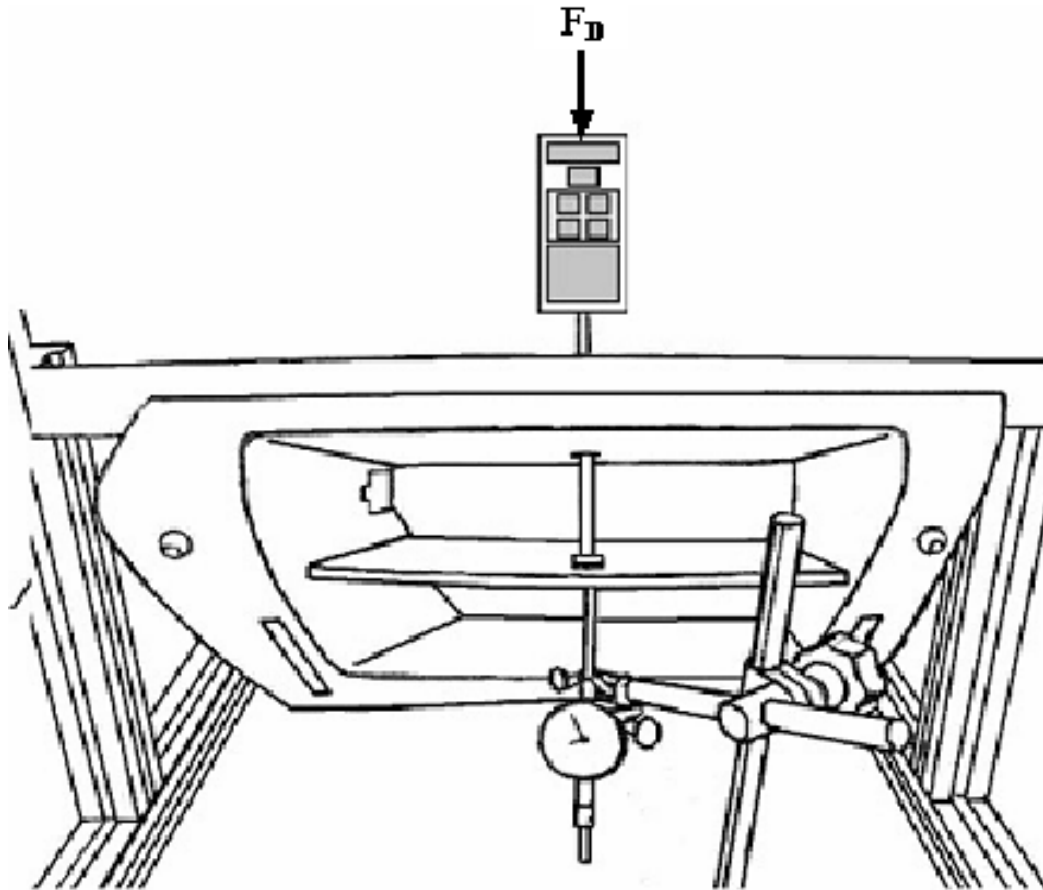


Figure 3: Measurement of Deflection and Firmness of the Glove Box Shelf

4.7 Closing and Opening Behavior Test.

Scope	Evaluation of the closing and opening behavior of the glove box.
Conditions	Tested from the driver's and passenger's seats when stationary operation.
Test Method	Evaluate the following with vehicle stationary: - Closing of the box at any point of application from the driver's and passenger's seats. - Opening of the box after being released. - Noises when releasing, opening or closing. - Noises from the opening stop of the lid. - Swinging back of the lid on reaching the opening stop.
Acceptance Criteria	- Opening and closing of the glove box shall be possible from the driver's and passenger's seats when stationary operation. - The glove box lid shall open automatically after being released. - A rating ≥ 7 shall be attained for the following characteristics according to GMW14264: - Closing and opening behavior. - Closing and opening noise (functional noise). - Noise from the opening stop. - Significant swinging back of the lid is not permissible.

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4.8 Illumination Test.

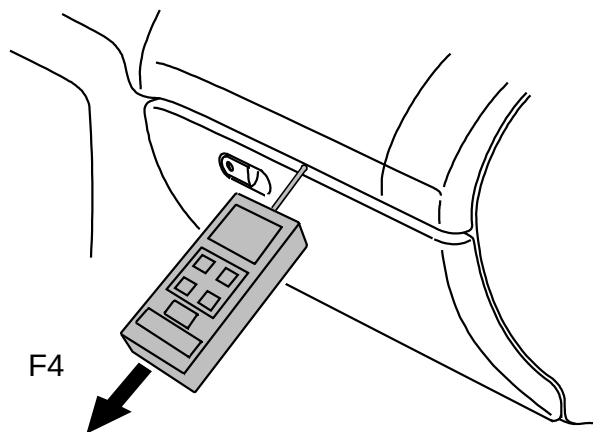
Scope	Evaluation of glove box interior for sufficient illumination.
Conditions	The tests shall be performed in the dark, if possible.
Test Method	The glove box interior shall be checked for sufficient illumination. Check for evidence of light diffusion through surrounding parts when the glove box illumination is switched on.
Acceptance Criteria	Box interior illumination shall have a rating ≥ 7 according to GMW14264. With illumination switch: The illumination shall be switched off when the lid is closed. Without illumination switch (permanent illumination): There shall be no light diffusion through surrounding parts or through the glove box lid joint when the glove box illumination is switched on

4.9 View Protection Test.

Scope	Evaluation of view protection.
Conditions	Not applicable.
Test Method	Not specified.
Acceptance Criteria	The contents of the closed glove box shall not be visible from outside.

4.10 Anti-theft Protection Test (F4).

Scope	Evaluation of anti-theft protection.
Conditions	The anti-theft protection shall be tested with the glove box locked using the hook and tensile/compression gauge.
Test Method	The hook shall be attached to the upper edge and centered between the glove box door outboard edges, (Figure 4). The gauge shall be pulled perpendicular to opening direction.
Acceptance Criteria	Displacement of the lock as a result of pushing the lid in a transverse direction shall not be possible. Refer to Table A1 for additional requirements.

**Figure 4: Anti-Theft Protection Test****GM Confidential**

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