Door Trim Fixed Storage Compartment

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. This specification establishes the test conditions and the requirements for testing a door trim fixed storage compartment to show compliance of the storage compartment to different performance criteria.

1.2 Applicability. The fixed storage compartments on all side swing door trim panels.

- Front side door fixed storage compartment left/right.
- Rear side door fixed storage compartment left/right.

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 GMW14144 GMW14264

2.3 Additional References.

- Best Practice KPAC INTDRTR-76.
- CG1945, Validation Cross Reference Index (VCRI).
- Statement of Requirements (SOR) Appendix C2.
- Subsystem Technical Specification (SSTS).

3 Test Preparation and Evaluation

3.1 Resources.

3.1.1 Facilities. Milford Proving Ground, GM Opel Dudenhofen Proving Ground, or equivalent proving ground.

3.1.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.1.2 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. Approved alternatives are shown in Section 4.

3.1.2 Equipment.

3.1.2.1 Walk in climatic chamber that is large enough to accommodate the test apparatus and the personnel conducting the testing.

3.1.2.2 Tensile/compression gauge (measuring range 0 N to 500 N) with the equipment required by the appropriate test method.

3.1.2.3 Tripod.

3.1.2.4 Measurement gauges.

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3.1.2.5 Load cell.

3.1.2.6 Travel sensor.

3.1.2.7 Force sensor.

3.1.3 Test Vehicle/Test Piece.

3.1.3.1 Test Vehicle. Not applicable.

3.1.3.2 Test Part. The finished door trim panel fixed storage compartment shall be tested. The door trim panel shall be a production design representative part. Unless otherwise specified in the applicable Subsystem Technical Specification (SSTS), at least three test parts shall be tested at each environmental condition shown, if not otherwise agreed upon with the responsible Validation Engineer.

3.1.3.2.1 A new test part is to be used for each test.

3.1.3.2.2 Test parts shall not be tested within 72 h of manufacture.

3.1.3.3 Test Part Support/Fixtures. The door trim panel with fixed storage compartment for testing shall be installed on a fixture or door assembly that simulates the in-vehicle position of the door trim panel.

3.1.4 Test Time. Not applicable.

3.1.5 Test Required Information. Not applicable.

3.1.6 Personnel/Skills. Not applicable.

3.2 Preparation. The door trim panels shall be checked for conformance to the current development, drawing, and release status before each test. All fasteners shall be present, undamaged, and correctly installed. If this is not the case, the fasteners shall be replaced or corrected. Any modification shall be noted in the test report.

3.3 Conditions.

3.3.1 Environmental Conditions. All testing is to be performed in the order shown in Section 4 at:

- +75 °C ± 3 °C
- -30 °C ± 3 °C
- +23 °C ± 5 °C

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.

The test is to be conducted in the climatic chamber after a minimum part soak time of 1 h. The tests are to be performed in the chamber at the temperature specified. Parts to be tested are not to be soaked in the chamber and subsequently removed from the chamber for the duration of the test (i.e., soaking the parts in the chamber and bringing them into an ambient temperature lab for the duration of the test is not permissible under this specification).

3.4 Instructions. Refer to Section 4.

3.5 Data. The results of the testing shall be presented in a test report along with pictures of the fixed storage compartment prior to the testing and at the end of test.

3.6 Safety. This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

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.

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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. Test values are given within the text. Deviations from these values will be defined in the appropriate documents (program specific Statement of Requirements (SOR) Appendix C2/part drawing/Engineering Work Order/SSTS).

3.7.2 Storage. Test reports shall be stored at General Motors at the completion of testing in the Global Document Management (GDM) system.

4 Requirements and Procedure

4.1 General. The door trim panel assembly may include more than one fixed storage compartment. The primary storage compartment (also known as a map pocket) is located in the lowest area of the door trim panel. Additional fixed storage compartments on the door trim panel are classified as secondary storage compartments. Figure 1 shows an example of a door trim panel with primary and secondary fixed storage compartments.

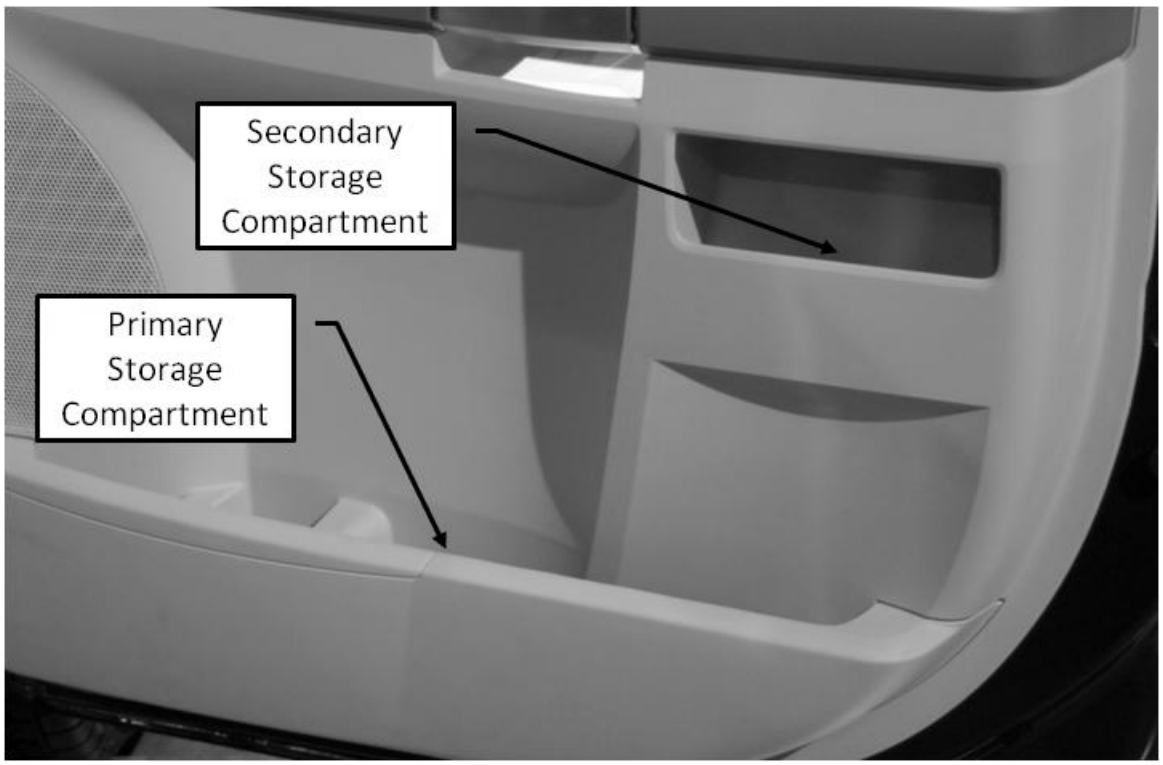

Figure 1: Example of Primary versus Secondary Fixed Storage Compartment

4.2 Primary Storage Compartment.

4.2.1 Tensile Deformation. The fixed primary storage compartment shall comply with the test requirements provided in Table 1.

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Table 1: Tensile Deformation Requirements

General	
1	A new door trim panel is to be used for each test.
2	Number of sample test parts for this testing according to Validation Cross Reference Index (VCRI) (CG1945).
3	Each test part will be tested at ambient temperature +23 °C ± 5 °C as described in the instructions in Equipment, Measurement Point, Instructions and End of Test as follows.
4	The length of the primary storage compartment opening is measured from the tangent of the forward radius of the opening to the tangent of the rearward radius of the opening, regardless of divider location or construction, as shown in Figure 2. **NOTE:** Additional examples of how to determine the length of the primary storage compartment are provided in Best Practice KPAC INTDRTR-76. The supplier shall work with the GM Bill of Material (BOM) Family Owner to comprehend this requirement.
Equipment	
1	The tensile/compression gauge with the 40 mm wide hook shown in Figure 3 shall be attached to the appropriate load application point at the weakest point identified along the upper edge of the door storage compartment (if weakest point cannot be determined, then use the midway point along the length of the door storage compartment opening) on the inner side of the door storage compartment to apply the required forces (Figure 5).
2	The hook should have at least 30 mm of its depth engaged in the door storage compartment for load application (maximum depth of 40 mm possible as shown in Figure 3) without bottoming out on a divider (if present). If the hook cannot have at least 30 mm of its depth engaged due to a divider it should be moved rearward of the divider and the deviation noted in the test report along with the force application point used for the testing.
3	A separate gauge shall be used for measuring the amount of deformation. The gauge shall be attached to a tripod fastened to the door outer panel or the perimeter of the door structure (Figure 4). If the tripod is standing on the floor, the door shall be secured so that it cannot move when a load is applied. The final measurement shall not be influenced by movement of the door.
Measurement Point	
1	The measurement under load deformation shall be performed at same point where the load is applied.

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Instructions	
1	The door trim panel shall be installed on a fixture or door assembly that simulates the in-vehicle position of the door trim panel. The in-vehicle position is the door in either the open or closed position.
2	The pull direction and the direction of measurement are perpendicular to the door trim panel (Figure 5).
3	If necessary, move the test setup into a climatic chamber in order to reach the specified temperature.
4	Maintain the test part for at least 1 h at +23 °C ± 5 °C.
5	In the climatic chamber, 200 N shall be applied at the weakest point or the middle of the fixed primary storage compartment at the upper edge of the opening (Figure 5).
6	Maintain the load for a minimum of 3 s.
7	Release the force.
8	Repeat steps 5 thru 7 two more times for a total of three load applications.
Tension Forces and Deformation Requirements	
1	**Compartment Opening with Ribs and Opening Length ≤ 380 mm.** The part must conform to the deformation requirements of Table 2.
2	**Compartment Opening with Ribs and Opening Length > 380 mm.** The part must conform to the deformation requirements of Table 3.
3	**Compartment Opening with a Back Plate.** The part must conform to the deformation requirements of Table 4.
End of Test Requirements (All Compartment Opening Lengths)	
1	The door trim panel and primary storage compartment shall be checked for any damage after the test.
2	The test shall not cause any permanent deformation or visible damage (e.g., no white marks, no grain distortion, no shape deformation, no tearing, not loosen or detached, etc.) to the A-surface of the storage compartment.

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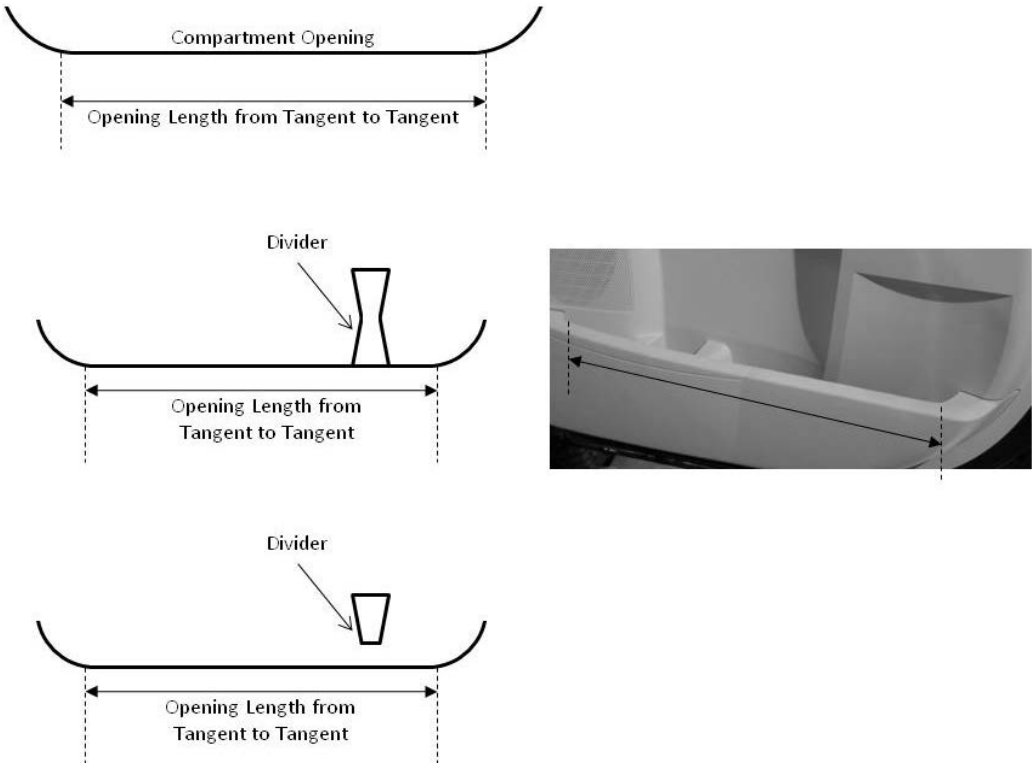

Figure 2: Measurement of Opening Length for Tensile Testing

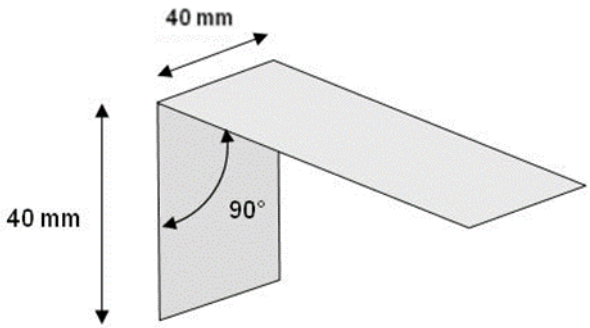

Figure 3: 40 mm Wide Hook

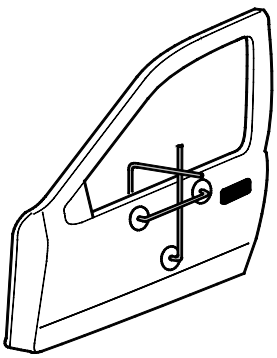

Figure 4: Tripod Fastened to the Side of the Door

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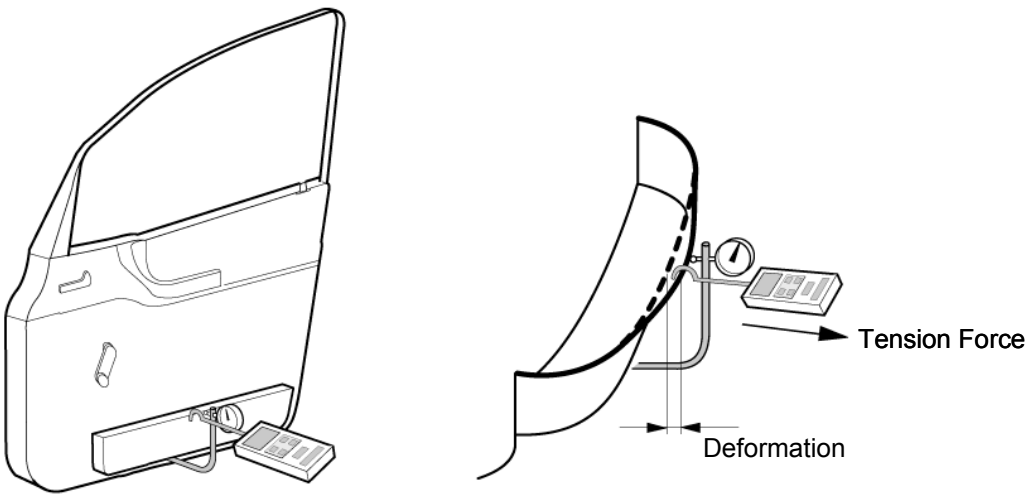

Figure 5: Measurement of Tensile Deformation of Primary Door Storage Compartment

Table 2: Tensile Forces and Deformation for Compartment Opening with Ribs ≤ 380 mm

Ambient Deformation	
1	At 200 N, the deformation under load shall be ≤ 25 mm.
2	Permanent deformation is not permitted.

Table 3: Tensile Forces and Deformation for Compartment Opening with Ribs > 380 mm

Ambient Deformation	
1	At 200 N, the deformation under load shall be ≤ 30 mm.
2	Permanent deformation is not permitted.

Table 4: Tensile Forces and Deformation for Compartment Opening with a Back Plate

Ambient Deformation	
1	At 200 N, the deformation under load shall be ≤ 25 mm.
2	Permanent deformation is not permitted.

4.2.2 Compression Deformation. The fixed primary storage compartment shall comply with the test requirements provided in Table 5.

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Table 5: Compression Deformation Requirements

General	
1	A new door trim panel is to be used for each test.
2	Number of sample test parts for this testing according to VCRI (CG1945).
3	Each test part will be tested at ambient temperature +23 °C ± 5 °C as described in the Instructions shown following.
4	The length of the primary storage compartment opening is measured from the tangent of the rearward radius of the opening to the rearward edge of the map pocket divider (if applicable) as shown in Figure 6. If there is no divider the length is the same as used for the tensile testing (Figure 2). **NOTE:** Additional examples of how to determine the length of the primary storage compartment are provided in Best Practice KPAC INTDRTR-76. The supplier shall work with the GM BOM Family Owner to comprehend this requirement.
Equipment	
1	The tensile/compression gauge with a 20 mm diameter piston rubber stamp with a minimum thickness of 5 mm and hardness < 60 Shore A shall be attached to the appropriate load application point on the outer side of the door storage compartment to apply the required forces.
2	A separate gauge shall be used for measuring the amount of deformation. The gauge shall be attached to a tripod fastened to the door outer panel or the perimeter of the door structure (Figure 4). If the tripod is standing on the floor, the door shall be secured so that it cannot move when a load is applied. The final measurement shall not be influenced by movement of the door.
Measurement Point	
1	The measurement of both under load deformation and permanent deformation shall be performed 5 mm below the upper edge of the door storage compartment, 20 mm rearward of the centerline of the load application point (Figure 7).
Instructions	
1	The door trim panel shall be installed on a fixture or door assembly that simulates the in-vehicle position of the door trim panel. The in-vehicle position is the door in either the open or closed position.
2	The push direction and the direction of measurement are perpendicular to the door trim panel (Figure 8).
3	If necessary, move the test setup into a climatic chamber in order to reach the specified temperature.
4	Maintain the test part for at least 1 h at +23 °C ± 5 °C.
5	In the climatic chamber, 200 N shall be applied in the middle of the fixed primary storage compartment with the center of the rubber stamp 15 mm below the upper edge of the opening (Figure 7).
6	Maintain the load for a minimum of 3 s.
7	Release the force.
8	Repeat steps 5 thru 7 two more times for a total of three load applications.

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