



## **Seat Back Pocket Performance and Durability 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.** The purpose of this procedure is to evaluate the functional requirements and durability of a seat back pocket. This standard applies to seat back pocket performance and durability testing.

**1.2 Applicability.** This procedure applies to all passenger cars and light duty trucks with seat back pockets.

**1.3 Remarks.** Not applicable.

### **2 References**

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

#### **2.1 External Standards/Specifications.**

None

#### **2.2 GM Standards/Specifications.**

GMW14264

#### **2.3 Additional References.**

- Appendix G2 of the Statement of Requirements (SOR).
- Facility data sheet or an equivalent document.
- GM approved test report form.
- Laboratory's certification.
- Subsystem Technical Specification (SSTS).
- Technical drawings.
- Unistrut, (unistrut.com).

### **3 Resources**

**3.1 Facilities.** An approved GM certified test lab with an adequate bedplate or equivalent work surface necessary for mounting of the test sample and associated test fixtures.

**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.**

**3.2.1 Mounting Blocks.** Rigid mounting blocks that simulate the floor attachment points and can mount the seat subsystem in the body position on a bedplate, or equivalent work surface.

**3.2.2 Durability Test Fixture.** Appropriate durability tester to complete the total cycle at a speed of at least ten Cycles per Minute (CPM).

**3.2.2.1** Structural framing to attach a pneumatic cylinder in a vehicle, or simulating body position of the part as required if no body is available.

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**3.2.2.2** A two pneumatic cylinder system or equivalent equipment (i.e., robot) with adequate capacity to provide required loads and perform the action of releasing the pocket and grabbing it again for the next cycle.

**3.2.2.3** Loading device that simulates the shape of a hand pulling at the top edge of the map pocket as shown in Figure 1. Contact surface of the device shall be covered by rubber to exclude the damage due to the edge of the device.

**3.2.2.4** Hardware to attach the loading device to the load cell and pneumatic cylinder.

**3.2.2.5** Torque wrench fittings/tools appropriate for the screws, bolts, etc., to be used.

**3.2.2.6** Climate chamber for a temperature range of (-20 to +80) °C, temperature deviation  $\leq 2$  °C, humidity  $\leq 5\%$ .

**3.2.3** Test block measuring: 250 mm height x 200 mm width x 20 mm depth with a weight of 1.5 kg.

**3.2.4** Angled test fixture measuring: 40 mm height x 60 mm width x 150 mm depth. Depth may be longer or shorter depending on equipment.

**3.2.5** Test fixture capable of retaining in a given position and releasing a rubber ball measuring: 127 mm diameter and mass 4.54 kg for simulating a free falling impact.

**3.2.6 Rubber Knee Form.** A 4.54 kg rubber ball having a 127 mm (5 in) diameter, simulating a knee form.

### **3.2.7 Instrumentation.**

**3.2.7.1** Pneumatic controller that can provide closed loop control of the pneumatic cylinder by monitoring the forces applied to the net and resulting displacements.

#### **3.2.7.2 Load Cell.**

**3.2.7.3** Amplifiers/signal conditioners for load cells and displacement transducers.

**3.2.7.4** Cables and wiring as needed.

**3.2.7.5.** Calipers and/or scales to measure deflection at force.

**3.3 Test Vehicle/Test Piece.** Complete trimmed seat subsystem. An appropriate seat subsystem consisting of all the components necessary to qualify as complete for the model and trim level specified by the Design Release Engineer (DRE). Each test will require a separate sample (e.g., Durability Test and Permanent Sag would be two (2) test samples).

### **3.4 Test Time.**

Calendar time: 2 days

Test hours: 8 h

Coordination hours: 4 h

**3.5 Test Required Information.** Not applicable.

### **3.6 Personnel/Skills.**

- General Motors Design Release Engineer (DRE).
- General Motors Subsystem Validation Engineer (SVE).
- Testing Organization's Test Engineer.
- Testing Organization's Test Technician.

## **4 Procedure**

### **4.1 Preparation.**

**4.1.1 Sample Inspection.** The test and requesting engineers should inspect the test time to ensure all material listed in 3.3 is of correct design level and assembled properly. Check for tears, abrasions, cracks, deformation, gaps, etc., and document any variation/deviation in assembly, etc.

**4.1.2 Facilities and/or Equipment Preparation.** Record the instrumentation calibration information on a facility data sheet or an equivalent document.

**4.1.3 Mounting.** Mount the complete trimmed seat subsystem on the appropriate rigid model mounting blocks. Include mounting spaces if specified for installation. Check the fastening torque of assembly nuts.

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**4.1.4 Positioning.** Adjustable seats shall be in their nominal design driving position.

**4.2 Conditions.**

**4.2.1 Environmental Conditions.** Conduct the tests as specified, and in agreement with the laboratory's certification. The completely trimmed seat subsystem shall be exposed to an ambient temperature of  $(21 \pm 3) ^\circ\text{C}$  for at least 4 h prior to test.

**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., seat subsystem shall be exposed to an ambient temperature of  $(21 \pm 3) ^\circ\text{C}$  for at least 4 h prior to test.

**4.3 Instructions.**

**4.3.1 Opening Effort Measurement.**

**4.3.1.1** Using a structural metal framing, such as Unistrut (a framing system), install the pneumatic cylinder/load cell/loading device. Insert the end of the loading device (3.2.2.3) into the upper center of the seat back pocket (Figure 1).

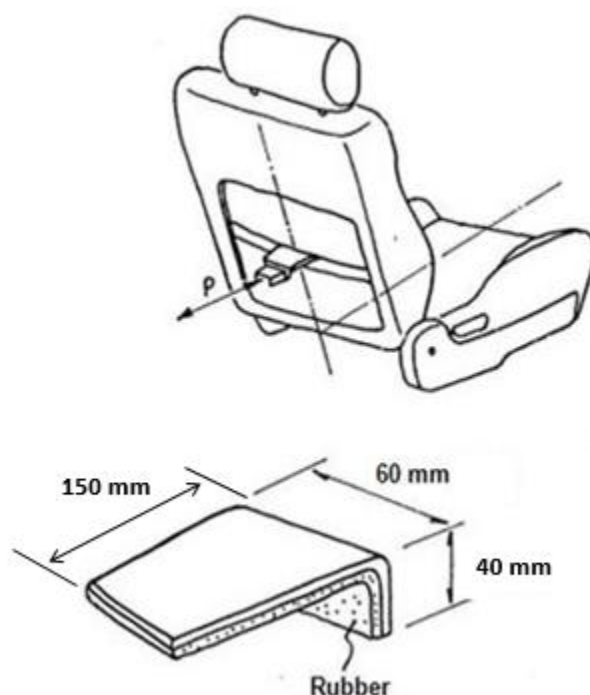


**Figure 1: Angled Loading Device and Location**

**4.3.1.2** Measure the effort needed to open horizontally the map pocket to a length of 80 mm. The maximum opening effort measured over the complete displacement range must not exceed the value indicated in the Subsystem Technical Specification (SSTS) or the technical drawings (if not otherwise noted, use 48 N). Measurement should be taken horizontally at the top center of pocket.

**4.3.1.3** Plot the force - deflection diagram resulting from the test.

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