



## **Door Lock System (Child Security Actuator) – Effort Test**

### **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.** To evaluate the efforts required to move the child security feature actuator of the rear door lock/latch system to the engaged/activated and disengaged/deactivated positions.

**1.2 Foreword.** Not applicable.

**1.3 Applicability.** This procedure applies to all passenger cars and light duty trucks having manual child security locks on conventional swing open doors, sliding side doors, and station wagon end gates.

This procedure does not apply to vehicles equipped with power child security locks.

The Effort Test (GMW15780) and Strength Test (GMW15781) can be run on the same samples, but the Effort Test should be conducted first.

### **2 References**

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

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

None

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

GMW15781

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

- Component Technical Specifications.
- Service Manual.
- Subsystem Technical Specifications.
- Vehicle Technical Specifications.

### **3 Resources**

**3.1 Facilities.** Body Test Laboratory or a similar equipped test facility.

**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.**

**Note:** The following description includes fixturing and instrumentation typically used by the Body Test Laboratory 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 requestor.

**GM Confidential**

© Copyright 2013 General Motors Company All Rights Reserved

September 2013

Page 1 of 7

### 3.2.1 Fixturing.

**3.2.1.1** If the test door is not on a body, it may be clamped to a fixture, such as a laboratory door cart that will constrain it in approximate body position and prevent tipping.

**3.2.1.2** Force gage or torque wrench accessories, as required, needed to apply a load to the specific type of actuator being tested. See Appendix A, Figure A1 for typical actuator illustrations and description of load application appropriate to each.

**3.2.2 Instrumentation.** Force gage or torque wrench (depending on actuator type) with a capacity approximately 1.5 times the specification (see 3.5).

**3.3 Test Vehicle/Test Piece.** This test requires one (1) properly assembled door, including any parts that may affect child security lock performance. Ensure that the entire locking assembly is present, including the lock module, attaching rods, interior lock components and door trim (if necessary). If parts are omitted from the test sample, they should be noted on the test datasheet. It is recommended that the door and latching/locking system be dimensionally certified before testing begins.

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

**Note:** These time estimates are approximate averages. Actual times may vary considerably depending on early component failures (and 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 test details, running multiple samples (times shown are for one (1) system), etc.

These times consider typical preparation and other downtime, actual time, and analysis of data in capturing a total calendar time. The report writing, approval, and processing, etc., are not part of this time.

Technician Resource: 1 hour

Engineer Resource: 2 hours

Total Calendar Duration: 1 hour

**3.5 Test Required Information.** The requesting engineer is responsible for providing the specifications appropriate to the particular vehicle line being tested. Reference Vehicle Technical Specifications/Subsystem Technical Specifications (VTS/SSTS), if applicable.

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 versus right hand), color, and mold or die source, etc.

The following specifications or information are required to run this test. In some cases, additional specifications may be required.

**3.5.1** Maximum/minimum operating effort for the child security actuator.

**3.5.2** Desired torques to be used for the fasteners (high end of range, low end of range, etc.)

**3.5.3** When this feature is engaged (in the activated position), door opening must only be possible using the outside handle, with the inside lock lever in the unlocked position or locked position. There shall be no intermediate position of the feature that might confuse the customer.

**GM Confidential**

© Copyright 2013 General Motors Company All Rights Reserved

September 2013

Page 2 of 7

**Documents**  
Document Sharing Hub

3.5.4 The actuator shall not be accessible to the rear seat occupant when the rear door is closed.

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 door to ensure all material listed in 3.3 is of correct design level (requesting engineer is to confirm that the parts provided for the test are the correct engineering change level) and assembled properly. Specifically, check for any paint chipping, scratching or burrs in the area of the child security actuator.

4.1.2 **Sample Preparation.** This test is normally run on the subject in an **as received** condition. If it is requested to run in a specifically adjusted condition, follow the applicable procedure(s).

To avoid recording initial false readings on newly assembled doors, operate the child security lock actuator five (5) times, with the rear door, inside manual lock actuator in both positions and the door latch in the **door open** condition/position before testing begins. This **break-in** of the system will reduce the influence of burrs, mold flash, etc., that may be present on newly assembled doors.

### 4.2 Conditions.

4.2.1 **Environmental Conditions.** Unless otherwise specified in the test of this document, or by the requesting engineer, the typical environmental conditions for this test are the temperature, humidity and pressure at the major test facility (3.1). Unless otherwise noted, these conditions are typically 22 °C ± 3 °C (72 °F ± 5 °F), relative humidity of 40% ± 20% and atmospheric pressure equivalent to the local barometric pressure (which is variable during any given day and from day to day).

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 **Setup Instructions.** Perform any functional/operational tests/evaluations as requested or as may be referenced in 4.1.2. As applicable, note any irregular sounds or erratic operation indicating a potential problem with design, manufacture, or assembly, and verify observations with requesting engineer.

4.3.1.1 Check to see that the child security feature is functioning per design intent as follows:

- With the feature engaged/activated and the latch in the closed condition, it should not be possible to open the door using the inside handle.
- It may be necessary to simulate door striker extraction from the door latch to determine whether or not the latch is opening.
- Conversely, when the feature is disengaged/deactivated, normal operation of the door locking/latching system should be possible.
- If anything unusual is observed, such as interference between the child security actuator and the door sheet metal, the test should be halted until corrective action is taken and/or the requesting engineer is consulted.

**Note:** Perform step 4.3.1.1 with the rear door, inside manual lock lever in the locked and unlocked positions.

#### 4.3.2 Test Operating Instructions.

4.3.2.1 Determine the force application point on the child security lock actuator (as it would normally be used by the customer). This point should be as close to the center of the actuator surface as possible (see Appendix A, Figure A1). If testing a key slotted design (see Appendix A, Figure A1 or service manual), insert a key and hold it rigidly with one (1) hand. Then apply a force gage to the key with other hand, close to the actuator and parallel to its motion. Describe this point on the datasheet (or include an illustration) for future reference. Efforts may vary depending on where the force is applied on the lock actuator surface.

4.3.2.2 Attach the appropriate accessory (hook attachment, flat target shape, or specially made attachment) to the hand held force gage or torque wrench. Hold the force gage so that it remains normal to the lock actuator surface (where the force is being applied) and parallel to the motion of the child security actuator. If a torque wrench is used, it is necessary to ensure that the center line of the torque wrench head (and adapter) coincides with the rotational center of the actuator. See Appendix A, Figure A1 for sample setup illustrations.

## GM Confidential

© Copyright 2013 General Motors Company All Rights Reserved

September 2013

Page 3 of 7