



Vehicle Locking/Unlocking/Latching/Unlatching Evaluation

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 test is to verify the results of a series of driver and passenger operations; performed both inside and outside the test vehicle, with the vehicle in various power modes (OFF, ACCESSORY, RUN/PROPULSION). This physical evaluation is performed on a full vehicle, while GMW16064 (Entry Control Subsystem function Test) is performed on a bench. This procedure is used to confirm a portion the locking/latching section of government compliance documentation (CMVSS 206, FMVSS 206, EEC 70/387, UN ECE R11, GSO 419/1994 and GSO 420/1994). The requirements are outlined in CG968 (Side Closures Subsystem Technical Specifications).

Operations/Tasks in various power modes include:

- a. Mechanical Functionality
 1. Operate the locks and confirm all handles (both inside and outside) function as intended.
 2. Lock and unlock using inside sill buttons (manual lock rod knob) and confirm all handles (both inside and outside) function as intended.
 3. Lock and unlock using inside manual rocker buttons and confirm all handles (both inside and outside) function as intended.
 4. Activate the child security locks and confirm the rear door inside/outside handles and latches function as intended.
 5. Lock and unlock using the key cylinder(s) on the door(s) and confirm locking functions as intended.
- b. Electrical Functionality (if equipped)
 1. Lock and unlock using the remote keyless entry (fob) and evaluate and confirm all handles (both inside and outside) function as intended.
 2. Lock and unlock doors using the unlocking passive entry function (UPE).
 3. Lock and unlock all switches and confirm all handles (both inside and outside) function as intended.
 4. Activate the power child security locks and confirm they function as intended (if equipped).
- c. Double Locking (if equipped)
 1. Activate and deactivate using fob.
 2. Activate and deactivate using the key cylinders.

1.2 Applicability. This procedure applies to all (Global A electrical architecture) passenger cars, trucks and crossover/multi-purpose vehicles having swing doors that open, allowing access to the passenger compartment. Swing doors include: front side doors, rear side doors, and back doors (liftgate, hatch, and cargo doors).

2 References

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

2.1 External Standards/Specifications.

CMVSS 206	EEC 70/387	GSO419/1994
FMVSS 206	UN ECE R11	GSO 420/1994

GM Confidential

© Copyright 2018 General Motors Company All Rights Reserved

June 2018

Page 1 of 14



Documents
Document Sharing Hub

2.2 GM Standards/Specifications.

GMW16064

2.3 Additional References.

- CG190 GM Evaluation Report Template (ID)
- CG968 Side Closures Subsystem Technical Specifications (SSTS) (ID)
- CG2502 Gen 2 CCC Global Side Door Latch Component Technical Specification (CTS) (ID)
- CG5120 Vehicle Locking/Unlocking/Unlatching Data Sheets

(ID) = This document is limited to internal use within General Motors and shall not be accessed outside this company. Contact the GM Lead Engineer for further instructions.

3 Resources

3.1 Facilities. No special facility is required to perform this test.

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. No special tools are required to perform this evaluation. A standard screwdriver may be needed to remove the lockout hardware from the sill buttons (if installed), and to remove the “cap” (if equipped) from the outside release handle to get to the side door key cylinders.

Note: The lockout hardware is a small clamp used during vehicle testing phase to keep the lock rod in the unlock position so the vehicle never completely locks.

3.3 Test Vehicle/Test Piece. Base (with manual liftgate and/or manual locking and unlocking) and up-level vehicles of same program are required (if applicable). The intent of testing base and up-level vehicles is to confirm the function of the system between the trim levels. Typically a base level vehicle has a manual liftgate and the up-level has a power liftgate. Both must be evaluated.

3.4 Test Time.

Calendar time:	1 d
Test time:	4 h
Coordination time:	4 h (acquisition of vehicle, complete vehicle design assessment, prepare data sheets)

3.5 Test Required Information.

3.5.1 Terminology. To be consistent with the terminology used by the Federal Motor Vehicle Safety Standards, the following terms will be used throughout this test procedure:

- **Front Door (FD)** - refers to a side door that, in a vehicle side view, has 50% or more of its opening area forward of the rearmost point on the driver's seat back, when the seat back is adjusted to its most vertical and rearward position.
- **Rear Door (RD)** - refers to a side door that, in a vehicle side view, has 50% or more of its opening area to the rear of the rearmost point on the driver's seat back, when the driver's seat is adjusted to its most vertical and rearward position.
- **Back Door (BD)** - refers to a door or door system on the back end of a motor vehicle through which passengers can enter or depart the vehicle or cargo can be loaded or unloaded.

3.5.2 Prior to the start of the test, the program specific validation engineer should complete the “vehicle design” data sheet to identify the differences between the locking and latching systems on base level and up-level vehicle swing doors (side doors: front and rear, and back closures: liftgate, hatch and cargo doors) for the particular vehicle line being tested. Refer to Vehicle Technical Specification (VTS) for specific details and regions of sale.

3.5.3 Data should be recorded on the data sheets CG5120 - GMW17944 Vehicle Locking/Unlocking/Unlatching Data Sheets that are stored in General Motors Global Document Management (GDM).

GM Confidential

© Copyright 2018 General Motors Company All Rights Reserved

June 2018

Page 2 of 14

Documents
Document Sharing Hub

Note: Test results should be documented using the latest version of CG190 Evaluation Report Template and stored in General Motors Global Document Management (GDM).

3.6 Personnel/Skills.

3.6.1 Evaluators. Two evaluators are recommended; one evaluator on each side of the vehicle to perform checks. It is strongly recommended that all windows be fully opened so the inside lock/unlock features can be assessed by reaching through the window.

3.6.2 Skills. No special skills are required to perform this evaluation.

4 Procedure

4.1 Preparation

4.1.1 Obtain vehicle(s) required to be evaluated (see 3.3).

4.1.2. Data sheets should be printed so the results can be documented in conjunction with physical testing. Generic data sheets are stored in General Motors Global Document Management (GDM) document storage database and are titled: CG5120 - GMW17944 Vehicle Locking/Unlocking/Unlatching Data Sheets. It is required that the tab titled: "Vehicle Design" be discussed with hardware engineers in advance so the designs can be comprehended in the test plan and the data sheets modified as the design requires.

4.1.3 If the vehicle is not equipped with the functions noted on the data sheets, add "not applicable" (N/A) on the data sheet(s) depicting sections that are not applicable or note the deviation in the comments section.

4.2 Conditions.

4.2.1 Environmental Conditions. Evaluations should be performed at room temperature (ambient) and relative humidity conditions.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon by program specific hardware and design release engineers. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions. The vehicle swing doors' locking/unlatching functionality will be checked in three vehicle power modes: **OFF**, **ACCESSORY**, **RUN/PROPULSION**. When confirming the lock status of the vehicle swing doors, all doors must be closed and fully latched.

4.3.1 With the vehicle **power mode: OFF** (vehicle powered off and key out of ignition) perform the following checks and record the results on the corresponding section of the data sheets.

4.3.1.1 Mechanical Locking/Unlocking/Release Latching (All Vehicles).

4.3.1.1.1 Sill Buttons. Use the **sill buttons (SB)** to unlock and lock the vehicle, then verify the unlock/lock status of the vehicle swing doors. Perform the checks outlined and record the data in CG5120 - GMW17944 Vehicle Locking/Unlocking/Unlatching Data Sheets; on the tab titled: "Mechanical Tables" in "Table 1 – Sill Button".

See Appendix A: Figure A1 for image of a typical sill button.

Note: On some vehicles the sill button is recessed into the trim panel making the unlocking portion of this evaluation not applicable. Note N/A on the data sheet for this condition and perform the locking portion only.

Note: On vehicles that are in the process of being tested, there may be hardware on the sill button preventing it/them from locking. This hardware will need to be removed to run this evaluation. Once the evaluation is complete, the hardware will need to be reinstalled.

4.3.1.1.1.1 Begin this portion with a locked vehicle; all doors closed and fully latched. **Unlock** each door using the sill buttons and perform the following checks using the **outside release handles (OSRH)** located on the same door the sill button is located.

- a. Use the sill button(s) to unlock the front doors. Verify the door(s) unlocked and can be opened.
- b. Use the sill button(s) to unlock the rear doors. Verify the door(s) unlocked and can be opened.

4.3.1.1.1.2 Begin this portion with a locked vehicle; all doors closed and fully latched. **Unlock** each door using the sill buttons and perform the following checks using the **inside release handles (ISRH)** located on the same door the sill button is located.

- a. Use the sill button(s) to unlock the front doors. Verify the door(s) unlocked and can be opened.
- b. Use the sill button(s) to unlock the rear doors. Verify the door(s) unlocked and can be opened.

GM Confidential

© Copyright 2018 General Motors Company All Rights Reserved

June 2018

Page 3 of 14



Documents

Document Sharing Hub

4.3.1.1.1.3 Lock the doors using the sill buttons and perform the following checks using the **OSRH**.

Note: On some vehicle models, the sill button on the driver's door may lock all doors when pressed. When this occurs, note it in the comments section on Table 1. Typically, the sill button will lock only the door it is on.

- a. Use the sill button(s) to **lock** the front door(s). Verify the door(s) are locked and cannot be opened.
- b. Use the sill button(s) to **lock** the rear door(s). Verify the door(s) are locked and cannot be opened.

4.3.1.1.1.4 Vehicle should still be locked. Using the sill buttons and perform the following checks using the **ISRH**.

Note: Alarm may go off during this stage of evaluation. Keep fob close so alarm can be deactivated.

Note: Some vehicles are equipped with "**single pull**" ISRHs. When the vehicle is locked, the door can be opened by pulling on the ISRH one time. Single pull handles can be on front doors, on rear doors, or on all doors.

Note: Some vehicles are equipped with the "**double pull**" ISRHs. When the vehicle is locked, the first pull on the ISRH will unlock the door and the second pull will unlatch door and allow the door to open.

Note: Some vehicles are equipped with "**freewheeling**" latches. When the vehicle is locked, the inside release handles will not allow the door to unlatch until the vehicle/door is unlocked.

- a. Use the door sill button(s) to **lock** the front doors. **For single pull:** Verify the door(s) can be opened. **For freewheeling latch:** Verify the door(s) is locked and will not open. **For double pull:** Verify the first pull on the ISRH unlocks the door(s), and the second pull of the ISRH unlatches and is able to be opened.
- b. Use the sill button(s) to **lock** the rear doors. **For single pull:** Verify the door(s) can be opened. **For freewheeling latch:** Verify the door(s) is locked and will not open. **For double pull:** Verify the first pull on the ISRH unlocks the door(s), and the second pull of the ISRH unlatches and allows door(s) to open.

4.3.1.1.2 Manual Rocker Button. Use the manual rocker (MR) button to unlock and lock the vehicle and verify the unlock/lock status of the vehicle swing doors. Perform the checks outlined in the preceding for the sill button (4.3.1.1.1) using the manual rocker to lock and unlock the doors, and record the data in CG5120 - GMW17944 Vehicle Locking/Unlocking/Unlatching Data Sheets; on the tab titled: "Mechanical Tables" in "Table 2 - Manual Rocker Button".

See Appendix A: Figure A2 for image of a manual rocker button.

4.3.1.1.3 Mechanical Child Security Lock. Activate the **mechanical child security lock (CSL)** on rear doors, close the doors so they fully latch, then verify the status of the rear swing doors using the outside (OSRH) and inside release handles (ISRH). Perform the checks outlined in the following and record the data in CG5120 - GMW17944 Vehicle Locking/Unlocking/Unlatching Data Sheets; on the tab titled "Mechanical Tables" in "Table 3 - Child Security Lock".

See Appendix A: Figure A3 for images of a typical mechanical child security locks

Note: Child security lock disables the inside handle by making it freewheeling. Door can still be unlocked when CSL is activated. In this case, the outside handle can be used open the door.

Note: Some vehicles are equipped with electrical child security locks. In this case skip 4.3.1.1.3 it will be addressed in another portion of this evaluation.

4.3.1.1.3.1 Begin with a locked vehicle. Confirm the mechanical CSL has been activated on the rear doors.

- a. Pull the **ISRH** on the RR door once, unlocking door (CSL should remain activated but door will be unlocked and should be able to be opened by using OSRH).
- b. Use the **OSRH** release handle on the RR door and confirm that door unlatches and can be opened.
- c. Use same process to evaluate LR door.

4.3.1.1.3.2 With vehicle unlocked; use **ISRH** on the RR door to verify CSL is activated and door is **child locked** and cannot be opened:

- a. Pull the **ISRH** on the RR door once and verify that the CSL is activated and door cannot be opened.
- b. Pull the **ISRH** more than once and verify the door cannot be opened.
- c. Use the same process to evaluate the LR door.

Note: Deactivate the mechanical child security lock before continuing.

4.3.1.1.4 Mechanical Key/Key Cylinder on Driver's Door. Use the mechanical key in the key cylinder on the outside release handle to unlock and lock the door(s). Verify the status of the vehicle swing door(s) that the key cylinder is mounted on. Perform the checks outlined in the following and record the data in CG5120 - GMW17944

GM Confidential

© Copyright 2018 General Motors Company All Rights Reserved

Vehicle Locking/Unlocking/Unlatching Data Sheets; on the tab titled "Mechanical Tables" in "Table 4 - Key Cylinder".

Note: Not all vehicles have key cylinders in both front doors. Place an N/A in the data sheets when this observation is made.

Note: Typically the key cylinder is on the driver's door. If it is not visible, it may be located under the outside handle. See Appendix A: Figure A4 for image of a key cylinder hidden inside the OSRH.

4.3.1.1.4.1 Begin with a locked vehicle; all doors closed and fully latched. **Unlock** the door by using the key and key cylinder. Use the **OSRH** (on same door as cylinder) and verify door is unlocked and can be opened.

- a. Use the key in the driver's door cylinder and unlock door. Verify the door is unlocked and can be opened.
- b. Use the key in the co-driver/front passenger's door cylinder and unlock door. Verify the door is unlocked and can be opened (if equipped). If this doesn't apply to the vehicle being tested then note it in the comments section of the applicable data sheet.

4.3.1.1.4.2 **Lock** the door by using the key and key cylinder. Use the **OSRH** (on same door as cylinder) and verify door is locked and cannot be opened.

- a. Use the key in the driver's door cylinder to lock door. Verify the door is locked and cannot be opened.
- b. Use the key in the co-driver/front passenger's door cylinder to lock door. Verify the door is locked and cannot be opened (if equipped).

Note: Alarm may go off during this stage of evaluation. Keep fob close so alarm can be deactivated.

4.3.1.2 Power Locking and Unlocking (if equipped).

4.3.1.2.1 Remote Keyless Entry. Use the **remote keyless entry (RKE)/fob** to unlock and lock the vehicle for the following options and verify the status of the vehicle swing doors. Perform the checks outlined in the following and record the data CG5120 - GMW17944 Vehicle Locking/Unlocking/Unlatching Data Sheets; on the tab titled "Power Tables" in "Table 5 - Remote Keyless Entry."

Note: When using the fob to unlock the vehicle, by default: the first press unlocks only the driver's door, the second press (within 2 seconds of the first press) unlocks all swing doors.

Note: Due to complexity issues/concerns, this portion will evaluate the factory default settings for this section.

4.3.1.2.1.1 Begin with a locked vehicle; all doors closed and fully latched. **Unlock** driver's door by pushing the unlock button on the fob **once**, and perform the following checks using the **OSRH**:

- a. Verify the driver's door is unlocked and can be opened.
- b. Verify the co-driver/front passenger's door is locked and cannot be opened
- c. Verify the back door (BD) is locked and cannot be opened (this will be N/A for vehicles that do not open directly into the occupant compartment).
- d. Verify the rear doors are locked and cannot be opened.

4.3.1.2.1.2 Lock then **unlock** vehicle (on the fob, push the unlock button two times) and perform the following checks using one pull of the **OSRH**:

- a. Verify the front doors are unlocked and can be opened.
- b. Verify the rear doors are unlocked and can be opened.

4.3.1.2.1.3 **Lock** the vehicle and perform the following checks using the **OSRH**:

Note: For passive entry vehicles, this portion requires that the fob to be moved at least one (1) meter away from the vehicle. This is only applicable when the vehicle power mode is **OFF** and key out of ignition. Moving the fob away from the vehicle is not applicable when the vehicle power mode is **ACC/ACCESSORY** or **RUN/PROPULSION**.

- a. Verify the front doors are locked and cannot be opened.
- b. Verify the BD is locked and cannot be opened.
- c. Verify the rear doors are locked and cannot be opened.

4.3.1.2.1.4 Continue with the **locked** vehicle from preceding steps, perform the following checks using the **ISRH**:

Note: Alarm may go off during this stage of evaluation. Keep fob close so alarm can be deactivated.

GM Confidential

© Copyright 2018 General Motors Company All Rights Reserved