

2010 ACCESSORIES & EQUIPMENT

Vehicle Access - Equinox & Terrain

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Front Side Door Latch Screws	10 N.m	89 lb in
Front Side Door Lock Striker Screws	25 N.m	18 lb ft
Front Side Door Outside Handle Bolts	9 N.m	80 lb in
Front Side Door Outside Handle Cover Screws	9 N.m	80 lb in
Front Side Door Outside Handle Housing Bolts	10 N.m	89 lb in
Liftgate Hydraulic Filler Screw	1.3 N.m	12 lb in
Liftgate Hydraulic Pump Screws	12 N.m	106 lb in
Liftgate Latch Screws	9 N.m	80 lb in
Liftgate Lock Striker Screws	25 N.m	18 lb ft
Liftgate Side Upper Sensor Screw	2.5 N.m	22 lb in
Rear Side Door Latch Screws	10 N.m	89 lb in
Rear Side Door Lock Striker Screws	25 N.m	18 lb ft
Rear Side Door Outside Handle Bolts	9 N.m	80 lb in
Rear Side Door Outside Handle Cover Screws	9 N.m	80 lb in
Rear Side Door Outside Handle Bolts	9 N.m	80 lb in
Rear Side Door Outside Handle Housing Bolts	10 N.m	89 lb in

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	
		United States	Canada
Liftgate Hydraulic Fluid Reservoir	Hydraulic Fluid	88863458	88863459

SCHEMATIC AND ROUTING DIAGRAMS

DOOR LOCK/INDICATOR SCHEMATICS

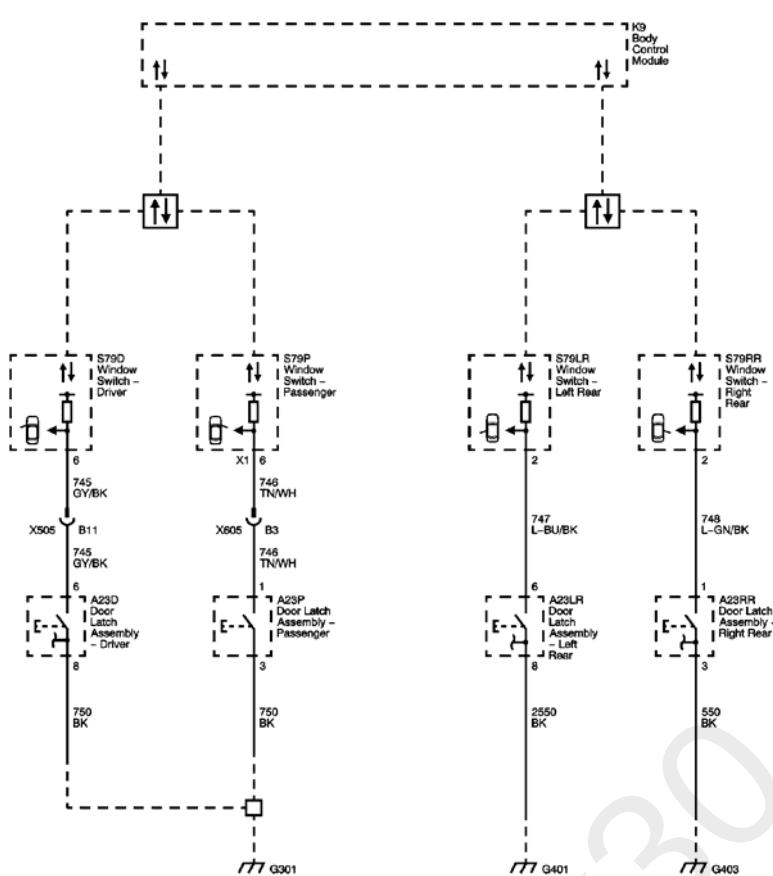


Fig. 1: Door Ajar Switches

Courtesy of GENERAL MOTORS CORP.

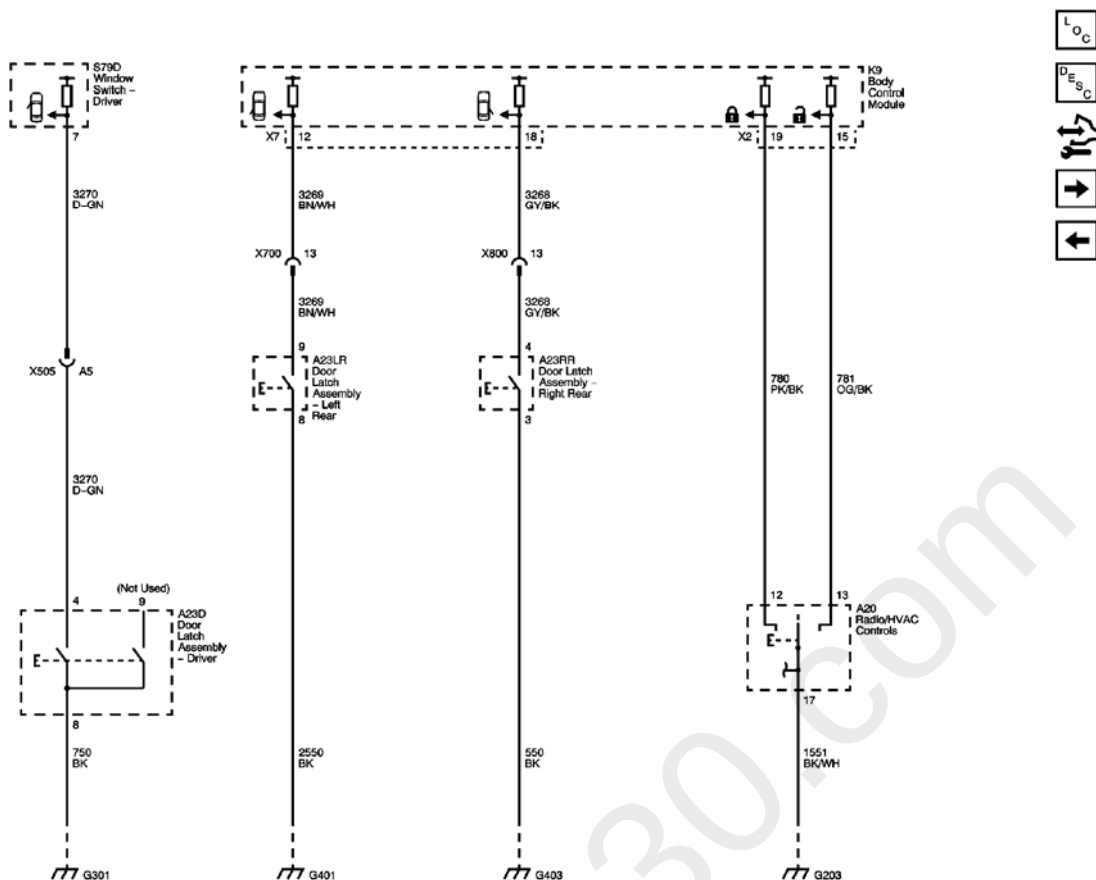


Fig. 2: Global Door Lock Controls
 Courtesy of GENERAL MOTORS CORP.

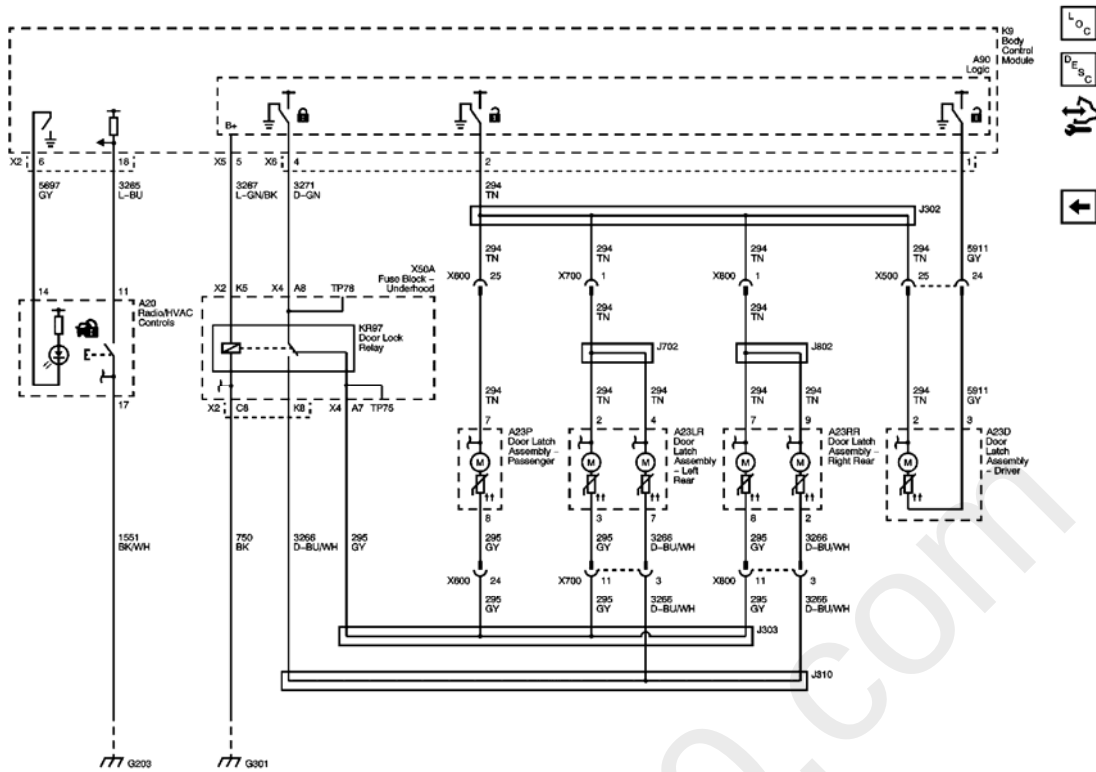


Fig. 3: Door Lock Actuators and Child Security Control
 Courtesy of GENERAL MOTORS CORP.

RELEASE SYSTEMS SCHEMATICS

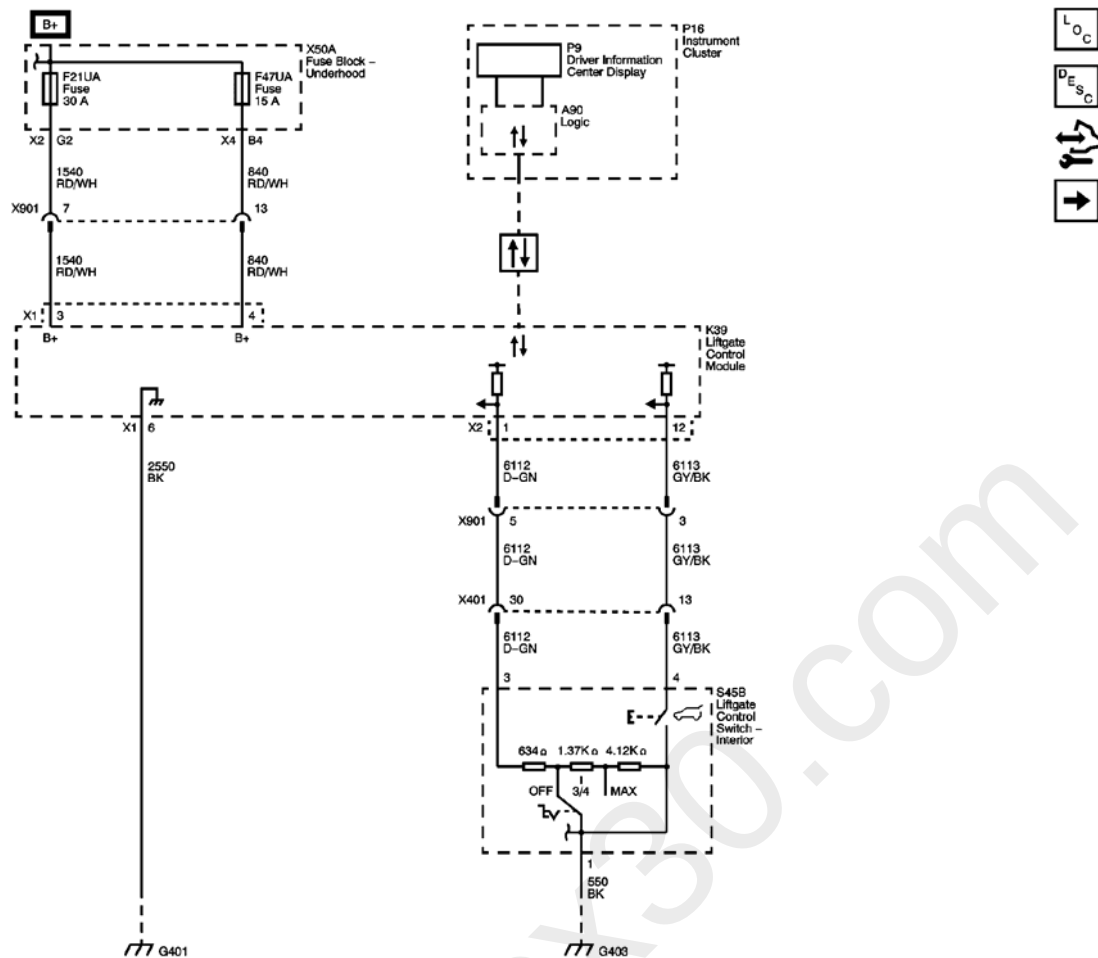


Fig. 5: Module Power, Ground, Serial Data, and Front Switch (TB5)
 Courtesy of GENERAL MOTORS CORP.

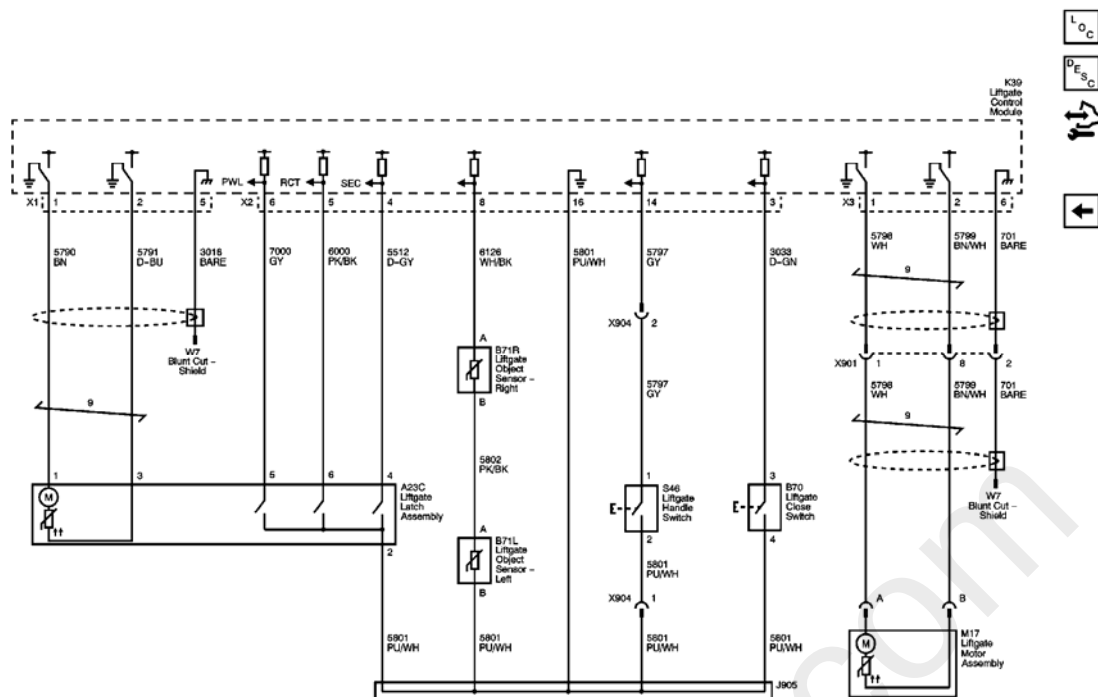


Fig. 6: Liftgate Motor Controls (TB5)
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B1019	B1019 00: System Configuration Error
DTC B153A	B153A 08: Power Liftgate Latch Switches Signal Invalid
DTC B153E	B153E 08: Power Liftgate Angle Sensor - External Signal Invalid
DTC B153F	B153F 02: Liftgate Object Sensor Signal Circuit Short to Ground B153F 05: Liftgate Object Sensor Signal Circuit Short to Battery or Open
DTC B2494 (Power Liftgate)	B2494 02: Liftgate Handle Switch Circuit Short to Ground
DTC B2494 (Manual Liftgate)	B2494 00: Liftgate Handle Switch Circuit
DTC B2495	B2495 01: Liftgate Latch Control Circuit Short to Battery B2495 02: Liftgate Latch Control Circuit Short to Ground B2495 04: Liftgate Latch Control Circuit Open
DTC B252C	B252C 00: Child Security Lock Switch Circuit
DTC B3125, B3130, or B3135	B3125 02: Driver Door Only Unlock Circuit Short to Ground B3130 02: All Doors Unlock Circuit Short to Ground

	B3135 02: All Doors Lock Circuit Short to Ground
<u>DTC B3140 or B3150</u>	B3140 00: Driver Unlock Switch Circuit B3150 00: Driver Lock Switch Circuit
<u>DTC B324A</u>	B324A 02: Rear Cargo Door Unlock Motor Circuit Short to Ground
<u>DTC B3930</u>	B3930 02: Child Security Lock Motors Circuit Short to Ground
<u>DTC B396A</u>	B396A 01: Liftgate Motor Control Circuit Short to Battery B396A 02: Liftgate Motor Control Circuit Short to Ground B396A 04: Liftgate Motor Control Circuit Open
<u>DTC B396C</u>	B396C 08: Liftgate Mode Switch Circuit Performance Signal Invalid
<u>DTC B396D</u>	B396D 02: Front Liftgate Actuator Switch Circuit Short To Ground
<u>DTC B396E</u>	B396E 02: Rear Liftgate Actuator Switch Circuit Short To Ground

DTC B1019

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B1019 00

System Configuration Error

Circuit/System Description

When calibrating the liftgate position, the liftgate module (LGM) is placed in a functional state to learn the liftgate travel limits. DTC B1019 00 will set automatically as an indicator that the system is in learn mode and not as a fault indicator. Once the travel limits are learned by the LGM, the liftgate module will exit calibration mode and DTC B1019 00 become a history code.

Conditions for Running the DTC

The system voltage is 9-18 V.

Conditions for Setting the DTC

Whenever the LGM is replaced or in learn mode.

Action Taken When the DTC Sets

The power liftgate system will be disabled.

Conditions for Clearing the DTC

- The DTC will be current until the liftgate calibration procedure has been completed.
- When the calibration procedure has been completed the DTC will be a history DTC.

Diagnostic Aids

Setting B1019 00 is normal after flashing the liftgate module. This DTC will be current after flashing and the DTC will go to history after learning. This is a normal behavior by design and is not necessary to replace the liftgate module.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

Perform the **Liftgate Calibration**. The liftgate module should learn the travel limits, exit the calibration mode, and B1019 00 will become a history code.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for LGM replacement, setup and programming

DTC B153A

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B153A 08

Power Liftgate Latch Switches Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Latch Pawl Switch Signal	B153A 08	B153A 08	B153A 08	-
Liftgate Latch Ratchet Switch Signal	B153A 08	B153A 08	B153A 08	-
Liftgate Latch Sector Switch Signal	B153A 08	B153A 08	B153A 08	-
Liftgate Latch Low Reference	-	B153A 08	B153A 08	-

Circuit/System Description

The ratchet, pawl, and sector switches are part of the liftgate latch assembly and are used by the liftgate module to determine the state of the latch during the process of cinching or unlatching. The ratchet and pawl switches will be inactive when the primary and secondary latches are latched, and the sector switch will be active during the power cinch function. Each of the latch switch signal circuits are supplied signal through a resistor and monitored within the liftgate module. The latch switches share a common low reference circuit from the liftgate module and when the switch contacts close the signal circuit goes low and the liftgate module determines the switch to be active.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

When the liftgate module detects an open/high resistance in the ratchet, pawl, and/or the sector signal circuit, an open/high resistance in the liftgate latch low reference circuit, or any incorrect combination of signals from the following switch inputs:

- Ratchet switch
- Sector switch
- Pawl switch

Action Taken When the DTC Sets

- The liftgate may not power open or power close.
- The latch may be inoperative or not function normally.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

DTC B153A may be set when the vehicle is driven while the liftgate is open, as when the owner transports a large package in the rear of the vehicle. The DTC will become history after the liftgate is closed and does not affect normal liftgate operation.

NOTE: Before testing can be performed on an inoperative liftgate, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the appropriate procedure.

Whenever the liftgate module loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the liftgate module.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- Testing for Intermittent Conditions and Poor Connections
- Circuit Testing
- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, doors unlocked, transaxle in Park, liftgate closed, command the liftgate to OPEN by pressing the S46 liftgate handle switch. The liftgate latch should release and the liftgate should power open.
2. Command the liftgate to CLOSE by pressing the B70 liftgate close switch. The liftgate should power close and the liftgate latch should cinch the liftgate shut.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A23C liftgate latch assembly.
2. Test for less than 30 ohms between the low reference circuit terminal 2 and ground.
 - If greater than the specified range, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
3. Ignition ON, verify the scan tool LGM Latch Pawl Sw. parameter is Closed.
 - If not the specified value, test the signal circuit terminal 5 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
4. Install a 3 A fused jumper wire between the signal circuit terminal 5 and the low reference circuit terminal 2. Verify the scan tool LGM Latch Pawl Sw. parameter is Open.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
5. Verify the scan tool LGM Latch Ratchet Sw. parameter is Closed.
 - If not the specified value, test the signal circuit terminal 6 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
6. Install a 3 A fused jumper wire between the signal circuit terminal 6 and low reference circuit terminal 2. Verify the scan tool LGM Latch Ratchet Sw. parameter is Open.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
7. Verify the scan tool LGM Latch Sector Sw. parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 4 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
8. Install a 3 A fused jumper wire between the signal circuit terminal 4 and low reference circuit terminal 2. Verify the scan tool LGM Latch Sector Sw. parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
9. If all circuits test normal, test or replace the A23C liftgate latch assembly.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic repair.

• **Liftgate Latch Replacement**

- **Control Module References** for the liftgate module replacement, setup and programming

DTC B153E

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B153E 08

Power Liftgate Angle Sensor - External Signal Invalid

Circuit/System Description

The liftgate control module continuously monitors power liftgate operation and calculates its location and direction of travel using 2 inputs from the internal liftgate position sensor. One input returns the position of the liftgate relative to the latch along the x-axis and the other returns the position of the liftgate relative to the latch along the y-axis. The liftgate control module then uses these 2 inputs together to calculate its angle relative to the liftgate latch.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

The liftgate module has detected an internal malfunction.

Action Taken When the DTC Sets

The power liftgate system will be disabled.

Conditions for Clearing the DTC

If the DTC is current, the liftgate module must be replaced before the DTC can be cleared.

Diagnostic Aids

NOTE: Before testing can be performed, the liftgate must be opened. Refer to **Opening the Liftgate Without Electrical Power** for the appropriate procedure.

Whenever the LGM loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the LGM.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Rear Hatch/Gate Description and Operation

Electrical Information Reference

- Testing for Intermittent Conditions and Poor Connections
- Circuit Testing
- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Clear all DTCs and operate the power liftgate within the Conditions for Running the DTC. The DTC should not set.

- If the DTC resets, replace the power liftgate module

Repair Procedures

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for LGM replacement, setup and programming

DTC B153F

Diagnostic Instructions

- Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

DTC Descriptors

DTC B153F 02

Liftgate Object Sensor Signal Circuit Short to Ground

DTC B153F 05

Liftgate Object Sensor Signal Circuit Short to Battery or Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left/Right Liftgate Object Sensor Signal	B153F 02	B153F 05	B153F 05	-
Right Liftgate Object Sensor Signal	B153F 02	B153F 05	B153F 05	-
Left Liftgate Object Sensor Low Reference	-	B153F 05	B153F 05	-

Circuit/System Description

The liftgate object sensors are pressure sensitive touch tapes located on either side of the upper inside edge of the liftgate panel. The two tape switches are placed in series between the liftgate object sensor signal circuit and the liftgate object low reference circuit. Each object sensor has a resistor as well as a switch. The resistors enable the liftgate module to perform diagnostic functions on the circuits. When both touch tape sensors are not pressed, the 5 volt reference voltage supplied by the liftgate module passes through the resistors and the liftgate module detects approximately 3.3 volts. Pressing a touch tape will cause the voltage to drop to approximately to 2.5 volts indicating an obstruction is present. If the liftgate is in the open position, the liftgate module will prohibit liftgate movement. If the obstruction occurs during the power close function, the liftgate module will command the liftgate to reverse direction.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

B153F 02

The liftgate module detects a short to ground in the liftgate tape switch signal circuit for greater than 10 minutes.

B153F 05

The liftgate module detects a short to voltage or an open/high resistance in the liftgate tape switch signal circuit or an open/high resistance in the low reference circuit for greater than 10 minutes.

Action Taken When the DTC Sets

The liftgate module will prevent any movement of the liftgate while attempting to command the liftgate to power close.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

NOTE: **Before testing can be performed, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the appropriate procedure.**

Whenever the liftgate module loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the liftgate module.

If the liftgate mode switch is in the Off position, the liftgate will only open and close manually. Before testing the liftgate for power open and power close functions, verify that the liftgate mode switch is in the 3/4 or MAX position

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- Testing for Intermittent Conditions and Poor Connections
- Circuit Testing
- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool Liftgate Secondary Obstacle Detection parameter. The reading should be between 3V-3.5V.
 - If not within the specified range, perform the Circuit/System Testing.
2. Observe the scan tool Liftgate Secondary Obstacle Detection parameter while pressing and releasing the B71R liftgate object sensor - right. The reading should change from 3V-3.5V to 2.25-2.75V as the sensor is pressed and released.
 - If the value does not change, test or replace the B71R liftgate object sensor - right.
3. Observe the scan tool Liftgate Secondary Obstacle Detection parameter while pressing and releasing the B71L liftgate object sensor - left. The reading should change from 3V-3.5V to 2.25-2.75V as the sensor is pressed and released.
 - If the value does not change, test or replace the B71L liftgate object sensor - left.
4. If the B71 liftgate object sensors function normally and the liftgate will not power close or if the DTC is history, replace both B71 liftgate object sensors.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the B71L liftgate object sensor - left.
2. Test for less than 30 ohms between the low reference circuit terminal B and ground.
 - If greater than the specified range, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
3. Disconnect the harness connector at the B71R liftgate object sensor - right.
4. Ignition ON, test for 4.75-5.25 V between the signal circuit terminal A and ground.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K39 liftgate module.
5. Test for less than 10 ohms between the signal circuit terminal B at the B71R liftgate object sensor - right and the signal circuit terminal A at the B71L liftgate object sensor - left.
 - If greater than the specified range, test the signal circuit for an open/high resistance.
6. Test for 8K-12K ohms between the signal terminal A and the low reference terminal B at the B71R liftgate object sensor - right.
 - If not within the specified range, replace the B71R liftgate object sensor - right.
7. Test for 8K-12K ohms between the signal terminal A and the low reference terminal B at the B71L liftgate object sensor - left.
 - If not within the specified range, replace the B71L liftgate object sensor - left.
8. If all circuits test normal, test or replace the B71L liftgate object sensor - left and the B71R liftgate object sensor - right.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Liftgate Side Upper Sensor Replacement (Equinox)** or **Liftgate Side Upper Sensor Replacement (Terrain)**
- **Control Module References** for liftgate module replacement, setup and programming

DTC B2494 (POWER LIFTGATE)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B2494 02

Liftgate Handle Switch Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Handle Switch Signal	B2494 02	1	1	-
Liftgate Handle Switch Low Reference	-	1	1	-
1. Liftgate Switch Malfunction				

Circuit/System Description

The power liftgate handle switch circuit provides a single input to the liftgate module. The liftgate handle switch is supplied a signal voltage, when the switch contact closes and the voltage drops, the liftgate module detects the voltage drop and commands the liftgate to open.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

The liftgate open signal circuit is active for greater than 30 seconds.

Action Taken When the DTC Sets

The liftgate module will ignore the signal from the liftgate handle switch. Normal power liftgate operation will be available from the interior liftgate control switch or from a request from the remote keyless entry module.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

NOTE: **Before testing can be performed, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the appropriate procedure.**

Whenever the liftgate module loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the liftgate module.

An intermittent short to ground in the Liftgate Handle Switch Signal circuit may cause the liftgate module to command the liftgate to open if the vehicle is in park and the doors are unlocked.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- Testing for Intermittent Conditions and Poor Connections
- Circuit Testing
- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Liftgate Handle Switch parameter while pressing and releasing the exterior S46 liftgate handle switch. The parameter should change between Active and Inactive.

- If the value is always Inactive or always Active, perform the Circuit/System Testing.
- If the value changes between Active and Inactive while pressing and releasing the exterior S46 liftgate handle switch and the DTC is history, replace the exterior S46 liftgate handle switch.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the exterior S46 liftgate handle switch.
2. Ignition ON, verify the scan tool Liftgate Handle Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 1 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
3. Connect a 3 A fused jumper wire between the signal circuit terminal 1 and ground, verify the scan tool Liftgate Handle Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
4. If all circuits test normal, test or replace the exterior S46 liftgate handle switch.

Component Testing

1. Ignition OFF, disconnect the harness connector at the exterior S46 liftgate handle switch.
2. Test for infinite resistance between the signal terminal 1 and the low reference terminal 2 with the switch in the open position.
 - If not the specified value, replace the exterior S46 liftgate handle switch.
3. Test for less than 2 ohms between the signal terminal 1 and the low reference terminal 2 with the switch in the closed position.
 - If greater than the specified range, replace the exterior S46 liftgate handle switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Liftgate Release Switch Replacement**
- **Control Module References** for liftgate module replacement, setup and programming

DTC B2494 (MANUAL LIFTGATE)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B2494 00

Liftgate Handle Switch Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Release Switch Signal	B2494 00	1	1	-
1. Liftgate Release Switch Malfunction				

Circuit/System Description

The liftgate release switch is an input to the body control module (BCM). The BCM supplies battery voltage to the signal circuit and when the release switch is activated the signal circuit voltage goes low. The BCM controls the liftgate release actuator through the liftgate latch release relay. When the release switch signal is activated, the BCM enables the liftgate latch release relay by applying battery voltage to the liftgate latch release relay supply circuit and the relay is energized when the BCM grounds the liftgate latch release relay control circuit. When the relay is energized battery voltage is supplied to the liftgate release actuator through the liftgate release actuator control circuit.

Conditions for Running the DTC

The system voltage is 9-18 V.

Conditions for Setting the DTC

The liftgate release switch signal circuit is active for longer than 10 minutes.

Action Taken When the DTC Sets

The liftgate latch will malfunction.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

Before testing can be performed the liftgate must be opened. Refer to **Opening the Liftgate Without Electrical Power** for the appropriate procedure.

Reference Information

Schematic Reference

Release Systems Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Rear Hatch/Gate Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Trunk Lid/Liftglass Exterior Unlatch Switch parameter while pressing the exterior liftgate switch. The reading should change between Active and Inactive.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the exterior liftgate switch.
2. Test for less than 1.0 ohms between the ground circuit terminal 2 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Trunk Lid/Liftglass Exterior Unlatch Switch parameter is Inactive.
 - If not the specified parameter, test the signal circuit terminal 1 for a short to ground. If the circuit tests normal, replace the BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 1 and the ground circuit terminal 2. Verify the scan tool Trunk Lid/Liftglass Exterior Unlatch Switch parameter is Active.
 - If not the specified parameter, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, test or replace the exterior liftgate switch.

Component Testing

1. Ignition OFF, disconnect the harness connector at the exterior liftgate switch.
2. Test for infinite resistance between the signal terminal 1 and the ground terminal 2 with the switch in the open position.
 - If not the specified value, replace the exterior liftgate switch.

3. Test for less than 2.0 ohms between the signal terminal 1 and the ground terminal 2 with the switch in the closed position.
 - If greater than the specified range, replace the exterior liftgate switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Liftgate Release Switch Replacement**
- **Control Module References** for BCM replacement, setup and programming

DTC B2495

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B2495 01

Liftgate Latch Control Circuit Short to Battery

DTC B2495 02

Liftgate Latch Control Circuit Short to Ground

DTC B2495 04

Liftgate Latch Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Latch Motor Close Control	B2495 02	B2495 04	B2495 01	-
Liftgate Latch Motor Open Control	B2495 02	B2495 04	B2495 01	-

Circuit/System Description

The latch motor is a bi-directional motor and cinch or unlatch operation is the result of the direction of the motor rotation. The liftgate module controls the latch motor through the control circuits by supplying power and ground in the appropriate polarity. The motor control circuits are monitored by the liftgate module prior to activation for a high or low condition and during motor operation for an insufficient current flow condition.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

B2495 01

The liftgate module detects a short to voltage in the liftgate latch motor cinch control circuit or the liftgate latch motor release control circuit.

B2495 02

The liftgate module detects a short to ground in the liftgate latch motor cinch control circuit or the liftgate latch motor release control circuit.

B2495 04

The liftgate module detects an open/high resistance in the liftgate latch motor cinch control circuit or the liftgate latch motor release control circuit.

Action Taken When the DTC Sets

The liftgate will be inoperative in the power and manual modes.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

DTC B2495 01 may set as current or history when the liftgate module detects erratic voltage levels in the electrical system and does not affect the operation of the power liftgate. If this DTC is set and the liftgate functions normally, clear the DTC.

NOTE: Before testing can be performed on an inoperative liftgate, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the appropriate procedure.

Whenever the liftgate module loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the liftgate module.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, doors UNLOCKED, open the liftgate by pressing the S46 liftgate handle switch, the liftgate latch should release the liftgate allowing the liftgate to be pulled open.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K39 liftgate module.
2. Test for less than 15 ohms between the control circuit terminal 1 and the control circuit terminal 2.
 - If greater than the specified range, test either control circuit for a short to voltage or an open/high resistance. If circuits test normal, test or replace the A23C liftgate latch assembly.
3. Install a 30 A fused jumper wire between one of the control circuit terminals and 12 V. Momentarily install a jumper wire between the other control circuit terminal and ground. Reverse the jumper wires at least two times, the M31 liftgate latch assembly should perform the CINCH and RELEASE functions
 - If it does not perform as specified, test either control circuit for a short to ground. If the circuits test normal, replace the A23C liftgate latch assembly.
4. If all circuits test normal, replace the K39 liftgate module.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Liftgate Latch Replacement**
- **Control Module References** for liftgate module replacement, setup and programming

DTC B252C

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B252C 00

Child Security Lock Switch Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Child Security Door Lockout Signal	B252C 00	1	1	-
Radio/HVAC Control Ground	-	1	-	-
1. Child Security Lockout Malfunction				

Circuit/System Description

The BCM monitors the voltage level in the child security door lockout switch signal circuit, when the switch is in the open position the voltage in the signal circuit will be equal to the B+ voltage level. When the child security door lockout switch is pressed, voltage within the signal circuit drops and the BCM will detect the voltage drop and will energize the Door Lock relay to disable the interior rear door handles.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

The BCM has detected a short to ground on the child security lockout switch signal circuit for greater than 60 seconds.

Action Taken When the DTC Sets

The BCM will ignore the input from the lockout switch and the child lockout feature will be inoperative.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.

- A history DTC will clear after 50 ignition cycles.

Reference Information

Schematic Reference

Door Lock/Indicator Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Power Door Locks Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, doors locked, command the child lockout function by pressing the child lockout switch, the interior rear door handles should become inoperative and the lockout indicator should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC control.
2. Ignition ON, test for greater than 10V between the signal circuit terminal 11 and ground.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
3. If all circuits test normal, test or replace the A20 radio/HVAC control.

Component Testing

Child Lockout Switch Test

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC control.
2. Test for infinite resistance between the signal terminal 11 and the ground terminal 17 with the switch in

the open position.

- If less than the specified value, replace the A20 radio/HVAC control.
- 3. Test for less than 2 ohms between the signal terminal 11 and the ground terminal 17 while holding the switch in the closed position.
 - If greater than the specified range, replace the A20 radio/HVAC control.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for BCM and the radio/HVAC control replacement, setup and programming

DTC B3125, B3130, OR B3135

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B3125 02

Driver Door Only Unlock Circuit Short to Ground

DTC B3130 02

All Doors Unlock Circuit Short to Ground

DTC B3135 02

All Doors Lock Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
BCM B+	B3125 02, B3130 02, B3135 02	B3125 02, B3130 02, B3135 02	-	-
Door Latch Control	B3125 02, B3130 02, B3135 02	2	2	-
Driver Door Lock Motor Lock	B3125 02, B3130 02,	1	1	-

Control	B3135 02			
Door Lock Actuator Unlock Control	B3125 02, B3130 02, B3135 02	1, 2	1, 2	-
1. Driver Door Lock Malfunction 2. Passenger/Rear Door Lock Malfunction				

Circuit/System Description

The body control module (BCM) controls the driver and passenger door latches. When the BCM receives a driver door unlock, passenger door unlock or all door lock command, it will provide voltage to the appropriate door lock circuits and ground to the opposite door lock circuits causing the actuator to perform the lock or unlock function.

Conditions for Running the DTC

When the output is actively being requested by the BCM.

Conditions for Setting the DTC

B3125 02, B3130 02 and B3135 02

- A short to ground or an open/high resistance in the BCM B+ circuit.
- The BCM detects a short to ground on a door latch control circuit.

Action Taken When the DTC Sets

The power door locks will be inoperative.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Reference Information

Schematic Reference

- Door Lock/Indicator Schematics
- Body Control System Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Power Door Locks Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Command the doors to LOCK and UNLOCK by using the central door lock switch, the doors should LOCK and UNLOCK when changing between the commanded states.

Circuit/System Testing

1. Ignition OFF, disconnect the X2 harness connector at the K9 BCM.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 4 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal and the B+ circuit fuse is open, replace the BCM.
3. Ignition OFF, connect the X2 harness connector and disconnect the X6 harness connector at the K9 BCM.
4. Disconnect the X2 and X4 harness connectors at the X50D fuse block-underhood.
5. Test for infinite resistance between the control circuit listed below and ground:
 - Connector X2, terminal K8 at the X50D fuse block-underhood
 - Connector X4, terminal A7 at the X50D fuse block-underhood
 - Connector X6 terminal 2 at the K9 BCM
 - Connector X6 terminal 1 at the K9 BCM
 - If not the specified value, test the appropriate control circuit for a short to ground. If the circuit tests normal, test or replace the appropriate A23 door latch assembly.
6. Connect the X4 harness connector at the X50D fuse block-underhood.
7. Test for infinite resistance between the control circuit terminal 4 at the K9 BCM and ground.
 - If not the specified value, test the control circuit for a short to ground. If the circuit tests normal, replace the X50D fuse block-underhood.
8. If all circuits test normal, replace the K9 BCM.

Component Testing

1. Ignition OFF, disconnect the harness connector at the appropriate A23 door latch assembly.
2. Install a 25 A fused jumper wire between one of the control terminals and 12 V. Momentarily install a jumper wire between the other control terminal and ground. Reverse the jumper wires at least two times, the A23 door latch assembly should perform the LOCK and UNLOCK functions.
 - If it does not perform as specified, replace the A23 door latch assembly

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Side Door Latch Replacement**
- **Rear Side Door Latch Replacement**
- **Accessory Wiring Junction Block Replacement**
- **Control Module References** for BCM replacement, setup and programming

DTC B3140 OR B3150

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B3140 00

Driver Unlock Switch Circuit

DTC B3150 00

Driver Lock Switch Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Central Door Lock Switch Lock Signal	B3150 00	1	1	-
Central Door Lock Switch Unlock Signal	B3140 00	1	1	-
1. Door Lock Switch Malfunction				

Circuit/System Description

The body control module (BCM) monitors the voltage level of the door lock and door unlock signal circuits. When the central door lock switch is in the open position, the voltage level in the signal circuit will be near 0 V. When the central door lock switch is pressed to the lock or unlock position, a signal will be sent to the BCM requesting a lock or unlock command.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

B3140 00

The BCM detects short to ground in the unlock signal circuit for greater than 60 seconds.

B3150 00

The BCM detects a short to ground in the lock signal circuit for greater than 60 seconds.

Action Taken When the DTC Sets

The door lock switch will malfunction.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Reference Information

Schematic Reference

Door Lock/Indicator Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Power Door Locks Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**

- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool BCM Central Door Lock Switch on Console parameter. The reading should be Inactive and change to Lock and Unlock when pushing the appropriate switch.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC control.
2. Ignition ON, verify the scan tool Central Door Lock Switch on Center Console parameter is Inactive.
 - If the value is Lock, test the signal circuit terminal 12 for a short to ground. If the circuit tests normal, replace the K9 BCM.
 - If the value is Unlock, test the signal circuit terminal 13 for a short to ground. If the circuit tests normal, replace the K9 BCM.
3. If all circuits test normal, replace the A20 radio/HVAC control.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for BCM and HVAC control replacement, setup and programming

DTC B324A

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B324A 02

Rear Cargo Door Unlock Motor Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
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Liftgate Relay Coil Control	B324A 02	1	1	-
1. Liftgate Release Malfunction				

Circuit/System Description

When the body control module (BCM) receives a liftgate release command, it will provide voltage to one side of the relay and ground to the other side of the relay. This will energize the relay causing the switch side of the relay to close and will then provide B+ voltage to the liftgate latch.

Conditions for Running the DTC

- The system voltage is 9-16 volts.
- When the relay is actively commanded by the BCM

Conditions for Setting the DTC

The BCM detects a short to ground in the liftgate release relay control circuit.

Actions Taken When DTC Sets

The liftgate latch will be inoperative.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Reference Information

Schematic Reference

Release Systems Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Rear Hatch/Gate Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs

- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Doors UNLOCKED, command the M31 liftgate latch assembly to release by pressing the S58A rear compartment lid release switch - exterior. The M31 liftgate latch assembly should release the liftgate.

Circuit/System Testing

1. Ignition OFF, disconnect the X4 harness connector at the K9 BCM.
2. Momentarily install a 3A fused jumper wire between the control circuit terminal 8 and B+.
3. Listen for the Liftgate Release PCB relay clicks.
 - If the Liftgate Release PCB relay does not perform as specified, test the control circuit for an open/high resistance. If the circuit tests normal, replace the X50D fuse block - underhood.
 - If the fuse within the jumper wire opens, test the control circuit for a short to ground. If the circuit tests normal, replace the X50D fuse block - underhood.
4. If all circuits test normal, replace the K9 BCM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Accessory Wiring Junction Block Replacement

Control Module References For BCM replacement, setup and programming

DTC B3930

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3930 02

Child Security Lock Motors Circuit Short to Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Child Security Door Latch Relay Control	B3930 02	1	1	-
Door Lock Relay Ground	1	1	1	-
1. Child Security Lockout Malfunction				

Circuit/System Description

The body control module (BCM) controls the child security lock relay when it receives a command to lockout the rear doors. The relay will apply voltage to both child security circuits at the rear door latches to disable the interior rear door handles.

Conditions for Running the DTC

When the Door Lock relay is being actively commanded by the BCM.

Conditions for Setting the DTC

The BCM detects a short to ground on the Door Lock Relay control circuit.

Action Taken When the DTC Sets

The interior rear door handles will continue to function when the child security lockout has been commanded and the BCM will command the lockout indicator to flash ON and OFF for 30 seconds to indicate a fault in the system.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Reference Information

Schematic Reference

Door Lock/Indicator Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Power Door Locks Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, command the doors to lock by using the central door lock switch and command the child security lockout by pressing the lockout switch, the interior rear door handles should become inoperative and the lockout indicator should illuminate.

Circuit/System Testing

1. Ignition OFF, disconnect the X5 harness connector at the K9 BCM.
2. Connect a 3A fused jumper wire between the control circuit terminal 5 and B+, listen as the Door Lock relay clicks to indicate that it is activated.
 - If the Door Lock relay does not activate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the X50D fuse block-underhood.
3. If all circuits test normal, replace the K9 BCM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Accessory Wiring Junction Block Replacement**
- **Control Module References** BCM replacement, setup and programming

DTC B396A

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B396A 01

Liftgate Motor Control Circuit Short to Battery

DTC B396A 02

Liftgate Motor Control Circuit Short to Ground

DTC B396A 04

Liftgate Motor Control Circuit Open

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Module B+	B396A 04	B396A 04	-	-
Liftgate Module B+	U0230 00	U0230 00	-	-
Liftgate Motor Close Control	B396A 02	B396A 04	B396A 01	-
Liftgate Motor Open Control	B396A 02	B396A 04	B396A 01	-

Circuit/System Description

The liftgate motor is a bi-directional motor and open or close operation is the result of the direction of the motor rotation. The liftgate control module controls the liftgate motor through the control circuits by supplying power and ground in the appropriate polarity. The motor control circuits are monitored by the liftgate control module prior to activation for a high or low condition and during motor operation for any irregular current flow conditions.

Conditions for Running the DTC

- The system voltage is 9-16 volts.
- Power open or close function is initiated.

Conditions for Setting the DTC

B396A 01

The liftgate module detects a short to voltage in a liftgate motor control circuit.

B396A 02

The liftgate module detects a short to ground in a liftgate motor control circuit.

B396A 04

The liftgate module detects an open/high resistance in a liftgate motor control circuit.

Action Taken When the DTC Sets

The power liftgate will only function in the manual mode.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

NOTE: Before testing can be performed, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the appropriate procedure.

NOTE: DTC B396A 01 may set as current or history when the liftgate module detects erratic voltage levels in the electrical system and does not affect the operation of the power liftgate. If this DTC is set and the liftgate functions normally, clear the DTC.

Whenever the liftgate module loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the liftgate module.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- Testing for Intermittent Conditions and Poor Connections
- Circuit Testing
- Wiring Repairs
- Connector Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, doors UNLOCKED, observe the function of the liftgate while pressing the S46 liftgate handle switch, the liftgate latch should release the liftgate and the liftgate should power OPEN.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the K39 liftgate module.
2. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 3 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance
3. Ignition OFF, connect the X1 harness connector at the K39 liftgate module and disconnect the harness connector at the M17 liftgate motor assembly.
4. Test for less than 30k ohms between the control circuit terminal A and ground.
 - If greater than the specified range, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
5. Test for less than 30k ohms between the control circuit terminal B and ground.
 - If greater than the specified range, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.

NOTE: Verify that the interior liftgate control switch is in the Garage Mode or the Full Open Mode

6. Connect a test lamp between the control circuit terminal A and control circuit terminal B.
7. Ignition ON, with the liftgate in the open position, command the liftgate to CLOSE by pressing the B70 liftgate close switch. The test lamp should illuminate during the CLOSE command.
 - If the test lamp does not illuminate, test control circuit terminal A for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
8. With the liftgate in the closed position, command the liftgate to OPEN by pressing the S46 liftgate handle switch. The test lamp should illuminate during the OPEN command.
 - If the test lamp does not illuminate, test control circuit terminal B for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
9. If all circuits test normal, test or replace the M17 liftgate motor assembly.

Component Testing

Liftgate Motor

1. Ignition OFF, disconnect the harness connector at the M17 liftgate motor assembly.
2. Install a 30 A fused jumper wire between one of the control terminals and 12 V. Momentarily install a jumper wire between the other control terminal and ground. Reverse the jumper wires at least two times, the M17 liftgate motor assembly should perform the OPEN and CLOSE functions.
 - If it does not perform as specified, replace the M17 liftgate motor assembly.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair..

- **Liftgate Hydraulic Pump Replacement**
- **Control Module References** for liftgate module replacement, setup and programming

DTC B396C

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B396C 08

Liftgate Mode Switch Circuit Performance Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate On/Off Switch Signal	B396C 08	B396C 08	B396C 08	-
Interior Liftgate Control Switch Ground	-	B396C 08	-	-

Circuit/System Description

The interior liftgate control switch contains 3 resistors which are in series for the liftgate mode, depending upon which position is selected will determine which combination of resistors are used. The liftgate module monitors the voltage level in the liftgate mode signal circuit, as each mode is selected, the voltage within the signal circuit incrementally drops. It is this method the liftgate module will determine the if mode switch is in the manual mode, the garage mode or the maximum open mode.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

The liftgate control module detects an out of range condition in the mode switch signal circuit.

Action Taken When the DTC Sets

The manual mode function and the garage mode function will be inoperative.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

NOTE: **Before testing can be performed, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the appropriate procedure.**

Whenever the liftgate control module loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the liftgate control module.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Liftgate Mode Switch parameter while changing the mode switch between the Off and 3/4 positions. The value should vary from greater than 100 counts to less than 400 counts as the switch is changed.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S45B liftgate control switch-interior.
2. Test for less than 30 ohms between the ground circuit terminal 1 and ground.
 - If greater than the specified range, test the ground circuit for a open/high resistance.
3. Ignition ON, verify the scan tool Liftgate Mode Switch parameter is greater than 300 counts.
 - If less than the specified range, test the signal circuit terminal 3 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
4. Connect a 3A fused jumper wire between the signal circuit terminal 3 and ground, verify the scan tool Liftgate Mode Switch parameter is less than 5 counts.
 - If greater than the specified range, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
5. If all circuits test normal, test or replace the S45B liftgate control switch-interior.

Component Testing

1. Ignition OFF, disconnect the harness connector at the S45B liftgate control switch-interior.
2. Test for 0.6-0.8 ohms between the signal terminal 3 and the ground terminal 1 with the liftgate mode switch in the Off position.
 - If not within the specified range, replace the S45B liftgate control switch-interior.
3. Test for 2-2.5 ohms between the signal terminal 3 and the ground terminal 1 with the liftgate mode switch in the Max position.
 - If not within the specified range, replace the S45B liftgate control switch-interior
4. Test for 6-7 ohms between the signal terminal 3 and the ground terminal 1 with the liftgate mode switch in the 3/4 position.
 - If not within the specified range, replace the S45B liftgate control switch-interior

Repair Procedures

Perform the **Diagnostic Repair Verification** Diagnostic Repair Verification after completing the repair.

- **Rear Compartment Lid Release Switch Replacement**
- **Control Module References** for the liftgate module replacement, setup and programming

DTC B396D

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B396D 02

Front Liftgate Actuator Switch Circuit Short To Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Rear Liftgate Open/Close Switch Signal	B396D 02	1	1	-
1. Liftgate Switch Malfunction				

Circuit/System Description

The interior liftgate control switch consists of a push button switch to command the liftgate to open and close and a rotary switch to control the opening modes. The liftgate module monitors the voltage level on the open/close signal circuit, when the switch is not being pressed the voltage level is at the system voltage. When the switch is pressed a contacts within the interior liftgate control switch closes providing a ground path for the signal circuit causing the voltage level to drop to near zero volts. The liftgate module will detect the voltage drop and will then command the liftgate to open or close depending upon the current state of the liftgate at the time the switch is pressed.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

The liftgate control module detects a short to ground in the rear liftgate open/close switch signal circuit for greater than 60 seconds.

Action Taken When the DTC Sets

The liftgate module will ignore the switch input from the interior liftgate control switch and the liftgate operations will only be available from the liftgate switches located on the liftgate panel or by an open or close request from the remote control keyless entry module.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

NOTE: Before testing can be performed on an inoperative liftgate, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the

appropriate procedure.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Liftgate Front Control Switch parameter while pressing and releasing the liftgate button on the S58B Rear Compartment Lid Unlatch Switch - Interior. The parameter should change between Inactive and Active.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the S58B Rear Compartment Lid Unlatch Switch - Interior.
2. Ignition ON, verify the scan tool Liftgate Front Control Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 4 for a short to ground. If the circuit tests normal, replace the K39 liftgate control module
3. Install a 3 A fused jumper wire between the signal circuit terminal 4 and ground. Verify the scan tool Liftgate Front Control Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate control module
4. If all circuits test normal, test or replace the S58B Rear Compartment Lid Unlatch Switch - Interior.

Component Testing

Interior Liftgate Control Switch Assembly

- 1. Ignition OFF, disconnect the harness connector at the S58B Rear Compartment Lid Unlatch Switch - Interior.
- 2. Test for infinite resistance between the signal terminal 4 and the ground terminal 1 with the switch open.
 - o If not the specified value, replace the S58B Rear Compartment Lid Unlatch Switch - Interior
- 3. Test for less than 3 ohms between the signal terminal 4 and the ground terminal 1 with the switch closed.
 - o If greater than the specified range, replace the S58B Rear Compartment Lid Unlatch Switch - Interior

Repair Procedures

Perform the Diagnostic Repair Verification after completing the repair.

- Rear Compartment Lid Release Switch Replacement
- Control Module References for the liftgate control module replacement, setup and programming

DTC B396E

Diagnostic Instructions

- Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

DTC Descriptor

DTC B396E 02

Rear Liftgate Actuator Switch Circuit Short To Ground

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Close Switch Signal	B396E 02	1	1	-
Liftgate Close Switch Low Reference	-	1	1	-
1. Liftgate Switch Malfunction				

Circuit/System Description

The liftgate close switch circuit provides a single input to the liftgate module. The liftgate close switch is

supplied a signal voltage, when the switch contact closes, the liftgate module detects the voltage drop and commands the liftgate to close. Pressing and holding the liftgate close switch for 5 seconds while the liftgate is opening will cause the liftgate to stop at the desired opening distance and will set the garage mode opening height.

Conditions for Running the DTC

The system voltage is 9-16 V.

Conditions for Setting the DTC

The liftgate module detects the Liftgate Close Signal circuit is active for greater than 30 seconds.

Action Taken When the DTC Sets

The liftgate module will ignore the input from the liftgate close switch, the liftgate will only power close by using the interior liftgate control switch or by a close request from the remote control door lock receiver.

Conditions for Clearing the DTC

- The DTC will be current for as long as the fault is present.
- When the fault is no longer present, the DTC will be a history DTC.
- A history DTC will clear after 50 ignition cycles.

Diagnostic Aids

NOTE: **Before testing can be performed, the liftgate must be opened. Refer to Opening the Liftgate Without Electrical Power for the appropriate procedure.**

Whenever the LGM loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the LGM.

In some circumstances high or low control circuit faults may cause the LGM to react as if the liftgate has encountered an object in its travel and reverse direction.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, with the liftgate open, observe the scan tool Liftgate Rear Close Switch parameter while pressing and releasing the B70 liftgate close switch. The parameter should change from Inactive to Active.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the B70 liftgate close switch.
2. Ignition ON, verify the scan tool Liftgate Rear Close Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 3 for a short to ground. If the circuit tests normal, replace the K39 liftgate module
3. If all circuits test normal, test or replace the B70 liftgate close switch.

Component Testing

Liftgate Close Switch Assembly

1. Ignition OFF, disconnect the harness connector at the B70 liftgate close switch.
2. Test for infinite resistance between the signal terminal 3 and the low reference terminal 4 with the switch in the inactive position.
 - If not the specified value, replace the B70 liftgate close switch.
3. Test for less than 3 ohms between the signal terminal 3 and the low reference terminal 4 with the switch in the active position.
 - If greater than the specified range, replace the B70 liftgate close switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Liftgate Close Switch Replacement**
- **Control Module References** for LGM replacement, setup and programming

SYMPTOMS - VEHICLE ACCESS

NOTE: The following steps must be completed before using the symptom tables.

1. Perform the **Diagnostic System Check - Vehicle** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:
 - **Door Ajar Indicator Description and Operation**
 - **Liftgate Description and Operation**
 - **Power Door Locks Description and Operation**
 - **Liftgate Ajar Indicator Description and Operation**

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the system. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Liftgate Release Malfunction (Power)** or **Liftgate Release Malfunction (Manual)**
- **Liftgate Ajar Indicator Malfunction (Manual Liftgate)** or **Liftgate Ajar Indicator Malfunction (Power Liftgate)**
- **Door Ajar Indicator Malfunction**
- **Power Door Locks Malfunction**
- **Power Door Child Lock Malfunction**

LIFTGATE RELEASE MALFUNCTION (POWER)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.

- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Control Module B+	B396A 04	B396A 04	-	-
Liftgate Control Module B+	U0230 00	U0230 00	-	-
Liftgate Mode Signal	B396C 08	B396C 08	B396C 08	-
Liftgate Open Signal	B396D 02	1	1	-
Object Sensors Signal	B153F 02	B153F 05	B153F 05	-
Liftgate Handle Switch Signal	B2494 02	1	1	-
Liftgate Close Switch Signal	B396E 02	1	1	-
Pawl Switch Signal	B153A 08	B153A 08	B153A 08	-
Ratchet Switch Signal	B153A 08	B153A 08	B153A 08	-
Sector Switch Signal	B153A 08	B153A 08	B153A 08	-
Liftgate Latch Cinch Control	B2495 02	B2495 04	B2495 01	-
Liftgate Latch Release Control	B2495 02	B2495 04	B2495 01	-
Liftgate Motor Close Control	B396A 02	B396A 04	B396A 01	-
Liftgate Motor Open Control	B396A 02	B396A 04	B396A 01	-
Liftgate Latch Assembly Low Reference	-	B153A 08	1	-
Interior Liftgate Control Switch Ground	-	1	-	-
Liftgate Control Module Ground	-	U0230 00	-	-
1. Liftgate Switch Malfunction 2. Liftgate Malfunction				

Circuit/System Description

The liftgate control module controls operation of the liftgate latch motor and the liftgate actuator assembly. Under normal conditions the power latch can only be unlatched under power from the liftgate control module through an input from the liftgate handle switch, the open/close switch on the overhead console, or the remote keyless entry transmitter, but the liftgate may be manually closed to the primary latched position without the liftgate control module performing the power latch function. The liftgate mode switch in the driver door will enable or disable the power operation of the liftgate but will have no effect on power latch operation. The liftgate pump motor is a bi-directional motor and open or close operation is the result of the direction of the motor rotation. The liftgate module controls the liftgate pump motor through the control circuits by supplying power and ground in the appropriate polarity. The motor control circuits are monitored by the liftgate module prior to activation for a high or low condition and during motor operation for any irregular current flow conditions.

The liftgate control module continuously monitors power liftgate operation and calculates its location and direction of travel using 2 inputs from the liftgate position sensor. One input returns the position of the liftgate relative to the latch along the x-axis and the other returns the position of the liftgate relative to the latch along

the y-axis. The liftgate control module then uses these 2 inputs together to calculate its angle relative to the liftgate latch.

Diagnostic Aids

Before testing can be performed, the liftgate must be opened. Refer to **Opening the Liftgate Without Electrical Power** for the appropriate procedure.

Power liftgate function will only be allowed if certain operating criteria are met. Any of the following may cause the power liftgate not to function:

- After a power loss of the low current battery supply until the ignition is cycled
- Vehicle is not in park
- Engine cranking is present.
- Ambient temperature at the liftgate control module must be within -17 to +80°C (+1 to +176°F).
- Liftgate motor excess current is detected which may be caused by a misaligned liftgate striker.
- System voltage is out of range.
- A DTC is set that disables power liftgate functionality.
- The vehicle doors are locked when attempting to open from the exterior handle.
- Interior trim and/or liftgate wedge/bumper misalignment.

A power liftgate that will not fully open may be caused by kinked or twisted hydraulic lines, inspect and replace any hydraulic lines.

Inspect the system for contaminated hydraulic fluid, improper fluid level and any hydraulic fluid leaks prior to any extensive electrical diagnostics; refer to **Liftgate Hydraulic System Refilling**

The liftgate module also receives input from 2 pressure sensing object detection sensors. If either of these sensors indicates an object may be pinched as the liftgate is brought to the closed position, the liftgate will reverse direction and power close operation will be suspended until the pressure against the sensor is released.

Whenever the liftgate module loses power or is disconnected, the ignition must be cycled OFF then ON in order to reactivate the liftgate module.

Certain SIR DTCs will make the power liftgate inoperative. Correct any SIR concern first before performing any extensive power liftgate diagnostics.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool Liftgate Front Control Switch parameter while pressing the open/close switch on the S58B Rear Compartment Lid Unlatch Switch - Interior. The parameter should change between Inactive and Active.
 - If the values do not change, refer to Interior Liftgate Control Switch Malfunction below.
2. Observe the scan tool Liftgate Mode Switch parameters while selecting the mode switch between the 3/4 and Off settings. The values should be between 80 counts and 430 counts.
 - If not within the specified range, refer to Interior Liftgate Control Switch Malfunction below.
3. Observe the scan tool Liftgate Handle Switch parameter while pressing and releasing the S46 liftgate handle switch. The parameter should change between Active and Inactive.
 - If the values do not change, refer to Liftgate Handle Switch Inoperative below.
4. With the liftgate mode switch in the 3/4 or Max position, command the liftgate to power OPEN by pressing S46 liftgate handle switch. The liftgate latch should release and the liftgate should power open.
 - If the liftgate will not open, refer to Liftgate Inoperative.
 - If the liftgate latch releases but does not perform the power OPEN function, refer to Power Open Inoperative below.
5. With the liftgate open, observe the scan tool Liftgate Rear Close Switch parameter while pressing and releasing the B70 liftgate close switch. The parameter should change from Inactive to Active.
 - If the value does not change, refer to Liftgate Close Switch Inoperative below.
6. Command the liftgate to power CLOSE pressing the open/close switch on the S58B Rear Compartment Lid Unlatch Switch - Interior. The liftgate should perform the power CLOSE function.
 - If the liftgate does not power CLOSE, refer to Power Close Inoperative below.
7. Manually open the liftgate and verify that the liftgate will remain at or near the full open position for several minutes.
 - If the liftgate will not remain open, replace the liftgate struts.

Circuit/System Testing

Interior Liftgate Control Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S58B Rear Compartment Lid Unlatch Switch - Interior.
2. Test for less than 30 ohms between the ground circuit terminal 1 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Liftgate Front Control Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 4 for a short to ground. If the circuit tests normal, replace the K39 liftgate control module.
4. Install a 3 A fused jumper wire between the signal circuit terminal 4 and ground. Verify the scan tool Liftgate Front Control Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate control module.
5. Verify the scan tool Liftgate Mode Switch parameter is greater than 300 counts.
 - If less than the specified range, test the signal circuit terminal 3 for a short to ground. If the circuit tests normal, replace the K39 liftgate control module.
6. Connect a 3 A fused jumper wire between the signal circuit terminal 3 and ground, verify the scan tool Liftgate Mode Switch parameter is less than 5 counts.
 - If greater than the specified range, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
7. If all circuits test normal, test or replace the S45B liftgate control switch - interior.

Liftgate Handle Switch Inoperative

1. Ignition OFF, disconnect the harness connector at the S46 liftgate handle switch.
2. Test for less than 30 ohms between the low reference circuit terminal 2 and ground.
 - If greater than the specified range, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
3. Ignition ON, verify the scan tool Liftgate Handle Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 1 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
4. Connect a 3 A fused jumper wire between the signal circuit terminal 1 and ground, verify the scan tool Liftgate Handle Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
5. If all circuits test normal, test or replace the S46 liftgate handle switch.

Liftgate Inoperative

1. Ignition OFF, disconnect the X1 harness connector at the K39 liftgate control module.
2. Test for less than 30 ohms between the ground circuit terminal 6 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.

3. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminals listed below and ground.
 - B+ terminal 3
 - B+ terminal 4
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
4. Test for less than 15 ohms between the control circuit terminal 1 and the control circuit terminal 2.
 - If greater than the specified range, test either control circuit for a short to voltage or an open/high resistance. If circuits test normal, test or replace the M31 liftgate latch assembly.
5. Verify that a test lamp does not illuminate between the control circuit terminal listed below and B+.
 - Control circuit terminal 1
 - Control circuit terminal 2
 - If the test lamp illuminates, test the control circuit for a short to ground. If circuit tests normal, test or replace the M31 liftgate latch assembly
6. If all circuits test normal test or replace the M31 liftgate latch assembly.

Liftgate Close Switch Inoperative

1. Ignition OFF, disconnect the harness connector at the B70 liftgate close switch.
2. Test for less than 30 ohms between the low reference circuit terminal 4 and ground.
 - If greater than the specified range, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
3. Ignition ON, verify the scan tool Liftgate Rear Close Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 3 for a short to ground. If the circuit tests normal, replace the K39 liftgate module
4. Connect a 3 A fused jumper wire between the signal circuit terminal 3 and ground, verify the scan tool Liftgate Rear Close Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
5. If all circuits test normal, test or replace the B70 liftgate close switch.

Power Open Inoperative

1. Ignition OFF, disconnect the harness connector at the A23C liftgate latch assembly.
2. Test for less than 30 ohms between the low reference circuit terminal 2 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
3. Ignition ON, verify the scan tool LGM Latch Pawl Sw. parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 5 for a short to ground. If the circuit tests normal, replace the K39 liftgate module
4. Install a 3A fused jumper wire between the signal circuit terminal 5 and low reference circuit terminal 2. Verify the scan tool LGM Latch Pawl Sw. parameter is Active.

- If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
- 5. Verify the scan tool Liftgate Latch Ratchet Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 6 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
- 6. Install a 3 A fused jumper wire between the signal circuit terminal 6 and low reference circuit terminal 2. Verify the scan tool Liftgate Latch Ratchet Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
- 7. Verify the scan tool Liftgate Latch Sector Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 4 for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
- 8. Install a 3 A fused jumper wire between the signal circuit terminal 4 and low reference circuit terminal 2. Verify the scan tool Liftgate Latch Sector Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
- 9. Ignition OFF, connect the harness connector at the A23C liftgate latch assembly.
- 10. Ignition ON, observe the scan tool LGM Latch Pawl Sw., LGM Latch Ratchet Sw and LGM Latch Ratchet Sw while opening and closing the liftgate. Each parameter should change for Inactive to active as the liftgate is opened and closed.
 - If a value is always Inactive or always Active, test or replace the A23C liftgate latch assembly.
- 11. Ignition OFF, disconnect the harness connector at the M17 liftgate motor assembly
- 12. Test for less than 30k ohms between the control circuit terminal A and ground.
 - If greater than the specified range, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
- 13. Test for less than 30k ohms between the control circuit terminal B and ground
 - If greater than the specified range, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
- 14. Connect a test lamp between control circuit terminal A and control circuit terminal B
- 15. Ignition ON, with the liftgate open, command the liftgate to CLOSE by pressing the interior liftgate control switch. The test lamp should briefly illuminate when commanding the CLOSE state.
 - If the test lamp is always OFF, test the control circuit terminal B for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
- 16. With the liftgate closed, command the liftgate to OPEN by pressing the interior liftgate control switch. The test lamp should briefly illuminate when commanding the OPEN state
 - If the test lamp is always OFF, test the control circuit terminal A for a short to ground. If the circuit tests normal, replace the K39 liftgate module.
- 17. If all circuits test normal, test or replace the M17 liftgate motor assembly.

Power Close Inoperative

1. Ignition OFF, disconnect the harness connector at the B71L liftgate object sensor - left.

2. Test for less than 30 ohms between the low reference circuit terminal B and ground.
 - If greater than the specified range, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
3. Disconnect the harness connector at the B71R liftgate object sensor - right.
4. Ignition ON, test for 4.75-5.25 V between the signal circuit terminal A and ground.
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K39 liftgate module.
 - If greater than the specified range, test the signal circuit for a short to voltage. If the circuit tests normal, replace the K39 liftgate module.
5. Test of infinite resistance between the signal circuit terminal B at the B71R liftgate object sensor - right and ground.
 - If not the specified value, test the signal circuit for a short to ground
6. Test for less than 1 ohms between the signal circuit terminal B at the B71R liftgate object sensor - right and the signal circuit terminal A at the B71L liftgate object sensor - left.
 - If greater than the specified range, test the signal circuit for an open/high resistance.
7. Test for 8k-12k ohms between the signal terminal A and the low reference terminal B at the B71R liftgate object sensor - right.
 - If not within the specified range, replace the B71R liftgate object sensor - right
8. Test for 8k-12k ohms between the signal terminal A and the low reference terminal B at the B71L liftgate object sensor - left.
 - If not within the specified range, replace the B71L liftgate object sensor - left.
9. If all circuits test normal, replace the B71L liftgate object sensor - left and the B71R liftgate object sensor - right.

Component Testing

Liftgate Handle Switch

1. Ignition OFF, disconnect the harness connector at the S46 liftgate handle switch.
2. Test for infinite resistance between the signal terminal 2 and the low reference terminal 1 with the switch in the open position.
 - If not the specified value, replace the S46 liftgate handle switch.
3. Test for less than 2 ohms between the signal terminal 2 and the low reference terminal 1 with the switch in the closed position.
 - If greater than the specified range, replace the S46 liftgate handle switch.

Interior Liftgate Control Switch

1. Ignition OFF, disconnect the harness connector at the S58B Rear Compartment Lid Unlatch Switch - Interior.
2. Test for infinite resistance between the signal terminal 3 and the low reference terminal 4 with the liftgate open switch in the inactive position.

- If not the specified value, replace the S58B Rear Compartment Lid Unlatch Switch - Interior.
- 3. Test for less than 3 ohms between the signal terminal 3 and the low reference terminal 4 with the liftgate open switch in the active position.
 - If greater than the specified range, replace the S58B Rear Compartment Lid Unlatch Switch - Interior.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Liftgate Latch Replacement**
- **Liftgate Hydraulic Actuator Replacement**
- **Liftgate Close Switch Replacement**
- **Rear Compartment Lid Release Switch Replacement**
- **Liftgate Side Upper Sensor Replacement (Equinox) or Liftgate Side Upper Sensor Replacement (Terrain)**
- **Liftgate Release Switch Replacement**
- **Control Module References** for liftgate module replacement, setup and programming

LIFTGATE RELEASE MALFUNCTION (MANUAL)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Release Relay B+	2	2	-	-
Liftgate Release Switch Signal	B2494 00	1	1	-
Liftgate Release Relay Control Low	-	2	2	-
Liftgate Release Relay Control High	B324A 02	2	2	-
Liftgate Latch Assembly Control	2	2	2	-
Underhood Fuse Block Ground	-	2	-	-
Liftgate Latch Assembly Ground	-	2	-	-
Liftgate Handle Switch Ground	-	1	-	-
1. Liftgate Release Switch Malfunction 2. Liftgate Release Malfunction				

Circuit/System Description

The liftgate switch is an input to the body control module (BCM). The BCM supplies 12 volts to the signal circuit and when the liftgate switch is activated the signal circuit voltage goes low. The BCM controls the liftgate latch assembly through the liftgate release PCB relay. When the liftgate switch signal is activated, the BCM enables the liftgate release relay by applying battery voltage to the relay circuit high and the relay is energized when the BCM grounds the relay control circuit low. When the relay is energized battery voltage is supplied to the liftgate latch assembly through the liftgate latch control circuit.

Diagnostic Aids

Before testing can be performed, the liftgate must be opened. Refer to **Opening the Liftgate Without Electrical Power** for the appropriate procedure.

Reference Information

Schematic Reference

Release Systems Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Rear Hatch/Gate Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool Trunk Lid/Liftglass Exterior Unlatch Switch parameter while pressing and releasing the S46 liftgate handle switch. The reading should change between Active and Inactive.
 - If the value does not change, refer to Liftgate Handle Switch Malfunction below.
2. Command the M31 liftgate latch assembly to UNLATCH with a scan tool. The M31 liftgate latch assembly should release the liftgate.

- If the M31 liftgate latch assembly does not perform as specified, refer to Liftgate Release Malfunction below.

Circuit/System Testing

Liftgate Handle Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the S46 liftgate handle switch.
2. Test for less than 30 ohms between the ground circuit terminal 2 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Trunk Lid/Liftglass Exterior Unlatch Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 1 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground. Verify the scan tool Trunk Lid/Liftglass Exterior Unlatch Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K9 BCM
5. If all circuits test normal, test or replace the S46 liftgate handle switch.

Liftgate Release Malfunction

1. Ignition OFF, disconnect the harness connector at the A23C liftgate latch assembly.
2. Test for less than 30 ohms between the ground circuit terminal 3 and ground.
 - If greater than the specified range, test the ground circuit for and open/high resistance.
3. Connect a test lamp between the control circuit terminal 1 and the ground circuit terminal 3.
4. Ignition ON, command the A23C liftgate latch assembly to UNLATCH with a scan tool. The test lamp should briefly illuminate during the UNLATCH command.
 - If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the X50A fuse block-underhood.
 - If the test lamp is always OFF and the B+ circuit fuse is open, test the control circuit for a short to ground. If the circuit tests normal, test or replace the A23C liftgate latch assembly.
 - If the test lamp is always OFF and the B+ circuit fuse is normal, test the control circuit for an open/high resistance. If the circuit tests normal, refer to Underhood Fuse Block Test.
5. If all circuits test normal, test or replace the A23C liftgate latch assembly.

Underhood Fuse Block Test

1. Ignition OFF, disconnect the X4 and X5 harness connectors at the K9 BCM.
2. Ignition ON, test for less than 1 V between each control circuit terminal listed below and ground:
 - Low control circuit terminal 20 X5
 - High control circuit terminal 8 X4
 - If greater than the specified range, test the control circuit for a short to voltage. If the circuit tests

normal, replace the X50D fuse block-underhood.

3. Ignition OFF, test for infinite resistance between each control circuit terminal listed below and ground:
 - Low control circuit terminal 20 X5
 - High control circuit terminal 8 X4
 - If not the specified value, test the control circuit for a short to ground. If the circuit tests normal, replace the X50D fuse block-underhood.
4. Ignition ON, connect a 10 A fused jumper wire between the high control circuit terminal 8 X4 and B+ and a jumper wire between the low control circuit terminal 20 X5 and ground. Verify the A23C liftgate latch assembly is activated.
 - If the A23C liftgate latch assembly does not activate, test each control circuit for an open/high resistance. If the circuit tests normal, replace the X50A fuse block-underhood.
5. If all circuits test normal, replace the K9 BCM.

Component Testing

Liftgate Latch Assembly

1. Ignition OFF, disconnect the harness connector at the A23C liftgate latch assembly.
2. Install a 15 A fused jumper wire between the control terminal 1 and 12 V. Install a jumper wire between the ground terminal 3 and ground. Verify the release actuator activates.
 - If the actuator does not perform as specified, replace the A23C liftgate latch assembly.

Liftgate Release Switch

1. Ignition OFF, disconnect the harness connector at the S46 liftgate handle switch.
2. Test for infinite resistance between the signal terminal 1 and the ground terminal 2 with the switch in the open position.
 - If not the specified value, replace the S46 liftgate handle switch.
3. Test for less than 2 ohms between the signal terminal 1 and the ground terminal 2 with the switch in the closed position.
 - If greater than the specified range, replace the S46 liftgate handle switch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Liftgate Release Switch Replacement**
- **Liftgate Latch Replacement**
- **Accessory Wiring Junction Block Replacement**
- **Control Module References** for BCM replacement, setup and programming

LIFTGATE AJAR INDICATOR MALFUNCTION (MANUAL LIFTGATE)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provide an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Liftgate Ajar Switch Signal	1	2	2	-
Ground	-	2	-	-
1. Liftgate Ajar Indicator Always On 2. Liftgate Ajar Indicator Inoperative				

Circuit/System Description

The body control module (BCM) receives an input from the liftgate ajar assembly. The ajar assembly is normally open when the liftgate is fully closed. When the liftgate is opened, the ajar assembly contacts close providing a path to ground. The driver information center (DIC) illuminates the rear access open message when the gate is open. The instrument panel cluster (IPC) receives a serial data message from the BCM indicating the liftgate ajar status. If this message is displayed and the vehicle speed is greater than 8.1 km/h (5 mph), a chime will sound.

Diagnostic Aids

Before testing can be performed the liftgate must be opened. Refer to **Opening the Liftgate Without Electrical Power** for the procedure.

Reference Information

Schematic Reference

Release Systems Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Ajar Indicator Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**

- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Rear Closure Ajar Switch parameter while opening and closing the liftgate. The parameter should change from Inactive to Active.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the liftgate latch assembly.
2. Test for less than 1 ohms between the ground circuit terminal 5 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Rear Closure Ajar Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal 6 for a short to ground. If the circuit tests normal, replace the BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 6 and ground. Verify the scan tool Rear Closure Ajar Switch parameter is Active.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal replace the BCM.
5. If all circuits test normal, test or replace the liftgate latch assembly.

Component Testing

1. Ignition OFF, disconnect the harness connector at the liftgate latch assembly.
2. Test for infinite resistance between the signal terminal 6 and the ground terminal 5 with the switch in the open position.
 - If not the specified value, replace the liftgate latch assembly.
3. Test for less than 1.0 ohms between the signal terminal 6 and the ground terminal 5 with the switch in the closed position.
 - If greater than the specified range, replace the liftgate latch assembly.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Liftgate Latch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

LIFTGATE AJAR INDICATOR MALFUNCTION (POWER LIFTGATE)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Circuit/System Description

The driver information center (DIC) illuminates the Rear Access Open message when the liftgate module detects the liftgate ratchet and the liftgate sector switches are closed to ground indicating the liftgate is open. The instrument panel cluster receives a serial data message from the liftgate module indicating the liftgate ajar status.

Diagnostic Aids

For the Rear Access Open message to malfunction would require a fault in both the ratchet and sector signal circuits. This kind of failure would result in the liftgate to become inoperative in the manual mode and the power mode.

Reference Information

Schematic Reference

Liftgate Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Liftgate Ajar Indicator Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

With the doors unlocked and the liftgate mode switch selected to Max, command the liftgate to OPEN by pressing the liftgate handle switch. The liftgate should perform the power OPEN function.

- If the liftgate does not perform as specified, refer to **Liftgate Release Malfunction (Power)** or **Liftgate Release Malfunction (Manual)** Power

DOOR AJAR INDICATOR MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Door Ajar Switch Signal	1	2	2	-
Left Rear Door Ajar Switch Signal	1	2	2	-
Right Front Door Ajar Switch Signal	1	2	2	-
Right Rear Door Ajar Switch Signal	1	2	2	-
Driver Door Latch Ground	-	2	-	-
Passenger Door Latch Ground	-	2	-	-
Left Rear Door Latch Ground	-	2	-	-
Right Rear Door Latch Ground	-	2	-	-
1. Ajar Indicator Always Illuminated 2. Ajar Indicator Inoperative				

Circuit/System Description

The driver window motor and passenger window motor each receive a discrete input from their respective door ajar switch signal circuits. The body control module (BCM) receives discrete inputs from each of the rear door ajar switch signal circuits. The door ajar switches are integral to each door latch assembly. When a door is opened, the normally open door ajar switch closes. With the door ajar switch closed, ground is provided to the door ajar switch signal circuit. The window motors and/or BCM interprets this and communicates via serial data with the instrument panel cluster.

Reference Information

Schematic Reference

Door Lock/Indicator Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Door Ajar Indicator Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, observe the scan tool Driver Door Ajar Switch parameter, the Passenger Door Ajar Switch parameter, the Left Rear Door Ajar Switch parameter and the Right Rear Door Ajar Switch parameter while opening and closing each door. Each parameter for each door should change between Active and Inactive

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the appropriate A23 door latch assembly.
2. Test for less than 10 ohms between the ground circuit terminal listed below and ground:
 - A23D door latch assembly-driver terminal 8
 - A23P door latch assembly-passenger terminal 3
 - A23LR door latch assembly-left rear terminal 8
 - A23RR door latch assembly-right rear terminal 3
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the appropriate scan tool Door Ajar Switch parameter is Inactive.
 - If not the specified value, test the signal circuit terminal listed below for a short to ground. If the circuit tests normal, replace the appropriate S79 window switch.
 - A23D door latch assembly-driver terminal 6
 - A23P door latch assembly-passenger terminal 1
 - A23LR door latch assembly-left rear terminal 6
 - A23RR door latch assembly-right rear terminal 1
4. Install a 3 A fused jumper wire between the signal circuit terminal listed below and ground. Verify the scan tool Door Ajar Switch parameter is Active.
 - A23D door latch assembly-driver terminal 6
 - A23P door latch assembly-passenger terminal 1
 - A23LR door latch assembly-left rear terminal 6

- A23RR door latch assembly-right rear terminal 1
 - If not the specified value, test the signal circuit for an open/high resistance. If the circuit tests normal, replace the S79 window switch.
- 5. If all circuits test normal, test or replace the A23 door latch assembly.

Component Testing

Static Test

1. Ignition OFF, disconnect the harness connector at the appropriate A23 door latch assembly.
2. With the switch in the open position, test for infinite resistance between the signal terminal and the ground terminal listed below:
 - A23D door latch assembly-driver terminal 6 and terminal 8
 - A23LR door latch assembly-left rear terminal 6 and terminal 8
 - A23RR door latch assembly-right rear terminal 1 and terminal 3
 - A23P door latch assembly-passenger terminal 1 and terminal 3
 - If not the specified value, replace the door latch.
3. With the switch in the closed position, test for less than 5 ohms between the signal terminal and the ground terminal listed below:
 - A23D door latch assembly-driver terminal 6 and terminal 8
 - A23LR door latch assembly-left rear terminal 6 and terminal 8
 - A23RR door latch assembly-right rear terminal 1 and terminal 3
 - A23P door latch assembly-passenger terminal 1 and terminal 3
 - If greater than the specified range, replace the door latch.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Front Side Door Latch Replacement**
- **Rear Side Door Latch Replacement**
- **Front Side Door Window and Multifunction Switch Replacement**
- **Front Side Door Window Switch Replacement**
- **Rear Side Door Window Switch Replacement**

POWER DOOR CHILD LOCK MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Child Security Door Lockout Signal	B252C 00	1	1	-
Left Rear Door Ajar Switch Signal	2	2	2	-
Right Rear Door Ajar Switch Signal	2	2	2	-
Door Lock Relay Control	B3930 02	2	2	-
Child Security Door Lockout Indicator Control	3	3	3	-
Left Rear Door Latch Lockout Control	B3130 02, B3135 02	1	1	-
Left Rear Door Latch Unlock Control	B3130 02, B3135 02	1	1	-
Right Rear Door Latch Lockout Control	B3130 02, B3135 02	2	2	-
Right Rear Door Latch Unlock Control	B3130 02, B3135 02	2	2	-
Door Lock Relay Ground	-	2	-	-
Left Rear Door Latch Ground	-	2	-	-
Right Rear Door Latch Ground	-	2	-	-
1. Child Door Lockout Switch Malfunction 2. Child Door Lockout Malfunction 3. Child Security Door Lockout Indicator Malfunction				

Circuit/System Description

The child door lockout switch on the radio/HVAC display controls the child locks on the rear doors. The lockout switch is an input to the body control module (BCM) and the BCM controls the Door Lock relay. When the BCM receives a command from the child door lockout switch, it will apply voltage to the Door Lock relay coil, this will energize the relay and the contact within the relay will then direct the voltage to lock the left rear and right rear child locks and then isolate them from the normal door lock system to prevent the rear doors from being opened by using the interior rear door handles. The BCM will then provide a ground for the lockout indicator causing the indicator to illuminate to notify the driver that the child door lockout system has been activated. If the BCM detects a fault in the child door lockout system, it will command the lockout indicator to flash ON and OFF for 30 seconds.

Reference Information

Schematic Reference

Door Lock/Indicator Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Power Door Locks Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, command all doors to LOCK by pressing the appropriate switch on the central door lock switch. All doors should perform the LOCK command.
 - If a door does not LOCK, refer to **Power Door Locks Malfunction**.
2. Command the child security lockout by pressing the lockout switch, the interior rear door handles should become inoperative and the lockout indicator should illuminate.
 - If both interior rear door handles continue to function, refer to Child Security Door Lockout Inoperative below.
 - If the left or right interior rear door handles continue to function, refer to Child Security Door Lockout Malfunction below.
 - If the lockout indicator flashes ON and OFF, refer to Child Security Door Lockout Inoperative or Child Security Door Lockout Malfunction below.
 - If the lockout indicator is always ON or always OFF, refer to Lockout Indicator Malfunction below.

Circuit/System Testing

Child Security Door Lockout Inoperative

1. Ignition OFF, disconnect the X2 harness connector at the X50D fuse block-underhood.
2. Test for less than 10 ohms between the ground circuit terminal C8 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect the X2 harness connector at the X50D fuse block-underhood and disconnect the X5 harness connector at the K9 BCM.
4. Verify that a test lamp does not illuminate between the control circuit terminal 5 and ground.

- If the test lamp is always ON, test the control circuit for a short to voltage. If the circuit tests normal, replace the X50D fuse block-underhood.
- 5. Connect a 3A fused jumper wire between the control circuit terminal 5 and B+, listen as the Door Lock relay clicks to indicate that it is activated.
 - If the Door Lock relay does not activate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the X50D fuse block-underhood.
- 6. Connect the X5 harness connector and disconnect the X2 harness connector at the K9 BCM.
- 7. Connect a test lamp between the signal circuit terminal 18 and B+
- 8. Command the child security door lockout ON and OFF by pressing and depressing the child lockout switch. The test lamp should turn ON and OFF while changing between the commanded states.
 - If the test lamp is always OFF, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the A20 radio/HVAC control.
 - If the test lamp is always ON, test the signal circuit for a short to ground. If the circuit tests normal, replace the A20 radio/HVAC control.
- 9. If all circuits test normal, replace the K9 BCM.

Child Security Door Lockout Malfunction

1. Ignition OFF, disconnect the harness connector at the appropriate A23R door latch assembly-rear.
2. Test for less than 5 ohms between the ground circuit terminal listed below and ground.
 - Left rear door latch terminal 8
 - Right rear door latch terminal 3
 - If greater than the specified range, test the ground circuit for an open/high resistance..
3. Ignition ON, test for greater than 10V between the signal circuit terminal listed below and ground.
 - Left rear door latch terminal 9
 - Right rear door latch terminal 4
 - If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
4. Connect a test lamp between the control circuit terminals listed below:
 - Left rear door latch terminal 4 and terminal 7
 - Right rear door latch terminal 2 and terminal 9
5. Command the child lockout ON and OFF by pressing the child lockout switch, the test lamp should briefly illuminate while changing between the commanded states.
 - If the test lamp is always OFF, test either control circuit for an open/high resistance. If the circuit tests normal, replace the X50D fuse block-underhood.
6. If all circuits test normal, test or replace the A23R door latch assembly-rear.

Lockout Indicator Malfunction

1. Ignition OFF, disconnect the X2 harness connector at the K9 BCM.
2. Ignition ON, verify that the lockout indicator is OFF.

- If the lockout indicator is ON, test the control circuit terminal 6 for a short to ground. If the circuit tests normal, replace the A20 radio/HVAC control.
- 3. Install a 3 A fused jumper wire between the control circuit terminal 6 and ground, verify that the lockout indicator is ON.
 - If the lockout indicator is OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the A20 radio/HVAC control.
- 4. If all circuits test normal, replace the K9 BCM.

Component Testing

1. Ignition OFF, disconnect the harness connector at the appropriate A23R door latch assembly-rear.
2. Install a 25 A fused jumper wire between one of the control terminals and 12 V. Momentarily install a jumper wire between the other control terminal and ground. Reverse the jumper wires at least two times, the A23R door latch assembly-rear should perform the LOCK and UNLOCK functions.
 - If it does not perform as specified, replace the A23R door latch assembly-rear.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Rear Side Door Latch Replacement**
- **Accessory Wiring Junction Block Replacement**
- **Control Module References** BCM and HVAC control replacement, setup and programming

POWER DOOR LOCKS MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Central Door Lock Switch Lock Signal	B3150 00	2	2	-
Central Door Lock Switch Unlock Signal	B3140 00	2	2	-
Door Lock Control	B3125 02, B3130 02, B3135 02	1	1	-
	B3125 02,			

Driver Unlock Control	B3130 02, B3135 02	1	1	-
Passenger Unlock Control	B3125 02, B3130 02, B3135 02	1	1	-
1. Door Lock Malfunction 2. Door Lock Switch Malfunction				

Circuit/System Description

The body control module (BCM) monitors the voltage level of the door lock and door unlock signal circuits. When the central door lock switch is in the open position, the voltage level in the signal circuit will be near 0 V. When the central door lock switch is pressed to the lock or unlock position, a signal will be sent to the BCM requesting a lock or unlock command.

Reference Information

Schematic Reference

Door Lock/Indicator Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Power Door Locks Description and Operation

Electrical Information Reference

- **Testing for Intermittent Conditions and Poor Connections**
- **Circuit Testing**
- **Wiring Repairs**
- **Connector Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, observe the scan tool BCM Central Door Lock Switch on Console parameter. The reading should be Inactive and change to Lock and Unlock when pushing the appropriate switch.
 - If the reading does not change, refer to Central Door Lock Switch Malfunction below.
2. Command the doors to LOCK and UNLOCK by using the central door lock switch, the doors should

LOCK and UNLOCK when changing between the commanded states.

- If a door does not LOCK or UNLOCK, refer to Door Lock Malfunction.
- If all doors do not LOCK or UNLOCK, refer to All Door Locks inoperative.

Circuit/System Testing

Central Door Lock Switch Malfunction

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC control.
2. Test for less than 5 ohms between the ground circuit terminal 17 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify the scan tool Central Door Lock Switch on Center Console parameter is Inactive.
 - If the value is Lock, test the signal circuit terminal 12 for a short to ground. If the circuit tests normal, replace the K9 BCM.
 - If the value is Unlock, test the signal circuit terminal 13 for a short to ground. If the circuit tests normal, replace the K9 BCM.
4. Install a 3 A fused jumper wire between the signal circuit terminal 12 and ground. Verify the scan tool Central Door Lock Switch on Center Console parameter is Lock.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. Install a 3 A fused jumper wire between the signal circuit terminal 13 and ground. Verify the scan tool Central Door Lock Switch on Center Console parameter is Unlock.
 - If not the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
6. If all circuits test normal, replace the A20 radio/HVAC control.

Door Lock Malfunction

1. Ignition OFF, disconnect the harness connector at the A23 door latch assembly.
2. Connect a test lamp between the control circuit terminals listed below:
 - A23D door latch assembly-driver terminal 2 and terminal 3
 - A23P door latch assembly-passenger terminal 7 and terminal 8
 - A23LR door latch assembly-left rear terminal 2 and terminal 3
 - A23RR door latch assembly-right rear terminal 7 and terminal 8
3. Ignition ON, command the door to LOCK and UNLOCK by using the central door lock switch. The test lamp should briefly illuminate when commanding the LOCK and UNLOCK states.
 - If the test lamp is always OFF, test either control circuit for an open/high resistance.
4. If all circuits test normal, test or replace the A23 door latch assembly.

All Door Locks Inoperative

1. Ignition OFF, disconnect the X6 harness connector at the K9 BCM.

2. Disconnect the X2 and X4 harness connectors at the X50D fuse block-underhood.
3. Test for infinite resistance between the control circuit listed below and ground:
 - Connector X2, terminal K8 at the X50D fuse block-underhood
 - Connector X4, terminal A7 at the X50D fuse block-underhood
 - Connector X6 terminal 2 at the K9 BCM
 - Connector X6 terminal 1 at the K9 BCM
 - If not the specified value, test the appropriate control circuit for a short to ground. If the circuit tests normal, test or replace the appropriate A23 door latch assembly.
4. Connect the X4 harness connector at the X50D fuse block-underhood.
5. Test for infinite resistance between the control circuit terminal 4 at the K9 BCM and ground.
 - If not the specified value, test the control circuit for a short to ground. If the circuit tests normal, replace the X50D fuse block-underhood.
6. If all circuits test normal, replace the K9 BCM.

Component Testing

Door Latch

1. Ignition OFF, disconnect the harness connector at the appropriate A23 door latch assembly.
2. Install a 25 A fused jumper wire between one of the control terminals and 12 V. Momentarily install a jumper wire between the other control terminal and ground. Reverse the jumper wires at least two times, the door latch should perform the LOCK and UNLOCK functions.
 - If it does not perform as specified, replace the A23 door latch assembly.

Central Door Lock Switch

1. Ignition OFF, disconnect the harness connector at the A20 radio/HVAC control.
2. Test for infinite resistance between the signal terminal 12 and the ground terminal 17 with the switch in the open position.
 - If not the specified value, replace the A20 radio/HVAC control.
3. Test for infinite resistance between the signal terminal 13 and the ground terminal 17 with the switch in the open position.
 - If not the specified value, replace the A20 radio/HVAC control.
4. Test for less than 2 ohms between the signal terminal 12 and the ground terminal A17 with the switch in the lock position.
 - If greater than the specified range, replace the A20 radio/HVAC control.
5. Test for less than 2 ohms between the signal terminal 13 and the ground terminal A with the switch in the unlock position.
 - If greater than the specified range, replace the A20 radio/HVAC control.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Front Side Door Latch Replacement**
- **Rear Side Door Latch Replacement**
- **Accessory Wiring Junction Block Replacement**
- **Control Module References** BCM and HVAC control replacement, setup and programming

DOOR WILL NOT OPEN/CLOSE, DOOR BINDING, OR LOCKS, HANDLES, OR CYLINDERS DO NOT FUNCTION

Door Latch System Diagnosis

Step	Action	Yes	No
DEFINITION: This diagnostic table is designed to address the mechanical diagnosis of the door latching system, which could include the inside and outside handles, latch rods/cables, latches, or latch cylinders.			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	Were you sent here from a Vehicle Access Symptom Table?	Go to Step 3	Go to <u>Symptoms - Vehicle Access</u>
3	Does the door open with the outside handle?	Go to Step 4	Go to Step 10
4	Does the door open with the inside handle?	Go to Step 5	Go to Step 11
5	Does the manual latch knob latch and unlatch the latch smoothly without binding?	Go to Step 6	Go to Step 12
6	Does the door latch switch and/or the keyless entry transmitter latch and unlatch the door latch or door latches?	Go to Step 7	Go to Step 14
7	Is the outside key cylinder loose or does it rattle or fall out? (if equipped)	Go to Step 15	Go to Step 8
8	Does the outside key cylinder latch and unlatch the latch and function smoothly without binding? (if equipped)	Go to Step 9	Go to Step 16
9	Does the door bind, does it take excessive effort to open, or is it misaligned?	Go to Step 17	Go to Step 18
	If the door will not open with the outside handle, or the handle is obstructed or loose, check the following: • For cold weather freezing, thaw as necessary. • Check the handle for foreign material. Remove material as necessary. • Check the handle grab bar for looseness or damage. Repair as necessary. • Check the handle for full travel. If the issue is not resolved, remove the trim panel as		

10	necessary to gain access to door hardware and check the following: • Check the handle chassis for loose fasteners, broken chassis inserts, loose or missing spring, or a loose, missing or bent rod lever. • Check for bent rod to the outside handle. • Check that the handle grab bar engages the rod lever properly. • Check for interference of rod and handle to other components in the door. • Check that handle rod is securely attached at both latch and handle. • Check if rod is positioned properly in the clip on the latch. At rest position, the handle should be fully against the down stop and the latch lever should be at the bottom of its travel. Correct by opening clip, repositioning rod in clip and closing clip till it snaps, as necessary.		
	Did you find and correct the condition?	Go to Step 18	Go to Step 11
11	Door will not open with the inside handle: • Check the inside handle for foreign material. Remove material as necessary. • Check that the handle is secure. Correct as necessary. • If rear door, verify child security is not engaged. • Remove the trim panel as necessary to and check the inside handle rod/cable attachments at both the latch and handle. If the cable is kinked or pinched, correct as necessary.		
	Did you find and correct the condition?	Go to Step 18	Go to Step 12
	The door will not or is difficult to unlatch with the inside manual latch knob: • For cold weather freezing, thaw as necessary • Check the latch knob for a loose condition. Repair or replace as necessary. Check the latch knob for binding or dragging using the		

12	following procedure: 1. Remove the latch knob. 2. If condition goes away, check for drag/interference of the latch knob against the inner belt seal, or the trim panel. Correct as required. If further action is required, remove the trim panel and check the latch rod and latch knob for interference with the following: • Water deflector/paper • Side Impact Foam • Rod Grommet in sheet metal • Glass Run Channel • Other rods or cables • Trim panel Did you find and correct the condition?	Go to Step 18	Go to Step 13
13	With a manual lock, if the latch will not function properly do the following: 1. Function the lock/unlatch lever on the latch to unlatch the latch. Check for high internal resistance. 2. With the door open, manually close the latch with a screwdriver. 3. Check the latch for internal binding by actuating the latch with the inside door handle lever. 4. Manually close the latch with a screwdriver again. 5. Check the latch for internal binding by actuating the latch with the outside door handle lever. Did you find and correct the condition?	Go to Step 18	Go to Step 14
	If power locks are included in vehicle options and do not function with either the keyless entry transmitter or switch: 1. For cold weather freezing, thaw as necessary. 2. Remove trim pad as required and check the		

14	following: • Verify door harness has appropriate power connectors for switches and latch. • Check harness connector pins for corrosion. • Assure wire harness connectors are seated and locked properly at latch and switch. Remove and re-seat if required. • Check door harness for cuts/chafing/corrosion. Correct/replace as required. • Check for 12V at latch and door switch. Correct/proceed accordingly. • Check BCM for trouble codes. Correct/proceed accordingly. 3. If power locks still do not function do the following: • Remove latch from door cavity. • Connect latch to electrical connector outside the door. • Function power lock/unlatch switch in both latch and unlatch directions. Watch for lock/unlatch lever on latch to move completely from one position to the other. • If lever does not move, remove connector from old latch and attach to new latch outside of door cavity. • Verify new latch is functional, if so, attach rods and install new latch in door.		
	Did you find and correct the condition?	Go to Step 18	Go to Step 15
15	If the key cylinder is loose do the following: • Remove the trim if necessary. • Check that the retaining clip is properly seated. (if equipped) • Check that the fastener is properly torqued. (if equipped)		
	Did you find and correct the condition?	Go to Step 18	Go to Step 16
	The outside key cylinder will not latch and unlatch the latch and function smoothly without binding:		

16	1. For cold weather freezing, thaw as necessary 2. Remove trim if required. 3. Check that the key cylinder rod is securely attached both to the key cylinder pawl and the latch. 4. Check that key cylinder lever, rod and latch lever are free of interferences. Remove interferences as required. 5. Check that latch cylinder rod is routed properly. Re-route as required. 6. Remove rod from latch cylinder and actuate cylinder. Check for internal resistance. Lubricate latch cylinder as required 7. Verify Cylinder rotates with vehicle key. If not, code and replace cylinder to match vehicle key. See latch cylinder coding and replacing.		
	Did you find and correct the condition?	Go to Step 18	Go to Step 17
17	The door is difficult to open: • Check for interference with the fender, adjacent door, body opening or door striker and adjust as necessary. • Check for binding door hinges. Lubricate or align/adjust as necessary. • Check the door check link for binding. Lubricate as necessary. • Adjust the door as necessary.		
	Did you find and correct the condition?	Go to Step 18	Go to Side Door Adjustment
18	Verify proper operation of the door closing system. • Outside Handle • Inside Handle • Manual lock/unlatch ○ Outside Key Cylinder ○ Inside latch knob ○ Double pull handle • Power lock/unlatch ○ Key Fob		

○ Door switches ● Door opening/closing effort		
Is the condition still present?	Go to Step 1	System OK

REPAIR INSTRUCTIONS

FRONT SIDE DOOR INSIDE HANDLE CABLE REPLACEMENT

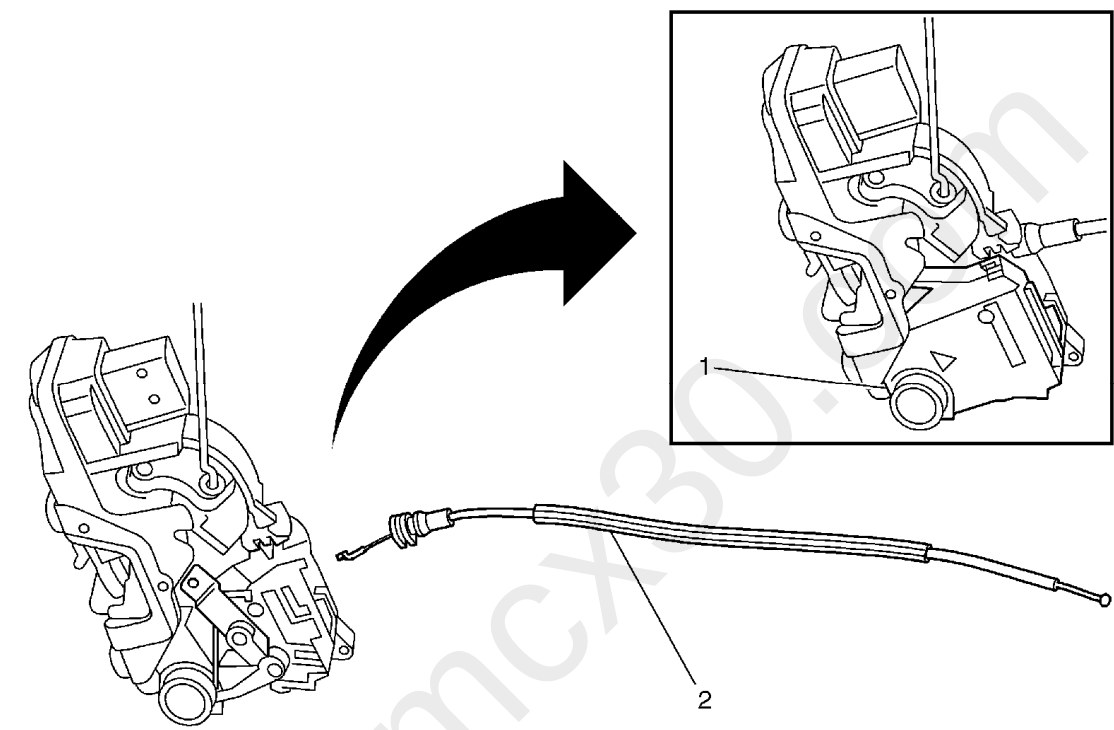


Fig. 7: Front Side Door Inside Handle Cable
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the front side door lock. Refer to Front Side Door Latch Replacement .	
1	Front Side Door Inside Handle Cable Cover Tip: Open the front side door inside handle cable cover to access and release the front side door inside handle cable.
2	Front Side Door Inside Handle Cable Procedure: Inspect the door for proper operation before installing the door trim panel.

REAR SIDE DOOR INSIDE HANDLE CABLE REPLACEMENT

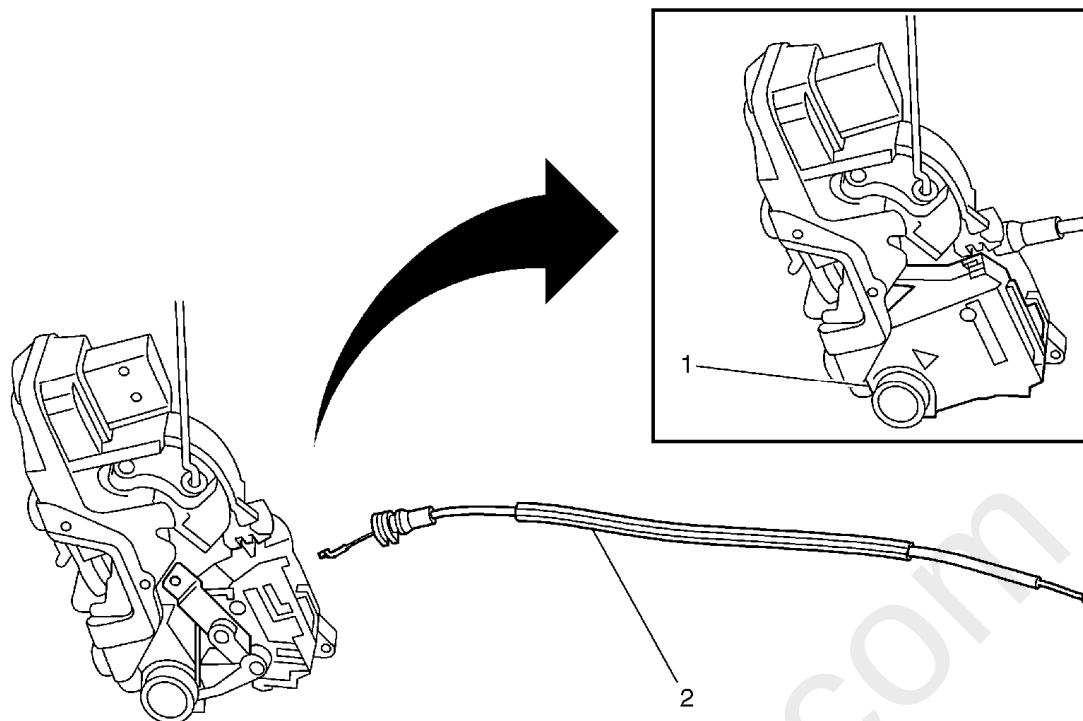


Fig. 8: Rear Side Door Inside Handle Cable
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear side door lock. Refer to <u>Rear Side Door Latch Replacement</u> .	
1	Rear Side Door Inside Handle Cable Cover Tip: Open the rear side door inside handle cable cover to access and release the rear side door inside handle cable.
2	Rear Side Door Inside Handle Cable Procedure: Inspect the door for proper operation before installing the door trim panel.

FRONT SIDE DOOR LOCK CYLINDER REPLACEMENT

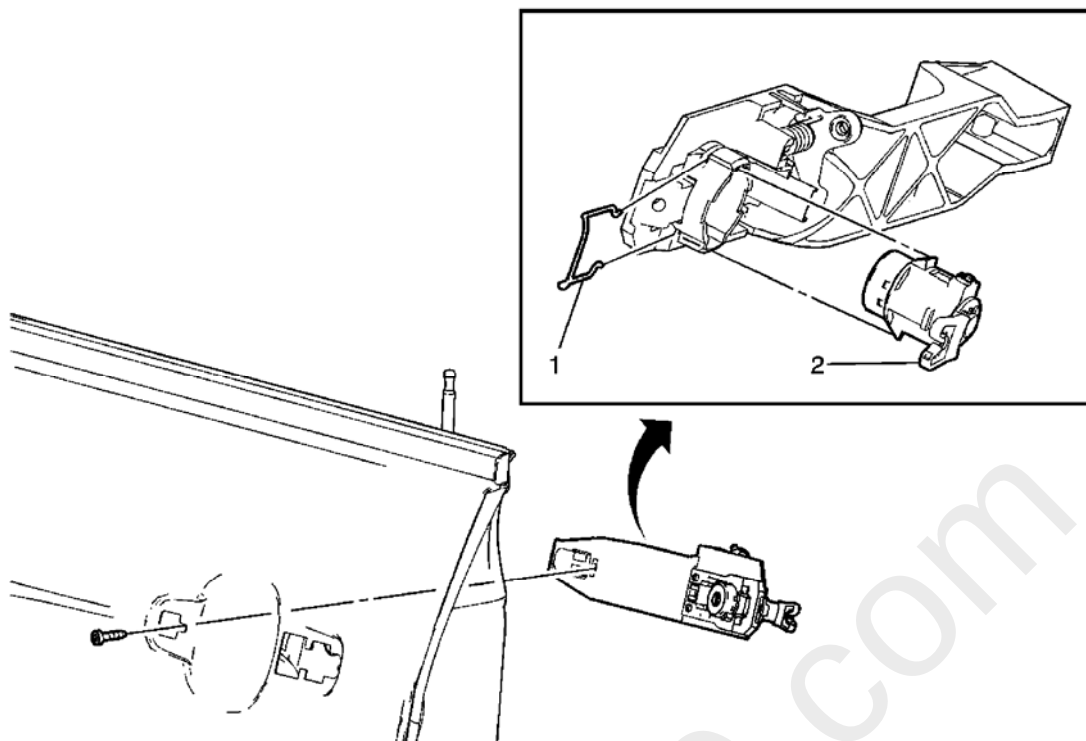


Fig. 9: Front Side Door Lock Cylinder
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures: Remove the front side door trim panel. Refer to Front Side Door Trim Panel Replacement .	
1	Front Side Door Lock Cylinder Clip Procedures 1. It is not necessary to remove the outside door handle or housing to replace the cylinder. 2. Remove the water deflector. 3. Do Not remove the outside handle cylinder cap from the outside door handle. 4. Remove the access plug located on the inner door. 5. Disconnect the lock rod from the cylinder. 6. Pull the lock cylinder clip. Tip: Use a flat-bladed tool to remove the clip.
2	Front Side Door Lock Cylinder Procedure: Inspect the door for proper operation before installing the door trim panel.

Tip: Pull the lock cylinder from the housing.

LIFTGATE CALIBRATION

- NOTE:** To ensure proper calibration of the liftgate, the liftgate assembly must be at room temperature during calibration.
- NOTE:** DTC B1019 00 will set automatically as an indicator that the system is in learn mode and not as a fault indicator. Once the travel limits are learned by the liftgate module, the liftgate module will exit calibration mode and DTC B1019 00 become a history code.

Conditions

Use this procedure after replacing, repairing, or disassembling any portion of the power liftgate assembly.

1. Connect the scan tool to the vehicle.
2. Select Module Diagnosis.
3. Select Liftgate Control Module.
4. Select Liftgate Maximum Open Position Learn.
5. Press "Launch" and follow the on screen instructions.

OPENING THE LIFTGATE WITHOUT ELECTRICAL POWER

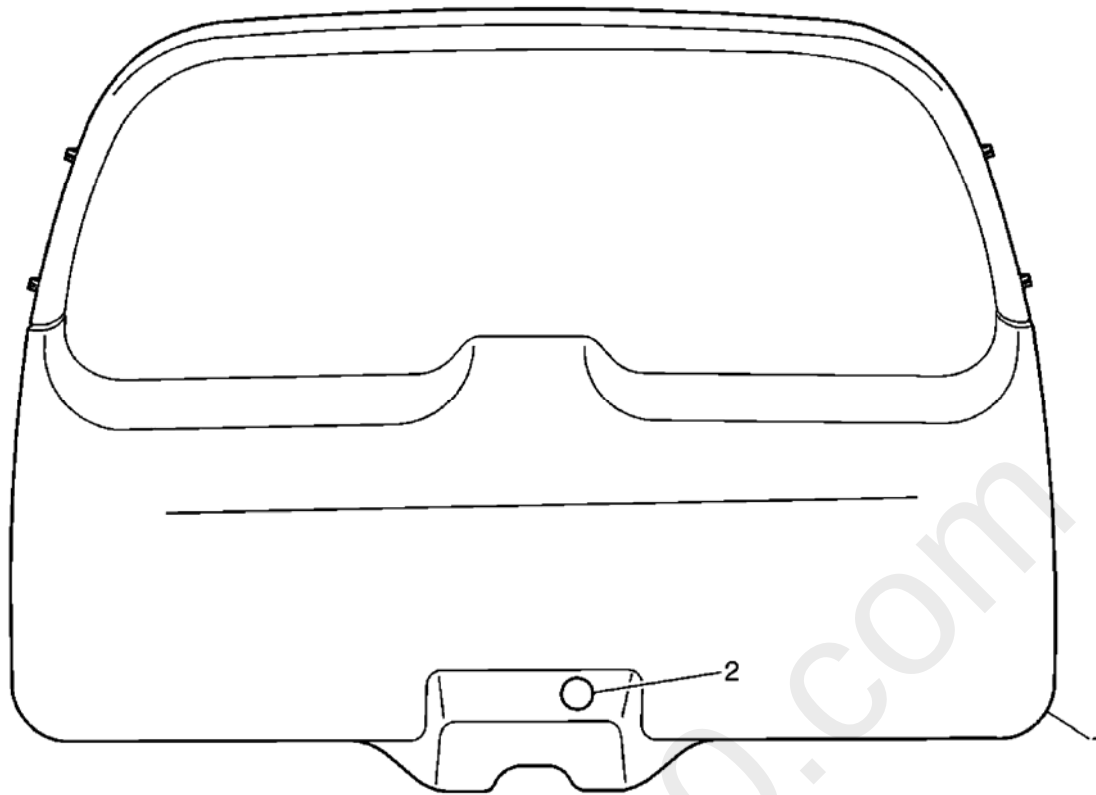


Fig. 10: View Of Liftgate & Trim Panel Plug
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Liftgate
2	Liftgate Trim Panel Plug
	Procedure 1. Locate dimple on trim panel. 2. Remove the access cover. 3. Using a flat-bladed tool push down on the black bellcrank lever, through the access hole, to unlock the liftgate. 4. Push open the liftgate from the inside. 5. Install the access cover.

FRONT SIDE DOOR OUTSIDE HANDLE REPLACEMENT

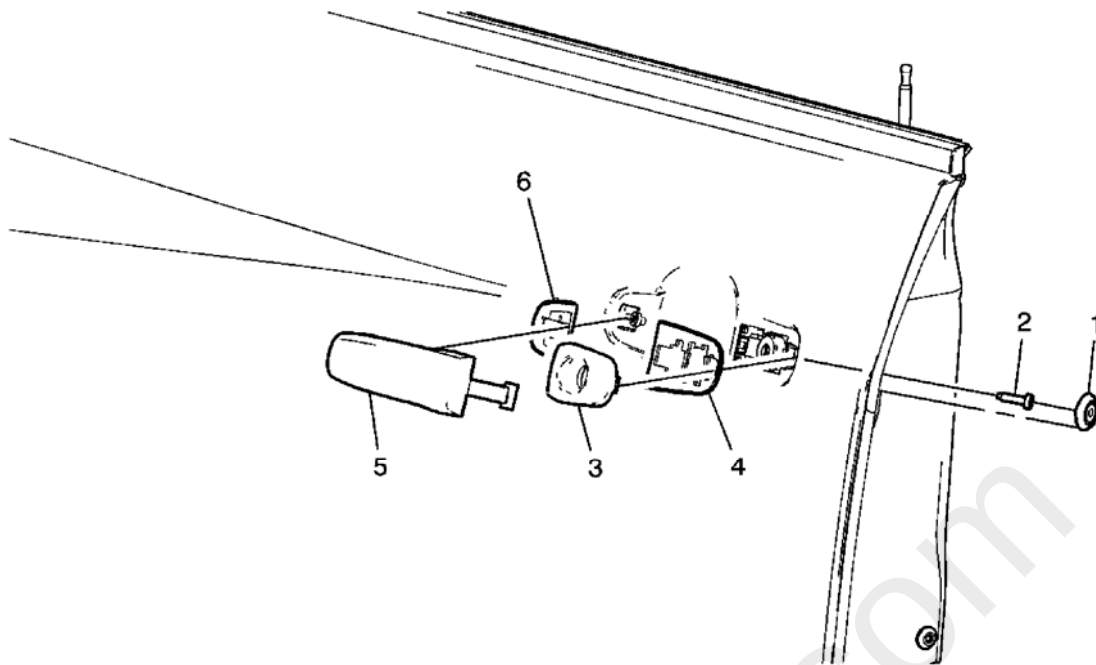


Fig. 11: Front Side Door Outside Handle
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Front Side Door Outside Handle Bolt Access Plug Procedure 1. Do Not remove the trim panel. 2. Use a plastic flat-bladed tool to remove the screw cover located on the inner door.
2	Front Side Door Outside Handle Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 9 N.m (80 lb in)
3	Front Door Outside Handle Cap
4	Front Door Outside Handle Cap Gasket
5	Front Door Outside Handle Tip: Pull the outside handle rearward to release it from the inside handle housing.
6	Front Door Outside Handle Gasket

FRONT SIDE DOOR LOCK OPENING COVER REPLACEMENT

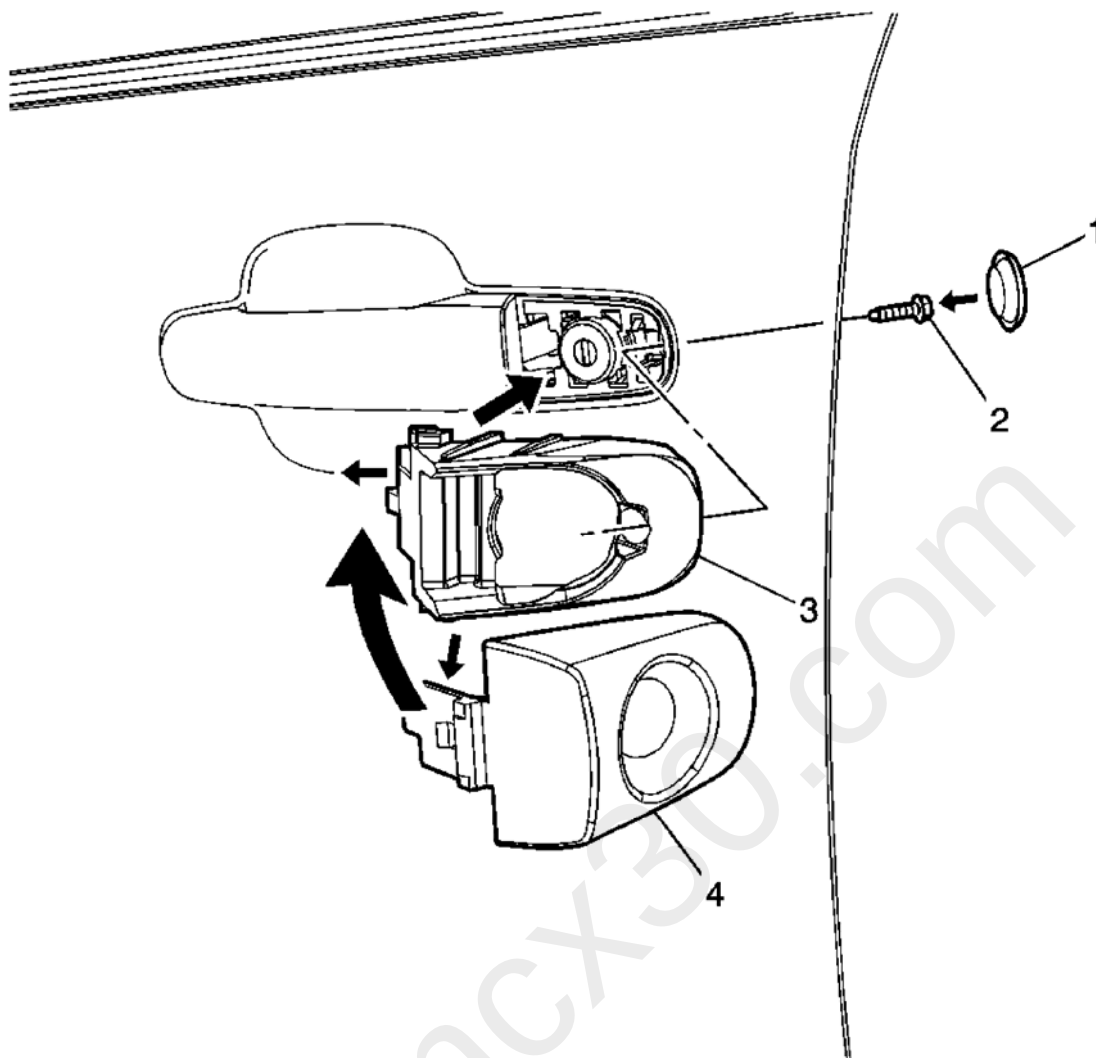


Fig. 12: Front Side Door Lock Opening Cover
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Front Side Door Outside Handle Screw Plug Procedure • Do Not remove the door trim panel. • Use a flat-bladed tool to remove the cylinder opening access plug.
	Front Side Door Outside Handle Screw CAUTION: Refer to <u>Fastener Caution</u> Fastener Caution.

2	Procedure: Do Not remove the cylinder screw completely from the housing. Unscrew the screw to a hard stop. Tighten: 7 N.m (62 lb in)
3	Front Side Door Outside Lock Core
4	Front Side Door Outside Lock Core Cap Tip: Use a flat-bladed tool to remove the cover from the lock cylinder core.

LIFTGATE OUTSIDE HANDLE REPLACEMENT

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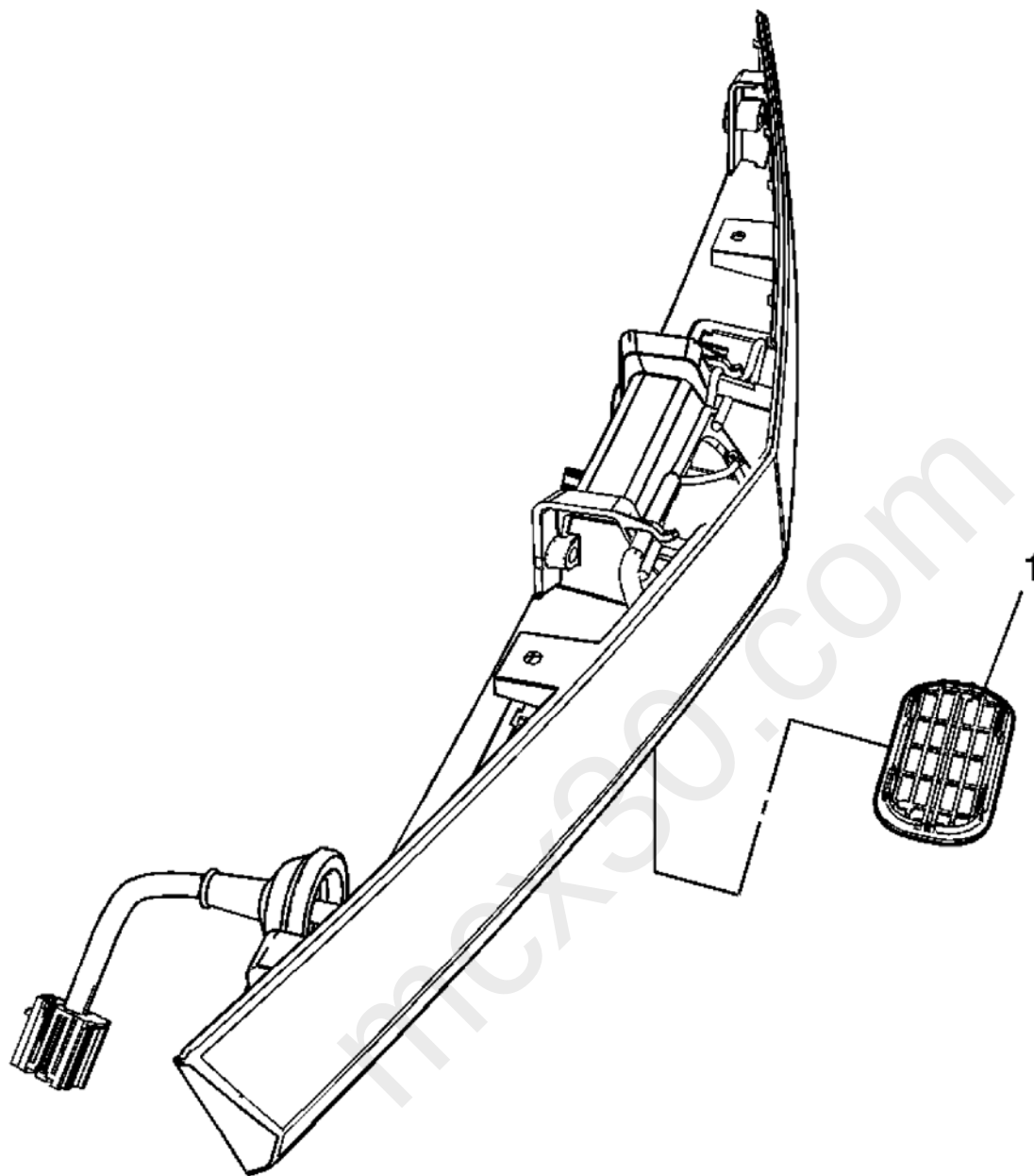


Fig. 13: Liftgate Outside Handle
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the liftgate applique. Refer to <u>Liftgate Applique Replacement (Equinox w/UVC)</u> or <u>Liftgate Applique Replacement (Equinox wo/UVC)</u> or <u>Liftgate Applique Replacement (Terrain)</u> .	
	Liftgate Outside Handle
	Procedure

- | | |
|---|---|
| 1 | <ol style="list-style-type: none"> 1. Disconnect the electrical harness from the applique. 2. Depress the clip fingers and push outward to remove the outside handle from the applique. |
|---|---|

LIFTGATE LATCH REPLACEMENT

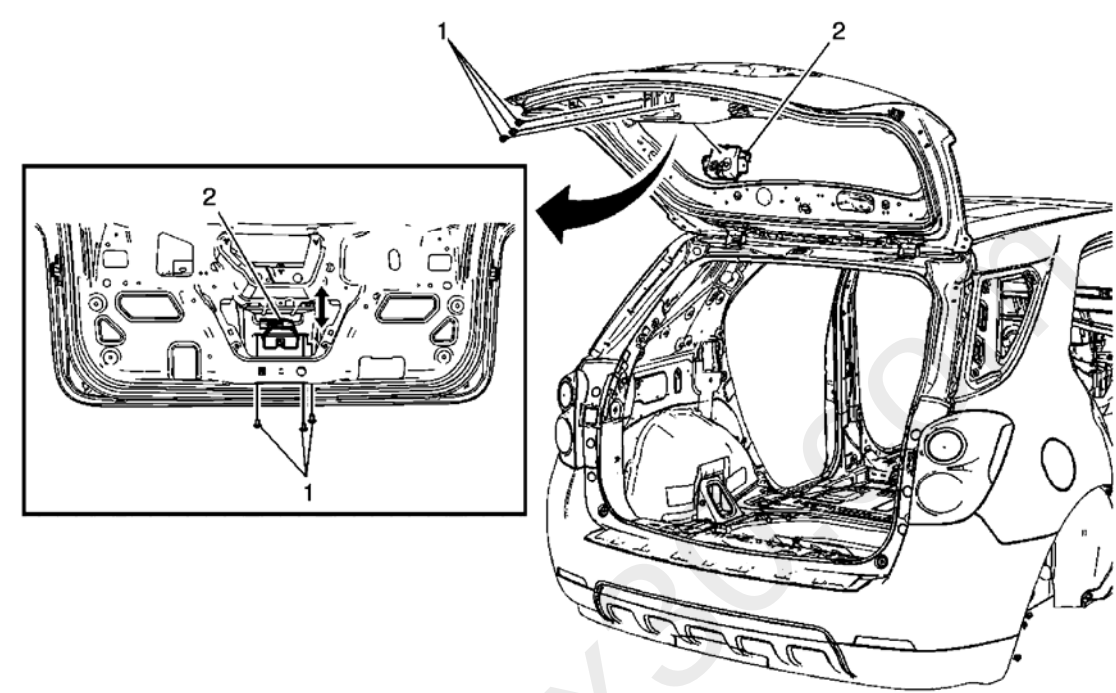


Fig. 14: Liftgate Latch
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the liftgate lower trim panel. Refer to Liftgate Lower Trim Finish Panel Replacement .	
1	Liftgate Latch Screw (Qty: 3) CAUTION: Refer to Fastener Caution . Tighten: 9 N.m (80 lb in)
2	Liftgate Latch Assembly Procedure 1. Disconnect the electrical connector. 2. Remove the plastic tether before installing the liftgate latch.

3. Calibrate the liftgate. Refer to Liftgate Calibration.
4. Adjust the liftgate if needed. Refer to Liftgate Adjustment.

REAR SIDE DOOR OUTSIDE HANDLE REPLACEMENT

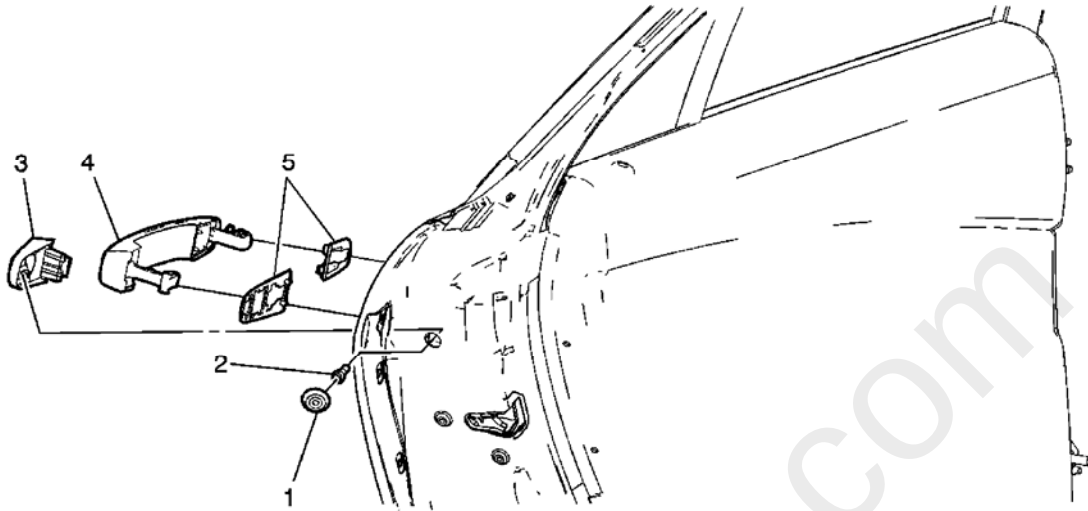


Fig. 15: Rear Side Door Outside Handle
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Bolt Access Plug Tip: Use a plastic flat-bladed tool to remove.
2	Rear Side Door Outside Handle Cap Bolt CAUTION: Refer to <u>Fastener Caution</u>. Tighten: 9 N.m (80 lb in)
3	Rear Door Outside Handle Cap
4	Rear Door Outside Handle Tip: Pull the outside handle rearward to release it from the handle housing.
5	Rear Door Outside Handle Gasket Procedure: Inspect the door for proper operation before installing the door trim panel.

REAR SIDE DOOR OUTSIDE HANDLE HOUSING REPLACEMENT

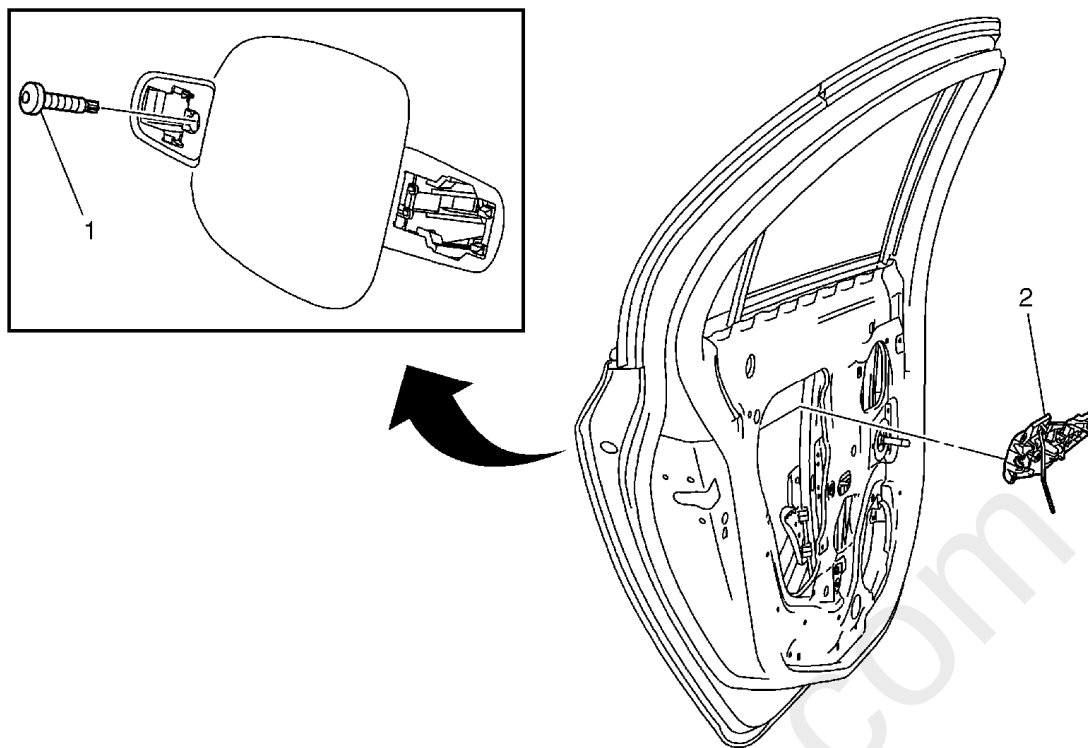


Fig. 16: Rear Side Door Outside Handle Housing
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the rear side door trim panel. Refer to <u>Rear Side Door Trim Panel Replacement</u> . 2. Remove the outside door handle. Refer to <u>Rear Side Door Outside Handle Replacement</u>	
1	Rear Side Door Outside Handle Housing Bolt CAUTION: Refer to <u>Fastener Caution</u> . Procedure: Remove the water deflector. Tighten: 10 N.m (89 lb in)
2	Rear Side Door Outside Handle Housing Procedure: Inspect the door for proper operation before installing the door trim panel. Tip: Disconnect the lock and handle rods to remove the housing.

FRONT SIDE DOOR LATCH REPLACEMENT

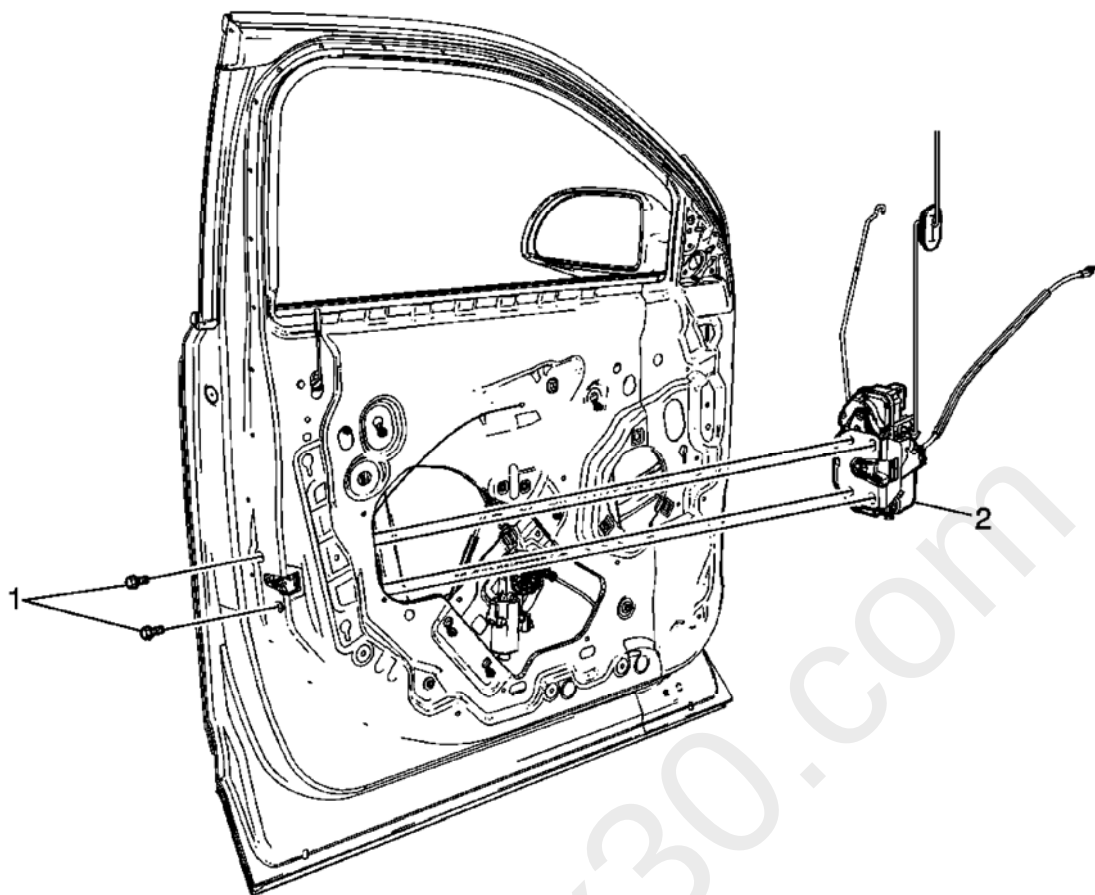


Fig. 17: Front Side Door Latch
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Front Side Door Lock Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Procedures 1. Remove the water deflector. 2. Release the door lock cable retainers from the door. 3. Remove the outside door handle housing, lock and rods together. 4. Disconnect the door lock electrical connector. 5. Disconnect the lock rods. Tighten: 10 N.m (89 lb in)

	Tip: Un-bolt and reposition the window run channel to allow the latch to be remove.
2	Front Side Door Lock Assembly Procedure: Inspect the door lock for proper operation before installing the door trim panel.

REAR SIDE DOOR LATCH REPLACEMENT

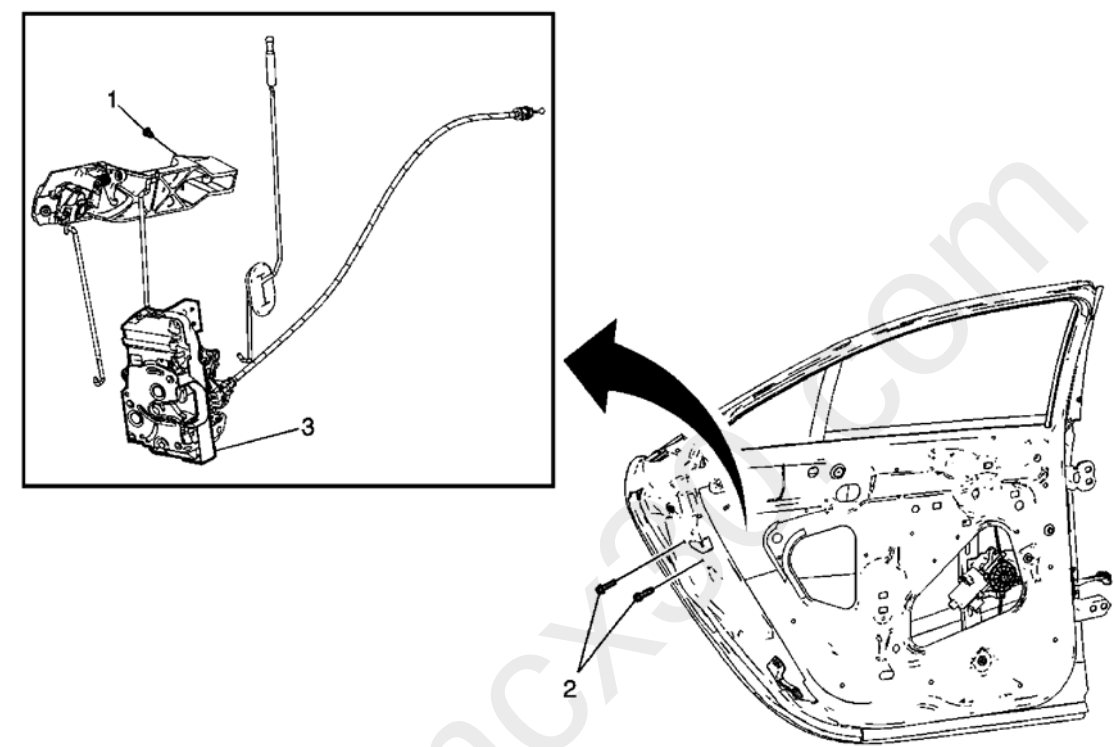


Fig. 18: Rear Side Door Latch
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear side door trim panel. Refer to <u>Rear Side Door Trim Panel Replacement</u> .	
1	Rear Side Door Outside Handle Housing Screw CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Remove the water deflector. 2. Release the inside handle cable retainers before removing the door lock.

	3. Disconnect the door lock electrical connector. 4. Remove the door lock rods Tighten: 10 N.m (89 lb in)
2	Rear Side Door Lock Bolt (Qty: 2) Tighten: 10 N.m (89 lb in)
3	Rear Side Door Lock Assembly Procedure: Inspect the door for proper operation before installing the door trim panel.

REAR SIDE DOOR LOCK CYLINDER OPENING COVER REPLACEMENT

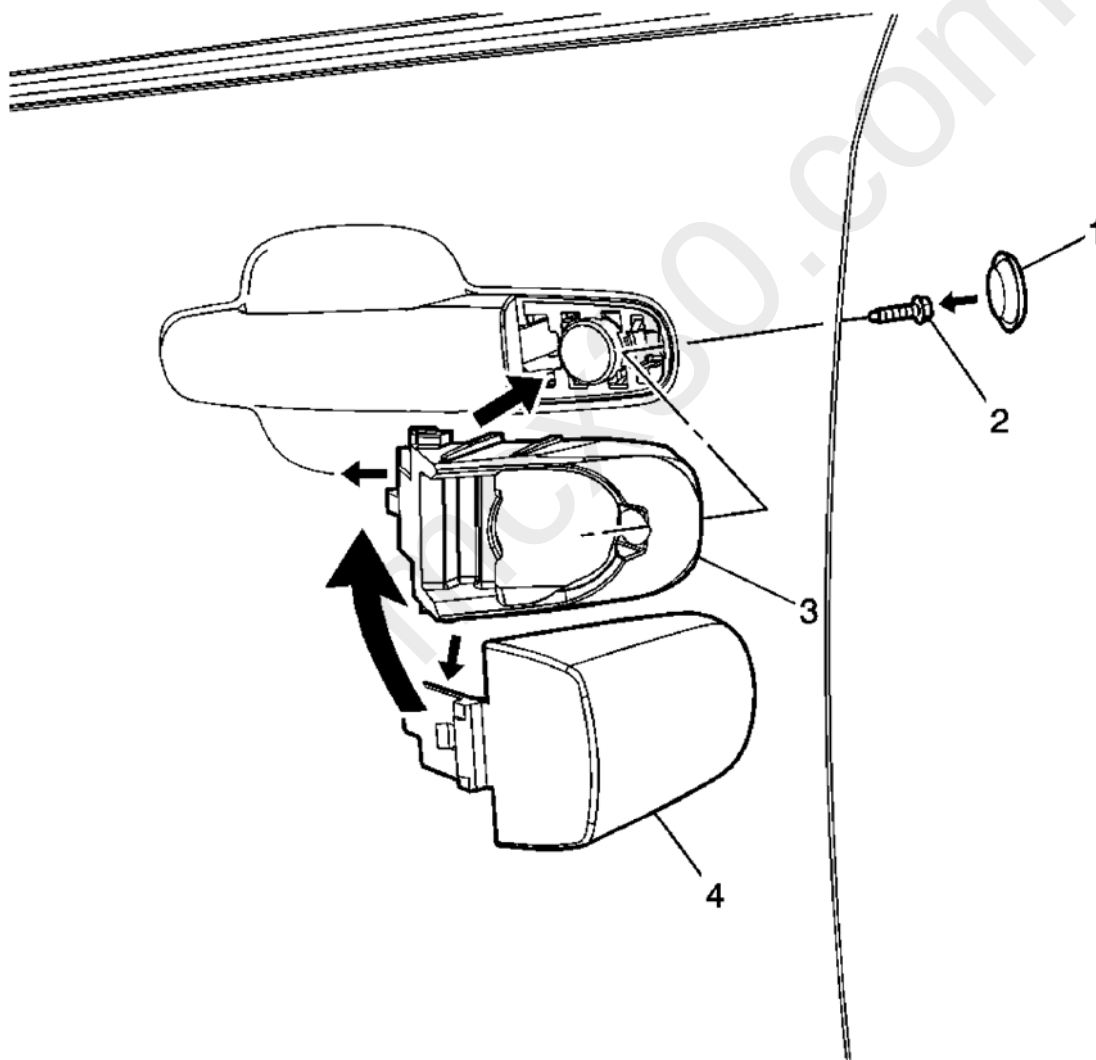


Fig. 19: Rear Side Door Lock Cylinder Opening Cover
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Rear Side Door Outside Handle Screw Plug Procedure • Do Not remove the door trim panel. • Use a flat-bladed tool to remove the cylinder opening access plug.
2	Rear Side Door Outside Handle Screw CAUTION: Refer to <u>Fastener Caution</u> Fastener Caution. Procedure: Do Not remove the cylinder screw completely from the housing. Unscrew the screw to a hard stop. Tighten: 7 N.m (62 lb in)
3	Rear Side Door Outside Lock Core
4	Rear Side Door Outside Lock Core Cap Tip: Use a flat-bladed tool to remove the cover from the lock cylinder core.

ACCESSORY AND LIFTGATE CONTROL MODULE REPLACEMENT

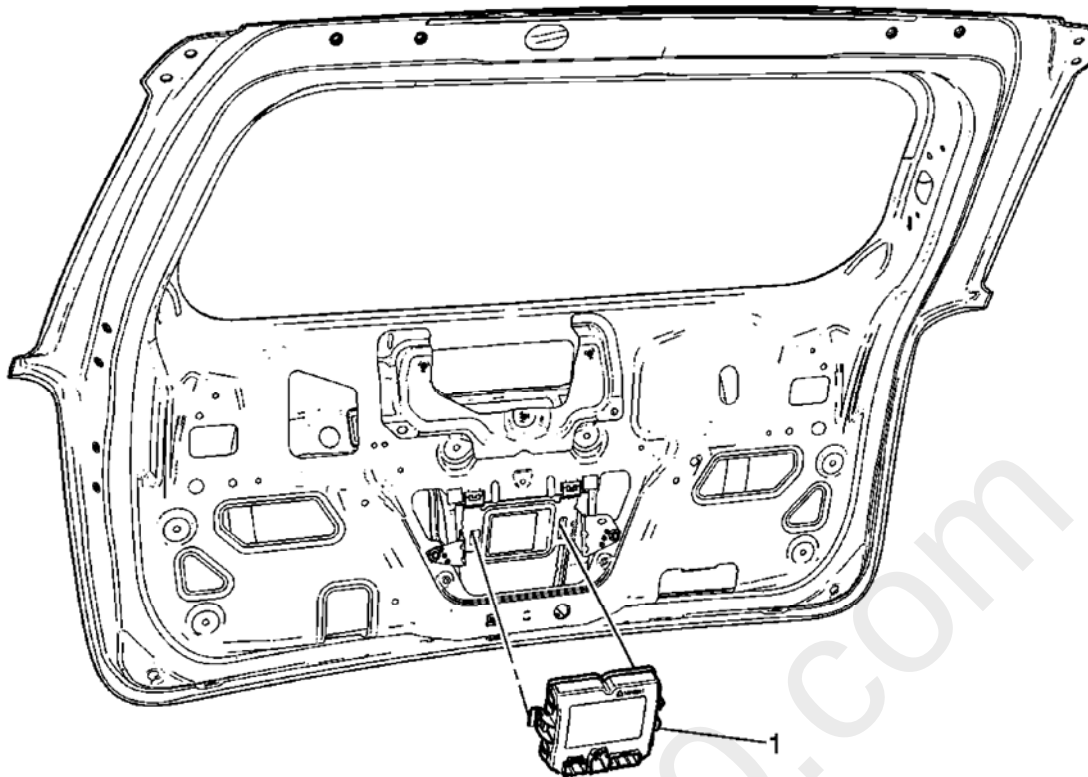


Fig. 20: Accessory and Liftgate Control Module
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the lower liftgate trim panel. Refer to <u>Liftgate Lower Trim Finish Panel Replacement</u>	
1	Accessory and Liftgate Control Module Procedure 1. Disconnect the electrical connectors. 2. Push in tabs to release module from the bracket. 3. Reprogram the control module if replaced. Refer to <u>Control Module References</u> .

LIFTGATE HYDRAULIC PUMP REPLACEMENT

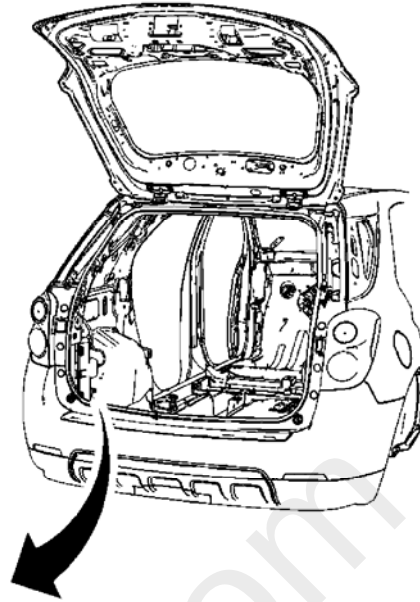
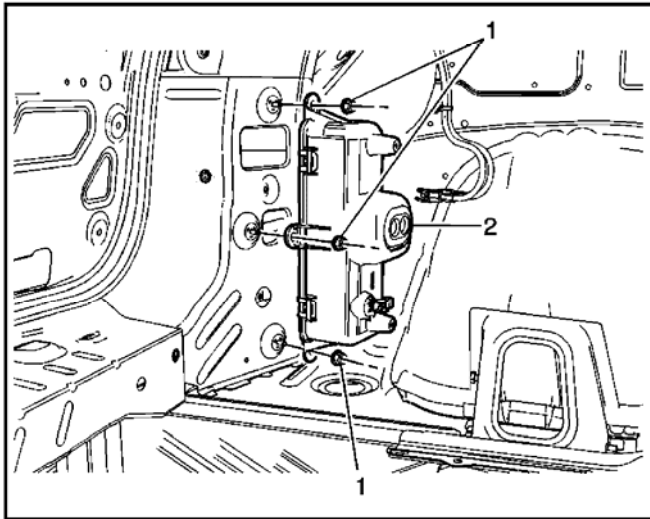


Fig. 21: Liftgate Hydraulic Pump
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: Refer to <u>Eye Protection Warning</u> .	
WARNING: Refer to <u>Liftgate Hydraulic System Warning</u> .	
Preliminary Procedures	
1. Open and support the liftgate.	
2. Disconnect the battery. Refer to <u>Battery Negative Cable Disconnection and Connection</u> .	
3. Remove the body side trim panel - left side. Refer to <u>Body Side Trim Panel Replacement - Left Side</u> .	
4. Disconnect the hydraulic pump hoses. Refer to <u>Liftgate Hydraulic Actuator Hose Disconnection and Connection</u> .	
5. Position a clean protective covering over the interior and adjacent panels.	
1	Liftgate Hydraulic Pump Nut (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> .

	Tighten: 12 N.m (106 lb in)
2	Liftgate Hydraulic Pump Procedure: Inspect the liftgate hydraulic system for proper operation before final assembly of the trim panels. Refer to <u>Liftgate Hydraulic System Refilling</u> and <u>Liftgate Hydraulic System Bleeding</u> .

LIFTGATE HYDRAULIC PUMP INSULATOR REPLACEMENT

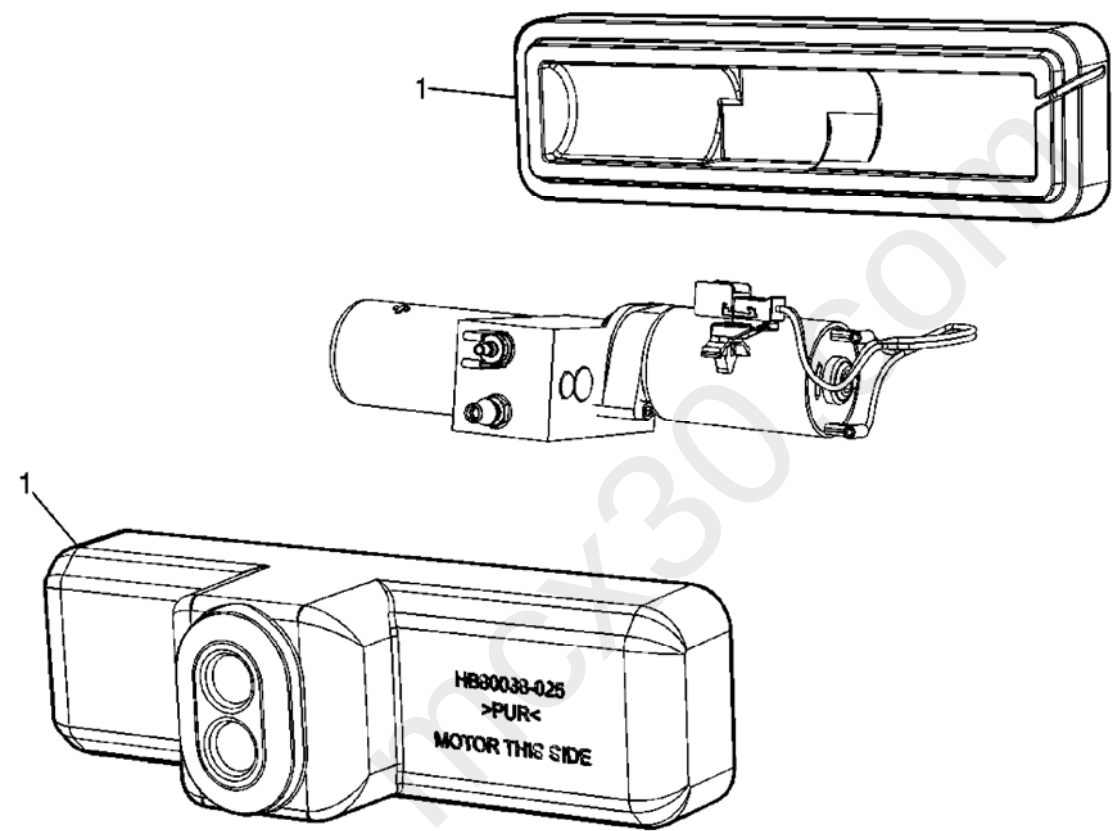


Fig. 22: Liftgate Hydraulic Pump Insulator
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: Refer to <u>Eye Protection Warning</u> .	
WARNING: Refer to <u>Liftgate Hydraulic System Warning</u> .	
Preliminary Procedures	

1. Remove the liftgate hydraulic pump. Refer to **Liftgate Hydraulic Pump Replacement**.
2. Remove the liftgate hydraulic pump cover. Refer to **Liftgate Hydraulic Pump Cover Replacement (Equinox)** or **Liftgate Hydraulic Pump Cover Replacement (Terrain)**.

1

Liftgate Hydraulic Pump Insulator

Procedure:

Separate the foam insulator halves from the liftgate hydraulic pump motor.

LIFTGATE HYDRAULIC PUMP COVER REPLACEMENT (EQUINOX)

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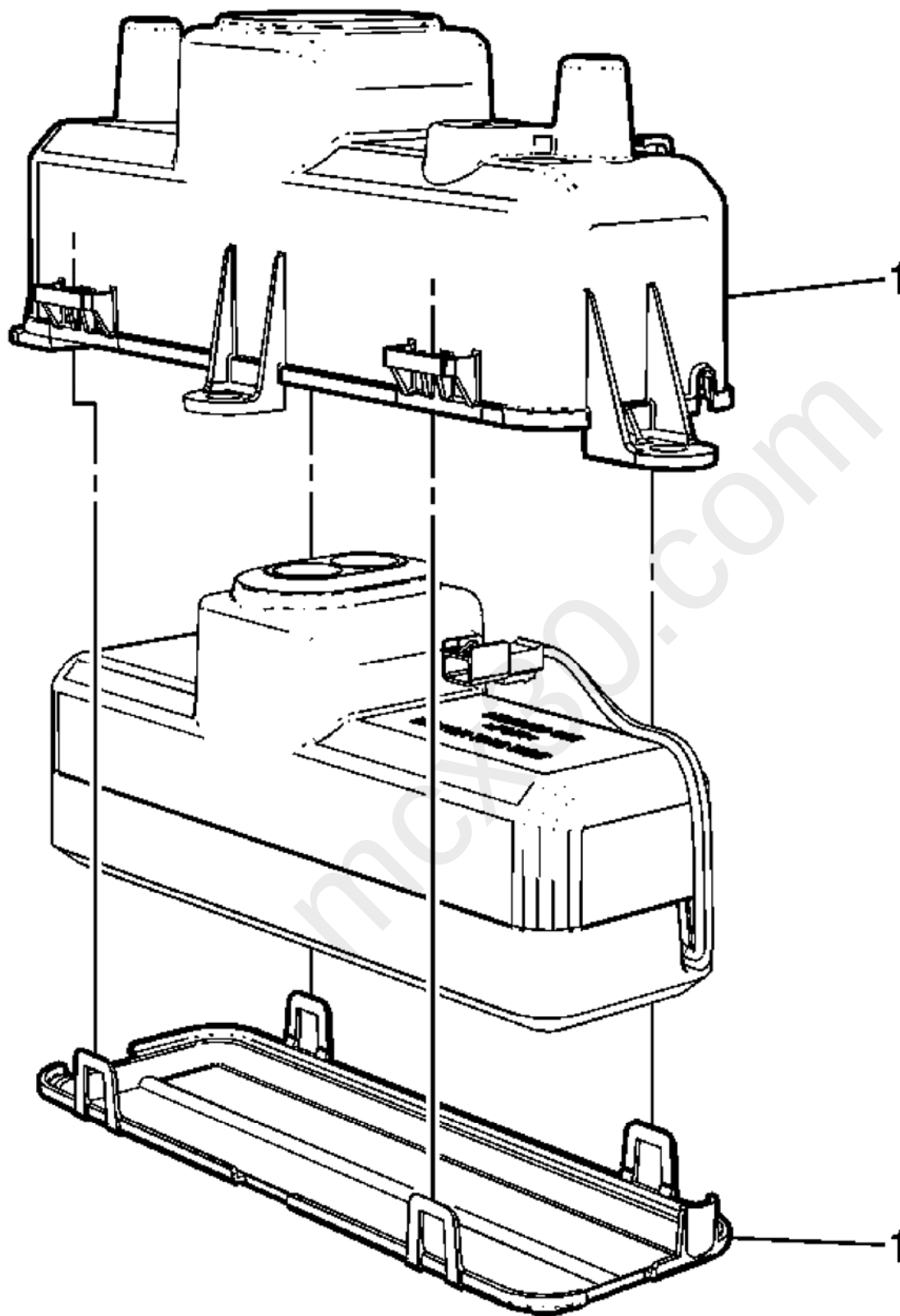


Fig. 23: Liftgate Hydraulic Pump Cover (Equinox)

Callout	Component Name
WARNING: Refer to <u>Eye Protection Warning</u> . WARNING: Refer to <u>Liftgate Hydraulic System Warning</u> . Preliminary Procedures 1. Open and support the liftgate. 2. Disconnect the battery. Refer to <u>Battery Negative Cable Disconnection and Connection</u> . 3. Remove the liftgate hydraulic pump from the vehicle. Refer to <u>Liftgate Hydraulic Pump Replacement</u>.	
1	Liftgate Hydraulic Pump Cover Procedure 1. Separate the cover halves from the liftgate pump by releasing the retainer tabs. 2. Inspect the liftgate hydraulic system for proper operation before final assembly of the trim panels. Refer to <u>Liftgate Hydraulic System Refilling</u> and <u>Liftgate Hydraulic System Bleeding</u>.

LIFTGATE HYDRAULIC PUMP COVER REPLACEMENT (TERRAIN)

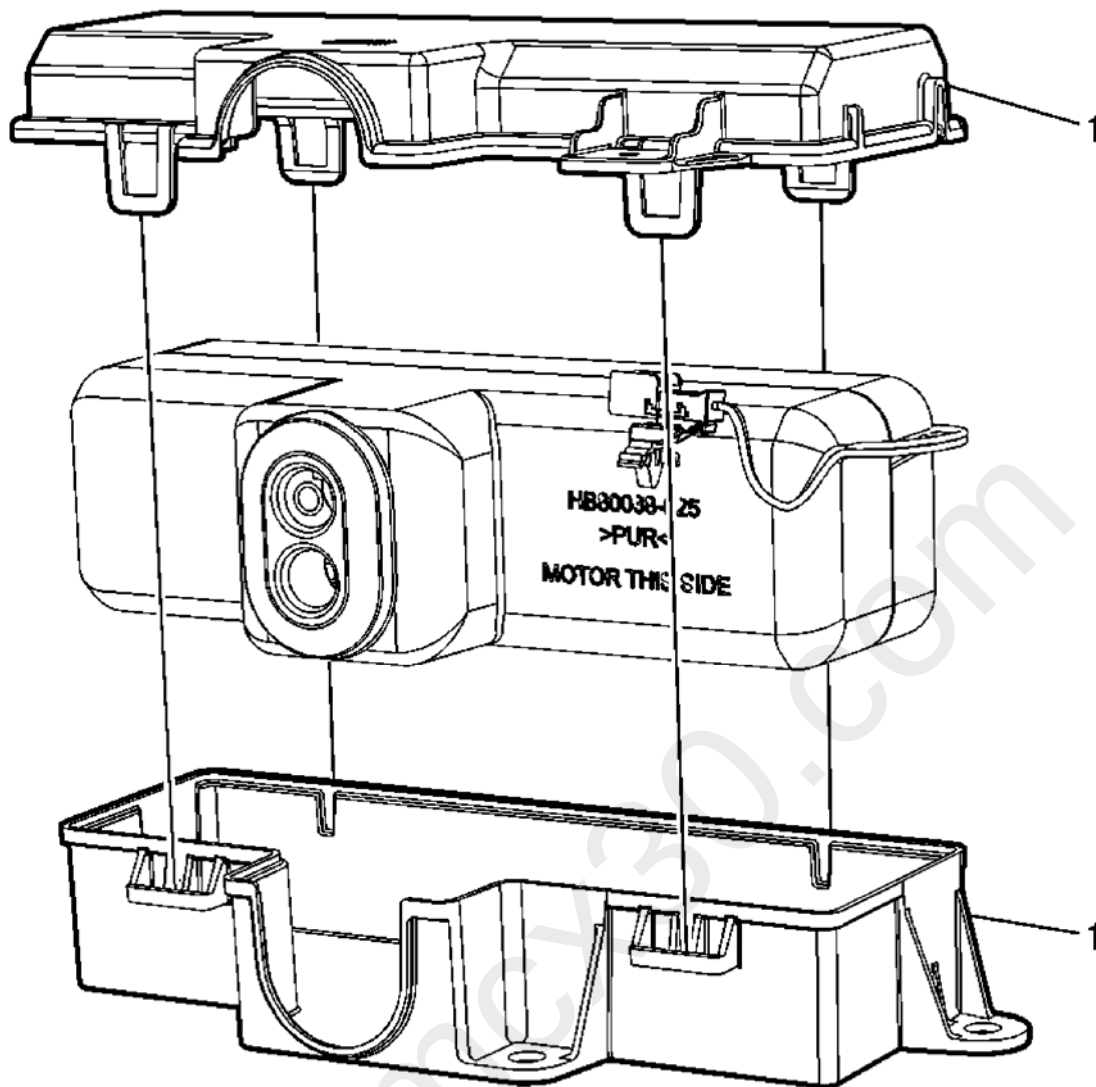


Fig. 24: Liftgate Hydraulic Pump Cover (Terrain)
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: Refer to <u>Eye Protection Warning</u> .	
WARNING: Refer to <u>Liftgate Hydraulic System Warning</u> .	
Preliminary Procedures	
1. Open and support the liftgate.	
2. Disconnect the battery. Refer to <u>Battery Negative Cable Disconnection and Connection</u> .	

3. Remove the liftgate hydraulic pump from the vehicle. Refer to <u>Liftgate Hydraulic Pump Replacement</u> .	
1	Liftgate Hydraulic Pump Cover Procedure 1. Separate the cover halves from the liftgate pump by releasing the retainer tabs. 2. Inspect the liftgate hydraulic system for proper operation before final assembly of the trim panels. Refer to <u>Liftgate Hydraulic System Refilling</u> and <u>Liftgate Hydraulic System Bleeding</u>.

FRONT SIDE DOOR OUTSIDE HANDLE HOUSING REPLACEMENT

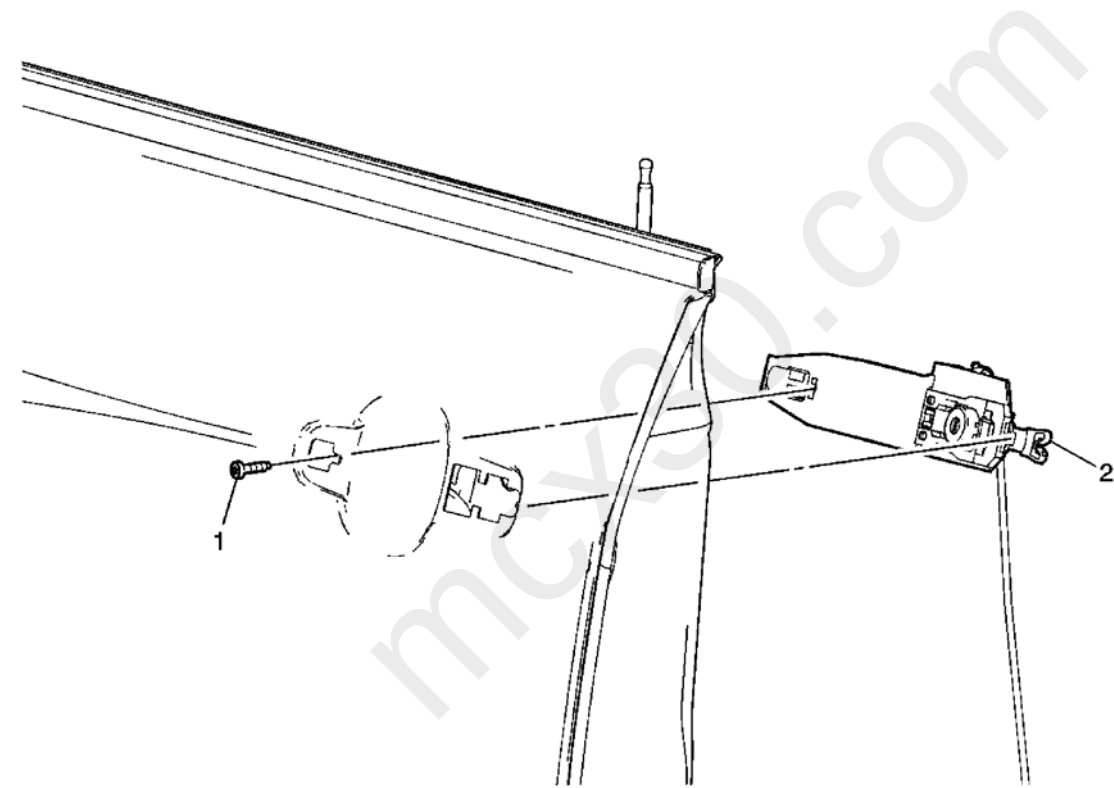


Fig. 25: Front Side Door Outside Handle Housing
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures	
1. Remove the front side door trim panel. Refer to <u>Front Side Door Trim Panel Replacement</u>. 2. Remove the outside door handle. Refer to <u>Front Side Door Outside Handle Replacement</u>.	
	Front Side Door Handle Housing Bolt (Qty: 2)

1	CAUTION: Refer to <u>Fastener Caution</u> . Procedure 1. Remove the water deflector. 2. Disconnect the door lock electrical connector. Tighten: 7 N.m (62 lb in)
2	Front Side Door Handle Housing Procedure 1. Disconnect the lock and handle rods to remove the housing. 2. Release the inside handle cable retainers before removing the door lock. 3. Inspect the door for proper operation before installing the door trim panel.

FRONT SIDE DOOR LOCKING ROD REPLACEMENT

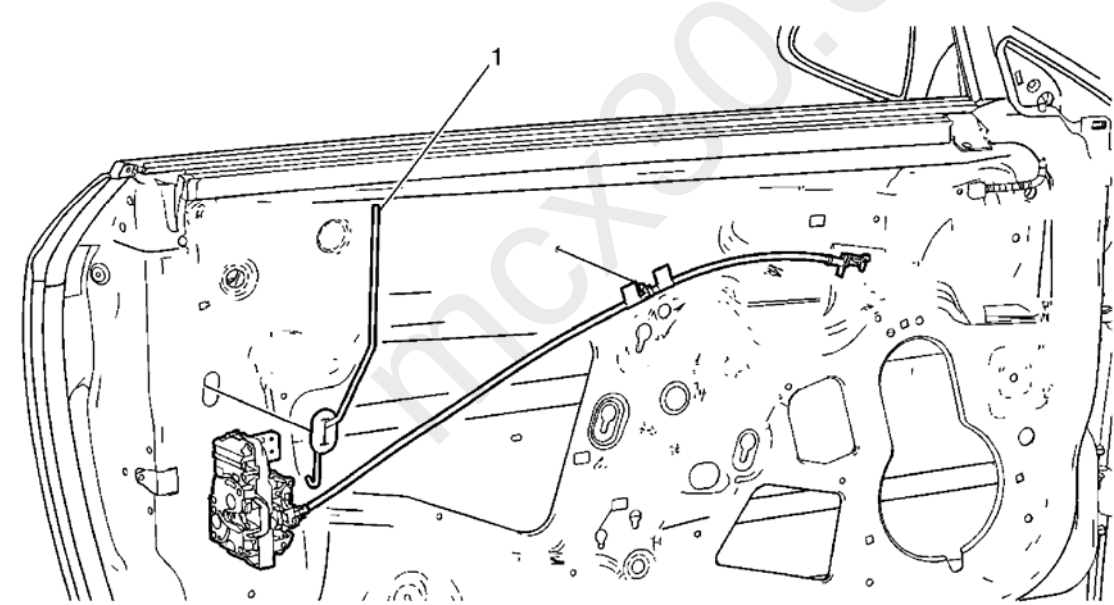


Fig. 26: Front Side Door Locking Rod
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the front side door trim panel. Refer to <u>Front Side Door Trim Panel Replacement</u> . 2. Remove the front side door lock. Refer to <u>Front Side Door Latch Replacement</u>.	

1	Front Side Door Lock Rod Procedure 1. Remove the water deflector. 2. Inspect the door for proper operation before installing the door trim panel.
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FRONT SIDE DOOR LOCK CYLINDER ROD REPLACEMENT

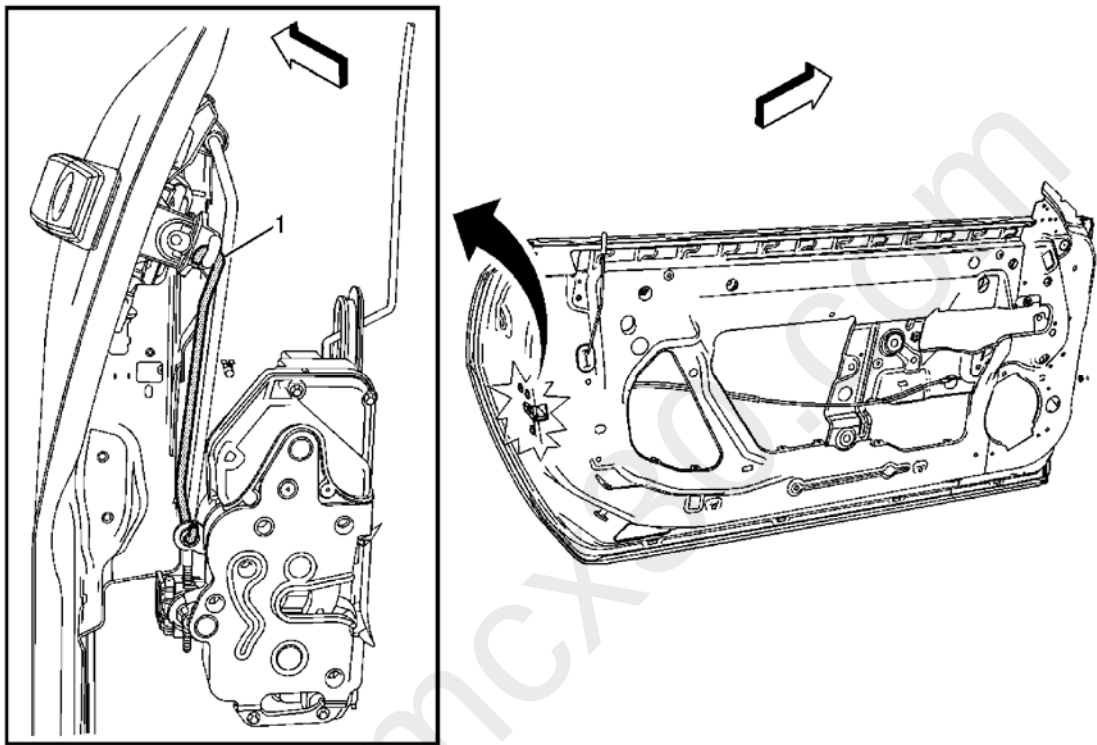


Fig. 27: Front Side Door Lock Cylinder Rod
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures 1. Remove the front side door trim panel. Refer to <u>Front Side Door Trim Panel Replacement</u>. 2. Remove the front side door latch. Refer to <u>Front Side Door Latch Replacement</u>.	
1	Front Side Door Locking Rod Procedure 1. Remove the water deflector. 2. Inspect the door for proper operation before installing the door trim panel.

FRONT SIDE DOOR OUTSIDE HANDLE ROD ADJUSTMENT

Removal Procedure

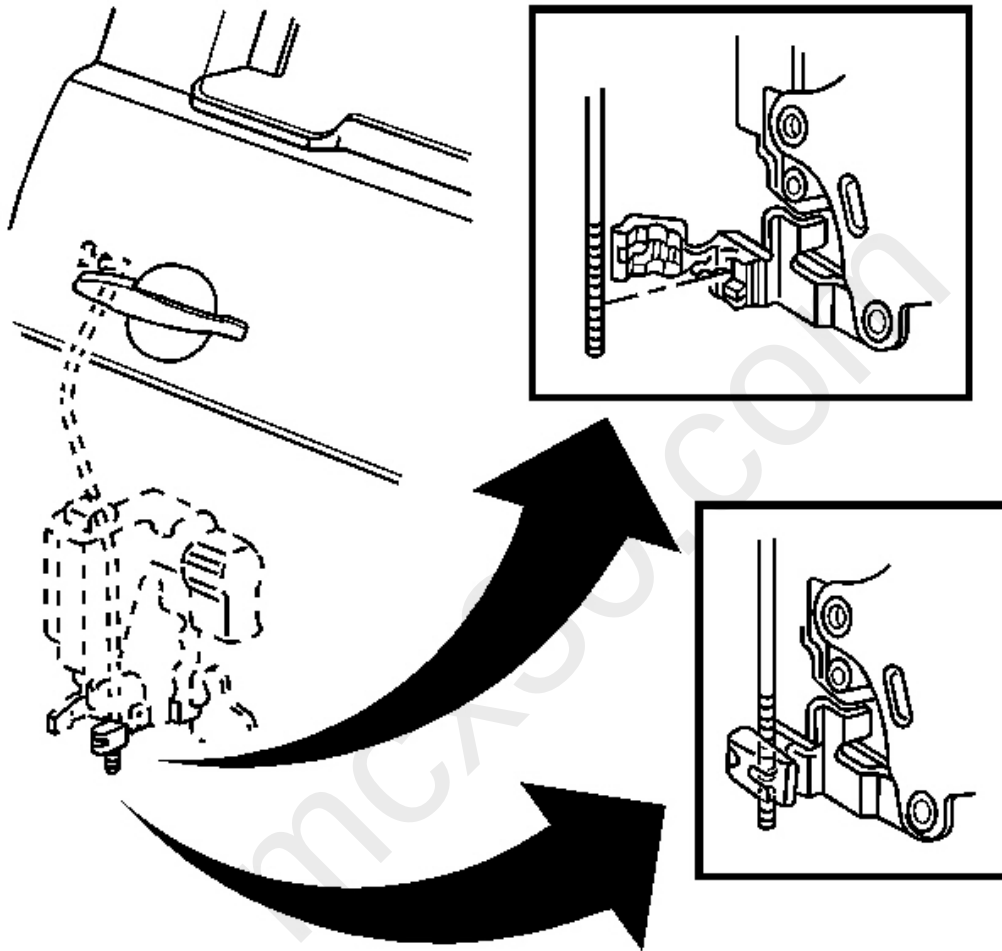


Fig. 28: View Of Handle Rod To Lock Clip
Courtesy of GENERAL MOTORS CORP.

1. Remove the front side door trim panel. Refer to **Front Side Door Trim Panel Replacement** .
2. Remove the front side door water deflector.
3. Use a flat-head tool to open the clip from the threaded rod connecting the lock to the outside handle.

NOTE: The rear window channel blocks access to the rod clip. Removing the two bolts from the rear run channel enough to undo clip.

4. Adjust the travel of the handle by removing the threaded rod from the clip.

Installation Procedure

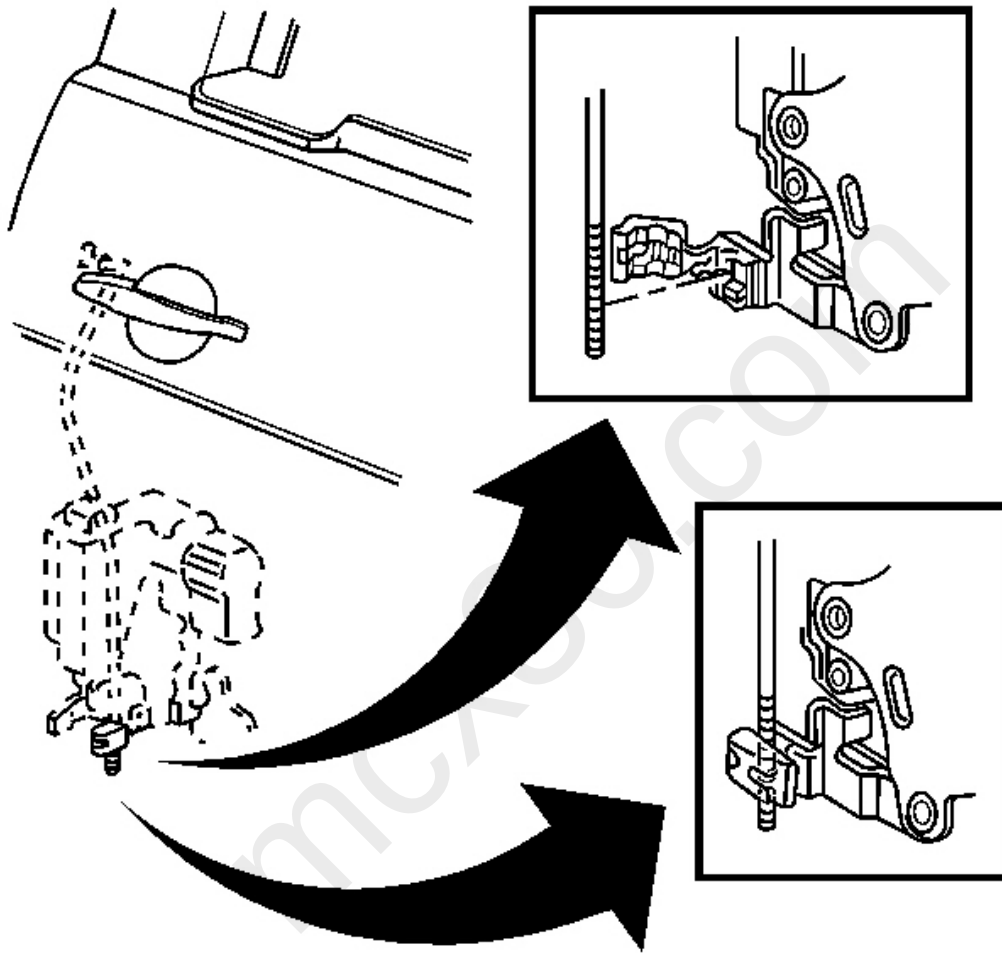


Fig. 29: View Of Handle Rod To Lock Clip
Courtesy of GENERAL MOTORS CORP.

1. Position the outside door handle rod in the clip in order to eliminate any free play in the outside door handle.
2. Install the clip cover closed over the threaded outside door handle rod.
3. Inspect the door lock system for proper operation.
4. Install the front side door water deflector.
5. Install the front side door trim panel. Refer to **Front Side Door Trim Panel Replacement** .

FRONT SIDE DOOR OUTSIDE HANDLE ROD REPLACEMENT

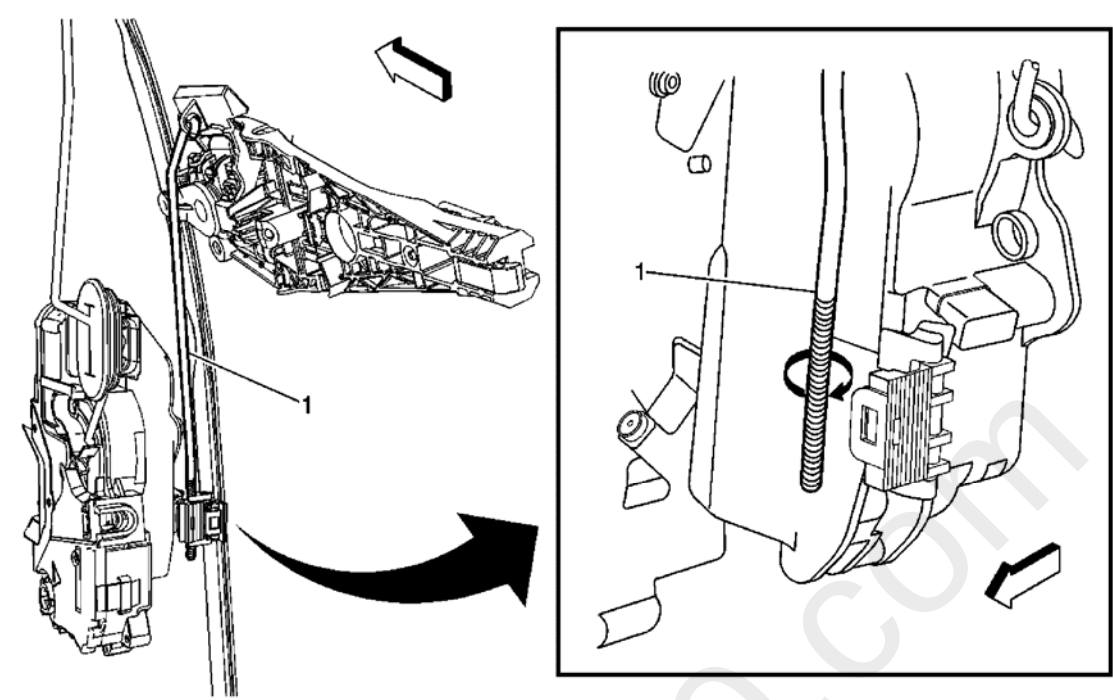


Fig. 30: Front Side Door Outside Handle Rod
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures: Remove the front side door trim panel. Refer to <u>Front Side Door Trim Panel Replacement</u> .	
1	Front Side Door Outside Handle Rod
	Procedures
	1. Remove the water deflector.
	2. Position the window run channel to gain access to the linkage lever-clip
	3. Opening mechanism at shift linkage lever - clip
	4. Outside door handle adjustment. Refer to <u>Front Side Door Outside Handle Rod Adjustment</u> .
	5. Inspect the door for proper operation before installing the door trim panel.

LIFTGATE HYDRAULIC SYSTEM REFILLING

WARNING: Refer to **Eye Protection Warning** .

WARNING: Refer to Battery Disconnect Warning .

NOTE:

- The actuator/hose assemblies are shipped full with fluid. In this case the pump fluid reservoir should only be filled to the normal + sign. Do not overfill to compensate for an empty actuator/hose assembly.
- Symptom of a low fluid condition will be a jerking liftgate and with an abnormal hydraulic pump noise as the liftgate is being open. The liftgate will not open to the full open position. The liftgate will reverse before reaching the full open position if not operating properly.
- Inspection of the hydraulic fluid level and/or refilling may only be completed if the liftgate hydraulic actuator pump is removed from the vehicle and placed on a clean/level workbench horizontally to the + sign to accurately inspect and add fluid as needed. The liftgate hydraulic actuator pump must rest in the horizontal position for one minute before the hydraulic fluid level is inspected. The level must be above the + mark.
- The liftgate hydraulic system components must be tested for proper operation before reinstalling the trim panels that cover the liftgate hydraulic actuator pump and actuator/hose assemblies so the fluid level can be recheck after cycling the liftgate 3-5 times to ensure proper fluid level. Rechecking the fluid level will require removal of the liftgate hydraulic pump.

1. Remove the liftgate hydraulic pump. Refer to Liftgate Hydraulic Pump Replacement.

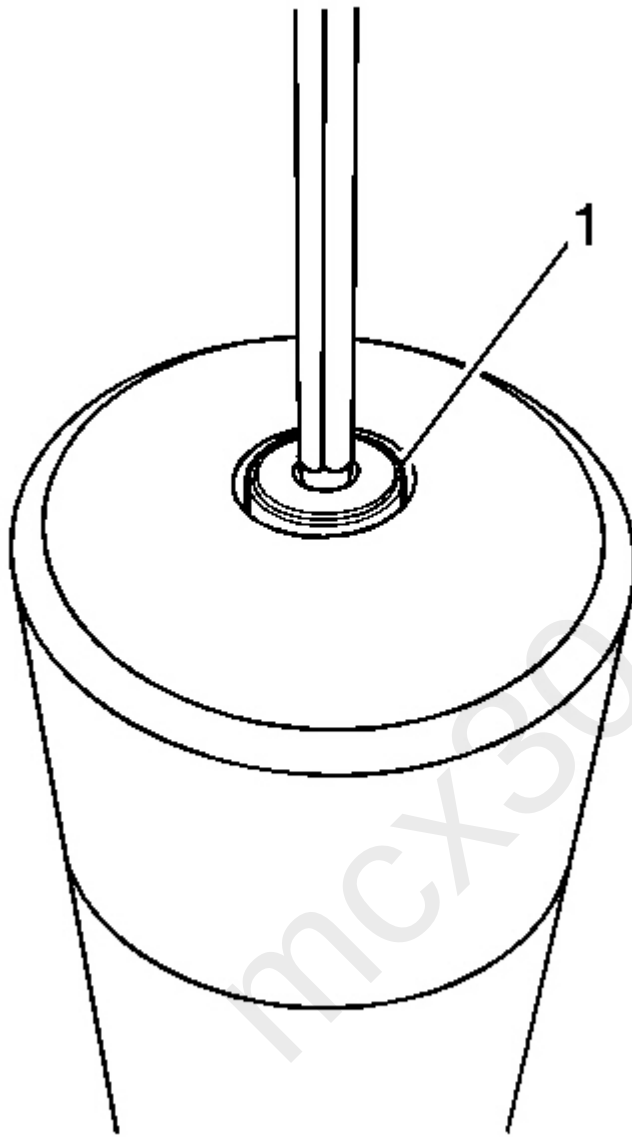


Fig. 31: Identifying Filler Screw
Courtesy of GENERAL MOTORS CORP.

2. Position the pump with the fluid reservoir in a vertical position with the filler screw (1) in the up and/or on top position.
3. Wipe the surface around the filler screw clean.
4. Remove the filler screw (1) and place on a clean, lint and dust free surface.

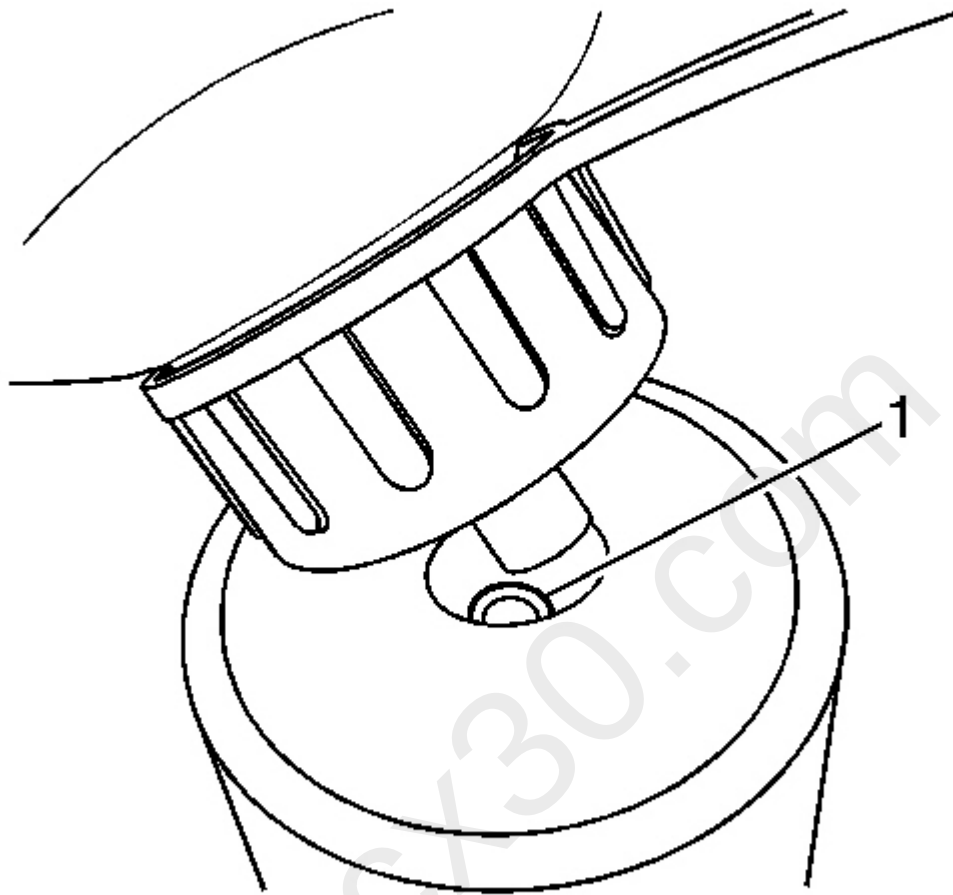


Fig. 32: Identifying Container

Courtesy of GENERAL MOTORS CORP.

5. Add hydraulic fluid from a clean container (1). Refer to **Adhesives, Fluids, Lubricants, and Sealers** for the recommended fluid.

CAUTION: Refer to Fastener Caution .

6. Install the filler screw and tighten to 1.3 N.m (12 lb in).

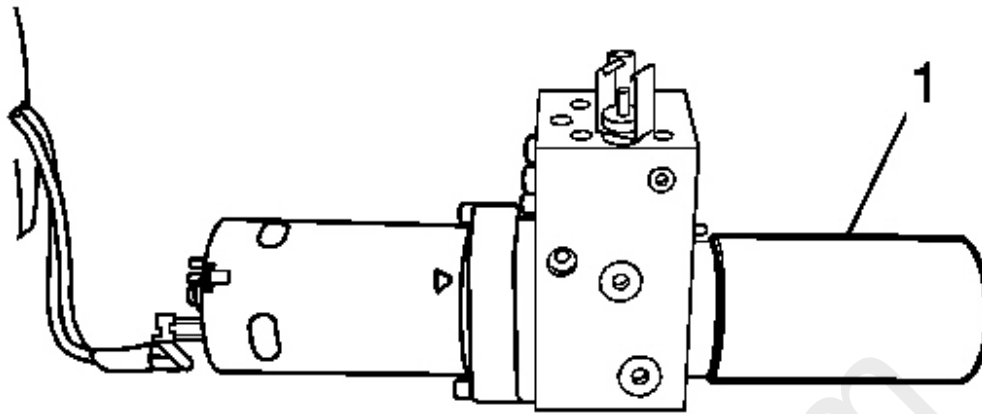


Fig. 33: Positioning Liftgate Hydraulic Actuator Pump
Courtesy of GENERAL MOTORS CORP.

7. Position the liftgate hydraulic actuator pump (1) on a clean/level workbench horizontally to the + sign to accurately inspect and add fluid as needed.

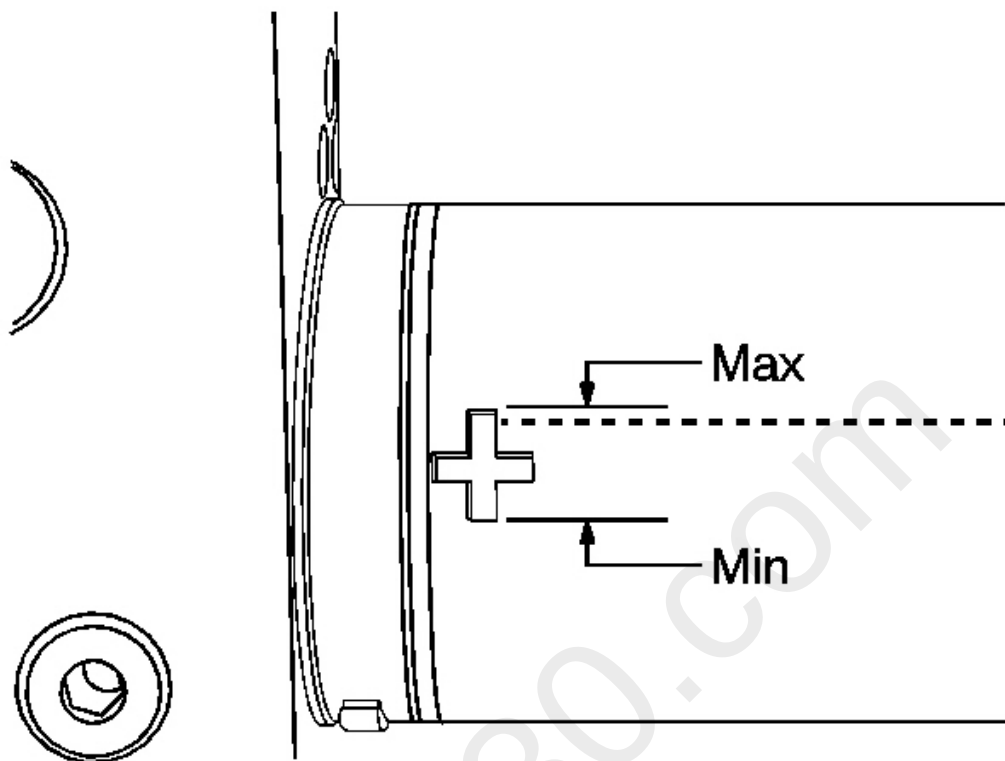


Fig. 34: Identifying Fluid Level Marks
Courtesy of GENERAL MOTORS CORP.

8. The liftgate hydraulic actuator pump must rest in the horizontal position for one minute before the hydraulic fluid level is inspected. The level must be above the + mark.
9. Install the pump without the trim and inspect for proper operation and fluid level. The fluid level can be checked after cycling the liftgate 3-5 times to ensure proper fluid level. If the fluid is still low repeat the procedure.
10. Install the liftgate hydraulic pump after inspection. Refer to **Liftgate Hydraulic Pump Replacement**.

LIFTGATE HYDRAULIC SYSTEM BLEEDING

WARNING: Refer to **Eye Protection Warning** .

NOTE: Inspection of the hydraulic fluid level and/or refilling may only be completed if the liftgate hydraulic actuator pump is removed from the vehicle and placed on a clean/level workbench horizontally to the + sign to accurately inspect and add

fluid as needed. The liftgate hydraulic actuator pump must rest in the horizontal position for one minute before the hydraulic fluid level is inspected. The level must be above the + mark after cycling the liftgate 3-5 times.

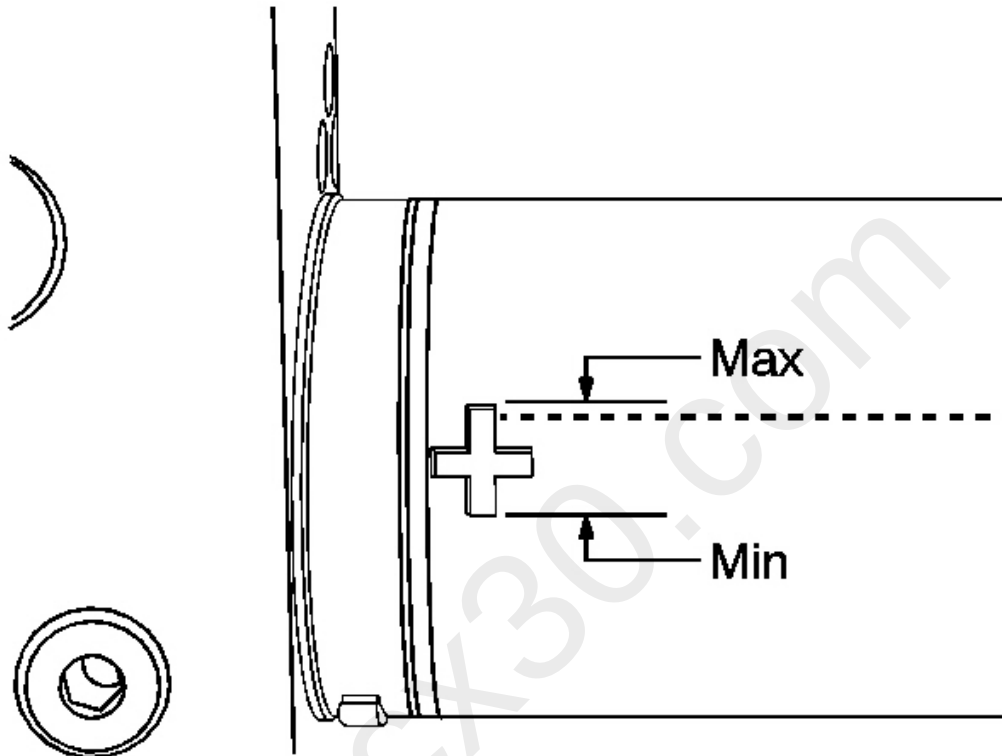


Fig. 35: Identifying Fluid Level Marks
Courtesy of GENERAL MOTORS CORP.

1. Cycle the liftgate 3-5 times to ensure proper fluid level.
2. Inspect the fluid level. Refer to **Liftgate Hydraulic Pump Replacement**.
3. If adding fluid is required, refer to **Liftgate Hydraulic System Refilling**.

LIFTGATE HYDRAULIC ACTUATOR REPLACEMENT

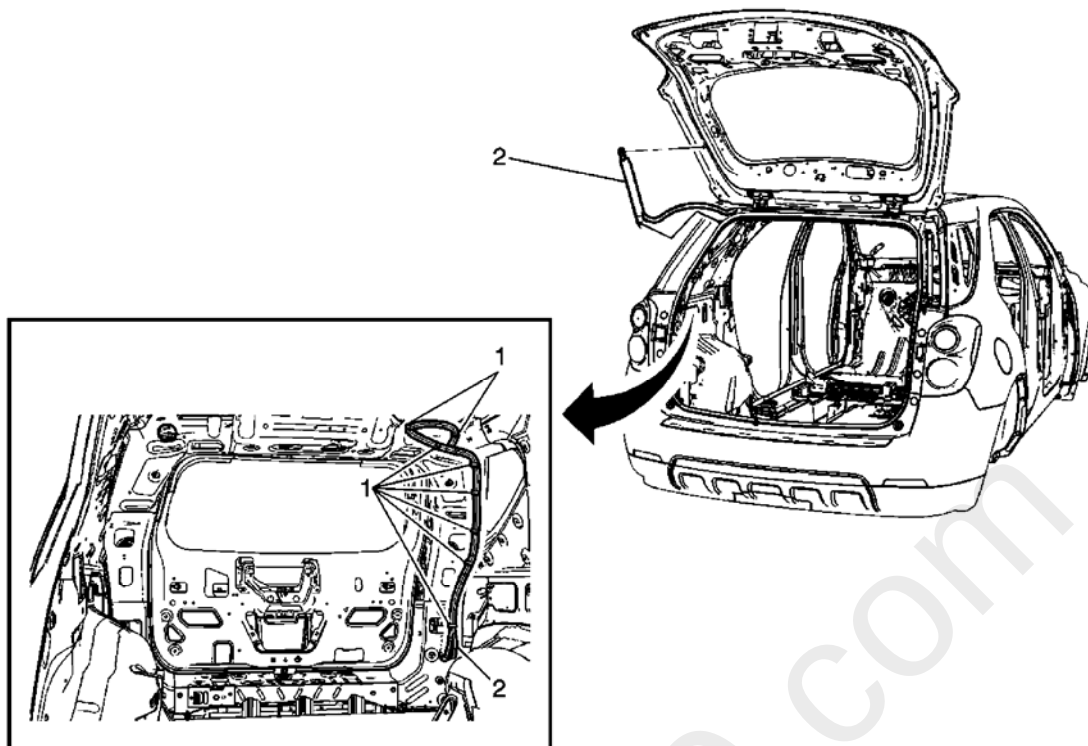


Fig. 36: Liftgate Hydraulic Actuator
 Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
WARNING: Refer to <u>Eye Protection Warning</u> . WARNING: Refer to <u>Liftgate Hydraulic System Warning</u> .	
Preliminary Procedures 1. Open and support the liftgate. 2. Disconnect the battery. Refer to <u>Battery Negative Cable Disconnection and Connection</u> . 3. Remove the left body side trim panel. Refer to <u>Body Side Trim Panel Replacement - Left Side</u> . 4. Position a protective covering over the interior and the adjacent body panels. 5. Disconnect the hydraulic hose from the hydraulic pump. Refer to <u>Liftgate Hydraulic Actuator Hose Disconnection and Connection</u> .	
1	Tie Wrap Retainer (Qty: 8) Procedure: Cut the tie wraps and replace with new tie wraps.
	Liftgate Hydraulic Actuator with Hose

	Procedure
2	1. Release the hydraulic hose rubber grommet from the liftgate opening channel. 2. Disconnect the liftgate hydraulic actuator from the liftgate and liftgate opening and slowly pull the hydraulic hoses from the pillar. 3. Inspect the liftgate hydraulic system for proper operation before final assembly of trim panels. Refer to <u>Liftgate Hydraulic System Refilling</u> and <u>Liftgate Hydraulic System Bleeding</u>.

LIFTGATE HYDRAULIC ACTUATOR HOSE DISCONNECTION AND CONNECTION

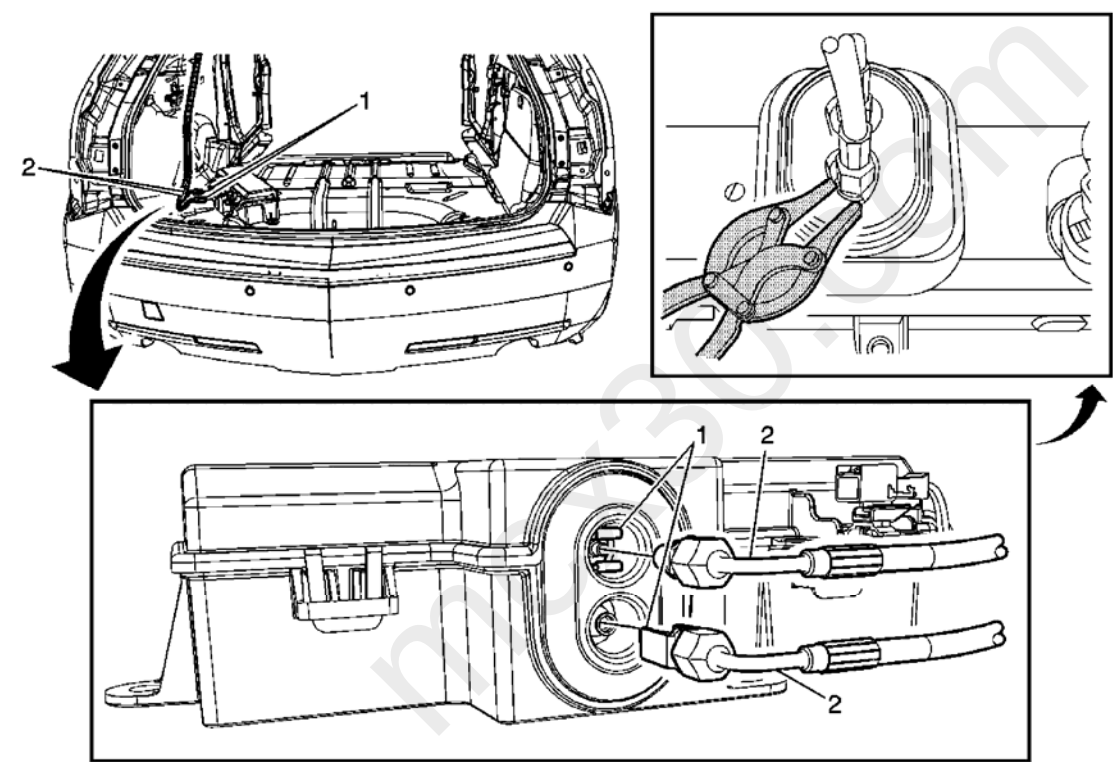


Fig. 37: Liftgate Hydraulic Actuator Hose
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Reposition the liftgate hydraulic pump. Refer to <u>Liftgate Hydraulic Pump Replacement</u> .	
1	Liftgate Hydraulic Actuator Quick Coupler
	Liftgate Hydraulic Actuator
	Procedure

2

1. Place a clean protective covering over the interior and adjacent areas.
2. Reposition the pump so that the lines are on top for minimal leakage.
3. Disconnect the quick connects using **J-8059**: pliers while gently pulling on the hydraulic actuator hose or equivalent.
4. Ensure the quick connects are not distorted during removal or installation by over spreading the quick connects.
5. Bleed the hydraulic system. Refer to **Liftgate Hydraulic System Bleeding**.
6. Refill the hydraulic system. Refer to **Liftgate Hydraulic System Refilling**.

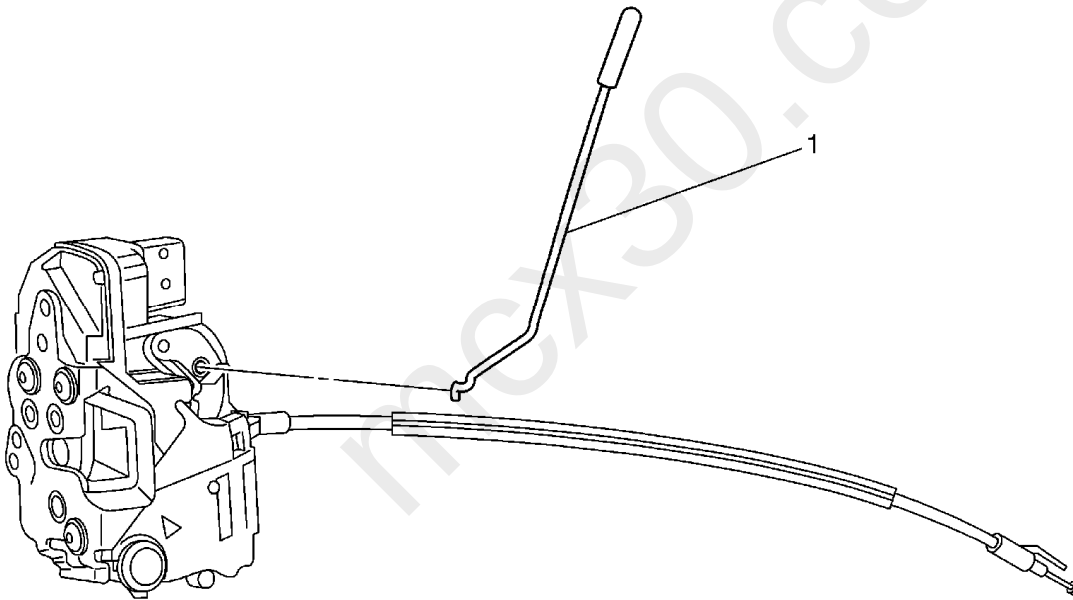
Special Tools:**J-8059:** Snap Ring Pliers - Parallel JawFor equivalent regional tools, refer to **Special Tools**.**REAR SIDE DOOR LOCKING ROD REPLACEMENT**

Fig. 38: Rear Side Door Locking Rod
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the rear side door lock. Refer to <u>Rear Side Door Latch Replacement</u> .	
1	Rear Side Door Locking Rod
Procedures	

1. Remove the water deflector.
2. Inspect the door for proper operation before installing the door trim panel.

REAR SIDE DOOR OUTSIDE HANDLE ROD ADJUSTMENT

Removal Procedure

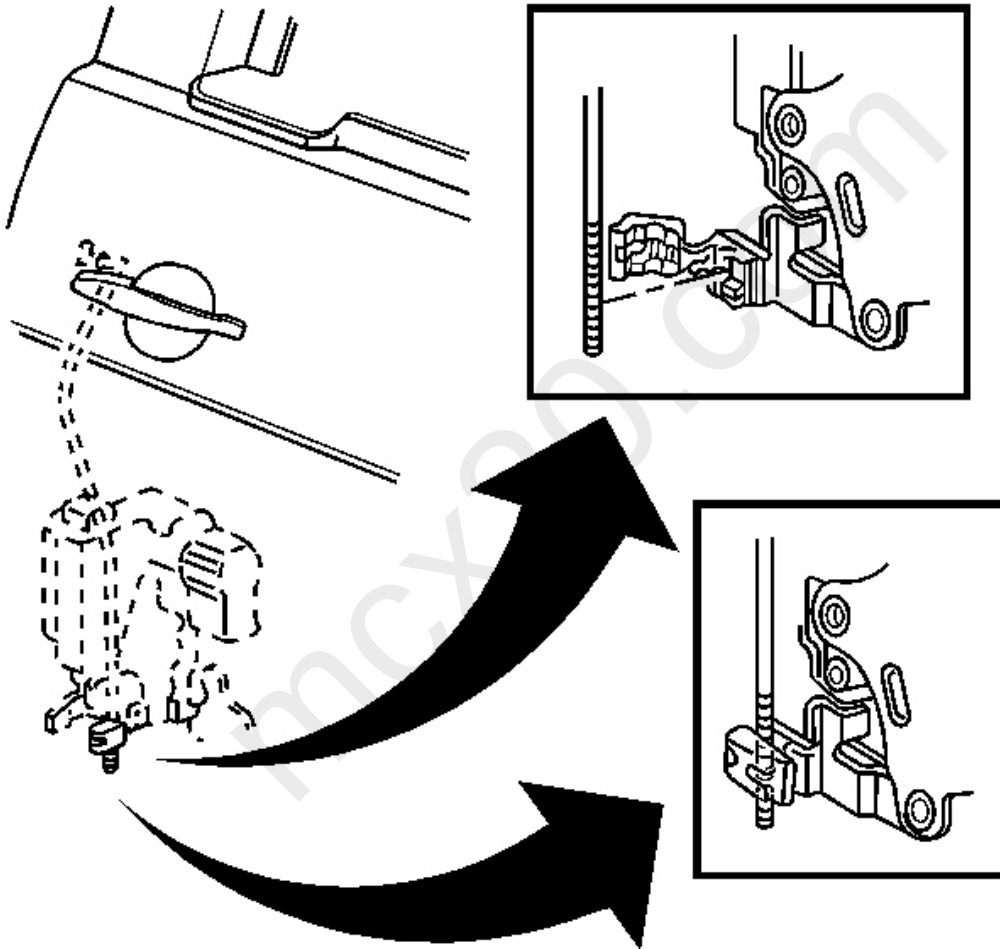


Fig. 39: View Of Handle Rod To Lock Clip
Courtesy of GENERAL MOTORS CORP.

1. Remove the rear side door trim panel. Refer to **Rear Side Door Trim Panel Replacement** .
2. Remove the rear side door water deflector.
3. Use a flat-head tool to open the clip from the threaded rod connecting the lock to the outside handle.

4. Adjust the travel of the handle by removing the threaded rod from the clip.

Installation Procedure

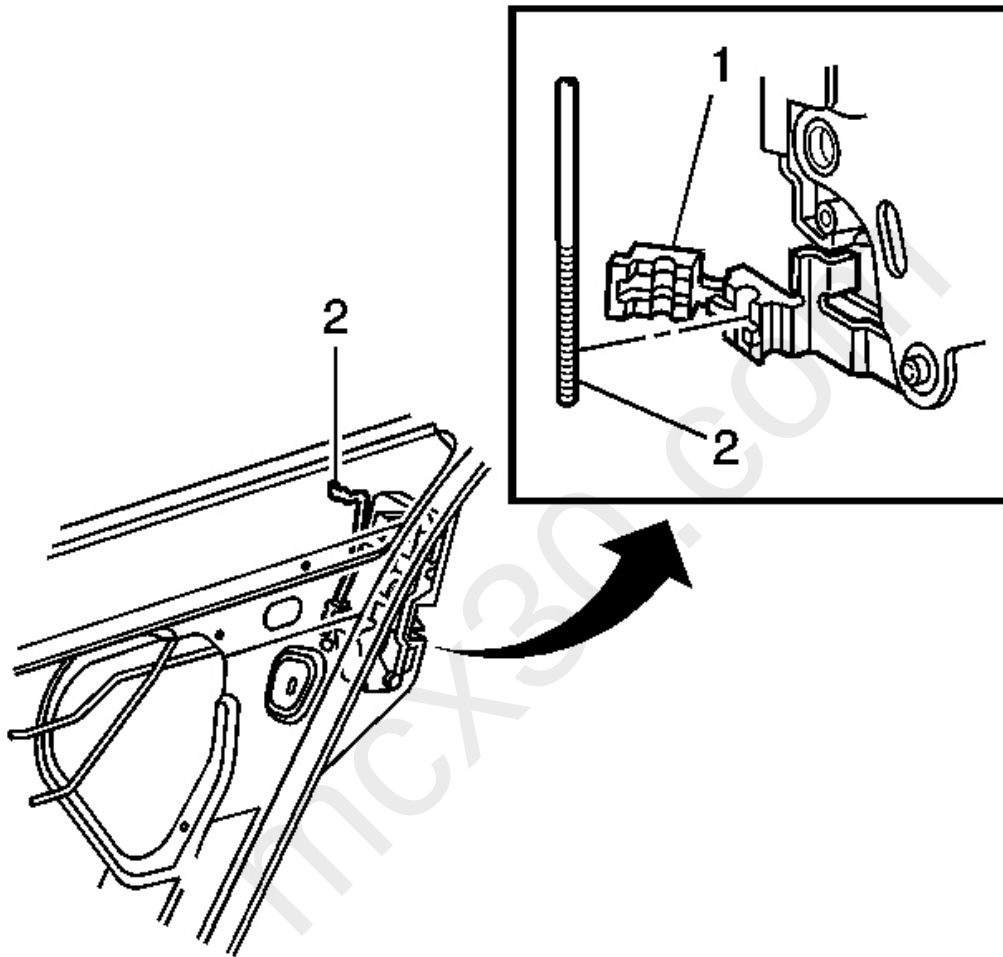


Fig. 40: Positioning Outside Door Handle Rod In Clip
Courtesy of GENERAL MOTORS CORP.

1. Position the outside door handle rod (2) in the clip (1) in order to eliminate any free play in the outside door handle.
2. Install the clip cover closed over the threaded outside door handle rod.
3. Inspect the door lock system for proper operation.
4. Install the rear side door water deflector.
5. Install the rear side door trim panel. Refer to **Rear Side Door Trim Panel Replacement** .

REAR SIDE DOOR OUTSIDE HANDLE ROD REPLACEMENT

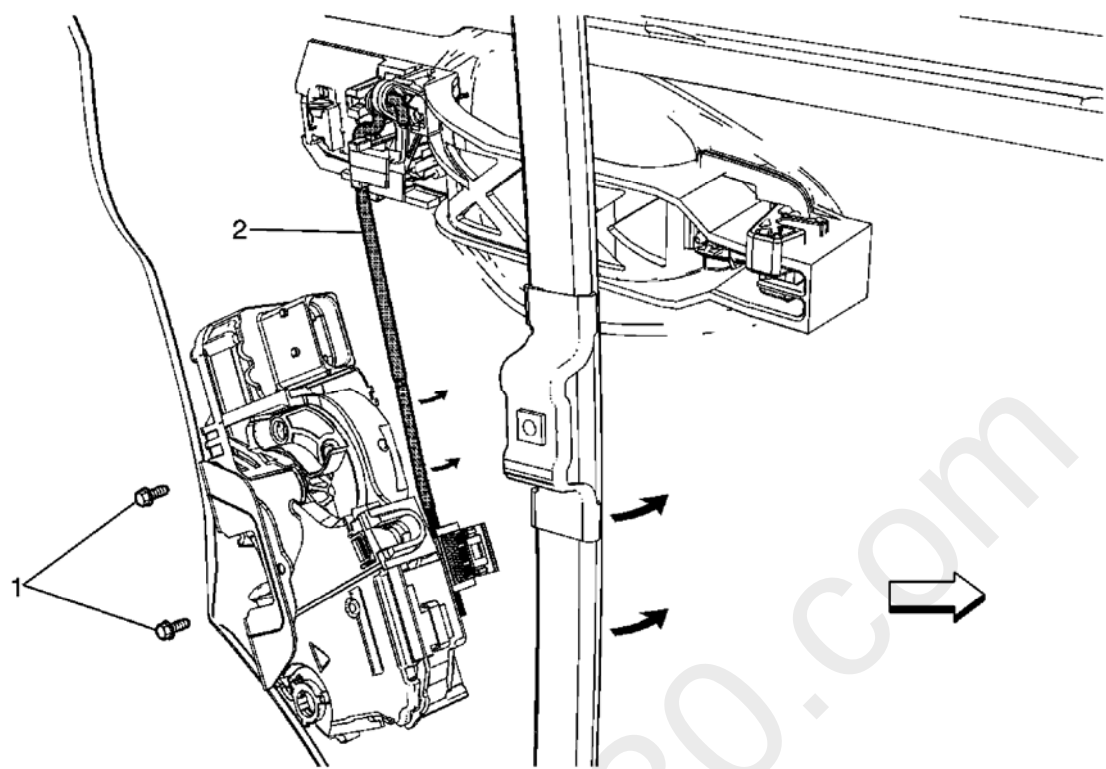


Fig. 41: Rear Side Door Outside Handle Rod
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedures: Remove the rear door outside handle housing. Refer to <u>Rear Side Door Outside Handle Housing Replacement</u> .	
1	Rear Side Door Lock Bolt (Qty: 2)
	CAUTION: Refer to Fastener Caution.
	Procedure
	1. Remove the water deflector. 2. Release the inside handle cable retainers before removing the door lock. 3. Disconnect the door lock electrical connector.
	Tighten: 25 N.m (18 lb in)

	Tip: It is not necessary to remove the entire lock form the door, un-clip rod from the lock. Rear Side Door Lock Handle Rod
2	Procedure 1. Transfer the lock rod and handle rod. 2. Inspect the door for proper operation before installing the door trim panel.

LIFTGATE SIDE UPPER SENSOR REPLACEMENT (EQUINOX)

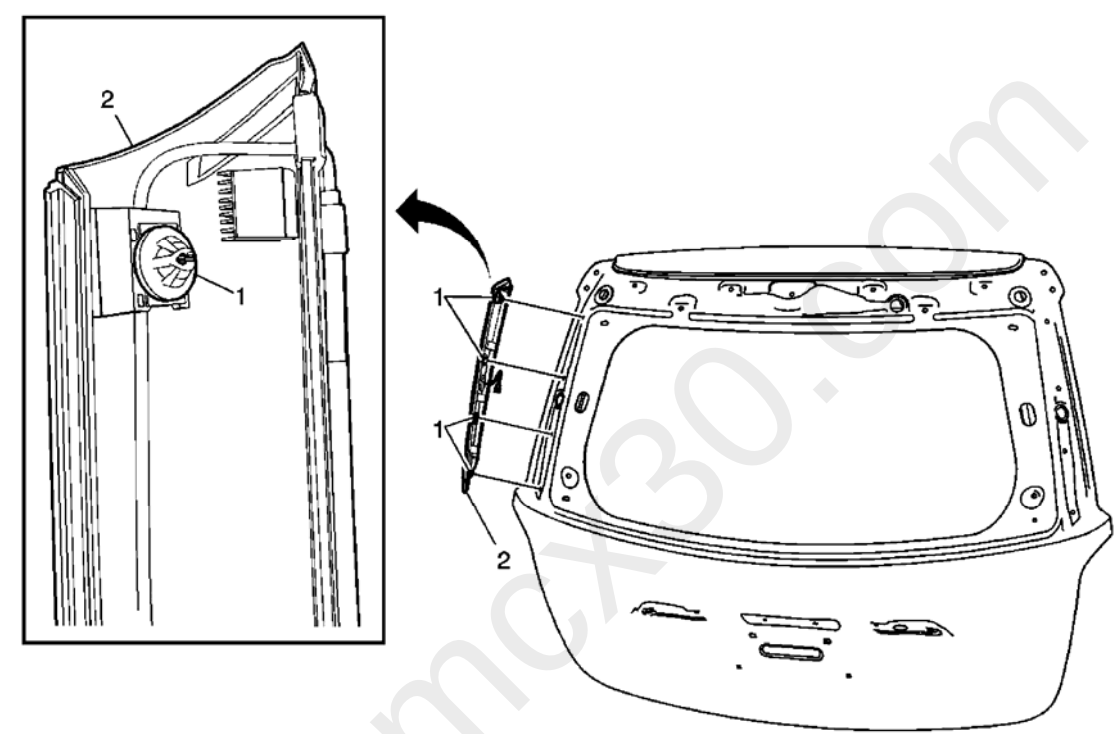


Fig. 42: Liftgate Side Upper Sensor (Equinox)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the upper liftgate trim finish panel. Refer to <u>Liftgate Upper Trim Finish Panel Replacement</u> .	
1	Liftgate Side Upper Sensor Retainers (Qty: 4)
	Liftgate Procedure 1. Disconnect the electrical connector from the liftgate. 2. Begin from the bottom of the applique using a trim-type tool, release the retainers

2

working upward toward the rear end spoiler.

3. When the last retainer is released, lift the bottom edge of the applique and remove from under the edge of the rear end spoiler.
4. Remove the grommet and guide the connector through the liftgate.

Tip: The liftgate side upper sensor is serviced with the applique, not separately.

LIFTGATE SIDE UPPER SENSOR REPLACEMENT (TERRAIN)

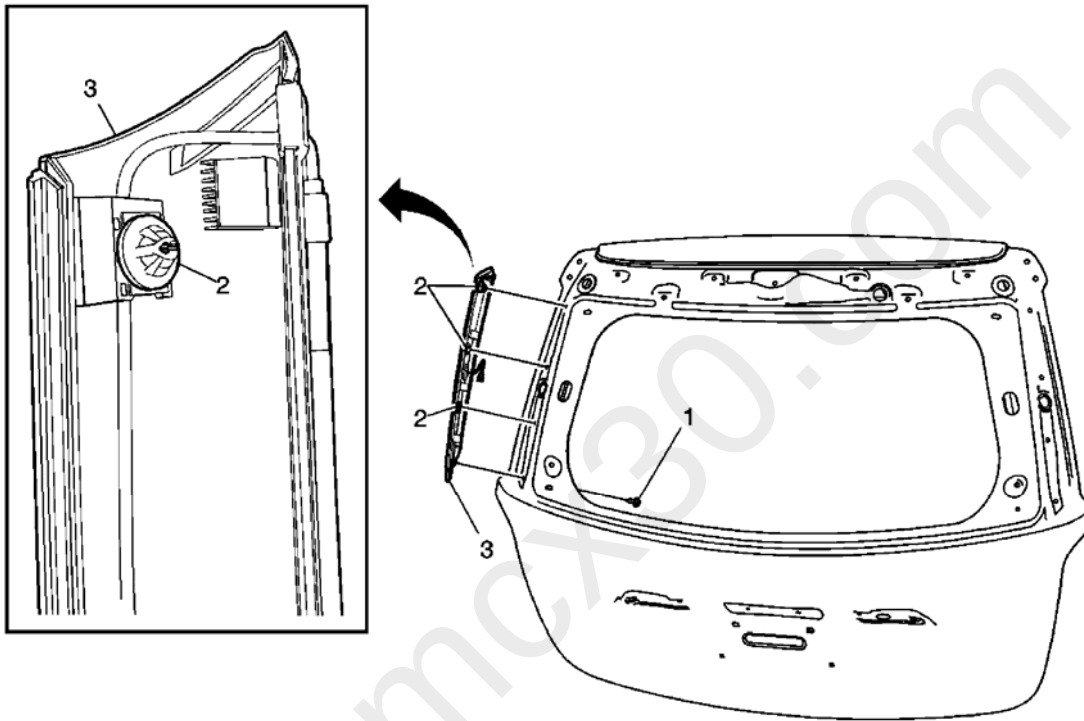


Fig. 43: Liftgate Side Upper Sensor (Terrain)
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the upper liftgate trim finish panel. Refer to <u>Liftgate Upper Trim Finish Panel Replacement</u> .	
1	Liftgate Side Upper Sensor Screw CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 2.5 N.m (22 lb in)
2	Liftgate Side Upper Sensor Retainer (Qty: 3)

Liftgate

Procedure

3

1. Begin from the bottom of the applique using a trim-type tool, release the retainers working upward toward the rear end spoiler.
2. When the last retainer is released, lift the bottom edge of the applique and remove from under the edge of the rear end spoiler.
3. Disconnect the electrical connector.

Tip: The liftgate side upper sensor is serviced with the applique, not separately.

FRONT SIDE DOOR LOCK STRIKER ADJUSTMENT

To determine if striker adjustment is required, proceed as follows:

WARNING: In order to prevent SIR deployment, personal injury, or unnecessary SIR system repairs, do not strike the door or the door pillar in the area of the side impact sensor (SIS). Turn OFF the ignition and remove the key when performing service in the area of the SIS.

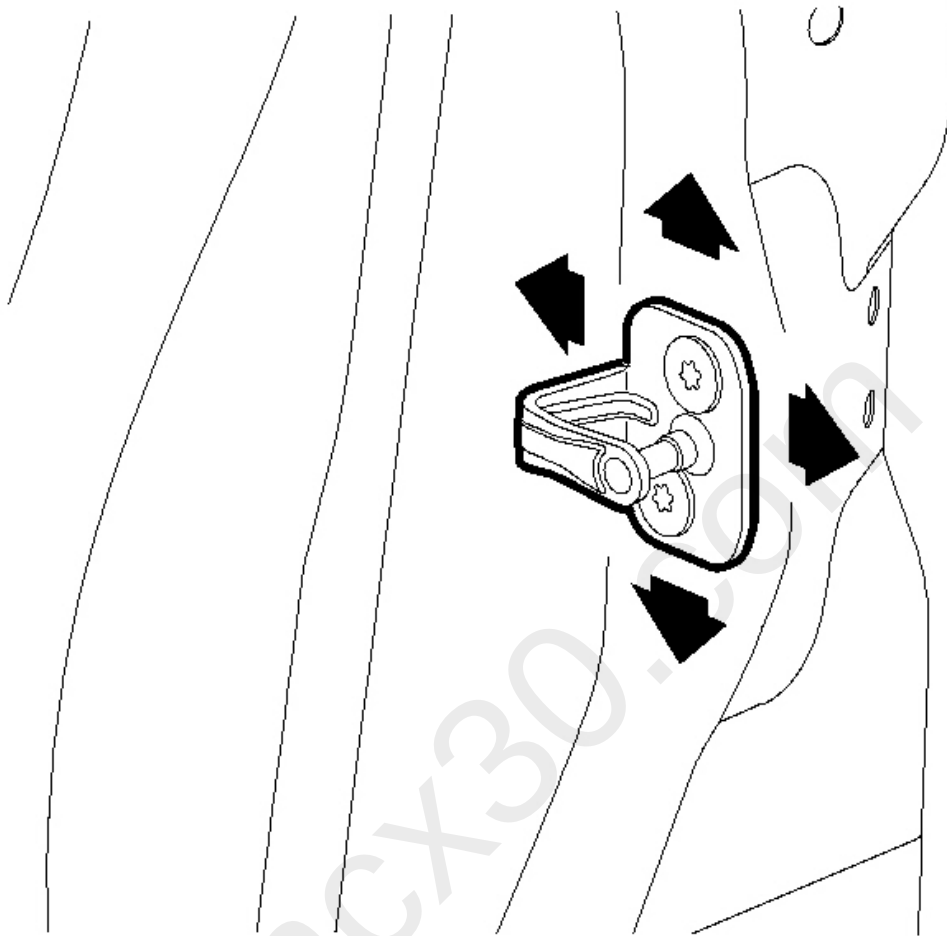


Fig. 44: View Of Door Striker

Courtesy of GENERAL MOTORS CORP.

1. Ensure the door is properly aligned within the door opening before proceeding with the striker adjustment.
2. Close the door onto the striker and note if the door drags on the striker causing the door to move upward or downward upon contact with the striker. Also note the closing effort to fully engage the latch.
3. Using a grease pencil, mark around the striker for reference of the original position. Loosen the striker.
4. Move the striker to eliminate drag on the striker and door latch and to achieve the proper door position within the door opening. Start with the up/down position, then position the striker to achieve proper alignment to the door opening. Set the in/out adjustment for the proper door seal engagement making sure the door closing efforts are correct.

CAUTION: Refer to Fastener Caution .

5. Tighten the striker bolts. Tighten the door striker bolts to 25 N.m (18 lb ft).

FRONT SIDE DOOR LOCK STRIKER REPLACEMENT

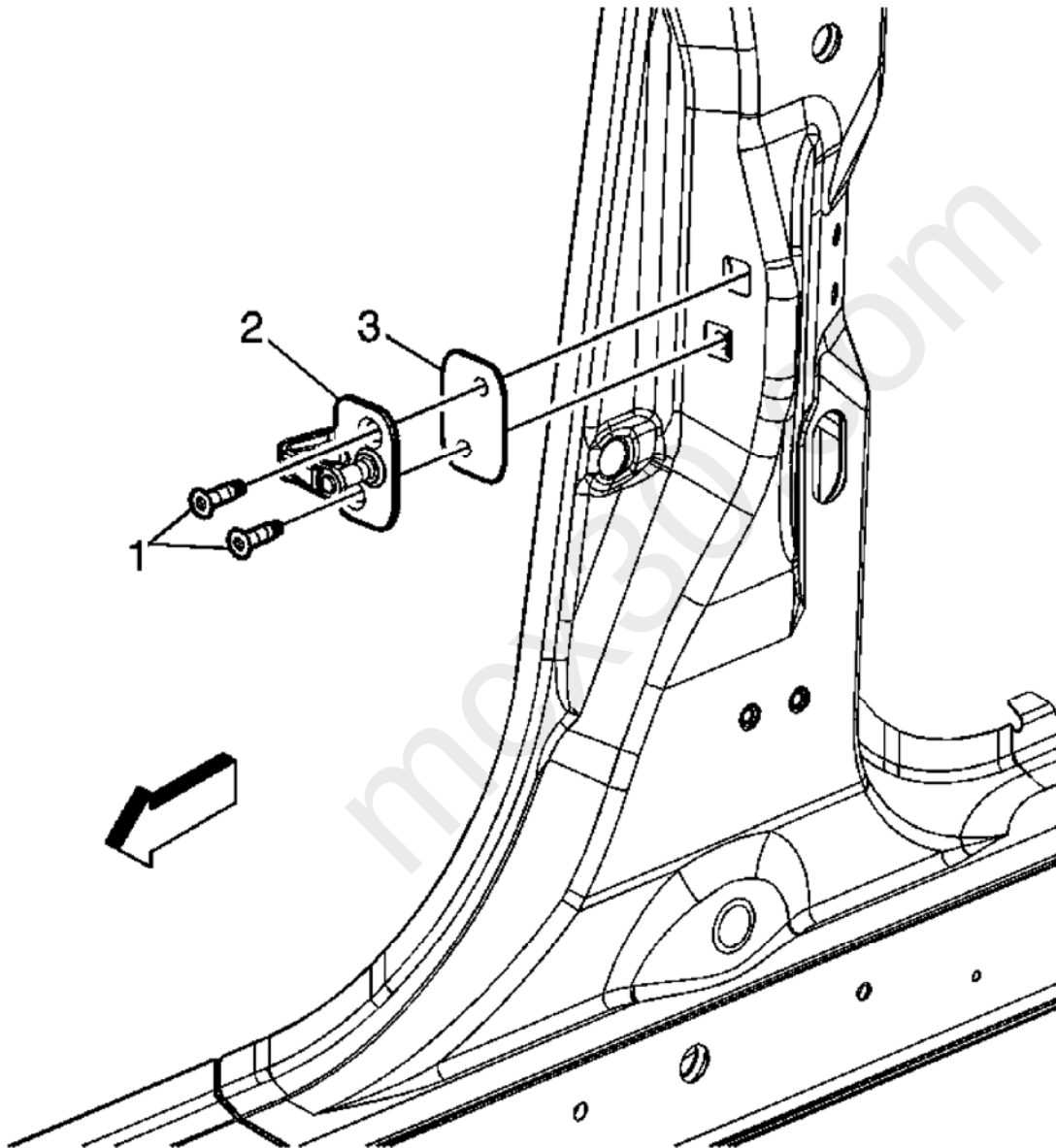


Fig. 45: Front Side Door Lock Striker
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name

WARNING:

In order to prevent SIR deployment, personal injury, or unnecessary SIR system repairs, do not strike the door or the door pillar in the area of the side impact sensor (SIS). Turn OFF the ignition and remove the key when performing service in the area of the SIS.

1	Front Side Door Lock Striker Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 25 N.m (18 lb ft)
2	Front Side Door Lock Striker Assembly Tip: Ensure proper alignment after installation. Refer to <u>Front Side Door Lock Striker Adjustment</u> .
3	Front Side Door Lock Striker Spacer

LIFTGATE LOCK STRIKER REPLACEMENT

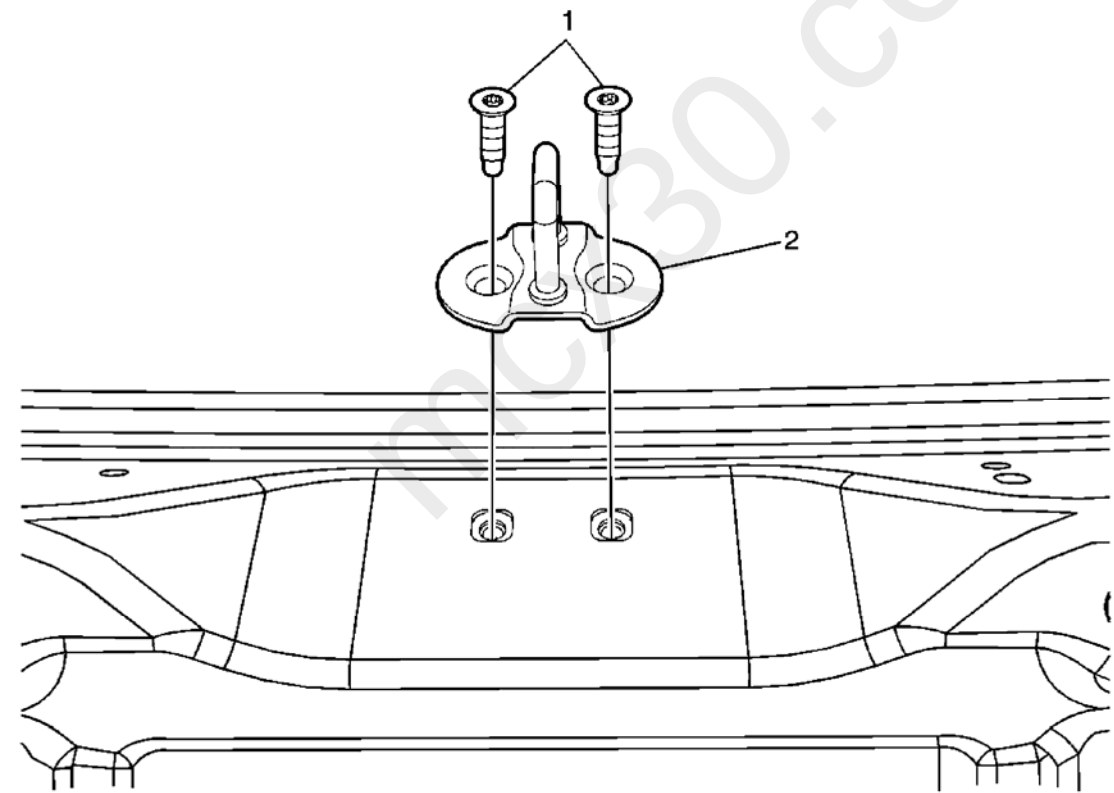


Fig. 46: Liftgate Lock Striker
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure:	

Remove the rear end trim finish panel. Refer to **Rear End Trim Finish Panel Replacement** .

1	Liftgate Lock Striker Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 25 N.m (18 lb ft)
2	Liftgate Lock Striker Procedure 1. Mark the location of the striker with a grease pencil to ensure proper alignment during installation. 2. Adjust the liftgate if needed.

LIFTGATE LOCK STRIKER ADJUSTMENT

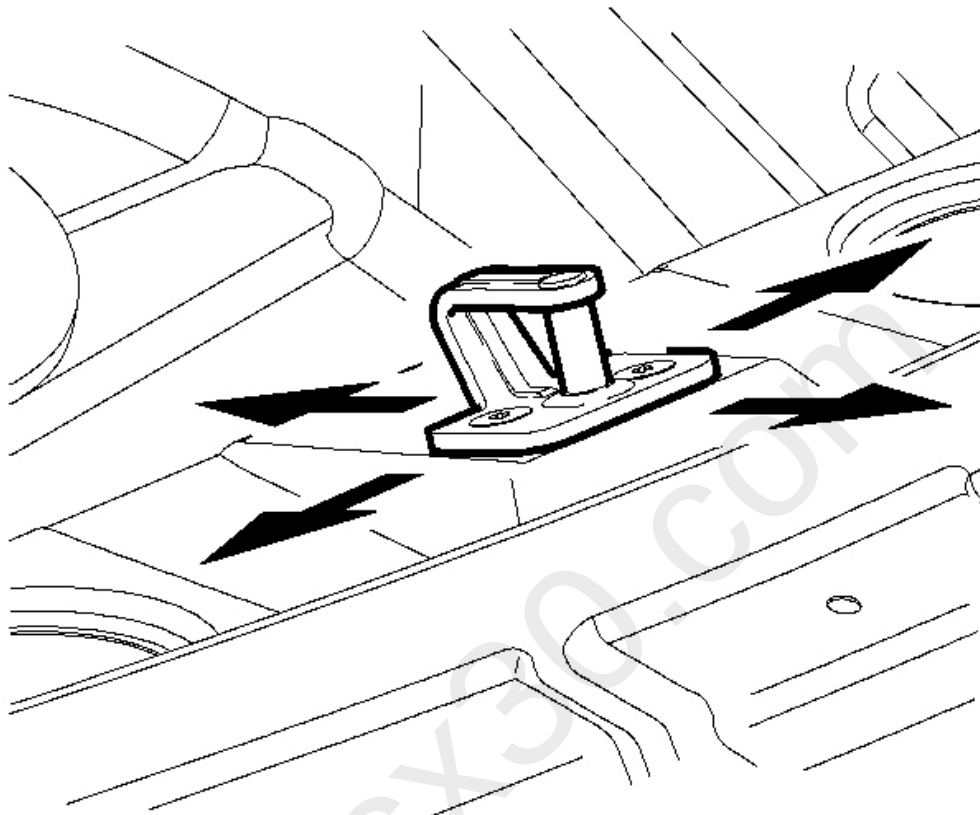


Fig. 47: Identifying Striker Adjustment
Courtesy of GENERAL MOTORS CORP.

NOTE: **Make certain the liftgate is properly aligned within the liftgate opening before proceeding with the striker adjustment.**

1. Close the liftgate onto the striker and note if liftgate drags on striker causing the liftgate to move side to side upon contact with the striker. Also note closing efforts to fully engage latch.
2. Mark around the striker with a grease pencil for reference of original position.
3. Loosen striker bolts.
4. Move the striker to eliminate drag on striker and liftgate latch and to achieve proper liftgate position within the liftgate opening.

5. Align the left/right liftgate position, then position the striker to achieve proper alignment to liftgate opening.
6. Align the in/out adjustment for proper liftgate seal engagement making sure the liftgate closing efforts are correct.

CAUTION: Refer to Fastener Caution .

7. Verify correct alignment of striker and tighten striker bolts.

Tighten the bolts to 25 N.m (18 lb ft).

REAR SIDE DOOR LOCK STRIKER ADJUSTMENT

To determine if striker adjustment is required, proceed as follows:

WARNING: In order to prevent SIR deployment, personal injury, or unnecessary SIR system repairs, do not strike the door or the door pillar in the area of the side impact sensor (SIS). Turn OFF the ignition and remove the key when performing service in the area of the SIS.

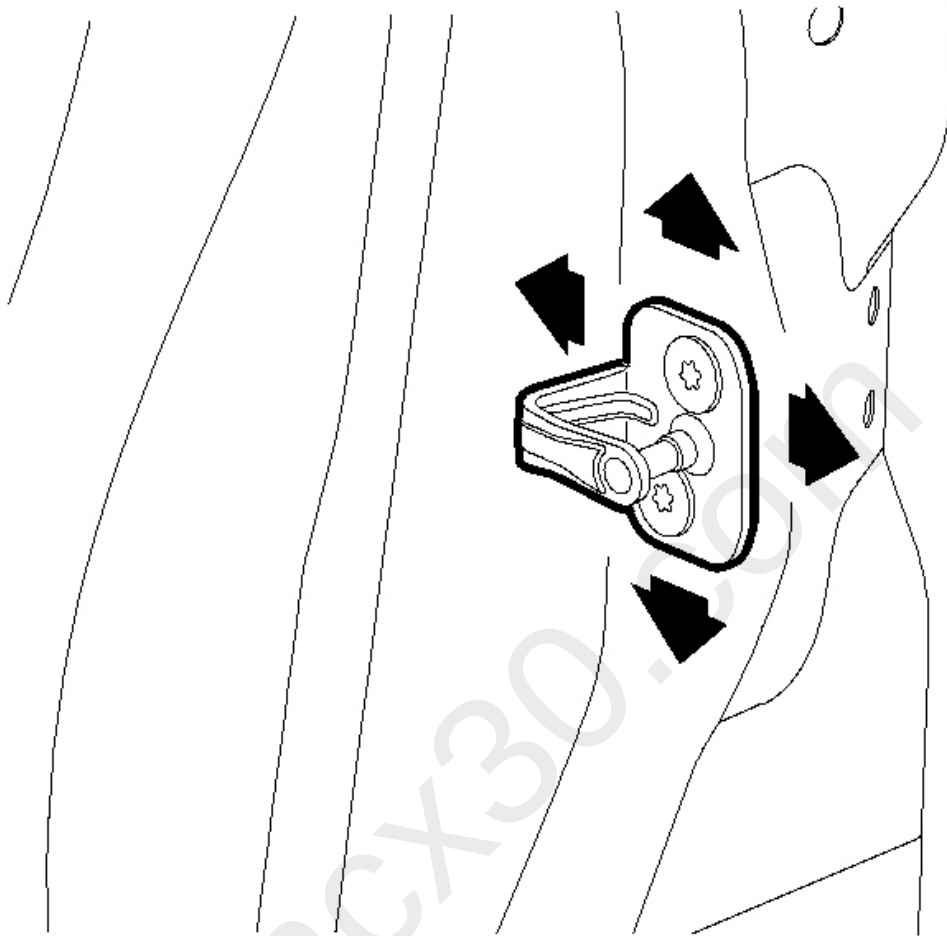


Fig. 48: View Of Door Striker

Courtesy of GENERAL MOTORS CORP.

1. Ensure the door is properly aligned within the door opening before proceeding with the striker adjustment.
2. Close the door onto the striker and note if the door drags on the striker causing the door to move upward or downward upon contact with the striker. Also note the closing effort to fully engage the latch.
3. Using a grease pencil, mark around the striker for reference of the original position. Loosen the striker.
4. Move the striker to eliminate drag on the striker and door latch and to achieve the proper door position within the door opening. Start with the up/down position, then position the striker to achieve proper alignment to the door opening. Set the in/out adjustment for the proper door seal engagement making sure the door closing efforts are correct.

CAUTION: Refer to Fastener Caution .

5. Tighten the striker screws. Tighten the door striker screws to 25 N.m (18 lb ft).

REAR SIDE DOOR LOCK STRIKER REPLACEMENT

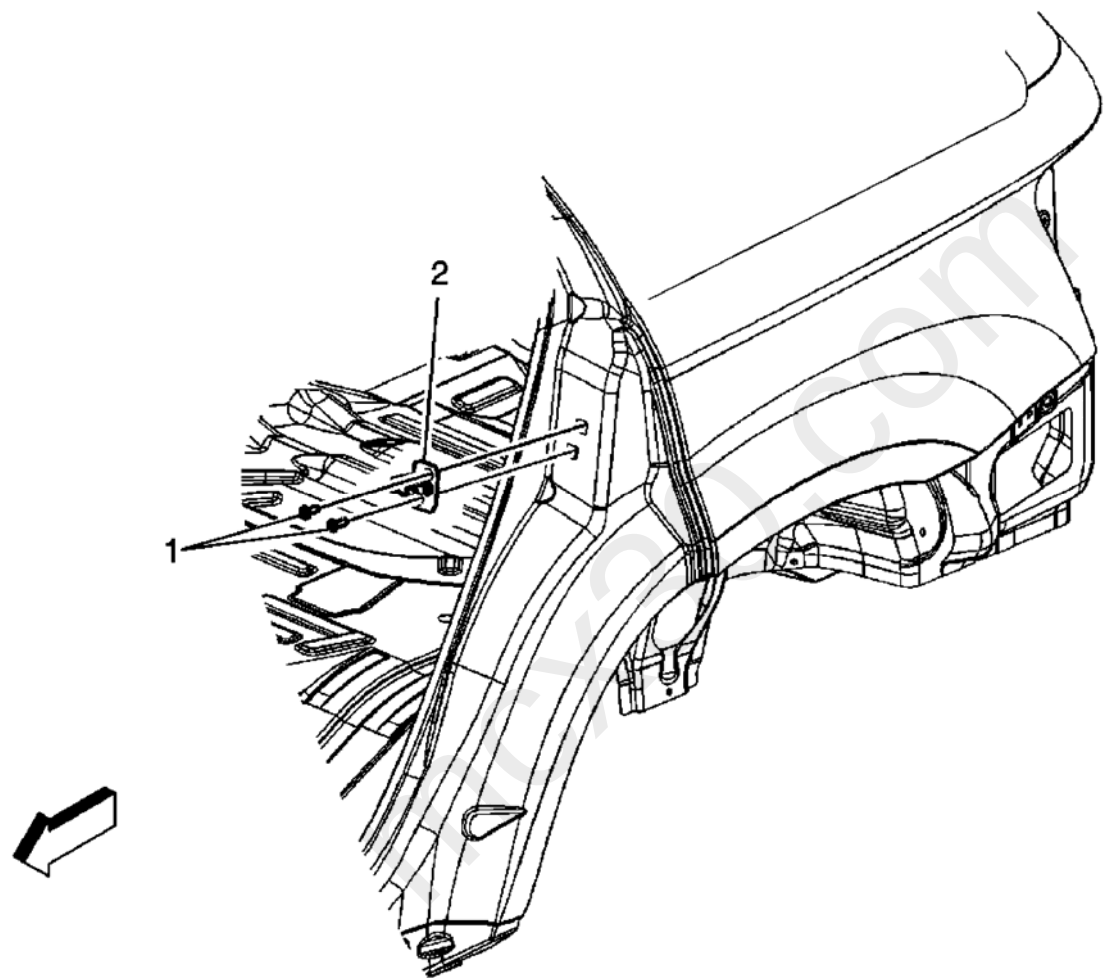


Fig. 49: Rear Side Door Lock Striker
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
1	Rear Side Door Latch Striker Bolt (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten: 25 N.m (18 lb ft)

Rear Side Door Latch Striker

2

Procedure

1. Ensure the spacer is in place.
2. Ensure proper alignment after installation. Refer to **Rear Side Door Lock Striker Adjustment**.

LIFTGATE RELEASE SWITCH REPLACEMENT

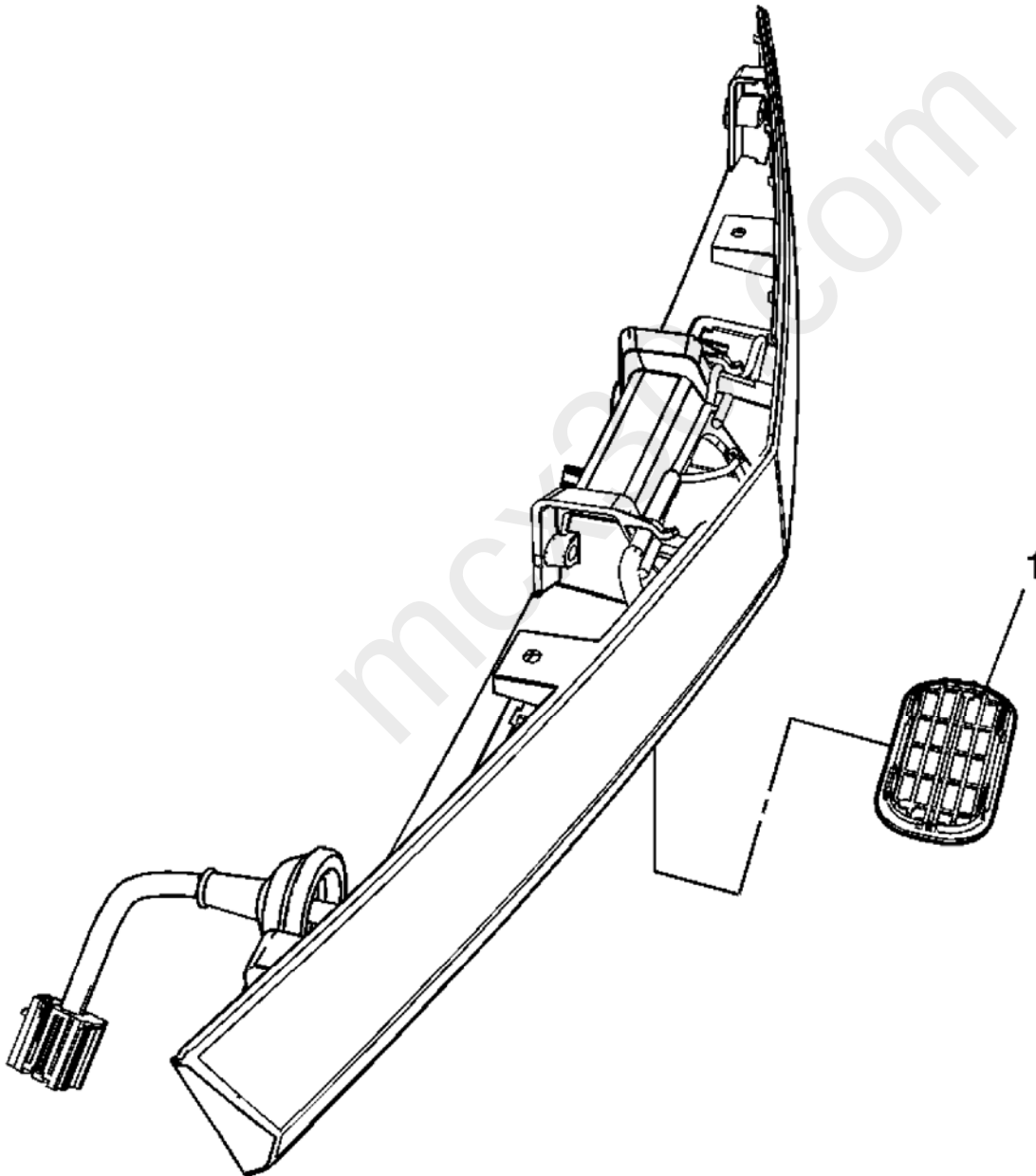


Fig. 50: Liftgate Release Switch
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the liftgate applique. Refer to <u>Liftgate Applique Replacement (Equinox w/UVC)</u> or <u>Liftgate Applique Replacement (Equinox wo/UVC)</u> or <u>Liftgate Applique Replacement (Terrain)</u> .	
1	Liftgate Release Switch Procedure 1. Disconnect the electrical harness from the applique. 2. Depress the clip fingers and push outward to remove the release switch from the applique.

LIFTGATE CLOSE SWITCH REPLACEMENT

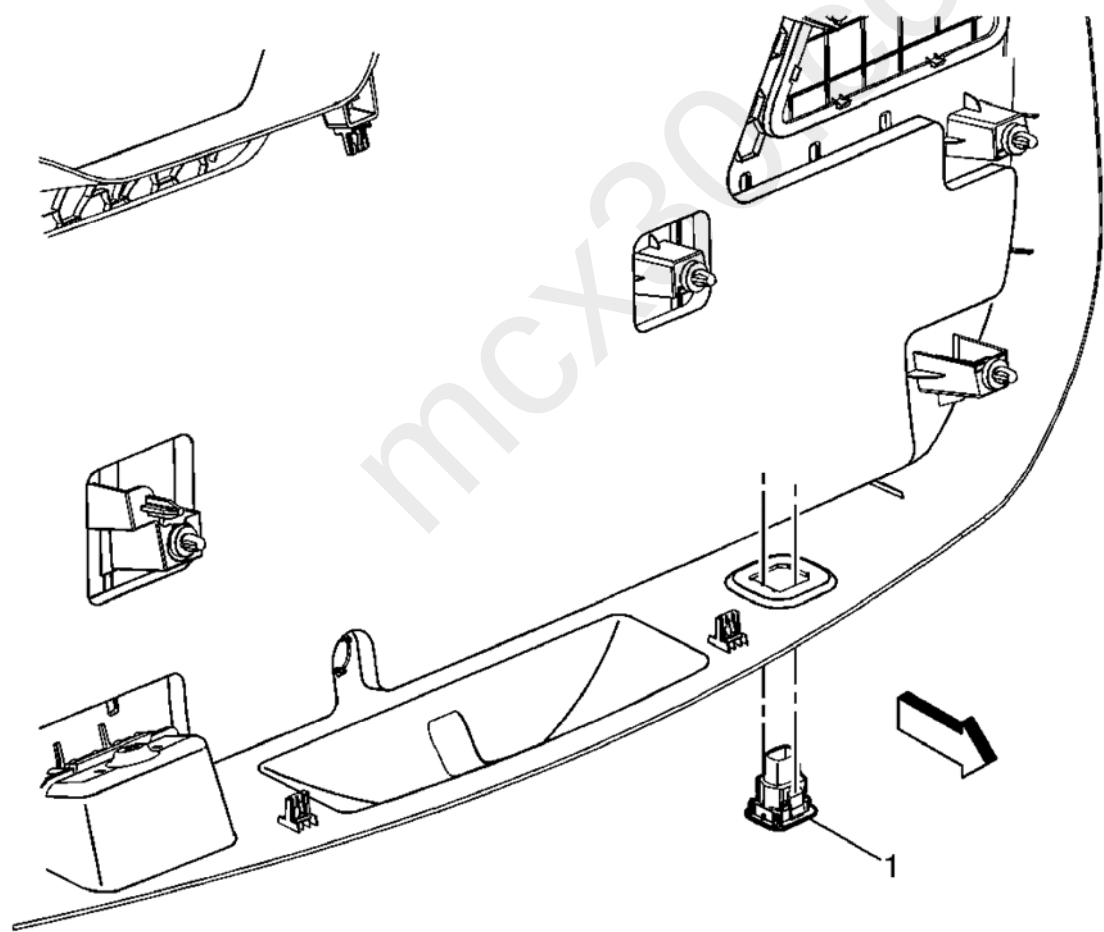


Fig. 51: Liftgate Close Switch
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the liftgate lower trim finish panel. Refer to <u>Liftgate Lower Trim Finish Panel Replacement</u> .	
1	Liftgate Close Switch

REAR COMPARTMENT LID RELEASE SWITCH REPLACEMENT

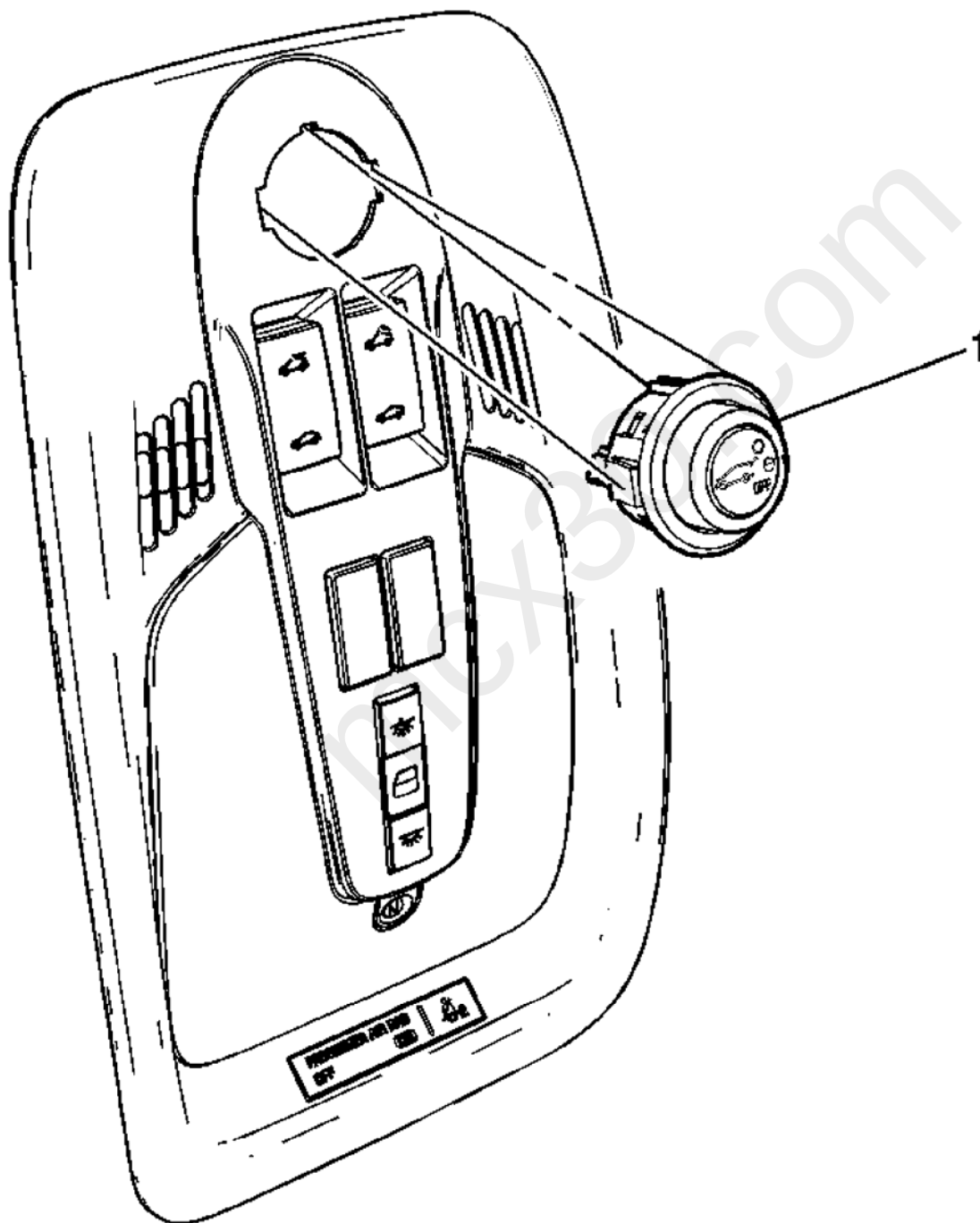


Fig. 52: Rear Compartment Lid Release Switch
Courtesy of GENERAL MOTORS CORP.

Callout	Component Name
Preliminary Procedure: Remove the roof console. Refer to Roof Console Replacement .	
1	Rear Compartment Lid Release Switch Procedures 1. Depress tabs to remove. 2. Disconnect electrical connector.

DESCRIPTION AND OPERATION

DOOR AJAR INDICATOR DESCRIPTION AND OPERATION

Door Ajar Indicator System Components

The door ajar indicator system consists of the following components:

- Body control module (BCM)
- Instrument cluster
- Driver information center
- Driver door latch
- Passenger door latch
- Left rear door latch
- Right rear door latch
- Liftgate door latch
- Driver window switch
- Passenger window switch
- Left rear window switch
- Right rear window switch

Driver Door Ajar

The driver window switch receives a discrete input from the driver door ajar switch within the driver door latch to indicate the status of the door. The window switch then communicates this status to the instrument cluster via GMLAN message. The instrument panel cluster, upon receipt of this GMLAN message, will illuminate the appropriate door ajar message in the driver information center and also send a GMLAN message to the radio to activate the door ajar audible warning when the vehicle speed is greater then 8 km/h (5 MPH).

Passenger Door Ajar

The passenger window switch receives a discrete input from the passenger door ajar switch within the passenger door latch to indicate the status of the door. The window switch then communicates this status to the instrument cluster via GMLAN message. The instrument panel cluster, upon receipt of this GMLAN message, will illuminate the appropriate door ajar message in the driver information center and also send a GMLAN message to the radio to activate the door ajar audible warning when the vehicle speed is greater than 8 km/h (5 MPH).

Left Rear Door Ajar And Right Rear Door Ajar

The body control module (BCM) (without power rear windows) or the left and right rear window switches (with power rear windows AED) receive discrete inputs from both the rear door latches and the rear compartment lid latch to indicate the status of the doors and rear compartment lid. The BCM or window switches then communicate this status to the instrument cluster via GMLAN message. The instrument panel cluster, upon receipt of this GMLAN message, will illuminate the appropriate door ajar message in the driver information center and also send a GMLAN message to the radio to activate the door ajar audible warning when the vehicle speed is greater than 8 km/h (5 MPH)

LIFTGATE AJAR INDICATOR DESCRIPTION AND OPERATION

LIFTGATE OPEN Indicator

Manual Liftgate

The instrument panel cluster (IPC) illuminates the LIFTGATE OPEN indicator when the body control module (BCM) detects that the liftgate is open. The IPC receives a serial data message from the BCM requesting illumination. If the vehicle is in the forward or reverse gear position, the BCM activates an audible warning.

Power Liftgate

The liftgate module (LGM) detects the liftgate ratchet switch is closed to ground indicating the liftgate is open. The IPC receives a serial data message from the LGM indicating the liftgate ajar status and the driver information center (DIC) illuminates the LIFTGATE OPEN indicator.

LIFTGATE DESCRIPTION AND OPERATION

System Description

The power liftgate system consists of the following components:

- Liftgate module
- Driver door lock/window switch
- Power liftgate mode switch
- Liftgate outside handle release switch
- Liftgate shutface switch
- Liftgate latch assembly
- Liftgate pump motor
- Left and right liftgate object sensors

Operation

The power liftgate can be commanded to function in the following methods:

- An open/close command from the power liftgate mode switch
- An open command from the liftgate outside handle release switch
- A close command from the liftgate shutface switch
- An open request by a signal from the key fob to the remote control door lock receiver

The liftgate module will respond to a request by commanding the liftgate latch to release the liftgate and commanding the liftgate pump motor to activate and pump hydraulic fluid to the liftgate control arm piston raising the liftgate to the open position.

Power Latch

The liftgate control module continuously monitors power liftgate operation and calculates its location and direction of travel from an internal liftgate position sensor. One input returns the position of the liftgate relative to the x-axis and y-axis. The liftgate control module then uses these 2 inputs together to calculate its angle relative to the liftgate. When the liftgate mode switch is in the Garage position, the liftgate module will command the liftgate pump motor and monitor the x-axis and y-axis to stop the liftgate parallel to the vehicle roof.

The latch motor is a bi-directional motor and latch or unlatch operation is the result of the direction of the motor rotation. The liftgate module controls the latch motor through the control circuits by supplying power and ground in the appropriate polarity. The motor control circuits are monitored by the liftgate module prior to activation for a high or low condition and during motor operation for an insufficient current flow condition. The ratchet, pawl, and sector switches are part of the latch motor assembly and are used by the liftgate control module to determine the state of the latch during the process of latching or unlatching. Each of the latch switch signal circuits are supplied battery voltage through a resistor and monitored within the liftgate module. The latch switches share a common low reference circuit from the liftgate module and when the switch contacts close the signal circuit goes low and the liftgate module determines the switch to be active.

The handle switch and close switch are parallel circuits and provide a single input to the liftgate control module. The handle/close switch signal circuit is supplied battery voltage through a resistor and monitored within the liftgate module. The switches share a common low reference circuit from the liftgate module and when the switch contacts close the signal circuit goes low and the liftgate module determines the switch to be active.

Liftgate Pump Motor

The liftgate pump motor is a bi-directional motor and open or close operation is the result of the direction of the motor rotation. The liftgate module controls the liftgate pump motor through the control circuits by supplying power and ground in the appropriate polarity. The motor control circuits are monitored by the liftgate module prior to activation for a high or low condition and during motor operation for any irregular current flow conditions.

Object Detection

The power liftgate system uses an object detection method which consists of object sensors fixed to both sides of the liftgate near the seal area. The object sensors consist of an internal fixed resistor and normally open switch contacts which when closed will bypass the resistor. The signal circuit is supplied 5 volts through a resistor and monitored within the liftgate control module, and during normal power liftgate operation the signal circuit should remain a fixed value. When an object presses one of the sensors the contacts close and the resistor is bypassed causing the signal circuit voltage at the module to go low.

POWER DOOR LOCKS DESCRIPTION AND OPERATION

Door Lock System Components

The power door lock system consists of the following components:

- Central door lock switch
- Child door lockout switch
- Door lock actuators in each of the doors
- Body control module (BCM)
- Underhood fuse block

Door Lock System Controls

The power door lock system can be controlled by any of the following:

- A door lock switch LOCK or UNLOCK activation
- A mechanical key cylinder lock/unlock
- A keyless entry transmitter activation
- An automatic door lock activation
- An automatic door unlock activation

Door Lock Operation

When the central door lock switch is activated in the lock or unlock position the BCM will receive a ground signal on either the door lock switch lock or unlock signal circuits.

The BCM, upon receipt of a lock switch lock or unlock signal, will supply voltage to the door lock actuator lock or unlock control circuits. Since the opposite side of the lock actuator is connected to ground through the other lock actuator control circuit, the doors will then lock or unlock as commanded.

The following three circuits are used to operate the lock:

- Driver door unlock
- Passenger door unlock
- All door lock

Child Door Lockout Operation

The operator has the option to disable the interior rear door handles to prevent the unauthorized opening of the rear door doors while still retaining normal driver and passenger door handle functions. The rear door latches contain switches that are open when the rear doors are unlocked and closed when the rear doors are locked. The operator will first lock all the doors by pressing the central door lock switch. When the child door lockout switch is pressed, the BCM will confirm that the rear doors have been locked, if the rear doors are locked the BCM will then command the child lockout latches and will command the child lockout indicator to illuminate. The driver and passenger doors will still function normally by pressing the central door lock switch which will unlock the doors but the child lockout latches will continue to disable the interior rear door handles. Pressing the child lockout switch again will signal a command to the BCM to unlatch the rear doors, restore normal interior rear door handle functions and the turn off the child lockout indicator.

If the child lockout indicator flashes while trying to lockout the rear door handles means one or both rear door latches are not locked and the child lockout system will not function.

REAR HATCH/GATE DESCRIPTION AND OPERATION

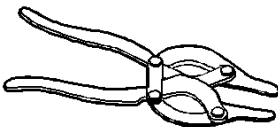
Rear Liftgate Release

The liftgate can be released by operating the liftgate release switch. The gear selector may be in any position, but the doors must be unlocked and the vehicle must be stationary for the liftgate to release.

Pressing the liftgate release switch closes a contact providing a ground for the liftgate release switch signal circuit. The body control module (BCM) will detect the voltage drop and command a ground to be supplied to the liftgate release relay control circuit thus energizing the Liftgate Release relay which provides voltage to the liftgate latch. When the doors are locked, the BCM will disable the liftgate release system by ignoring the liftgate release switch input command and not providing a ground for the Liftgate Release relay.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description
	J-8059 Snap Ring Pliers - Parallel Jaw