

2013 BRAKES

Park Brake - Malibu

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Electronic Parking Brake Control Module Nut	10 N.m	89 lb in
Electronic Parking Brake Rear Cable Nut	6 N.m	53 lb in

SCHEMATIC WIRING DIAGRAMS

PARK BRAKE SYSTEM WIRING SCHEMATICS

Park Brake Wiring Schematics

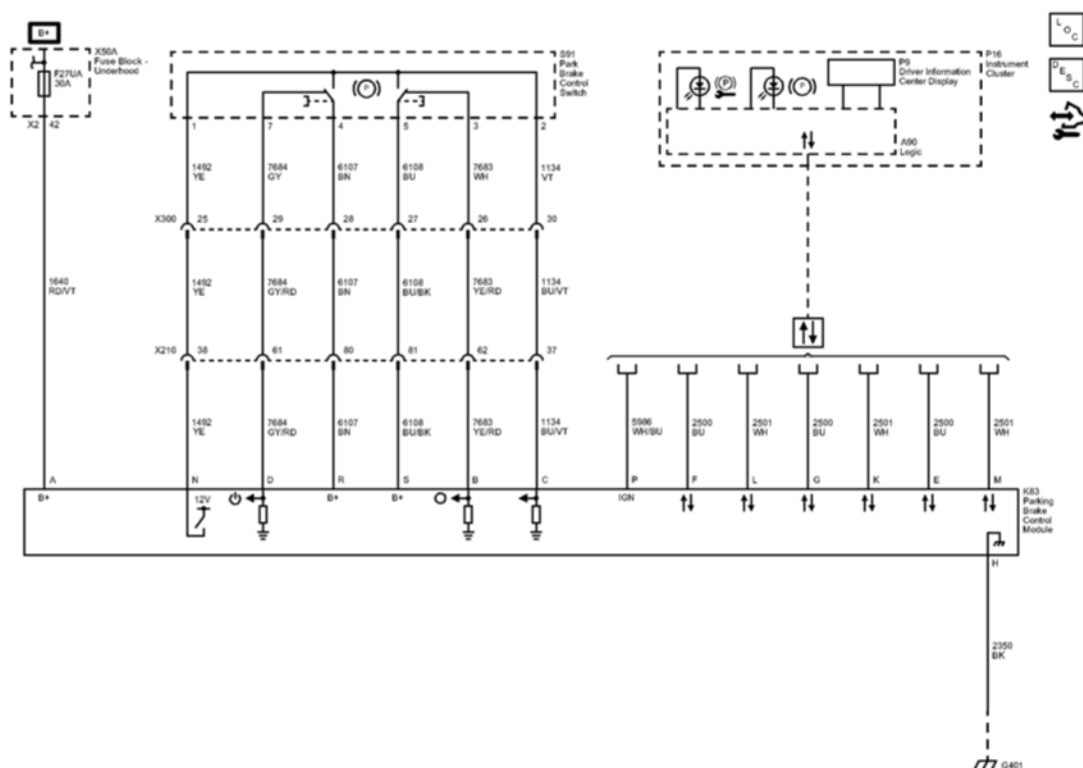


Fig. 1: Park Brake Wiring Schematics
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC C028A, C028B, or C028F</u>	DTC C028A 00 Park Brake Motor Circuit Malfunction
	DTC C028A 01 Park Brake Motor Circuit Short to Battery
	DTC C028A 02 Park Brake Motor Circuit Short to Ground
	DTC C028A 04 Park Brake Motor Circuit Open Circuit
	DTC C028A 05 Park Brake Motor Circuit Short to Battery or Open Circuit
	DTC C028A 08 Park Brake Motor Circuit Performance - Signal Invalid
	DTC C028A 28 Park Brake Motor Circuit Performance - Incorrect Frequency
	DTC C028A 61 Park Brake Motor Circuit Actuator Stuck
	DTC C028B 08 Park Brake Motor Position Sensor Signal Performance - Signal Invalid
	DTC C028B 26 Park Brake Motor Position Sensor Signal Low Frequency
	DTC C028B 29 Park Brake Motor Position Sensor Signal Too Few Pulses
	DTC C028B 2A Park Brake Motor Position Sensor Signal Too Many Pulses
	DTC C028F 01 Park Brake Solenoid Actuator Circuit Short to Battery
	DTC C028F 02 Park Brake Solenoid Actuator Circuit Short to Ground
	DTC C028F 08 Park Brake Solenoid Actuator Circuit Performance - Signal Invalid
<u>DTC C027D or C028D</u>	DTC C027D 64 Park Brake Slip Detected
	DTC C028D 00 Replace Park Brake Pad
<u>DTC C0293</u>	DTC C0293 00 Park Brake Switch Malfunction
	DTC C0293 01 Park Brake Switch Short to Battery
	DTC C0293 02 Park Brake Switch Short to Ground
	DTC C0293 04 Park Brake Switch Open
	DTC C0293 06 Park Brake Switch Low Voltage/Open
	DTC C0293 08 Park Brake Switch Performance - Signal Invalid
<u>DTC C0298</u>	DTC C0298 00 Park Brake Unlatch Switch Circuit Malfunction
	DTC C0298 01 Park Brake Unlatch Switch Circuit Short to Battery
	DTC C0298 02 Park Brake Unlatch Switch Circuit Short to Ground
	DTC C0298 04 Park Brake Unlatch Switch Circuit Open
	DTC C0298 08 Park Brake Unlatch Switch Circuit Performance - Signal Invalid

<u>DTC C0558</u>	DTC C0558 55 Calibration Data Too Few Transitions DTC C0558 5A Calibration Data Not Plausible
<u>DTC C0561</u>	DTC C0561 71 System Disabled Information Stored Invalid Data
<u>DTC C056D</u>	DTC C056D 00 Electronic Control Unit Hardware Malfunction DTC C056D 34 Electronic Control Unit Hardware RAM Malfunction DTC C056D 35 Electronic Control Unit Hardware ROM Malfunction DTC C056D 36 Electronic Control Unit Hardware EEPROM Performance/Malfunction DTC C056D 37 Electronic Control Unit Hardware Software Malfunction DTC C056D 38 Electronic Control Unit Hardware Supervision Software Malfunction DTC C056D 39 Electronic Control Unit Hardware Internal Malfunction DTC C056D 3B Electronic Control Unit Hardware Internal Self - Test Malfunction DTC C056D 3C Electronic Control Unit Hardware Internal Communication Malfunction
<u>DTC C056E</u>	DTC C056E 41 Electronic Control Unit Software Not Programmed DTC C056E 42 Electronic Control Unit Software Calibration Not Programmed DTC C056E 47 Electronic Control Unit Software VIN Not Programmed DTC C056E 5A Electronic Control Unit Software Not Plausible DTC C056E 71 Electronic Control Unit Software Invalid Data
<u>DTC C0574</u>	DTC C0574 00 Printed Circuit Board Temperature Sensor Malfunction DTC C0574 01 Printed Circuit Board Temperature Sensor Short to Battery DTC C0574 02 Printed Circuit Board Temperature Sensor Short to Ground DTC C0574 54 Printed Circuit Board Temperature Sensor High

DTC C028A, C028B, OR C028F

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.

DTC Descriptors

DTC C028A 00

Park Brake Motor Circuit Malfunction

DTC C028A 01

Park Brake Motor Circuit Short to Battery

DTC C028A 02

Park Brake Motor Circuit Short to Ground

DTC C028A 04

Park Brake Motor Circuit Open Circuit

DTC C028A 05

Park Brake Motor Circuit Short to Battery or Open Circuit

DTC C028A 08

Park Brake Motor Circuit Performance - Signal Invalid

DTC C028A 28

Park Brake Motor Circuit Performance - Incorrect Frequency

DTC C028A 61

Park Brake Motor Circuit Actuator Stuck

DTC C028B 08

Park Brake Motor Position Sensor Signal Performance - Signal Invalid

DTC C028B 26

Park Brake Motor Position Sensor Signal Low Frequency

DTC C028B 29

Park Brake Motor Position Sensor Signal Too Few Pulses

DTC C028B 2A

Park Brake Motor Position Sensor Signal Too Many Pulses

DTC C028F 01

Park Brake Solenoid Actuator Circuit Short to Battery

DTC C028F 02

Park Brake Solenoid Actuator Circuit Short to Ground

DTC C028F 08

Park Brake Solenoid Actuator Circuit Performance - Signal Invalid

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation.

The parking brake control module will diagnose the internal park brake motor circuit to verify it is functioning properly. The park brake motor circuit is used to command motor operation, apply and release tension on the parking brake cable, which will apply and release the parking brake. The park brake will self diagnose the internal park brake motor circuit. This circuit is used to drive the motor, which pulls on the park brake cable, ultimately applying and releasing the park brake.

The parking brake control module contains an internal park brake motor position sensor which monitors the park brake motor position. The parking brake control module contains an internal park brake solenoid actuator, and performs diagnostics on the solenoid actuator circuitry to verify it is functioning properly.

Conditions for Running the DTC

- Ignition OFF, ACCESSORY, or RUN mode.
- Battery voltage is between 9 - 16 V

Conditions for Setting the DTC

DTC C028A

The parking brake control module detects an internal motor malfunction.

DTC C028B

The parking brake control module detects an internal motor position sensor signal malfunction.

DTC C028F

The parking brake control module detects an internal park brake solenoid malfunction.

Action Taken When the DTC Sets

DTC C028A

- The parking brake is disabled.
- A message and/or a warning indicator may be displayed.

DTC C028B

- The parking brake is disabled, one release allowed.
- A message and/or a warning indicator may be displayed.

OR

- The parking brake functionality is degraded.
- A message and/or a warning indicator may be displayed.

DTC C028F

- The parking brake is disabled, one release allowed.
- A message and/or a warning indicator may be displayed.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 40 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- The condition for the DTC is no longer present.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify that DTC C028A, C028B, or C028F is not set.
 - **If any of the DTCs are set**
 1. Program the K83 Parking Brake Control Module. Refer to **Electronic Parking Brake Control Module Programming and Setup** .
 2. Ignition ON.
 3. Apply and release the park brake.
 4. Verify the DTC is not set.
 - If the DTC is set, replace the K83 Parking Brake Control Module.
 - If the DTC is not set
 5. All OK.
 - **If none of the DTC are set**
3. All OK.

Repair Instructions

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

Control Module References for parking brake control module replacement, programming and setup.

DTC C027D OR C028D

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.

DTC Descriptors

DTC C027D 64

Park Brake Slip Detected

DTC C028D 00

Replace Park Brake Pad

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the park brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the parking brake control module performs the requested operation. The parking brake control module checks for rear wheel speeds after applying the parking brake to check for mechanical faults.

Conditions for Running the DTC

Ignition OFF, ACCESSORY, or RUN mode.

Conditions for Setting the DTC

C027D 64

The parking brake control module has detected wheel speed on the rear wheels with the parking brake applied.

C028D 00

The parking brake control module has an internal counter which keeps track of dynamic applies. When the counter reaches the threshold value this DTC will set.

Action Taken When the DTC Sets

A message and/or a warning indicator may be displayed.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 100 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- Adjust or replace the park brake pads.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify no additional DTCs are set in other control modules.
 - **If additional DTCs are set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**

- **If no additional DTCs are set**
3. Verify that DTC C027D or C028D is not set.
 - **If the DTC is set**
 1. Verify the park brake cable is connected properly. Refer to **Park Brake System Diagnosis**
 2. Check park brake pads for excessive wear. Refer to **Disc Brake System Diagnosis**
 3. Program the K83 Parking Brake Control Module. Refer to **Electronic Parking Brake Control Module Programming and Setup**.
 4. Ignition ON. Apply and release the park brake.
 5. Verify the DTC is not set.
 - If the DTC is set, replace the K83 Parking Brake Control Module.
 - If the DTC is not set
 6. All OK.
 - **If the DTC is not set**
 - 4. All OK.

Repair Instructions

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

Control Module References for parking brake control module replacement, programming and setup.

DTC C0293

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.

DTC Descriptors

DTC C0293 00

Park Brake Switch Malfunction

DTC C0293 01

Park Brake Switch Short to Battery

DTC C0293 02

Park Brake Switch Short to Ground

DTC C0293 04

Park Brake Switch Open

DTC C0293 06

Park Brake Switch Low Voltage/Open

DTC C0293 08

Park Brake Switch Performance - Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+ Terminal 1	C0293 02 C0293 06	C0293 04 C0293 06	C0293 01	C0293 00 C0293 08
B+ Terminal 4	C0293 02 C0293 06	C0293 04 C0293 06	C0293 01	C0293 00 C0293 08
B+ Terminal 5	C0293 02 C0293 06	C0293 04 C0293 06	C0293 01	C0293 00 C0293 08

Signal Terminal 2	C0293 02 C0293 06	C0293 04 C0293 06	C0293 01	C0293 00 C0293 08
Signal Terminal 3	C0293 02 C0293 06	C0293 04 C0293 06	C0293 01	C0293 00 C0293 08
Signal Terminal 7	C0293 02 C0293 06	C0293 04 C0293 06	C0293 01	C0293 00 C0293 08

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. The parking brake control module will perform diagnostics on the park brake control switch and its wiring harness to verify it is functioning properly. When the parking brake control module receives a signal from the switch the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation.

The park brake switch control diagnostic checks for failure conditions in the park brake switch and associated wiring into the parking brake control module.

Conditions for Running the DTC

Ignition OFF, ACCESSORY, or RUN mode.

Conditions for Setting the DTC

The parking brake control module detects a short to battery, short to ground, open circuit, or an internal parking brake switch malfunction. The parking brake control module detects the apply or release button was activated for more than 90 seconds.

Action Taken When the DTC Sets

- The parking brake is disabled.
- A message and/or a warning indicator may be displayed.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 40 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- The condition for the DTC is no longer present.
- The park brake control switch button is INACTIVE using the scan tool without the switch being activated.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify the scan tool Park Brake Status parameter changes between Released and Apply while pressing and releasing the S91 park brake control switch.
 - **If the parameter does not change**

Refer to Circuit/System Test below.
 - **If the parameter changes**
3. All OK.

Circuit/System Test

C0293 01, C0293 02, C0293 04 or C0293 06

1. Ignition OFF, disconnect the harness at the S91 park brake control switch.
2. Ignition ON.
3. Test for greater than 11.5 V between the B+ circuit terminal listed below and ground:
 - Terminal 1
 - Terminal 4
 - Terminal 5
 - **If 11.5 V or less**
 1. Ignition OFF, disconnect the harness connector at the K83 parking brake control module.
 2. Test for infinite resistance between the B+ circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance
- 3. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, replace the K83 parking brake control module.
- **If greater than 11.5 V**
- 4. Connect the harness connector at the S91 park brake control switch. Disconnect the harness connector at the K83 parking brake control module.
- 5. Ignition ON, test for greater than 11.5 V between the ignition circuit terminal P and ground:
 - **If 11.5 V or less**
 - 1. Ignition OFF, test for infinite resistance between the ignition circuit terminal P and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 - 2. Test for less than 2 ohms in the B+ circuit end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms and the fuse is blown, replace the K83 parking brake control module.
 - **If greater than 11.5 V**
- 6. Ignition OFF, test for less than 1 V between the circuit terminals listed below and ground:
 - B+ circuit terminal N
 - B+ circuit terminal R
 - B+ circuit terminal S
 - Signal circuit terminal B
 - Signal circuit terminal C
 - Signal circuit terminal D
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**
- 7. Test for infinite resistance between the signal circuit terminals listed below and ground:
 - Signal circuit terminal B
 - Signal circuit terminal C
 - Signal circuit terminal D
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**
- 8. Test for less than 5 ohms between the signal circuit terminal D and the B+ circuit terminal R.

- **If 5 ohms or greater**

1. Ignition OFF, disconnect the harness connector at the S91 park brake control switch.
2. Test for less than 2 ohms in the signal circuit terminal D end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the S91 park brake control switch.

- **If less than 5 ohms**

9. Test for less than 5 ohms between the signal circuit terminal B and the B+ circuit terminal S.

- **If 5 ohms or greater**

1. Ignition OFF, disconnect the harness connector at the S91 park brake control switch.
2. Test for less than 2 ohms in the signal circuit terminal B end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the S91 park brake control switch.

- **If less than 5 ohms**

10. Test for less than 5 ohms between the signal circuit terminal C and the B+ circuit terminal N.

- **If 5 ohms or greater**

1. Ignition OFF, disconnect the harness connector at the S91 park brake control switch.
2. Test for less than 2 ohms in the signal circuit terminal C end to end.
 - If 2 ohms or greater, repair the open/high resistance in the circuit.
 - If less than 2 ohms, test or replace the S91 park brake control switch.

- **If less than 5 ohms**

11. Replace the K83 parking brake control module.

C0293 00 or C0293 08

1. Ignition ON.
2. Verify no additional DTCs are set in other control modules.

- **If additional DTCs are set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**

- **If no additional DTCs are set**

3. Verify DTC C0293 00 or C0293 08 is not set.

- **If DTC C0293 00 or C0293 08 is set**

1. Ignition OFF, remove the parking brake control module fuse and reinstall, ignition ON.
2. Verify DTC C0293 00 or C0293 08 is not set.
 - If the DTC is set,

replace the K83 parking brake control module.

- If the DTC is not set

3. All OK.

- **If DTC C0293 00 or C0293 08 is not set**

4. All OK.

Component Testing

1. Ignition OFF, disconnect the harness connector at the S91 park brake control switch.
2. Test for infinite resistance between the terminals listed below with the switch in the inactive state:
 - B+ terminal 4 and the park brake control switch signal terminal 1
 - B+ terminal 4 and the park brake control switch signal terminal 2
 - B+ terminal 5 and the park brake control switch signal terminal 1
 - B+ terminal 5 and the park brake control switch signal terminal 2
 - Park brake control switch signal terminal 3 and the park brake control switch signal terminal 1
 - Park brake control switch signal terminal 3 and the park brake control switch signal terminal 2
 - Park brake control switch signal terminal 7 and the park brake control switch signal terminal 1
 - Park brake control switch signal terminal 7 and the park brake control switch signal terminal 2
 - **If less than infinite resistance**

Replace the S91 park brake control switch.

- **If infinite resistance**

3. Test for less than 5 ohms between the terminals listed below with the switch in the inactive state:
 - Park brake control switch signal terminal 1 and terminal 2
 - B+ terminal 4 and park brake control switch signal terminal 7
 - B+ terminal 5 and park brake control switch signal terminal 3
 - **If 5 ohms or greater**

Replace the S91 park brake control switch.

- **If less than 5 ohms**

4. Test for less than 5 ohms between the terminals listed below with the switch in the apply position:
 - Park brake control switch signal terminal 1 and terminal 2
 - B+ terminal 4 and park brake control switch signal terminal 1
 - B+ terminal 4 and park brake control switch signal terminal 2
 - B+ terminal 5 and park brake control switch signal terminal 3
 - **If 5 ohms or greater**

Replace the S91 park brake control switch.

- **If less than 5 ohms**

5. Test for less than 5 ohms between the terminals listed below with the switch in the release position:

- Park brake switch control signal terminal 1 and terminal 2
- B+ terminal 5 and park brake control switch signal terminal 1
- B+ terminal 5 and park brake control switch signal terminal 2
- B+ terminal 4 and park brake control switch signal terminal 7
- **If 5 ohms or greater**

Replace the S91 park brake control switch.

- **If less than 5 ohms**

6. All OK.

Repair Instructions

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

- **Parking Brake Actuator Switch Replacement**
- **Control Module References** for parking brake control module replacement, programming and setup

DTC C0298

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.

DTC Descriptors

DTC C0298 00

Park Brake Unlatch Switch Circuit Malfunction

DTC C0298 01

Park Brake Unlatch Switch Circuit Short to Battery

DTC C0298 02

Park Brake Unlatch Switch Circuit Short to Ground

DTC C0298 04

Park Brake Unlatch Switch Circuit Open

DTC C0298 08

Park Brake Unlatch Switch Circuit Performance - Signal Invalid

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+ Terminal 1	C0298 08	C0298 08	-	C0298 00 C0298 08
B+ Terminal 5	C0298 02	C0298 04	C0298 01	C0298 00 C0298 08
Signal Terminal 2	C0298 08	C0298 08	-	C0298 00 C0298 08
Signal Terminal 3	C0298 02	C0298 04	C0298 01	C0298 00 C0298 08

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation.

Conditions for Running the DTC

Ignition OFF, ACCESSORY, or RUN mode.

Conditions for Setting the DTC

The parking brake control module detects a short to battery, short to ground, open circuit, or an internal parking brake switch malfunction. The parking brake control module detects the apply or release button was activated for more than 90 seconds.

Action Taken When the DTC Sets

A message and/or a warning indicator may be displayed.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 40 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- The condition for the DTC is no longer present.
- The park brake control switch button is INACTIVE using the scan tool without the switch being activated.

Diagnostic Aids

Check if the park brake control switch is stuck in the apply or release position which may cause the DTC to set.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify that DTC C0293 is not set.
 - **If DTC C0293 is set**

Refer to **DTC C0293**.

- **If DTC C0293 is not set**
3. Verify the scan tool Park Brake Status parameter changes between Released and Apply when pressing and releasing the S91 park brake control switch.
 - **If the parameter does not change**

Replace the S91 park brake control switch.

 - **If the parameter changes**
4. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

Parking Brake Actuator Switch Replacement

DTC C0558

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.

DTC Descriptors

DTC C0558 55

Calibration Data Too Few Transitions

DTC C0558 5A

Calibration Data Not Plausible

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation.

Conditions for Running the DTC

Ignition OFF, ACCESSORY, or RUN mode.

Conditions for Setting the DTC

C0558 55

The parking brake control module detects a calibration malfunction.

C0558 5A

The parking brake control module detects mechanical problems with the parking brake system.

Action Taken When the DTC Sets

C0558 55

- The parking brake is disabled, switch command will not be accepted.
- A message and/or a warning indicator may be displayed.

C0558 5A

- The parking brake is disabled, one release allowed.
- A message and/or a warning indicator may be displayed.

OR

- The parking brake functionality is degraded.
- A message and/or a warning indicator may be displayed.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 40 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- Calibrate the parking brake control module after mechanical repairs are made.

Diagnostic Aids

- Verify the parking brake control module software and calibrations are the newest available versions.
- Verify the parking brake cable and related hardware is not broken, seized or pinched.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify that DTC C0558 55 is not set.
 - **If DTC C0558 55 is set**
 1. Program the K83 Parking Brake Control Module. Refer to **Electronic Parking Brake Control Module Programming and Setup** .
 2. Ignition ON.
 3. Apply and release the park brake.
 4. Verify the DTC is not set.
 - If the DTC is set,

replace the K83 Parking Brake Control Module.
 - If the DTC is not set
5. All OK.
 - **If DTC C0558 55 is not set**
3. Verify the scan tool Park Brake Cable Position parameter is less than 1251 counts.
 - **If 1251 counts or greater**
 1. Verify the park brake cable is connected properly. Refer to **Park Brake System Diagnosis**
 2. Check park brake pads for excessive wear. Refer to **Disc Brake System Diagnosis**
 - **If less than 1251 counts**
4. All OK.

Repair Instructions

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

Control Module References for parking brake control module replacement, programming and setup

DTC C0561

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.

DTC Descriptors

DTC C0561 71

System Disabled Information Stored Invalid Data

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation. The parking brake module will verify it has a valid signal from other modules before it performs the requested operation.

Conditions for Running the DTC

- Ignition OFF, ACCESSORY, or RUN mode.
- Battery voltage is between 9-16V.

Conditions for Setting the DTC

The parking brake control module receives an invalid serial data message or does not receive a serial data message from another module.

Action Taken When the DTC Sets

- A message and/or a warning indicator may be displayed.
- The parking brake functionality is degraded.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 40 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- The parking brake control module receives valid signals from other modules.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify no additional DTCs are set in other control modules.
 - **If additional DTCs are set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**
 - **If no additional DTCs are set**
3. Verify the scan tool Park Brake Control Module Invalid Signal Identification parameters are all Valid.
 - **If any parameter is Invalid**

Refer to the appropriate subsection in which the failure occurred. Refer to **Symptoms - Vehicle**
 - **If all parameters are Valid**
4. All OK.

Repair Instructions

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

DTC C056D

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.

DTC Descriptors

DTC C056D 00

Electronic Control Unit Hardware Malfunction

DTC C056D 34

Electronic Control Unit Hardware RAM Malfunction

DTC C056D 35

Electronic Control Unit Hardware ROM Malfunction

DTC C056D 36

Electronic Control Unit Hardware EEPROM Performance/Malfunction

DTC C056D 37

Electronic Control Unit Hardware Software Malfunction

DTC C056D 38

Electronic Control Unit Hardware Supervision Software Malfunction

DTC C056D 39

Electronic Control Unit Hardware Internal Malfunction

DTC C056D 3B

Electronic Control Unit Hardware Internal Self - Test Malfunction

DTC C056D 3C

Electronic Control Unit Hardware Internal Communication Malfunction

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation. The parking brake module will perform diagnostics on the modules internal hardware to verify it is functioning properly

Conditions for Running the DTC

Ignition OFF, ACCESSORY, or RUN mode.

Conditions for Setting the DTC

The parking brake control module detects an internal hardware malfunction.

Action Taken When the DTC Sets

DTC C056D 00, C056D 34, C056D 35, C056D 36, C056D 37, C056D 38, C056D 3B, or C056D 3C

- The parking brake is disabled.
- A message and/or a warning indicator may be displayed.

DTC C056D 39

- The parking brake is disabled, one release allowed.
- A message and/or a warning indicator may be displayed.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 40 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- The condition for the DTC is no longer present.
- The latest software and calibrations are programmed into the parking brake control module.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify DTC C056D 36 is not set.
 - **If DTC C056D 36 is set**
 1. Program the K83 Parking Brake Control Module. Refer to **Electronic Parking Brake Control Module Programming and Setup** .
 2. Ignition ON.
 3. Apply and release the park brake.
 4. Verify the DTC is not set.
 - If the DTC is set, replace the K83 Parking Brake Control Module.
 - If the DTC is not set
 5. All OK.
 - **If DTC C056D 36 is not set**
3. Perform the Parking Brake Motor Reset procedure with a scan tool for the Parking Brake Control Module.
4. Verify DTC C056D is not set.
 - **If DTC C056D is set**

Replace the K83 Parking Brake Control Module.
 - **If DTC C056D is not set**
5. All OK.

Repair Instructions

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

Control Module References for parking brake control module replacement, programming and setup.

DTC C056E

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.

DTC Descriptors

DTC C056E 41

Electronic Control Unit Software Not Programmed

DTC C056E 42

Electronic Control Unit Software Calibration Not Programmed

DTC C056E 47

Electronic Control Unit Software VIN Not Programmed

DTC C056E 5A

Electronic Control Unit Software Not Plausible

DTC C056E 71

Electronic Control Unit Software Invalid Data

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the park brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the parking brake control module performs the requested operation.

Conditions for Running the DTC

Ignition OFF, ACCESSORY, or RUN mode.

Conditions for Setting the DTC

The parking brake module has detected missing calibration data, calibration procedure not run or completed, missing VIN, or internal software malfunction.

Actions Taken When DTC Sets

C056E 41 or C056E 5A

- The parking brake is disabled.
- A message and/or a warning indicator may be displayed.

C056E 42

- The parking brake functionality is degraded or disabled.
- A message and/or a warning indicator may be displayed.

C056E 47 or C056E 71

The parking brake will function normally.

Conditions for Clearing the DTC

- The parking brake control module will clear the DTC after 40 consecutive ignition on/off cycles with at least one test pass in each ignition cycle and no test fail result.
- The condition for the DTC is no longer present.
- The latest software and calibrations are programmed into the parking brake control module.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify that DTC C056E is not set.
 - **If the DTC is set**
 1. Program the K83 Parking Brake Control Module. Refer to **Electronic Parking Brake Control Module Programming and Setup** .
 2. Verify the DTC is not set.
 - If the DTC is set,

replace the K83 Parking Brake Control Module.

- If the DTC is not set
- 3. All OK.

- If the DTC is not set

- 3. All OK.

Repair Instructions

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

Control Module References for parking brake control module replacement, programming and setup

DTC C0574

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.

DTC Descriptors

DTC C0574 00

Printed Circuit Board Temperature Sensor Malfunction

DTC C0574 01

Printed Circuit Board Temperature Sensor Short to Battery

DTC C0574 02

Printed Circuit Board Temperature Sensor Short to Ground

DTC C0574 54

Printed Circuit Board Temperature Sensor High

Circuit/System Description

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch, the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation.

Conditions for Running the DTC

Ignition OFF, ACCESSORY, or RUN mode.

Conditions for Setting the DTC

C0574 01 or C0574 02

The parking brake control module detects a short to battery or a short to ground.

C0574 00 or C0574 54

The parking brake control module has detected an internal temperature that is above the allowed value.

Action Taken When the DTC Sets

- A message and/or a warning indicator may be displayed.
- The park brake is disabled, one release allowed.

Conditions for Clearing the DTC

- The parking brake control module clears the history DTC when a current DTC is not detected in 40 ignition cycles.
- The parking brake control module is replaced or the internal temperature drops below the allowed temperature.

Diagnostic Aids

- Check for debris on the parking brake control module which may cause the module to overheat.
- Diagnose all other parking brake control module system related faults before performing this diagnostic. Other faults may cause the circuit board to overheat. Do not attempt to apply the park brake.

Reference Information

Schematic Reference

Park Brake System Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Electronic Parking Brake Control Module Description

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

1. Ignition ON.
2. Verify no additional DTCs are set in other control modules.
 - **If additional DTCs are set**

Refer to **Diagnostic Trouble Code (DTC) List - Vehicle**

- **If no additional DTCs are set**
3. Verify that DTC C0574 01 or C0574 02 is not set.
 - **If DTC C0574 01 or C0574 02 is set**
 1. Ignition OFF. Remove the parking brake control module fuse and reinstall. Ignition ON.
 2. Verify DTC C0574 01 or C0574 02 is not set.
 - If the DTC is set, replace the K83 Parking Brake Control Module.
 - If the DTC is not set
 3. All OK.
 - **If DTC C0574 01 or C0574 02 is not set**
 4. Allow the K83 Parking Brake Control Module to cool down for 15 minutes.
 5. Verify the scan tool Calculated System Temperature parameter is less than 105° C.
 - **If 105° C or greater**

Replace the K83 Parking Brake Control Module.

- **If less than 105° C**
6. All OK.

Repair Instructions

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

Control Module References for parking brake control module replacement, programming and setup.

SYMPTOMS - PARK BRAKE

IMPORTANT: Review the system operation in order to familiarize yourself with the system

functions.

Refer to Electronic Parking Brake Control Module Description.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the park brake system.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Symptom List

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

Park Brake Will Not Hold or Release

PARK BRAKE WILL NOT HOLD OR RELEASE

Park Brake Will Not Hold or Release

Step	Action	Yes	No
1	Were you sent here from the Park Brake Symptom table?	Go to Step 2	Go to <u>Diagnostic Starting Point - Vehicle</u>
2	Inspect the park brake system for proper operation. Refer to <u>Park Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 5	Go to Step 3
3	Inspect the disc brake system for proper operation. Refer to <u>Disc Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 5	Go to Step 4
4	Inspect the hydraulic brake system for proper operation. Refer to <u>Hydraulic Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 5	Go to <u>Diagnostic Starting Point - Vehicle</u>
5	Road test the vehicle in order to confirm proper operation. Refer to <u>Brake System Vehicle Road Test</u> . Is the condition still present?	Go to Step 2	System OK

PARK BRAKE SYSTEM DIAGNOSIS

Park Brake System Diagnosis

Step	Action	Yes	No
DEFINITION: This diagnostic table is designed to diagnose ONLY the mechanical components of the PARK brake system in order to determine if the PARK brake system is operating properly. You will be directed by the appropriate Symptom table to go to other brake system diagnostic tables as appropriate.			

1	Were you sent here from a Hydraulic Brake Symptom table?	Go to Step 4	Go to Step 2
2	Were you sent here from a Park Brake Symptom table?	Go to Step 4	Go to Step 3
3	1. Raise and support the vehicle with the rear axle supported by jack stands. Refer to <u>Lifting and Jacking the Vehicle</u>. 2. With the park brake RELEASED, attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag.		
	Do the rear brakes have a significant amount of drag?	Go to Step 7	Go to Step 4
4	1. Apply the park brake. 2. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag.		
	Do the rear brakes have a significant amount of drag?	Go to Step 12	Go to Step 5
5	Visually inspect the park brake cable connections and the cables that are accessible on the UNDERSIDE of the vehicle for disconnections and/or damage. Were any of the park brake cables disconnected and/or damaged?	Go to Step 6	Go to Step 7
6	Reconnect or replace the park brake cables as necessary. Refer to <u>Parking Brake Rear Cable Replacement</u> . Did you complete the repair and/or replacement?	Go to Step 12	-
7	1. Disconnect the rear park brake cables from the equalizer and from the brake caliper piston apply levers. Refer to <u>Parking Brake Rear Cable Replacement</u>. 2. Have an assistant apply and maintain the caliper piston apply lever to apply the caliper piston. 3. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. 4. Release the caliper piston apply lever. 5. Repeat steps 2-4 for the opposite caliper piston apply lever. 6. Rotate the rear wheels to check the brake for a significant reduction of drag.		
	Did the brake calipers apply and release properly?	Go to Step 9	Go to Step 8
8	Replace the appropriate rear brake caliper. Refer to <u>Rear Brake Caliper Replacement</u> . Did you complete the replacement?	Go to Step 12	-
	With the aid of an assistant, apply and release the		

9	parking brake while observing the cables for free movement. Did the park brake cables move freely?	Go to Step 11	Go to Step 10
10	Replace any of the park brake cables inspected that do not have free movement. Refer to <u>Parking Brake Rear Cable Replacement</u> . Did you complete the replacement?	Go to Step 12	-
11	Inspect the electronic parking brake control module for proper operation and replace if necessary. Refer to <u>Electronic Parking Brake Control Module Replacement</u> . Did you complete the replacement?	Go to Step 12	-
12	Install or connect any components that were removed or disconnected during diagnosis. Did you complete the operation?	Park Brake System OK	-

REPAIR INSTRUCTIONS

ELECTRONIC PARKING BRAKE CONTROL MODULE REPLACEMENT

Removal Procedure

1. Block the drive wheels.
2. Disable the parking brake cable adjuster. Refer to **Parking Brake Cable Adjuster Disabling**
3. Place the ignition in the OFF position.
4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the left rear tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
6. Remove the left rear wheelhouse liner. Refer to **Rear Wheelhouse Liner Replacement** .

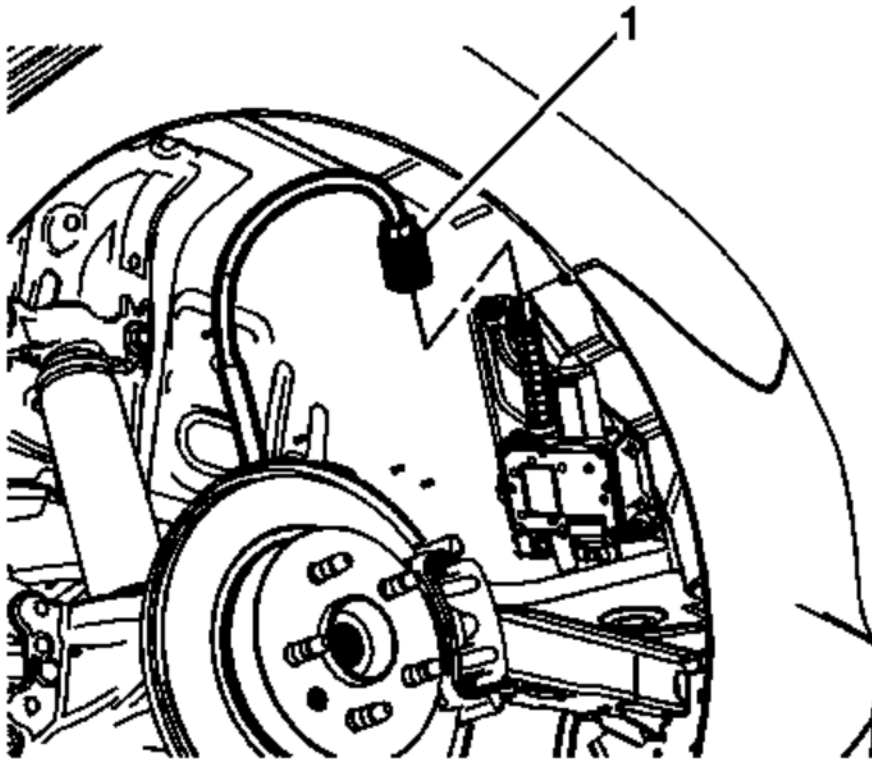


Fig. 2: NO CONTENT

Courtesy of GENERAL MOTORS COMPANY

7. Disconnect the parking brake rear cable nut (1).
8. Disconnect the electronic parking brake control module electrical connector.

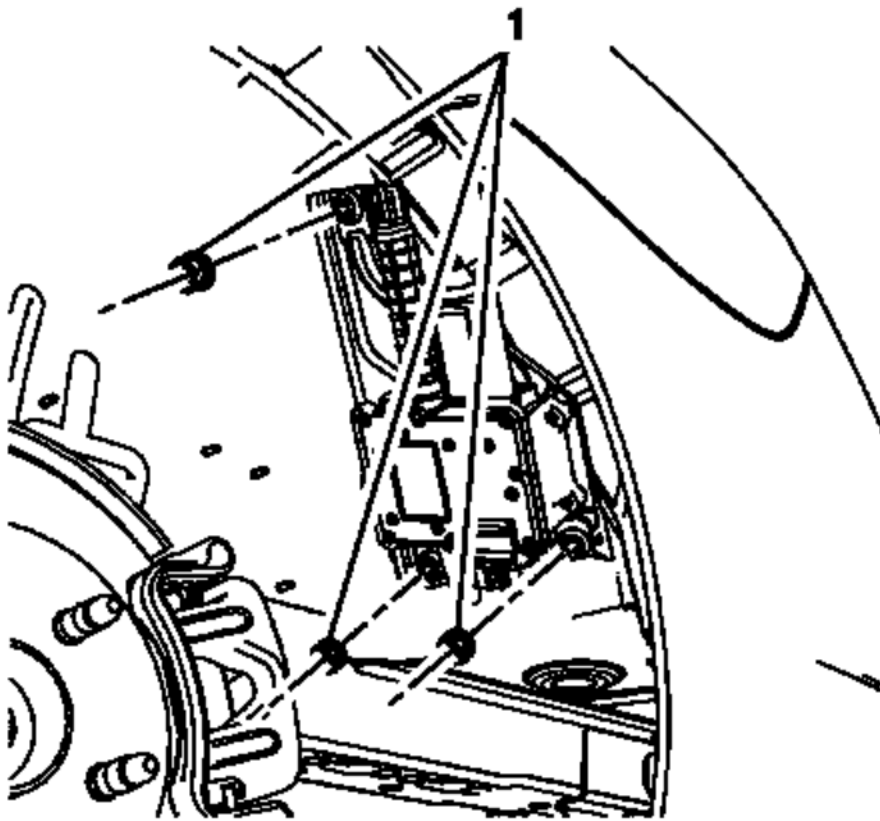


Fig. 3: NO CONTENT

Courtesy of GENERAL MOTORS COMPANY

9. Remove the electronic parking brake control module nuts (1).
10. Remove the electronic parking brake control module.

Installation Procedure

1. Install the electronic parking brake control module to the vehicle.
2. Inspect the O-ring seals on the spindle and the cable for damage and correct positioning and replace, if necessary.

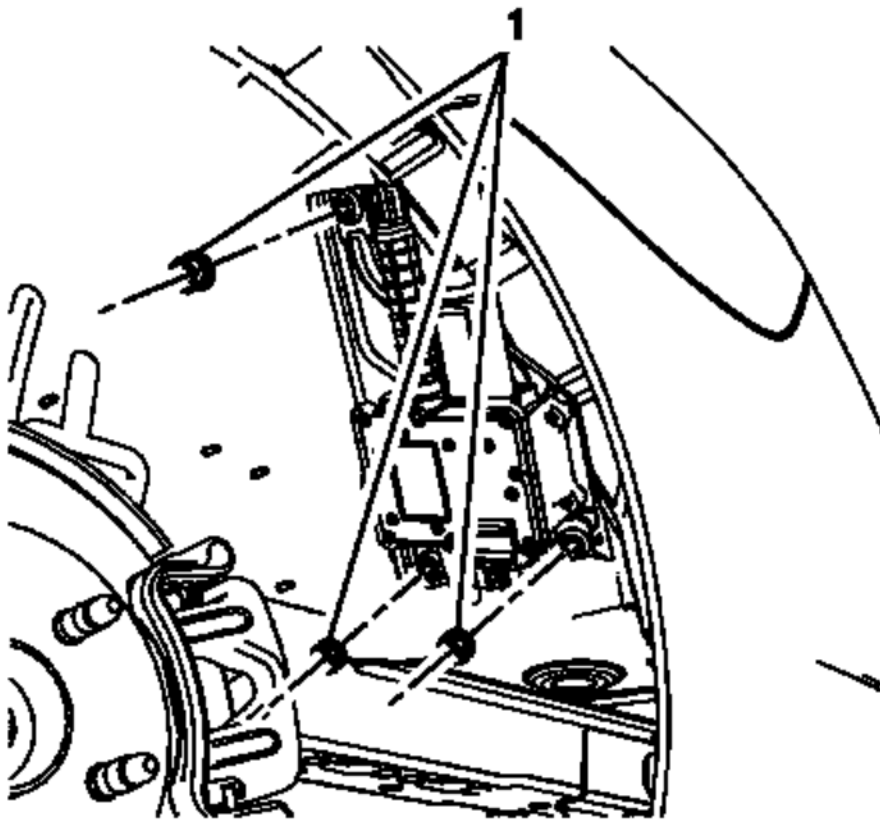


Fig. 4: NO CONTENT
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

3. Install the electronic parking brake control module nuts (1) and tighten to 10 N.m (89 lb in).

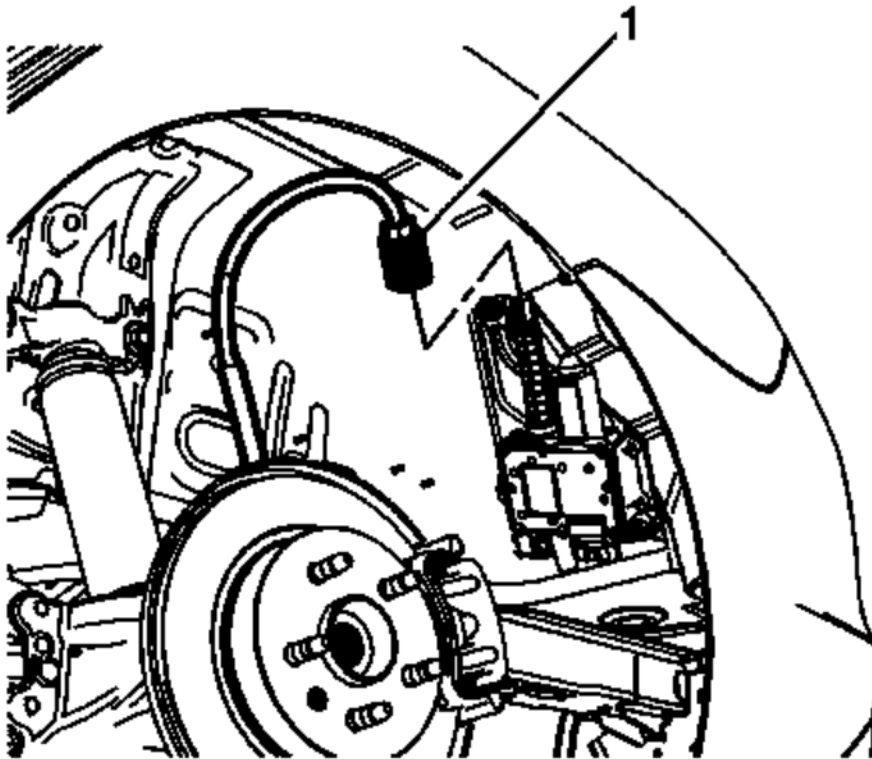


Fig. 5: NO CONTENT

Courtesy of GENERAL MOTORS COMPANY

NOTE: When installing the electronic park brake cable nut to the electronic park brake module spindle, hold the spindle housing securely to avoid distorting the housing.

4. Install the parking brake rear cable nut (1) and tighten to 6 N.m (53 lb in).
5. Connect the electronic parking brake control module electrical connector.
6. Install the left rear wheelhouse liner. Refer to [Rear Wheelhouse Liner Replacement](#) .
7. Install the left rear tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#) .
8. Enable the parking brake cable adjuster. Refer to [Parking Brake Cable Adjuster Enabling](#)
9. Program the electronic parking brake control module. Refer to [Electronic Parking Brake Control Module Programming and Setup](#) .

PARKING BRAKE REAR CABLE REPLACEMENT

Removal Procedure

WARNING: Refer to [Brake Dust Warning](#) .

1. Disable the parking brake cable adjuster. Refer to **Parking Brake Cable Adjuster Disabling**.
2. Turn the ignition to the OFF position.
3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**.
4. Remove the left rear wheelhouse liner. Refer to **Rear Wheelhouse Liner Replacement**.

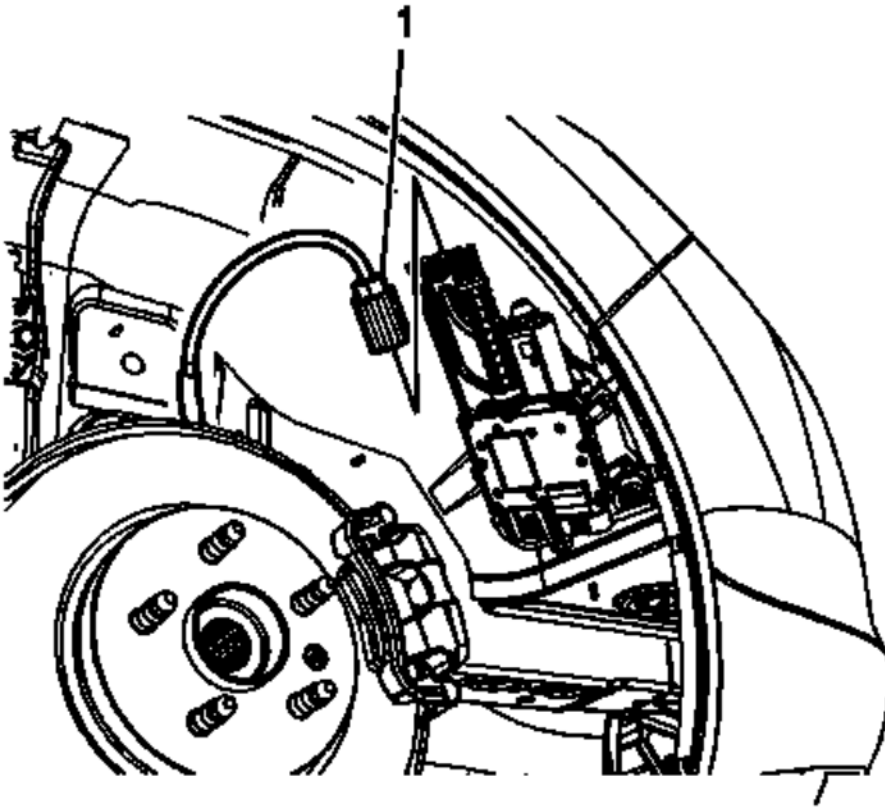


Fig. 6: Rear Parking Brake Cable Nut And Electronic Parking Brake Control Module
Courtesy of GENERAL MOTORS COMPANY

5. Remove the rear parking brake cable nut (1) from the electronic parking brake control module.

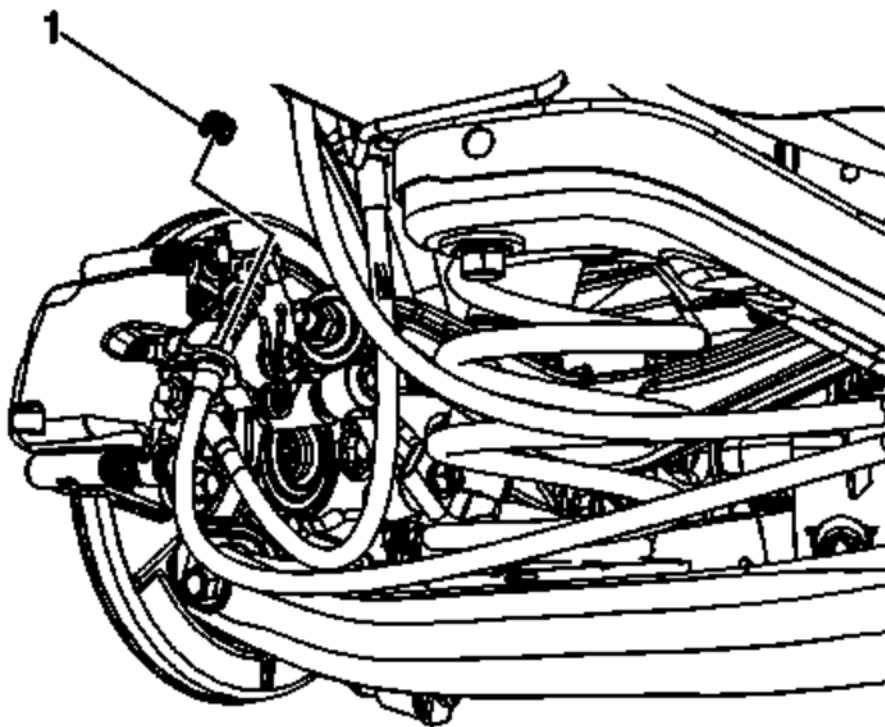


Fig. 7: Left Rear Parking Brake Cable Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Remove the left rear parking brake cable retainer (1).

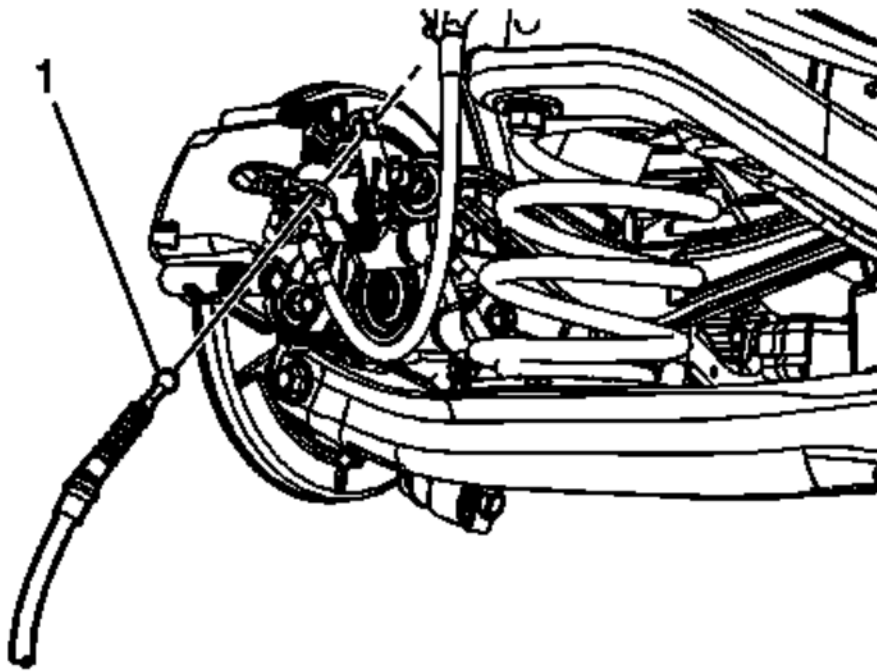


Fig. 8: Rear Parking Brake Cable And Parking Brake Actuator Lever
Courtesy of GENERAL MOTORS COMPANY

7. Disconnect the rear parking brake cable (1) from the parking brake actuator lever and remove the cable from the left rear brake caliper.

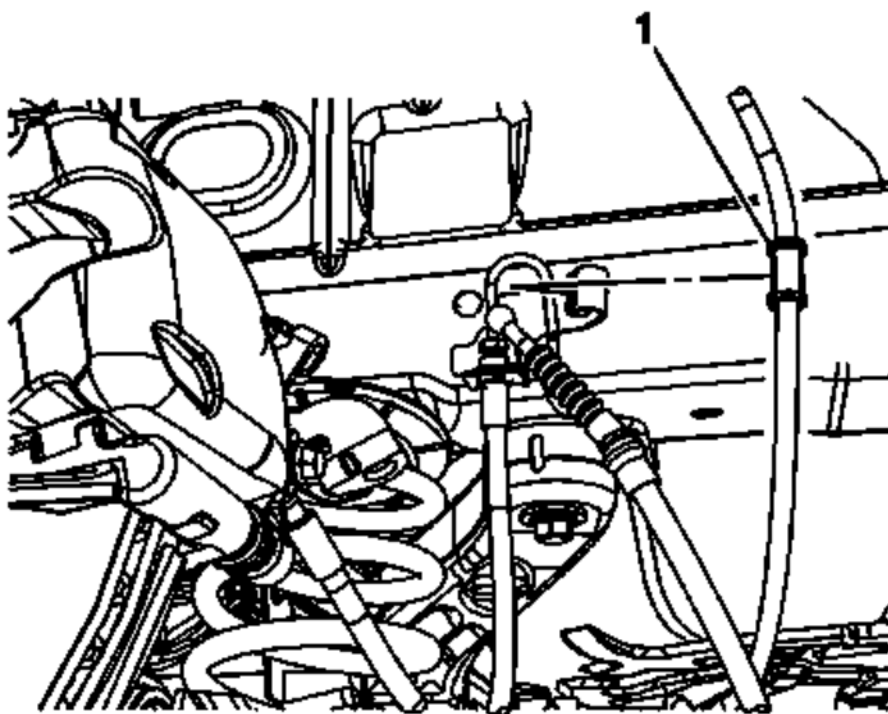


Fig. 9: Rear Parking Brake Cable

Courtesy of GENERAL MOTORS COMPANY

8. Release the rear parking brake cable (1) from the left rear brake hose bracket.

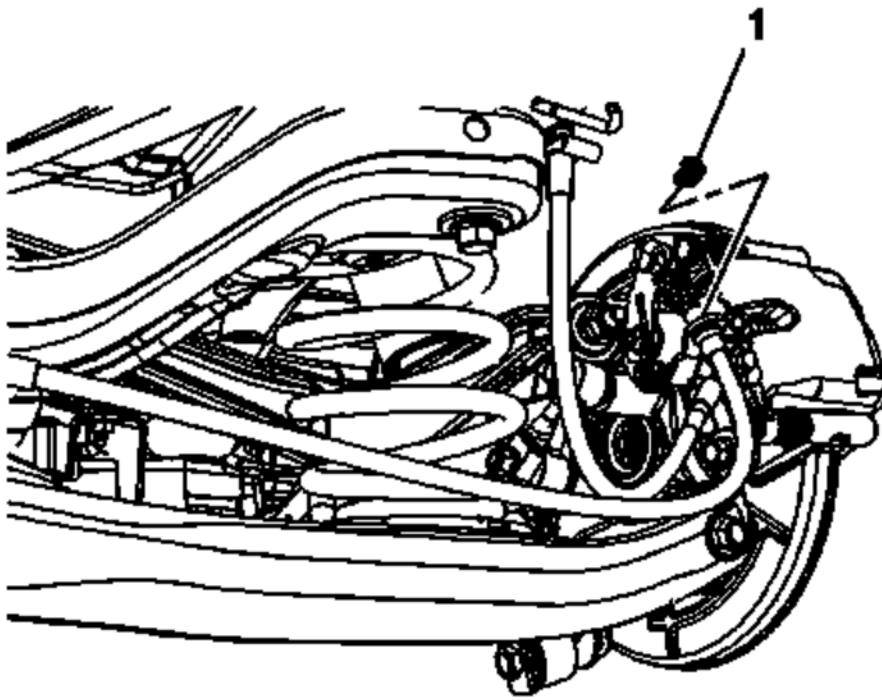


Fig. 10: Right Rear Parking Brake Cable Retainer
Courtesy of GENERAL MOTORS COMPANY

9. Remove the right rear parking brake cable retainer (1).

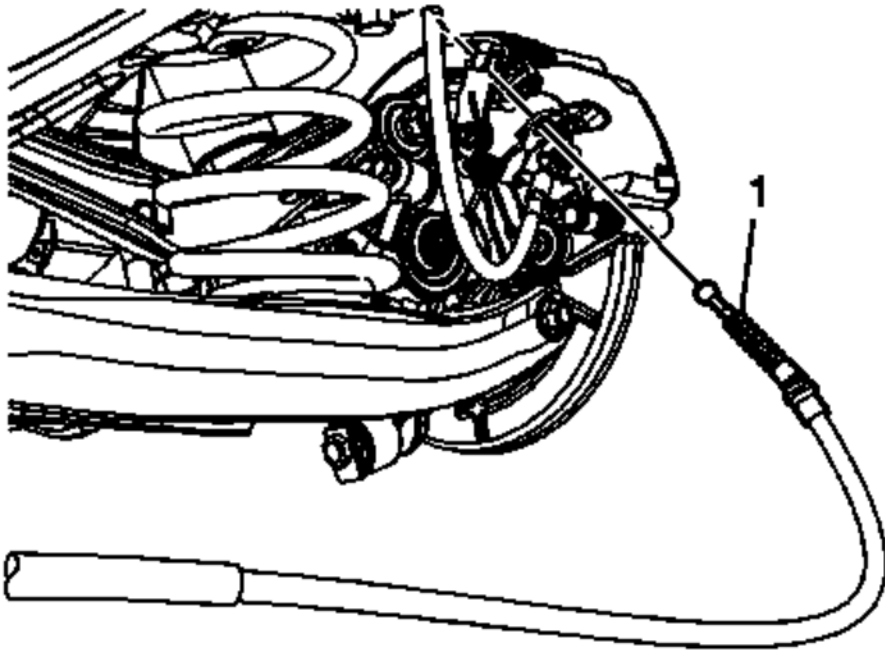


Fig. 11: Rear Parking Brake Cable, Parking Brake Actuator Lever And Right Rear Brake Caliper
Courtesy of GENERAL MOTORS COMPANY

10. Disconnect the rear parking brake cable (1) from the parking brake actuator lever and remove the cable from the right rear brake caliper.

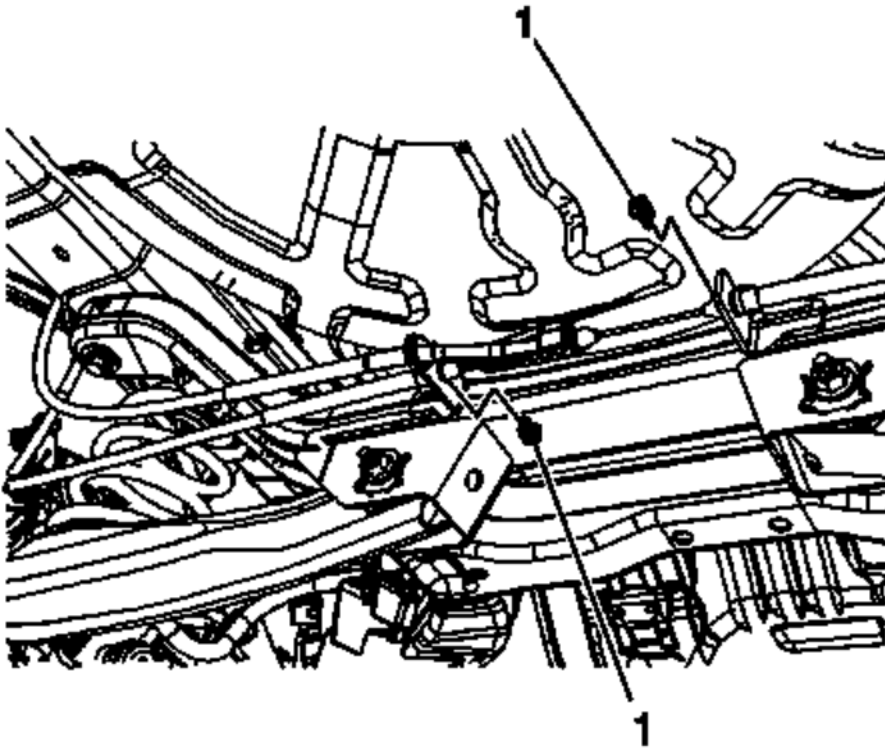


Fig. 12: Rear Parking Brake Cable Retainers And Rear Frame
Courtesy of GENERAL MOTORS COMPANY

11. Remove the rear parking brake cable retainers (1) on the rear frame.

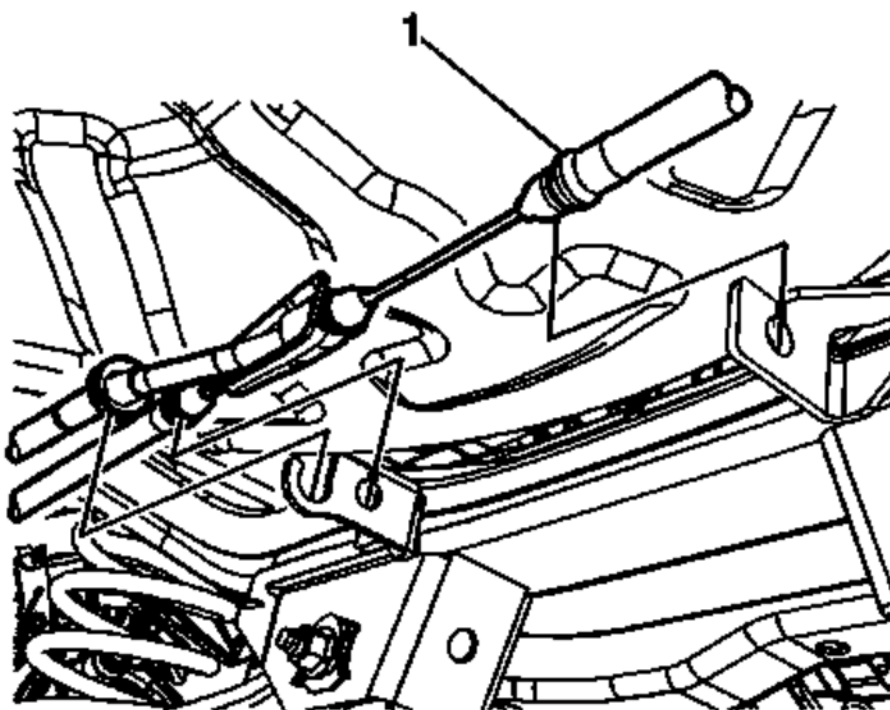


Fig. 13: Rear Parking Brake Cable
Courtesy of GENERAL MOTORS COMPANY

12. Remove the rear parking brake cable (1).

Installation Procedure

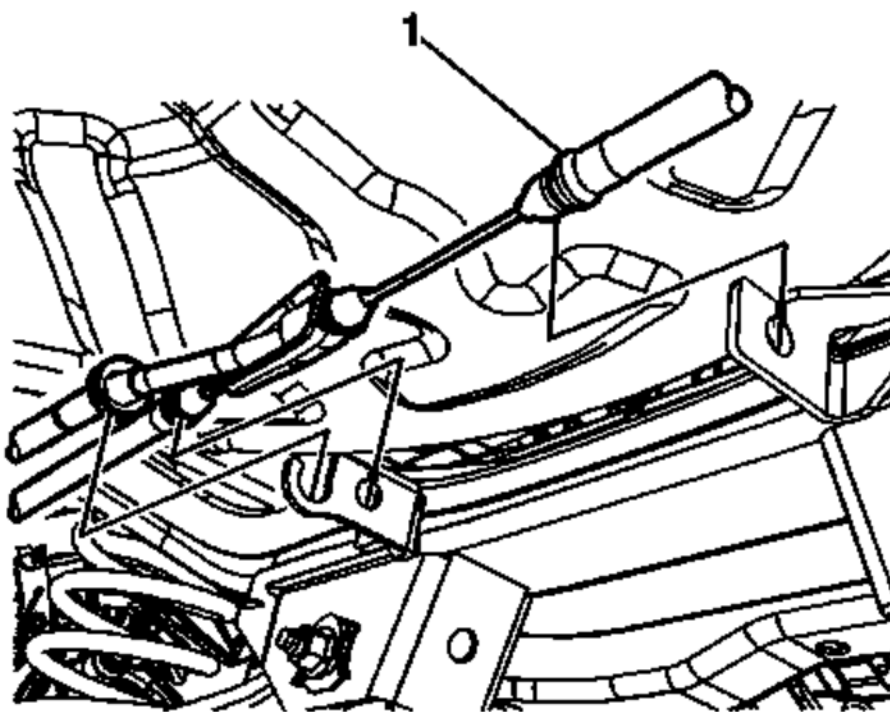


Fig. 14: Rear Parking Brake Cable
Courtesy of GENERAL MOTORS COMPANY

1. Install the rear parking brake cable (1).

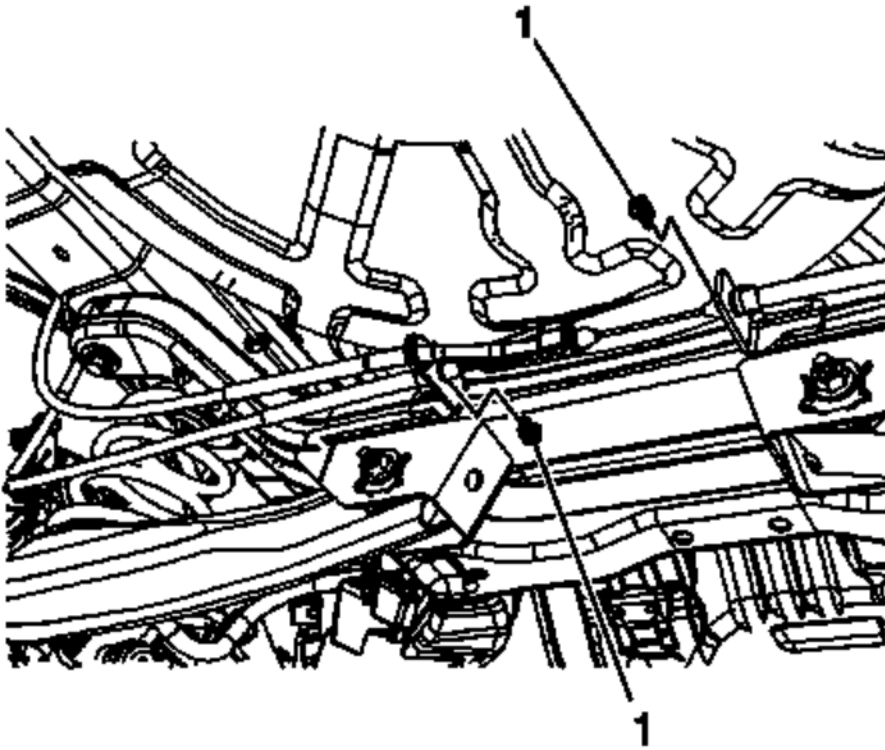


Fig. 15: Rear Parking Brake Cable Retainers And Rear Frame
Courtesy of GENERAL MOTORS COMPANY

2. Install the rear parking brake cable retainers (1) on the rear frame.

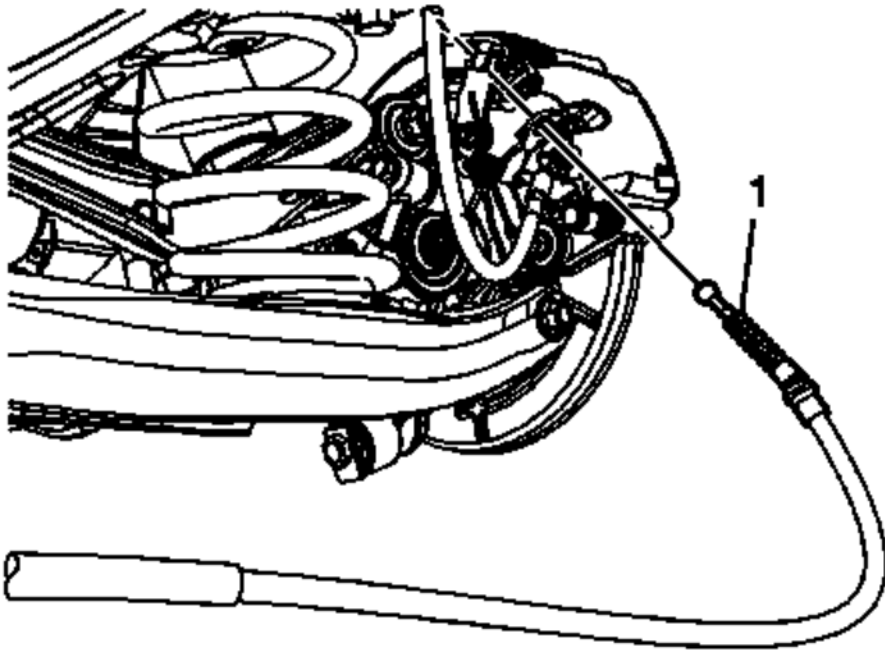


Fig. 16: Rear Parking Brake Cable, Parking Brake Actuator Lever And Right Rear Brake Caliper
Courtesy of GENERAL MOTORS COMPANY

3. Install the rear parking brake cable (1) to the right rear brake caliper and connect the cable to the parking brake actuator lever.

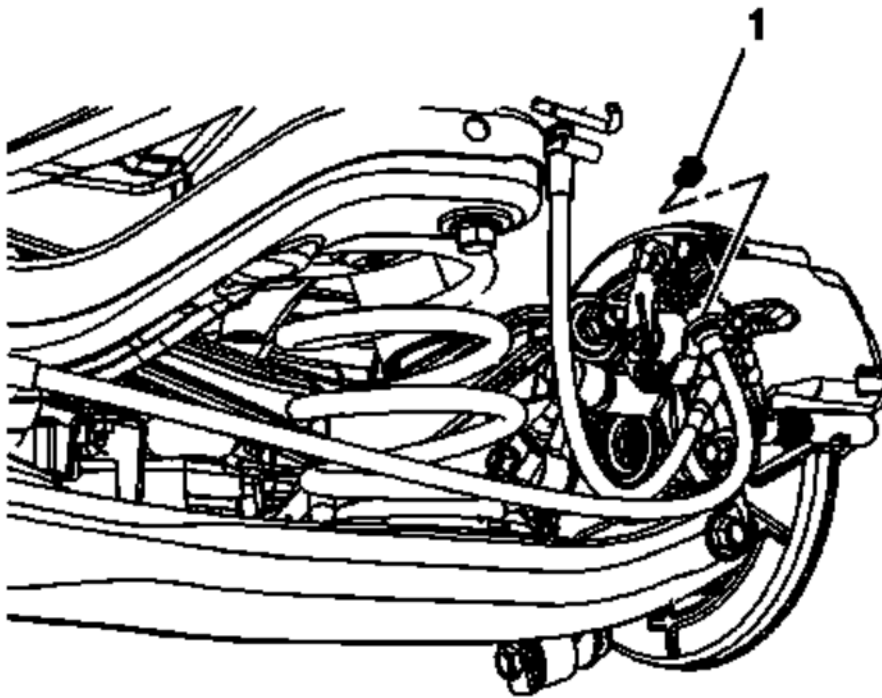


Fig. 17: Right Rear Parking Brake Cable Retainer
Courtesy of GENERAL MOTORS COMPANY

4. Install the right rear parking brake cable retainer (1).

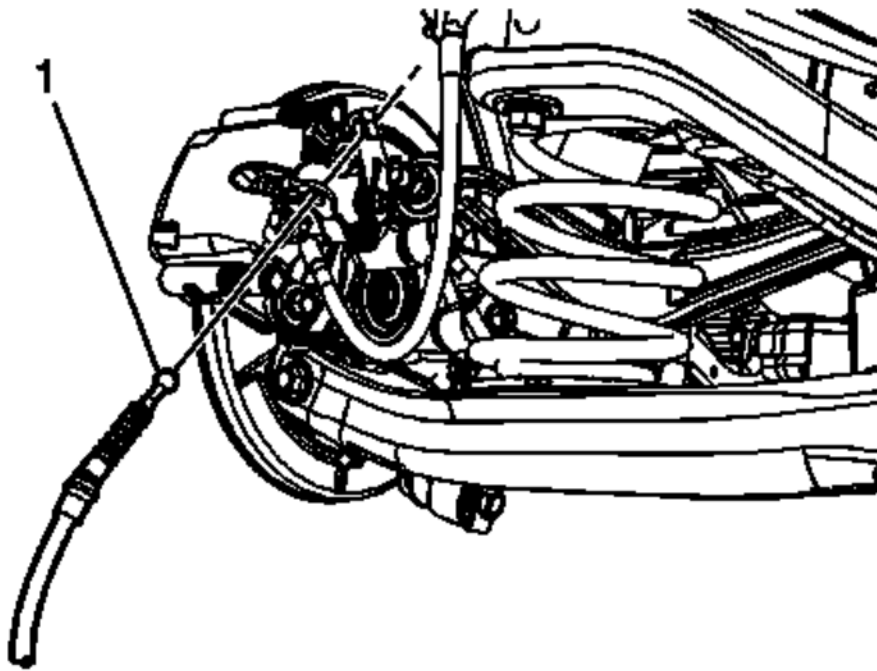


Fig. 18: Rear Parking Brake Cable And Parking Brake Actuator Lever
Courtesy of GENERAL MOTORS COMPANY

5. Install the rear parking brake cable (1) to the left rear brake caliper and connect the cable to the parking brake actuator lever.

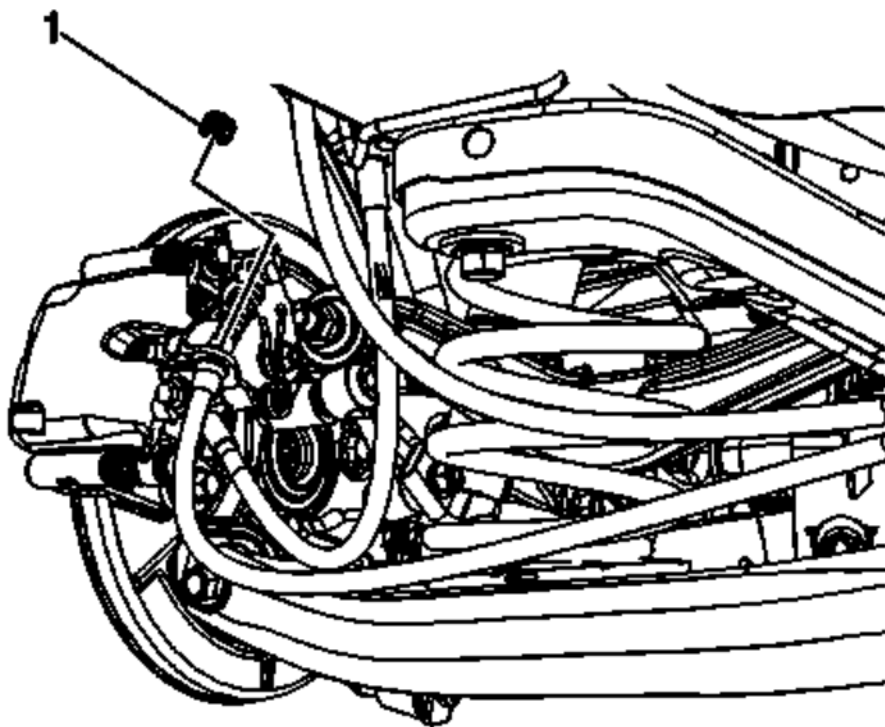


Fig. 19: Left Rear Parking Brake Cable Retainer
Courtesy of GENERAL MOTORS COMPANY

6. Install the left rear parking brake cable retainer (1).

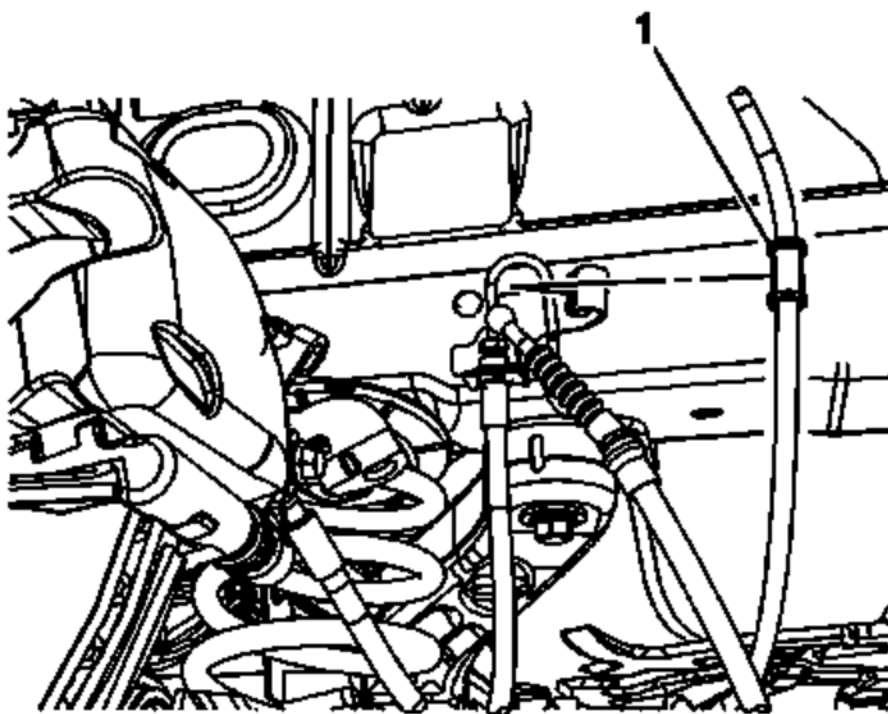


Fig. 20: Rear Parking Brake Cable
Courtesy of GENERAL MOTORS COMPANY

7. Install the rear parking brake cable (1) to the left rear brake hose bracket.

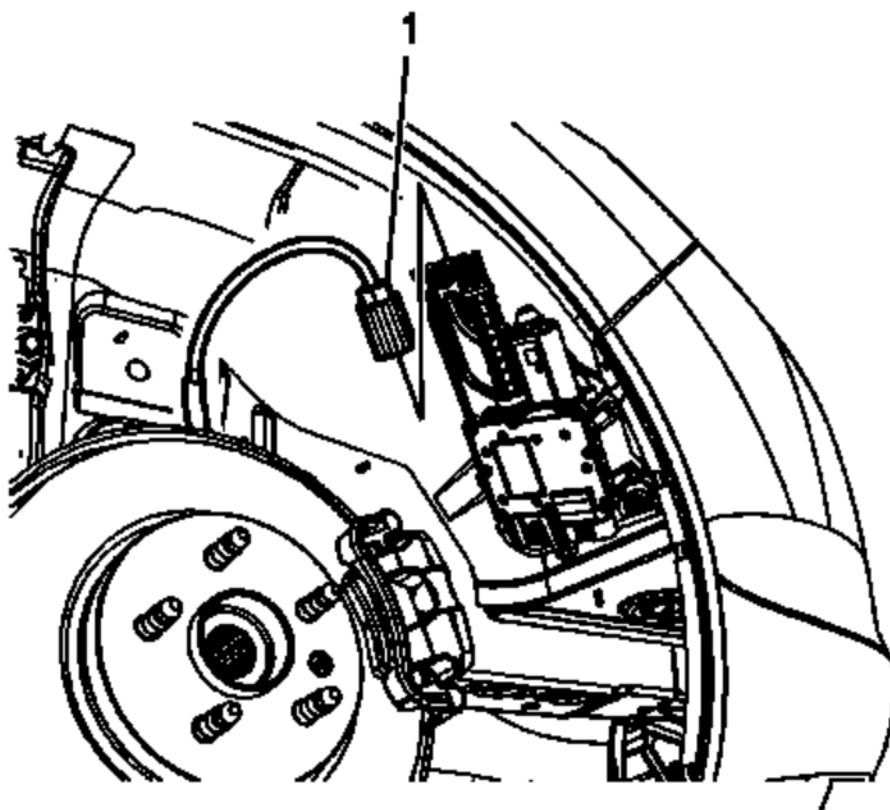


Fig. 21: Rear Parking Brake Cable Nut And Electronic Parking Brake Control Module
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

8. Install the rear parking brake cable nut (1) to the electronic parking brake control module and tighten to 6 N.m (53 lb in).
9. Install the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement .
10. Enable the parking brake cable adjuster. Refer to Parking Brake Cable Adjuster Enabling.

PARKING BRAKE CABLE ADJUSTER DISABLING

The park brake cable tension is controlled by the electronic park brake (EPB) module. Tension can be fully released from the park brake cables to allow for service of the park brake system. Perform one of the following three methods to fully release cable tension.

Electronic Parking Brake Cable Tension Release

With Scan Tool - Preferred Method

1. Block the drive wheels.
2. Install a scan tool to the vehicle.
3. Turn the ignition switch to the ON/RUN position with the engine OFF.
4. Select Control Functions from the electronic parking brake control module menu.
5. Follow the instructions on the scan tool.

Without Scan Tool - Optional Method

1. Block the drive wheels.
2. Turn the ignition switch to the ON/RUN position with the engine OFF.
3. Place the automatic transmission in PARK or manual transmission in NEUTRAL, as equipped.
4. Apply and hold the brake pedal. The brake pedal must remain applied throughout the park brake cable tension release process.
5. Press and hold down the electronic park brake (EPB) switch approximately 5 seconds.
6. Observe the PARK BRAKE lamp on the instrument cluster.
7. When the PARK BRAKE lamp flashes, release then immediately press and release the EPB switch.

The parking brake cable tension is fully released.

8. Release the brake pedal.

Manual Parking Brake Cable Tension Release

In the event the above methods to release the parking brake cable tension are unsuccessful, the following procedure may be necessary to release the parking brake cable tension.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the left rear wheelhouse panel liner. Refer to **Rear Wheelhouse Liner Replacement** .

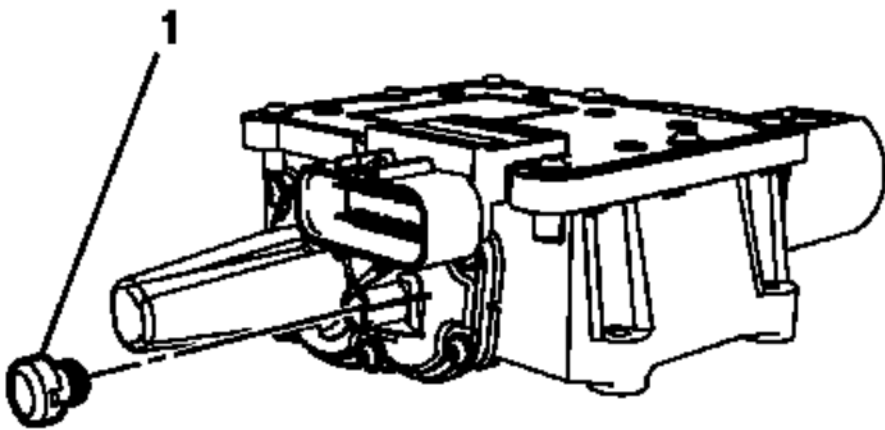


Fig. 22: Protective Plug

Courtesy of GENERAL MOTORS COMPANY

NOTE: The protective plug for the manual release is located near the electrical connector.

4. Remove the protective plug (1) from the EPB manual release.
5. Using an appropriate square-drive tool, rotate the mechanism clockwise until the tension is fully released from the parking brake cables.

Up to 50 cycles may be required until the parking brake cable tension is fully released.

6. Install the protective plug to the EPB module.

PARKING BRAKE CABLE ADJUSTER ENABLING

The park brake cable tension is controlled by the electronic park brake (EPB) module. Cable tension needs to be set and the EPB module needs to be calibrated following the cable tension disabling procedure. Perform one of the following two methods to fully restore cable tension.

Electronic Parking Brake Cable Tensioning

With Scan Tool - Preferred Method

1. Block the drive wheels.
2. Install a scan tool to the vehicle.
3. Turn the ignition switch to the ON/RUN position with the engine OFF.
4. Select Configuration/Reset Functions from the electronic parking brake control module menu.
5. Perform the Parking Brake Calibration procedure.

Without Scan Tool - Optional Method

1. Block the drive wheels.
2. Turn the ignition switch to the ON/RUN position with the engine OFF.
3. Apply the brake pedal.
4. Place the automatic transmission in PARK or manual transmission in NEUTRAL, as equipped.
5. Momentarily lift then release the EPB switch to apply the EPB.
6. Momentarily press down then release the EPB switch to release the EPB.
7. Repeat step 5 and 6 to cycle the EPB on then off an additional 4 times.
8. The EPB module will be calibrated and proper tension will be applied to the parking brake cables.

PARKING BRAKE ACTUATOR SWITCH REPLACEMENT

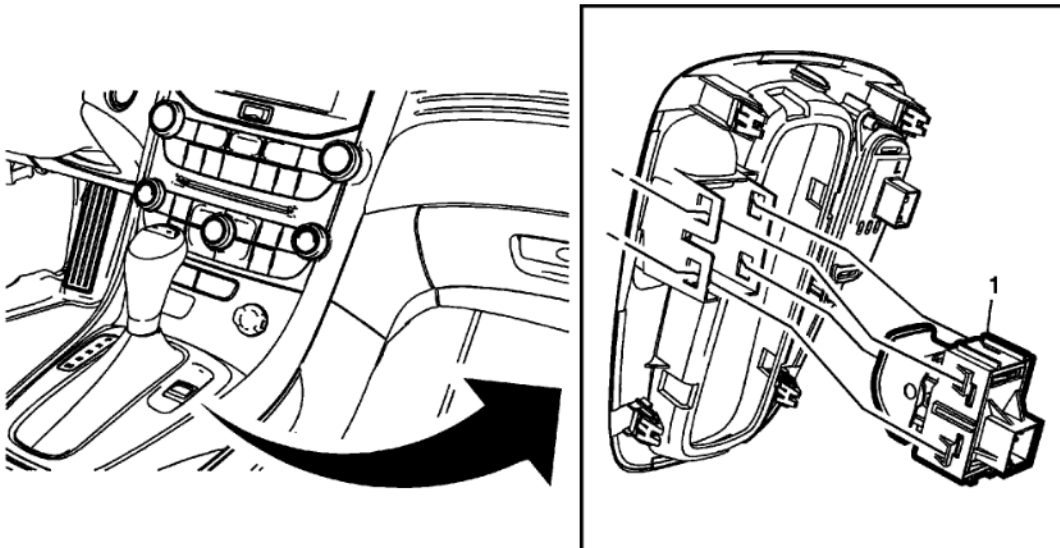


Fig. 23: NO CONTENT

Courtesy of GENERAL MOTORS COMPANY

Parking Brake Actuator Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the shifter bezel. Refer to Automatic Transmission Control Indicator Bezel Replacement .	
1	Parking Brake Actuator Switch Procedure Release tabs to remove the switch from the bezel.

DESCRIPTION AND OPERATION

ELECTRONIC PARKING BRAKE CONTROL MODULE DESCRIPTION

Vehicles with the electric parking brake have a switch in the center console, which takes the place of the manual parking brake system, the foot pedal and release handle. In case of insufficient electrical power, the electric parking brake cannot be applied or released.

Parking Brake Control Module

The parking brake control module has an internal motor, apply actuator, release actuator, and temperature sensor. The parking brake control module also contains the logic for applying and releasing the parking brake when commanded by the park brake control switch. When the parking brake control module receives a signal from the switch the internal circuit board temperature is checked to verify it is within operating range before the control module performs the requested operation.

Electric Parking Brake Apply

The electric parking brake can be applied any time the vehicle is stopped or in motion. The electric parking brake is applied by momentarily lifting up on the park brake control switch. The red park brake light will momentarily flash while the parking brake is being applied. Once fully applied, the red park brake light will turn on. If the electric parking brake is applied while the vehicle is in motion, a chime will sound, and the message "Release Park Brake Switch" will be displayed.

If the red park brake light is flashing, the electric parking brake is only partially applied or released, or there is a problem with the electric parking brake. The message "Service Park Brake" will be displayed.

Electric Parking Brake Release

To release the electric parking brake, turn the ignition switch to the ON or RUN position, apply and hold the brake pedal, and push down momentarily on the park brake control switch. When the electric parking brake is released the red park brake light turns off.

The electric parking brake can be used to prevent roll back for vehicles with a manual transmission taking off on a hill. In a situation where no roll back is desired, an applied electric parking brake will allow both feet to be used for the clutch and accelerator pedals in preparation for starting the vehicle moving in the intended direction. In this situation, perform the normal clutch and accelerator actions required to begin moving the vehicle. There is no need to push the switch to release the electric parking brake. To disable this feature lift and hold the park brake control switch while the vehicle is in motion, this will keep the electric parking brake

applied.