

## 2018 BRAKES

### Park Brake - Equinox & Terrain

## SPECIFICATIONS

### FASTENER SPECIFICATIONS

#### Single Use Non-Threaded Fasteners/Components

**NOTE:**

*All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.*

| Application                            |
|----------------------------------------|
| Rear Parking Brake Actuator Lever Seal |

#### Reusable Threaded Fastener Tightening Specifications

**NOTE:**

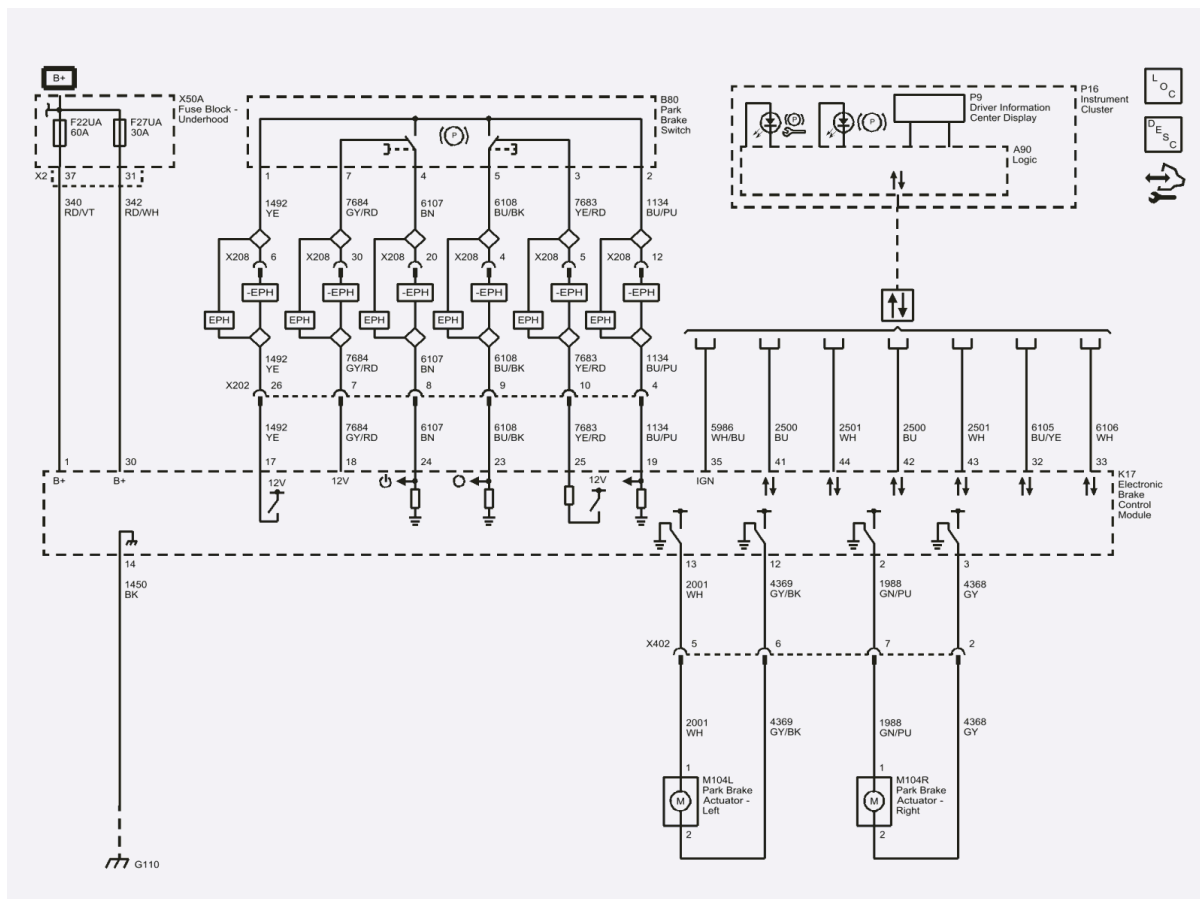
*All fasteners listed in this table can be reused after removal.*

| Application                 | Specification      |
|-----------------------------|--------------------|
|                             | Metric (English)   |
| Parking Brake Actuator Bolt | 12 N.m (106 lb in) |

## SCHEMATIC WIRING DIAGRAMS

### PARK BRAKE SYSTEM WIRING SCHEMATICS

#### Electric Park Brake



## **DIAGNOSTIC INFORMATION AND PROCEDURES**

### **DTC C028F: PARK BRAKE SOLENOID ACTUATOR CIRCUIT**

#### **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 C028F**

Park Brake Solenoid Actuator Circuit

For symptom byte information, refer to [Symptom Byte List](#)

#### **Diagnostic Fault Information**

| <b>Circuit</b>                           | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|------------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Left Park Brake Actuator Apply Control   | C028F 00               | C028F 04                    | C028F 0B                | C028F 59                  |
| Left Park Brake Actuator Release Control | C028F 00               | C028F 04                    | C028F 0B                | C028F 59                  |

#### **Circuit/System Description**

The Electronic Brake Control Module will diagnose the park brake motor circuits to verify that they are functioning properly. The park brake motor circuits are used to command motor operation, apply and release tension on the parking brake cable, which will apply and release the parking brake. These circuits are used to drive the motors, which pulls on the park brake cable, ultimately applying and releasing the park brake.

When the Park Brake Switch is pulled, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the apply control circuits and ground to the release control circuits which will cause the left and right park brake actuators to activate causing the park brakes to engage. When the Park Brake Switch is pressed, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the released control circuits and ground to the apply control circuits which will cause the left and right park brake actuators to activate causing the park brakes to release.

#### **Conditions for Running the DTC**

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

#### **Conditions for Setting the DTC**

The Electronic Brake Control Module detects a malfunction in the left park brake actuator or its circuits.

#### **Action Taken When the DTC Sets**

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

#### **Conditions for Clearing the DTC**

- The Electronic 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.

### Diagnostic Aids

After repairing any fault, the DTC will still be set as current and the park brakes will not function. It is necessary to clear the DTC with a scan tool in order to place the DTC in history and regain park brake function.

### Reference Information

Schematic Reference

### Park Brake System Wiring Schematics

Connector End View Reference

### COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

### Electronic Parking Brake 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. Verify the M104L Park Brake Actuator - Left apply when pulling the B80 Park Brake Switch.
  - **If the M104L Park Brake Actuator - Left does not apply**  
Refer to the Circuit/System Testing below.
  - **Go to next step: If the M104L Park Brake Actuator - Left does apply**
2. Verify the M104L Park Brake Actuator - Left release when pressing the B80 Park Brake Switch.
  - **If the M104L Park Brake Actuator - Left does not release**  
Refer to the Circuit/System Testing below.
  - **Go to next step: If the M104L Park Brake Actuator - Left does release**
3. All OK.

### Circuit/System Testing

**NOTE:** It is necessary to clear the DTC after any repair is made to regain park brake output control and have the DTC to set as history.

1. Ignition OFF, disconnect the harness connector at the M104L Park Brake Actuator - Left and the harness connector at the K17 Electronic Brake Control Module. Ignition ON
2. Test for less than 1 V between the K17 Electronic Brake Control Module harness connector terminals listed below and ground:
  - Terminal 12

- Terminal 13

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **Go to next step: If less than 1 V**

3. Ignition OFF.

4. Test for infinite resistance between the K17 Electronic Brake Control Module harness connector terminals listed below and ground:

- Terminal 12
- Terminal 13

- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **Go to next step: If infinite resistance**

5. Test for less than 2  $\Omega$  between the M104L Park Brake Actuator - Left harness connector terminal 1 and the K17 Electronic Brake Control Module harness connector terminal 13

- **If 2  $\Omega$  or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2  $\Omega$**

6. Test for less than 2  $\Omega$  between the M104L Park Brake Actuator - Left harness connector terminal 2 and the K17 Electronic Brake Control Module harness connector terminal 12

- **If 2  $\Omega$  or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2  $\Omega$**

7. Install a 25 A fused jumper wire between one of the control terminals at the M104L Park Brake Actuator - Left and 12 V. Momentarily install a jumper wire between the other control terminal and ground. Reverse the jumper wires at least two times, the M104L Park Brake Actuator - Left should perform the apply and release function.

- **If the actuator does not perform the apply and release function**

Replace the M104L Park Brake Actuator - Left.

- **Go to next step: If the actuator performs the apply and release function**

8. Replace the K17 Electronic Brake Control Module.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Parking Brake Actuator Replacement](#)
- [Control Module References](#) for control module replacement, programming and setup.

## DTC C0293: PARK BRAKE SWITCH CIRCUIT

### 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

For symptom byte information, refer to [Symptom Byte List](#)

### Diagnostic Fault Information

| Circuit           | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-------------------|-----------------|----------------------|------------------|--------------------|
| B+ Terminal 2     | C0293 00        | C0293 04             | C0293 01         | C0293 00, C0293 08 |
| B+ Terminal 4     | C0293 00        | C0293 04             | C0293 01         | C0293 00, C0293 08 |
| B+ Terminal 5     | C0293 00        | C0293 04             | C0293 01         | C0293 00, C0293 08 |
| Signal Terminal 1 | C0293 00        | C0293 04             | C0293 01         | C0293 00, C0293 08 |
| Signal Terminal 3 | C0293 00        | C0293 04             | C0293 01         | C0293 00, C0293 08 |
| Signal Terminal 7 | C0293 00        | C0293 04             | C0293 01         | C0293 00, C0293 08 |

### Circuit/System Description

The parking brake function is integrated into the Electronic Brake Control Module. The Electronic Brake Control Module contains the logic for applying and releasing the parking brake when commanded by the Park Brake Switch. The Electronic Brake Control Module will perform diagnostics on the Park Brake Switch and its wiring harness to verify it is functioning properly.

The Park Brake Switch diagnostic checks for failure conditions in the Park Brake Switch and associated wiring into the Electronic Brake Control Module.

### Conditions for Running the DTC

Ignition OFF, ACCESSORY or RUN mode.

### Conditions for Setting the DTC

The Electronic Brake Control Module detects a short to battery, short to ground, open circuit or an internal Parking Brake Control Switch malfunction. The Electronic Brake Control Module detects the apply or release button was activated for more than 90 s.

### 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 Electronic 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 Switch button is INACTIVE using the scan tool without the switch being activated.

### Reference Information

Schematic Reference

### [Park Brake System Wiring Schematics](#)

Connector End View Reference

### [COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

### [Electronic Parking Brake 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 Switch parameter changes between Released and Apply while pressing and releasing the B80 Park Brake Switch.
  - **If the parameter does not change**  
Refer to Circuit/System Test below.
  - **Go to next step: If the parameter changes**
3. All OK.

### Circuit/System Test

1. Ignition OFF, disconnect the harness connector at the K17 Electronic Brake Control Module. Ignition ON.
2. Test for less than 1 V between each circuit terminals listed below and ground;
  - Terminal 17
  - Terminal 18
  - Terminal 19
  - Terminal 23
  - Terminal 24
  - Terminal 25
  - **If 1 V or greater**  
Repair the short to voltage on the circuit.
  - **Go to next step: If less than 1 V**
3. Ignition OFF.
4. Test for infinite resistance between the circuit terminals listed below and ground;
  - Terminal 17
  - Terminal 18
  - Terminal 19
  - Terminal 23
  - Terminal 24
  - Terminal 25
  - **If less than infinite resistance**  
Repair the short to ground on the circuit.
  - **Go to next step: If infinite resistance**
5. Test for less than 5  $\Omega$  between the circuit terminal 18 and the circuit terminal 24.
  - **If 5  $\Omega$  or greater**
    1. Ignition OFF, disconnect the harness connector at the B80 Park Brake Switch.
    2. Test for less than 2  $\Omega$  in the circuits end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.

- If less than 2  $\Omega$ , replace the B80 Park Brake Switch.
  - **Go to next step: If less than 5  $\Omega$**
6. Test for less than 5  $\Omega$  between the circuit terminal 25 and the circuit terminal 23.
- **If 5  $\Omega$  or greater**
    1. Ignition OFF, disconnect the harness connector at the B80 Park Brake Switch.
    2. Test for less than 2  $\Omega$  in the circuits end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the B80 Park Brake Switch.
  - **Go to next step: If less than 5  $\Omega$**
7. Test for less than 5  $\Omega$  between the circuit terminal 17 and the circuit terminal 19.
- **If 5  $\Omega$  or greater**
    1. Ignition OFF, disconnect the harness connector at the B80 Park Brake Switch.
    2. Test for less than 2  $\Omega$  in the circuits end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , replace the B80 Park Brake Switch.
  - **Go to next step: If less than 5  $\Omega$**
8. Test for less than 5  $\Omega$  between the circuit terminal 19 and the circuit terminal 24 while closing the switch.
- **If 5  $\Omega$  or greater**

Replace the B80 Park Brake Switch.
  - **Go to next step: If less than 5  $\Omega$**
9. Test for less than 5  $\Omega$  between the circuit terminal 19 and the circuit terminal 23 while closing the switch.
- **If 5  $\Omega$  or greater**

Replace the B80 Park Brake Switch.
  - **Go to next step: If less than 5  $\Omega$**
10. Ignition OFF, all access doors closed, all vehicle systems OFF, disconnect the harness connector at the B80 Park Brake Switch.
11. Test for less than 10  $\Omega$  between the ground circuit terminal 8 at the B80 Park Brake Switch and ground.
- **If 10  $\Omega$  or greater**
    1. Ignition OFF.
    2. Test for less than 2  $\Omega$  in the ground circuit end to end.
      - If 2  $\Omega$  or greater, repair the open/high resistance in the circuit.
      - If less than 2  $\Omega$ , repair the open/high resistance in the ground connection.
  - **Go to next step: If less than 10  $\Omega$**
12. Replace the B80 Park Brake Switch.
13. Verify that DTC C0293 does not set while operating the vehicle within the Conditions for Running the DTC.
- **If the DTC sets**

Replace the K17 Electronic Brake Control Module.
  - **Go to next step: If DTC does not set**
14. All OK.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Parking Brake Switch Replacement \(Equinox\)](#)[Parking Brake Switch Replacement \(Terrain\)](#).
- [Control Module References](#) for K17 Electronic Brake Control Module replacement, programming and setup.

## **DTC C056E: ELECTRONIC CONTROL UNIT SOFTWARE - CALIBRATION NOT LEARNED**

### **Diagnostic Instructions**

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

### **DTC Descriptor**

#### **DTC C056E 4B**

Electronic Control Unit Software - Calibration Not Learned

**Symptom Byte Information:** [Symptom Byte List](#)

### **Circuit/System Description**

For an overview of the component/system, refer to [Electronic Parking Brake Description](#)

### **Conditions for Running the DTC**

Ignition = On

### **Conditions for Setting the DTC**

- K17 Electronic Brake Control Module = Missing Calibration - Electric Park Brake (J71)

### **Actions Taken When the DTC Sets**

Electric Park Brake = Degraded or Disabled

### **Conditions for Clearing the DTC**

K17 Electronic Brake Control Module = Calibrated - Electric Park Brake (J71)

### **Reference Information**

Schematic Reference

### **[Park Brake System Wiring Schematics](#)**

Connector End View Reference

## **[COMPONENT CONNECTOR END VIEWS - INDEX](#)**

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

## **[Powertrain Diagnostic Trouble Code \(DTC\) Type Definitions](#)**

Scan Tool Reference

### **[Control Module References](#)**

## DTC C056E 4B

1. Ignition - On / Vehicle - In Service Mode
2. Verify DTC C056E 4B is not set.
  - **If the DTC is set**
    1. Perform the necessary programming and setup procedure: K17 Electronic Brake Control Module - Step 4
    2. Verify the DTC does not set.
      - If the DTC sets - Replace the component: K17 Electronic Brake Control Module
      - If the DTC is not set
    3. All OK.
  - **Go to next step: If the DTC is not set**
3. All OK.

## Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#)

For control module replacement, programming and setup, refer to [Control Module References](#)

## DTC C1280 OR C1281: ELECTRIC PARK BRAKE AVAILABILITY STATUS MESSAGE COUNTER INCORRECT

### 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 C1280

Electric Park Brake Availability Status Message Counter Incorrect

#### DTC C1281

Electric Park Brake Application Status Message Counter Incorrect

### Circuit/System Description

The Electronic Brake Control Module contains the logic for the parking brake function. The EBCM sends out a EPB availability and application status signal on the high speed GMLAN which is monitored by the Engine Control Module. The ECM uses this information for certain functions associated with the Electronic Transmission Range Selector. The ECM needs to verify that EPB functionality is available for ETRS Critical Fault Mode or Latent Fault Mode.

### Conditions for Running the DTC

The system voltage is between 9 - 16 V.

### Conditions for Setting the DTC

A supervised periodic message from the electronic brake control module has not been received by the engine control module or the engine control module has detected an incorrect message counter.

### Action Taken When the DTC Sets

- ETRS Automatic Braking unavailable.
- If vehicle is in Park when the fault is active, the vehicle may not be able to shift out of Park.

## Conditions for Clearing the DTC

- A current DTC clears when the malfunction is no longer present.
- A history DTC clears when the device ignition cycle counter reaches the reset threshold of 50, without a repeat of the malfunction.

## Reference Information

### Schematic Reference

- [Park Brake System Wiring Schematics](#)
- [Control Module References](#)

### Connector End View Reference

## [COMPONENT CONNECTOR END VIEWS - INDEX](#)

### Description and Operation

## [Data Link Communications 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

1. Ignition ON.
2. Verify that no other DTCs are set.
  - **If any other DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **Go to next step: If no other DTCs are set**
3. Reprogram the K17 Electronic Brake Control Module. Refer to [Control Module References](#)
  4. Ignition ON. Apply and release the park brake.
  5. Verify that DTC C1280 or C1281 is not set.
    - **If DTC C1280 or C1281 is set**
      1. Replace the K17 Electronic Brake Control Module.
      2. Ignition ON.
      3. Verify that DTC C1280 or C1281 is not set.
        - If DTC C1280 or C1281 is set, replace the K20 Engine Control Module.
        - If DTC C1280 or C1281 is not set
    - 4. All OK.
      - **Go to next step: If DTC C1280 or C1281 is not set**
  6. All OK.

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup.

## DTC C1586: RIGHT PARK BRAKE ACTUATOR CIRCUIT

### 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 C1586

Right Park Brake Actuator Circuit

For symptom byte information, refer to [Symptom Byte List](#)

### Diagnostic Fault Information

| Circuit                                   | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|-------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Right Park Brake Actuator Apply Control   | C1586 00        | C1586 04             | C1586 0B         | C1586 59           |
| Right Park Brake Actuator Release Control | C1586 00        | C1586 04             | C1586 0B         | C1586 59           |

### Circuit/System Description

The Electronic Brake Control Module will diagnose the park brake motor circuits to verify that they are functioning properly. The park brake motor circuits are used to command motor operation, apply and release tension on the parking brake cable, which will apply and release the parking brake. These circuits are used to drive the motors, which pulls on the park brake cable, ultimately applying and releasing the park brake.

When the Park Brake Switch is pulled, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the apply control circuits and ground to the release control circuits which will cause the left and right park brake actuators to activate causing the park brakes to engage. When the Park Brake Switch is pressed, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the released control circuits and ground to the apply control circuits which will cause the left and right park brake actuators to activate causing the park brakes to release.

### Conditions for Running the DTC

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

### Conditions for Setting the DTC

The Electronic Brake Control Module detects a malfunction in the right park brake actuator or its circuits.

### Action Taken When the DTC Sets

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

### Conditions for Clearing the DTC

- The Electronic 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.

### Diagnostic Aids

After repairing any fault, the DTC will still be set as current and the park brakes will not function. It is necessary to clear the DTC with a scan tool in order to place the DTC in history and regain park brake function.

## Reference Information

Schematic Reference

## Park Brake System Wiring Schematics

Connector End View Reference

## COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

## Electronic Parking Brake 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. Verify the M104R Park Brake Actuator - Right apply when pulling the B80 Park Brake Switch.
  - **If the M104R Park Brake Actuator - Right does not apply**  
Refer to the Circuit/System Testing below.
    - **Go to next step: If the M104R Park Brake Actuator - Right does apply**
2. Verify the M104R Park Brake Actuator - Right release when pressing the B80 Park Brake Switch.
  - **If the M104R Park Brake Actuator - Right does not release**  
Refer to the Circuit/System Testing below.
    - **Go to next step: If the M104R Park Brake Actuator - Right does release**
3. All OK.

## Circuit/System Testing

**NOTE:** It is necessary to clear the DTC after any repair is made to regain park brake output control and have the DTC to set as history.

1. Ignition OFF, disconnect the harness connector at the M104R Park Brake Actuator - Right and the harness connector at the K17 Electronic Brake Control Module. Ignition ON
2. Test for less than 1 V between the K17 Electronic Brake Control Module harness connector terminals listed below and ground:
  - Terminal 2
  - Terminal 3
  - **If 1 V or greater**  
Repair the short to voltage on the circuit.
    - **Go to next step: If less than 1 V**

3. Ignition OFF.
4. Test for infinite resistance between the K17 Electronic Brake Control Module harness connector terminals listed below and ground:
  - Terminal 2
  - Terminal 3
  - **If less than infinite resistance**  
  
Repair the short to ground on the circuit.
  - **Go to next step: If infinite resistance**
5. Test for less than 2  $\Omega$  between the M104R Park Brake Actuator - Right harness connector terminal 1 and the K17 Electronic Brake Control Module harness connector terminal 2
  - **If 2  $\Omega$  or greater**  
  
Repair the open/high resistance in the circuit.
  - **Go to next step: If less than 2  $\Omega$**
6. Test for less than 2  $\Omega$  between the M104R Park Brake Actuator - Right harness connector terminal 2 and the K17 Electronic Brake Control Module harness connector terminal 3
  - **If 2  $\Omega$  or greater**  
  
Repair the open/high resistance in the circuit.
  - **Go to next step: If less than 2  $\Omega$**
7. Install a 25 A fused jumper wire between one of the control terminals at the M104R Park Brake Actuator - Right and 12 V. Momentarily install a jumper wire between the other control terminal and ground. Reverse the jumper wires at least two times, the M104R Park Brake Actuator - Right should perform the apply and release function.
  - **If the actuator does not perform the apply and release function**  
  
Replace the M104R Park Brake Actuator - Right.
  - **Go to next step: If the actuator performs the apply and release function**
8. Replace the K17 Electronic Brake Control Module.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Parking Brake Actuator Replacement](#)
- [Control Module References](#) for control module replacement, programming and setup.

## DTC C1587: LEFT PARK BRAKE ACTUATOR

### 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 C1587

Left Park Brake Actuator

For symptom byte information, refer to [Symptom Byte List](#)

### Circuit/System Description

The Electronic Brake Control Module will diagnose the park brake motor circuits to verify that they are functioning properly. The park brake motor circuits are used to command motor operation, apply and release tension on the parking brake cable, which will apply and release the parking brake. These circuits are used to drive the motors, which pulls on the park brake cable, ultimately applying and releasing the park brake.

When the Park Brake Switch is pulled, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the apply control circuits and ground to the release control circuits which will cause the left and right park brake actuators to activate causing the park brakes to engage. When the Park Brake Switch is pressed, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the released control circuits and ground to the apply control circuits which will cause the left and right park brake actuators to activate causing the park brakes to release.

#### **Conditions for Running the DTC**

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

#### **Conditions for Setting the DTC**

The Electronic Brake Control Module detects a malfunction in the left park brake actuator.

#### **Action Taken When the DTC Sets**

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

#### **Conditions for Clearing the DTC**

- The Electronic 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 Wiring Schematics**

Connector End View Reference

#### **COMPONENT CONNECTOR END VIEWS - INDEX**

Description and Operation

#### **Electronic Parking Brake 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 C1587 is not set.
  - **If the DTC is set**

1. Perform the Park Brake Calibration learn procedure. Refer to [Park Brake Calibration](#).
2. Ignition ON.
3. Apply and release the park brake.
4. Verify the DTC is not set.
  - If the DTC is set, replace the M104L Park Brake Actuator - Left.
  - If the DTC is not set
5. All OK.
  - **Go to next step: If the DTC is not set**

3. All OK.

### Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Parking Brake Actuator Replacement](#)
- [Control Module References](#) for control module replacement, programming and setup.

## DTC C1588: RIGHT PARK BRAKE ACTUATOR

### 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 C1588

Right Park Brake Actuator

For symptom byte information, refer to [Symptom Byte List](#)

### Circuit/System Description

The Electronic Brake Control Module will diagnose the park brake motor circuits to verify that they are functioning properly. The park brake motor circuits are used to command motor operation, apply and release tension on the parking brake cable, which will apply and release the parking brake. These circuits are used to drive the motors, which pulls on the park brake cable, ultimately applying and releasing the park brake.

When the Park Brake Switch is pulled, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the apply control circuits and ground to the release control circuits which will cause the left and right park brake actuators to activate causing the park brakes to engage. When the Park Brake Switch is pressed, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the released control circuits and ground to the apply control circuits which will cause the left and right park brake actuators to activate causing the park brakes to release.

### Conditions for Running the DTC

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

### Conditions for Setting the DTC

The Electronic Brake Control Module detects a malfunction in the right park brake actuator.

### Action Taken When the DTC Sets

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

## **Conditions for Clearing the DTC**

- The Electronic 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 Wiring Schematics**

Connector End View Reference

## **COMPONENT CONNECTOR END VIEWS - INDEX**

Description and Operation

### **Electronic Parking Brake 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 C1588 is not set.
  - **If the DTC is set**
    1. Perform the Park Brake Calibration learn procedure. Refer to **Park Brake Calibration**.
    2. Ignition ON.
    3. Apply and release the park brake.
    4. Verify the DTC is not set.
      - If the DTC is set, replace the M104R Park Brake Actuator - Right.
      - If the DTC is not set
  - **Go to next step: If the DTC is not set**
3. All OK.

## **Repair Instructions**

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

- **Rear Parking Brake Actuator Replacement**
- **Control Module References** for control module replacement, programming and setup.

## **SYMPTOMS - PARK BRAKE**

### **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.

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**

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

#### **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 <b>Step 4</b> | Go to <b>Step 2</b> |
| 2                                                                                                                                                                                                                                                                                                           | Were you sent here from a Park Brake Symptom table?                                                                                                                                                                                                                    | Go to <b>Step 4</b> | Go to <b>Step 3</b> |
| 3                                                                                                                                                                                                                                                                                                           | 1. Raise and support the vehicle. <b>Lifting and Jacking the Vehicle</b><br>2. With the park brake RELEASED, attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag.<br><br>Do the rear brakes have a significant amount of drag? | Go to <b>Step 5</b> | Go to <b>Step 4</b> |
| 4                                                                                                                                                                                                                                                                                                           | 1. Apply the park brake.<br>2. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag.<br><br>Do the rear brakes have a significant amount of drag?                                                                               | Go to <b>Step 8</b> | Go to <b>Step 5</b> |

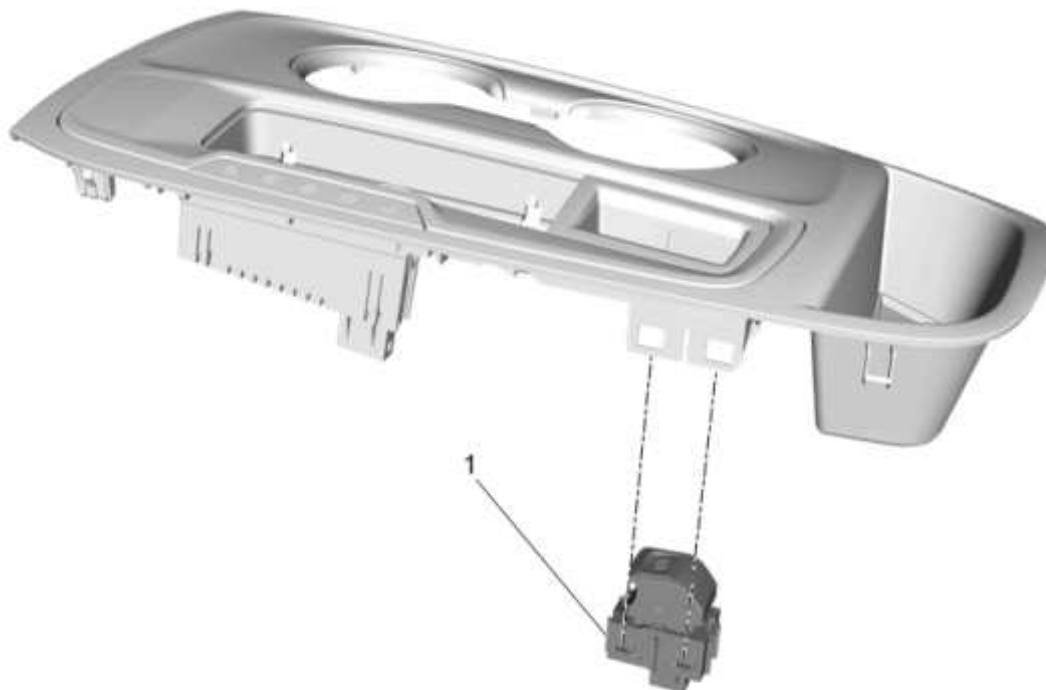
| Step | Action                                                                                                                                                                                                                                                                                                                                       | Yes                  | No                  |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------|
| 5    | 1. Have an assistant apply the brakes.<br>2. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag.<br>3. Repeat steps 1-2 for the opposite rear wheel.<br>4. Rotate the rear wheels to check the brake for a significant reduction of drag.<br><br>Did the brake calipers apply and release properly? | Go to <b>Step 7</b>  | Go to <b>Step 6</b> |
| 6    | Replace the appropriate rear brake caliper.<br><u><b>Rear Brake Caliper Replacement</b></u><br>Did you complete the replacement?                                                                                                                                                                                                             | Go to <b>Step 8</b>  | -                   |
| 7    | Inspect the rear parking brake actuators for proper operation and replace if necessary.<br><u><b>Rear Parking Brake Actuator Replacement</b></u><br>Did you complete the replacement?                                                                                                                                                        | Go to <b>Step 8</b>  | -                   |
| 8    | Connect any components that were disconnected during diagnosis.<br>Did you complete the operation?                                                                                                                                                                                                                                           | Park Brake System OK | -                   |

## REPAIR INSTRUCTIONS

### PARK BRAKE CALIBRATION

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 brake control module menu.
5. If available, perform the parking brake calibration procedure.
6. If park brake calibration is not available, proceed back and select Control Functions.
7. Perform the Rear Brake Caliper Piston Extend function.
8. Apply and release the park brakes using the park brake switch to ensure that the system is functioning.

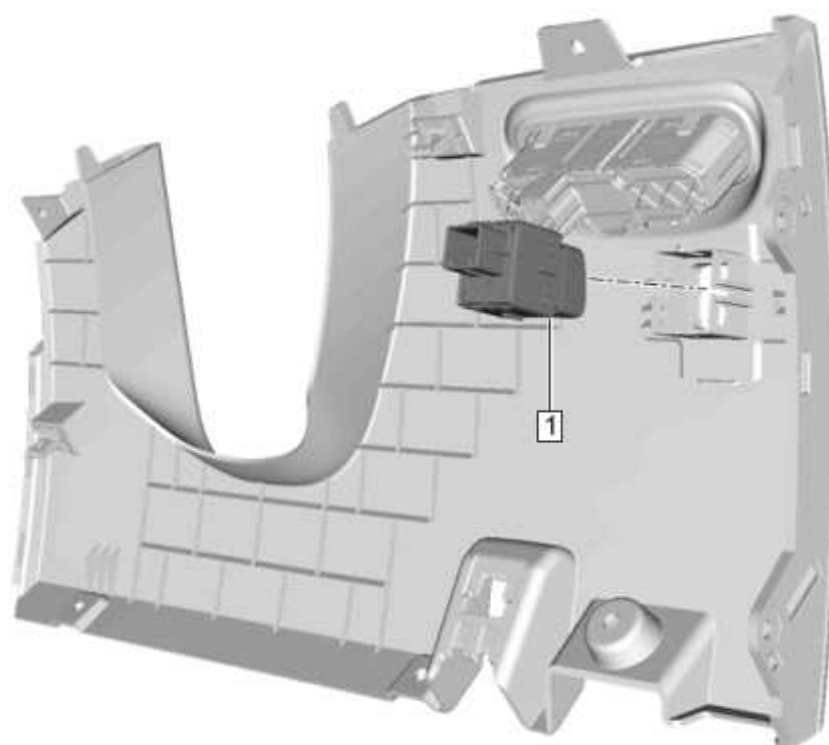
### PARKING BRAKE SWITCH REPLACEMENT (EQUINOX)



**Fig. 2: Parking Brake Switch (Equinox)**  
 Courtesy of GENERAL MOTORS COMPANY

| Callout                                                                              | Component Name       |
|--------------------------------------------------------------------------------------|----------------------|
| Preliminary Procedure<br><u>Front Floor Console Trim Plate Replacement (Equinox)</u> |                      |
| 1                                                                                    | Parking Brake Switch |

### **PARKING BRAKE SWITCH REPLACEMENT (TERRAIN)**



**Fig. 3: Parking Brake Switch (Terrain)**  
 Courtesy of GENERAL MOTORS COMPANY

| Callout | Component Name |
|---------|----------------|
|         |                |

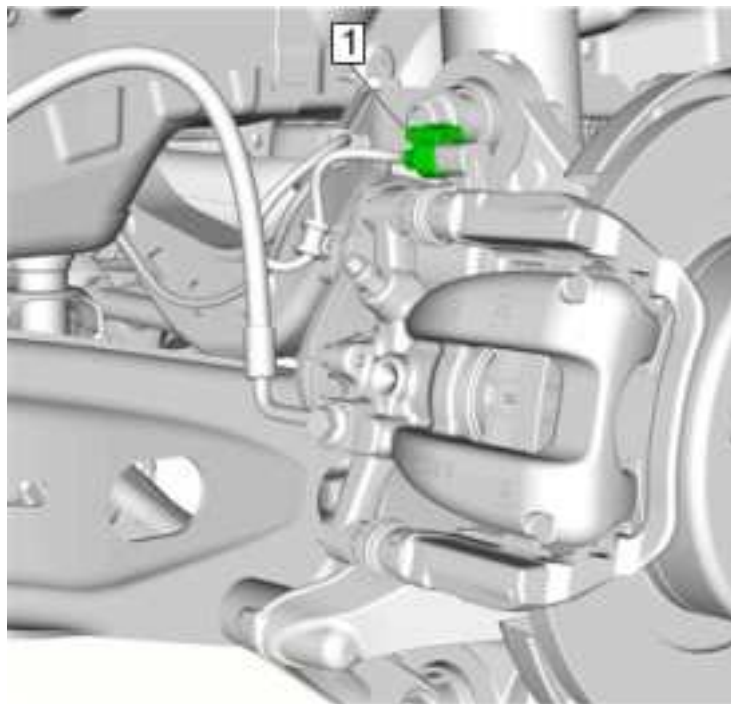
| Callout                                                                                           | Component Name                                                                             |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Preliminary Procedure</b><br><b><u>Instrument Panel Knee Bolster Replacement (Terrain)</u></b> |                                                                                            |
| 1                                                                                                 | Parking Brake Control Switch<br><b>Procedure</b><br>Release the Tabs to remove the switch. |

## REAR PARKING BRAKE ACTUATOR REPLACEMENT

### Removal Procedure

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

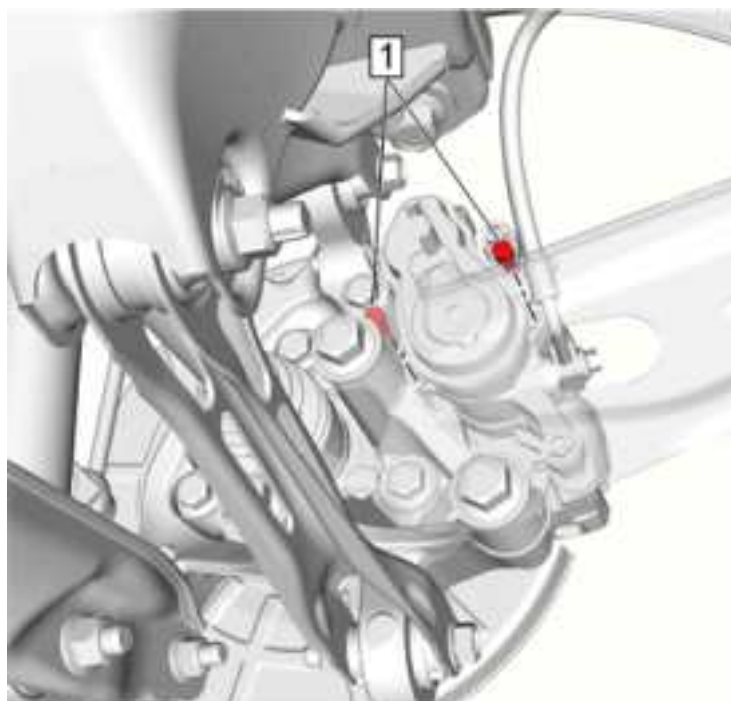
1. Set the parking brake in Service Mode. Refer to [Rear Parking Brake Service Mode Selection](#)
2. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#)
3. Remove the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)



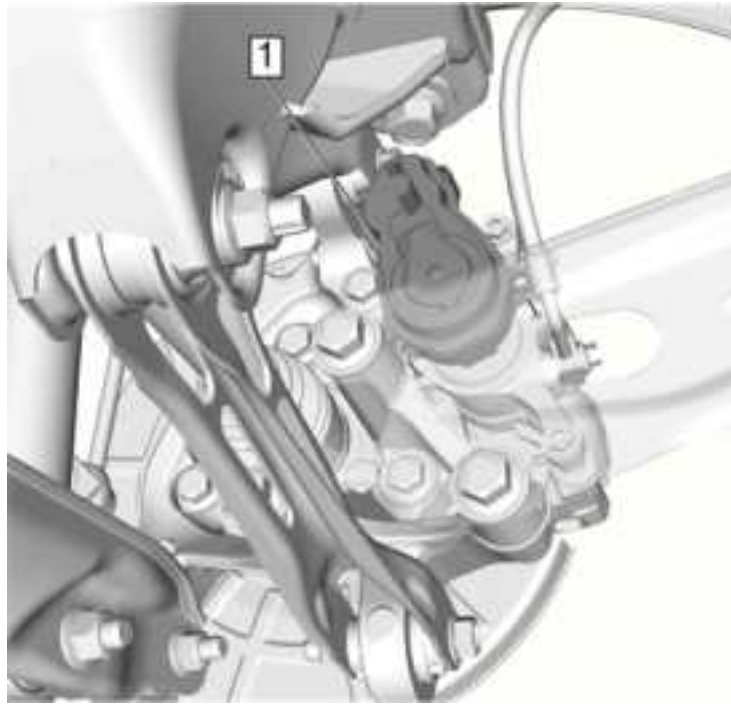
**Fig. 4: Elector**

Courtesy of GENERAL MOTORS COMPANY

4. Disconnect Electrical Connector (1).

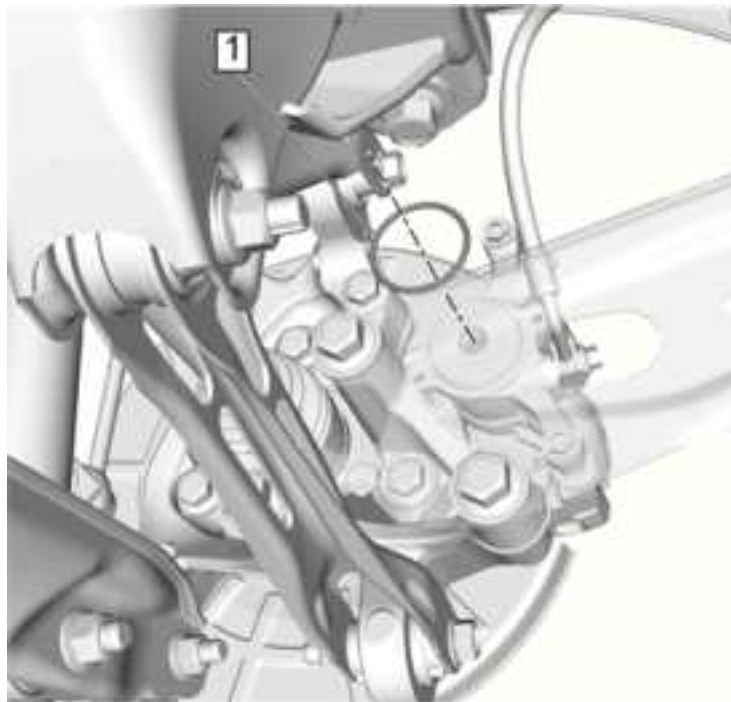


5. Remove Parking Brake Actuator Bolt (1) - [2x]



**Fig. 6: Rear Parking Brake Actuator**  
Courtesy of GENERAL MOTORS COMPANY

6. Remove Rear Parking Brake Actuator (1).

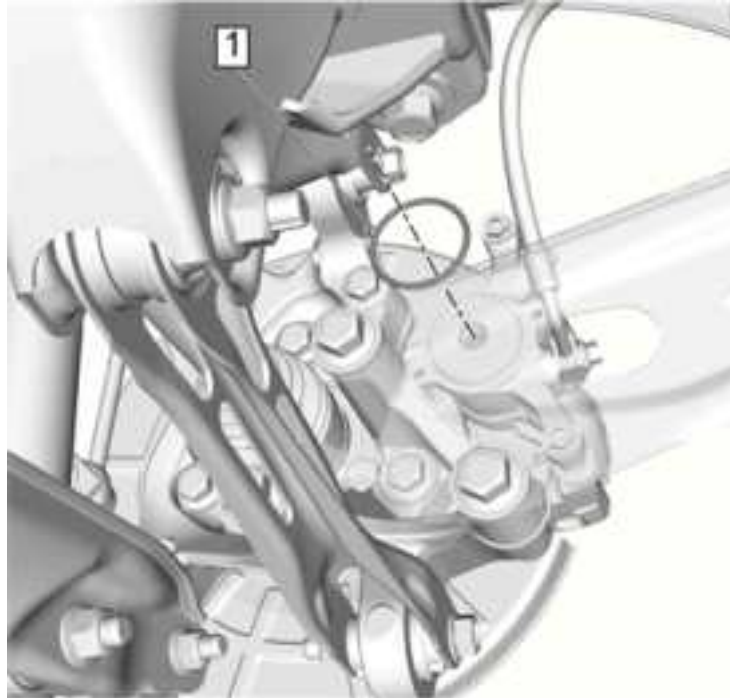


**Fig. 7: Rear Parking Brake Actuator Lever Seal**  
Courtesy of GENERAL MOTORS COMPANY

7. Remove Rear Parking Brake Actuator Lever Seal (1) and DISCARD

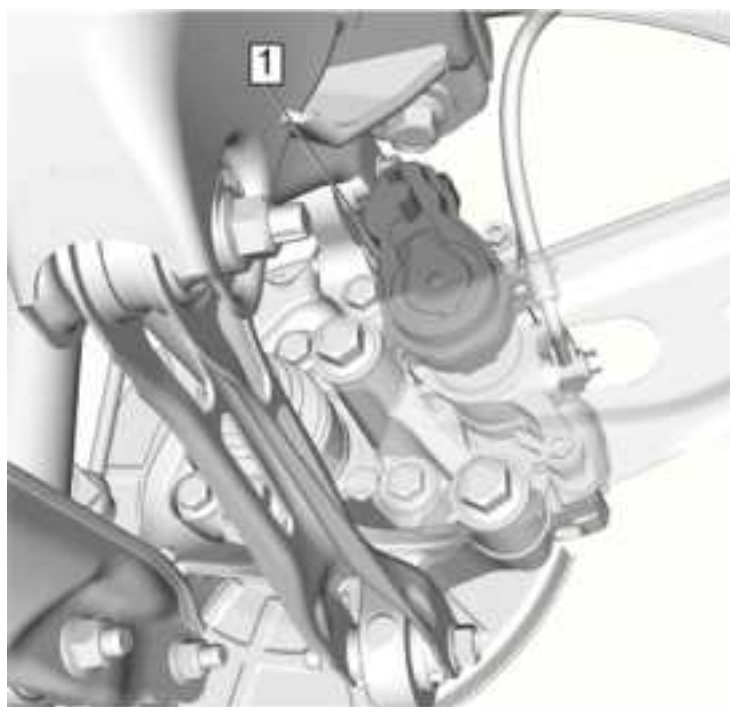
#### **Installation Procedure**

1. Install NEW Rear Parking Brake Actuator Lever Seal (1).



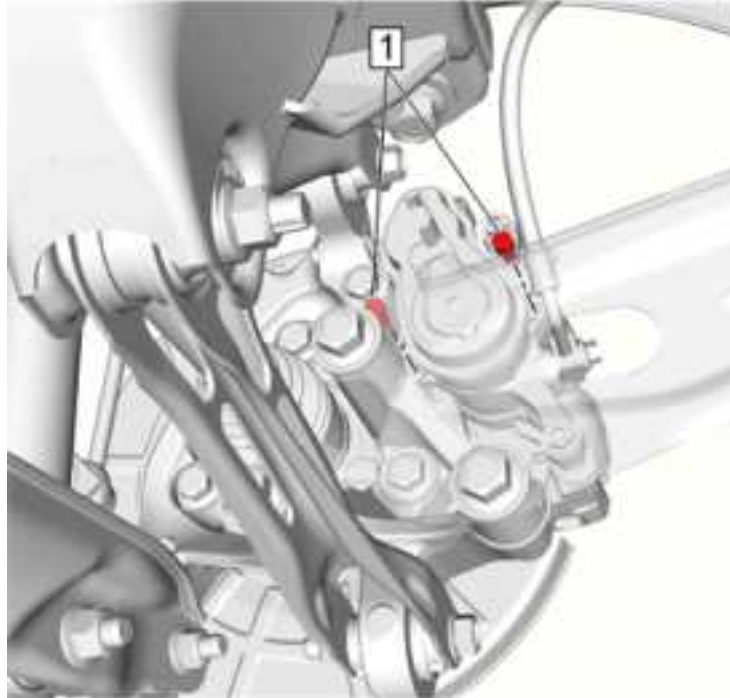
**Fig. 8: Rear Parking Brake Actuator Lever Seal**  
Courtesy of GENERAL MOTORS COMPANY

2. Install Rear Parking Brake Actuator (1).



**Fig. 9: Rear Parking Brake Actuator**  
Courtesy of GENERAL MOTORS COMPANY

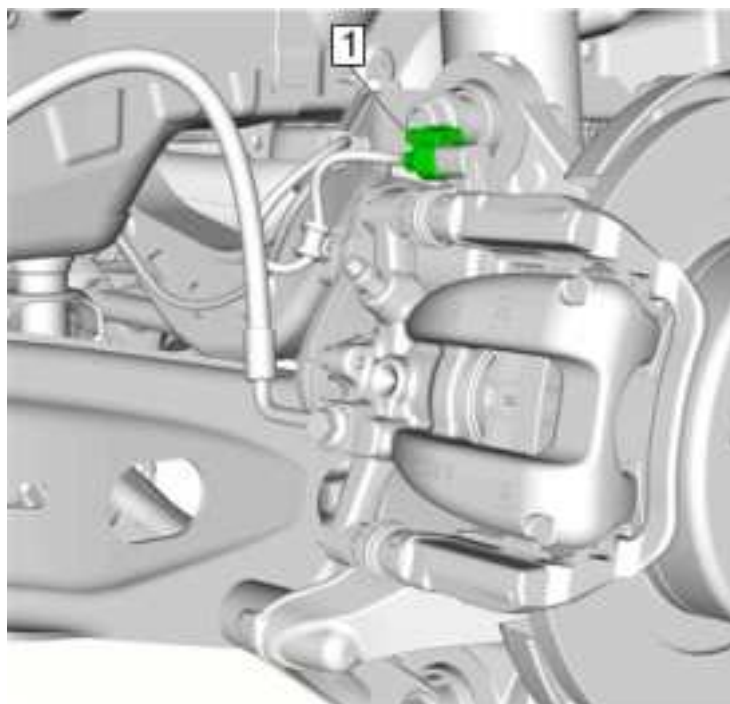
3. Install Parking Brake Actuator Bolt (1) and tighten [2x] 12 N.m (106 lb in)



**Fig. 10: Parking Brake Actuator Bolt**  
Courtesy of GENERAL MOTORS COMPANY

**CAUTION:** Refer to [Fastener Caution](#) .

4. Connect Electrical Connector (1).



**Fig. 11: Electrical Connector**  
Courtesy of GENERAL MOTORS COMPANY

5. Install the tire and wheel assembly. Refer to [Tire and Wheel Removal and Installation](#)
6. Calibrate the park brake. Refer to [Park Brake Calibration](#)

## **REAR PARKING BRAKE SERVICE MODE SELECTION**

### **Rear Parking Brake Actuator Release - Service Mode**

Prior to any rear disc brake or parking brake service, the parking brake actuator must be placed in Service Mode.

1. Install a scan tool to the vehicle.

2. Turn the ignition ON with the engine OFF.
3. Release the parking brake.
4. On the scan tool menu, select Electronic Brake Control Module.
5. Select Control Functions.
6. Select Rear Brake Caliper Piston Retract.

**NOTE:**        **Do NOT apply any brake pedal pressure during this step.**

7. After the repair is complete, calibrate the park brake. Refer to [Park Brake Calibration](#)

### **Rear Parking Brake Actuator Release - Manual Release**

In the event the rear parking brake actuator fails or there is a loss of electrical power, the parking brake may be released manually.

1. Remove the rear parking brake actuator. Refer to [Rear Parking Brake Actuator Replacement](#)
2. Insert an appropriate hex tool past the splines of the parking brake actuator piston apply spindle in the brake caliper.
3. Rotate the parking brake actuator piston apply spindle clockwise to release the parking brake.
4. After the repair is complete, calibrate the park brake. Refer to [Park Brake Calibration](#)

## **DESCRIPTION AND OPERATION**

### **ELECTRONIC PARKING BRAKE DESCRIPTION**

Vehicles with the electric parking brake have a switch in the center console or on the dash, 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.

#### **Electronic Brake Control Module**

The parking brake function is integrated into the Electronic Brake Control Module. The Electronic Brake Control Module contains the logic for applying and releasing the parking brake when commanded by the Park Brake Switch.

When the Park Brake Switch is pulled, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the apply control circuits and ground to the release control circuits which will cause the left and right park brake actuators to activate causing the park brakes to engage. When the Park Brake Switch is pressed, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the released control circuits and ground to the apply control circuits which will cause the left and right park brake actuators to activate causing the park brakes to release.

The Electronic Brake Control Module will diagnose the park brake motor circuits to verify that they are functioning properly. The park brake motor circuits are used to command actuator motor operation, which will apply and release the parking brake. These circuits are used to activate the actuator, which applies or releases pressure on the rear caliper pistons, ultimately applying and releasing the park brake.

The Park Brake Motor Position Sensor is an internal sensor to the park brake actuator, this sensor is used to monitor the park brake motor position.

#### **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.

The vehicle may automatically apply the electric parking brake in some situations when the vehicle is not moving. This is normal, and is done to periodically check the correct operation of the electric parking brake system.

### **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.

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