

2018 BRAKES

Park Brake - Traverse

SPECIFICATIONS

FASTENER SPECIFICATIONS

Single Use Non-Threaded Fasteners/Components

Application
NOTE: <i>All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.</i>
Parking Brake Actuator Seal Ring

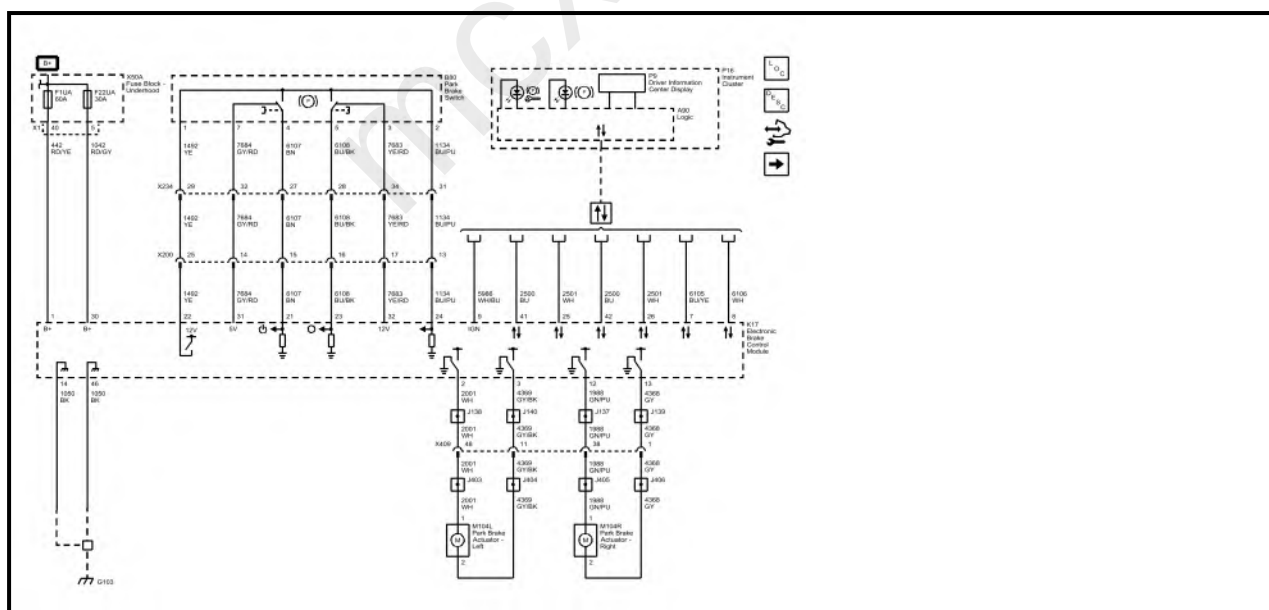
Reusable Threaded Fastener Tightening Specifications

Application	Specification
	Metric (English)
NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Parking Brake Actuator Bolt	12 N.m (106 lb in)

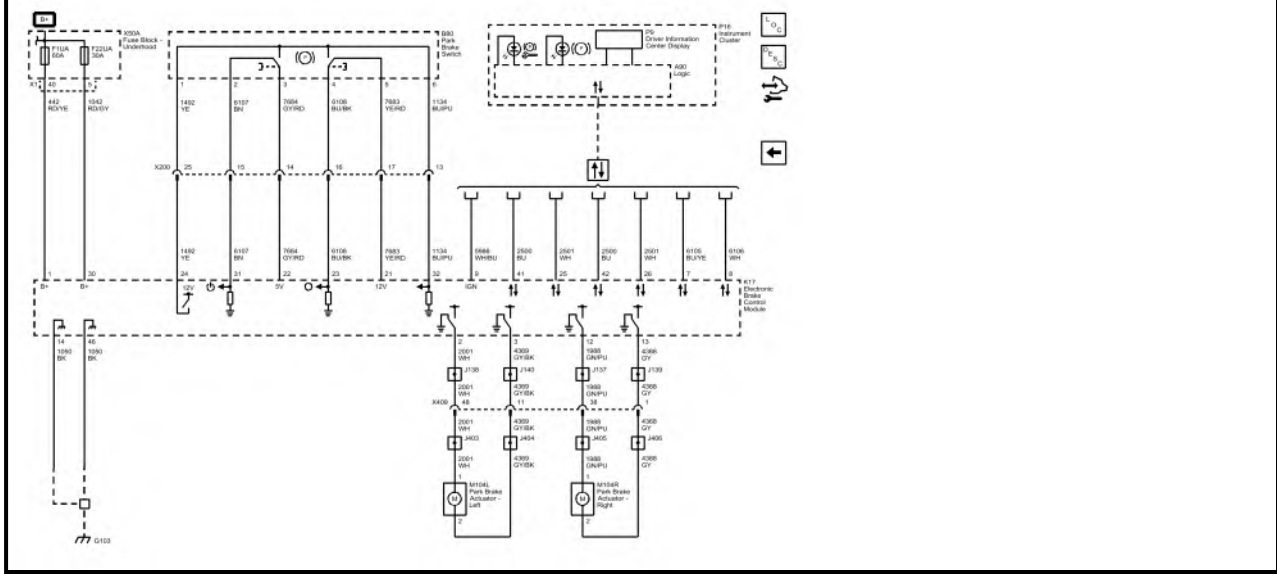
SCHEMATIC WIRING DIAGRAMS

PARK BRAKE SYSTEM WIRING SCHEMATICS

Electric Park Brake (X88)



Electric Park Brake (W49)



DIAGNOSTIC INFORMATION AND PROCEDURES

DTC C027D

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

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 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 electronic 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

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

Action Taken When the DTC Sets

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 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

[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 no additional DTCs are set in other control modules.
 - **If additional DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#)
 - **Go to next step: If no additional DTCs are set**
3. Verify that DTC C027D is not set.
 - **If the DTC is set**
 1. Verify the park brake is functioning properly. Refer to [Park Brake System Diagnosis](#)
 2. Check park brake pads for excessive wear. Refer to [Disc Brake System Diagnosis](#)
 3. Program the K17 Electronic Brake Control Module.
 4. Ignition ON. Apply and release the park brake.
 5. Verify the DTC is not set.
 - If the DTC is set, replace the K17 Electronic Brake Control Module.
 - Go to next step: If the DTC is not set
 - 6. All OK.
 - **Go to next step: If the DTC is not set**
4. All OK.

[Repair Instructions](#)

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

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

DTC 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 C028D 00

Replace Park Brake Pad Malfunction

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 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 electronic 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

The electronic 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 electronic brake control module clears the history DTC when a current DTC is not detected in 100 consecutive drive cycles.
- Adjust or replace the park brake pads.

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 no additional DTCs are set in other control modules.
 - **If additional DTCs are set**

- **Go to next step: If no additional DTCs are set**

3. Verify that DTC C028D is not set.

- **If the DTC is set**

1. Verify the park brake is functioning properly. Refer to [Park Brake System Diagnosis](#)
2. Check park brake pads for excessive wear. Refer to [Disc Brake System Diagnosis](#)
3. Program the K17 Electronic Brake Control Module.
4. Ignition ON. Apply and release the park brake.
5. Verify the DTC is not set.

- If the DTC is set, replace the K17 Electronic Brake Control Module.
- Go to next step: If the DTC is not set

6. All OK.

- **Go to next step: If the DTC is not set**

4. All OK.

Repair Instructions

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

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

DTC 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 C028F

Left 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
Left Park Brake Actuator Apply Control	C028F 04	C028F 04	C028F 04	C028F 00 C028F 0B
Left Park Brake Actuator Release Control	C028F 04	C028F 04	C028F 04	C028F 00 C028F 0B

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 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.

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 S91 Park Brake Switch.
 - **If the M104L Park Brake Actuator - Left does not apply**
Refer to the Circuit/System Testing.
 - **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 S91 Park Brake Switch.
 - **If the M104L Park Brake Actuator - Left does not release**
Refer to the Circuit/System Testing.

- **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 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**

NOTE: The following two steps are to test the circuits between the park brake actuators and the EBCM. There is no need to test the internal resistance of the actuators themselves.

5. Test for less than 2 Ω between the M104L Park Brake Actuator - Left harness connector terminal 1 and the K17 Electronic Brake Control Module harness connector terminal 2
 - **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2 Ω**

6. Test for less than 2 Ω between the M104L Park Brake Actuator - Left harness connector terminal 2 and the K17 Electronic Brake Control Module harness connector terminal 3
 - **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2 Ω**

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 for less than 2 seconds 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.

- [Parking Brake Actuator Replacement](#)
- [Control Module References](#) for 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

Park Brake Switch 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
Park Brake Switch Supply Voltage Terminal 22	C0293 00 C0293 08	C0293 00 C0293 08	C0293 00 C0293 08	C0293 08
Park Brake Apply Switch Voltage Reference Terminal 31	C0293 00 C0293 08	C0293 00 C0293 08	C0293 00 C0293 08	C0293 08
Park Brake Release Switch Voltage Reference Terminal 32	C0293 00 C0293 08	C0293 00 C0293 08	C0293 00 C0293 08	C0293 08
Park Brake Switch Signal Terminal 24	C0293 00 C0293 08	C0293 00 C0293 08	C0293 00 C0293 08	C0293 08
Park Brake Apply Switch Signal Terminal 21	C0293 00 C0293 08	C0293 00 C0293 08	C0293 00 C0293 08	C0293 08
Park Brake Release Switch Signal Terminal 23	C0293 00 C0293 08	C0293 00 C0293 08	C0293 00 C0293 08	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.
 - **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 22
 - Terminal 31
 - Terminal 21
 - Terminal 23
 - Terminal 32
 - Terminal 24
 - **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 22
- Terminal 31
- Terminal 21
- Terminal 23
- Terminal 32
- Terminal 24

- **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 Ω between the circuit terminal 21 and the circuit terminal 31.

- **If 5 Ω or greater**

1. Ignition OFF, disconnect the harness connector at the B80 Park Brake Switch.

2. Test for less than 2 Ω in the circuits end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the B80 Park Brake Switch.

- **Go to next step: If less than 5 Ω**

6. Test for less than 5 Ω between the circuit terminal 32 and the circuit terminal 23.

- **If 5 Ω or greater**

1. Ignition OFF, disconnect the harness connector at the B80 Park Brake Switch.

2. Test for less than 2 Ω in the circuits end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the B80 Park Brake Switch.

- **Go to next step: If less than 5 Ω**

7. Test for less than 5 Ω between the circuit terminal 24 and the circuit terminal 22.

- **If 5 Ω or greater**

1. Ignition OFF, disconnect the harness connector at the B80 Park Brake Switch.

2. Test for less than 2 Ω in the circuits end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the B80 Park Brake Switch.

- **Go to next step: If less than 5 Ω**

8. Test for less than 5 Ω between the circuit terminal 24 and the circuit terminal 21 while closing the switch.

- **If 5 Ω or greater**

Replace the B80 Park Brake Switch.

- **Go to next step: If less than 5 Ω**

9. Test for less than 5 Ω between the circuit terminal 24 and the circuit terminal 23 while closing the switch.

- **If 5 Ω or greater**

Replace the B80 Park Brake Switch.

- **Go to next step: If less than 5 Ω**

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 Ω between the ground circuit terminal 8 at the B80 Park Brake Switch and ground.
 - **If 10 Ω or greater**
 1. Ignition OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **Go to next step: If less than 10 Ω**
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 Actuator Switch Replacement](#)
- [Control Module References](#) for module replacement, programming and setup.

DTC C056E

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)

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

Circuit/System Verification

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
 - Go to next step: 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 C1586

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 04	C1586 04	C1586 04	C1586 00 C1586 0B
Right Park Brake Actuator Release Control	C1586 04	C1586 04	C1586 04	C1586 00 C1586 0B

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 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.

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

- [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 S91 Park Brake Switch.
 - **If the M104R Park Brake Actuator - Right does not apply**
Refer to the Circuit/System Testing.
 - **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 S91 Park Brake Switch.
 - **If the M104R Park Brake Actuator - Right does not release**
Refer to the Circuit/System Testing.
 - **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 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**

NOTE: The following two steps are to test the circuits between the park brake actuators and the EBCM. There is no need to test the internal resistance of the actuators themselves.

5. Test for less than 2 Ω between the M104R Park Brake Actuator - Right harness connector terminal 1 and the K17 Electronic Brake Control Module harness connector terminal 12

- **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2 Ω**

6. Test for less than 2 Ω between the M104R Park Brake Actuator - Right harness connector terminal 2 and the K17 Electronic Brake Control Module harness connector terminal 13

- **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

- **Go to next step: If less than 2 Ω**

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 for less than 2 seconds 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.

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

DTC C1587

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 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.

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.
 - Go to next step: 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.

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

DTC C1588

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 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.

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

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.
 - Go to next step: 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.

- **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.

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**

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>

Step	Action	Yes	No
2	Inspect the park brake system for proper operation. Refer to Park Brake System Diagnosis . 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 Disc Brake System Diagnosis . 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 Hydraulic Brake System Diagnosis . Did you find and correct a condition?	Go to Step 5	Go to Diagnostic Starting Point - Vehicle
5	Road test the vehicle in order to confirm proper operation. Refer to Brake System Vehicle Road Test . Is the condition still present?	Go to Step 2	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 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. Lifting and Jacking the Vehicle 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 5	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 8	Go to Step 5
5	1. Have an assistant apply the brakes. 2. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. 3. Repeat steps 1-2 for the opposite rear wheel. 4. 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 7	Go to Step 6
6	Replace the appropriate rear brake caliper. Rear Brake Caliper Replacement Did you complete the replacement?	Go to Step 8	-

Step	Action	Yes	No
7	Inspect the parking brake actuators for proper operation and replace if necessary. <u>Parking Brake Actuator Replacement</u> Did you complete the replacement?	Go to Step 8	-
8	Connect any components that were disconnected during diagnosis. Did you complete the operation?	Park Brake System OK	-

REPAIR INSTRUCTIONS

PARK BRAKE CALIBRATION

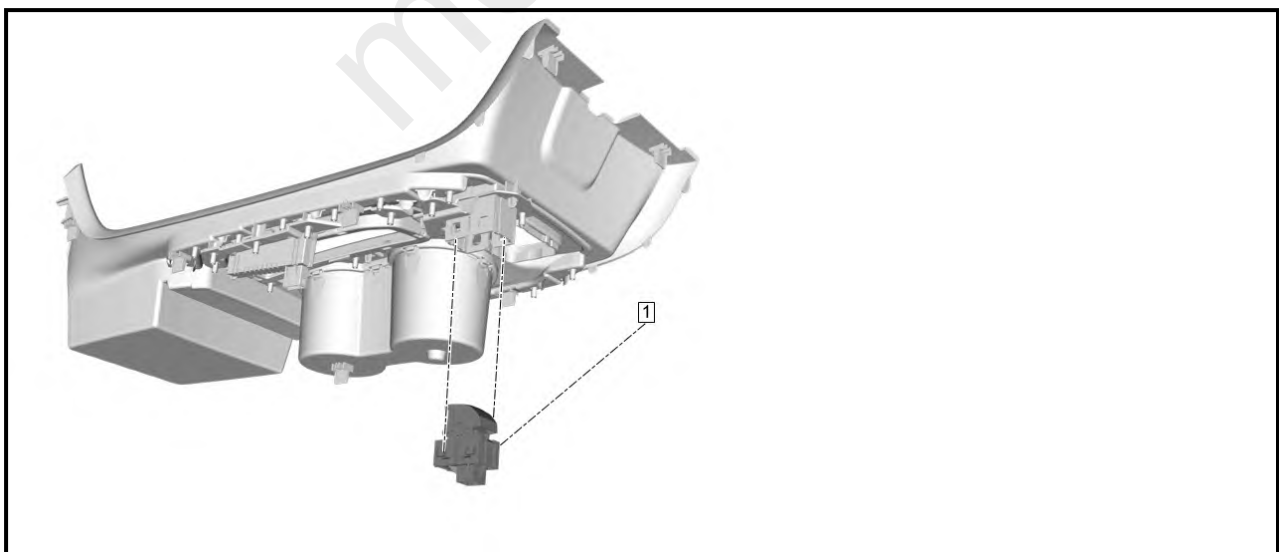
The park brakes do not require calibration often. Park brake calibration may be required after certain service procedures are performed. Some of these procedures are as follows:

- Park brake actuator replacement.
- Rear brake pad replacement.
- Rear brake rotor replacement.
- Rear brake caliper replacement.

The park brake calibration procedure can be completed using the following steps:

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 ACTUATOR SWITCH REPLACEMENT



Callout	Component Name
Preliminary Procedure <u>Front Floor Console Cup Holder Plate Replacement</u>	
1	Parking Brake Actuator Switch Procedure Release the tabs and remove the switch.

PARKING BRAKE ACTUATOR REPLACEMENT

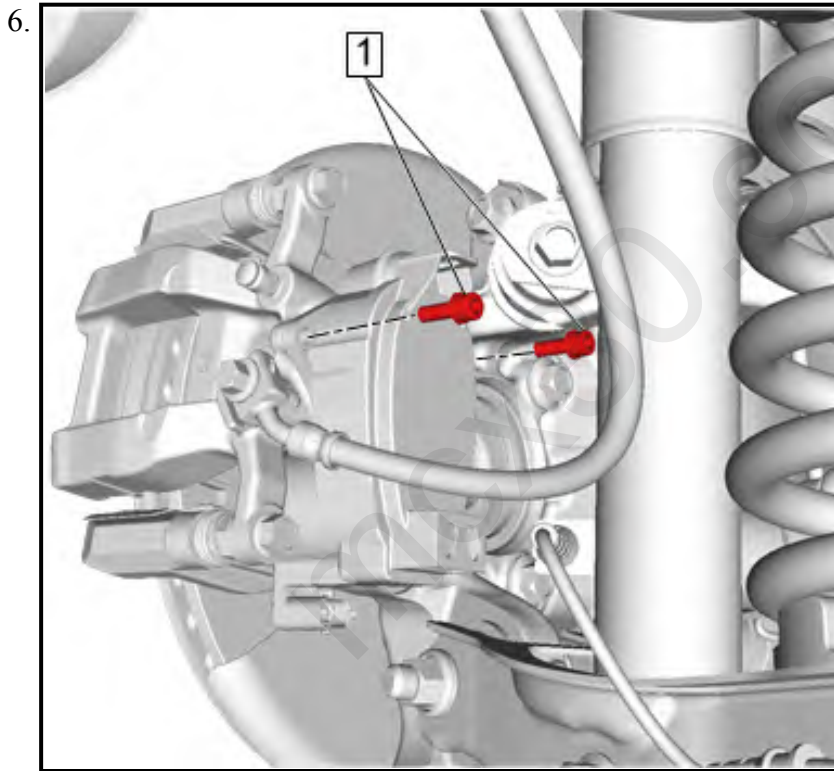
Removal Procedure

WARNING: Brake Dust Warning

1. Set the parking brake in Service Mode.
 1. Install a scan tool.
 2. Turn the ignition ON with the engine OFF.
 3. Select Electronic Brake Control Module.
 4. Select Control Functions.

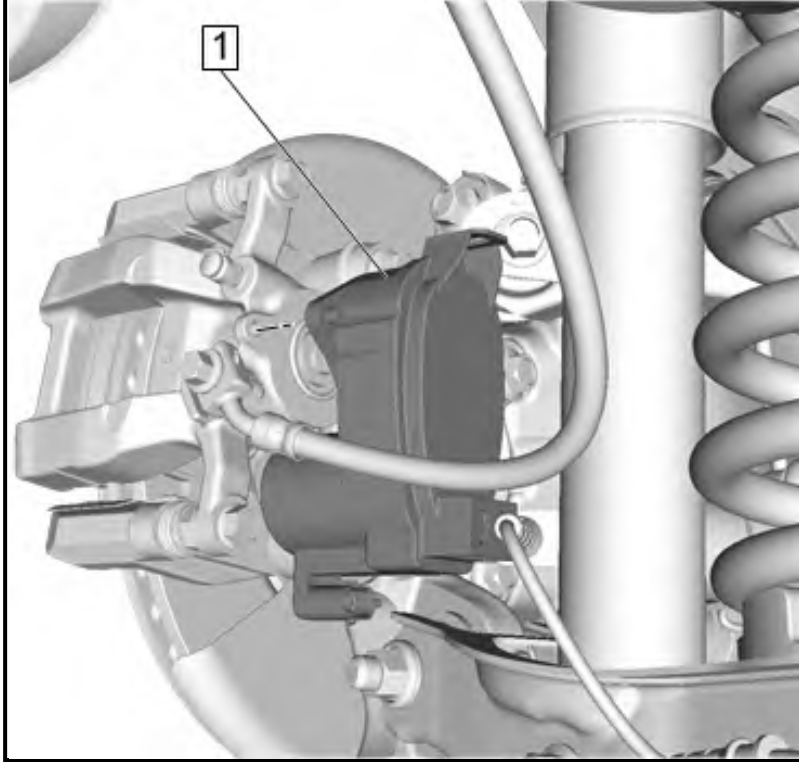
NOTE: Do NOT apply any brake pressure during this step.

5. Select Rear Brake Caliper Piston Retract.
2. Raise and support the vehicle. Lifting and Jacking the Vehicle .
3. Remove the tire and wheel assembly. Tire and Wheel Removal and Installation .
4. Disconnect the parking brake actuator electrical connector.
5. Release the parking brake actuator wiring harness from the parking brake actuator and position aside.

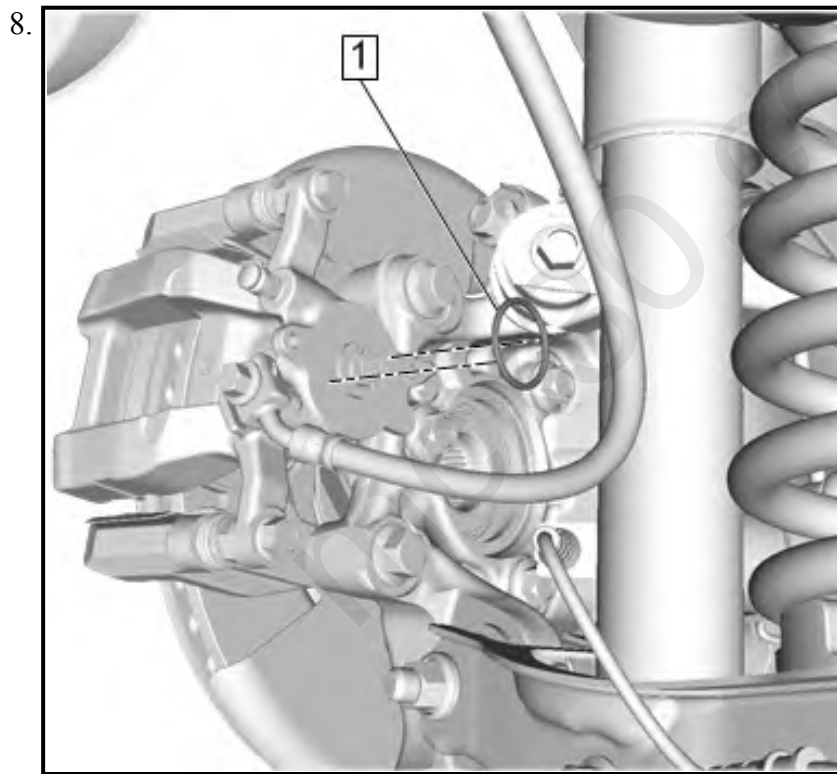


Parking Brake Actuator Bolt (1) - Remove [2x]





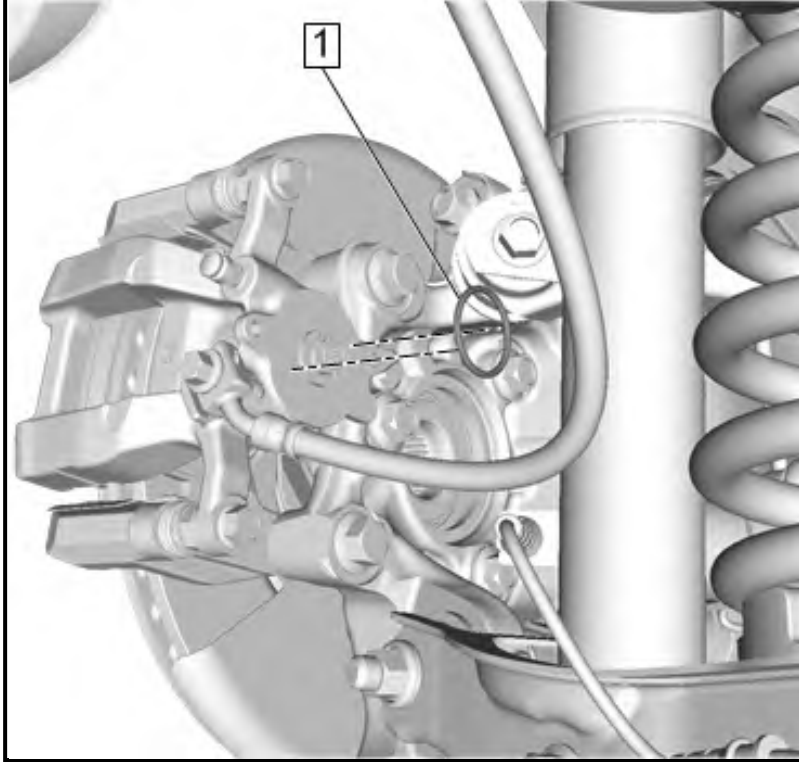
Parking Brake Actuator (1) - Remove



Parking Brake Actuator Seal Ring (1) - Remove and DISCARD

Installation Procedure

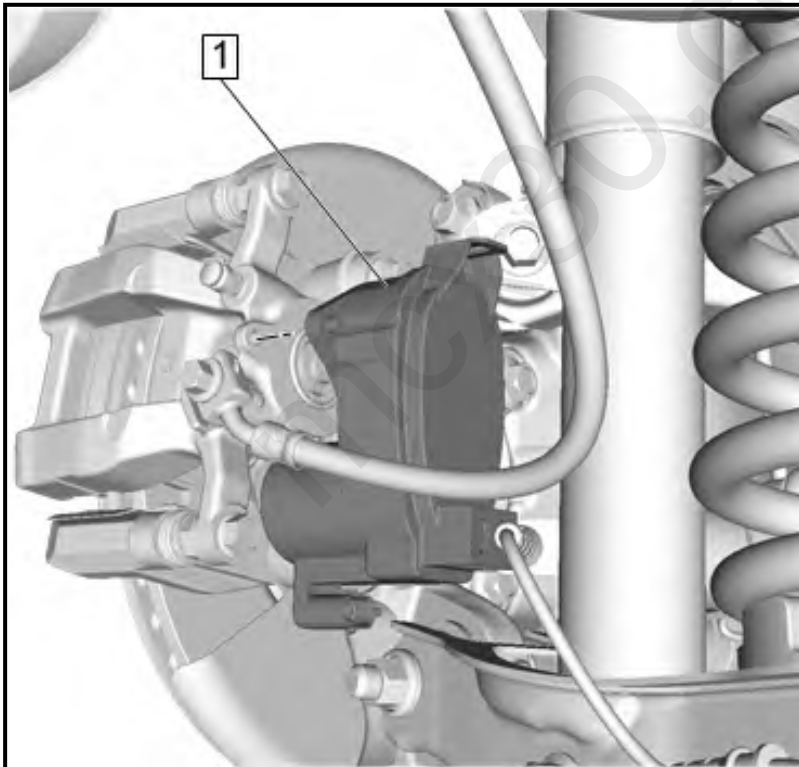




NOTE: The parking brake actuator mounting surfaces of the brake caliper must be clean and free of corrosion and debris.

Parking Brake Actuator Seal Ring (1) - Install NEW

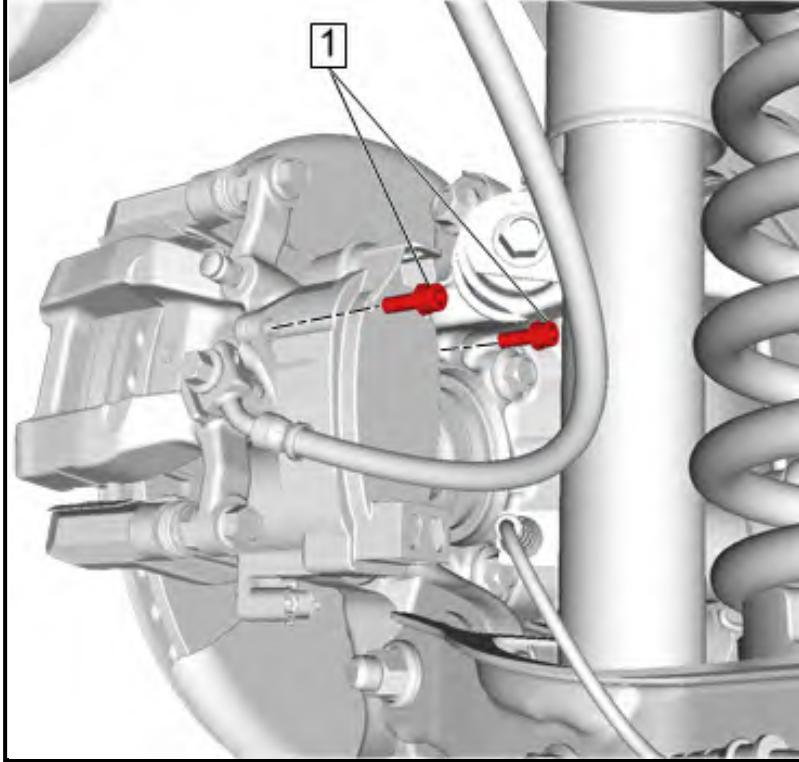
2.



Parking Brake Actuator (1) - Install

3.





CAUTION: Fastener Caution

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

4. Connect the parking brake actuator electrical connector.
5. Using an appropriate tie strap, secure the parking brake actuator electrical harness to the harness bracket.
6. Install the tire and wheel assembly. Tire and Wheel Removal and Installation
7. Calibrate the park brake. 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.

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

6. Select Rear Brake Caliper Piston Retract.
7. After the repair is complete, calibrate the park brake. 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. 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. Park Brake Calibration

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.