

2013 BRAKES

Park Brake - Cruze

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Park Brake Cable Guide Bolt	22 N.m	16 lb ft
Parking Brake Cable Casing Retainer Bolt	22 N.m	16 lb ft
Parking Brake Indicator Switch Bolt	2.5 Y	23 lb in
Parking Brake Lever Nut	9 N.m	80 lb in

DIAGNOSTIC INFORMATION AND PROCEDURES

SYMPTOMS - PARK BRAKE

NOTE: Review the system operation in order to familiarize yourself with the system functions.

Refer to Park Brake System Diagnosis (Drum Brakes), Park Brake System Diagnosis (Disc Brakes).

Visual/Physical Inspection

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

PARK BRAKE WILL NOT HOLD OR RELEASE (DISC BRAKE)

Park Brake Will Not Hold or Release (Disc Brake)

Step	Action	Yes	No
1	Were you sent here from the Park Brake Symptom table?	Go to Step 2	Go to <u>Symptoms - Park Brake</u>
2	Inspect the disc brake system for proper operation. Refer to <u>Disc Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 5	Go to Step 3
3	Inspect the park brake system for proper operation. Refer to <u>Park Brake System Diagnosis (Drum Brakes)</u> , <u>Park Brake System Diagnosis (Disc Brakes)</u> .		

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	Did you find and correct a condition?	Go to Step 5	Go to Step 4
4	Inspect the hydraulic brake system for proper operation. Refer to <u>Hydraulic Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 5	Go to <u>Symptoms - Park Brake</u>
5	Road test the vehicle in order to confirm proper operation. Refer to <u>Brake System Vehicle Road Test</u> . Is the condition still present?	Go to Step 2	System OK

PARK BRAKE WILL NOT HOLD OR RELEASE (DRUM BRAKE)

Park Brake Will Not Hold or Release (Drum Brake)

Step	Action	Yes	No
1	Were you sent here from the Park Brake Symptom Table?	Go to Step 2	Go to <u>Symptoms - Park Brake</u>
2	Inspect the park brake system for proper operation. Refer to <u>Park Brake System Diagnosis (Drum Brakes)</u> , <u>Park Brake System Diagnosis (Disc Brakes)</u> . Did you find and correct a condition?	Go to Step 6	Go to Step 3
3	Inspect the drum brake system for proper operation. Refer to <u>Drum Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 6	Go to Step 4
4	Inspect the disc brake system for proper operation. Refer to <u>Disc Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 6	Go to Step 5
5	Inspect the hydraulic brake system for proper operation. Refer to <u>Hydraulic Brake System Diagnosis</u> . Did you find and correct a condition?	Go to Step 6	Go to <u>Symptoms - Park Brake</u>
6	Road test the vehicle in order to confirm proper operation. Refer to <u>Brake System Vehicle Road Test</u> . Is the condition still present?	Go to Step 2	System OK

PARK BRAKE SYSTEM DIAGNOSIS (DISC BRAKES)

Park Brake System Diagnosis (Disc Brakes)

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.			

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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	Is the symptom related to the ability of the park brake system to hold and/or release?	Go to <u>Symptoms - Park Brake</u>	Go to <u>Symptoms - Hydraulic Brakes</u>
4	1. Raise and support the vehicle with the rear axle supported by jack stands. Refer to <u>Lifting and Jacking the Vehicle</u>. 2. With the park brake RELEASED, attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. Do the rear brakes have a significant amount of drag?	Go to Step 8	Go to Step 5
5	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 13	Go to Step 6
6	Visually inspect the park brake cable connections and the cables that are accessible on the UNDERSIDE of the vehicle for disconnections and/or damage. Were any of the park brake cables disconnected and/or damaged?	Go to Step 7	Go to Step 8
7	Reconnect or replace the park brake cables as necessary. Refer to <u>Parking Brake Cable Replacement (Mechanical Parking Brake)</u>. Did you complete the repair and/or replacement?	Go to Step 13	-
	1. Disconnect the rear park brake cables from the equalizer and from the brake caliper piston apply levers. Refer to <u>Parking Brake Cable Replacement (Mechanical Parking Brake)</u>. 2. Have an assistant apply and maintain the caliper piston apply lever to apply the caliper piston.		

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8	3. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. 4. Release the caliper piston apply lever. 5. Repeat steps 2, 3, and 4 for the other side of the vehicle. 6. Rotate the rear wheels to check the brake for a significant reduction of drag. Did the brake calipers apply and release properly?	Go to Step 10	Go to Step 9
9	Replace the appropriate rear brake caliper. Refer to <u>Rear Brake Caliper Replacement</u>. Did you complete the replacement?	Go to Step 13	-
10	With the aid of an assistant, apply and release the parking brake while observing the cables for free movement. Did the park brake cables move freely?	Go to Step 12	Go to Step 11
11	Replace any of the park brake cables inspected that do not have free movement. Refer to <u>Parking Brake Cable Replacement (Mechanical Parking Brake)</u>. Did you complete the replacement?	Go to Step 13	-
12	Inspect the park brake pedal assembly for proper operation and replace if necessary. Refer to <u>Parking Brake Lever Replacement</u>. Did you complete the replacement?	Go to Step 13	-
13	Install or connect any components that were removed or disconnected during diagnosis. Did you complete the operation?	Park Brake System OK Go to <u>Symptoms - Park Brake</u>	-

PARK BRAKE SYSTEM DIAGNOSIS (DRUM BRAKES)

Park Brake System Diagnosis (Drum Brakes)

Step	Action	Yes	No
DEFINITION: This diagnostic table is designed to diagnose ONLY the 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		

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	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	Is the symptom related to the ability of the park brake system to hold and/or release?	Go to <u>Symptoms - Park Brake</u>	Go to <u>Symptoms - Hydraulic Brakes</u>
4	1. Raise and support the vehicle with the rear axle supported by jack stands. Refer to <u>Lifting and Jacking the Vehicle</u>. 2. With the park brake RELEASED, attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. Do the rear brakes have a significant amount of drag?	Go to Step 9	Go to Step 5
5	1. Apply the park brake. 2. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. Did the rear brakes exhibit a significant reduction in the amount of drag?	Go to Step 6	Go to Step 7
6	1. Release the park brake. 2. Rotate the rear wheels to check the rear brakes for a significant reduction in the amount of drag. Did the rear brakes exhibit a significant reduction in the amount of drag?	Go to Step 16	Go to Step 9
7	1. Remove the brake drums. Refer to <u>Brake Drum Replacement</u>. 2. Visually check the park brake cable connections and the cables that are accessible on the UNDERSIDE of the vehicle for disconnections and/or damage. Were any or the park brake cables disconnected and/or damaged?	Go to Step 8	-
8	Reconnect or replace the park brake cables as necessary. Refer to <u>Parking Brake Cable Replacement (Mechanical Parking Brake)</u>. Did you complete the repair?	Go to Step 11	-

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9	CAUTION: Do not depress the brake pedal with the brake rotors and/or the brake drums removed, or with the brake calipers repositioned away from the brake rotors, or damage to the brake system may result. 1. Remove the brake drums. Refer to <u>Brake Drum Replacement</u> . 2. Inspect the park brake hardware for loose, damaged, broken or missing components. 3. Check the drum brake adjusters for a condition. Does the park brake hardware and/or the park brake adjusters require replacement?		
10	1. Replace park brake hardware components as necessary. Refer to <u>Brake Shoe Replacement</u> . 2. Replace the drum brake adjusting hardware as necessary. Refer to <u>Drum Brake Adjusting Hardware Replacement</u> . Did you complete the replacement?	Go to Step 10	Go to Step 11
11	Have an assistant apply and release the park brake, while you observe the park brake cables for free movement. Did the park brake cables move freely?	Go to Step 11	-
12	1. Apply the park brake. 2. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. 3. Release the park brake. 4. Rotate the rear wheels to check the rear brakes for a significant reduction of drag. Did the park brake apply and release properly?	Go to Step 12	Go to Step 13
	1. Remove the brake drums. Refer to <u>Brake Drum Replacement</u> . 2. Disconnect the park brake cable	Go to Step 18	Return to Symptom Table

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13	connections that are accessible on the UNDERSIDE of the vehicle one at a time and check each cable for free movement. Do any of the park brake cables accessible on the underside of the vehicle require replacement?	Go to Step 14	Go to Step 15
14	Replace any of the park brake cables that do not have free movement - not releasing properly. Refer to <u>Parking Brake Cable Replacement (Mechanical Parking Brake)</u> . Did you complete the replacement?	Go to Step 17	Return to Symptom Table
15	Replace the park brake lever assembly - not releasing properly. Refer to <u>Parking Brake Lever Replacement</u> . Did you complete the replacement?	Go to Step 17	-
16	1. Remove the brake drums. Refer to <u>Brake Drum Replacement</u> . 2. Check the drum brake adjusters for a seized condition. 3. Replace the drum brake adjusting hardware as necessary. Refer to <u>Drum Brake Adjusting Hardware Replacement</u> . Did you find and correct a condition?	Go to Step 17	-
17	1. Apply the park brake. 2. Attempt to rotate the rear wheels to check the rear brakes for a significant amount of drag. 3. Release the park brake. 4. Rotate the rear wheels to check the rear brakes for a significant reduction of drag. Did the park brake apply and release properly?	Go to Step 18	Return to Symptom Table
18	Install or connect any components that were removed or disconnected during diagnosis. Did you complete the operation?	Park Brake System OK Return to Symptom Table	Return to Symptom Table

REPAIR INSTRUCTIONS

PARKING BRAKE LEVER REPLACEMENT

Removal Procedure

1. Remove the front floor console. Refer to **Front Floor Console Replacement** .

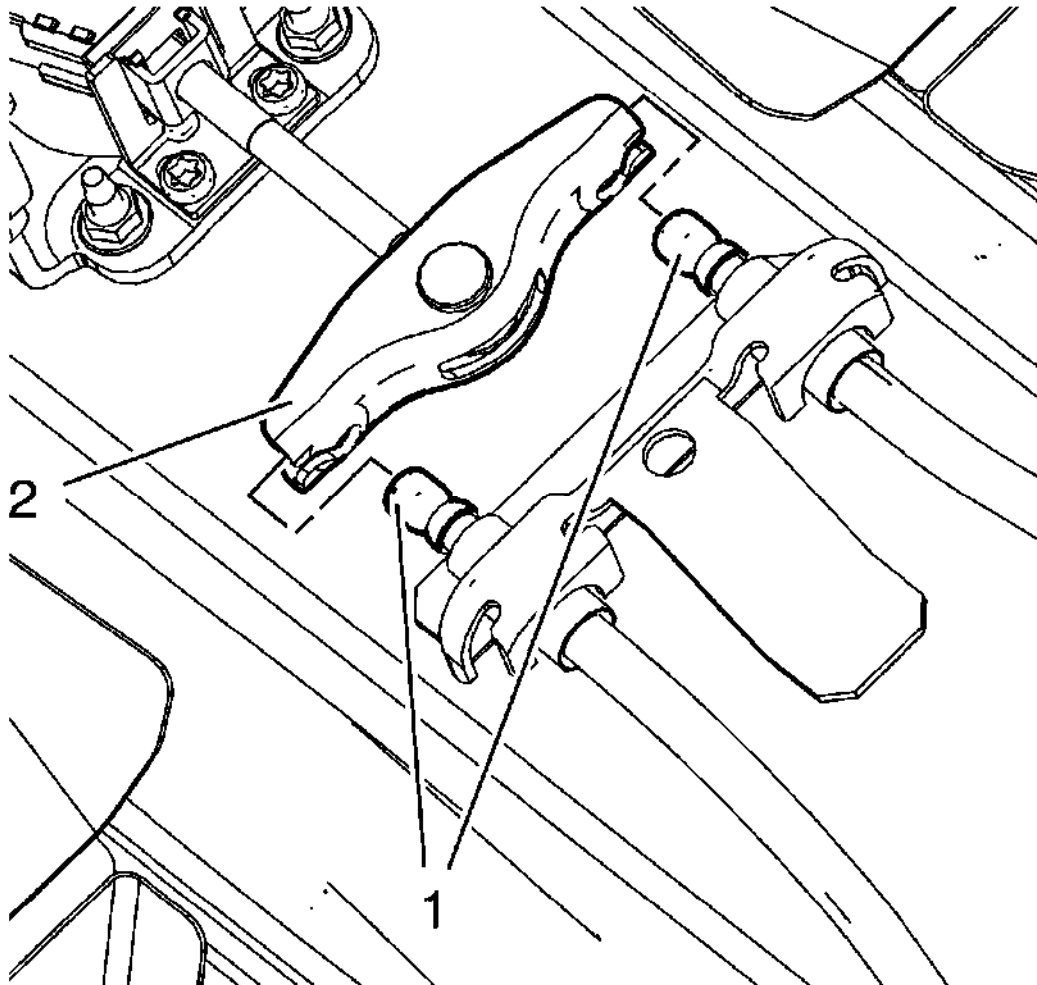


Fig. 1: Parking Brake Cable And Parking Brake Lever
Courtesy of GENERAL MOTORS COMPANY

2. Unhook the parking brake cable (1) from the parking brake lever (2).
3. Remove the parking brake indicator switch. Refer to **Parking Brake Indicator Switch Replacement**.

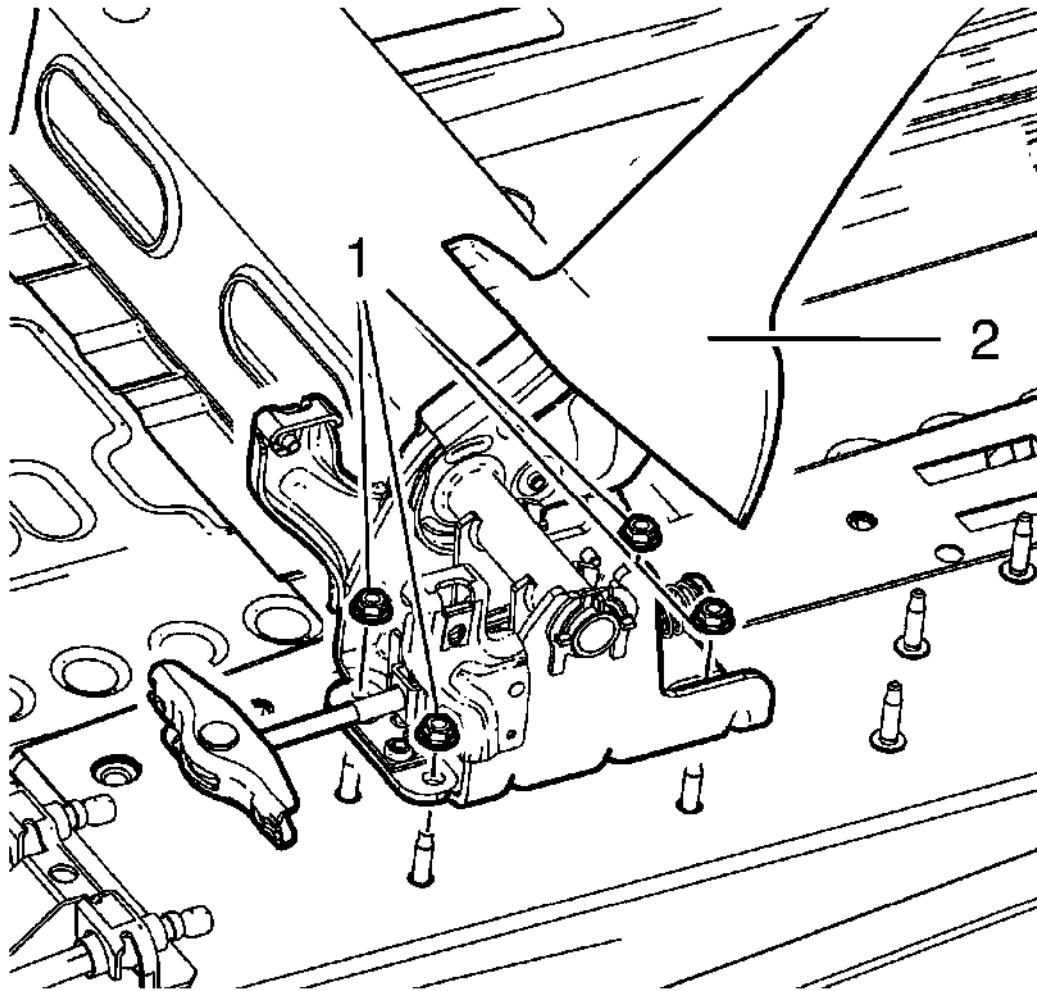


Fig. 2: Parking Brake Lever Nuts

Courtesy of GENERAL MOTORS COMPANY

4. Remove the parking brake lever nut (1).
5. Remove the parking brake lever (2).

Installation Procedure

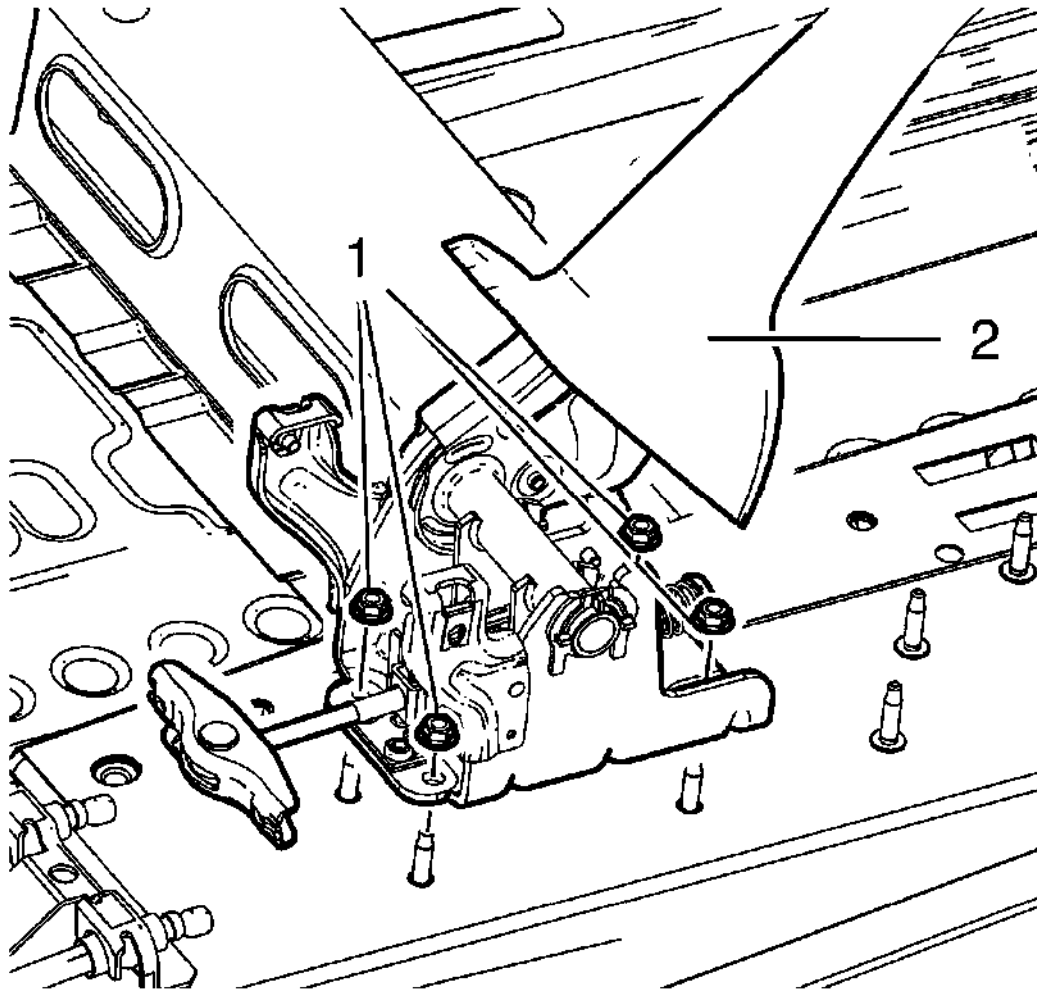


Fig. 3: Parking Brake Lever Nuts
Courtesy of GENERAL MOTORS COMPANY

1. Install the parking brake lever (2).

CAUTION: Refer to Fastener Caution .

2. Install the parking brake lever nut (1) and tighten to 9 N.m (80 lb in).
3. Install the parking brake indicator switch. Refer to Parking Brake Indicator Switch Replacement.

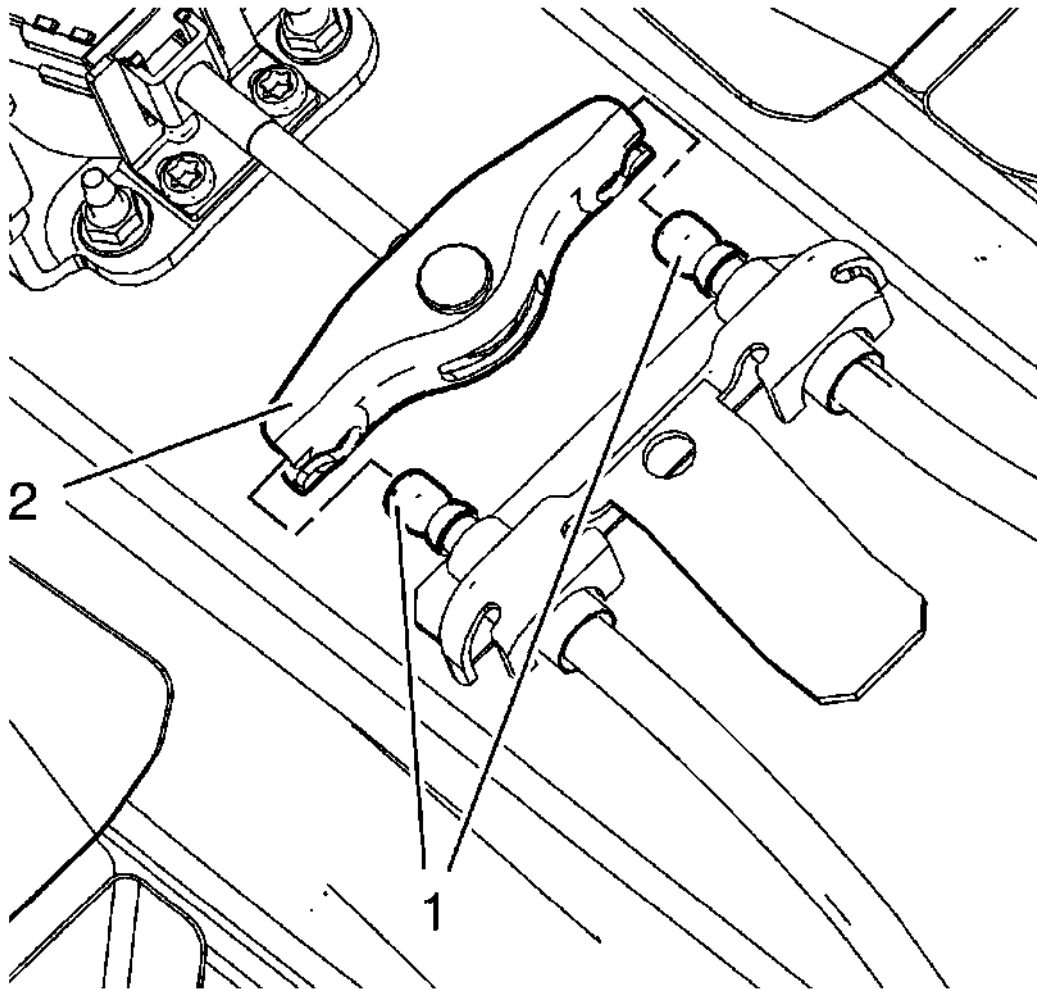


Fig. 4: Parking Brake Cable And Parking Brake Lever
Courtesy of GENERAL MOTORS COMPANY

4. Hook in the parking brake cable (1) to the parking brake lever (2).
5. Remove the transit support (1).
6. Install the front floor console. Refer to **Front Floor Console Replacement** .

PARKING BRAKE LEVER BOOT REPLACEMENT

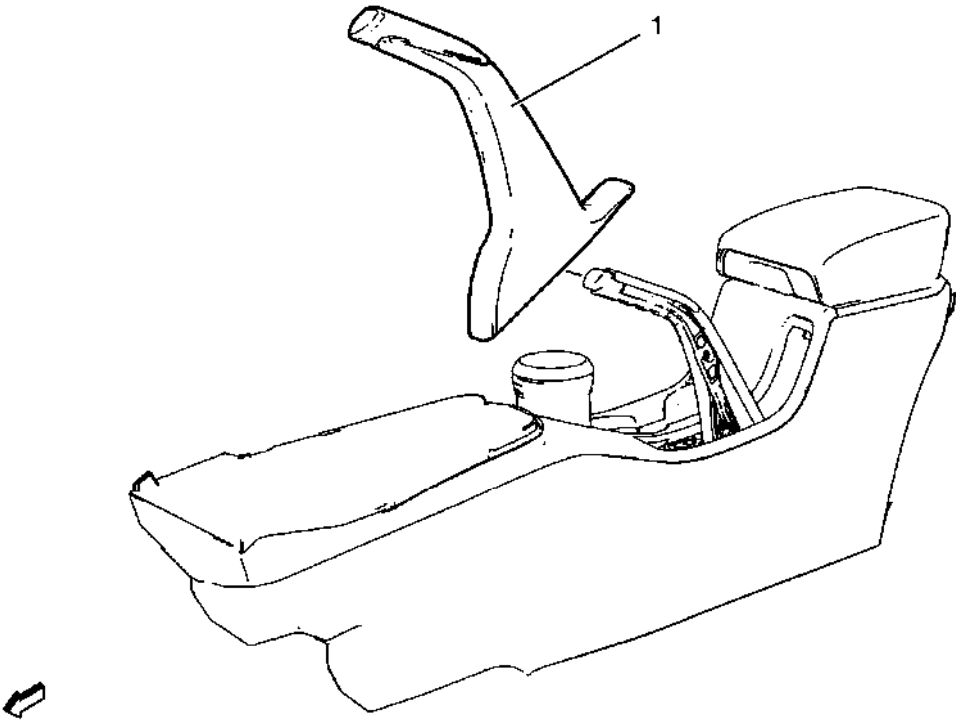


Fig. 5: Parking Brake Lever Boot
Courtesy of GENERAL MOTORS COMPANY

Parking Brake Lever Boot Replacement

Callout	Component Name
1	Parking Brake Lever Boot
	Procedure
	1. Pull down boot. 2. Apply bead of adhesive to upper surface of parking brake lever (arrow). 3. Install parking brake lever boot carefully.

PARKING BRAKE INDICATOR SWITCH REPLACEMENT

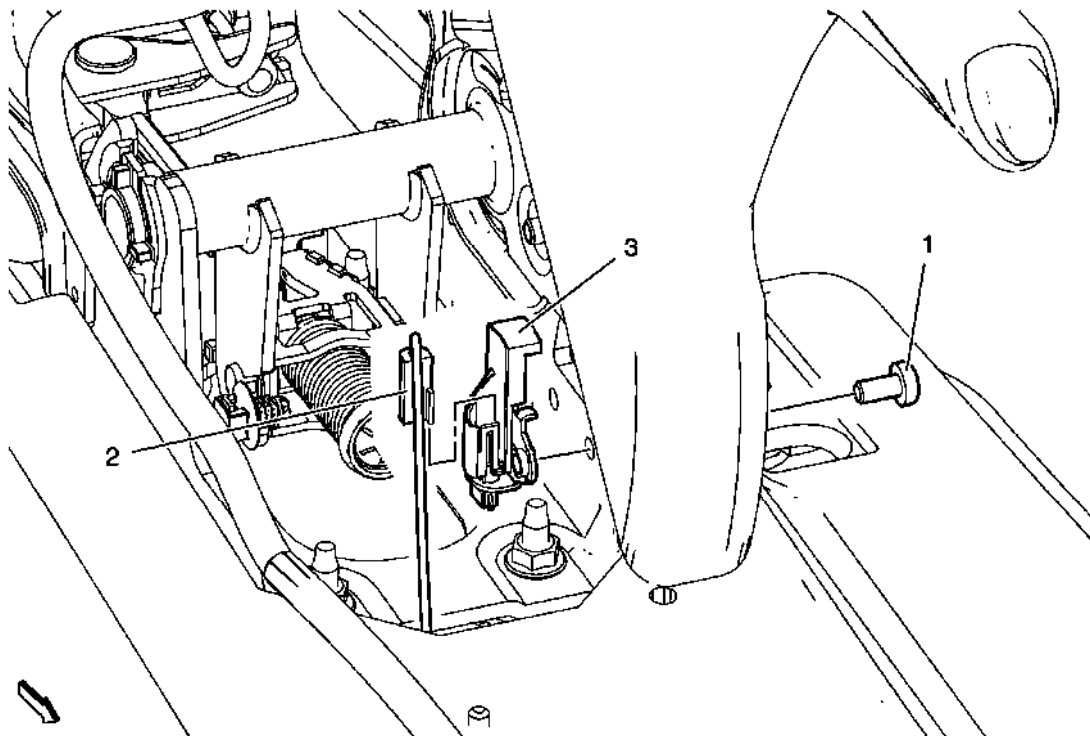


Fig. 6: Parking Brake Indicator Switch
Courtesy of GENERAL MOTORS COMPANY

Parking Brake Indicator Switch Replacement

Callout	Component Name
Preliminary Procedure Remove the front floor console. Refer to <u>Front Floor Console Replacement</u> .	
1	Parking Brake Indicator Switch Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 2.5 N.m (22 lb in)
2	Wiring Harness Connector Parking Brake Indicator Switch
3	Parking Brake Indicator Switch

PARKING BRAKE CABLE REPLACEMENT (MECHANICAL PARKING BRAKE)

WARNING: Refer to **Brake Dust Warning** .

Removal Procedure

1. Remove the front floor console. Refer to **Front Floor Console Replacement** .
2. Remove the rear seat cushion. Refer to **Rear Seat Cushion Removal and Installation** .
3. Remove the center pillar lower garnish molding. Refer to **Center Pillar Lower Garnish Molding Replacement** .

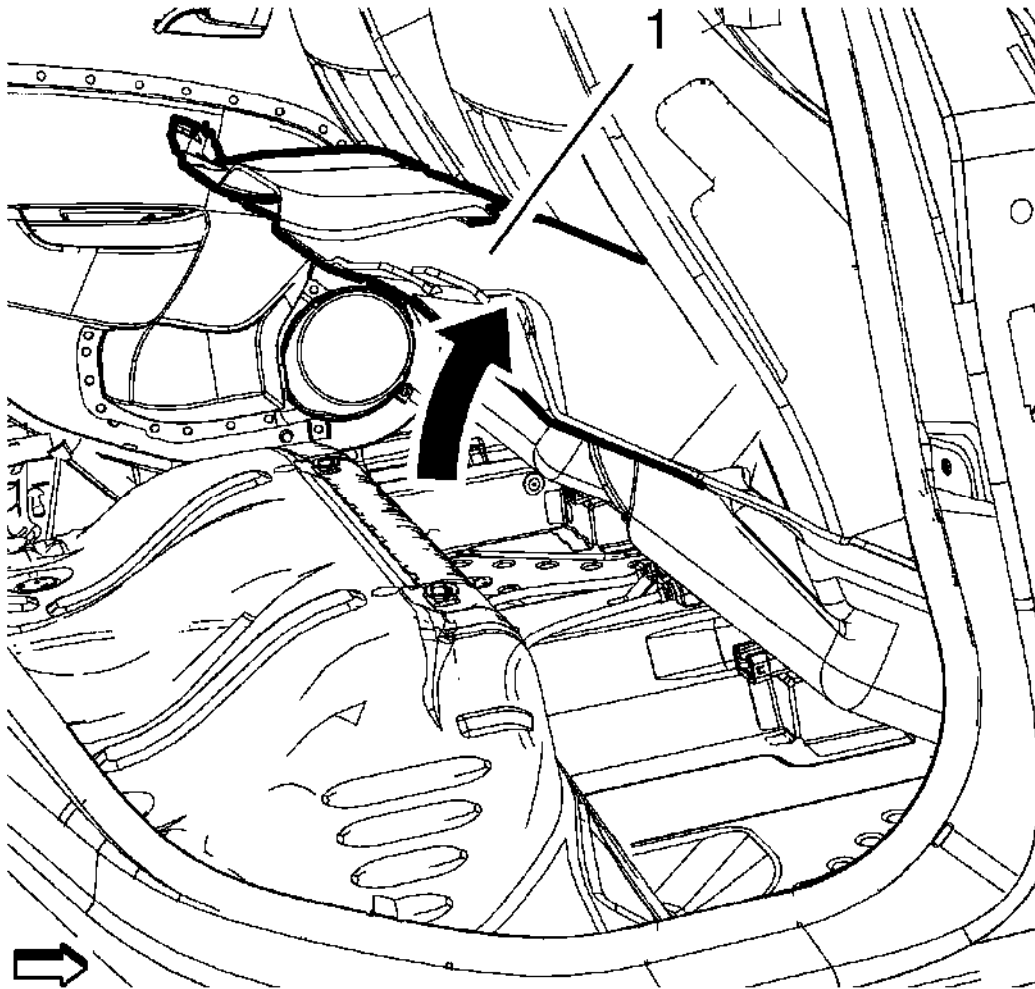


Fig. 7: Rear Floor Carpet

Courtesy of GENERAL MOTORS COMPANY

4. Partially remove the rear floor carpet (1).

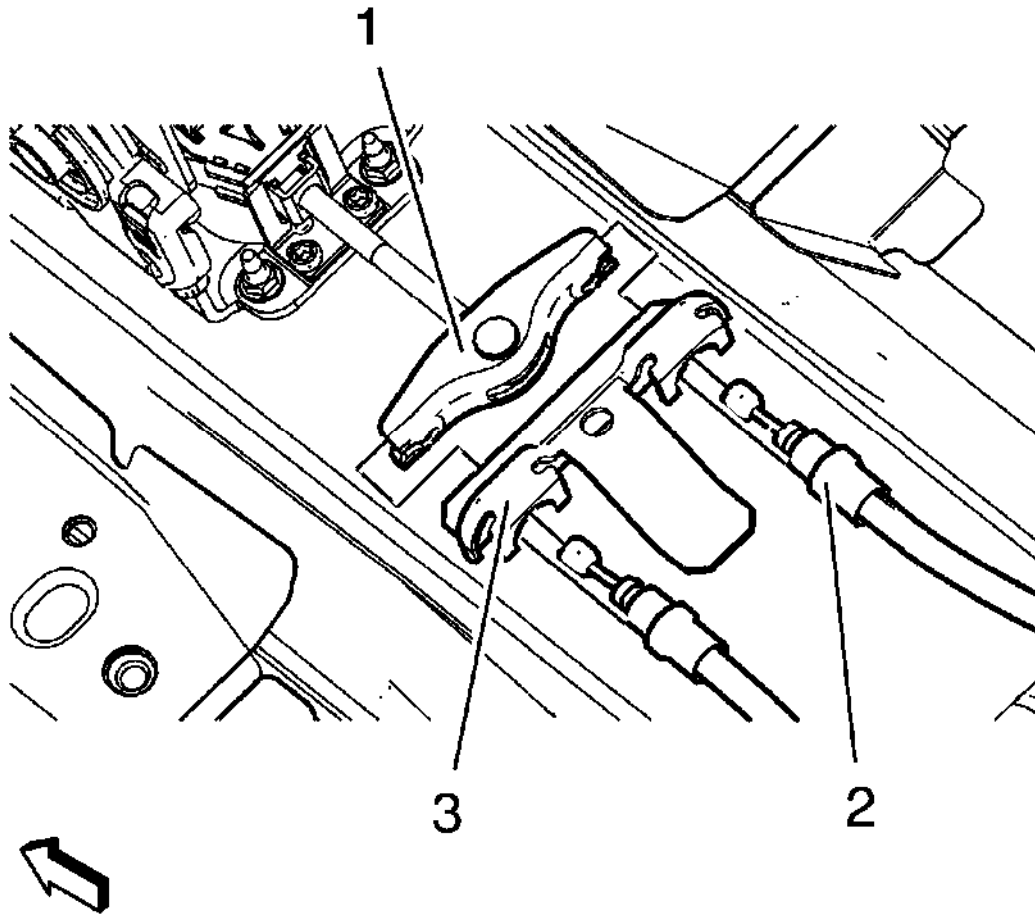


Fig. 8: Parking Brake Cable And Parking Brake Cable Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Remove the parking brake cable (2) from the parking brake lever (1).
6. Remove the parking brake cable (2) from the parking brake cable bracket (3).

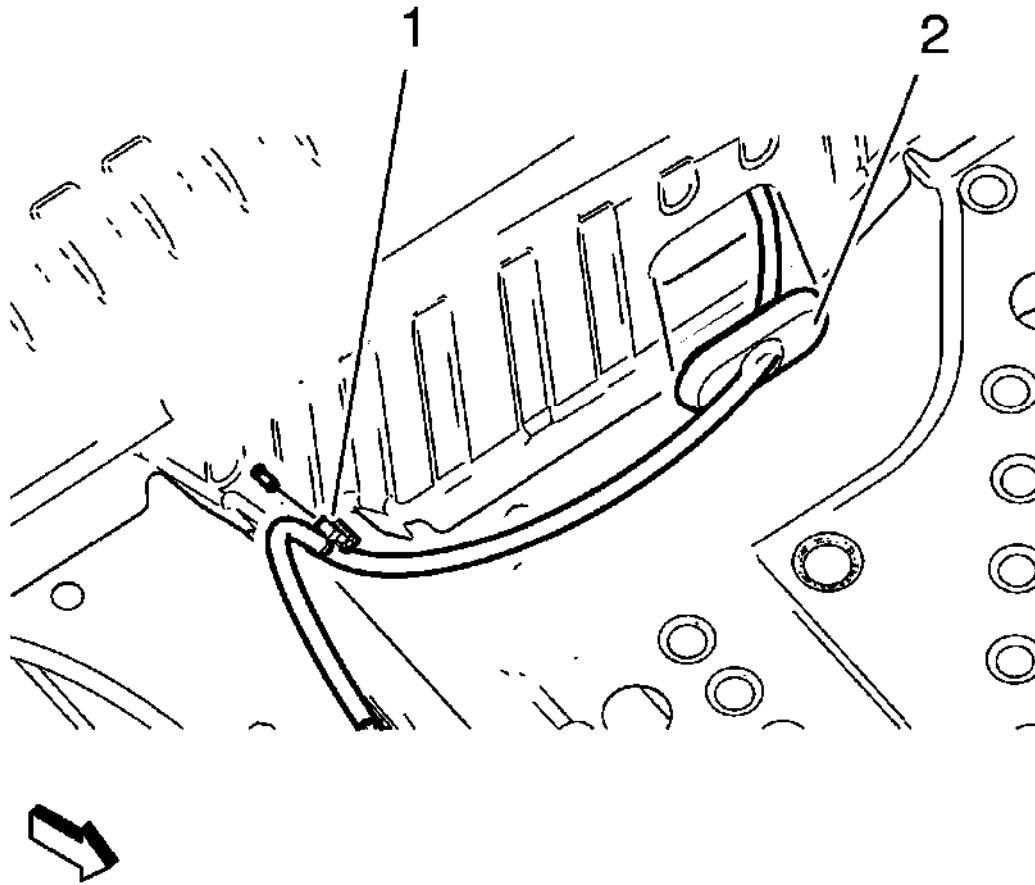


Fig. 9: Parking Brake Cable Clip

Courtesy of GENERAL MOTORS COMPANY

7. Remove the parking brake cable clip (1).
8. Remove the parking brake cable grommet (2).

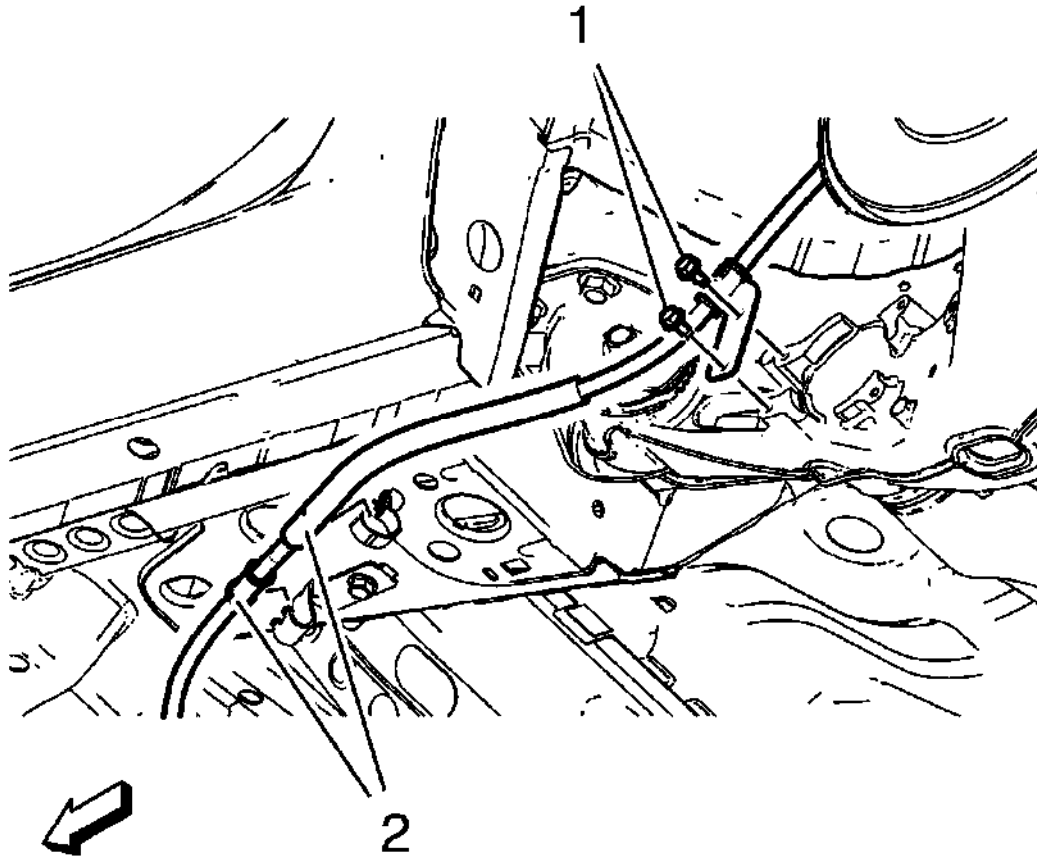


Fig. 10: Parking Brake Cable Casing Retainer Bolt
Courtesy of GENERAL MOTORS COMPANY

9. Remove the parking brake cable casing retainer bolt (1).
10. Unclip the parking brake cable.

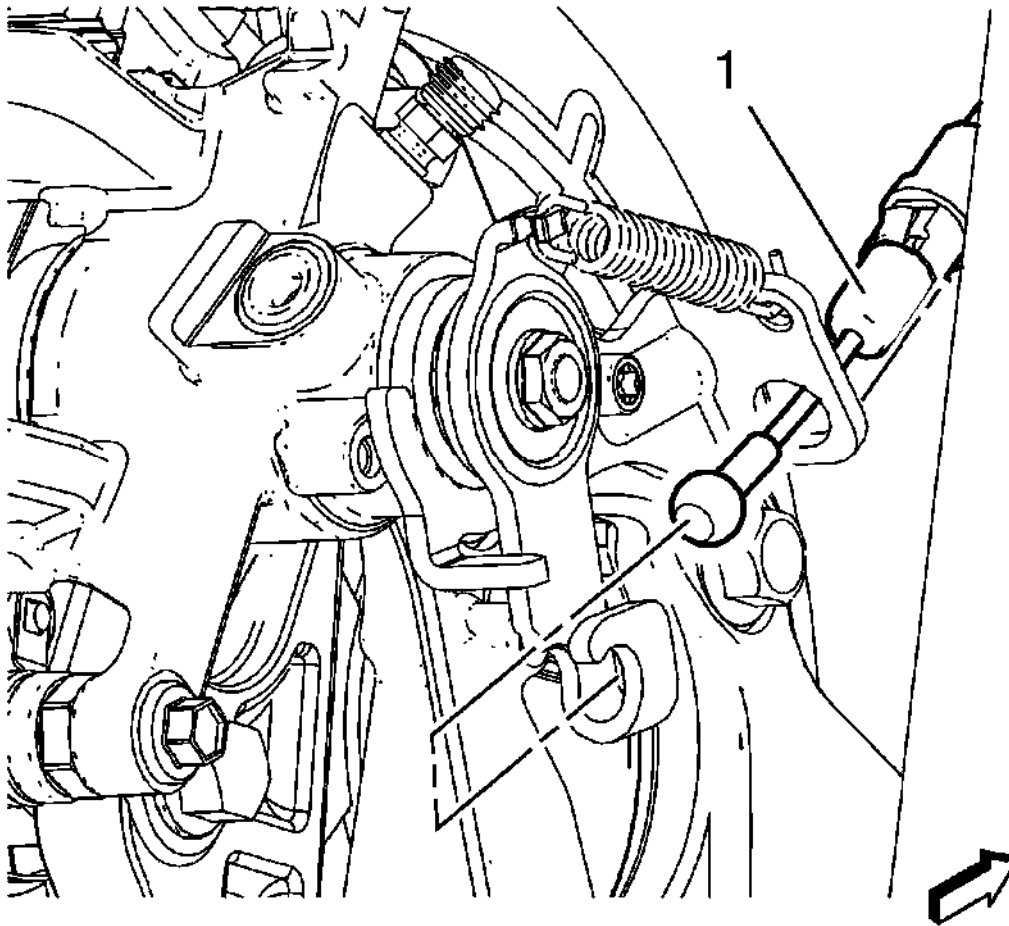


Fig. 11: Parking Brake Cable At Rear Brake Caliper
Courtesy of GENERAL MOTORS COMPANY

11. Remove the parking brake cable (1) from the rear brake caliper.

Installation Procedure

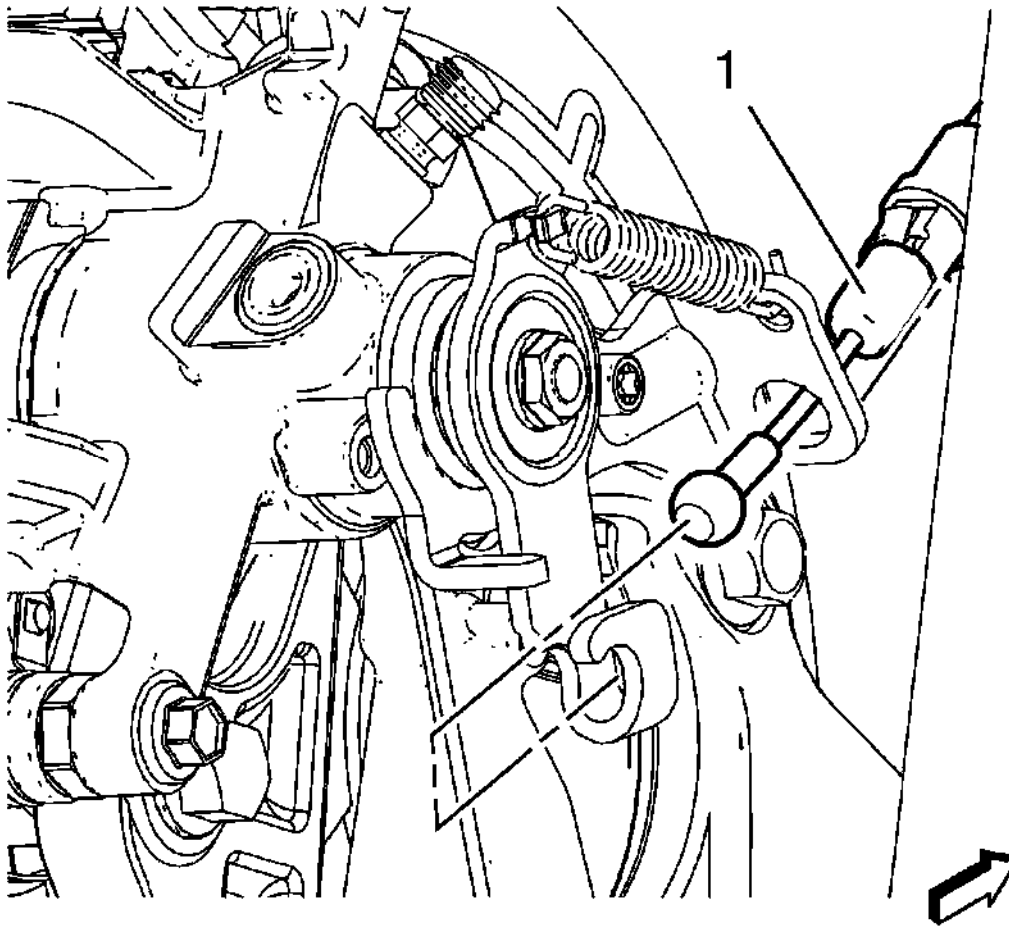


Fig. 12: Parking Brake Cable At Rear Brake Caliper
Courtesy of GENERAL MOTORS COMPANY

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

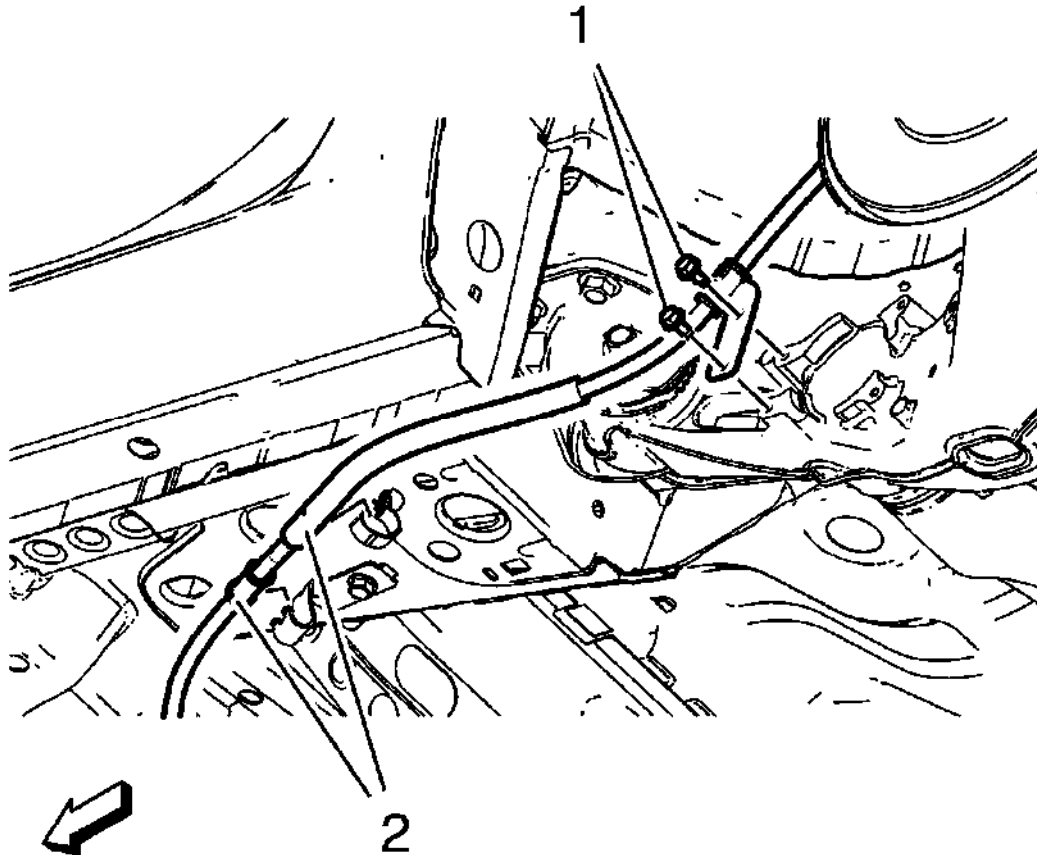


Fig. 13: Parking Brake Cable Casing Retainer Bolt
Courtesy of GENERAL MOTORS COMPANY

2. Clip in the parking brake cable (2).

CAUTION: Refer to Fastener Caution .

3. Install the parking brake cable casing retainer bolt (1) and tighten to 22 N.m (16 lb ft).

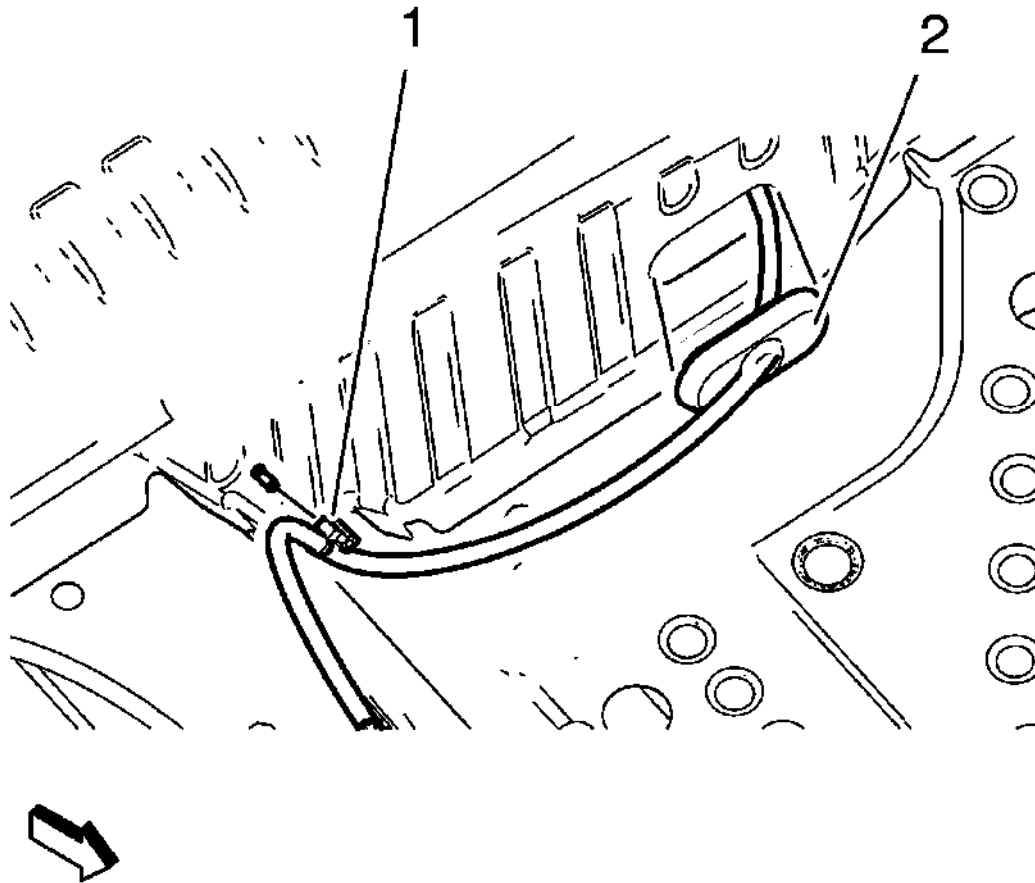


Fig. 14: Parking Brake Cable Clip
Courtesy of GENERAL MOTORS COMPANY

4. Install the parking brake cable grommet (2).
5. Install the parking brake cable clip (1).

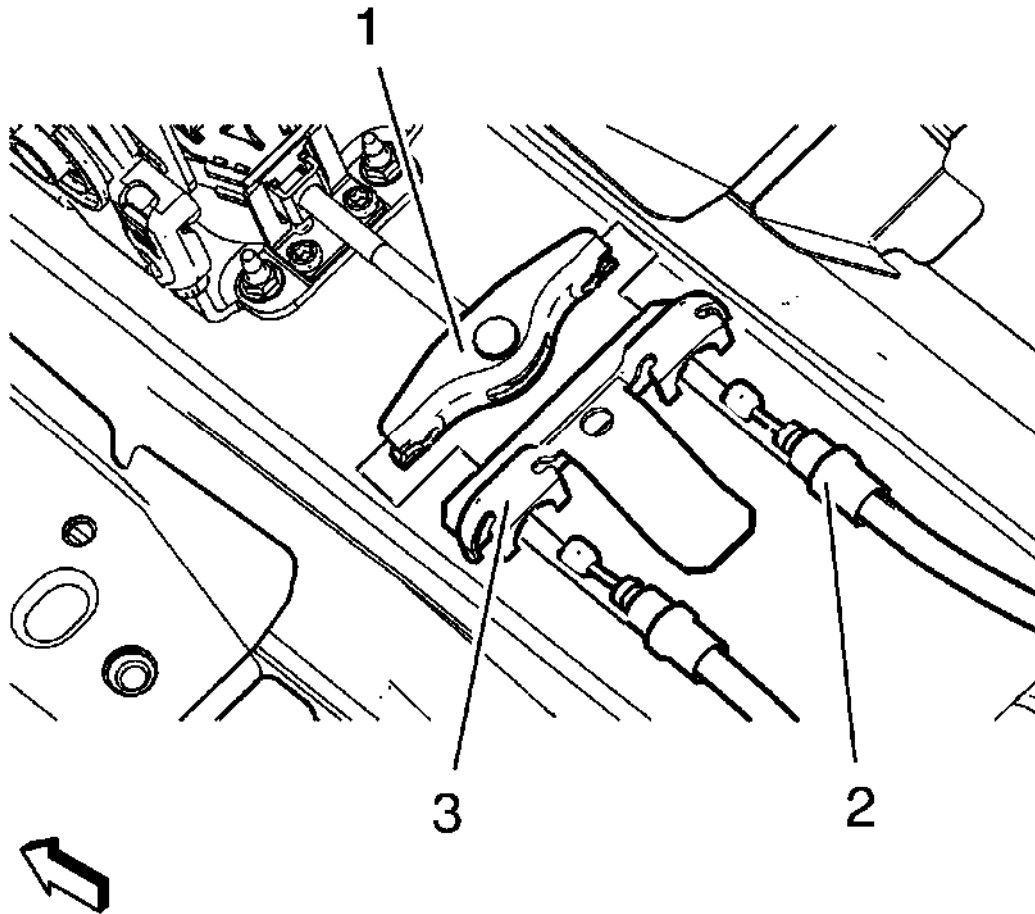


Fig. 15: Parking Brake Cable And Parking Brake Cable Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Install the parking brake cable (2) to the parking brake cable bracket (3).
7. Install in the parking brake cable (2) to the parking brake lever (1).

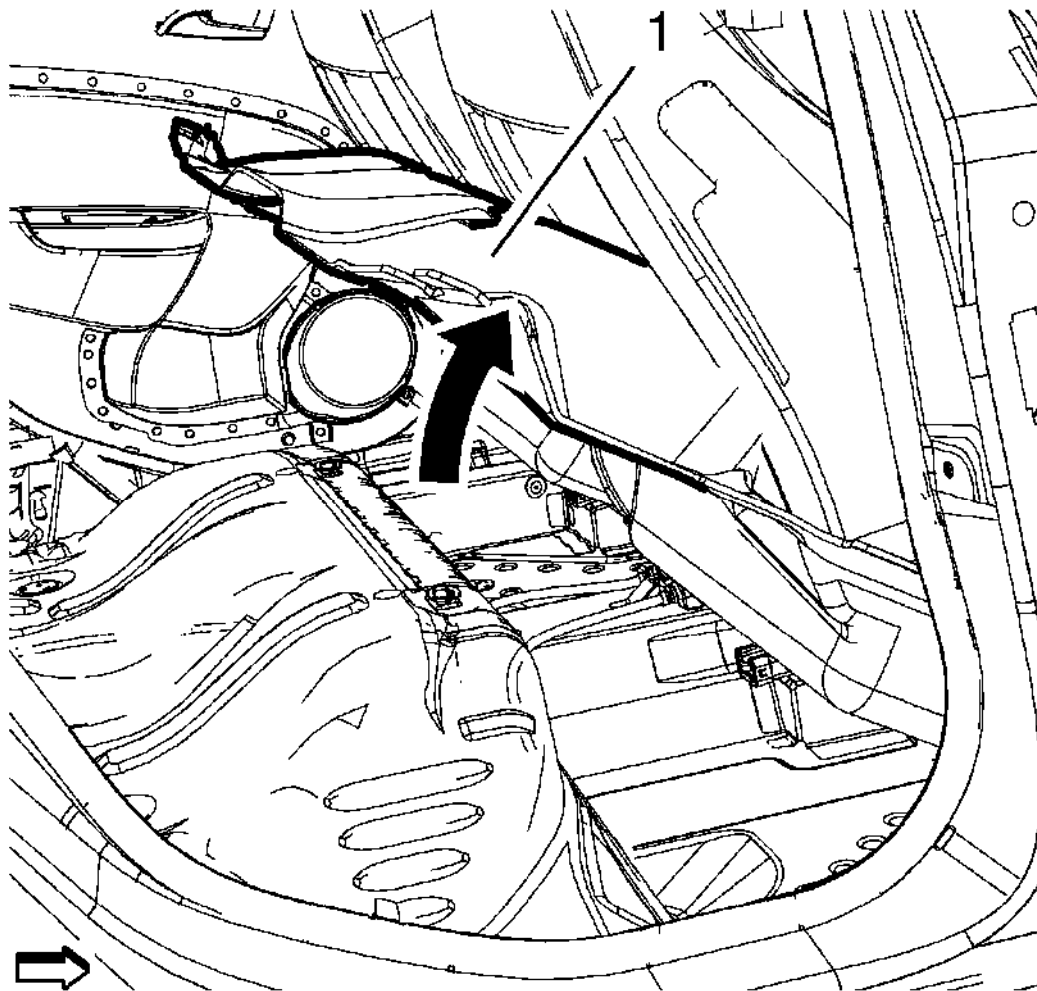


Fig. 16: Rear Floor Carpet

Courtesy of GENERAL MOTORS COMPANY

8. Install the rear floor carpet (1).
9. Install the center pillar lower garnish molding. Refer to **Center Pillar Lower Garnish Molding Replacement** .
10. Install the rear seat cushion. Refer to **Rear Seat Cushion Removal and Installation** .
11. Install the front floor console. Refer to **Front Floor Console Replacement** .

PARKING BRAKE REAR CABLE REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the rear tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

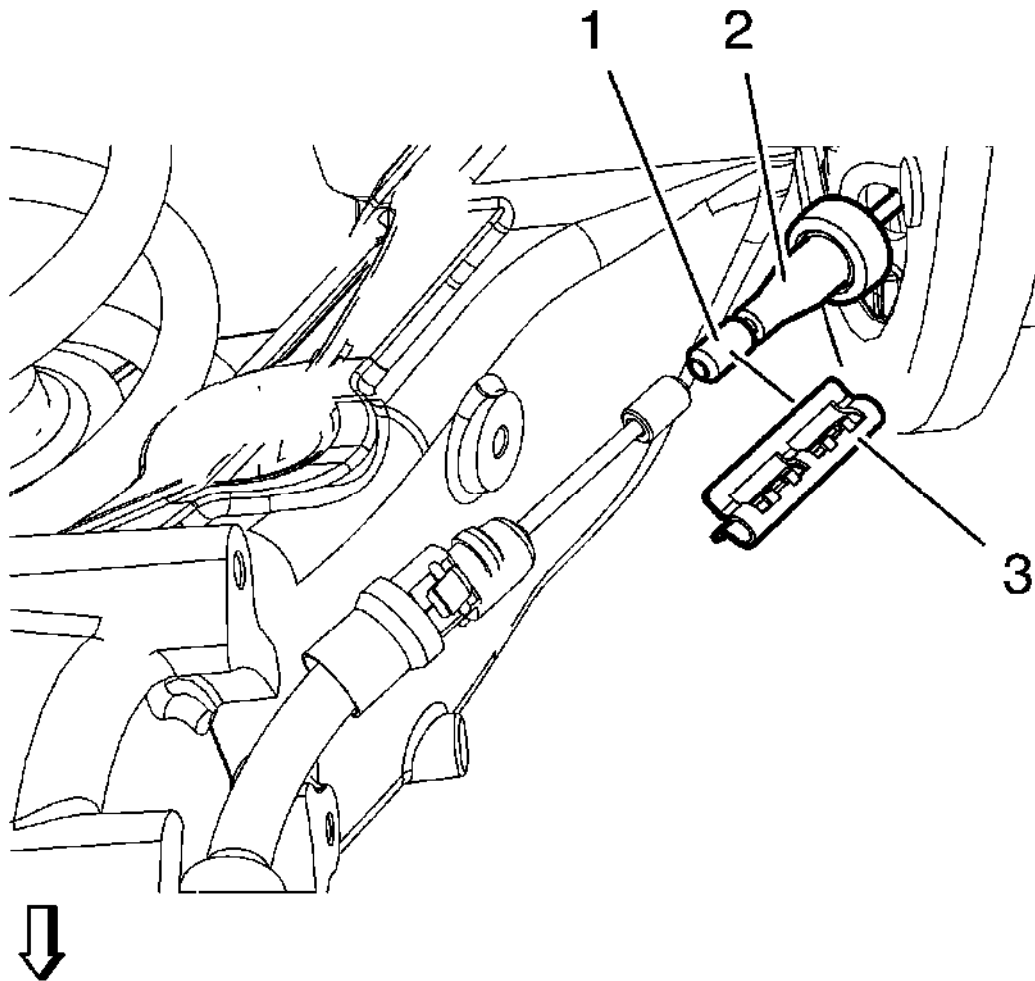


Fig. 17: Parking Brake Cable And Parking Brake Cable Retainer
Courtesy of GENERAL MOTORS COMPANY

3. Remove rear parking brake cable (1) from retainer (3).
4. Remove rear parking brake cable grommet (2) from rear backing plate.
5. Remove brake drum. Refer to **Brake Drum Replacement**.

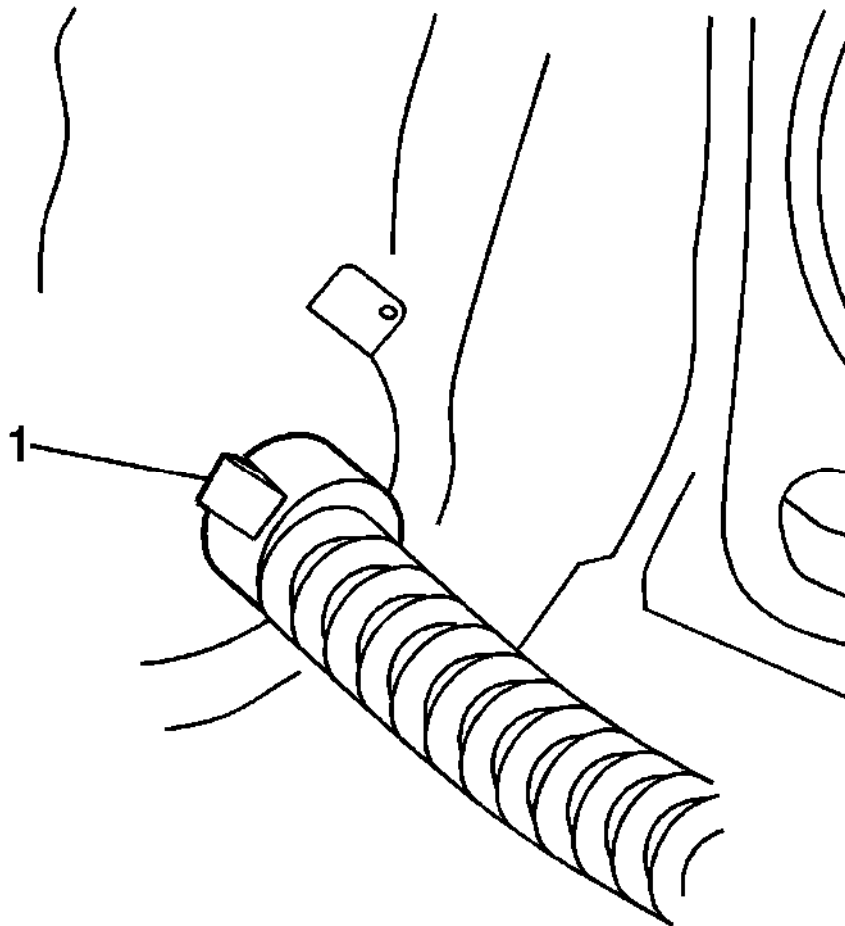


Fig. 18: View Of Rear Park Brake Cable End Fitting
Courtesy of GENERAL MOTORS COMPANY

6. Using a flat-bladed screwdriver, depress the visible retaining tab (1) on the park brake cable fitting, then tilt the released side of the cable end back into the backing plate.
7. Rotate the park brake cable to expose the other retaining tab.

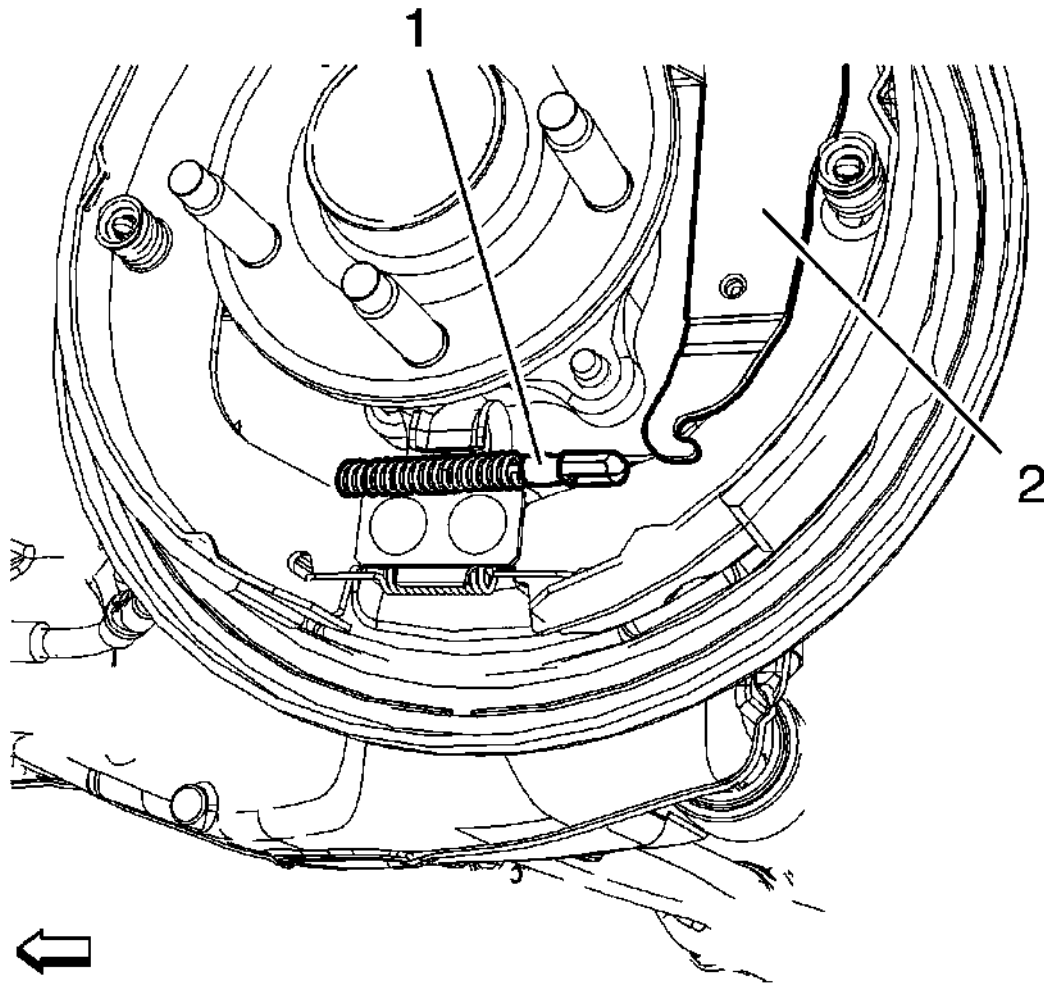


Fig. 19: Parking Brake Cable And Parking Brake Lever
Courtesy of GENERAL MOTORS COMPANY

8. Release rear parking brake cable (1) from parking brake lever (2), using a suitable tool.
9. Remove the rear parking brake cable (1) back through the opening in the backing plate.

Installation Procedure

1. Insert the park brake cable through the opening in the backing plate. Only install the cable return spring to just rearward of the spring positioning tab on the backing plate.

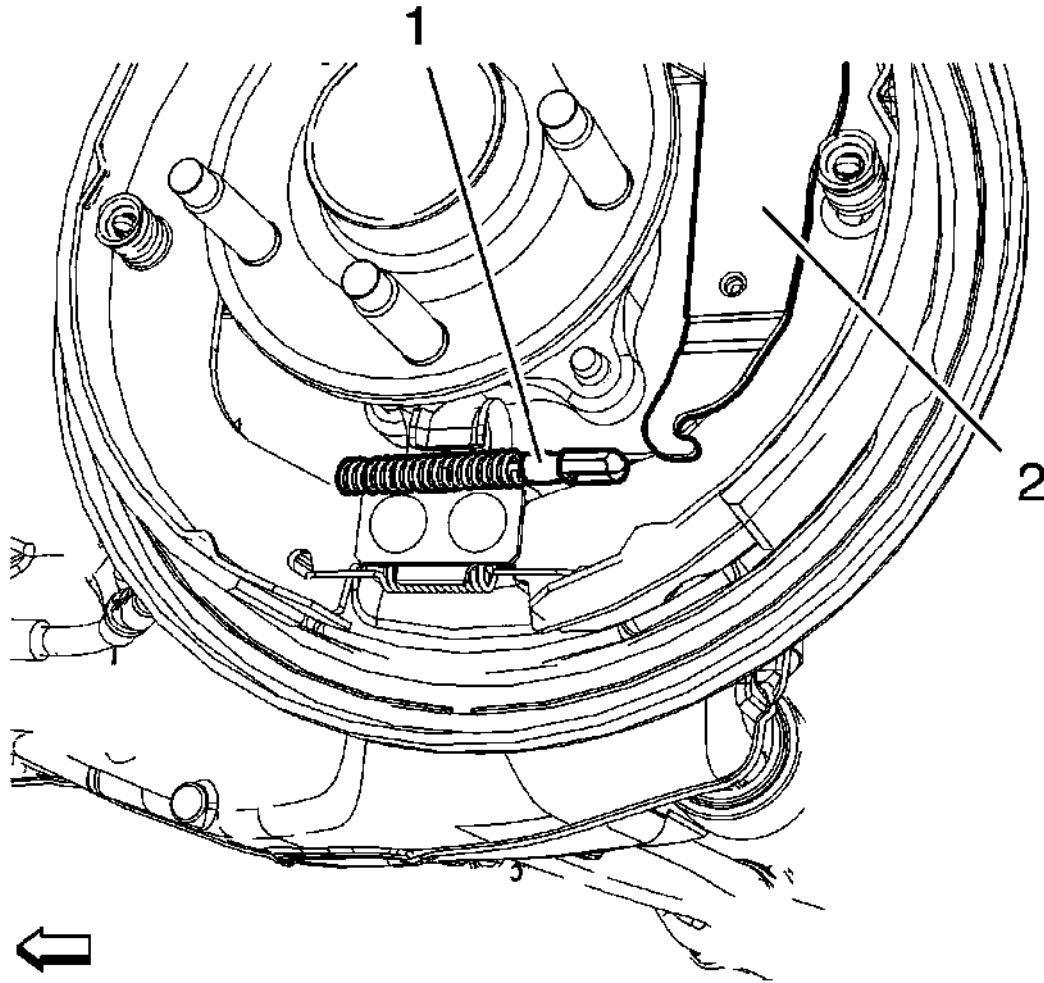


Fig. 20: Parking Brake Cable And Parking Brake Lever
Courtesy of GENERAL MOTORS COMPANY

2. Push the rear parking brake cable (1) toward the rear of the vehicle, along the outside of the trailing brake shoe, until the cable end is positioned just past the slot on the parking brake lever (2).
3. While holding the rear parking brake cable (1) in position from front to rear, move the cable end to the back of the parking brake lever (2).
4. Press the rear parking brake cable (1) into the slot on the lever (2), then pull the cable toward the front of the vehicle to secure the cable end to the slot.
5. While continuing to pull the cable away from the lever, insert a flat-bladed screwdriver into the opening on the lever to prevent the cable from lifting out of the slot on the lever.
6. Move the cable return spring through the opening in the backing plate.

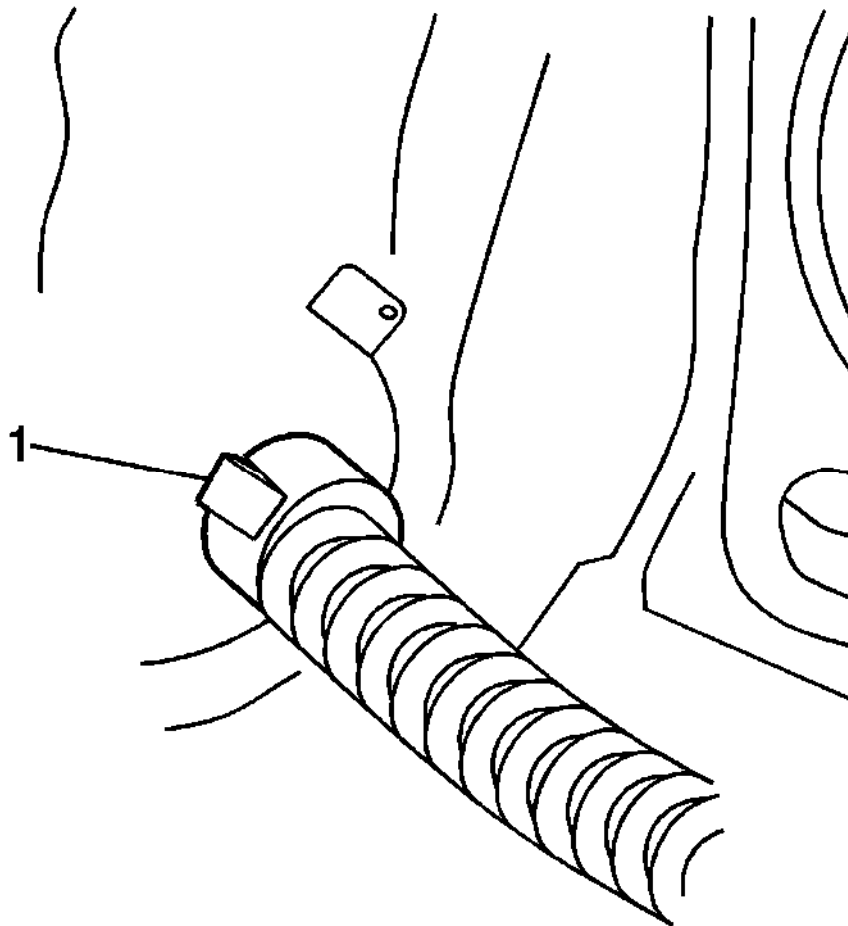


Fig. 21: View Of Rear Park Brake Cable End Fitting
Courtesy of GENERAL MOTORS COMPANY

7. Secure the cable fitting to the backing plate. Attempt to pull the park brake cable free of the backing plate, to ensure that the retaining tabs (1) on the fitting are properly secured.

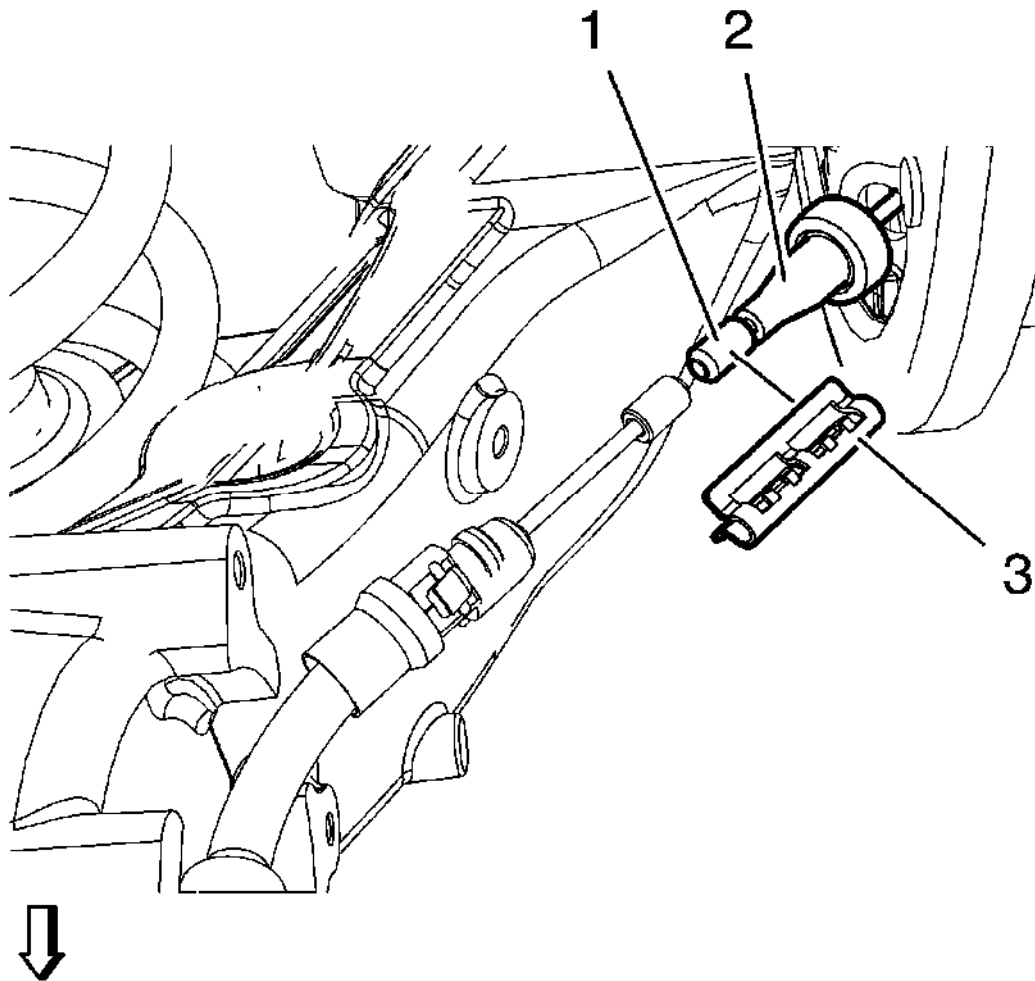


Fig. 22: Parking Brake Cable And Parking Brake Cable Retainer
Courtesy of GENERAL MOTORS COMPANY

8. Install rear parking brake cable (1) to retainer (3).
9. Install rear parking brake cable grommet (2) onto rear backing plate.
10. Install brake drum. Refer to **Brake Drum Replacement**.
11. Adjust the rear drum brakes. Refer to **Drum Brake Adjustment**.
12. Install the rear tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation**.
13. Lower the vehicle.

PARKING BRAKE ADJUSTMENT (MECHANICAL PARKING BRAKE)

WARNING: Refer to **Brake Dust Warning**.

NOTE: This vehicle utilizes a self-tensioning, or self-adjusting park brake cable system. The park brake system does not require adjustment under normal operating conditions. The tension on the park brake cables can be disabled and enabled when necessary during service of the disc or drum brake and/or the park brake system.

1. Apply and fully release the park brake several times. Verify that the park brake lever releases completely.
2. Turn ON the ignition. Verify the red BRAKE warning lamp is not illuminated.
3. If the red BRAKE warning lamp is illuminated, verify the following:
 - The park brake lever is in the fully released position and against the stop.
 - There is no slack in the park brake cables.
4. If the red BRAKE warning lamp remained illuminated and there were no other visible causes, refer to **Symptoms - Hydraulic Brakes**.
5. Turn OFF the ignition.
6. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**.
7. With the park brake lever fully released, check the park brake levers on the rear calipers (only necessary on vehicles equipped with disc brakes on the rear axle). The levers should be against the stops on the caliper housings. If the levers are not against the stops, binding may exist.
8. Fully apply and release the park brake lever 3-5 times in order for the cable tensioner to take up any slack in the park brake cables.
9. Fully apply the park brake lever, a firm lever should be obtained by depressing the lever less than one full stroke.
10. Attempt to rotate the rear tire and wheel assemblies. There should be no rotation forward or rearward.
11. Fully release the park brake lever.
12. Verify the park brake is released by rotating the rear tire and wheel assemblies. The rear tire and wheel assemblies should rotate freely and exhibit no brake drag.
13. Lower the vehicle.

DESCRIPTION AND OPERATION

PARK BRAKE SYSTEM DESCRIPTION AND OPERATION

Park Brake Cables

NOTE: Plastic coated park brake cables do not need periodic lubrication.

Coated park brake cables are used to reduce apply effort and increase corrosion protection. The cables are coated with plastic material which slides against nylon seals inside the conduit end fittings.

System Operation- Disc Brakes

Park brake apply input force is received by the park brake lever assembly being applied. The input force is multiplied by the lever assembly, transferred and evenly distributed, through the park brake cables and the park

brake cable equalizer, to the left and right park brake apply levers. The park brake apply levers multiply and transfer the apply input force to in turn apply the disc brake caliper pistons which compress the brake pads against the friction surface of the brake rotors in order to prevent the rotation of the rear tire and wheel assemblies. The park brake lever assembly releases an applied park brake system when it is released and returned to the at-rest position.

System Operation- Drum Brakes

Park brake apply input force is received by the park brake lever assembly being applied. The input force is multiplied by the lever assembly, transferred and evenly distributed, through the park brake cables and the park brake cable equalizer, to the left and right park brake apply levers. The park brake apply levers multiply and transfer the apply input force to the drum brake actuators/adjusters which expand the drum brake shoes toward the friction surface of the brake drum in order to prevent the rotation of the rear tire and wheel assemblies. The park brake lever assembly releases an applied park brake system when it is released and returned to the at-rest position.

Self Adjusting Park Brake System

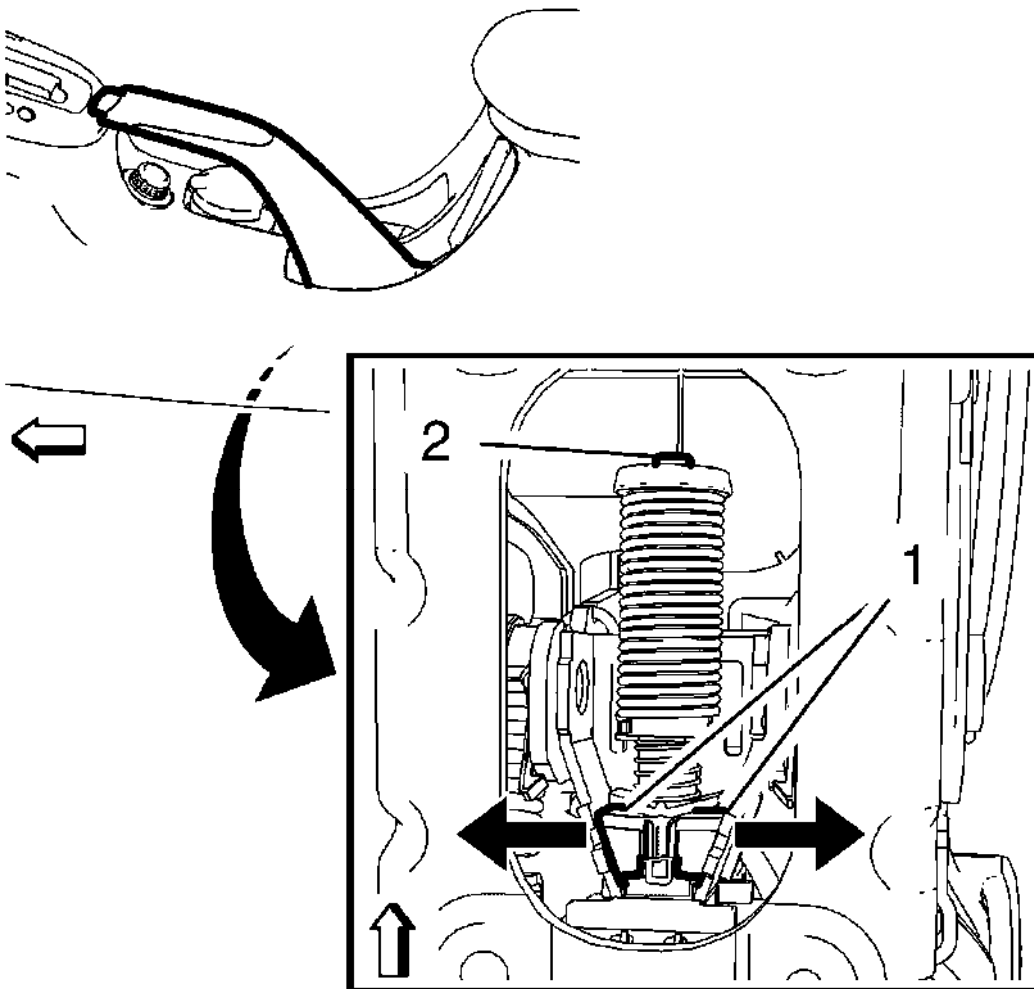
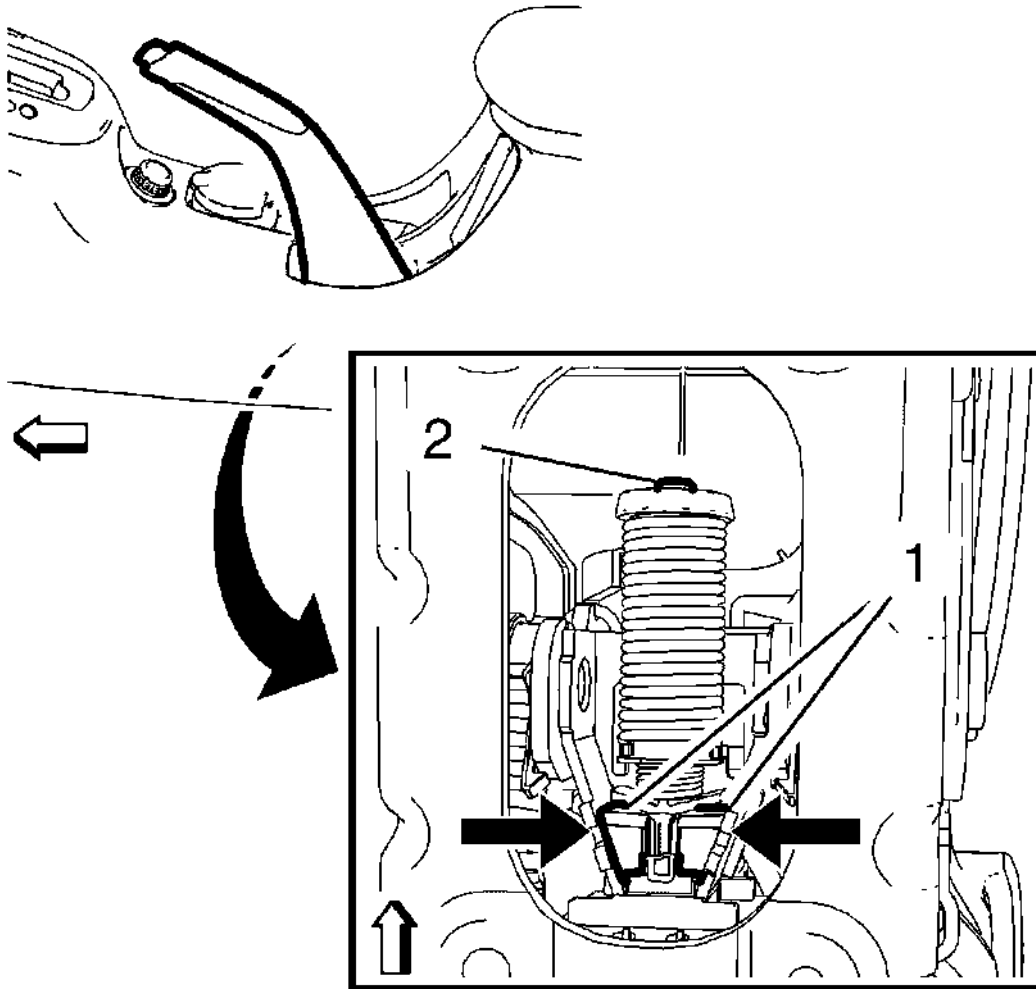


Fig. 23: Park Brake Jaws Pushed Apart In Released Position

Courtesy of GENERAL MOTORS COMPANY

If park brake is released, the jaws (1) are pushed apart (arrows) and will be retained by a locking mechanism. Thus the conduit (2) is disengaged. Now the conduit can move free in longitudinal direction during regular driving and braking.

**Fig. 24: Park Brake Jaws In Applied Position**

Courtesy of GENERAL MOTORS COMPANY

During engagement of park brake, the conduit (2) slides back to the limiting arrest given through the brake pads. The jaws (1) are pushed back (arrows) and clamp the conduit (2).

Fading through wearing process is prevented because the conduit will be clamped at any position.