

2006 Chevrolet HHR LT

2006 BRAKES Park Brake - HHR

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Park Brake - HHR

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Park Brake Cable Adjusting Nut, Drum Brakes	3.9 N.m	35 lb in
Park Brake Lever Assembly Mounting Nuts, Tighten in Sequence	25 N.m	18 lb ft
Park Brake Warning Lamp Switch Mounting Screw	3 N.m	27 lb in

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - PARK BRAKE

Begin the system diagnosis by reviewing the system description and operation. Reviewing the description and operation information will help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the description and operation information will also help you determine if the condition described by the customer is normal operation. Refer to **Symptoms - Park Brake** in order to identify the correct procedure for diagnosing the system and where the procedure is located.

SYMPTOMS - PARK BRAKE

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

Refer to **Park Brake System Description and Operation**.

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

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symptom:

Park Brake Will Not Hold or Release**PARK BRAKE WILL NOT HOLD OR RELEASE****Park Brake Will Not Hold or Release**

Step	Action	Yes	No
1	Were you sent here from the Park Brake Symptom Table?	Go to Step 2	Go to Diagnostic Starting Point - Park Brake
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 6	Go to Step 3
3	Inspect the drum brake system for proper operation. Refer to Drum Brake System Diagnosis in Hydraulic Brakes. 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 Disc Brake System Diagnosis in Hydraulic Brakes. 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 Hydraulic Brake System Diagnosis in Hydraulic Brakes. Did you find and correct a condition?	Go to Step 6	Go to Diagnostic Starting Point - Park Brake
6	Road test the vehicle in order to confirm proper operation. Refer to Brake System Vehicle Road Test in Hydraulic Brakes. Is the condition still present?	Go to Step 2	System OK

PARK BRAKE SYSTEM DIAGNOSIS**Park Brake System Diagnosis**

Step	Action	Yes	No
DEFINITION: This diagnostic table is designed to diagnose ONLY the 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
	Were you sent here from a Park Brake		

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2	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 Diagnostic Starting Point - Park Brake	Go to Diagnostic Starting Point - Hydraulic Brakes
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 11	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 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 20	Go to Step 11
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	Go to Step 9

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8	Reconnect or replace the park brake cables as necessary. Refer to <u>Park Brake Cable Replacement - Rear</u> . Did you complete the repair and/or replacement?	Go to Step 9	-
9	Check the adjustment of the park brake. Refer to <u>Park Brake Adjustment (Drum)</u> . Was the park brake adjusted properly?	Go to Step 11	Go to Step 10
10	Adjust the park brake. Refer to <u>Park Brake Adjustment (Drum)</u> . Were you able to attain adjustment of the park brake?	Go to Step 16	Go to Step 11
11	NOTE: 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. Refer to <u>Park Brake Hardware Inspection</u>. 3. Check the drum brake adjusters for a seized condition. Does the park brake hardware and/or the park brake adjusters require replacement?	Go to Step 12	Go to Step 13
12	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 13	-
13	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 14	Go to Step 17

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14	Check the adjustment of the park brake. Refer to <u>Park Brake Adjustment (Drum)</u> . Was the park brake adjusted properly?	Go to Step 16	Go to Step 15
15	Adjust the park brake. Refer to <u>Park Brake Adjustment (Drum)</u> . Were you able to attain adjustment of the park brake?	Go to Step 16	Go to Step 25
16	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 27	Return to Symptom Table
17	1. Remove the brake drums. Refer to <u>Brake Drum Replacement</u>. 2. Disconnect the park brake cable 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 18	Go to Step 19
18	Replace any of the park brake cables that do not have free movement - not releasing properly. Refer to <u>Park Brake Cable Replacement - Rear</u> . Did you complete the replacement?	Go to Step 23	-
19	Replace the park brake lever assembly - not releasing properly. Refer to <u>Park Brake Lever Assembly Replacement</u> . Did you complete the replacement?	Go to Step 24	-
20	Check the adjustment of the park brake. Refer to <u>Park Brake Adjustment (Drum)</u> . Was the park brake adjusted properly?	Go to Step 27	Go to Step 21

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21	Adjust the park brake. Refer to Park Brake Adjustment (Drum) . Were you able to attain adjustment of the park brake system?	Go to Step 26	Go to Step 22
22	1. Remove the brake drums. Refer to Brake Drum Replacement. 2. Check the drum brake adjusters for a seized condition. 3. Replace the drum brake adjusting hardware as necessary. Refer to Drum Brake Adjusting Hardware Replacement . Did you find and correct a condition?	Go to Step 23	Go to Step 25
23	Adjust the park brake. Refer to Park Brake Adjustment (Drum) . Were you able to attain adjustment of the park brake system?	Go to Step 26	Go to Step 25
24	Adjust the park brake. Refer to Park Brake Adjustment (Drum) . Were you able to attain adjustment of the park brake system?	Go to Step 26	Return to Symptom Table
25	Adjust the park brake. Refer to Park Brake Adjustment (Drum) . Did you complete the replacement and adjustment?	Go to Step 26	Return to Symptom Table
26	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 27	Return to Symptom Table
27	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	-

PARK BRAKE HARDWARE INSPECTION

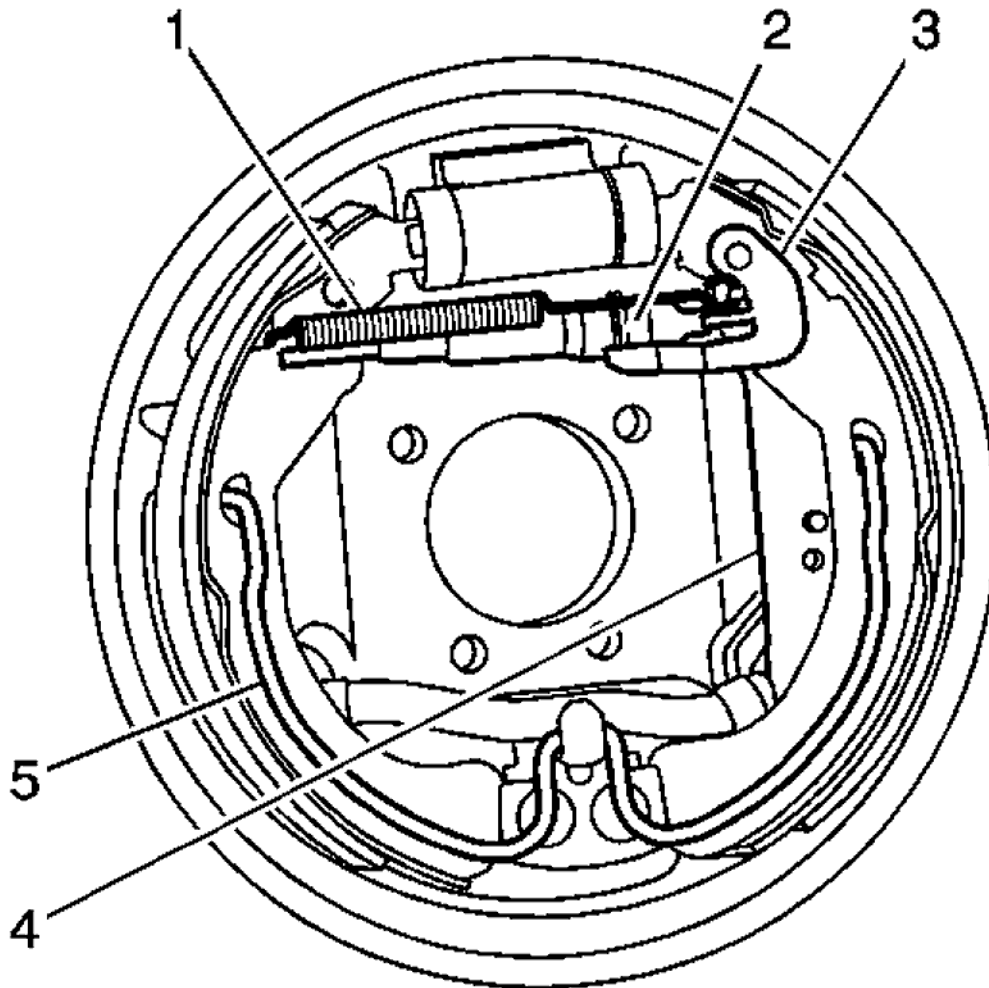


Fig. 1: Inspecting Drum Brake
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to Brake Dust Caution in Cautions and Notices.

1. Visually inspect the park brake lever and the lever pivot pin for the following conditions:
 - The lever being bent or broken at any point - particularly at the cable attachment
 - A seized or binding condition at lever pivot pin
 - A broken lever pivot pin

IMPORTANT: The brake shoe and park brake lever are not serviced separately. If either component requires replacement, they must be replaced as an assembly.

2. If any of the conditions listed were found, the park brake lever and brake shoe assembly requires replacement.

REPAIR INSTRUCTIONS

PARK BRAKE LEVER ASSEMBLY REPLACEMENT

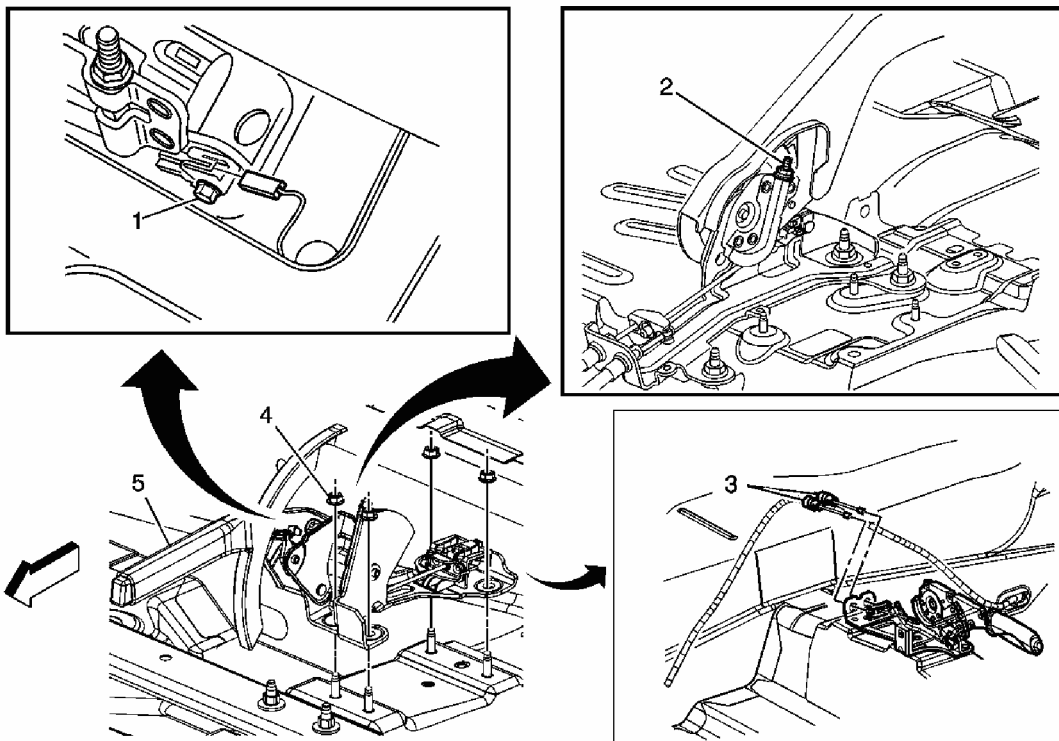


Fig. 2: Park Brake Lever Assembly
Courtesy of GENERAL MOTORS CORP.

Park Brake Lever Assembly Replacement

Callout	Component Name
NOTE: Refer to <u>Fastener Notice</u> .	
Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u> .	
Preliminary Procedure	

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1. Disable the SIR system. Refer to **SIR Disabling and Enabling Zone 8** .
2. Remove the console. Refer to **Console Replacement** .

1	Connector, Park Brake Warning Lamp Switch Electrical Tip: Ensure that the connector is located to the side.
2	Nut, Park Brake Cable Adjusting Tip: • Use only hand tools to loosen the adjusting nut • Adjust the nut to the end of the threaded rod.
3	Cables, Rear Park Brake
4	Nut, Park Brake Lever Retaining (Qty 4) Tighten: 25 N.m (18 lb ft).

PARK BRAKE WARNING LAMP SWITCH REPLACEMENT

Removal Procedure

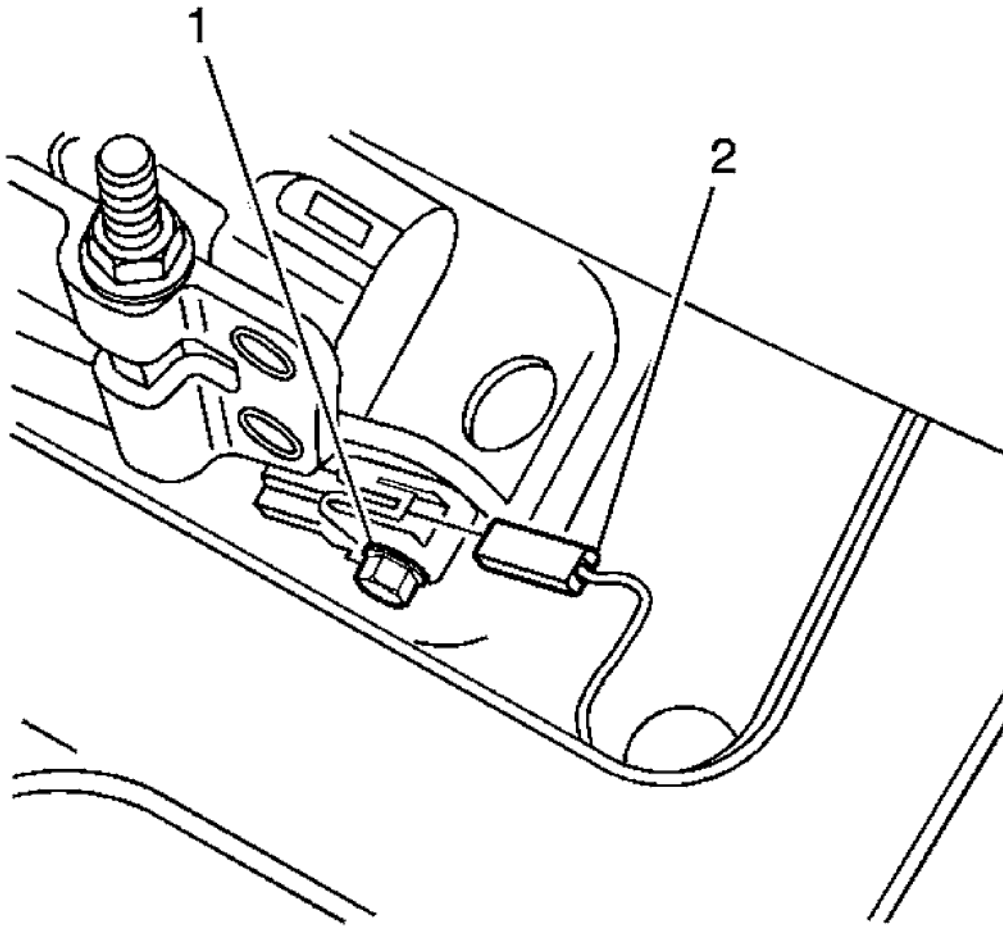


Fig. 3: View Of Warning Lamp Switch Mounting Screw & Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Remove the trim plate replacement - console rear. Refer to **Trim Plate Replacement - Console Rear**.
2. Disconnect the warning lamp switch electrical connector (2).
3. Remove the warning lamp switch mounting screw (1).
4. Remove the switch from the park brake lever assembly.

Installation Procedure

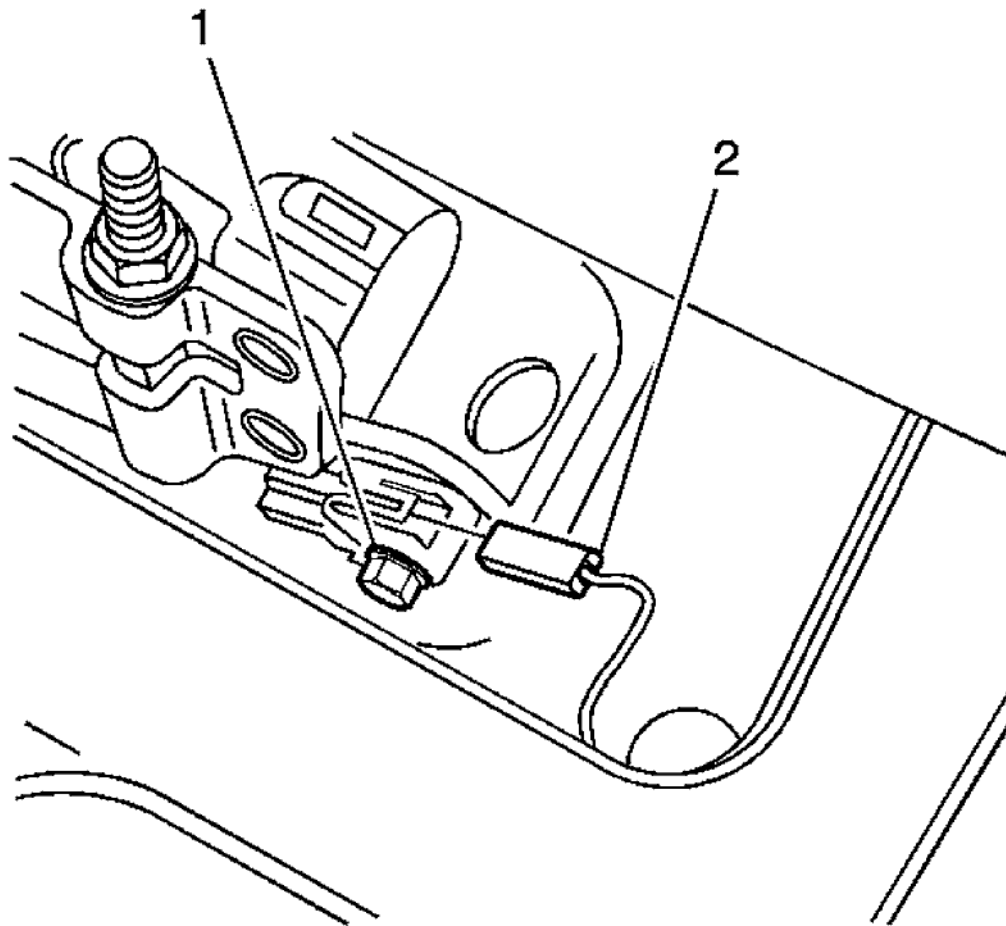


Fig. 4: View Of Warning Lamp Switch Mounting Screw & Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Align the park brake warning lamp switch locating tab to the locating hole on the park brake lever assembly.
2. Install the switch to the park brake lever.

NOTE: **Refer to Fastener Notice .**

3. Install the park brake warning lamp switch mounting screw (1).

Tighten: Tighten the screw to 3 N.m (27 lb in).

4. Connect the park brake warning lamp switch electrical connector (2).

5. Install the trim plate replacement - console rear. Refer to **Trim Plate Replacement - Console Rear** .
6. Verify correct park brake warning lamp operation.

PARK BRAKE CABLE REPLACEMENT - REAR

CAUTION: Refer to **Brake Dust Caution** .

Removal Procedure

1. Remove the extension replacement - floor console - center. Refer to **Extension Replacement - Floor Console - Center** .
2. Ensure that the park brake lever is in the fully released position.

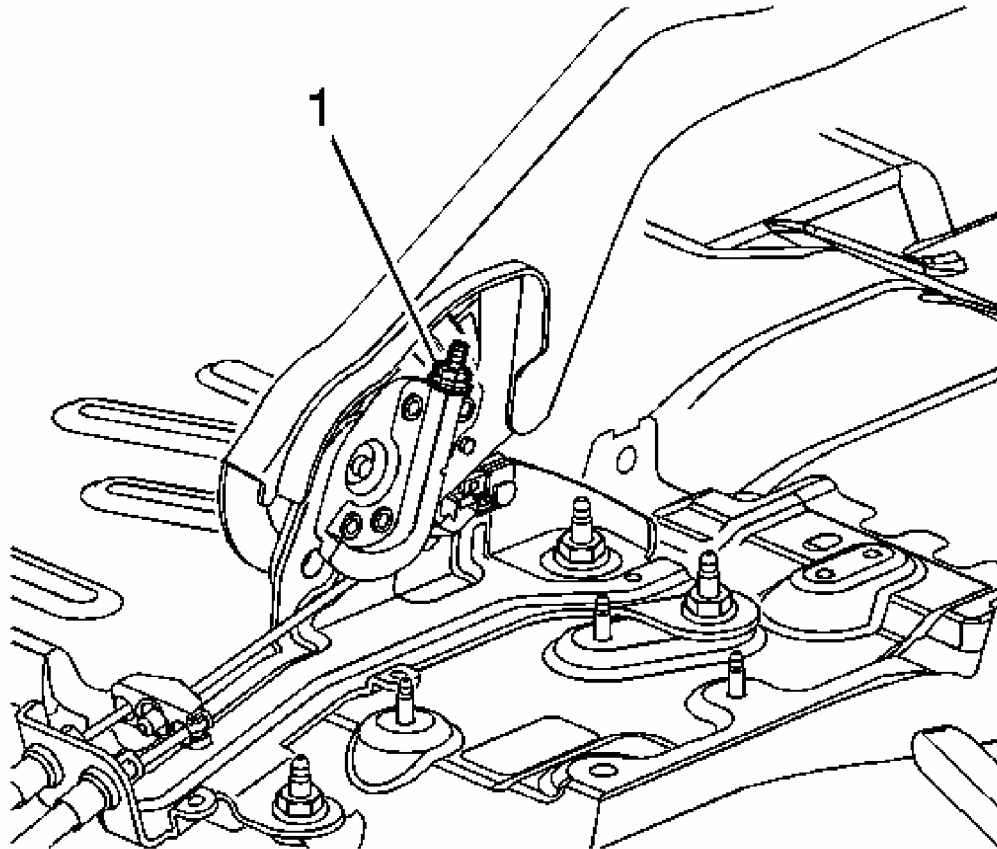


Fig. 5: Locating Parking Brake Cable Adjusting Nut
Courtesy of GENERAL MOTORS CORP.

3. Release the tension from the park brake cables.

Using ONLY HAND TOOLS, loosen the adjusting nut (1) completely to the end of the front cable threaded rod.

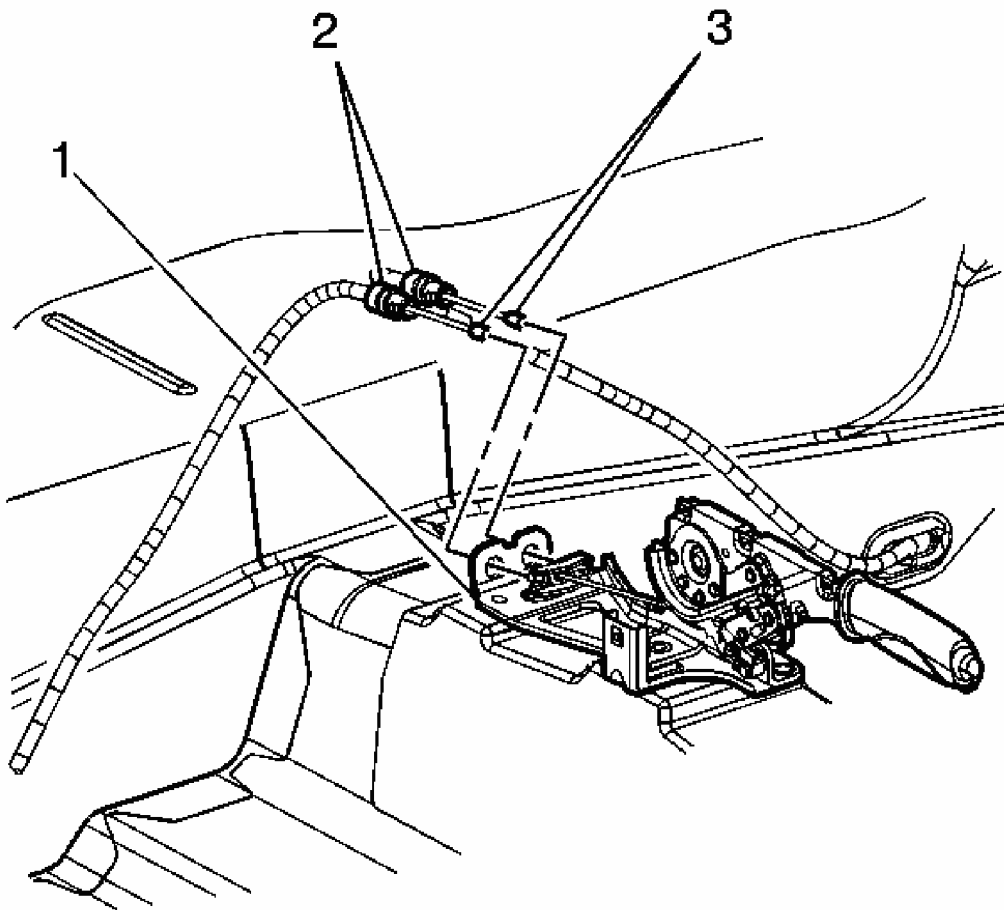


Fig. 6: View Of Park Brake Lever Bracket, Rear Cable Fittings, & Rear Cable Ends

Courtesy of GENERAL MOTORS CORP.

4. With the park brake lever in the released position, release the appropriate rear park brake cable end (3) from the cable equalizer.
5. Release the rear cable fitting (2) from the park brake lever bracket (1) and remove the cable from the lever assembly.
6. Release the rear park brake cable body pass-thru grommet.

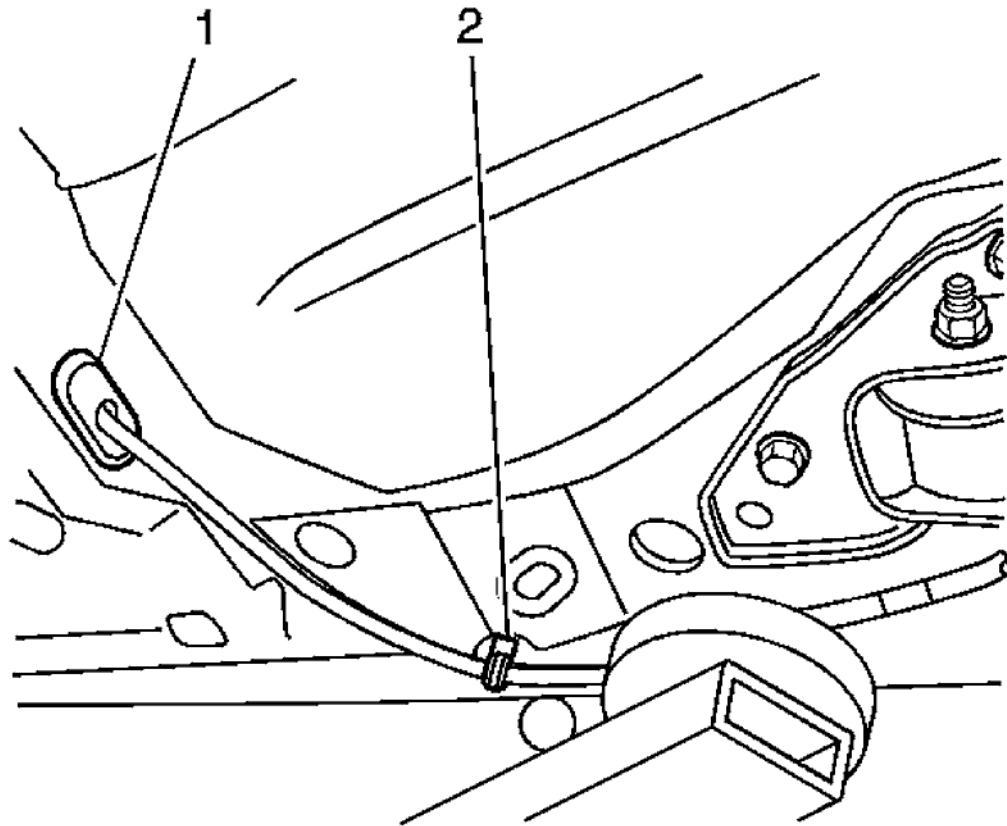


Fig. 7: View Of Park Brake Pass-Thru Grommet & Underbody Retainer
Courtesy of GENERAL MOTORS CORP.

7. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
8. If the park brake cable is being reused, release the tab on the underbody retainer (2) and remove the park brake cable from the retainer.
9. If a new park brake cable will be installed, release the underbody retainer (2) from the vehicle underbody.

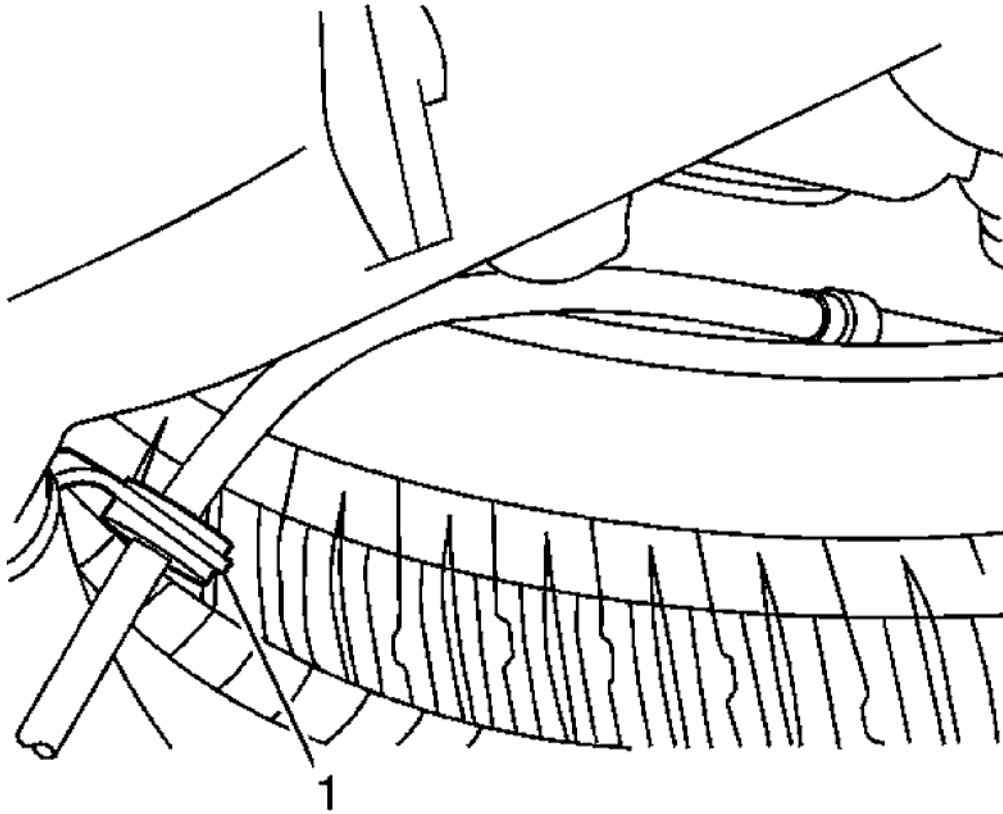


Fig. 8: Releasing Park Brake Cable C-Shaped Retainer
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do NOT pull on the park brake cable to release the C-shaped retainer (1) on the cable from the bracket at the rear axle trailing arm pivot.

10. Using a suitable tool, carefully pry against the edge of the C-shaped retainer (1) on the park brake cable, to release the retainer from the bracket at the rear axle trailing arm pivot.
11. Remove the cable from the opening in the vehicle underbody.

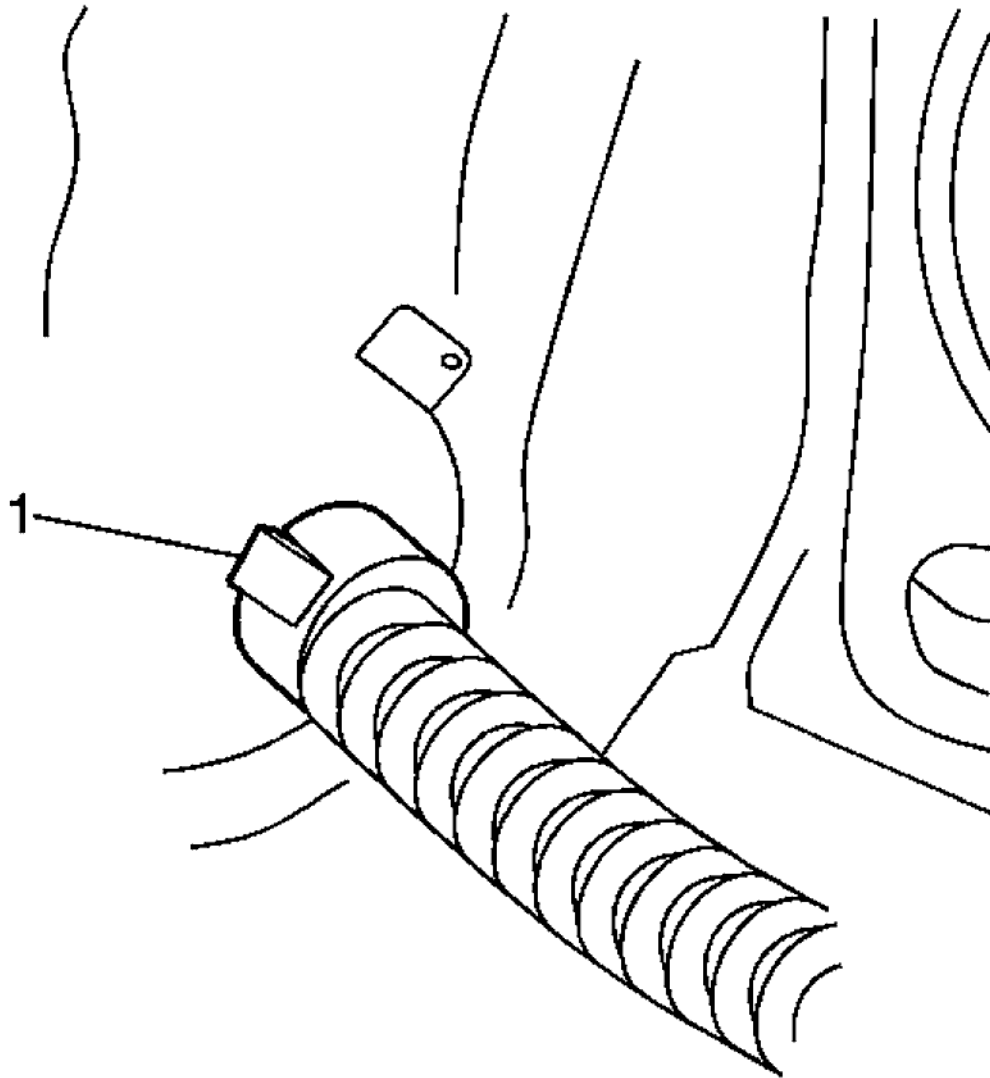


Fig. 9: View Of Rear Park Brake Cable End Fitting
Courtesy of GENERAL MOTORS CORP.

12. Remove the rear tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
13. Remove the brake drum. Refer to **Brake Drum Replacement** .
14. 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.
15. Rotate the park brake cable to expose the other retaining tab.
16. Using a flat-bladed screwdriver, depress the remaining retaining tab on the park brake

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- cable fitting, and release the cable fitting from the backing plate.
17. Move the majority of the cable return spring back through the opening in the backing plate.
 18. Push the cable toward the rear of the vehicle, just enough to clear the cable end from the slot on the park brake lever.
 19. Using a flat-bladed screwdriver, lift the cable to fully release the cable from the lever, then remove the cable.

Installation Procedure

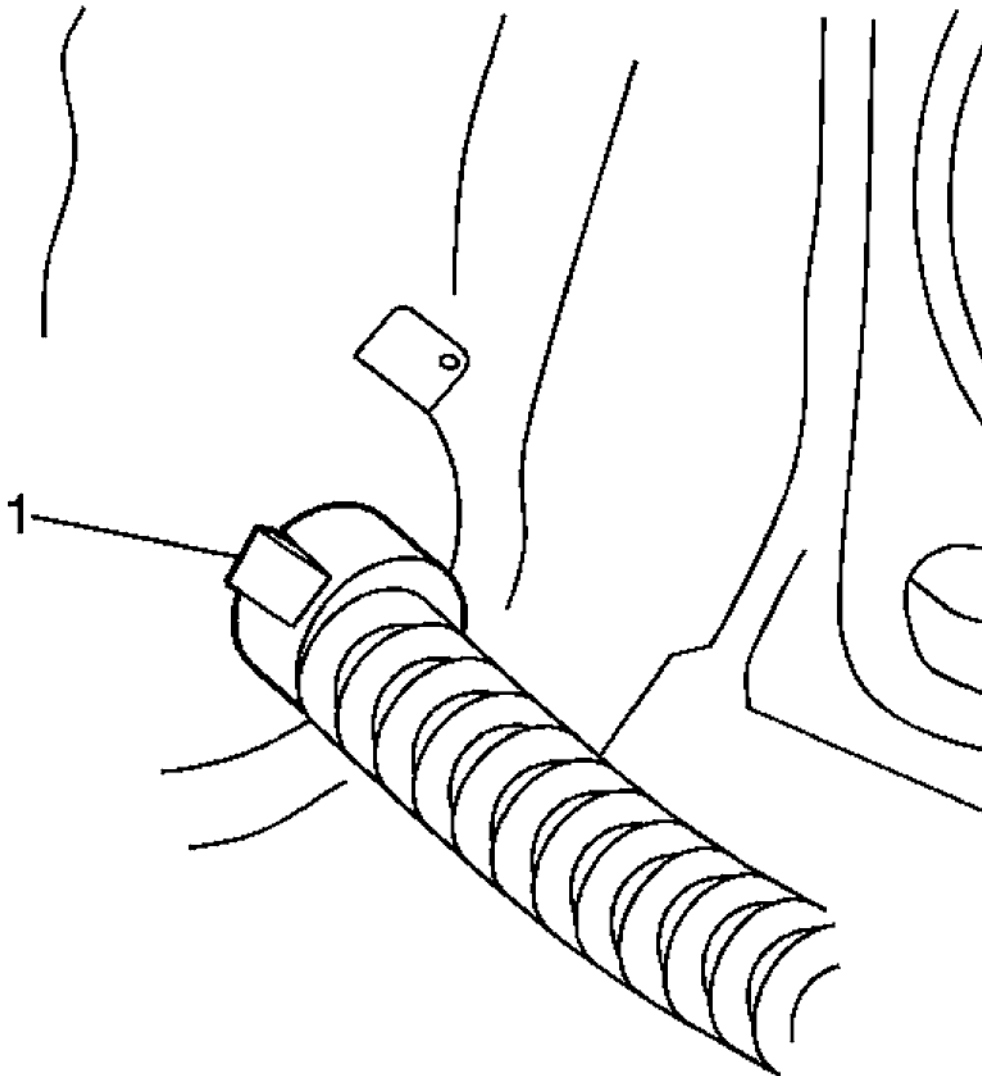


Fig. 10: View Of Rear Park Brake Cable End Fitting

Courtesy of GENERAL MOTORS CORP.

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.
2. Push the cable 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 park brake lever.
3. While holding the cable in position from front to rear, move the cable end to the back of the park brake lever.
4. Press the cable down into the slot on the lever, 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.
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.
8. Adjust the rear drum brakes. Refer to **Drum Brake Adjustment** .
9. Install the brake drum. Refer to **Brake Drum Replacement** .
10. Install the rear tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

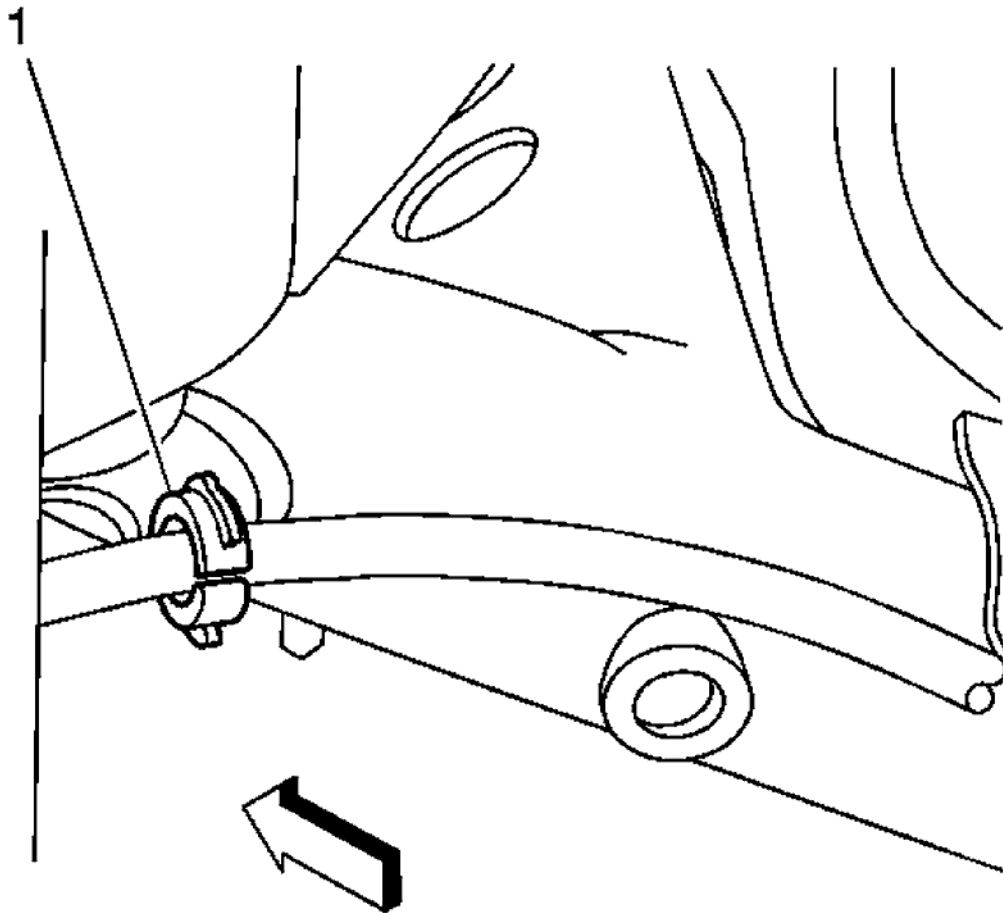


Fig. 11: Installing Park Brake C-Shaped Retainer
Courtesy of GENERAL MOTORS CORP.

11. Insert the cable through the opening in the vehicle underbody.
12. Install the C-shaped retainer (1) on the park brake cable into the bracket at the rear axle trailing arm pivot.

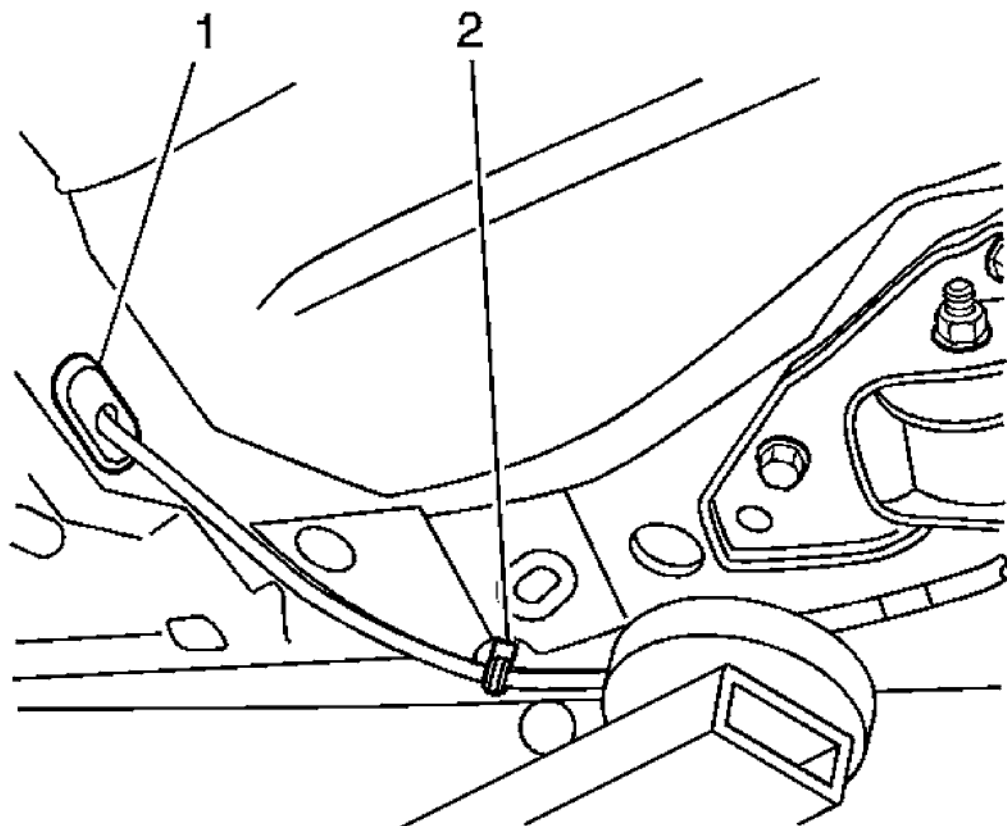


Fig. 12: View Of Park Brake Pass-Thru Grommet & Underbody Retainer
Courtesy of GENERAL MOTORS CORP.

13. Install and secure park brake cable pass-thru grommet (1) to the opening in the vehicle underbody.
14. If a new park brake cable is being installed, secure the underbody retainer (2) to the vehicle underbody.
15. If the park brake cable is being reused, install the park brake cable to the underbody retainer (2) and press the tab into place to secure.
16. Lower the vehicle.

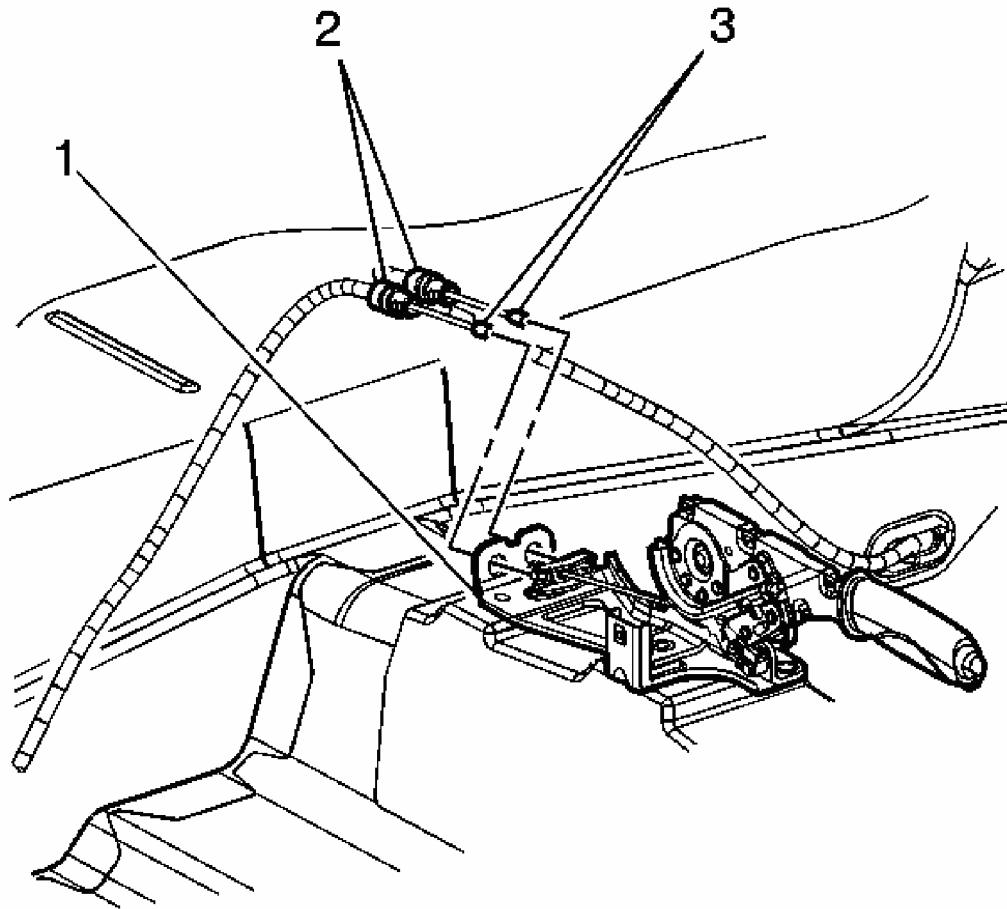


Fig. 13: View Of Park Brake Lever Bracket, Rear Cable Fittings, & Rear Cable Ends

Courtesy of GENERAL MOTORS CORP.

17. Secure the cable fitting (2) to the park brake lever bracket (1). Attempt to pull the park brake cable free of the lever bracket, to ensure that the retaining tabs on the fitting are properly secured.
18. Adjust the park brake cable tension. Refer to **Park Brake Adjustment (Drum)**.
19. Install the extension replacement - floor console - center. Refer to **Extension Replacement - Floor Console - Center**.

PARK BRAKE ADJUSTMENT (DRUM)

CAUTION: Refer to Brake Dust Caution in Cautions and Notices.

IMPORTANT: The park brake cable adjusting nut is a nylon lock type. Use **ONLY HAND TOOLS** whenever tightening or loosening the adjusting nut.

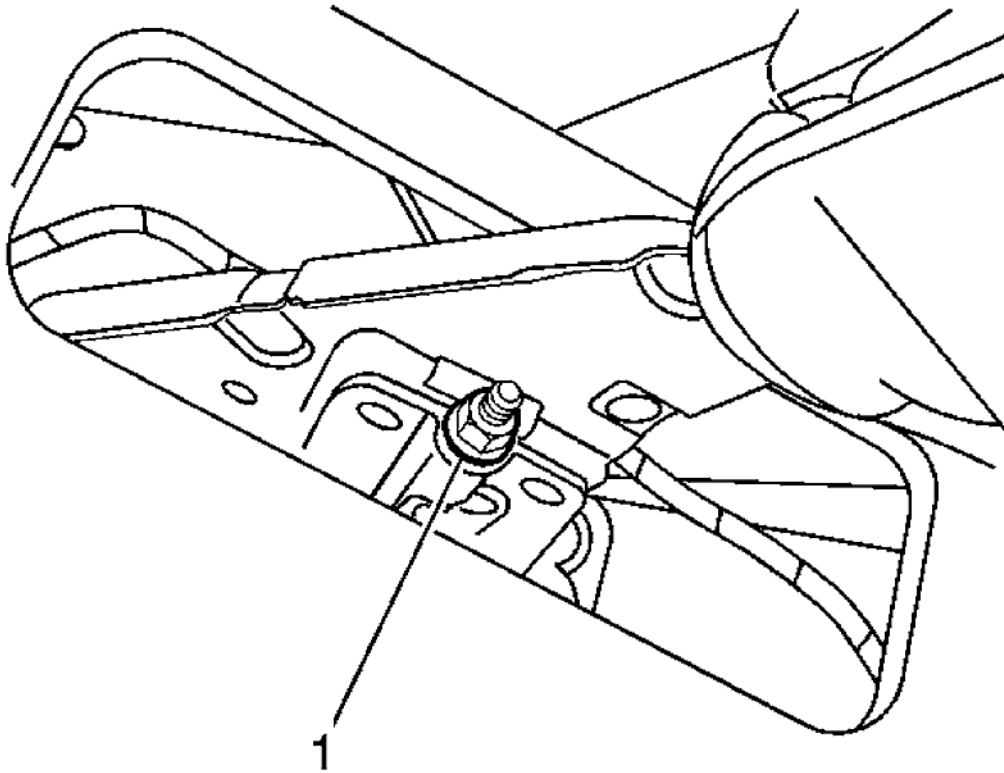


Fig. 14: Locating Park Brake Adjusting Nut
Courtesy of GENERAL MOTORS CORP.

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** in Hydraulic Brakes.
5. Turn OFF the ignition.
6. Release the park brake lever boot from the floor console by applying light pressure

inward on the sides of the boot retainer, and pull the boot back.

7. With the park brake lever in the released position, loosen the adjusting nut (1) enough to completely relieve tension on the front cable.
8. Raise and support the vehicle. Raise the vehicle just enough to allow rear tire and wheel assembly removal and rear drum adjustment. Refer to **Lifting and Jacking the Vehicle** in General Information.
9. Remove the rear tire and wheel assemblies. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
10. Adjust the rear drum brakes. Refer to **Drum Brake Adjustment** in Drum Brakes.
11. Ensure there is no brake shoe drag after adjustment by rotating the brake drums. If drag exists, re-center the brake shoes and perform the brake shoe adjustment again.
12. Install 2 wheel nuts to the wheel studs and firmly hand tighten in order to retain the brake drums.
13. Raise the park brake lever 6 detent positions.

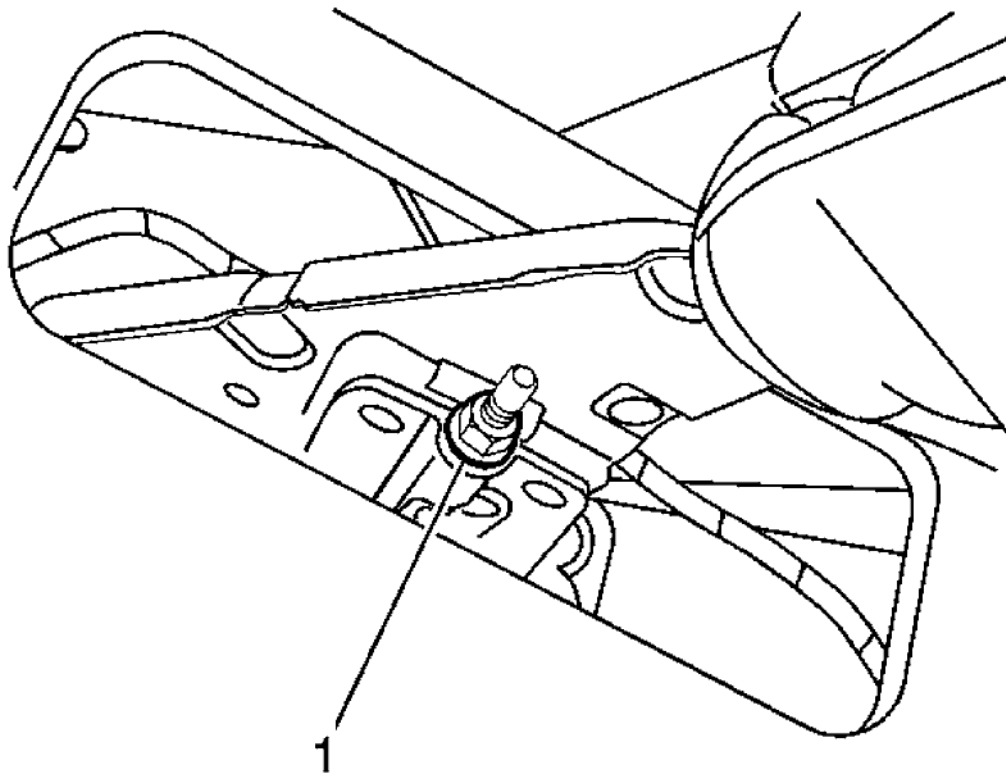


Fig. 15: Locating Front Park Brake Adjusting Nut
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

14. Tighten the park brake cable adjusting nut (1).

Tighten: Tighten the nut to 3.9 N.m (35 lb in).

15. Attempt to rotate the rear brake drums. There should be no rotation forward or rearward.
16. Fully release the park brake lever.
17. Verify the park brake is released by rotating the rear brake drums. The drums should rotate freely and exhibit no brake shoe drag.
18. If the drums do not rotate freely, repeat the park brake cable adjustment procedure.
19. Raise the park brake lever 3 detent positions and attempt to rotate the rear brake drums:
- One of the brake drums should not rotate forward or rearward.
 - The other brake drum should not rotate forward or rearward, or should require substantial effort to rotate.
20. Raise the park brake lever one additional detent position and attempt to rotate the rear brake drums.
21. Verify that the left and right brake drums cannot be rotated.
22. Remove the wheel nuts retaining the brake drums.
23. Install the rear tire and wheel assemblies. Refer to Tire and Wheel Removal and Installation in Tires and Wheels.
24. Lower the vehicle.
25. Position the park brake lever boot to the floor console and press the boot retainer into place to secure.
26. Release the park brake lever.

DESCRIPTION AND OPERATION

PARK BRAKE SYSTEM DESCRIPTION AND OPERATION

System Component Description

The park brake system consists of the following:

Park Brake Lever Assembly

Receives, multiplies, and transfers park brake system apply input force from driver to park brake cable system.

Releases applied park brake system when lever release button is depressed and lever is returned to the at-rest position.

Park Brake Cables

Transfers input force received from park brake lever, through park brake cable equalizer, to park brake apply levers.

Park Brake Cable Equalizer

Evenly distributes input force to both the left and right park brake units. Threaded front park brake cable adjuster is also used to remove slack in park brake cables.

Park Brake Apply Lever

Multiplies and transfers input force to park brake actuator/adjuster.

Disc Brake Caliper Actuator

Uses multiplied input force from park brake apply lever to apply disc brake caliper piston which compresses the brake pads against friction surface of brake rotor.

Drum Brake Actuator/Adjuster

Uses multiplied input force from park brake apply lever to expand drum brake shoes toward the friction surface of the brake drum.

Threaded drum brake actuators/adjusters are also used to control clearance between the drum brake shoes and the friction surface of the brake drum.

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

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assemblies. The park brake lever assembly releases an applied park brake system when it is released and returned to the at-rest position.