SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Brake Pipe Fitting at the Wheel Cylinder, First or Second Design	19 N.m	14 lb ft
Wheel Cylinder Bleeder Valve	8 N.m	71 lb in
Wheel Cylinder Mounting Bolts	16 N.m	12 lb ft

DRUM BRAKE COMPONENT SPECIFICATIONS

Drum Brake Component Specifications

Application	Specification	
	Metric	English
Brake Drum Discard Diameter	231.0 mm	9.094 in
Brake Drum Diameter - New	230.125 mm +/- 0.125 mm	9.06 in +/- 0.005 in
Brake Drum Maximum Allowable Radial Runout	0.104 mm	0.004 in
Brake Drum Maximum Allowable Scoring	1.5 mm	0.059 in
Brake Drum Maximum Diameter After Refinish	230.50 mm	9.075 in
Brake Shoe Lining Minimum Thickness	0.5 mm	0.020 in
Brake Shoe Lining Thickness - New	4.2 mm	0.165 in
Brake Shoe Lining-to-Drum Clearance	0.635 mm	0.025 in

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - DRUM BRAKES

Begin the drum brake system diagnosis with **Diagnostic Starting Point - Hydraulic Brakes** in Hydraulic Brakes. The use of the Diagnostic Starting Point leads to the identification of the correct procedure for diagnosing the system and where the procedure is located.

BRAKE DRUM DIAMETER MEASUREMENT

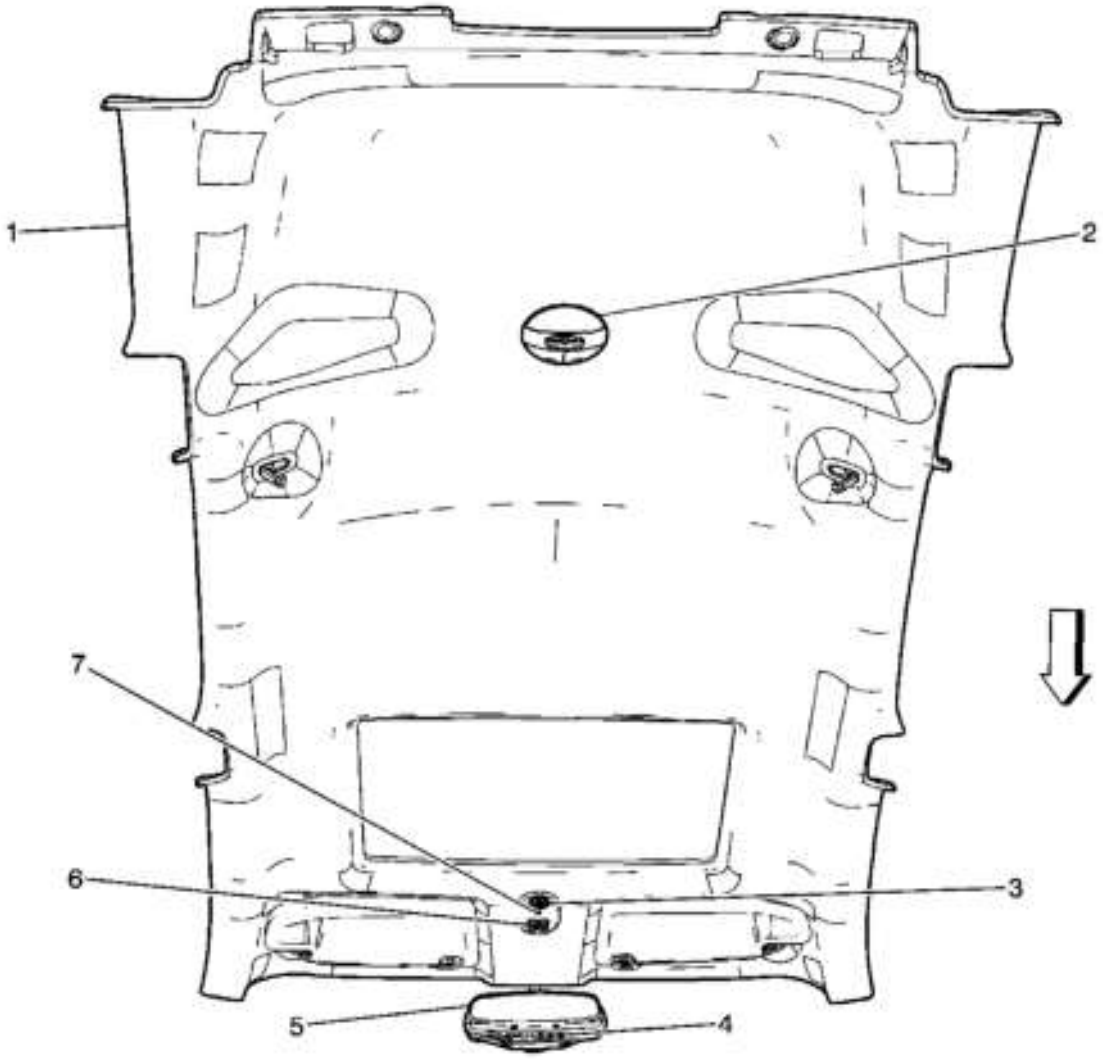


Fig. 1: Measuring Brake Drum
Courtesy of GENERAL MOTORS CORP.

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

1. Clean the brake shoe lining contact surface of the brake drum with denatured alcohol or an equivalent approved brake cleaner.
2. Using a brake drum micrometer calibrated in thousanths-of-an-inch, measure and record the largest diameter of the brake drum at four or more points, equally spaced around the drum.

   Ensure the measurements are only taken within the brake shoe lining contact area. The micrometer must be positioned the same distance from the outside edge of the drum for each measurement.

3. Compare the largest diameter measurement recorded to the following specifications:

   Specification:

   - Brake drum maximum allowable diameter after refinishing: 230.50 mm (9.075 in).

- Brake drum discard diameter: 231.0 mm (9.094 in).

4. If the largest diameter measurement of the brake drum is less than the maximum allowable inside diameter after refinishing specification; the drum may be refinished, depending upon surface and wear conditions.
5. If the largest diameter measurement of the brake drum is equal to or greater than the maximum allowable diameter after refinishing specification; the drum may not be refinished.
6. If the largest diameter measurement of the brake drum is equal to or greater than the discard diameter specification; the drum requires replacement.

BRAKE DRUM SURFACE AND WEAR INSPECTION

Tools Required

J 8001 Dial Indicator, or equivalent. See **Special Tools**.

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

1. With the brake drum removed, clean the brake shoe lining contact surface of the brake drum with denatured alcohol or an equivalent approved brake cleaner.
2. Inspect the braking surface of the brake drum for the following Braking Surface Conditions:
   - Heavy rust and/or pitting

     Light surface rust can be removed with an abrasive disc; heavy surface rust and/or pitting must be removed by refinishing the drum.

   - Cracks and/or heat spots
   - Excessive blueing discoloration
   - Missing balance weights
3. If the braking surface of the brake drum exhibits one or more of the Braking Surface Conditions listed, the drum requires refinishing or replacement.

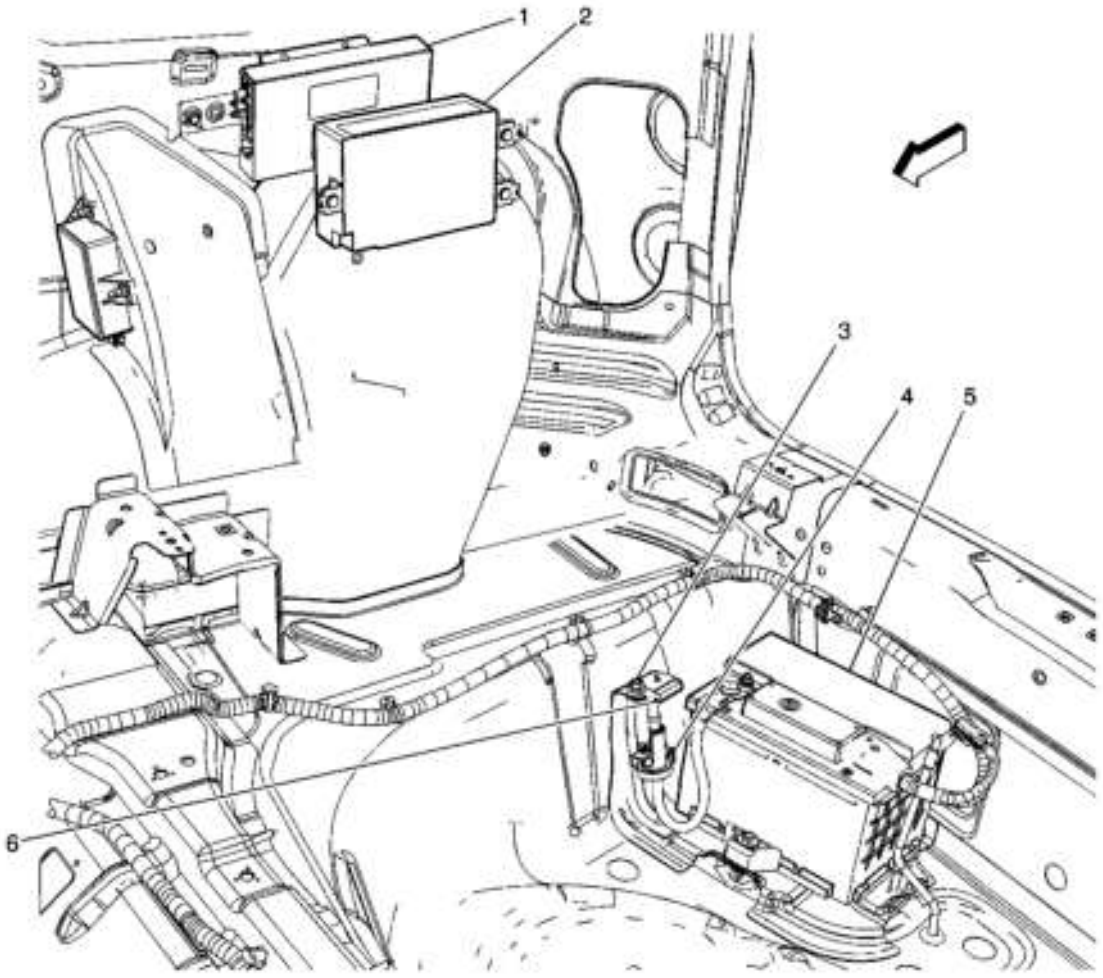


Fig. 2: Measuring Brake Drum
Courtesy of GENERAL MOTORS CORP.

4. Using a brake drum micrometer calibrated in thousanths-of-an-inch, measure and record any grooves present on the drum braking surface.

   Ensure that the measurements are only taken within the brake shoe lining contact area.

5. Compare the groove, or scoring depth recorded to the following specification:

   Specification: Brake drum maximum allowable scoring: 1.5 mm (0.059 in).

6. If the brake drum scoring depth exceeds the specification, or if an excessive amount of scoring is present, the drum requires refinishing or replacement.
7. Mount the brake drum on a brake lathe.
8. Mount a dial indicator, **J 8001** or equivalent, and position the indicator button so it contacts the braking surface of the brake drum at a 90 degree angle, approximately 19 mm (0. See **Special Tools**.75 in) from the outer edge of the drum.
9. Measure and record the radial runout of the brake drum.
   1. Rotate the drum until the lowest reading is displayed on the indicator dial, then zero the dial.
   2. Rotate the drum until the highest reading is displayed on the dial.

10. Compare the radial runout of the brake drum to the following specification:

    Specification: Brake drum maximum allowable radial runout: 0.104 mm (0.004 in).

11. If the brake drum radial runout exceeds the specification, the drum requires refinishing or replacement.

DRUM BRAKE HARDWARE INSPECTION

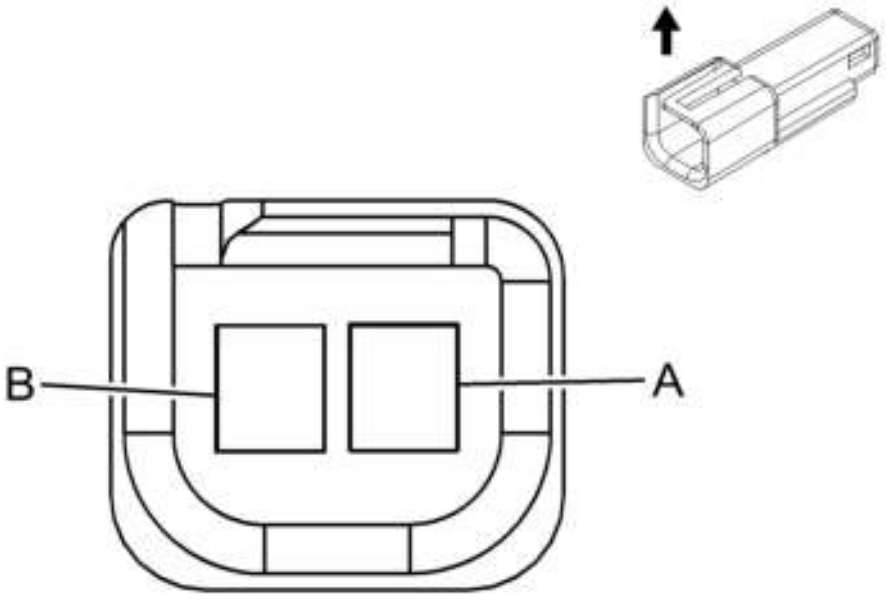


Fig. 3: Inspecting Drum Brake
Courtesy of GENERAL MOTORS CORP.

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

1. Visually inspect the drum brake system universal spring (5) for the following conditions:
    - The spring being bent, damaged, or broken at any point along the spring
    - Excessive corrosion
    - Excessive stretching, twisting, or binding
2. If any of the conditions listed were found, the drum brake system universal spring requires replacement.

DRUM BRAKE ADJUSTING HARDWARE INSPECTION

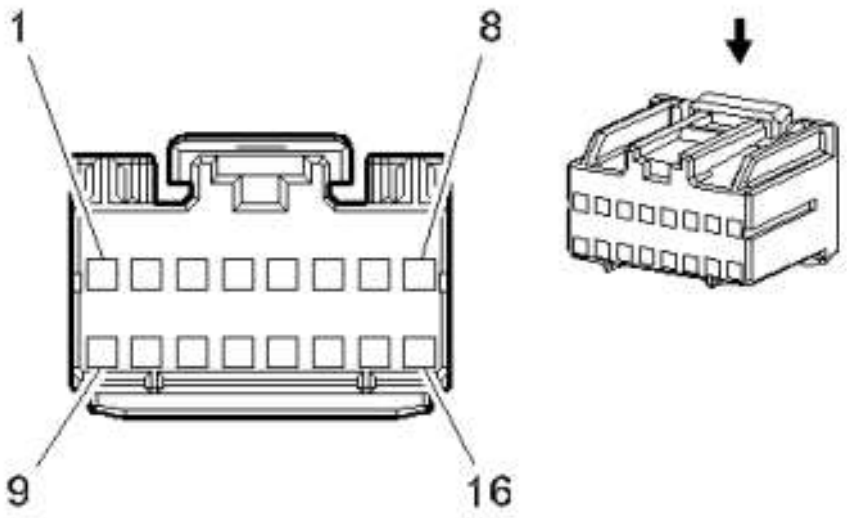


Fig. 4: Inspecting Drum Brake
Courtesy of GENERAL MOTORS CORP.

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

1. Visually inspect the adjuster actuator spring (1) for the following conditions:
   - Excessive stretching, twisting, or binding
   - The spring being bent, or broken at any point along the spring
   - Excessive corrosion
   - Missing
2. Visually inspect the adjuster assembly (2) for the following conditions:
   - The adjuster being bent, or broken
   - Excessively worn, damaged, or missing teeth
3. Visually inspect the adjuster actuator lever (3) for the following conditions:
   - The lever being bent, or broken
   - The lever to adjuster surface being excessively worn
   - Broken spring attachment tab
   - Missing
4. If any of the conditions listed were found, the affected part, or parts require replacement.

REPAIR INSTRUCTIONS

BRAKE DRUM REPLACEMENT

Tools Required

- **J 41013** Rotor Resurfacing Kit

- **J 42450-A** Wheel Hub Resurfacing Kit

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

Removal Procedure

1. Check to ensure that the park brake is fully released.
2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
3. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.

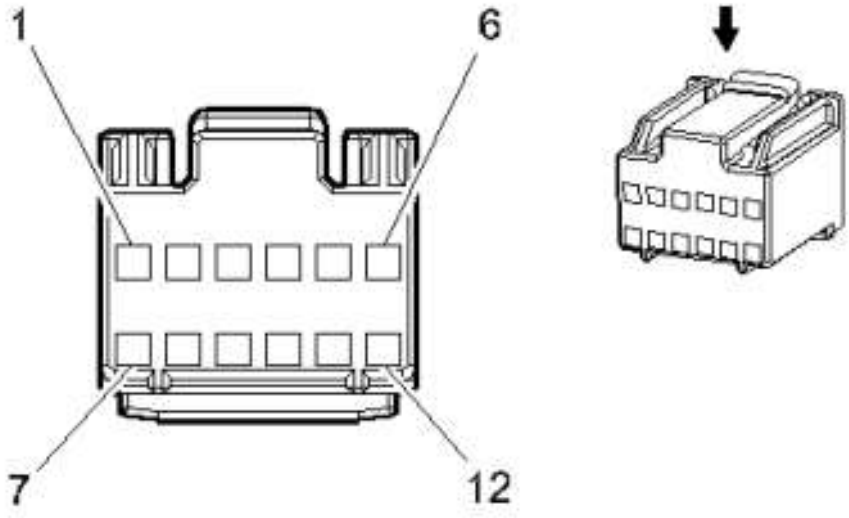


Fig. 5: View Of Brake Drum
Courtesy of GENERAL MOTORS CORP.

4. Remove the brake drum.
5. If the brake drum is to be reinstalled to the vehicle, use the **J 41013** to clean any rust or corrosion from the hub/flange mating surface of the brake drum.

   If necessary, carefully remove any corrosion from the edge of the drum braking surface in order to ease installation.

6. Use the **J 42450-A** to clean the wheel hub flange.

Installation Procedure

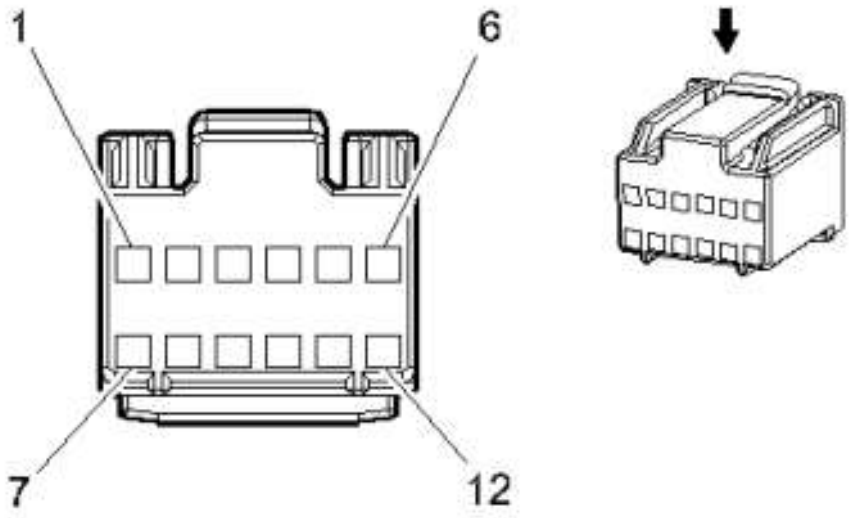


Fig. 6: View Of Brake Drum
Courtesy of GENERAL MOTORS CORP.

1. Adjust the drum brakes. Refer to **Drum Brake Adjustment**.
2. Install the brake drum.
3. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
4. Apply the brakes approximately three times in order to seat and center the brake shoes within the drum.
5. Lower the vehicle.

BRAKE DRUM REFINISHING

Tools Required

- **J 41013** Rotor/Drum Flange Resurfacing Kit
- **J 42450-A** Hub Cleaning Kit

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

1. The brake drums do not require refinishing as part of routine brake system service. Do not refinish brake drums in an attempt to correct the following conditions:
   - Brake system noise (squeal, growl, groan)
   - Uneven and/or premature brake lining wear
   - Superficial or cosmetic corrosion/rust of the brake drum surface
   - Scoring of the brake drum surface (less than the maximum allowable specification)
2. Brake drums should only be refinished if the following conditions exist:
   - Excessive corrosion/rust and/or pitting

- Cracks and/or heat spots
- Excessive blueing discoloration
- Scoring of the brake drum surface (in excess of the maximum allowable specification)
- Radial runout in excess of the maximum allowable specification

3. Inspect each of the brake drums and determine if the brake drums can be refinished and remain within the maximum allowable diameter after refinish specification:
    1. With the tire and wheel assemblies removed, measure the diameter of each of the brake drums. Refer to **Brake Drum Diameter Measurement** .
    2. Inspect each of the brake drums for excessive surface wear and/or radial runout. Refer to **Brake Drum Surface and Wear Inspection** .
4. If the brake drums can be refinished, proceed with the rotor refinishing procedure.
5. If necessary, use the **J 41013** in order to thoroughly clean any corrosion/rust from the brake drum flange.
6. Mount the brake drum to the brake lathe according to the lathe manufacturer's instructions.
7. Ensure that any vibration dampening attachments are securely in place.
8. With the brake lathe running, slowly bring in the cutting tool until it just contacts the brake drum friction surface.
9. Observe the witness mark on the brake drum. If the witness mark extends approximately three-quarters or more of the way around the brake drum surface, the brake drum is properly mounted to the lathe.
10. If the witness mark does not extend three-quarters or more of the way around the brake drum, re-mount the brake drum to the lathe.
11. Following the brake lathe manufacturer's instructions, refinish the brake drum.
12. After each successive cut, inspect the brake drum diameter. Refer to **Brake Drum Diameter Measurement**.
13. If at any time the brake drum exceeds the maximum allowable diameter after refinish specification, the brake drum must be replaced.
14. After refinishing the brake drum, use the following procedure in order to obtain the desired non-directional finish:
    1. Follow the brake lathe manufacturer's recommended speed setting for applying a non-directional finish
    2. Using moderate pressure, apply the non-directional finish:
        - If the lathe is equipped with a non-directional finishing tool, apply the finish with 120 grit aluminum oxide sandpaper.
        - If the lathe is not equipped with a non-directional finishing tool, apply the finish with a sanding block and 150 grit aluminum oxide sandpaper.
    3. After applying a non-directional finish, clean each friction surface of the brake drum with denatured alcohol or an equivalent brake cleaner
15. Remove the brake drum from the brake lathe.

IMPORTANT: Failure to clean the corrosion from the wheel bearing flange may result in increased lateral runout of the brake drum and brake system pulsation.

16. If necessary, use the **J 42450-A** in order to thoroughly clean any corrosion from the wheel bearing

flange.

BRAKE SHOE REPLACEMENT

Tools Required

J 38400 Brake Shoe Spanner and Spring Remover. See **Special Tools**.

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

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the brake drum. Refer to **Brake Drum Replacement**.

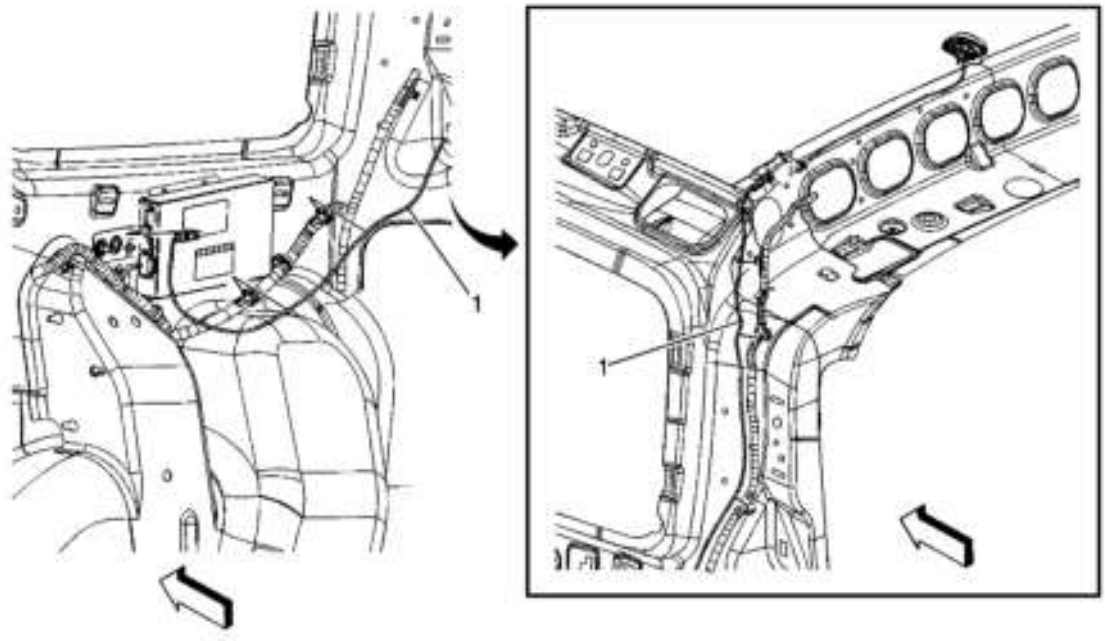


Fig. 7: Locating Adjuster Spring
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not over stretch the adjuster spring. Damage can occur if the spring is over stretched.

4. Remove the adjuster spring (1). Disengage the adjuster spring hook end from the tab on the adjuster actuator lever, then release the spring from the brake shoe web hole.

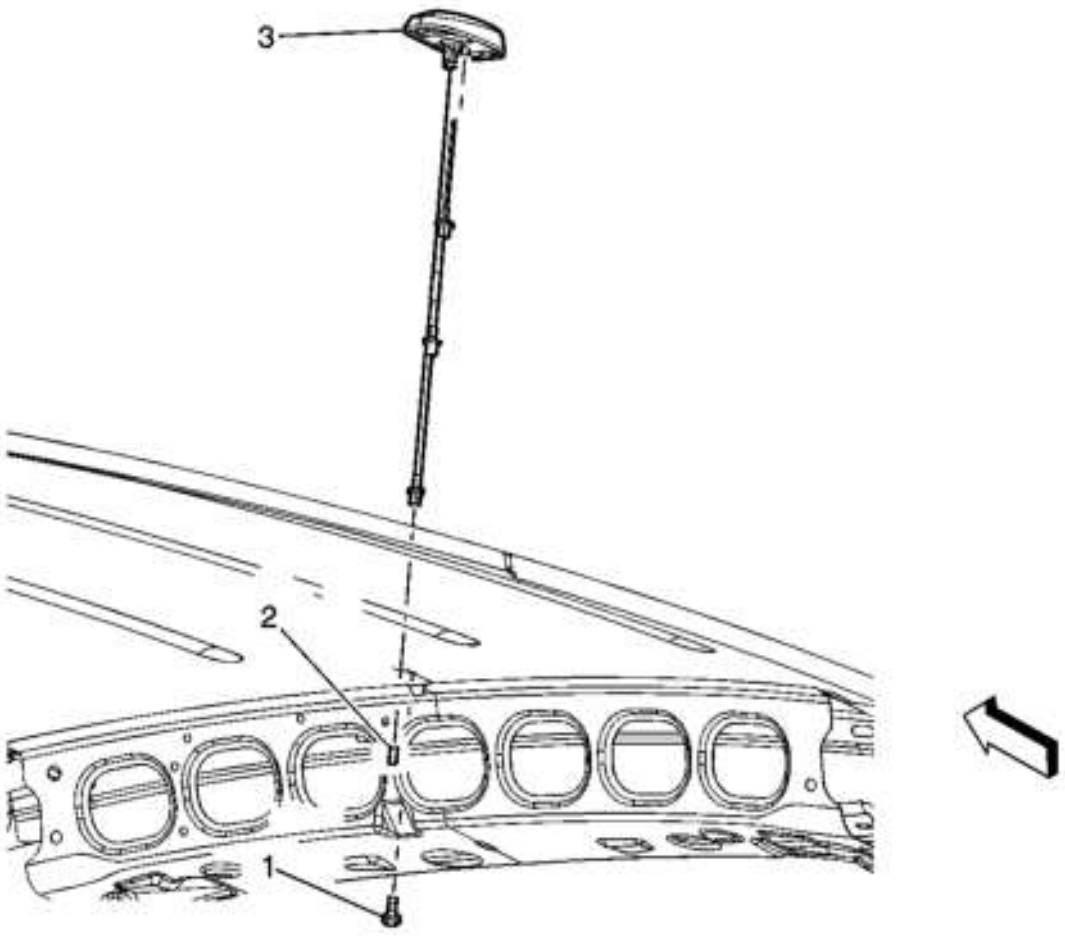


Fig. 8: Locating Adjuster Actuator Lever
Courtesy of GENERAL MOTORS CORP.

5. Remove the adjuster actuator lever (1) from the pivot.

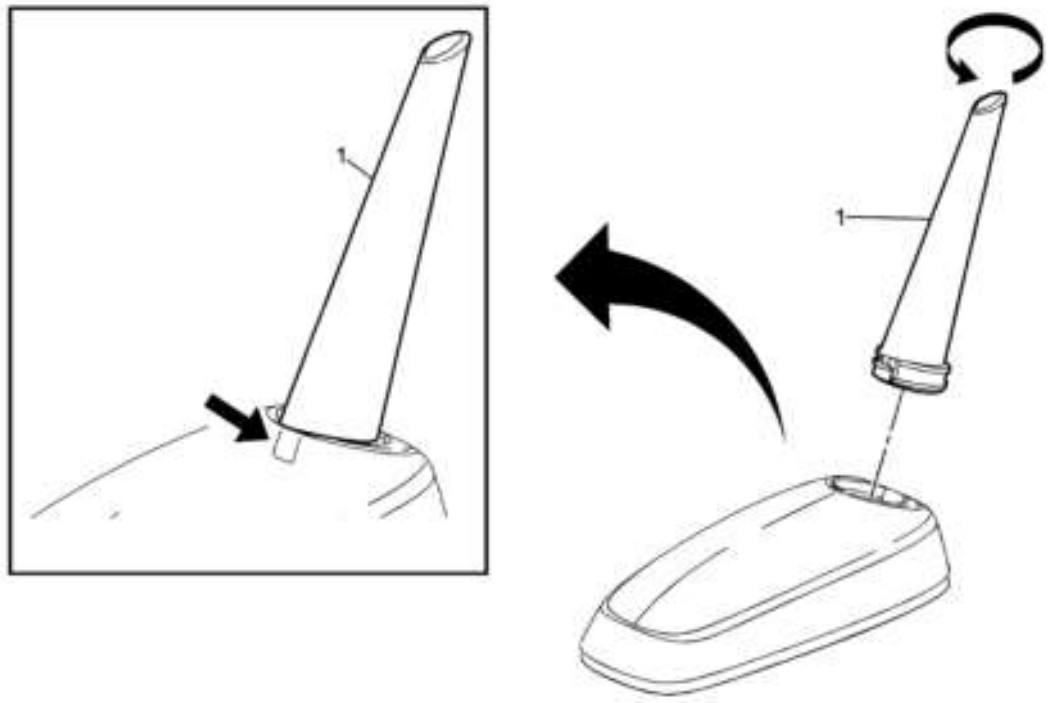


Fig. 9: Removing/Installing Brake Shoe Adjuster Assembly Using Special Tool
Courtesy of GENERAL MOTORS CORP.

6. Using the **J 38400** (1), spread the top of the brake shoes apart. See **Special Tools**.
7. Remove the adjuster assembly (2) from the brake shoes.

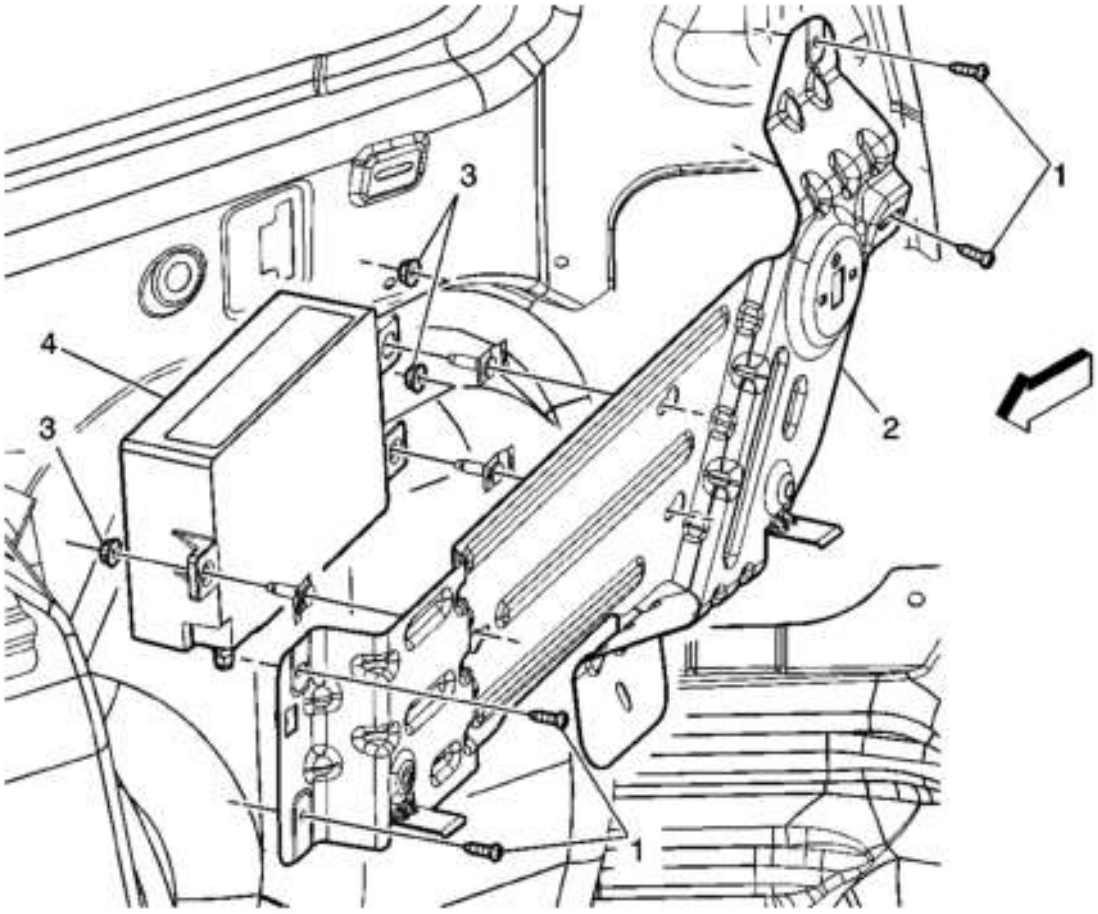


Fig. 10: Pulling Universal Spring End Out Of Shoe Web Hole
Courtesy of GENERAL MOTORS CORP.

8. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out of the shoe web hole. See **Special Tools**. Hold the universal spring while removing the trailing brake shoe.
9. Release the park brake cable from the park brake lever on the trailing shoe.

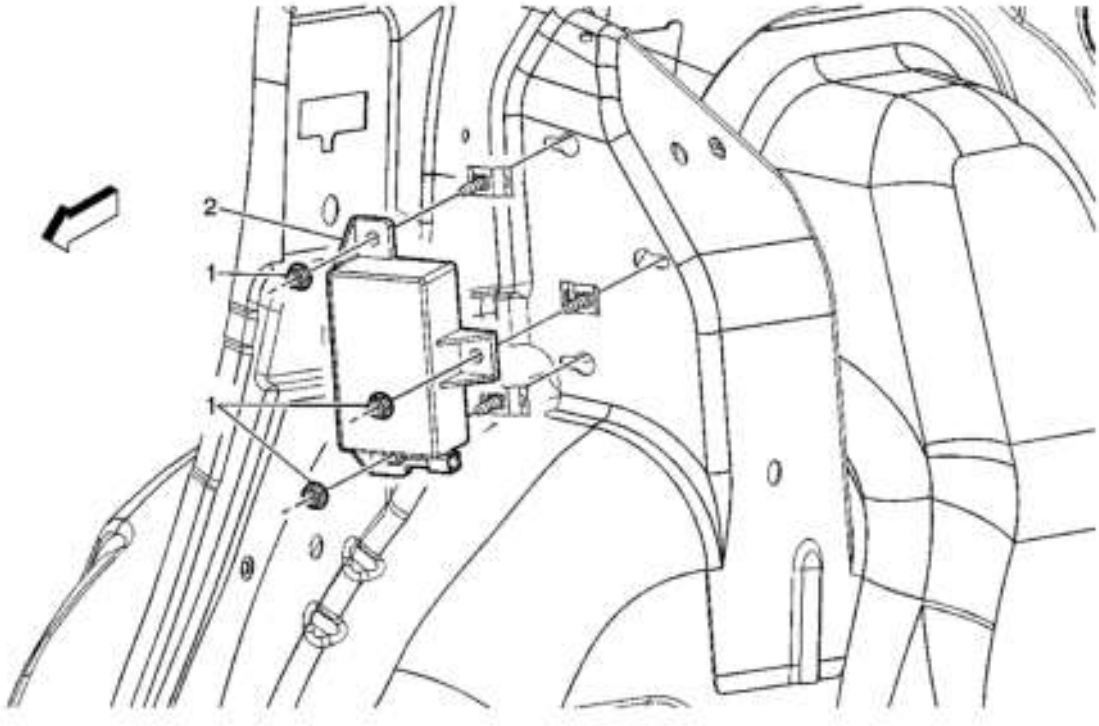


Fig. 11: Using Hook End Of J 38400
Courtesy of GENERAL MOTORS CORP.

10. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out of the shoe web hole. See **Special Tools**. Hold the universal spring while removing the leading brake shoe.

Installation Procedure

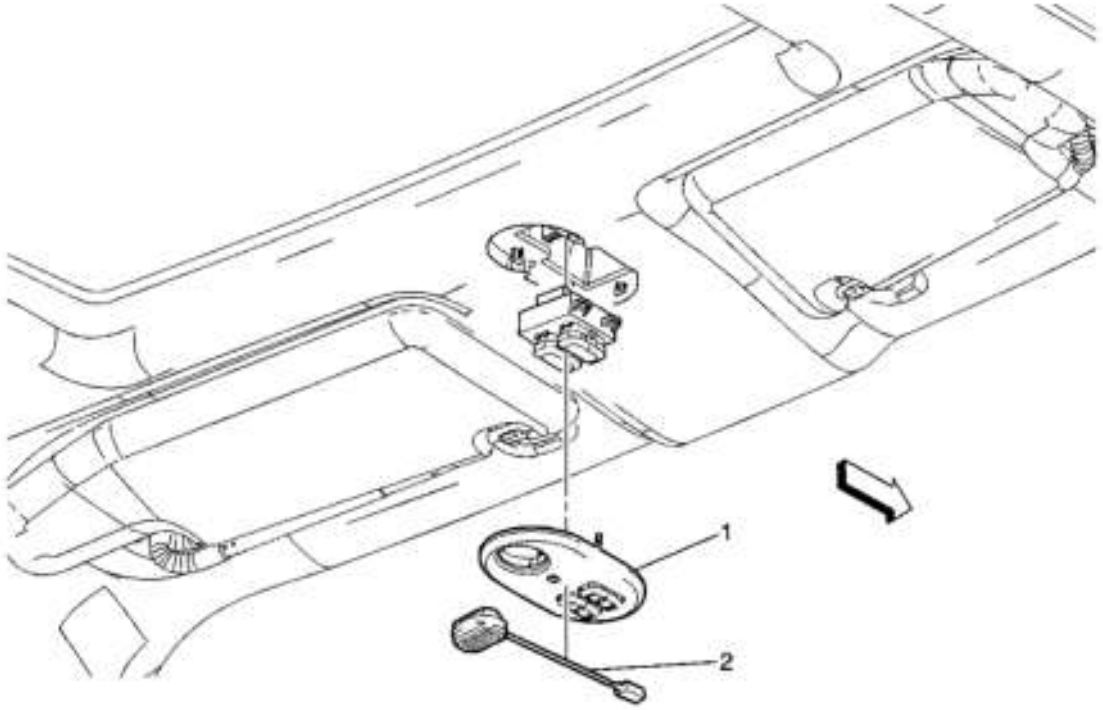


Fig. 12: Measuring Brake Shoe Lining Thickness
Courtesy of GENERAL MOTORS CORP.

1. Measure the brake shoe lining thickness.

   Specification: Brake Shoe Lining Minimum Thickness: 0.5 mm (0.020 in).

2. If the brake shoe lining thickness is at or below the minimum specification, replace the brake shoes.

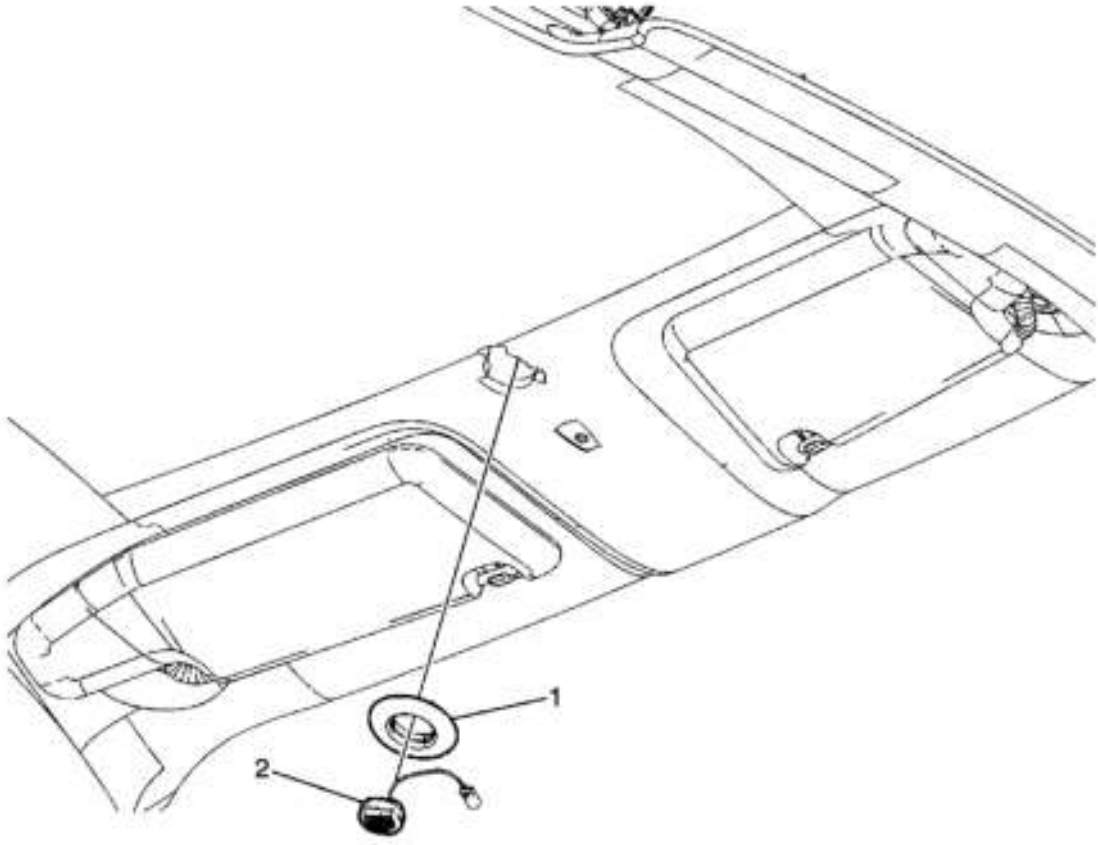


Fig. 13: Using Hook End Of J 38400
Courtesy of GENERAL MOTORS CORP.

3. Apply a thin, light coat of high temperature silicone brake lubricant to the brake shoe contact surfaces of the brake backing plate.
4. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out while installing the leading brake shoe. See **Special Tools**. Ensure that the universal spring engages the brake shoe web hole.

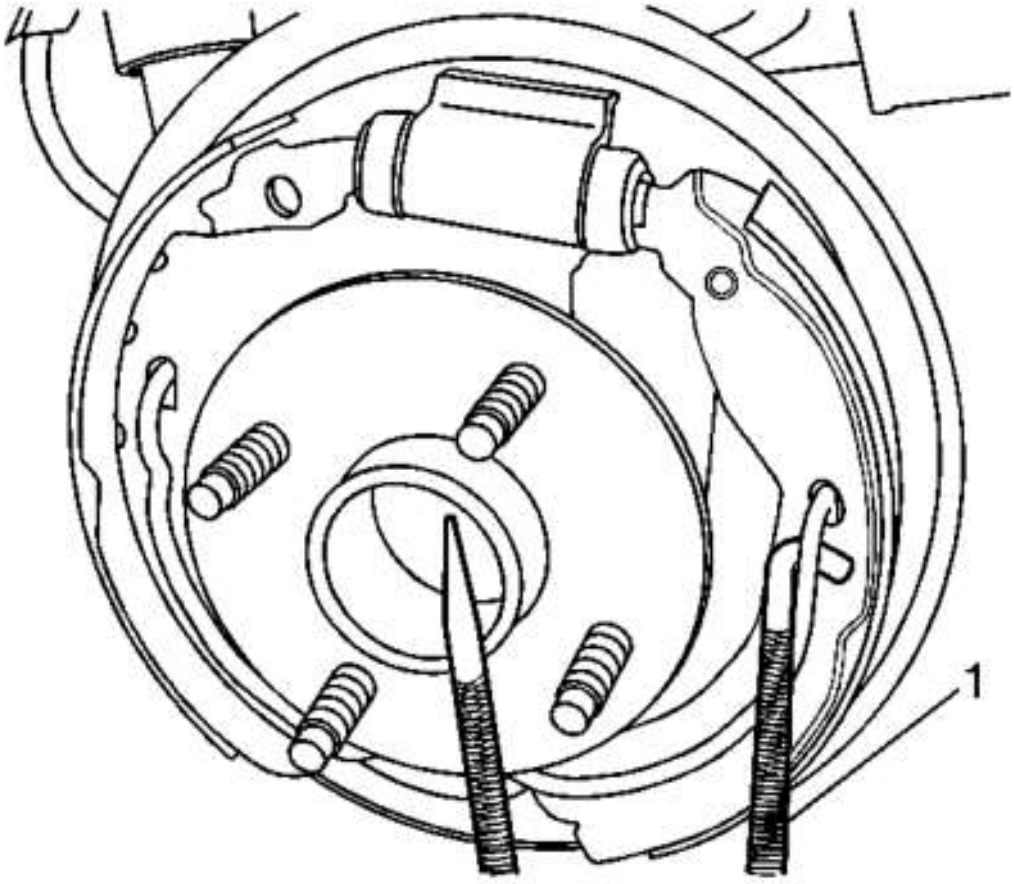


Fig. 14: Pulling Universal Spring End Out Of Shoe Web Hole
Courtesy of GENERAL MOTORS CORP.

5. Install the park brake cable to the park brake lever on the trailing brake shoe.
6. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out while installing the trailing brake shoe. See **Special Tools**. Ensure that the universal spring properly engages the brake shoe web hole.

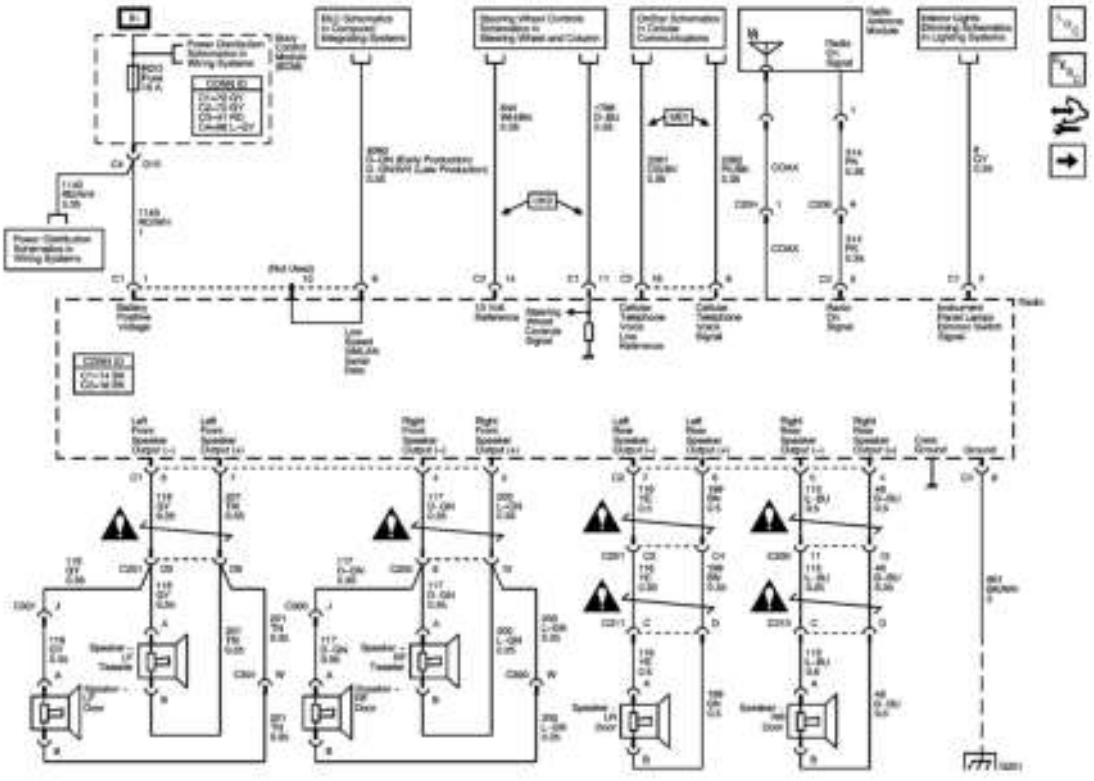


Fig. 15: Removing/Installing Brake Shoe Adjuster Assembly Using Special Tool
Courtesy of GENERAL MOTORS CORP.

7. Using the **J 38400** (1), spread the top of the brake shoes apart. See **Special Tools**.
8. Install the adjuster assembly (2) to the brake shoes.

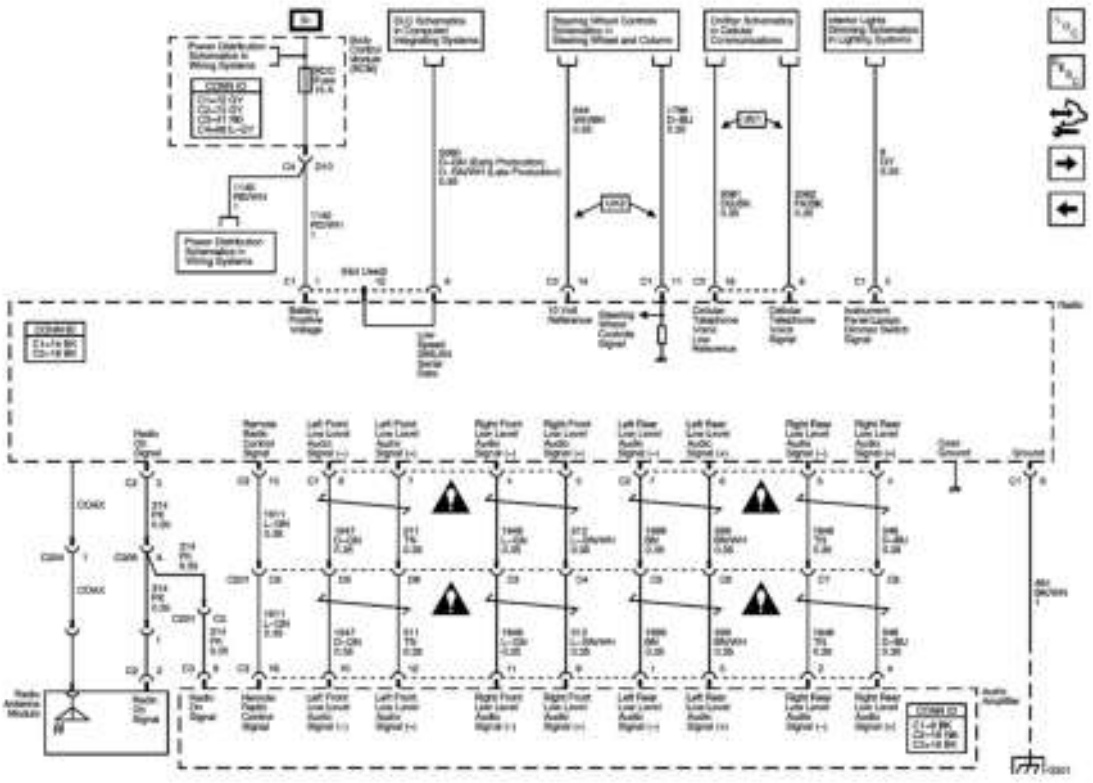


Fig. 16: Locating Adjuster Actuator Lever
Courtesy of GENERAL MOTORS CORP.

9. Install the adjuster actuator lever (1) to the brake shoe and the adjuster assembly. Ensure that the lever is properly engaged between the adjuster assembly and the brake shoe.

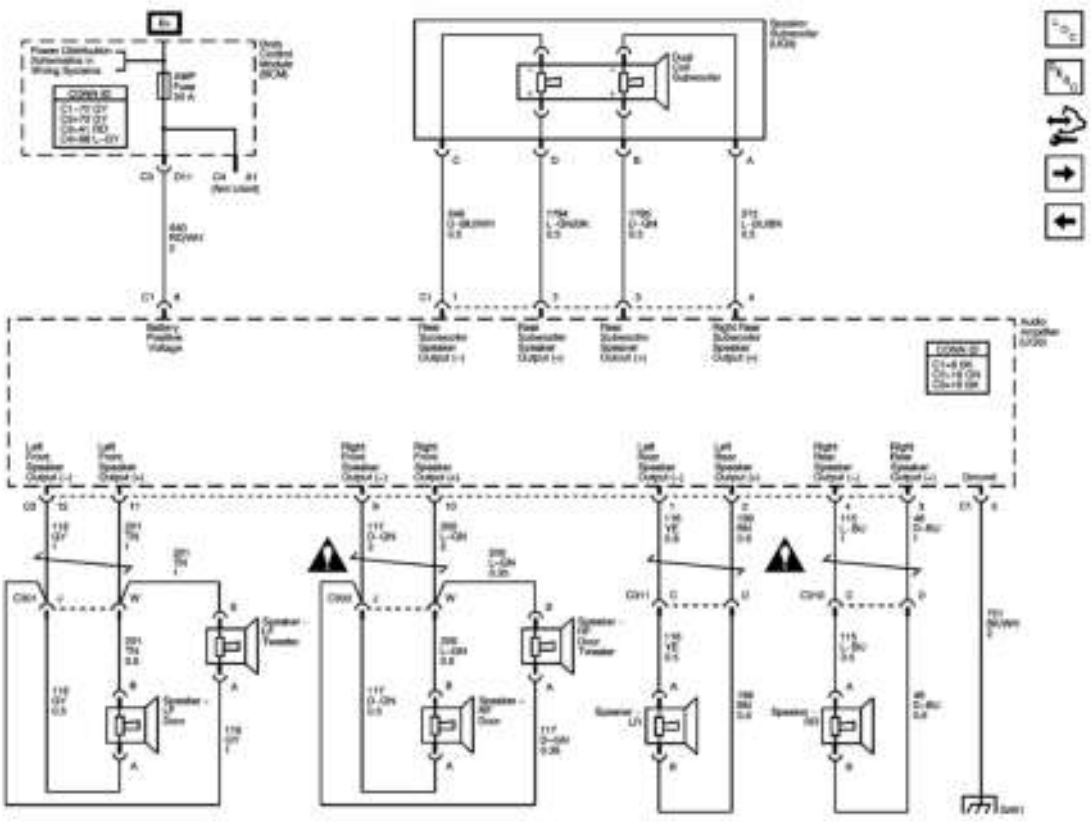


Fig. 17: Locating Adjuster Spring
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not over stretch the adjuster spring. Damage can occur if the spring is over stretched.

10. Install the adjuster spring (1). Ensure that the loop end of the spring fully engages the tab on the actuator lever.
11. Adjust the drum brakes. Refer to **Drum Brake Adjustment**.
12. Install the brake drum. Refer to **Brake Drum Replacement**.
13. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
14. Lower the vehicle.

DRUM BRAKE BACKING PLATE REPLACEMENT

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

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.

3. Remove the brake drum. Refer to **Brake Drum Replacement**.

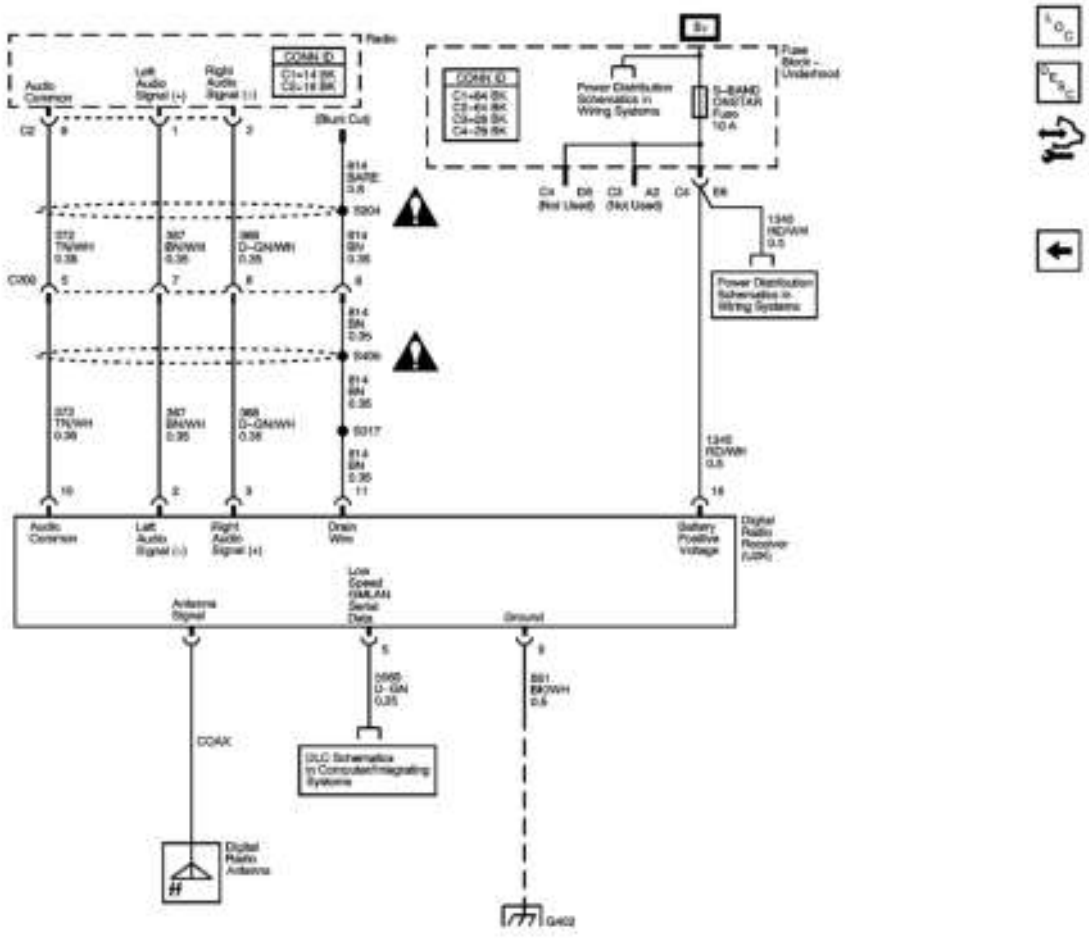


Fig. 18: View Of Brake Drum Universal Spring
Courtesy of GENERAL MOTORS CORP.

4. Remove the brake shoes. Refer to **Brake Shoe Replacement**
5. Remove the universal spring (1) from the brake backing plate.
6. Remove the wheel cylinder. Refer to **Wheel Cylinder Replacement**.

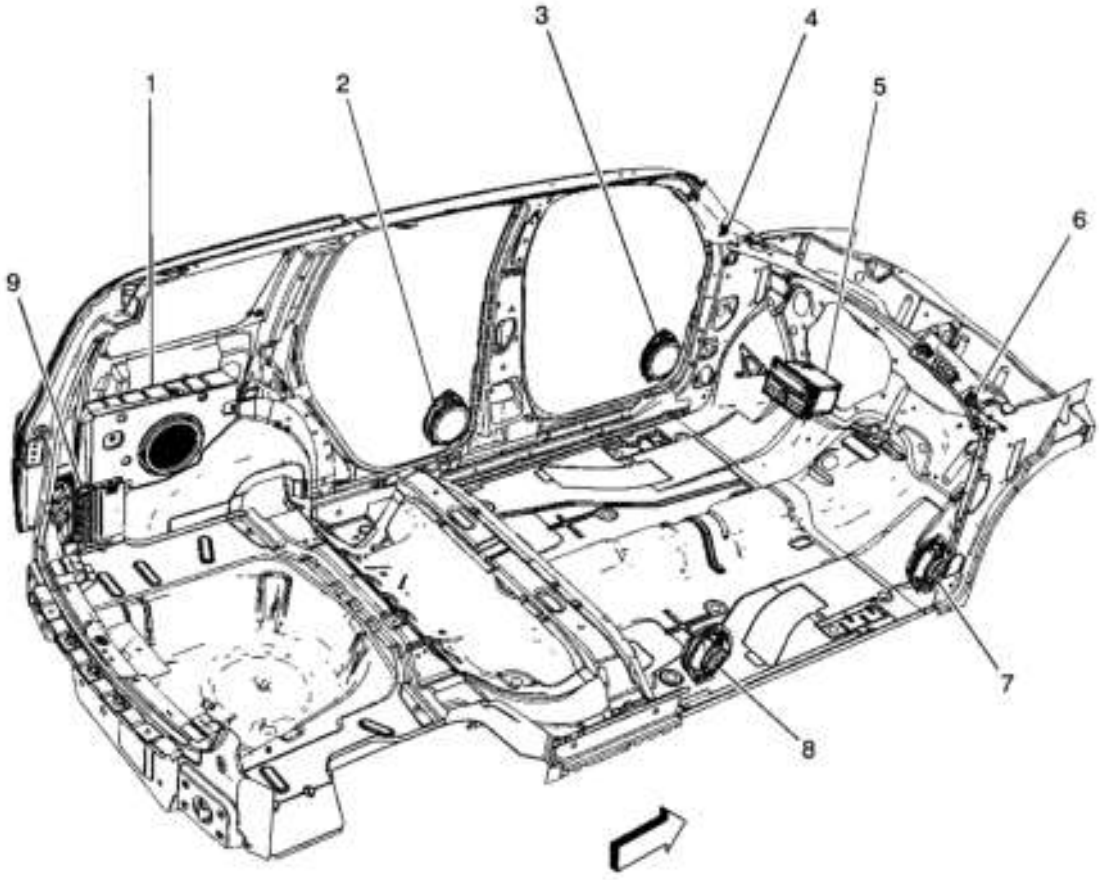


Fig. 19: View Of Rear Park Brake Cable End Fitting
Courtesy of GENERAL MOTORS CORP.

7. Release the rear park brake cable end fitting (1) from the drum brake backing plate.

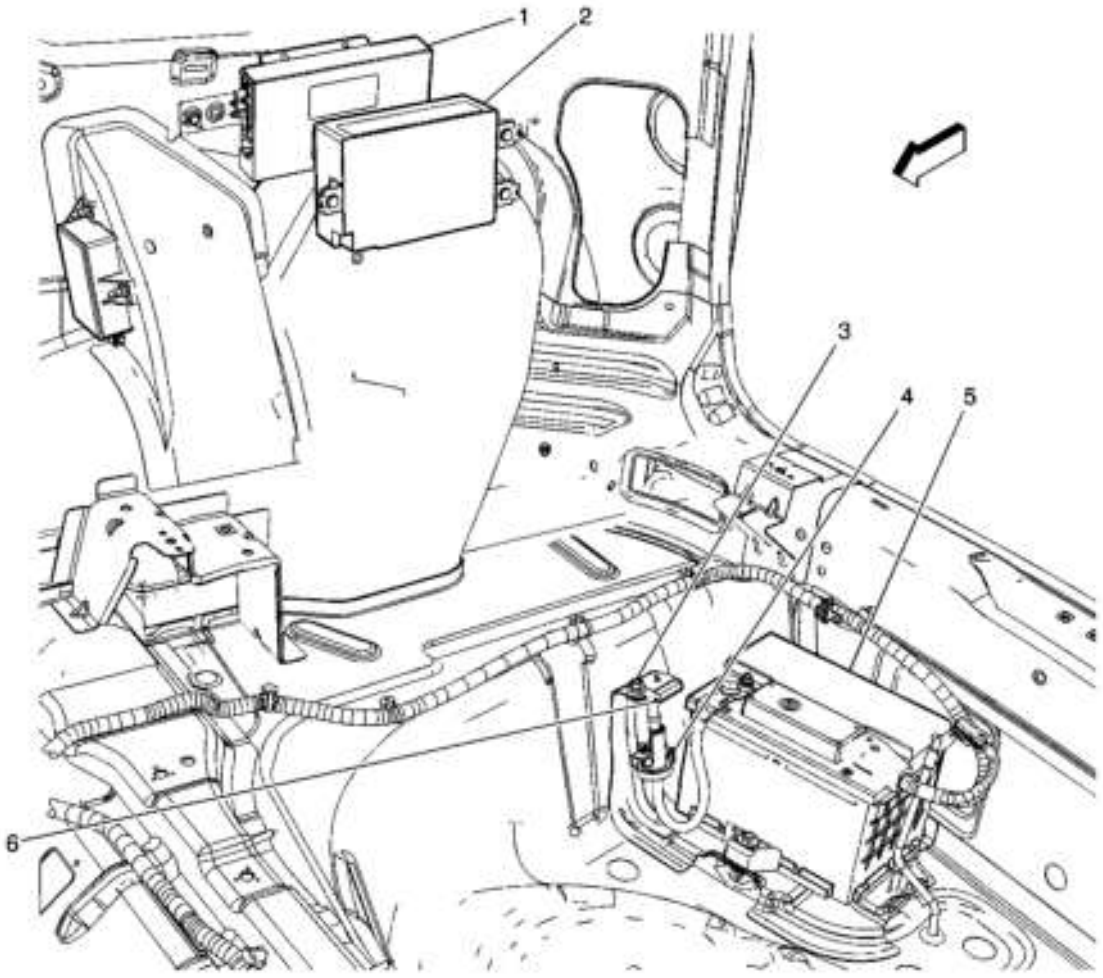


Fig. 20: View Of Wheel Bearing/Hub Assembly
Courtesy of GENERAL MOTORS CORP.

8. Remove the wheel bearing/hub assembly. Refer to **Wheel Bearing/Hub Replacement - Rear** in Rear Suspension.
9. Remove the brake backing plate.

Installation Procedure

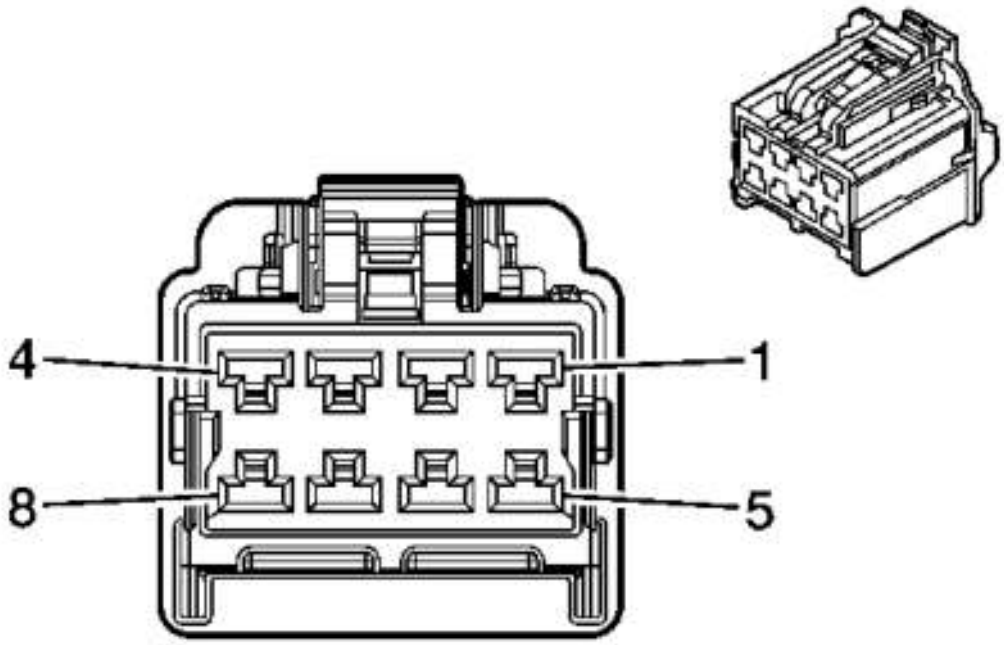


Fig. 21: View Of Wheel Bearing/Hub Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the brake backing plate.
2. Install the wheel bearing/hub assembly. Refer to **Wheel Bearing/Hub Replacement - Rear** in Rear Suspension.

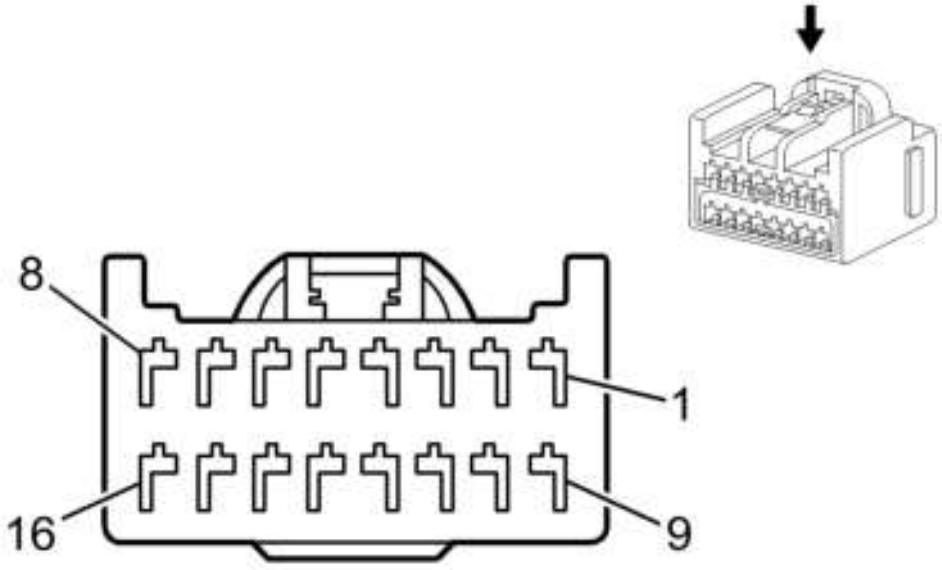


Fig. 22: View Of Rear Park Brake Cable End Fitting
Courtesy of GENERAL MOTORS CORP.

3. Secure the rear park brake cable end fitting (1) to the brake backing plate.

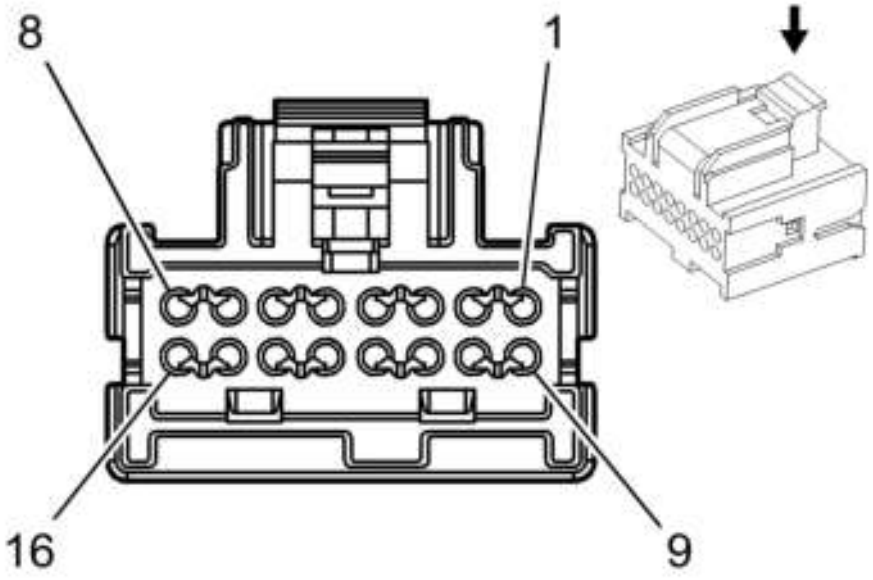


Fig. 23: View Of Brake Drum Universal Spring
Courtesy of GENERAL MOTORS CORP.

4. Install the wheel cylinder. Refer to **Wheel Cylinder Replacement**.
5. Install the universal spring (1) to the backing plate.

6. Install the brake shoes. Refer to **Brake Shoe Replacement**.
7. Adjust the drum brakes. Refer to **Drum Brake Adjustment**.
8. Install the brake drum. Refer to **Brake Drum Replacement**.
9. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Pressure)** or **Hydraulic Brake System Bleeding (Manual)** in Hydraulic Brakes.
10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
11. Lower the vehicle.

DRUM BRAKE HARDWARE REPLACEMENT

Tools Required

J 38400 Brake Shoe Spanner and Spring Remover. See **Special Tools**.

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

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the brake drum. Refer to **Brake Drum Replacement**.

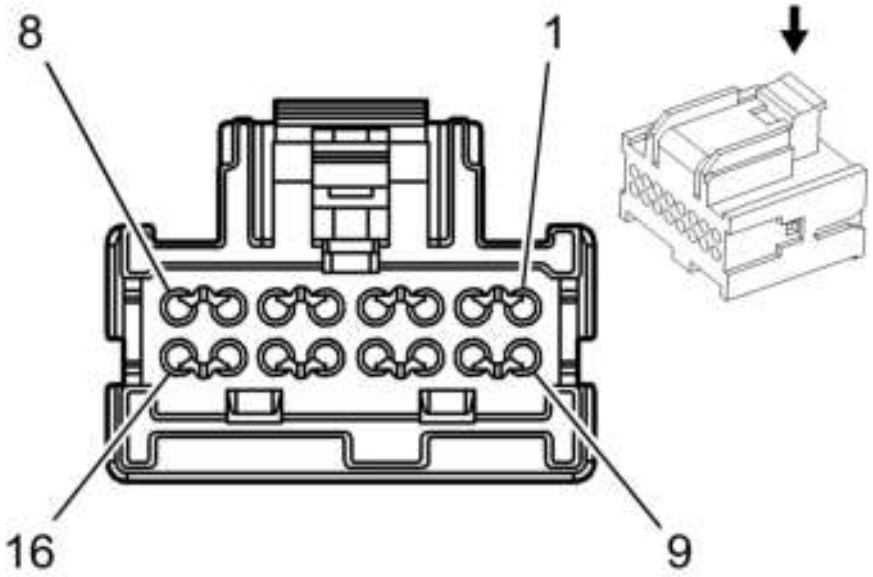


Fig. 24: Pulling Universal Spring End Out Of Shoe Web Hole
Courtesy of GENERAL MOTORS CORP.

4. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out of the shoe web hole. See **Special Tools**.

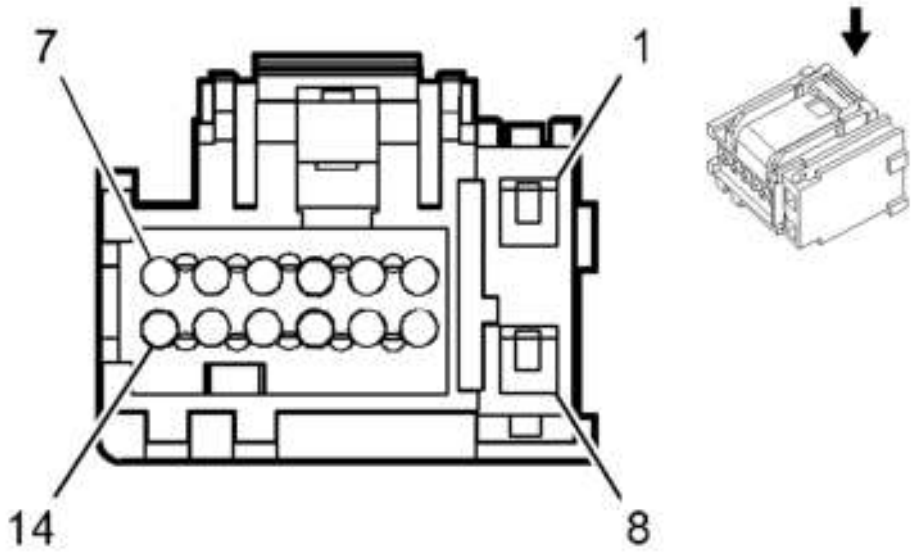


Fig. 25: Using J 38400 To Pull Universal Spring
Courtesy of GENERAL MOTORS CORP.

5. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out of the shoe web hole. See **Special Tools**.

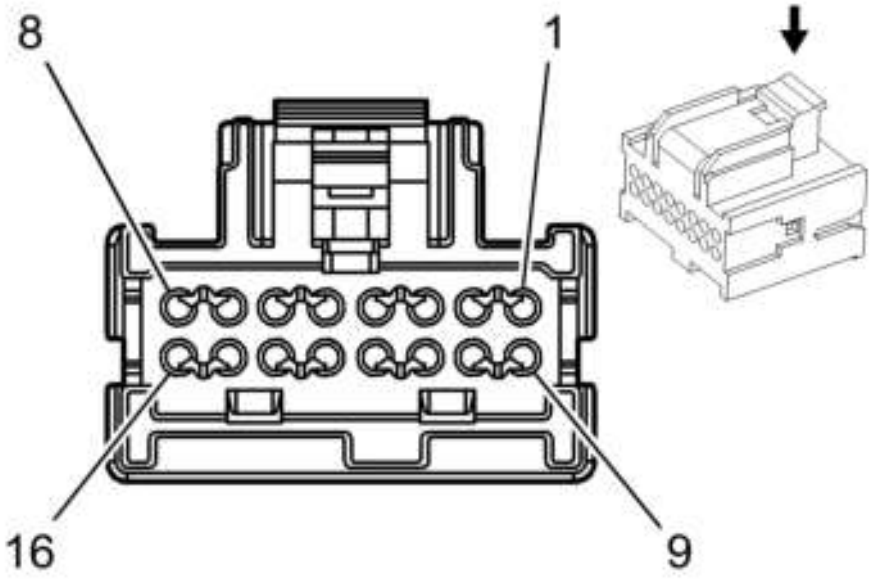


Fig. 26: View Of Brake Drum Universal Spring

Courtesy of GENERAL MOTORS CORP.

6. Remove the universal spring (1) from the brake backing plate.

Installation Procedure

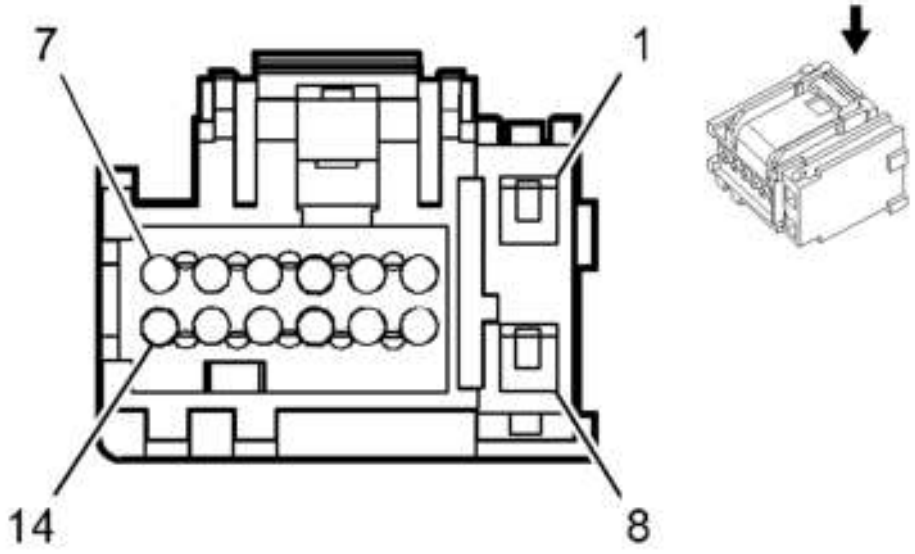


Fig. 27: View Of Brake Drum Universal Spring
Courtesy of GENERAL MOTORS CORP.

1. Install the universal spring (1) to the brake backing plate.

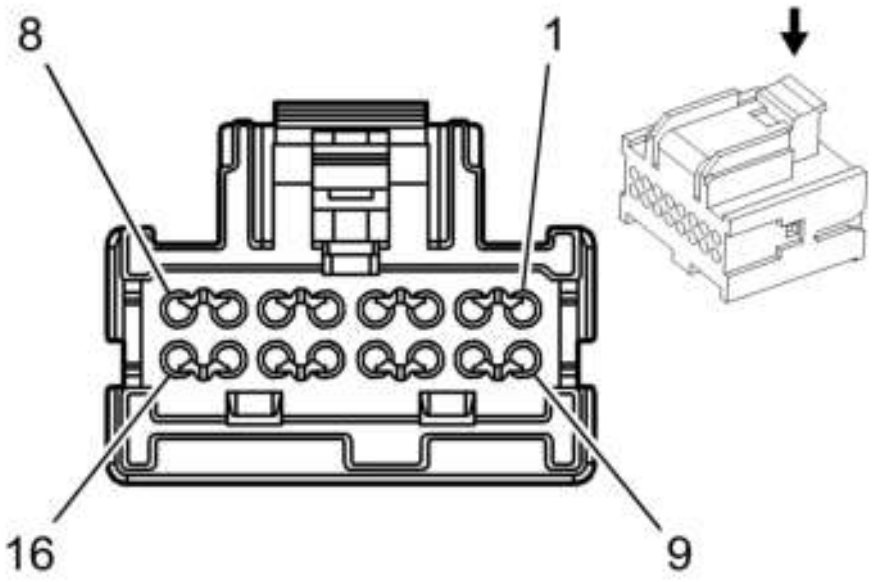


Fig. 28: Using J 38400 To Pull Universal Spring
Courtesy of GENERAL MOTORS CORP.

2. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out, away from the hub, while installing the spring end into the shoe web hole. See **Special Tools**.

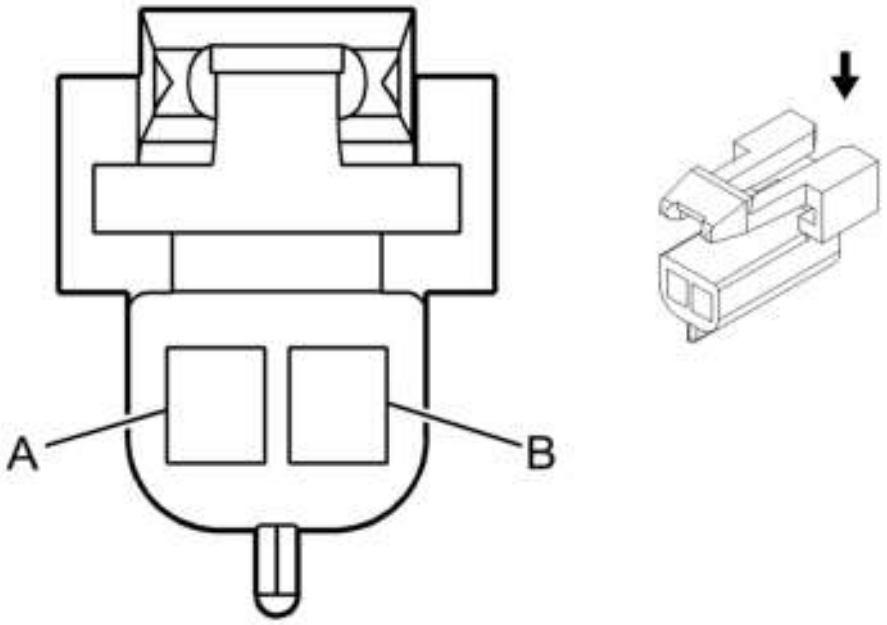


Fig. 29: Pulling Universal Spring End Out Of Shoe Web Hole
Courtesy of GENERAL MOTORS CORP.

3. Position the hook end of the **J 38400** (1) under the universal spring and lightly pull the universal spring end out, away from the hub, while installing the spring end into the shoe web hole. See **Special Tools**.
4. Install the brake drum. Refer to **Brake Drum Replacement**.
5. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
6. Lower the vehicle.

DRUM BRAKE ADJUSTING HARDWARE REPLACEMENT

Tools Required

J 38400 Brake Shoe Spanner and Spring Remover. See **Special Tools**.

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

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the brake drum. Refer to **Brake Drum Replacement**.

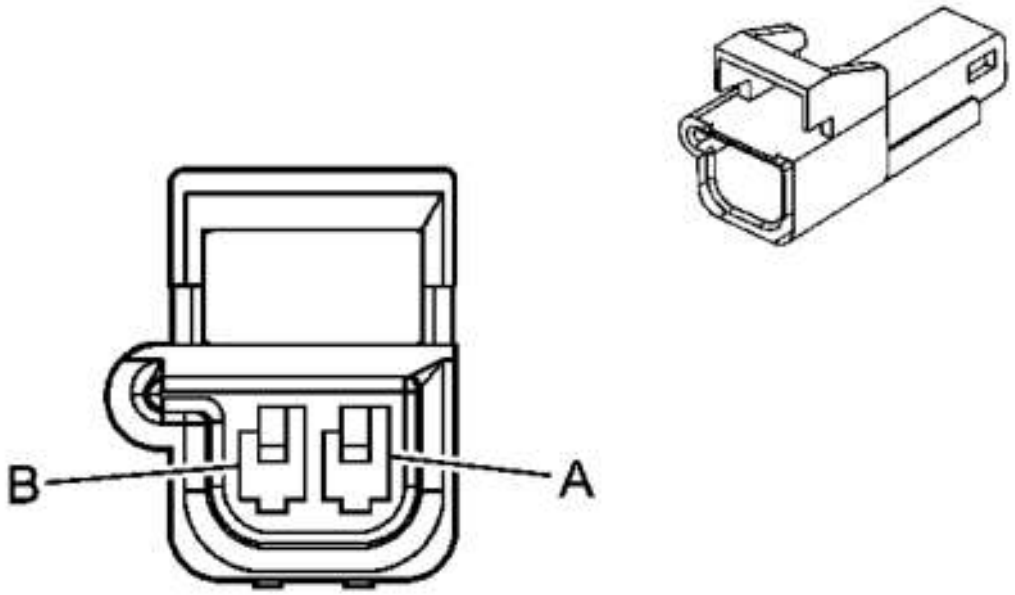


Fig. 30: View Of Drum Brake Adjusting Hardware

Courtesy of GENERAL MOTORS CORP.

NOTE: **Do not over stretch the adjuster spring. Damage can occur if the spring is over stretched.**

4. Remove the adjuster spring (1). Disengage the adjuster spring hook end from the tab on the adjuster actuator lever (2), then release the spring from the brake shoe web hole.
5. Remove the adjuster actuator lever (2) from the pivot.

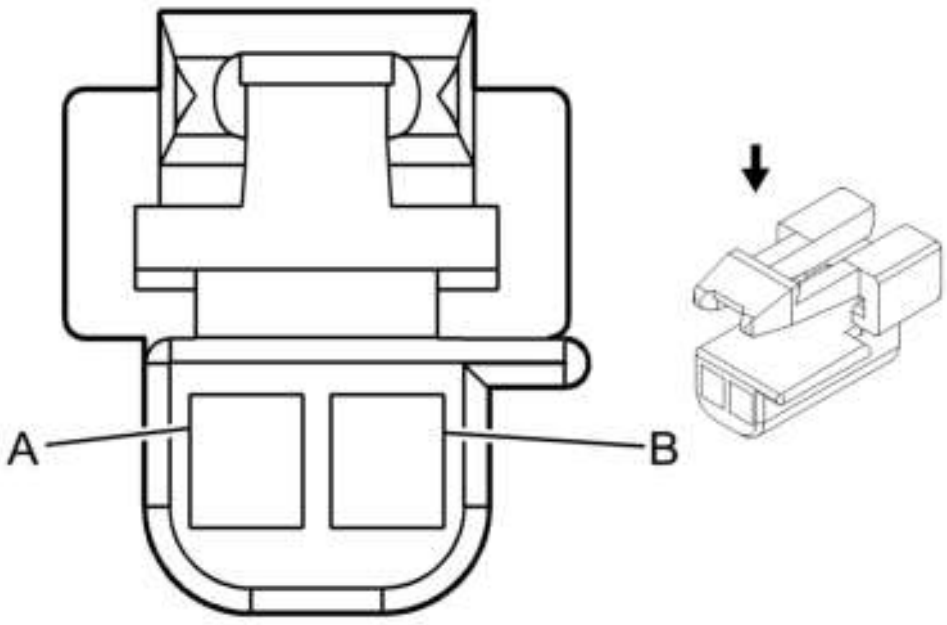


Fig. 31: Removing/Installing Brake Shoe Adjuster Assembly Using Special Tool
Courtesy of GENERAL MOTORS CORP.

6. Using the **J 38400** (1), spread the top of the brake shoes apart. See **Special Tools**.
7. Remove the adjuster assembly (2) and inspect for the following conditions:
   - Binding or seized threaded adjuster assembly.
   - Damaged or missing adjuster screw teeth.
8. Replace the adjuster assembly if any of the conditions listed are present.

Installation Procedure

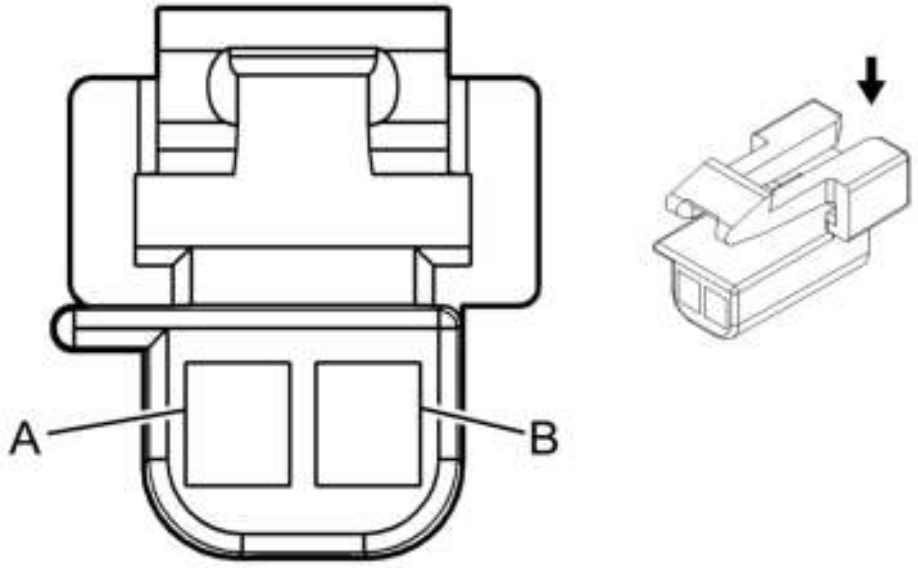


Fig. 32: Removing/Installing Brake Shoe Adjuster Assembly Using Special Tool
Courtesy of GENERAL MOTORS CORP.

1. Using the **J 38400** (1), spread the top of the brake shoes apart. See **Special Tools**.
2. Install the adjuster assembly (2) to the brake shoes.

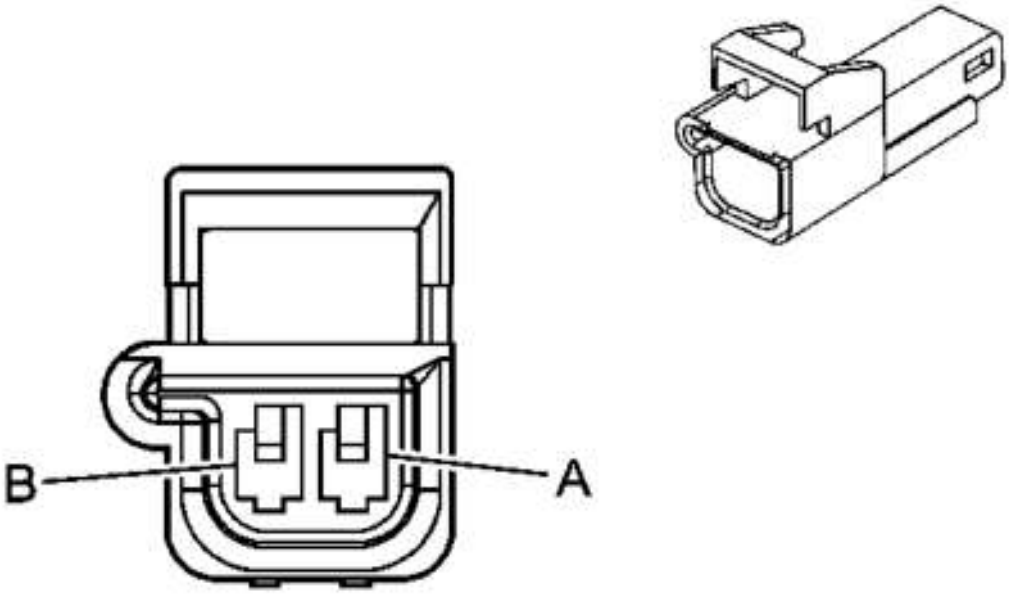


Fig. 33: View Of Drum Brake Adjusting Hardware

Courtesy of GENERAL MOTORS CORP.

3. Install the adjuster actuator lever (2) to the brake shoe and the adjuster assembly (3). Ensure that the lever is properly engaged between the adjuster assembly and the brake shoe.

NOTE: Do not over stretch the adjuster spring. Damage can occur if the spring is over stretched.

4. Install the adjuster spring (1). Ensure that the loop end of the spring fully engages the tab on the actuator lever (2).
5. Adjust the drum brakes. Refer to **Drum Brake Adjustment**.
6. Install the brake drum. Refer to **Brake Drum Replacement**.
7. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
8. Lower the vehicle.

WHEEL CYLINDER REPLACEMENT

Tools Required

J 38400 Brake Shoe Spanner and Spring Remover. See **Special Tools**.

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

CAUTION: Refer to Brake Fluid Irritant Caution in Cautions and Notices.

NOTE: Refer to Brake Fluid Effects on Paint and Electrical Components Notice in Cautions and Notices.

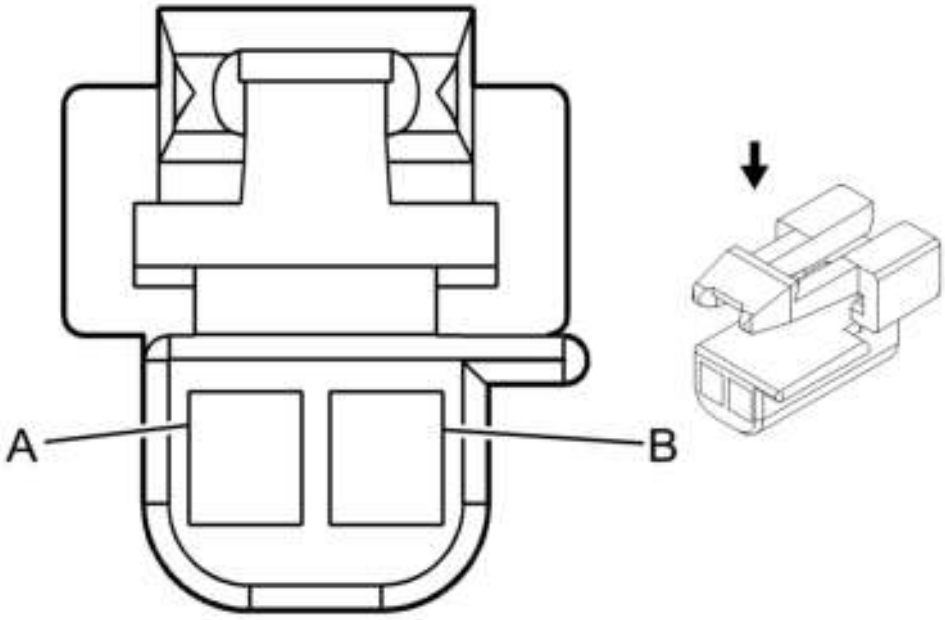


Fig. 34: Flare Designs
Courtesy of GENERAL MOTORS CORP.

NOTE: **There is a first design and second design of brake pipe flare for the hydraulic brake pipes and system components used on this vehicle. Do NOT mis-match flare types. If the flare types are mis-matched, damage to the pipes and/or components, and/or a brake fluid leak may occur.**

- **First design, ISO flare (1)**
- **Second design, double inverted flare (2)**

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the brake drum. Refer to **Brake Drum Replacement**.
4. Clean any debris and contaminants from around the wheel cylinder.

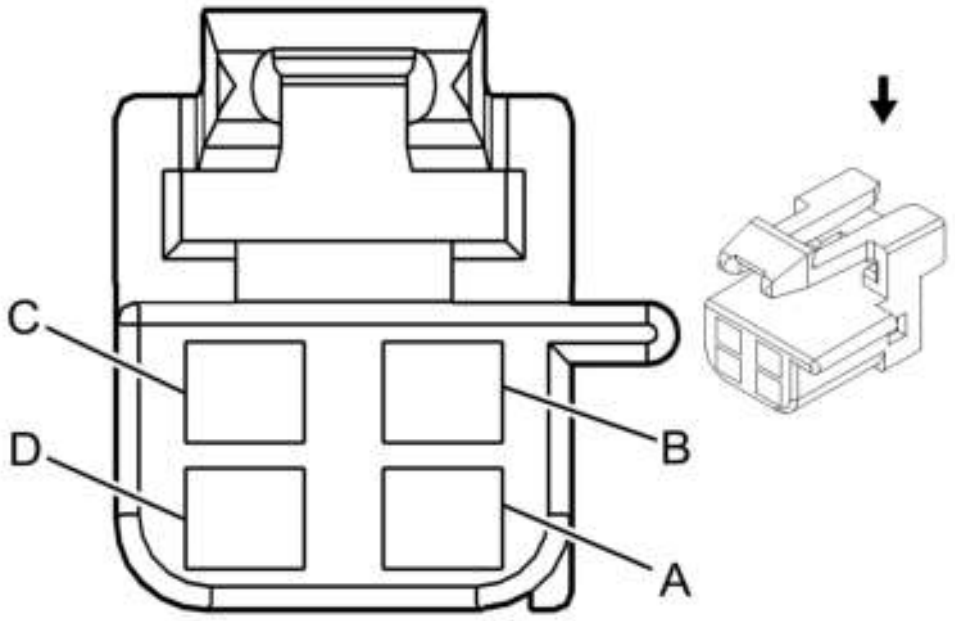


Fig. 35: View Of Brake Pipe Fitting, Wheel Cylinder Bleeder Valve & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

5. Remove the wheel cylinder bleeder cap and valve (2).
6. Disconnect the brake pipe fitting (1) from the wheel cylinder. Cap the exposed brake pipe end to prevent fluid loss and contamination.
7. Remove the wheel cylinder mounting bolts (3).

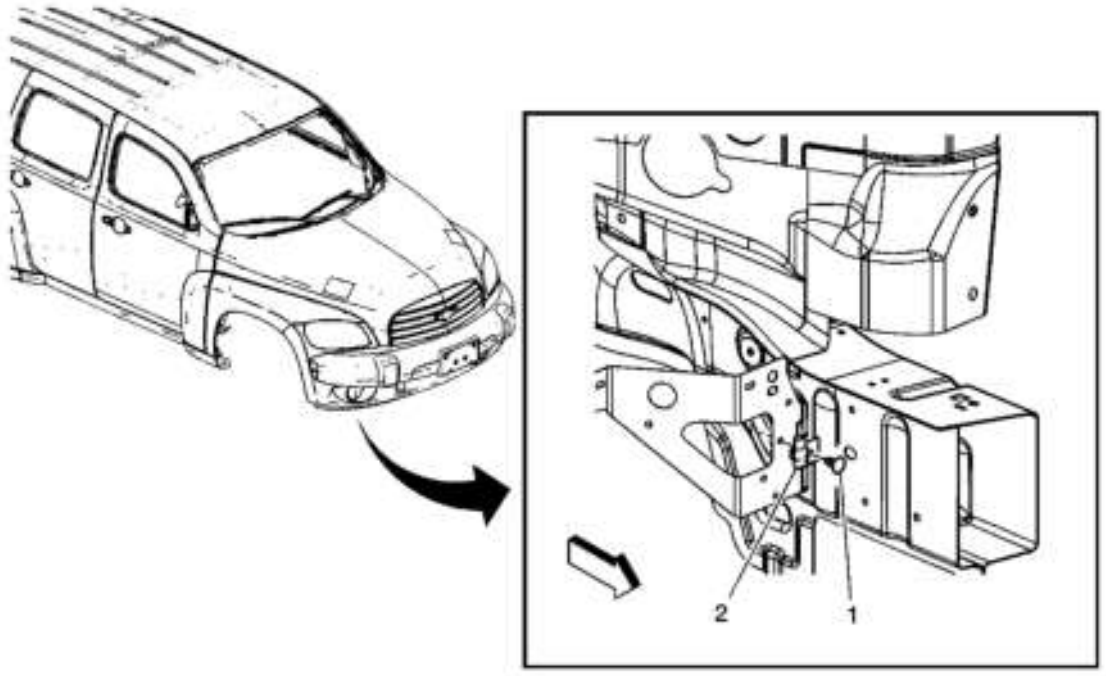


Fig. 36: View Of Wheel Cylinder

Courtesy of GENERAL MOTORS CORP.

8. Using the **J 38400** , spread the top of the brakes shoes apart, then remove the wheel cylinder from the brake backing plate. See **Special Tools**.

Installation Procedure

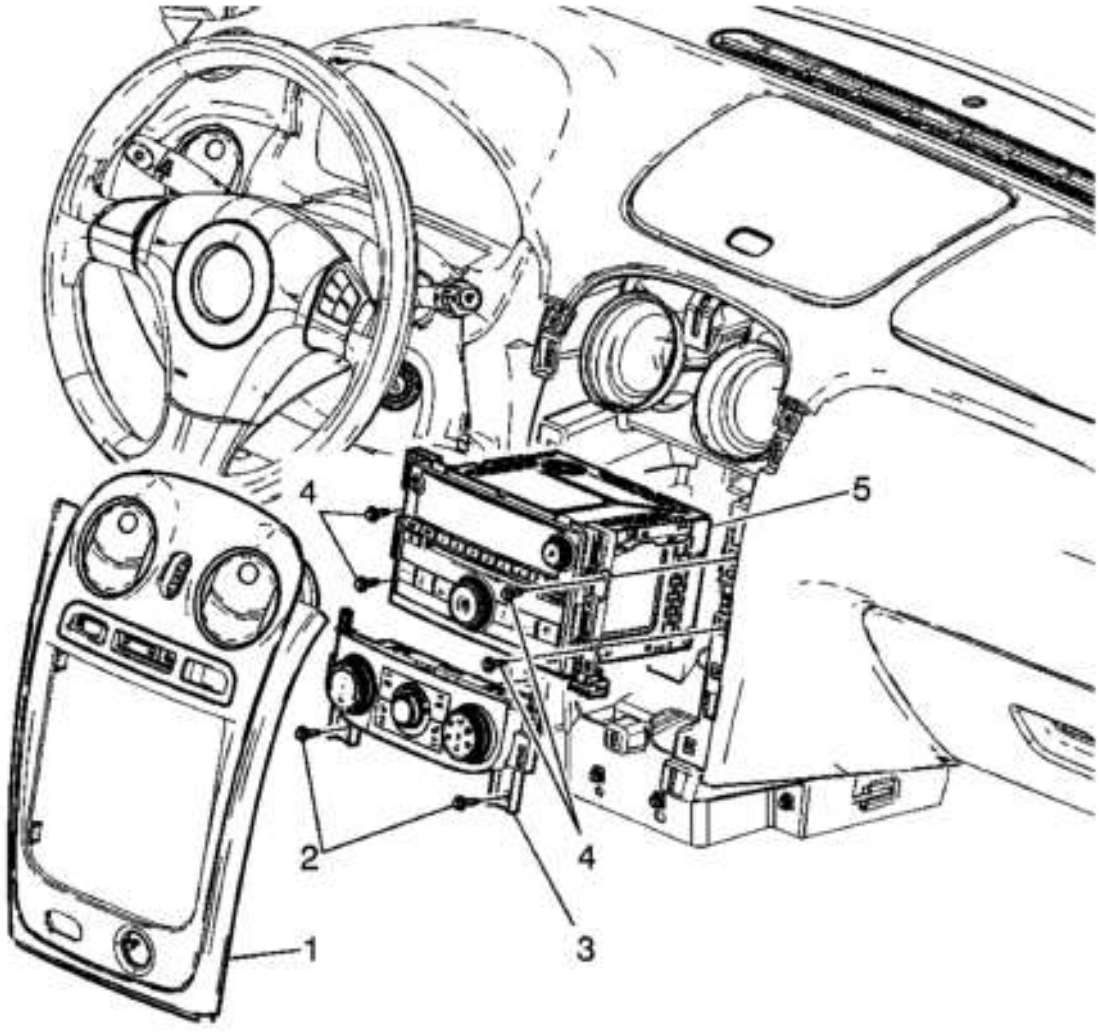


Fig. 37: View Of Wheel Cylinder
Courtesy of GENERAL MOTORS CORP.

1. Using the **J 38400** , spread the top of the brakes shoes apart, then install the wheel cylinder to the brake backing plate. See **Special Tools**.

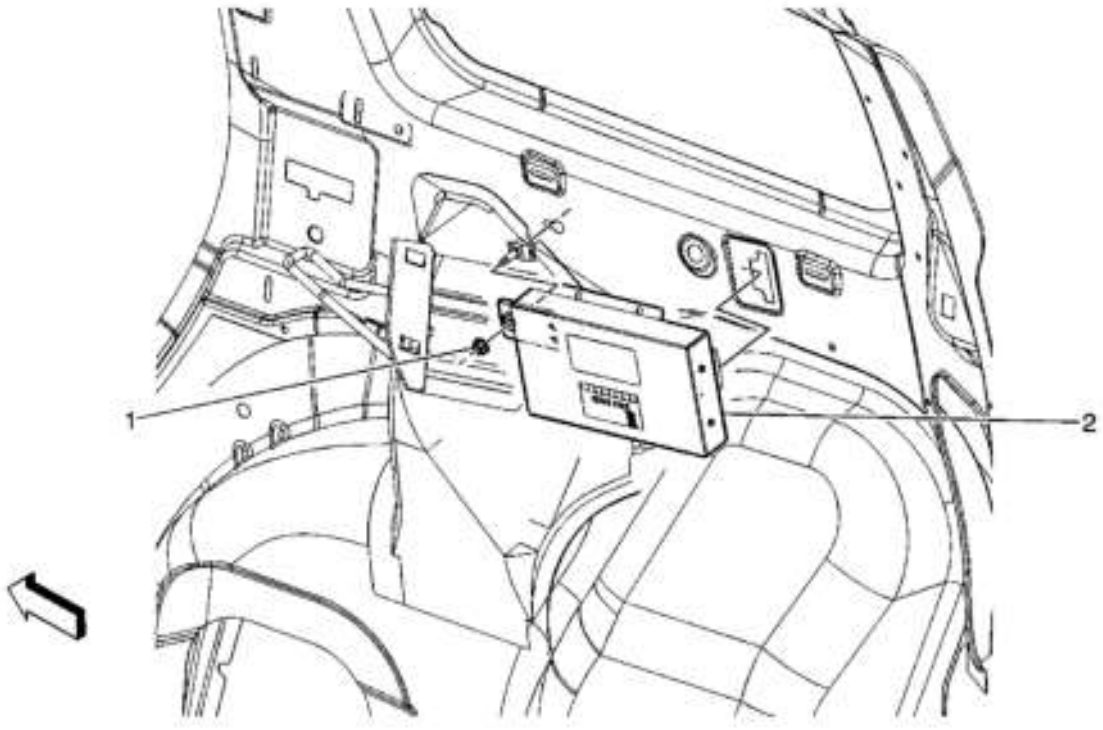


Fig. 38: View Of Brake Pipe Fitting, Wheel Cylinder Bleeder Valve & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the wheel cylinder mounting bolts (3).

   Tighten: Tighten the bolts to 16 N.m (12 lb ft).

3. Remove the cap from the brake pipe end.
4. Connect the brake pipe fitting (1) at the wheel cylinder.

   Tighten: Tighten the fitting, first or second design to 19 N.m (14 lb ft).

5. Install the wheel cylinder bleeder valve.

   Tighten: Tighten the valve to 8 N.m (71 lb in).

6. Install the brake drum. Refer to **Brake Drum Replacement**.
7. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Pressure)** or **Hydraulic Brake System Bleeding (Manual)** in Hydraulic Brakes.
8. Install the bleeder valve cap.
9. Adjust the drum brakes. Refer to **Drum Brake Adjustment**.
10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
11. Lower the vehicle.

DRUM BRAKE ADJUSTMENT

Tools Required

J 21177-A Drum to Brake Shoe Clearance Gage. See **Special Tools**.

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

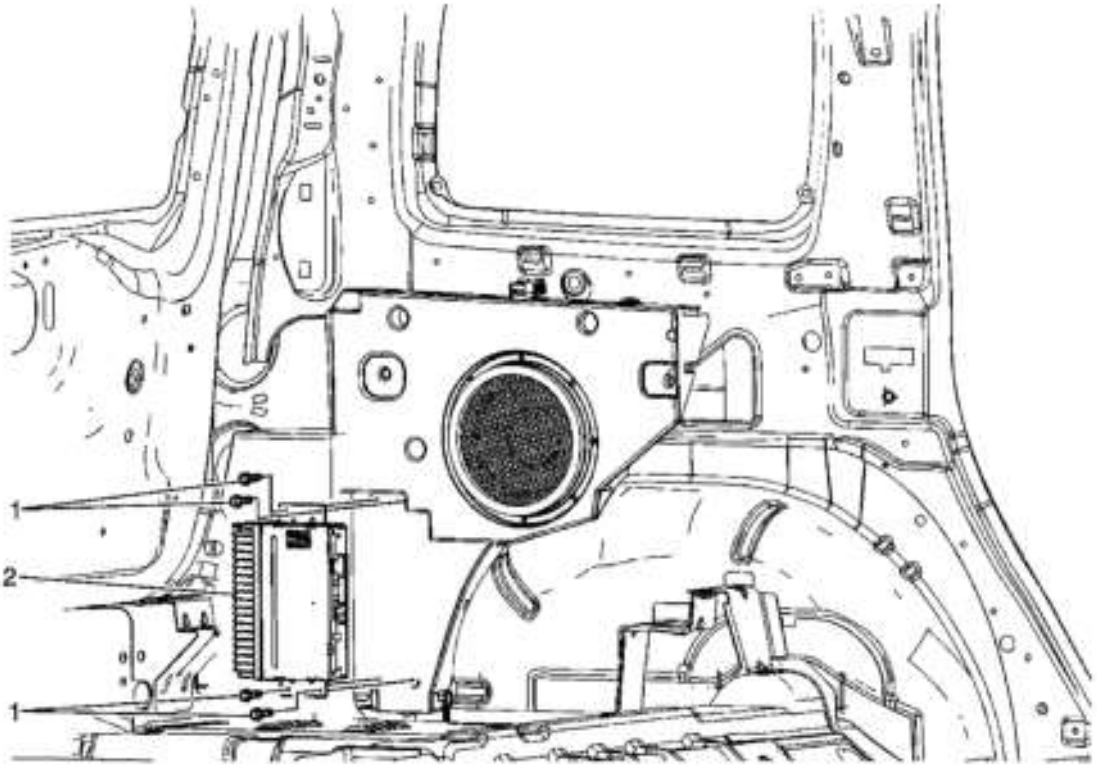


Fig. 39: Locating Front Park Brake Adjusting Nut
Courtesy of GENERAL MOTORS CORP.

1. Ensure that the park brake lever is in the fully released position.
2. Release the park brake lever boot from the floor console by applying light pressure inward on the sides of the boot retainer.
3. Pull the boot away from the console to expose the front park brake cable adjusting nut (1).
4. Release the tension from the park brake cable system at the front cable adjusting nut (1).

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

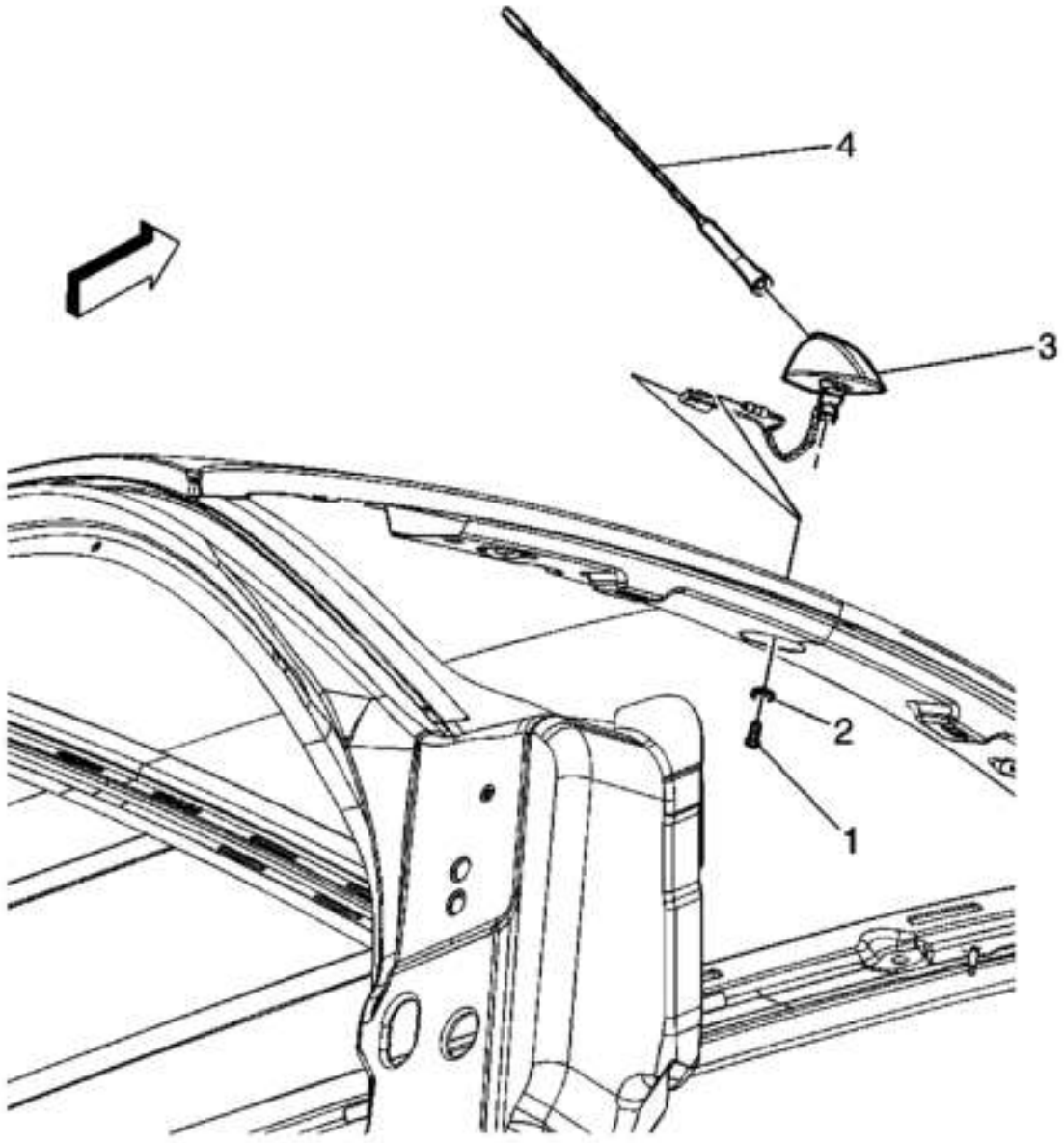


Fig. 40: Installing J 21177-A Inside Brake Drum Diameter
Courtesy of GENERAL MOTORS CORP.

5. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
6. Remove the rear tire and wheel assemblies. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
7. Remove the brake drums. Refer to **Brake Drum Replacement**.
8. Position the **J 21177-A** to widest point of the brake drum inside diameter. See **Special Tools**.
9. Firmly hand tighten the set screw on the **J 21177-A** . See **Special Tools**.

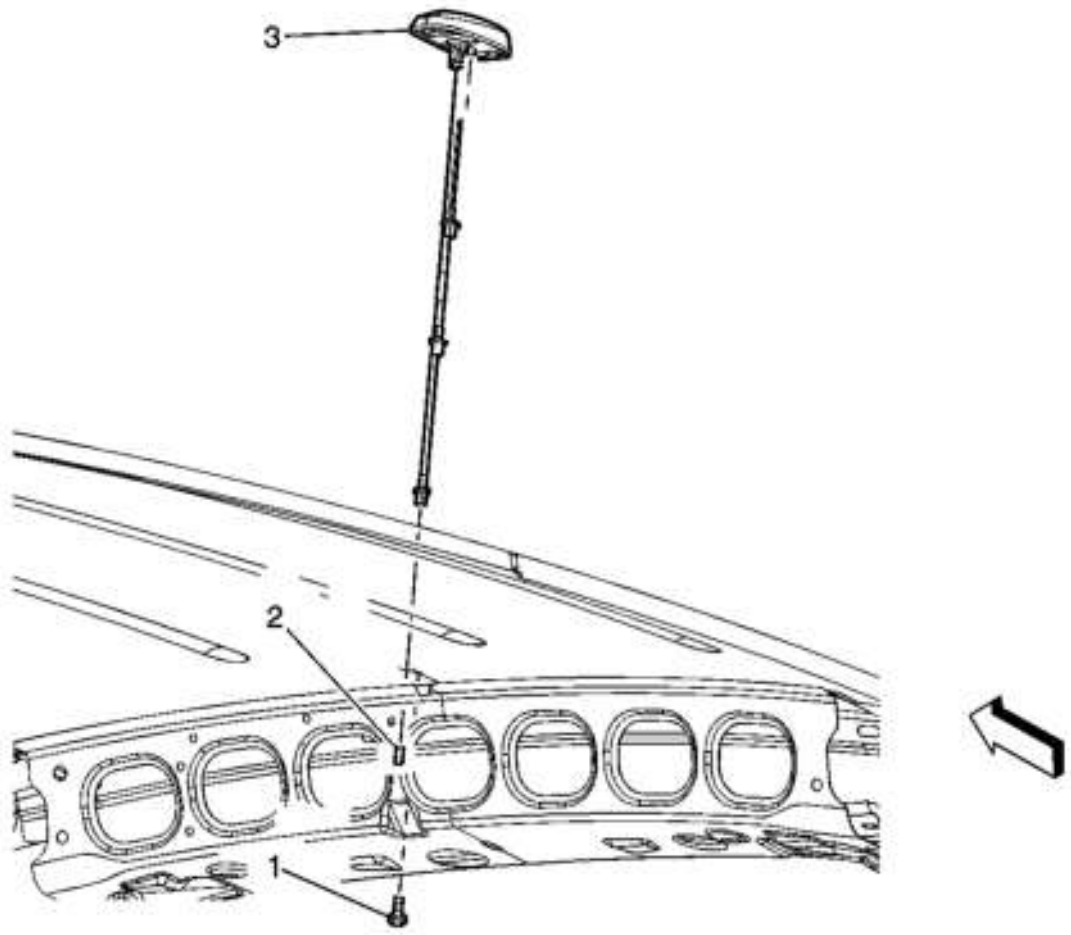


Fig. 41: Positioning J 21177-A Over Brake Shoe Assembly
Courtesy of GENERAL MOTORS CORP.

10. Remove the **J 21177-A** from the brake drum and position it over the corresponding brake shoe assembly at its widest point. See **Special Tools**.
11. While holding the **J 21177-A** in position, insert a 0. See **Special Tools**.635 mm (0.025 in) feeler gage between one side of the **J 21177-A** , and the corresponding brake shoe lining. See **Special Tools**.
12. Rotate the brake shoe adjuster screw until the brake shoe linings contact the **J 21177-A** , and the feeler gage. See **Special Tools**.

    Specification: Brake shoe lining-to-drum clearance: 0.635 mm (0.025 in).

13. Repeat the above steps for the opposite brake drum and brake shoe assembly.
14. Install the brake drums. Refer to **Brake Drum Replacement**.
15. Adjust the park brake. Refer to **Park Brake Adjustment (Drum)** in Park Brake.
16. Install the rear tire and wheel assemblies. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
17. Lower the vehicle.
18. Position the park brake lever boot to the floor console and press the boot retainer into place to secure.

DESCRIPTION AND OPERATION

DRUM BRAKE SYSTEM DESCRIPTION AND OPERATION

System Component Description

The drum brake system consists of the following:

Drum Brake Shoes

Applies mechanical output force, from hydraulic brake wheel cylinders, to friction surface of brake drums.

Brake Drums

Uses mechanical output force applied to friction surface from drum brake shoes to slow speed of tire and wheel assembly rotation.

Drum Brake Hardware

Secures drum brake shoes firmly in proper relationship to hydraulic brake wheel cylinders. Enables sliding motion of brake shoes needed to expand toward friction surface of drums when mechanical output force is applied. Provides return of brake shoes when mechanical output force is relieved.

Drum Brake Adjusting Hardware

Provides automatic adjustment of brake shoes to brake drum friction surface whenever brake apply occurs.

System Operation

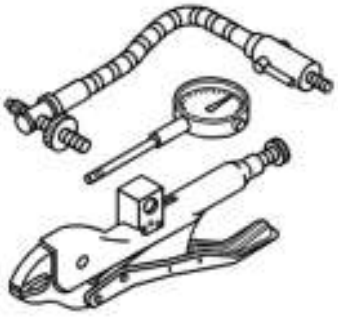
Mechanical output force is applied from the hydraulic brake wheel cylinder pistons to the top of the drum brake shoes. The output force is then distributed between the primary and secondary brake shoes as the shoes expand toward the friction surface of the brake drums. The brake shoes apply the output force to the friction surface of the brake drums, which slows the rotation of the tire and wheel assemblies. The proper function of both the drum brake hardware and adjusting hardware is essential to the proper distribution of braking force.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/ Description
	J 8001 Dial Indicator Set

	
	J 21177-A Drum to Brake Shoe Clearance Gage
	J 38400 Brake Shoe Spanner and Spring Remover
	J 41013 Rotor Resurfacing Kit
	J 42450-A Wheel Hub Resurfacing Kit