

2008 Isuzu Ascender LS

2008 BRAKES Disc Brakes - Ascender, Envoy & Trailblazer

2008 BRAKES

Disc Brakes - Ascender, Envoy & Trailblazer

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

| Application | Specification | |
|---|---------------|-----------|
| | Metric | English |
| Front Brake Bleed Valve | 13 N.m | 115 lb in |
| Front Brake Caliper Bracket Mounting Bolt | 160 N.m | 118 lb ft |
| Front Brake Caliper Guide Pin Tighten the leading guide pin bolt closest to the bleed screw first. | 42 N.m | 31 lb ft |
| Front Brake Hose Bolt | 40 N.m | 30 lb ft |
| Rear Brake Bleed Valve | 12 N.m | 110 lb in |
| Rear Brake Caliper Bracket Mounting Bolt | 200 N.m | 148 lb ft |
| Rear Brake Caliper Guide Pin | 31 N.m | 23 lb ft |
| Rear Brake Hose Bolt | 54 N.m | 40 lb ft |
| Rear Disc Brake Backing Plate Nuts | 135 N.m | 100 lb ft |

DISC BRAKE COMPONENT SPECIFICATIONS

General Specifications

| Application | Specification | |
|---|---------------|----------|
| | Metric | English |
| Front Brakes | | |
| • Rotor Minimum Thickness * | 27.5 mm | 1.08 in |
| • Rotor Thickness - New | 29.0 mm | 1.14 in |
| • Rotor Maximum Allowable Lateral Runout | 0.051 mm | 0.002 in |
| • Rotor Maximum Allowable Scoring | 1.50 mm | 0.059 in |
| • Rotor Maximum Allowable Thickness Variation | 0.025 mm | 0.001 in |
| Rear Brakes | | |
| • Rotor Minimum Thickness * | 18.50 mm | 0.728 in |
| • Rotor Thickness - New | 20.0 mm | 0.787 in |
| • Rotor Maximum Allowable Lateral Runout | 0.051 mm | 0.002 in |
| • Rotor Maximum Allowable Scoring | 1.50 mm | 0.059 in |
| • Rotor Maximum Allowable Thickness Variation | 0.025 mm | 0.001 in |

* All brake rotors have a minimum thickness dimension cast into them. Replace any rotor that is worn or

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machined below this specification.

DIAGNOSTIC INFORMATION & PROCEDURES

DIAGNOSTIC STARTING POINT - DISC BRAKES

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

BRAKE ROTOR THICKNESS MEASUREMENT

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

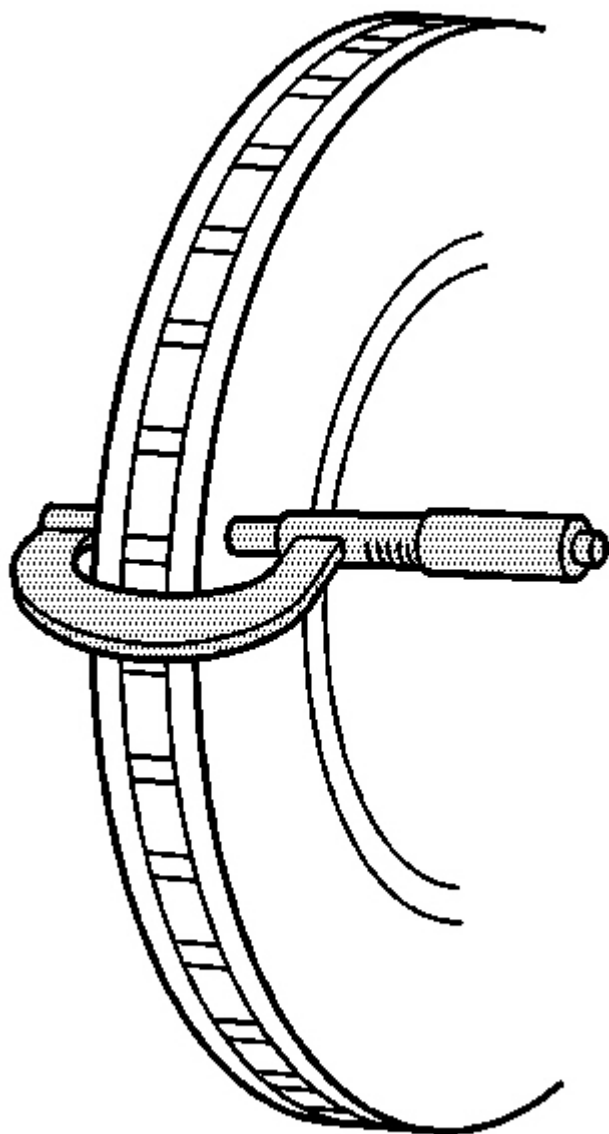


Fig. 1: Measuring Brake Rotor Thickness
Courtesy of GENERAL MOTORS CORP.

1. Clean the brake pad lining contact surface of the brake rotor with denatured alcohol or an equivalent brake cleaner.
2. Using a micrometer calibrated in ten-thousands of an inch, measure and record the lowest thickness of the brake rotor at four or more points, equally spaced around the rotor.

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Ensure that the measurements are only taken within the brake pad lining contact area and that the micrometer is positioned the same distance from the outside edge of the rotor for each measurement.

3. Compare the lowest thickness measurement recorded to the specifications. Refer to **Disc Brake Component Specifications**.
4. If the lowest thickness measurement of the brake rotor is above the brake rotor minimum thickness specification; the rotor may be refinished, depending upon the surface and wear conditions which may be present.
5. If the lowest thickness measurement of the brake rotor is below the minimum thickness specification; the rotor requires replacement.

BRAKE ROTOR SURFACE & WEAR INSPECTION

Tools Required

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

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

1. With the tire and wheel assemblies removed and the brake rotors retained by wheel lug nuts, clean the braking surfaces of the brake rotor with denatured alcohol or an equivalent approved brake cleaner.
2. Inspect the braking surfaces of the brake rotor 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 rotor.

 - Cracks and/or heat spots
 - Excessive blueing discoloration
3. If the braking surfaces of the brake rotor exhibits one or more of the braking surface conditions, the rotor requires refinishing or replacement.

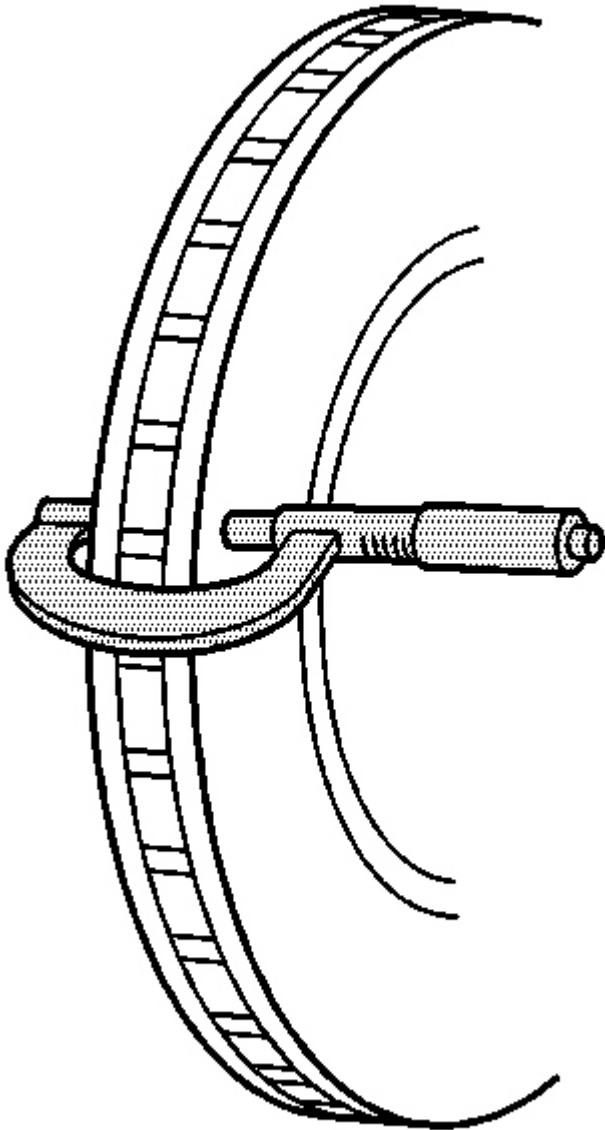


Fig. 2: Measuring Brake Rotor Thickness
Courtesy of GENERAL MOTORS CORP.

4. Using a micrometer calibrated in ten-thousands of an inch, measure and record the thickness variation of the brake rotor at four or more points, around the rotor.

Ensure that the measurements are only taken within the brake pad lining contact area and that the

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micrometer is positioned the same distance from the outside edge of the rotor for each measurement.

5. Compare the thickness variation recorded to the following specification:

Specification: Brake rotor maximum allowable thickness variation 0.0254 mm (0.001 in).

6. If the brake rotor thickness variation exceeds the specification, the rotor requires refinishing or replacement.
7. Using the micrometer, measure and record any grooves present on the rotor braking surface.
8. Compare the groove (scoring) depth recorded to the following specification:

Specification: Brake rotor maximum allowable scoring 1.50 mm (0.059 in).

9. If the brake rotor scoring depth exceeds the specification, or if an excessive amount of scoring is present, the rotor requires refinishing or replacement.

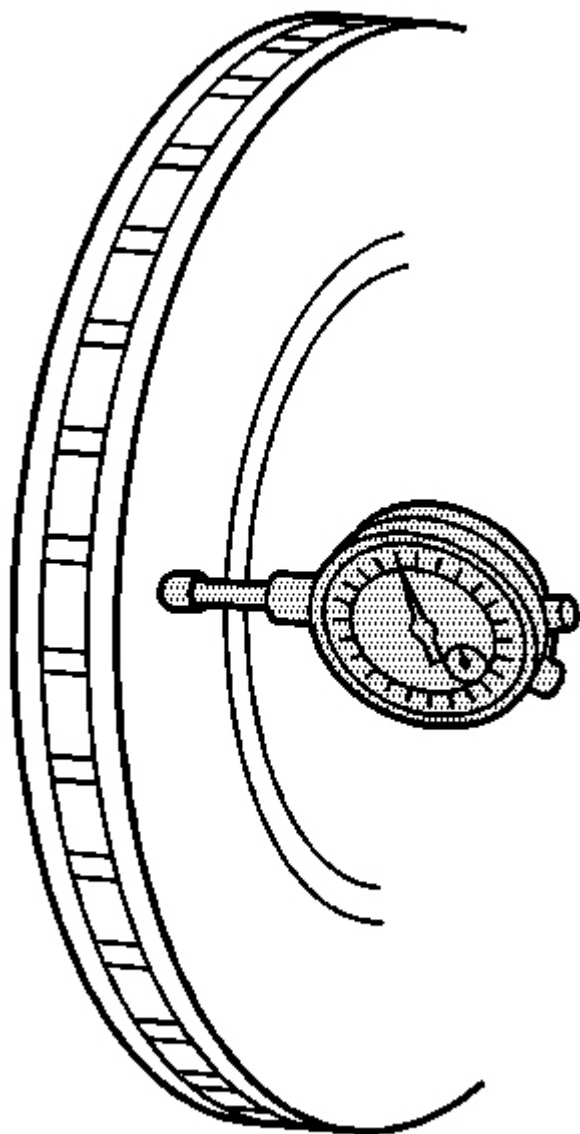


Fig. 3: Checking Brake Rotor Runout
Courtesy of GENERAL MOTORS CORP.

10. Mount a dial indicator, **J 8001** or equivalent, and position the indicator button so it contacts the brake rotor at a 90 degree angle, approximately 13 mm (0. See **Special Tools**.5 in) from the rotor's outer edge.
11. Measure and record the lateral runout of the brake rotor.
 1. Rotate the rotor until the lowest reading is displayed on the indicator dial, then zero the dial.

2. Rotate the rotor until the highest reading is displayed on the dial.
 3. Measure and record the amount of sealed wheel bearing play, then subtract the bearing play from the lateral runout recorded to obtain the true amount of lateral runout.
12. Compare the lateral runout of the brake rotor to the following specification:

Specification: Brake rotor maximum allowable lateral runout 0.051 mm (0.002 in).

13. If the brake rotor lateral runout exceeds the specification, the rotor requires refinishing or replacement.

BRAKE PAD INSPECTION

CAUTION: Refer to Brake Dust Caution .

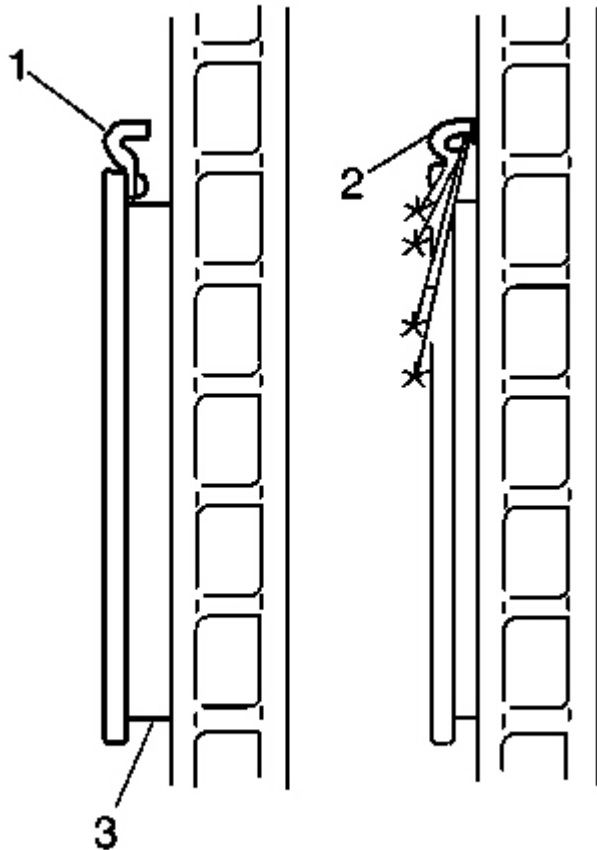


Fig. 4: View Of Brake Pads & Audible Wear Sensors
Courtesy of GENERAL MOTORS CORP.

- Inspect the disc brake pads at regular intervals, or whenever the tire and wheel assemblies are removed from the vehicle.
- If replacement is necessary, always replace disc brake pads in axle sets.
- Inspect both edges of the disc brake pad friction surfaces (3). The highest rate of wear normally occurs at the trailing edge of the disc brake pads.
- Inspect the thickness of the disc brake pads (3) in order to ensure that they have not worn prematurely. The disc brake pad wear should be approximately even per axle set.
- Both front and rear disc brake pads have integral, audible wear sensors (1). When the disc brake pad wear reaches the minimum allowable thickness, the wear sensor contacts the disc brake rotor (2). The wear indicator will then produce an audible, high-pitched warning noise during wheel rotation.
- Replace the disc brake pads when the friction surface (3) is worn to within 0.76 mm (0.030 in) of the mounting plates.
- Remove the brake calipers and inspect the friction surfaces of the inner and outer disc brake pads to ensure that they are level. Place the disc brake pad friction surfaces together and measure the gap between the surfaces. If more than 0.13 mm (0.005 in) gap exists midway between the length of the disc brake pads, replace the disc brake pads.
- Verify that any disc brake pad shims that may be required are in place and not damaged or excessively corroded. Replace any missing or damaged shims in order to preserve proper disc brake performance.
- Replace the disc brake pads if any have separated from the mounting plates.
- Inspect the disc brake pads friction surfaces for cracks, fractures, or damage which may cause noise or otherwise impair disc brake performance.

BRAKE CALIPER INSPECTION

CAUTION: Refer to Brake Dust Caution .

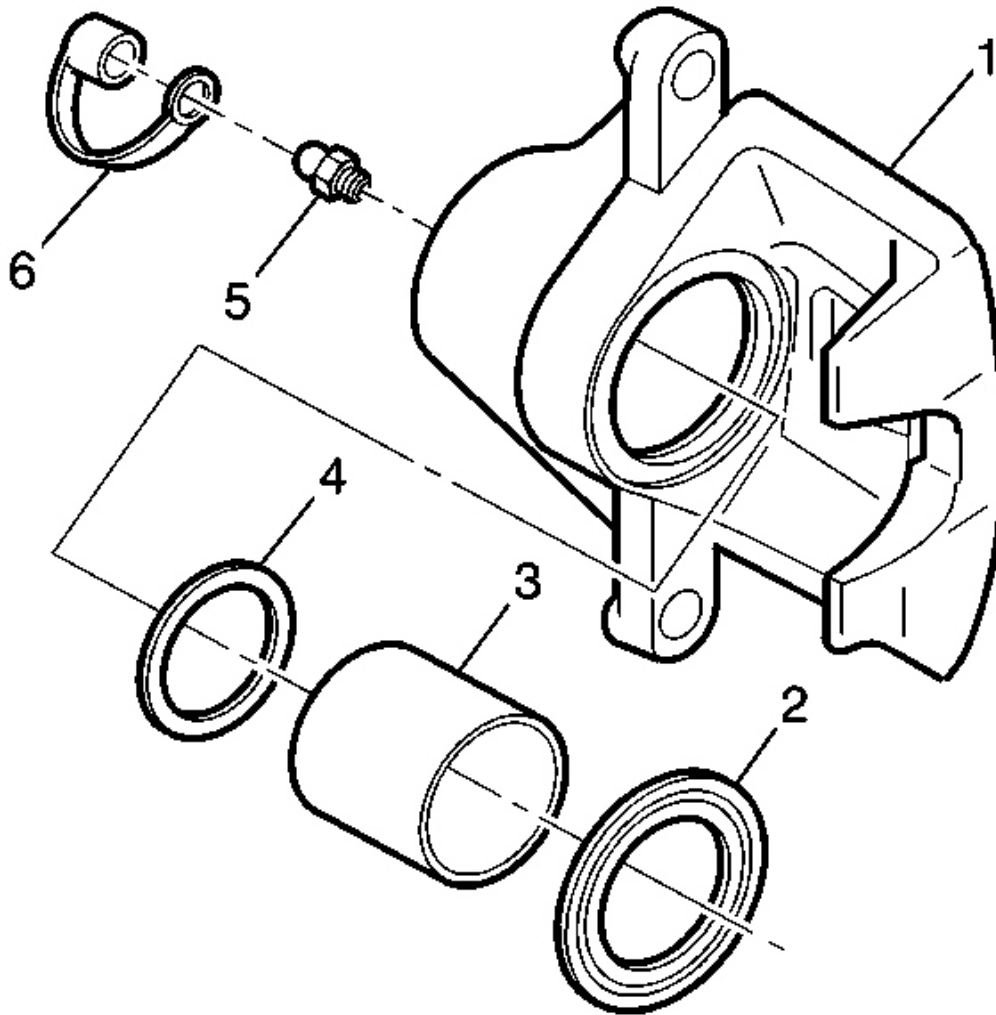


Fig. 5: Exploded View Of Brake Caliper
Courtesy of GENERAL MOTORS CORP.

1. Inspect the brake caliper housing (1) for cracks, excess wear, and/or damage. If any of these conditions are present, the brake caliper requires replacement.
2. Inspect the caliper piston dust boot seal (2) for cracks, tears, cuts, deterioration and/or improper seating in the caliper body. If any of these conditions are present, the brake caliper requires overhaul or replacement.
3. Inspect for brake fluid leakage around the caliper piston dust boot seal (2) and on the disc brake pads. If there is any evidence of brake fluid leakage, the brake caliper requires overhaul or replacement.

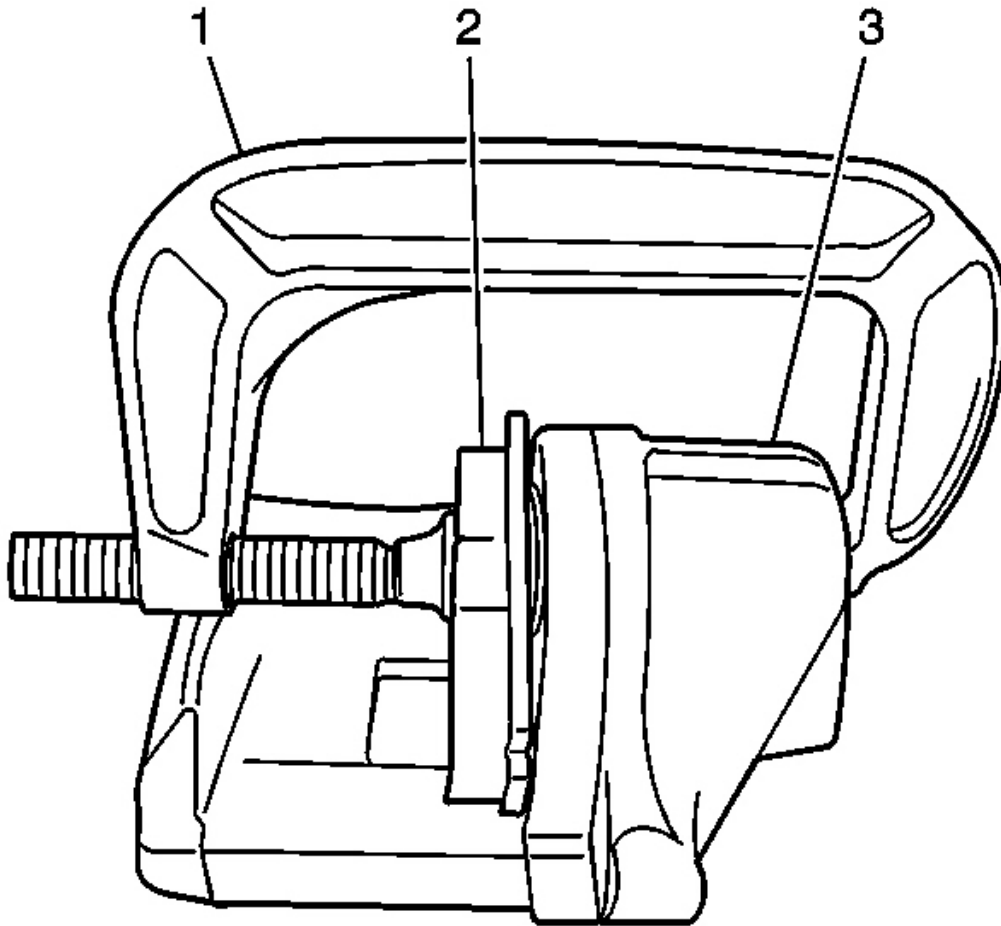


Fig. 6: Compressing Caliper Piston
Courtesy of GENERAL MOTORS CORP.

4. Inspect for smooth and complete travel of the caliper pistons into the caliper bores:

The movement of the caliper pistons into the caliper bores should be smooth and even. If the caliper piston is frozen or difficult to bottom, the caliper requires overhaul or replacement.

- For single piston caliper applications, insert a discarded inner brake pad (2) or block of wood in front of the piston. Using a large C-clamp (1) installed over the body of the caliper (3) and against the brake pad or block of wood, slowly bottom the piston in the bore.
- For dual piston caliper applications, insert a discarded inner brake pad (2) or block of wood in front of the pistons. Using 2 large C-clamps (1) installed over the body of the caliper (3) and against the brake pad or block of wood, slowly bottom the pistons evenly into the bores.

FRONT DISC BRAKE MOUNTING & HARDWARE INSPECTION

CAUTION: Refer to Brake Dust Caution .

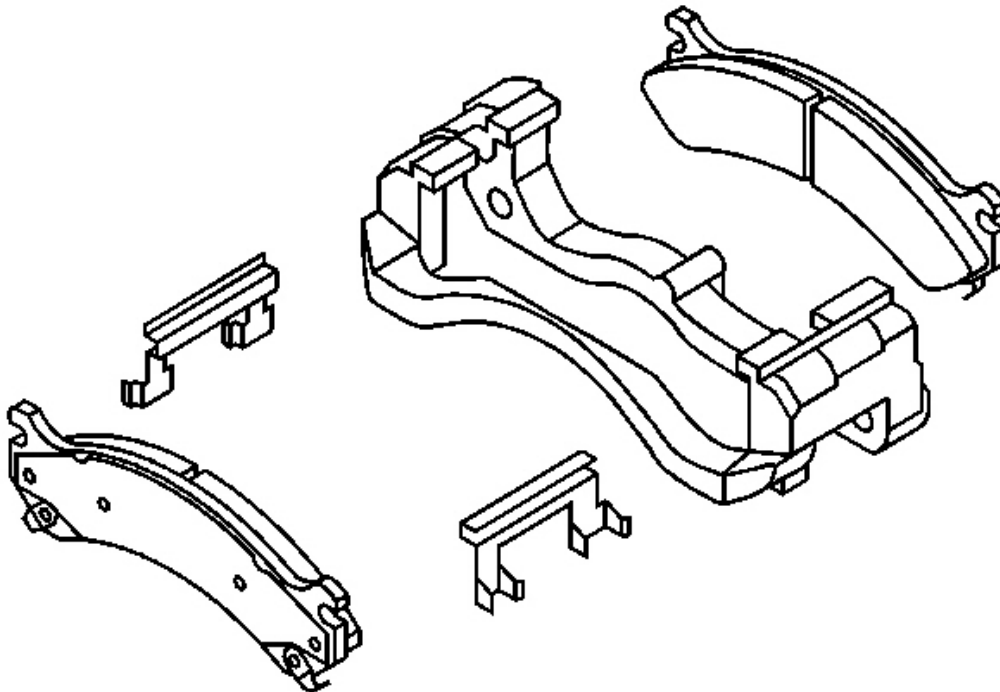


Fig. 7: View Of Disc Brake Pads & Brake Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

1. Remove the disc brake caliper from the caliper mounting bracket. Refer to **Front Brake Caliper Replacement**.
2. Remove the disc brake pads from the caliper mounting bracket.
3. Inspect the disc brake pad mounting hardware for the following:
 - Missing mounting hardware
 - Excessive corrosion
 - Bent mounting tabs
 - Looseness at the caliper mounting bracket
 - Looseness at the disc brake pads
4. If any of the conditions listed are found, the disc brake pad mounting hardware requires replacement.

5. Ensure the disc brake pads are held firmly in place on the caliper mounting bracket, yet slide easily on the mounting hardware without binding.
6. Install the disc brake pads to the caliper mounting bracket.
7. Install the disc brake caliper to the mounting bracket. Refer to **Front Brake Caliper Replacement**.

REAR DISC BRAKE MOUNTING & HARDWARE INSPECTION

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

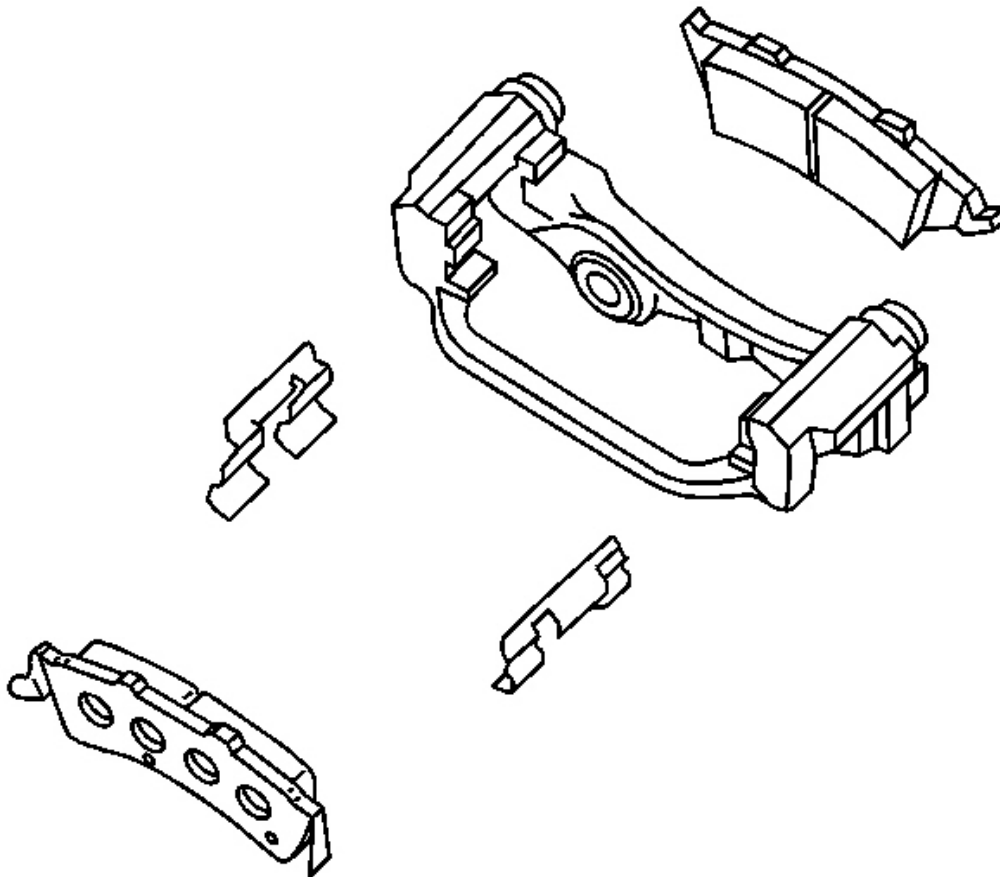


Fig. 8: Disc Brake Pads & Caliper Mounting Bracket - Rear (1500 Series Pickup)
Courtesy of GENERAL MOTORS CORP.

1. Remove the disc brake caliper from the caliper mounting bracket. Refer to **Rear Brake Caliper**

Replacement.

2. Remove the disc brake pads from the caliper mounting bracket.
3. Inspect the disc brake pad mounting hardware for the following:
 - Missing mounting hardware
 - Excessive corrosion
 - Bent mounting tabs
 - Looseness at the caliper mounting bracket
 - Looseness at the disc brake pads
4. If any of the conditions listed are found, the disc brake pad mounting hardware requires replacement.
5. Ensure the disc brake pads are held firmly in place on the caliper mounting bracket, yet slide easily on the mounting hardware without binding.

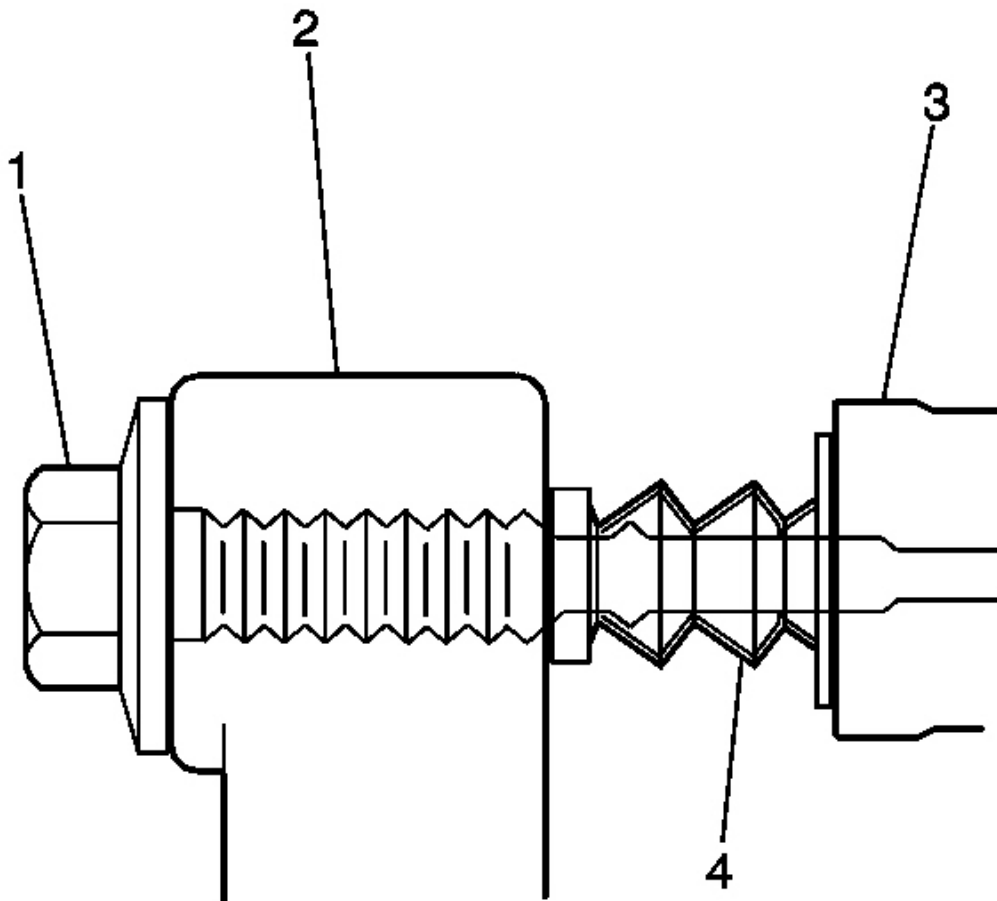


Fig. 9: View Of Caliper, Pin, Boots & Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

6. Inspect the caliper bolts (1) for the following:
 - Binding
 - Seizing
 - Looseness in the caliper mounting bracket (3)
 - Bent or damaged caliper bolts
 - Cracked or torn boots (4)
 - Missing boots
 - Bent or damaged caliper mounting bracket (3)
7. If any of the conditions listed are found, the caliper mounting hardware requires replacement.
8. Install the disc brake pads to the caliper mounting bracket.
9. Install the disc brake caliper to the mounting bracket. Refer to **Rear Brake Caliper Replacement**.

REPAIR INSTRUCTIONS

FRONT DISC BRAKE PADS REPLACEMENT

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

Removal Procedure

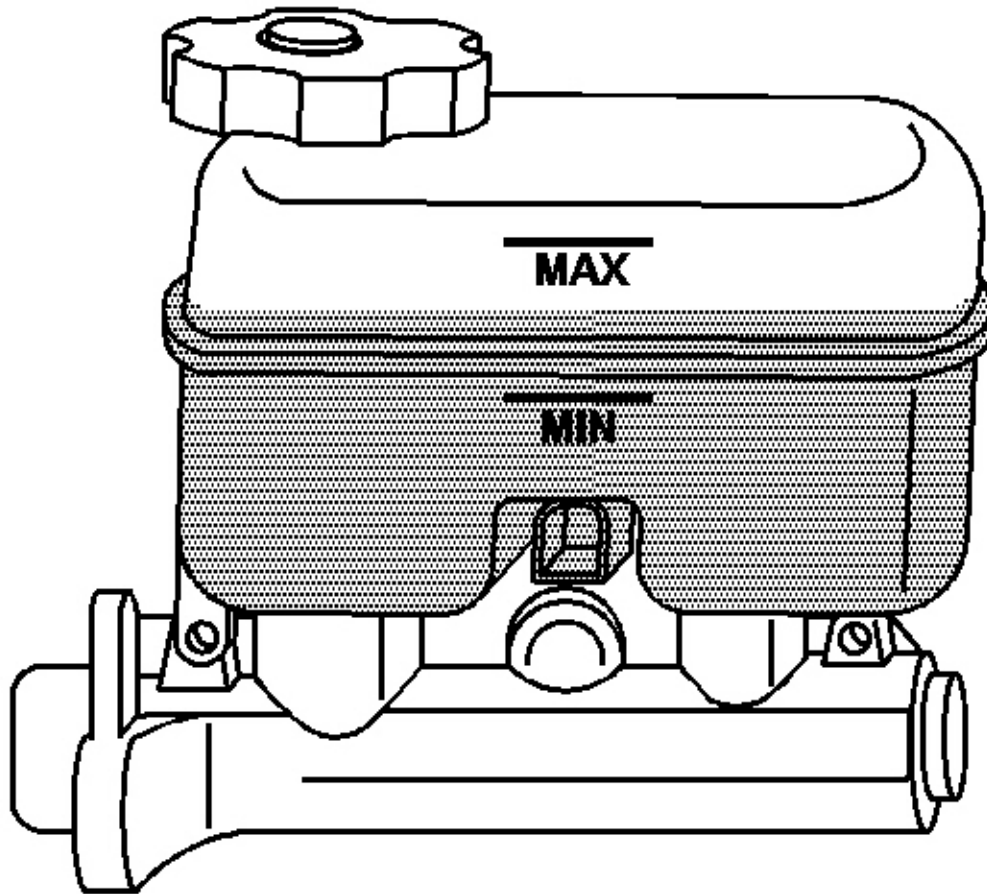


Fig. 10: View Of Half-Full Master Cylinder Reservoir
Courtesy of GENERAL MOTORS CORP.

1. Inspect the brake fluid level in the brake master cylinder reservoir.
2. If the brake fluid is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.

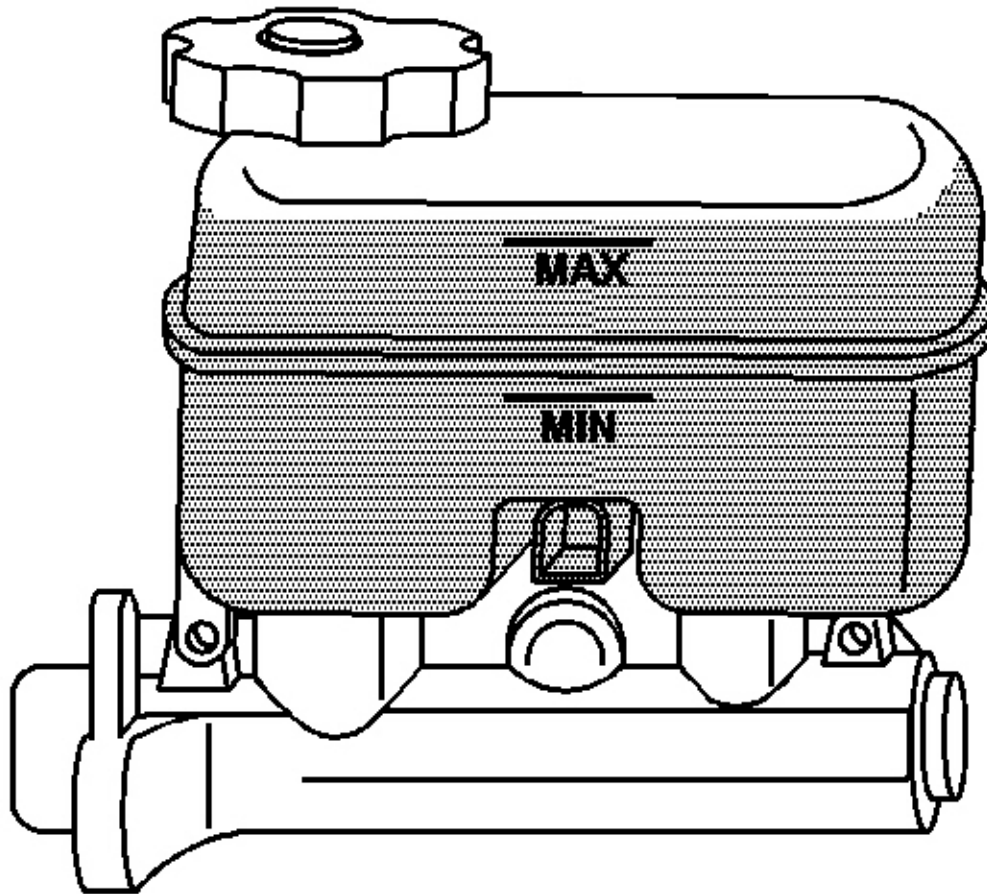


Fig. 11: View Of Full Master Cylinder Reservoir MAX & MIN Marks
Courtesy of GENERAL MOTORS CORP.

3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove the brake fluid with appropriate tool to the midway point before proceeding.
4. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

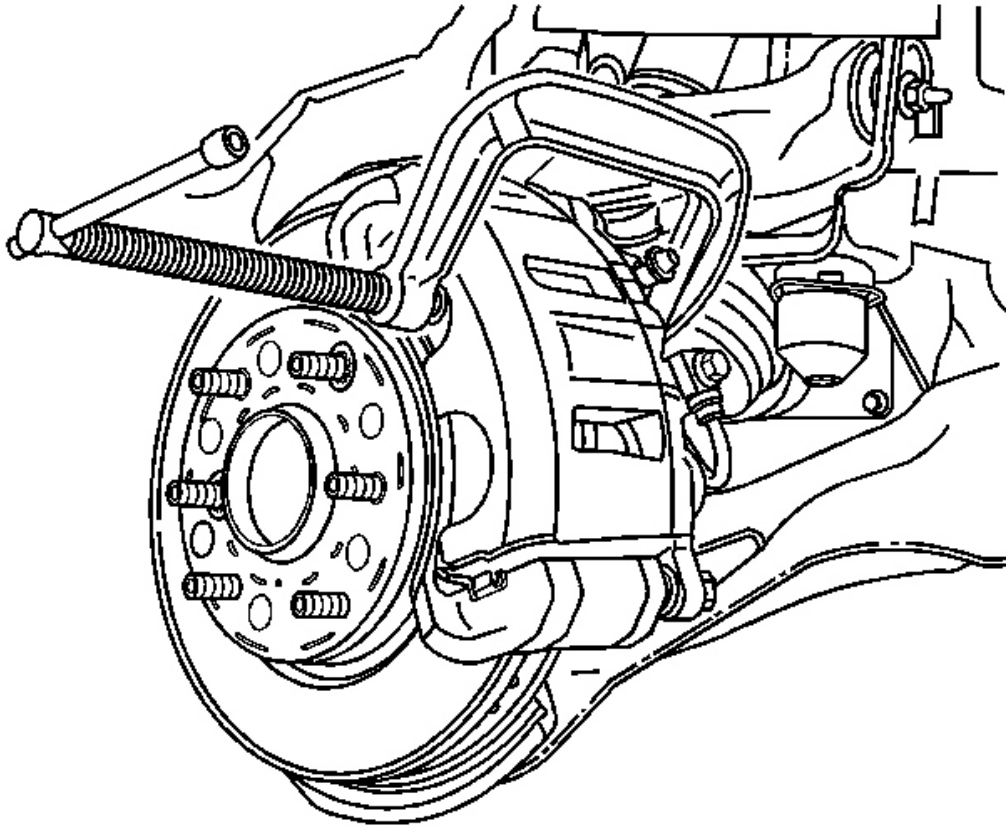


Fig. 12: View Of Large C-Clamp Over Brake Caliper Housing
Courtesy of GENERAL MOTORS CORP.

6. Compress the front brake caliper pistons.
 1. Install a large C-clamp over the top of the brake caliper housing and against the back of the outboard brake pad.
 2. Slowly tighten the C-clamp until the pistons push into the brake caliper enough to slide the brake caliper off the rotor.
 3. Remove the C-clamp from the brake caliper.

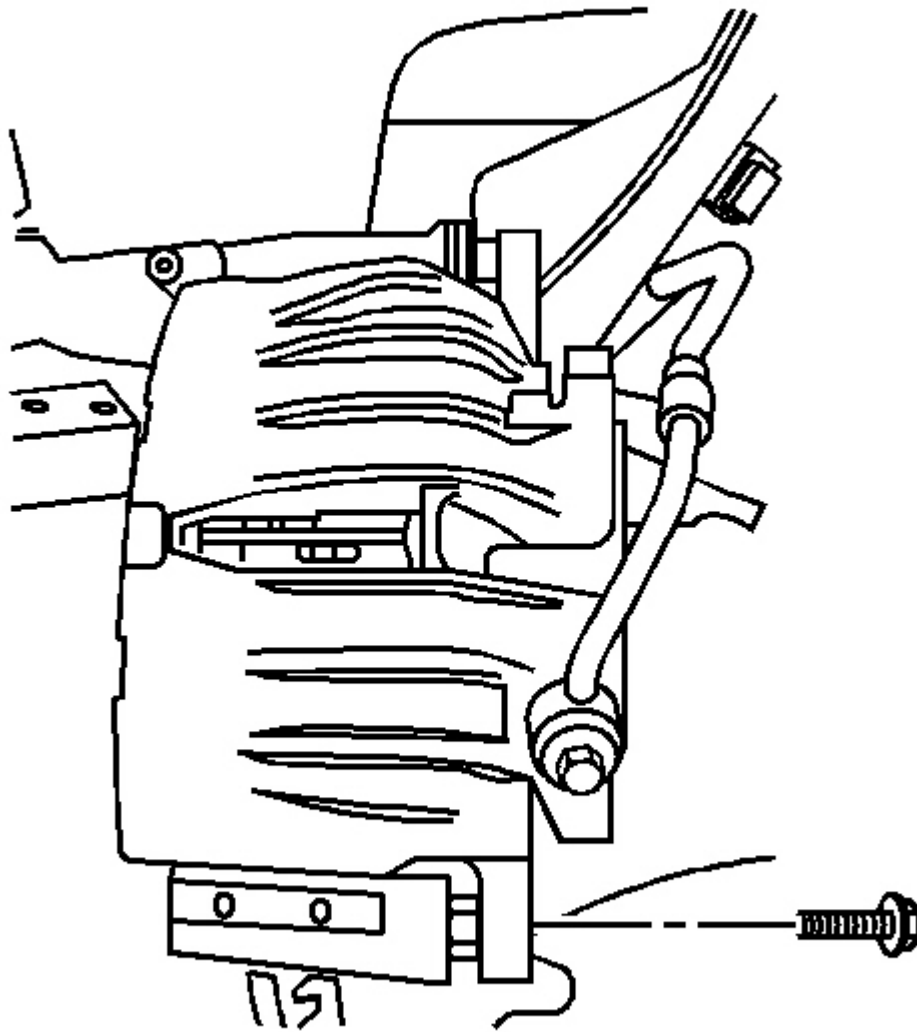


Fig. 13: View Of Lower Brake Caliper Mounting Bolt
Courtesy of GENERAL MOTORS CORP.

7. Remove the lower mounting bolt from the guide pin.

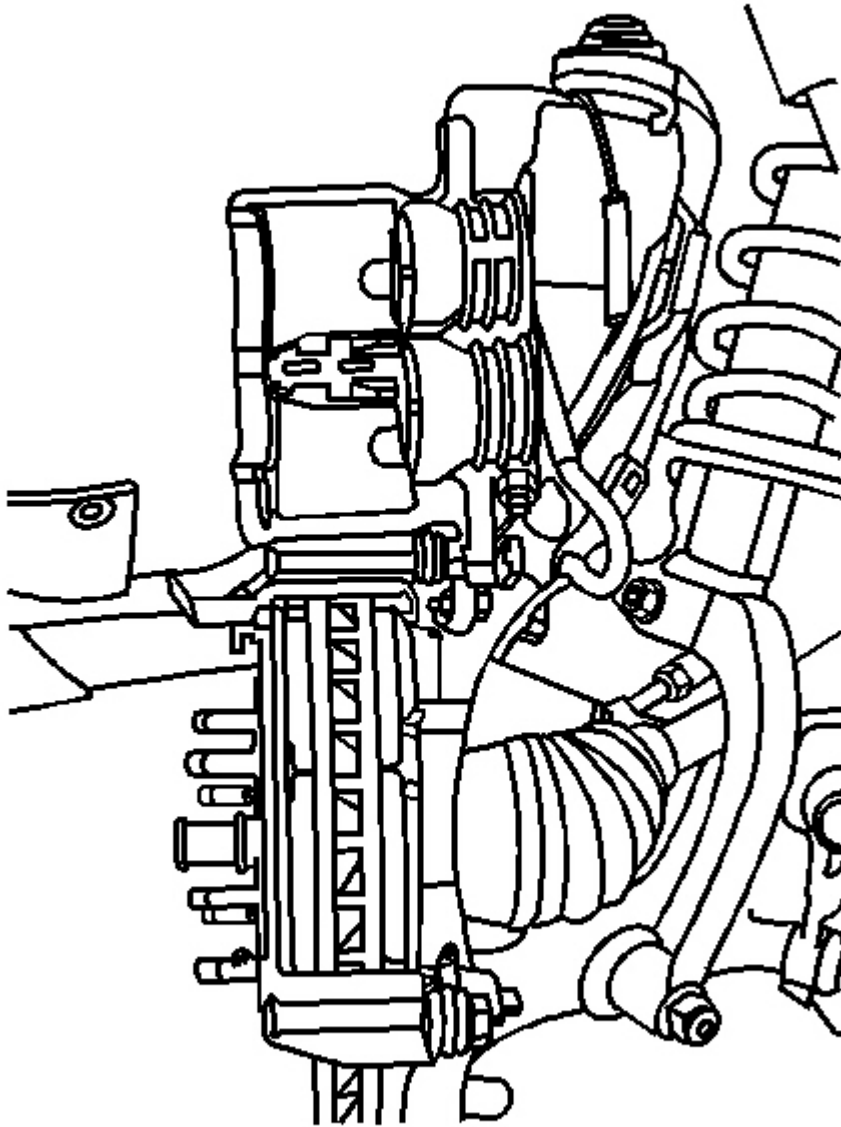


Fig. 14: View Of Brake Caliper Rotated Upward
Courtesy of GENERAL MOTORS CORP.

8. Rotate the brake caliper upward until it stops.

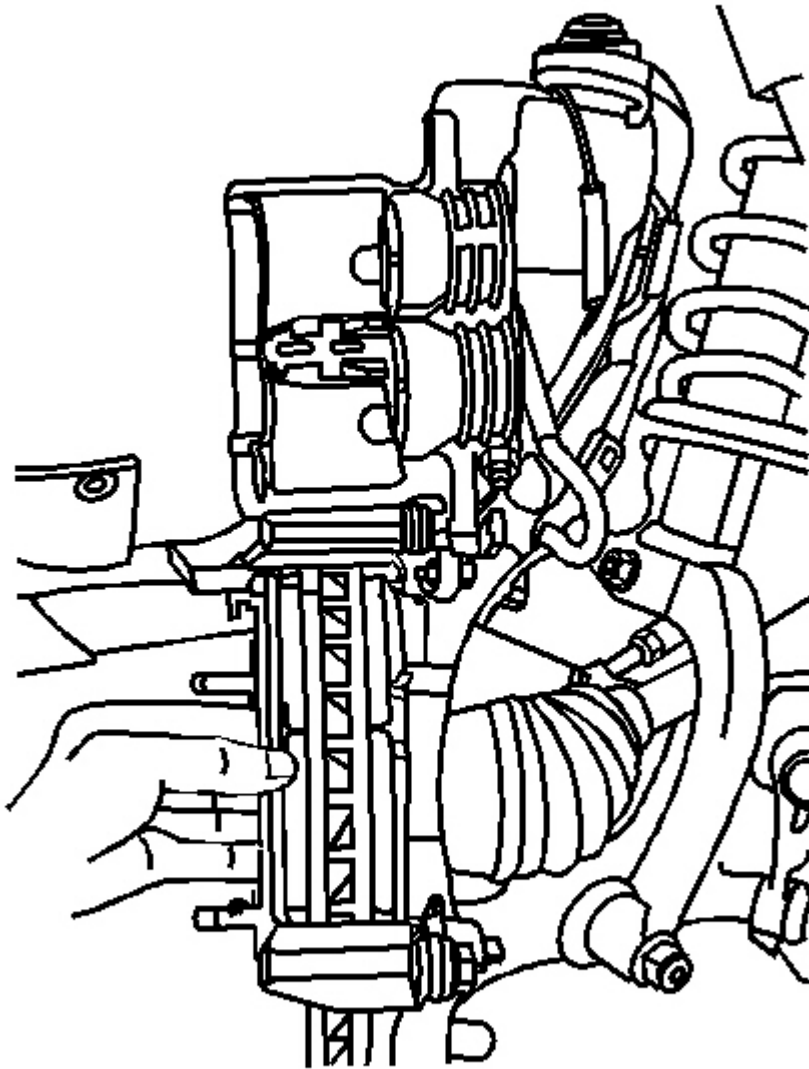


Fig. 15: Removing/Installing Outboard Brake Pad
Courtesy of GENERAL MOTORS CORP.

9. Remove the outboard brake pad.

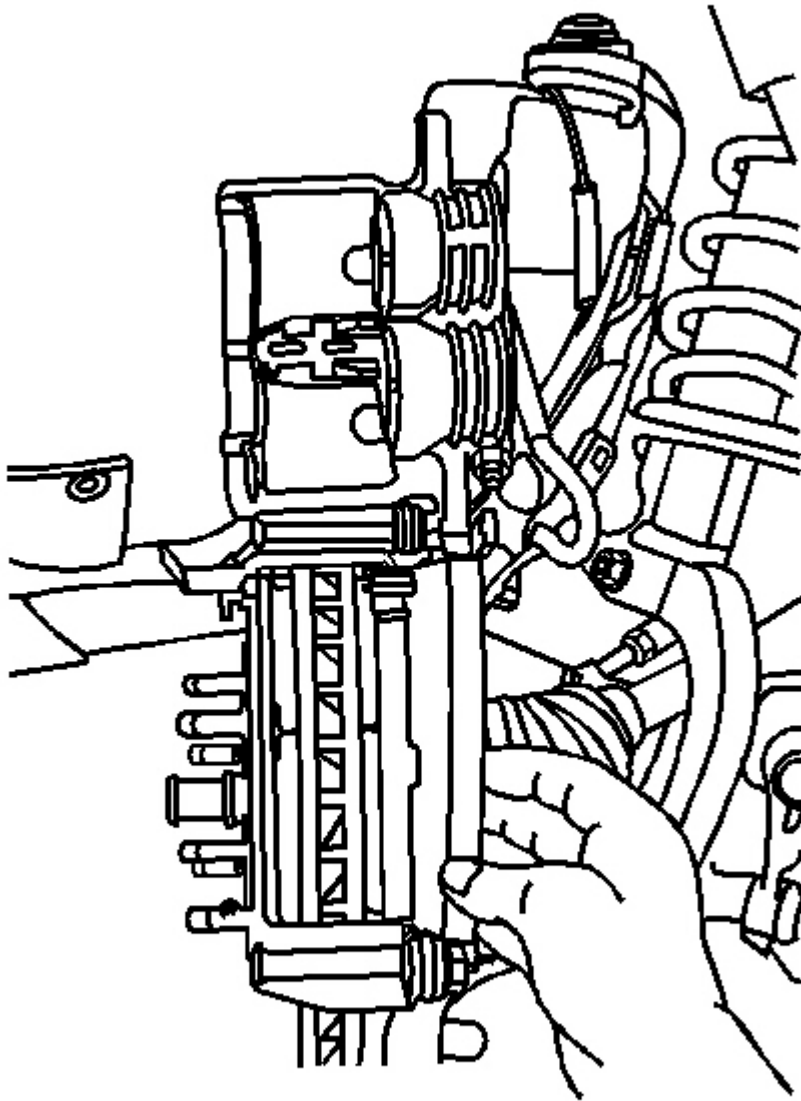


Fig. 16: Removing/Installing Inboard Brake Pad
Courtesy of GENERAL MOTORS CORP.

10. Remove the inboard brake pad.

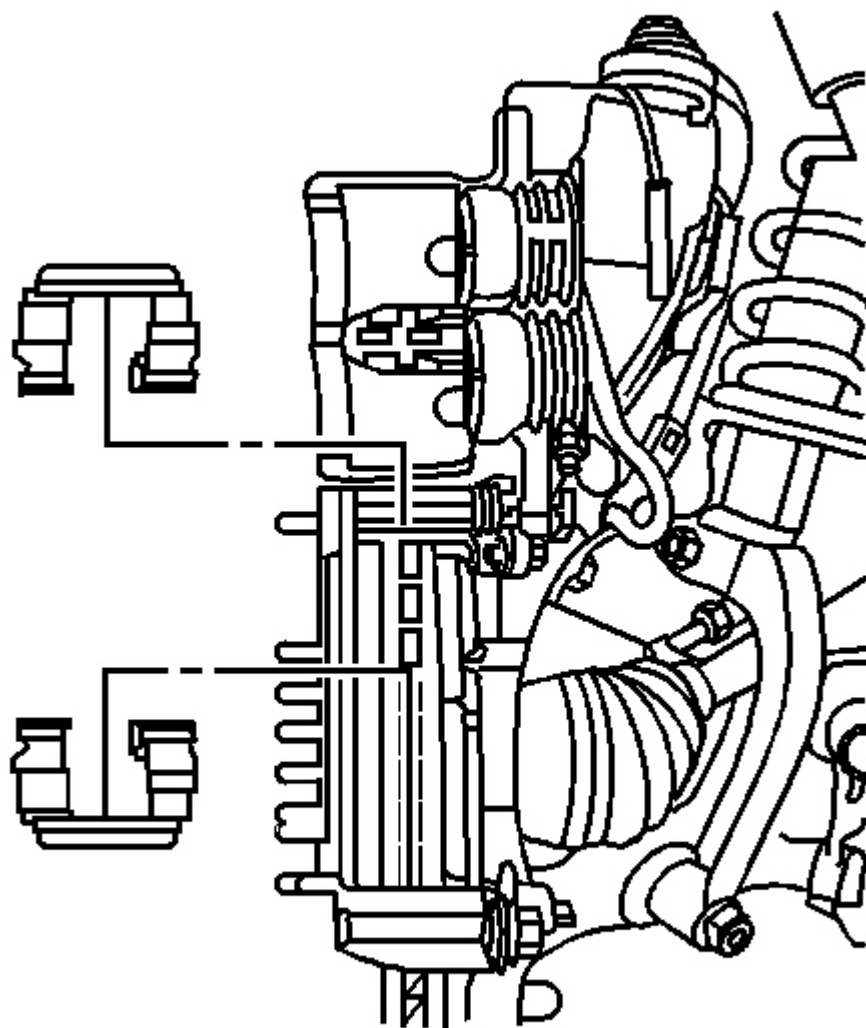


Fig. 17: View Of Caliper & Retaining Clips
Courtesy of GENERAL MOTORS CORP.

11. Remove the brake pad retaining clips from the brake caliper mounting bracket and discard.
12. Remove all foreign material from the brake caliper using denatured alcohol.

Installation Procedure

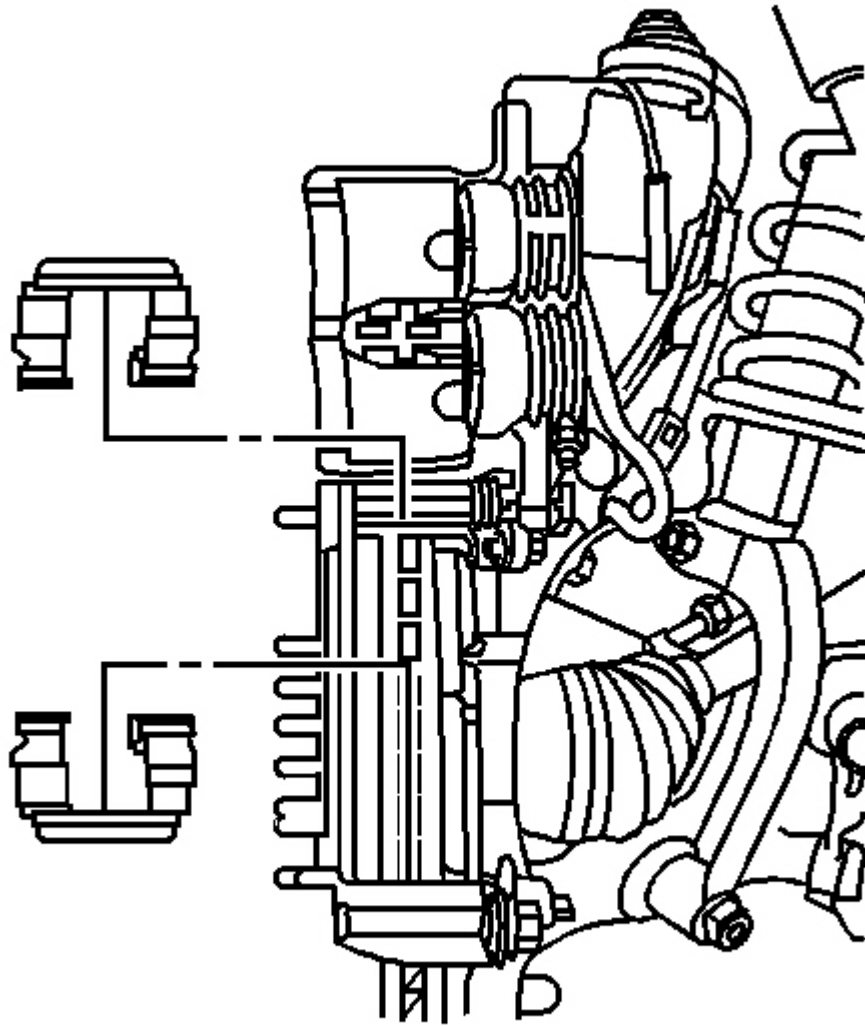


Fig. 18: View Of Caliper & Retaining Clips
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: When installing new brake pads, DO NOT reuse the old retaining clips for the brake pad. Use only NEW brake pad retaining clips.

1. Install the brake pad retaining clips to the brake caliper mounting bracket.

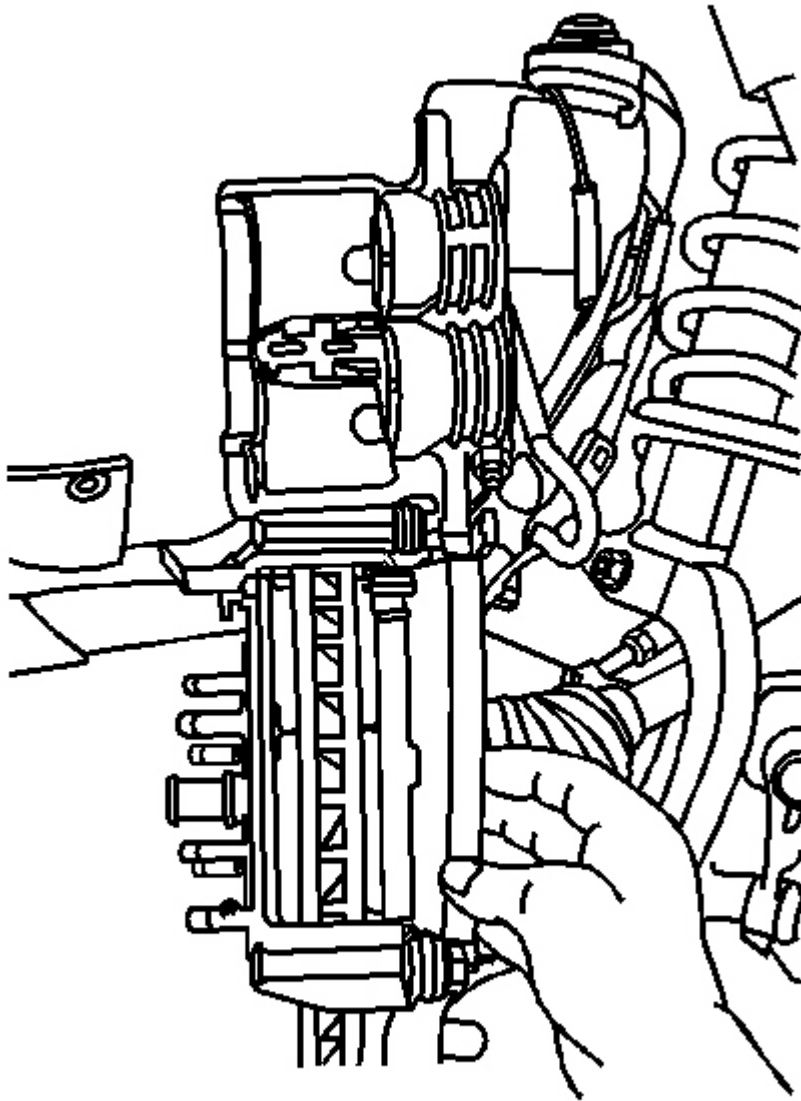


Fig. 19: Removing/Installing Inboard Brake Pad
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use care when installing the pad so the spreader springs are not excessively deformed.

2. Install the inboard brake pad.

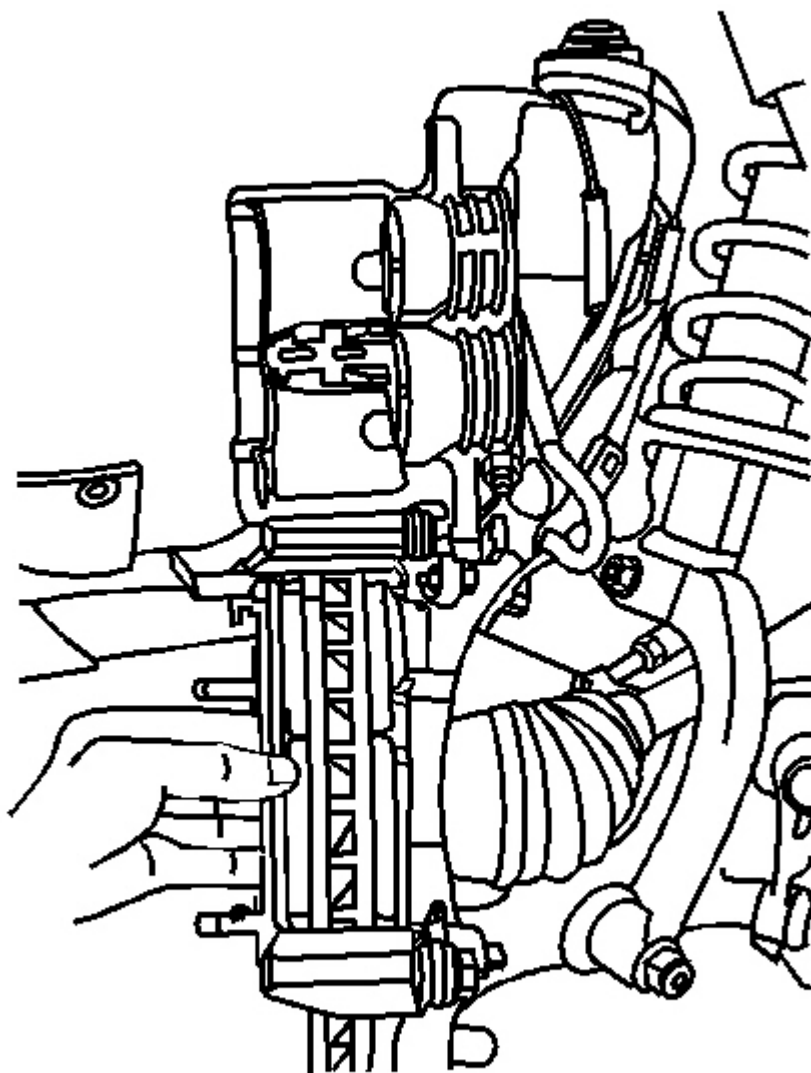


Fig. 20: Removing/Installing Outboard Brake Pad
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use care when installing the pad so the spreader springs are not excessively deformed.

3. Install the outboard brake pad.
4. Rotate the brake caliper down into position.

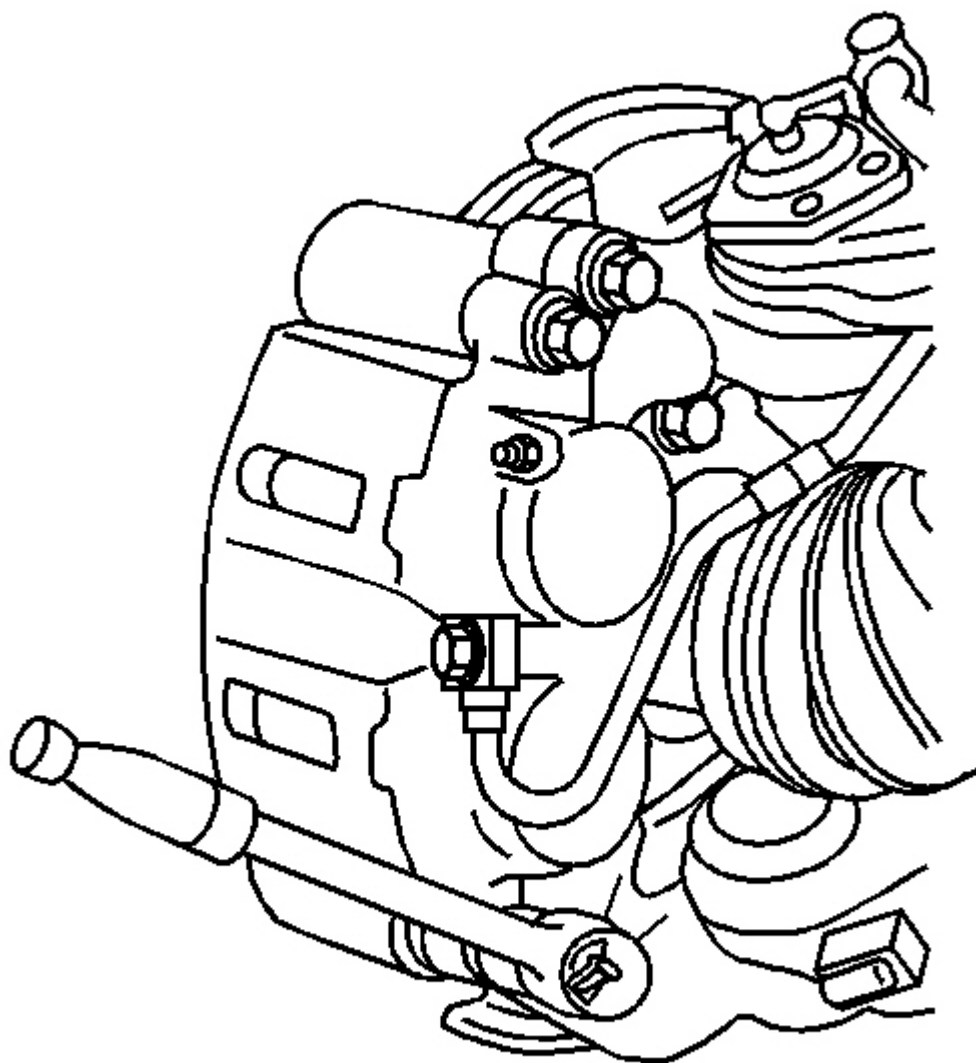


Fig. 21: Identifying Brake Caliper Guide Pin Bolt
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

5. Install the lower brake caliper guide pin bolt.

Tighten: Tighten the brake caliper guide pin bolt to 64 N.m (47 lb ft).

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6. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
7. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .
8. Fill the brake master cylinder reservoir. Refer to **Master Cylinder Reservoir Filling** .

CAUTION: Refer to **Firm Brake Pedal Caution** .

9. Pump the brake pedal slowly and firmly to seat the brake pads.
10. Burnish the new brake pads. Refer to **Brake Pad and Rotor Burnishing**.

REAR DISC BRAKE PADS REPLACEMENT

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

Removal Procedure

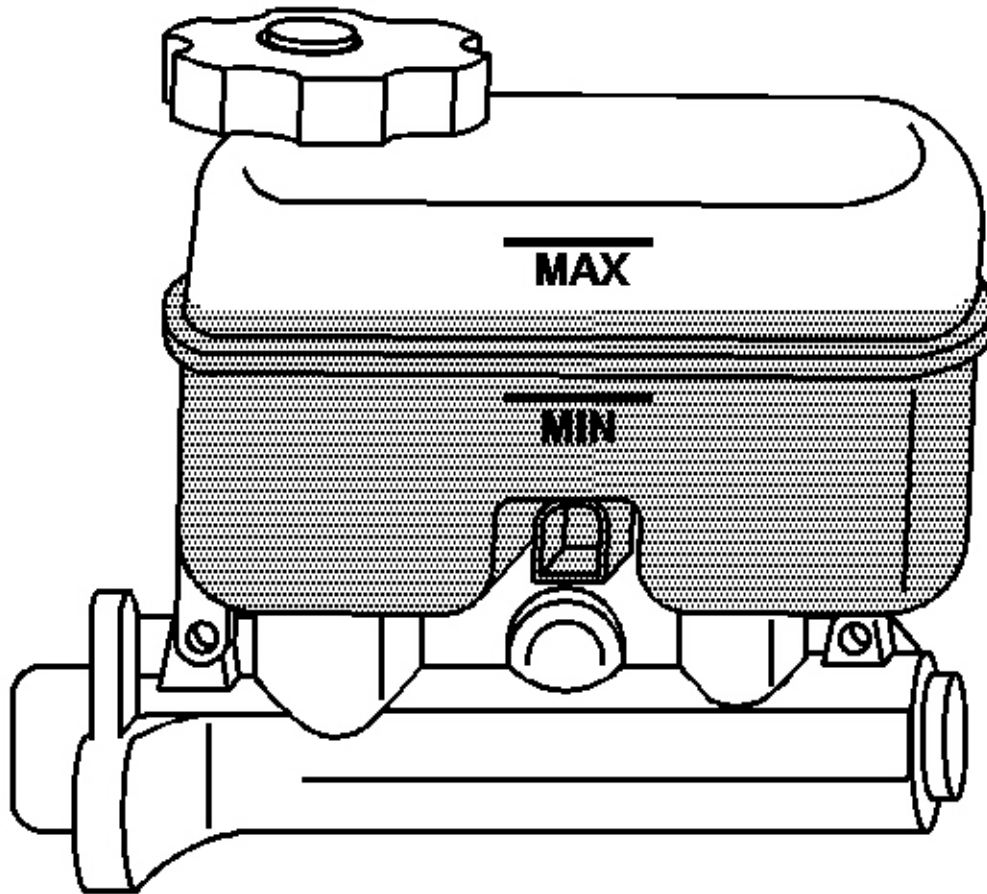


Fig. 22: View Of Half-Full Master Cylinder Reservoir
Courtesy of GENERAL MOTORS CORP.

1. Inspect the brake fluid level in the brake master cylinder reservoir.
2. If the brake fluid is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.

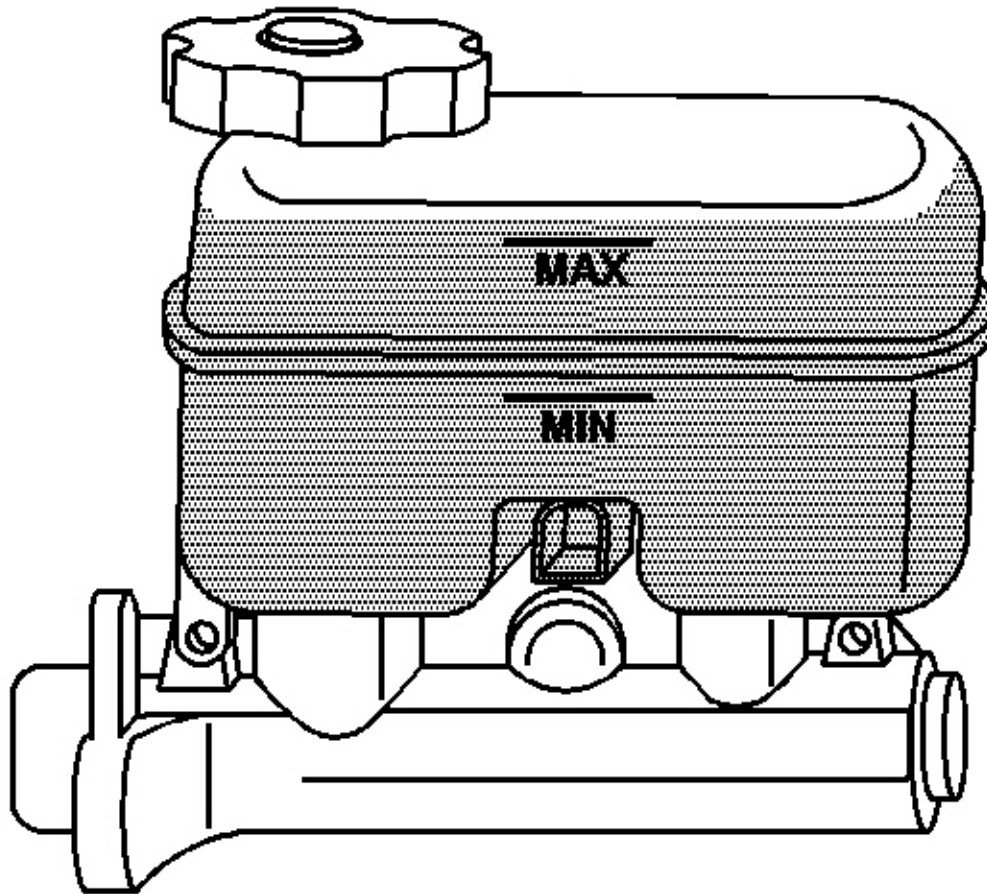


Fig. 23: View Of Full Master Cylinder Reservoir MAX & MIN Marks
Courtesy of GENERAL MOTORS CORP.

3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove the brake fluid with appropriate tool to the midway point before proceeding.
4. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

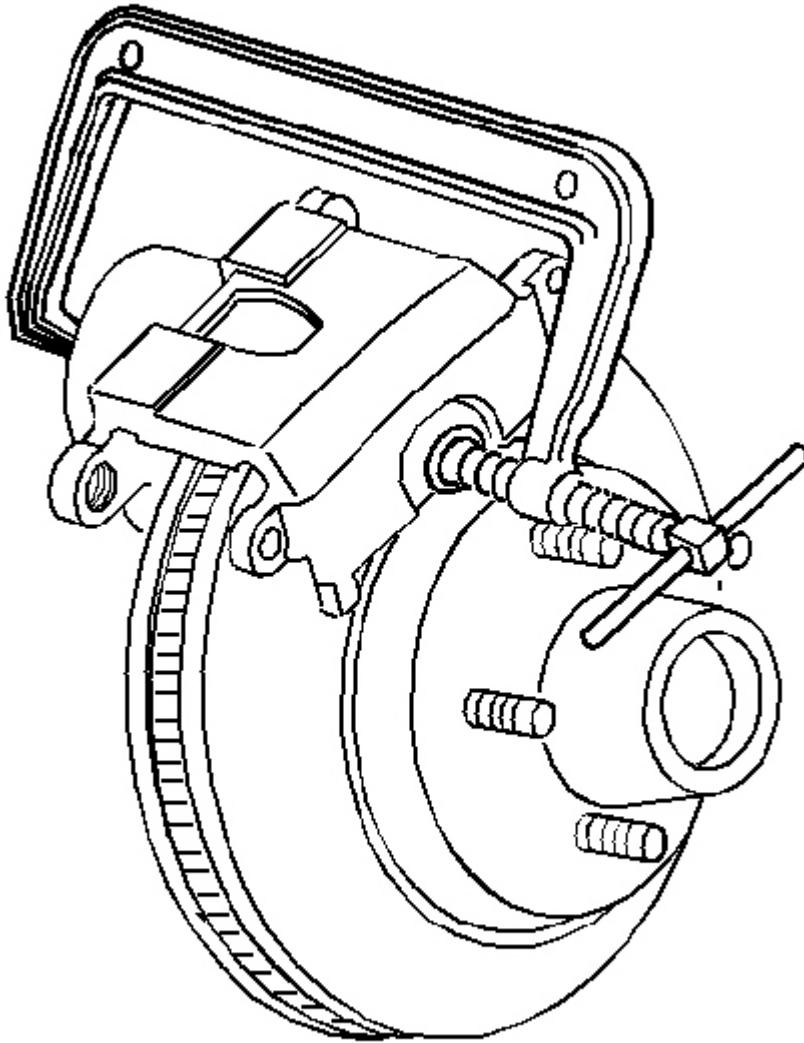


Fig. 24: View Of C-Clamp Over Brake Caliper Housing (Rear)
Courtesy of GENERAL MOTORS CORP.

6. Compress the rear brake caliper piston.
 1. Install a large C-clamp over the top of the brake caliper housing and against the back of the outboard brake pad.
 2. Slowly tighten the C-clamp until the pistons push into the brake caliper enough to slide the brake caliper off the rotor.
 3. Remove the C-clamp from the brake caliper.

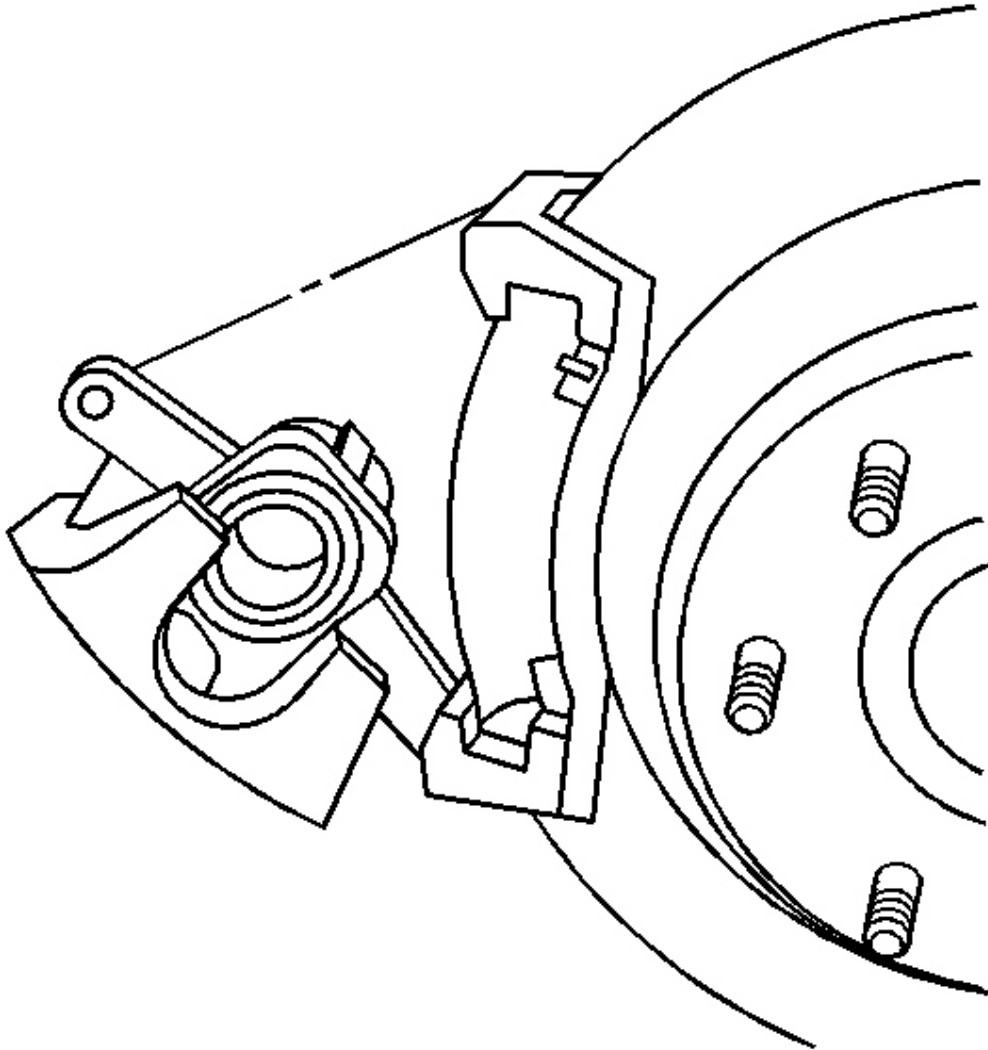


Fig. 25: View Of Rear Brake Caliper Rotated Downward
Courtesy of GENERAL MOTORS CORP.

7. Remove the upper brake caliper mounting bolt.
8. Rotate the rear brake caliper downward until it stops.

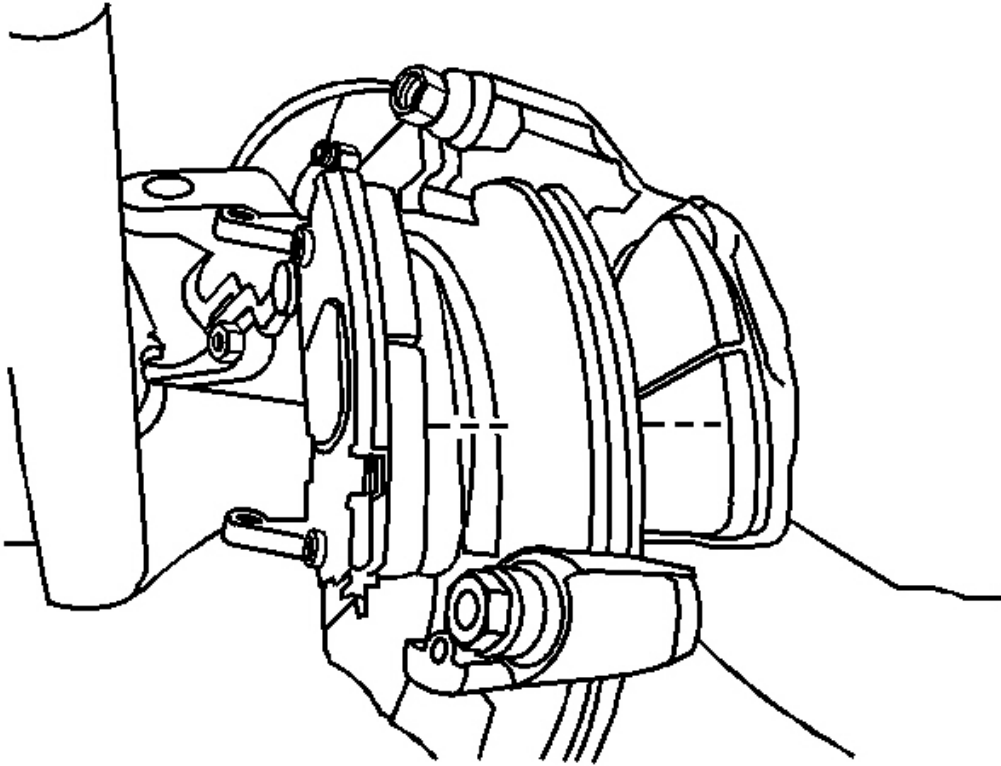


Fig. 26: View Of Caliper Mounting

Courtesy of GENERAL MOTORS CORP.

9. Remove the rear brake pads.

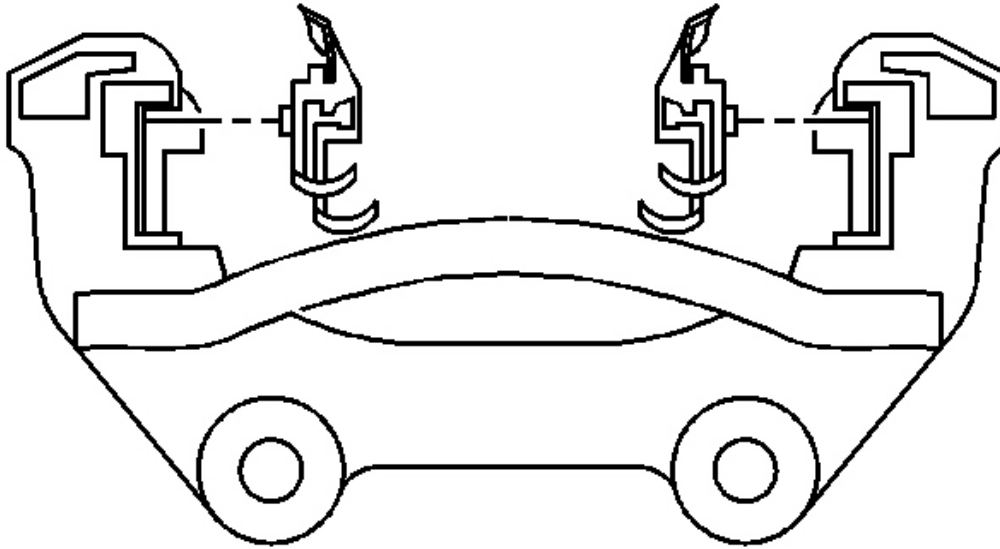


Fig. 27: View Of Caliper Bracket
Courtesy of GENERAL MOTORS CORP.

10. Remove the brake pad retaining clips from the brake caliper mounting bracket.

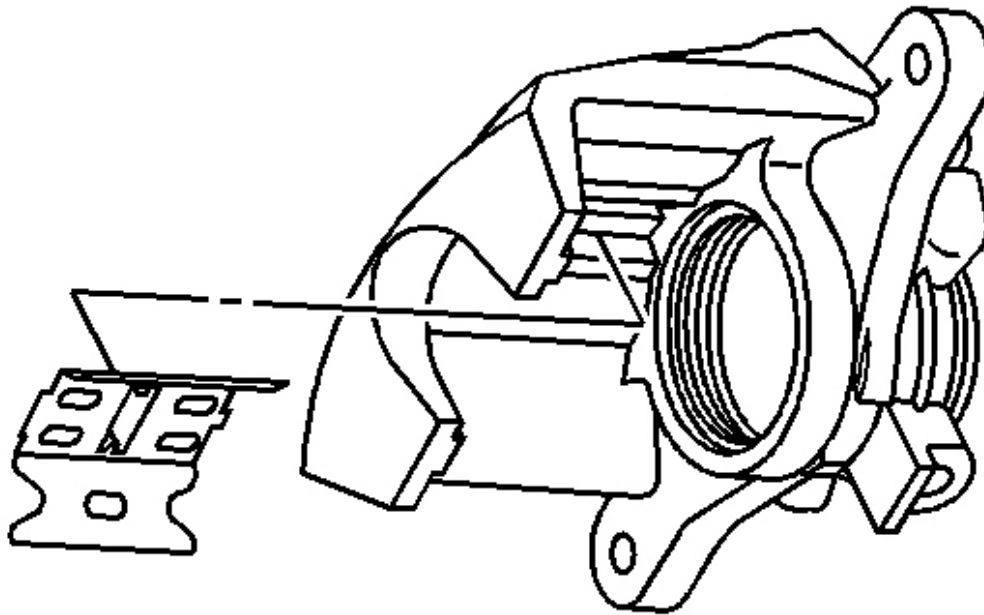


Fig. 28: View Of Caliper & Retaining Clip
Courtesy of GENERAL MOTORS CORP.

11. Remove the retaining clip from the brake caliper.
12. Clean the brake caliper mounting bracket with denatured alcohol.
13. Using non-lubricated, filtered air, dry the brake caliper mounting bracket.

Installation Procedure

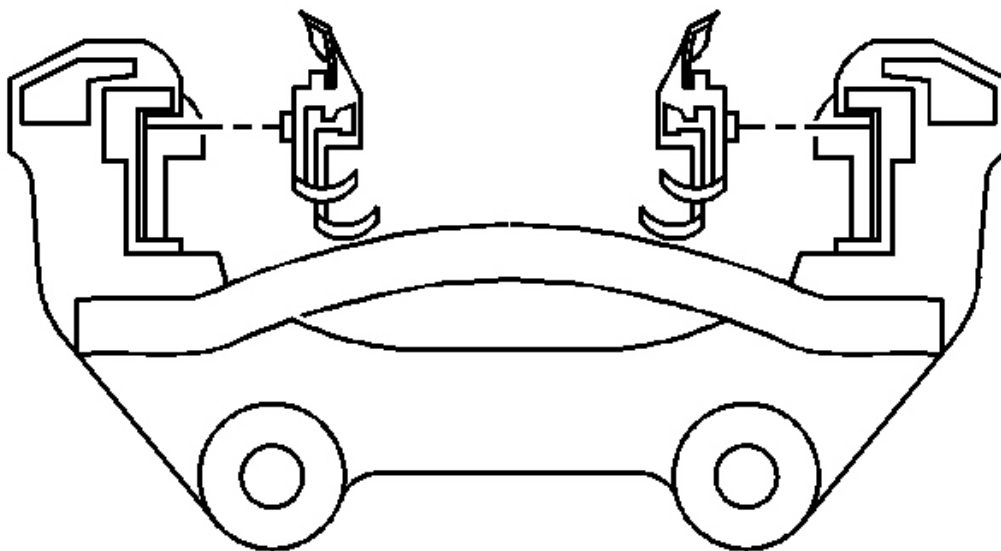


Fig. 29: View Of Caliper Bracket
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: When installing new brake pads, **DO NOT** reuse the old retaining clips for the brake pad. Use only **NEW** brake pad retaining clips.

1. Install the brake pad retaining clips on the brake caliper mounting bracket.

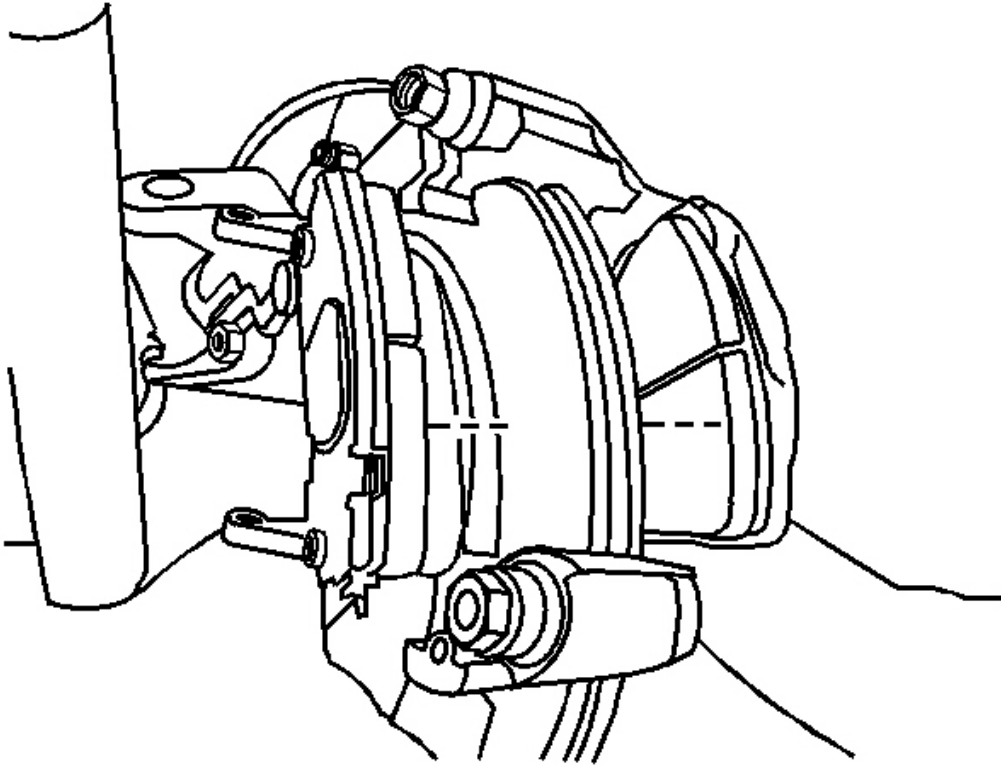


Fig. 30: View Of Caliper Mounting

Courtesy of GENERAL MOTORS CORP.

2. Install the brake pads to the brake caliper mounting bracket.

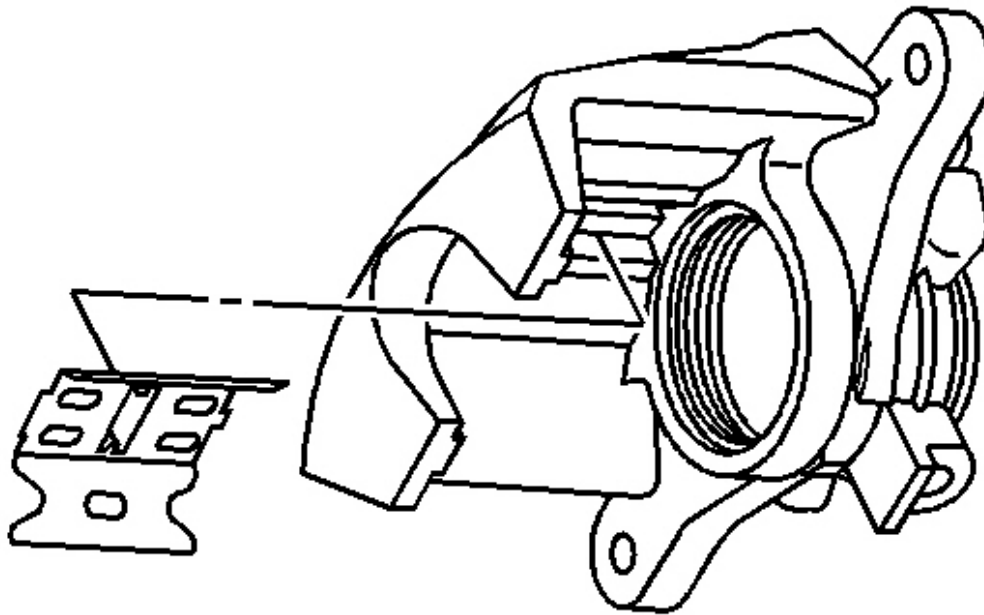


Fig. 31: View Of Caliper & Retaining Clip
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure that the retaining clip for the brake pads is properly seated in the brake caliper.

3. Install the retaining clip from the brake caliper.

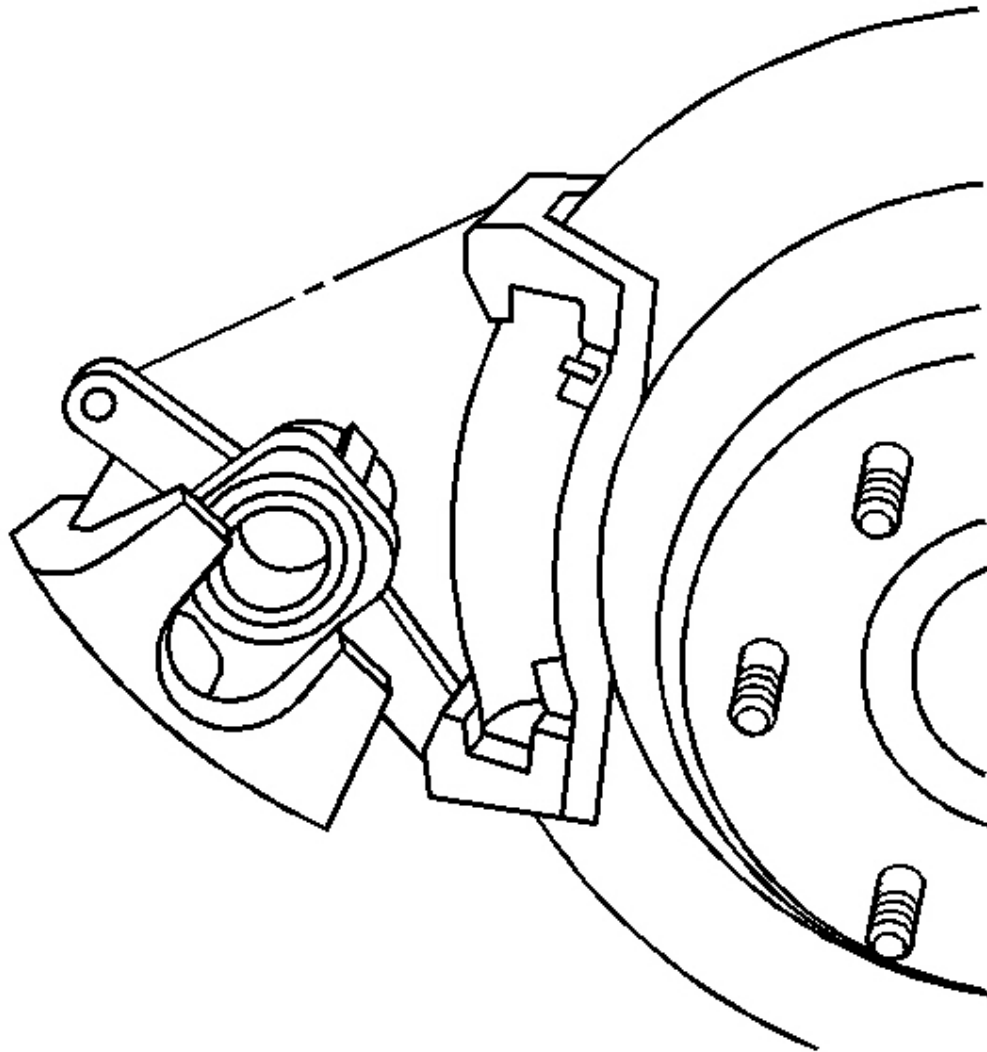


Fig. 32: View Of Rear Brake Caliper Rotated Downward
Courtesy of GENERAL MOTORS CORP.

4. Rotate the rear brake caliper upward until the brake caliper assembly is in the proper position.

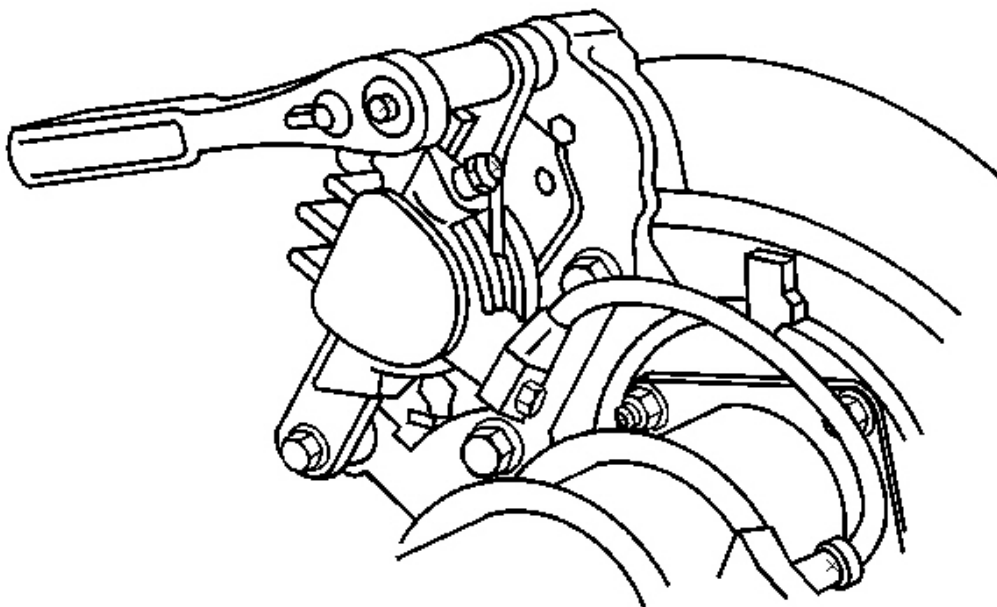


Fig. 33: Removing/Installing Upper Brake Caliper Mounting Bolt
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

5. Install the upper brake caliper mounting bolt.

Tighten: Tighten the brake caliper bolt to 31 N.m (23 lb ft).

6. Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation .
7. Lower the vehicle. Refer to Lifting and Jacking the Vehicle .
8. Fill the brake master cylinder reservoir, if needed. Refer to Master Cylinder Reservoir Filling .

CAUTION: Refer to Firm Brake Pedal Caution .

9. Pump the brake pedal slowly and firmly in order to seat the brake pads.
10. Burnish the new brake pads. Refer to Brake Pad and Rotor Burnishing.

BRAKE PAD & ROTOR BURNISHING

2008 Isuzu Ascender LS

2008 BRAKES Disc Brakes - Ascender, Envoy & Trailblazer

CAUTION: Refer to Road Test Caution .

Burnishing the brake pads and brake rotors is necessary in order to ensure that the braking surfaces are properly prepared after service has been performed on the disc brake system.

This procedure should be performed whenever the disc brake rotors have been refinished or replaced, and/or whenever the disc brake pads have been replaced.

1. Select a smooth road with little or no traffic.
2. Accelerate the vehicle to 48 km/h (30 mph).

IMPORTANT: Use care to avoid overheating the brakes while performing this step.

3. Using moderate to firm pressure, apply the brakes to bring the vehicle to a stop. Do not allow the brakes to lock.
4. Repeat steps 2 and 3 until approximately 20 stops have been completed. Allow sufficient cooling periods between stops in order to properly burnish the brake pads and rotors.

FRONT BRAKE CALIPER REPLACEMENT

CAUTION: Refer to Brake Dust Caution .

CAUTION: Refer to Brake Fluid Irritant Caution .

Removal Procedure

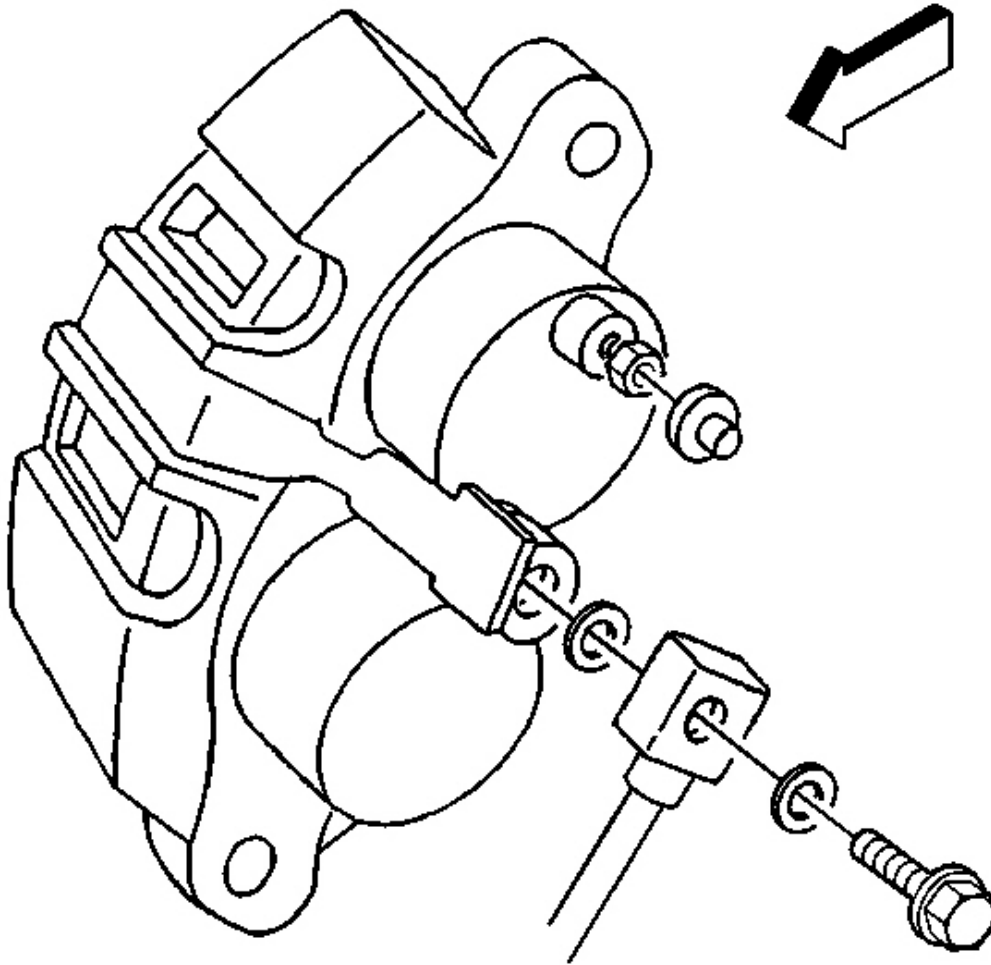


Fig. 34: View Of Banjo Fitting To Caliper
Courtesy of GENERAL MOTORS CORP.

1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the front brake hose bolt.
4. Install a plug in the front brake caliper hose in order to prevent excessive brake fluid loss and contamination.
5. Discard the metal/copper gaskets. DO NOT reuse them replace with NEW copper gaskets.

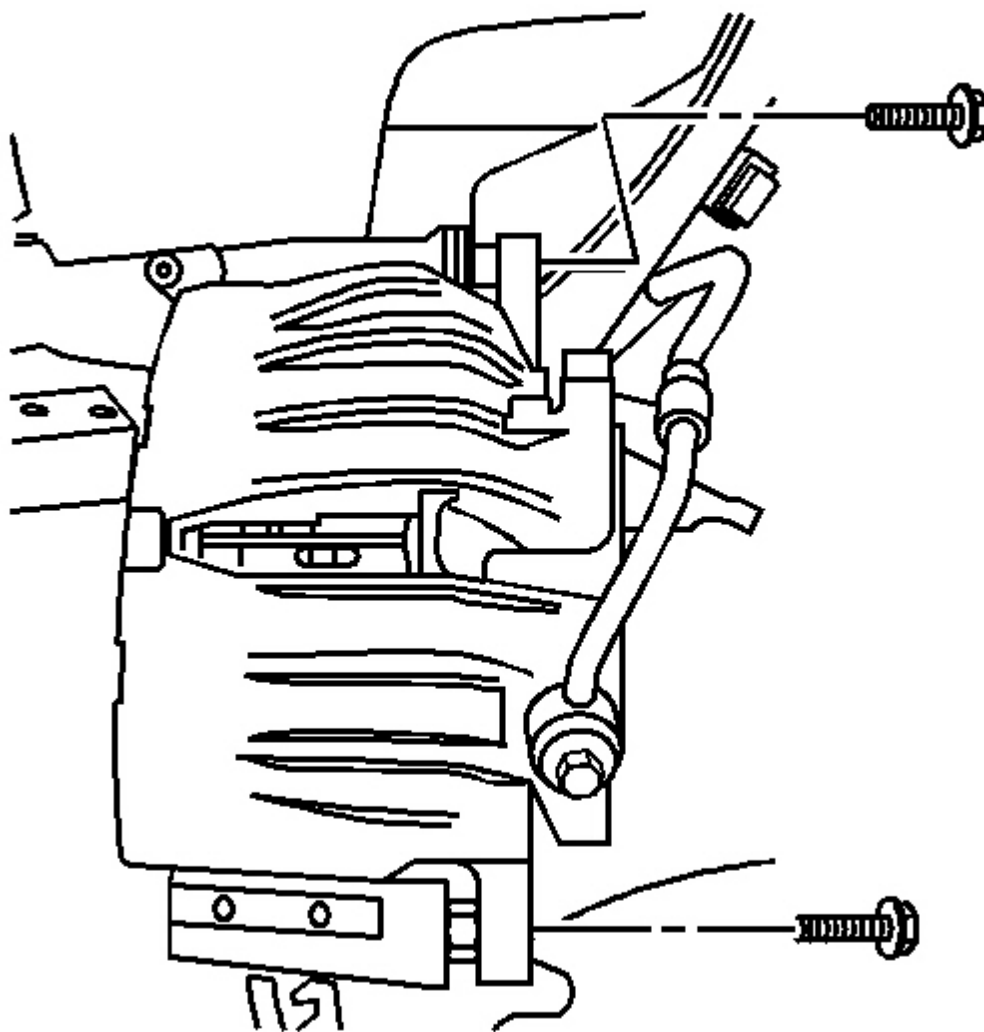


Fig. 35: Front Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS CORP.

6. Remove the front brake caliper guide pin bolts.
7. Remove the front brake caliper from the mounting bracket.

Installation Procedure

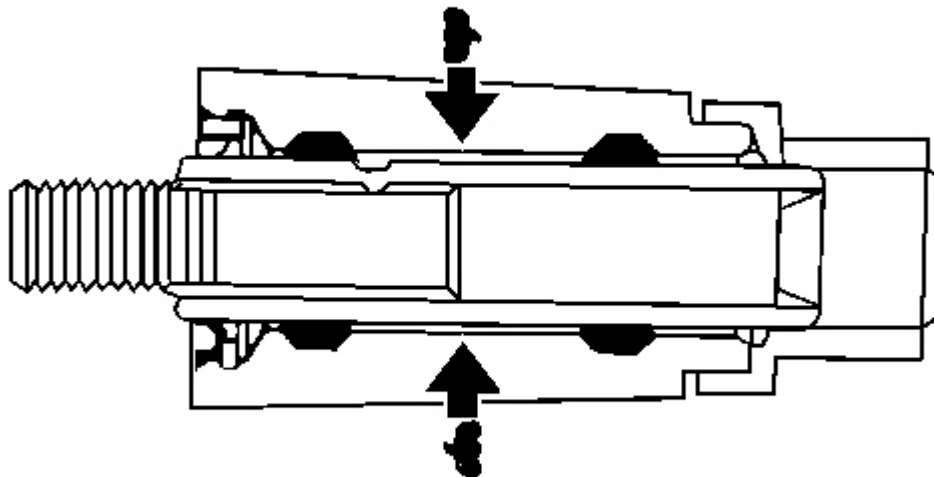


Fig. 36: View Of Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS CORP.

1. If the brake caliper guide pin is to be reused, clean the brake caliper guide pin using denatured alcohol, or equivalent.
2. Dry the brake caliper guide pin using non-lubricated, filtered air.
3. Apply high temperature silicone brake lubricant to the brake caliper guide pin. DO NOT apply lubricant to the brake pad hardware.

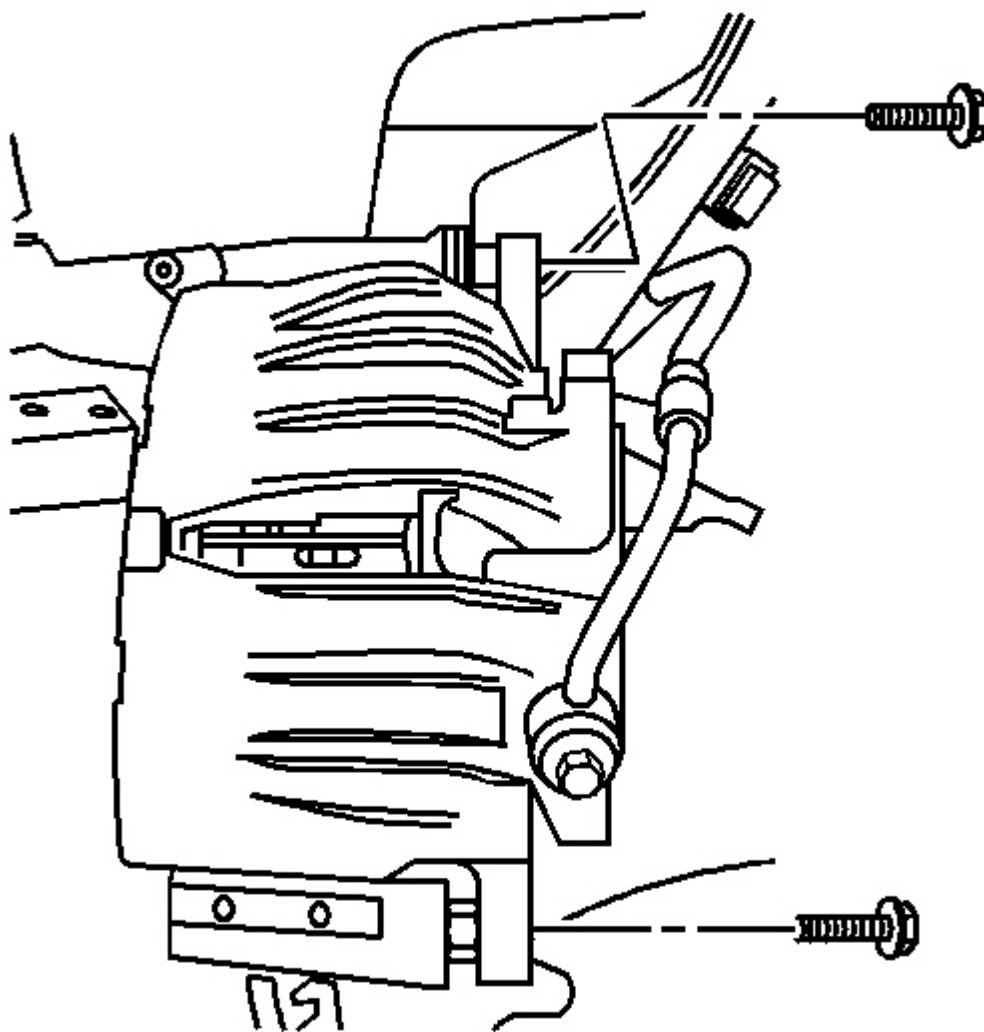


Fig. 37: Front Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS CORP.

4. Install the front brake caliper to the mounting bracket.

NOTE: Refer to Fastener Notice .

IMPORTANT: Tighten the leading bolt, closest to the bleed screw, first.

5. Install the front brake caliper guide pins bolts.

Tighten: Tighten the front brake caliper guide pin bolts to 64 N.m (47 lb ft).

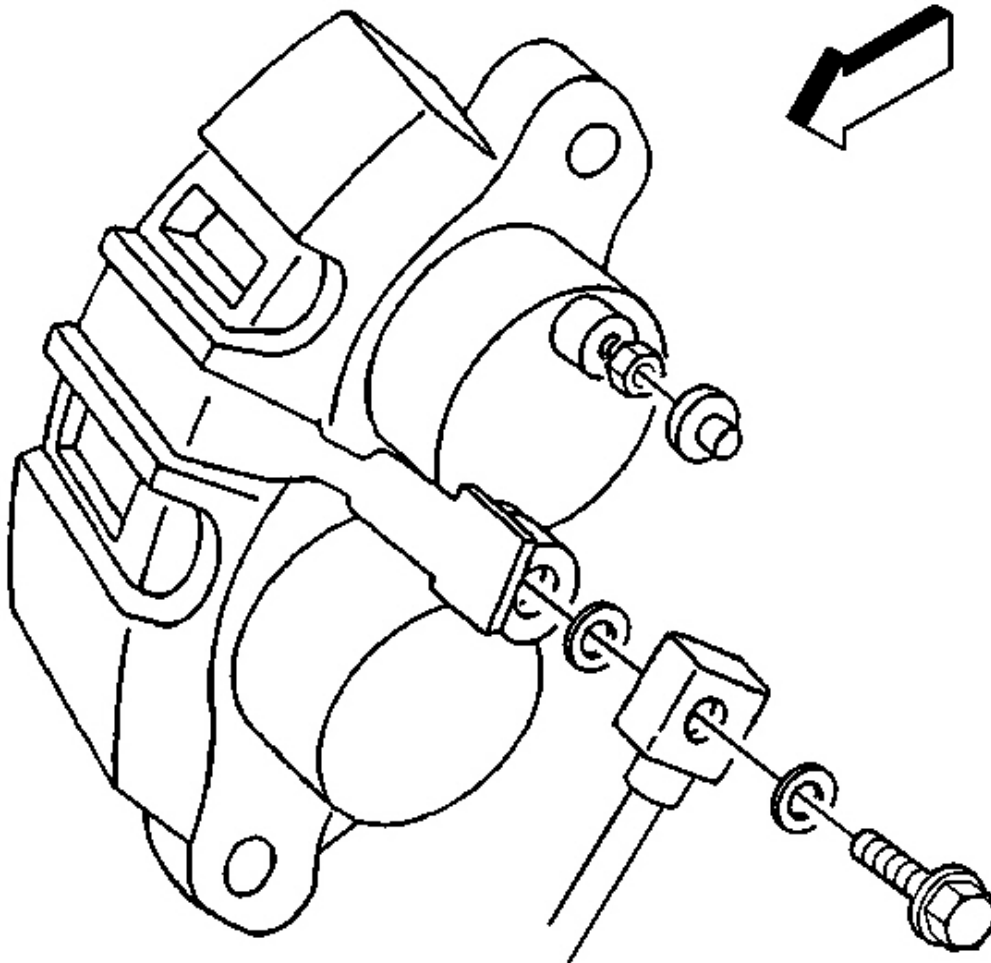


Fig. 38: View Of Banjo Fitting To Caliper
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: DO NOT reuse the metal/copper gaskets. Use only new copper gaskets.

6. Install the NEW metal/copper gaskets to the front brake caliper bolt.
7. Install the front brake hose bolt and gaskets.

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Tighten: Tighten the brake hose bolt to 40 N.m (30 lb ft).

8. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Manual)** or **Hydraulic Brake System Bleeding (Pressure)** .
9. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
10. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

REAR BRAKE CALIPER REPLACEMENT

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

CAUTION: Refer to **Brake Fluid Irritant Caution** .

Removal Procedure

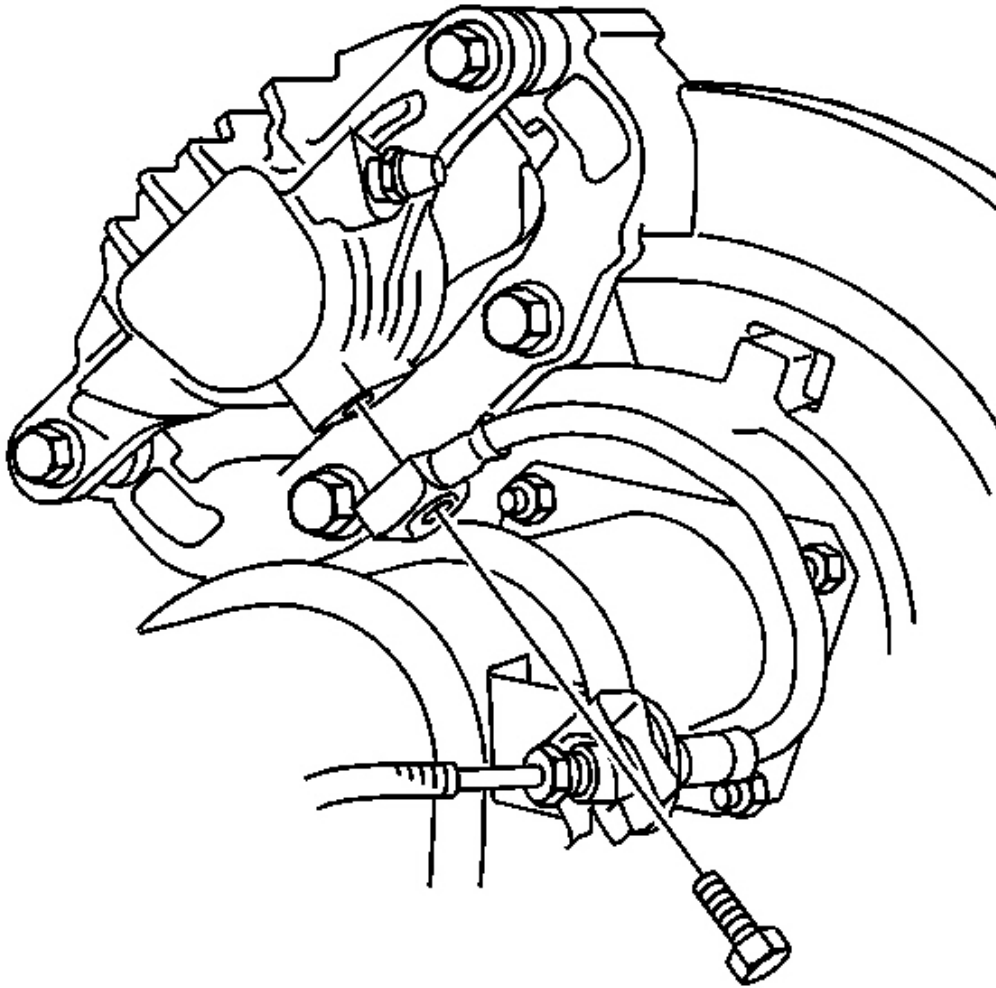


Fig. 39: Locating Brake Hose To Brake Caliper Bolt
Courtesy of GENERAL MOTORS CORP.

1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the rear brake hose bolt from the rear brake caliper.
4. Plug the opening of the brake hose in order to prevent excessive brake fluid loss and contamination.

IMPORTANT: Discard the copper gaskets. DO NOT reuse the copper, replace them.

5. Remove the copper gaskets from the brake hose bolt.

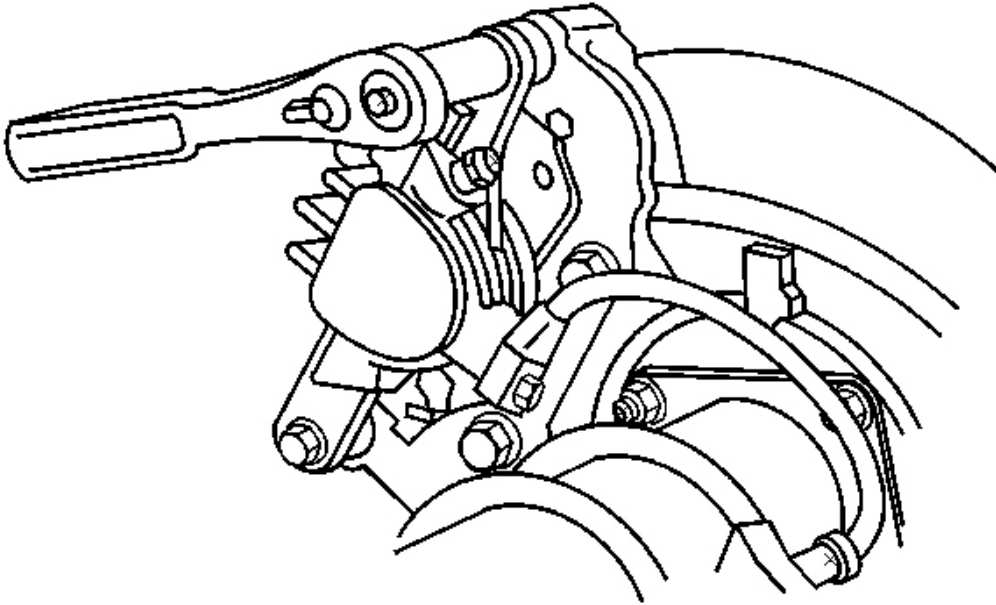


Fig. 40: Removing/Installing Upper Brake Caliper Mounting Bolt
Courtesy of GENERAL MOTORS CORP.

6. Remove the rear brake caliper mounting bolts.

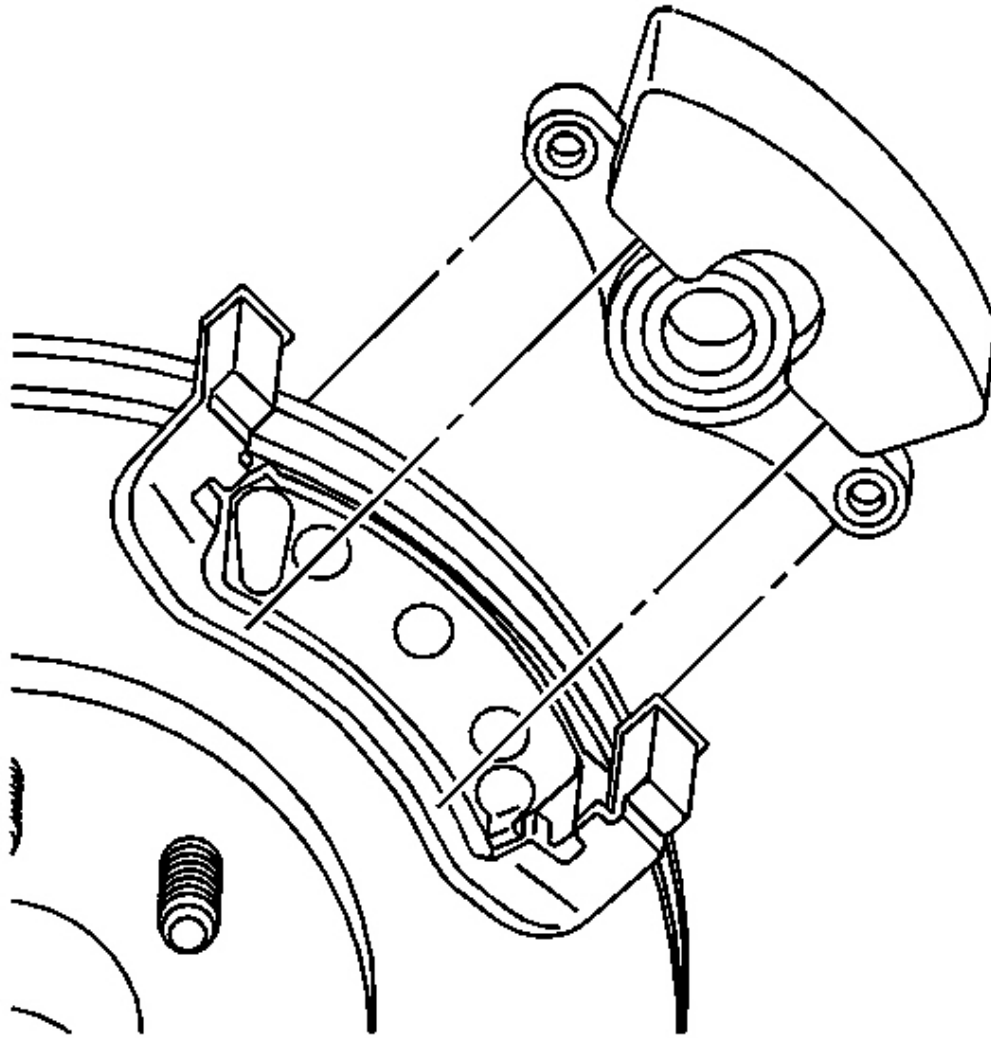


Fig. 41: View of Caliper & Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

7. Remove the rear brake caliper from the brake caliper mounting bracket.

Installation Procedure

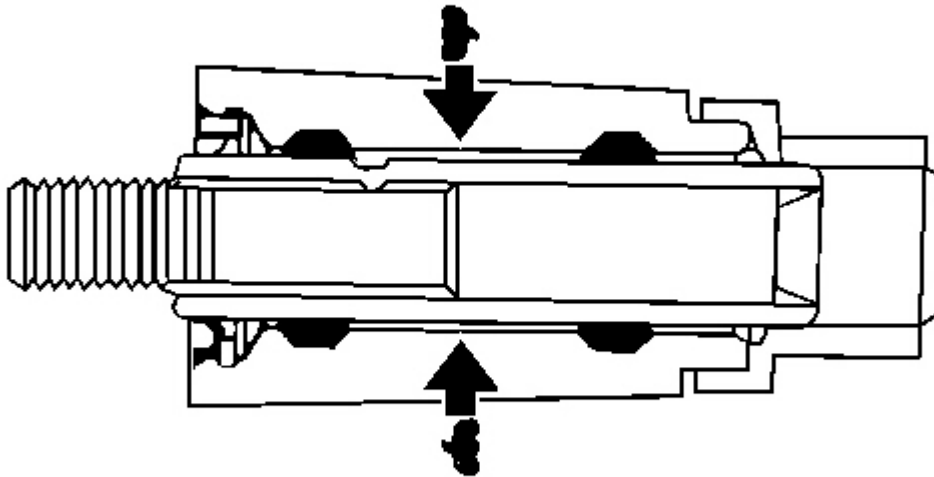


Fig. 42: View Of Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS CORP.

1. If the brake caliper guide pin is to be reused, clean the brake caliper guide pin using denatured alcohol, or equivalent.
2. Dry the brake caliper guide pin using non-lubricated, filtered air.
3. Apply high temperature silicone brake lubricant to the brake caliper guide pin. DO NOT apply lubricant to the brake pad hardware.

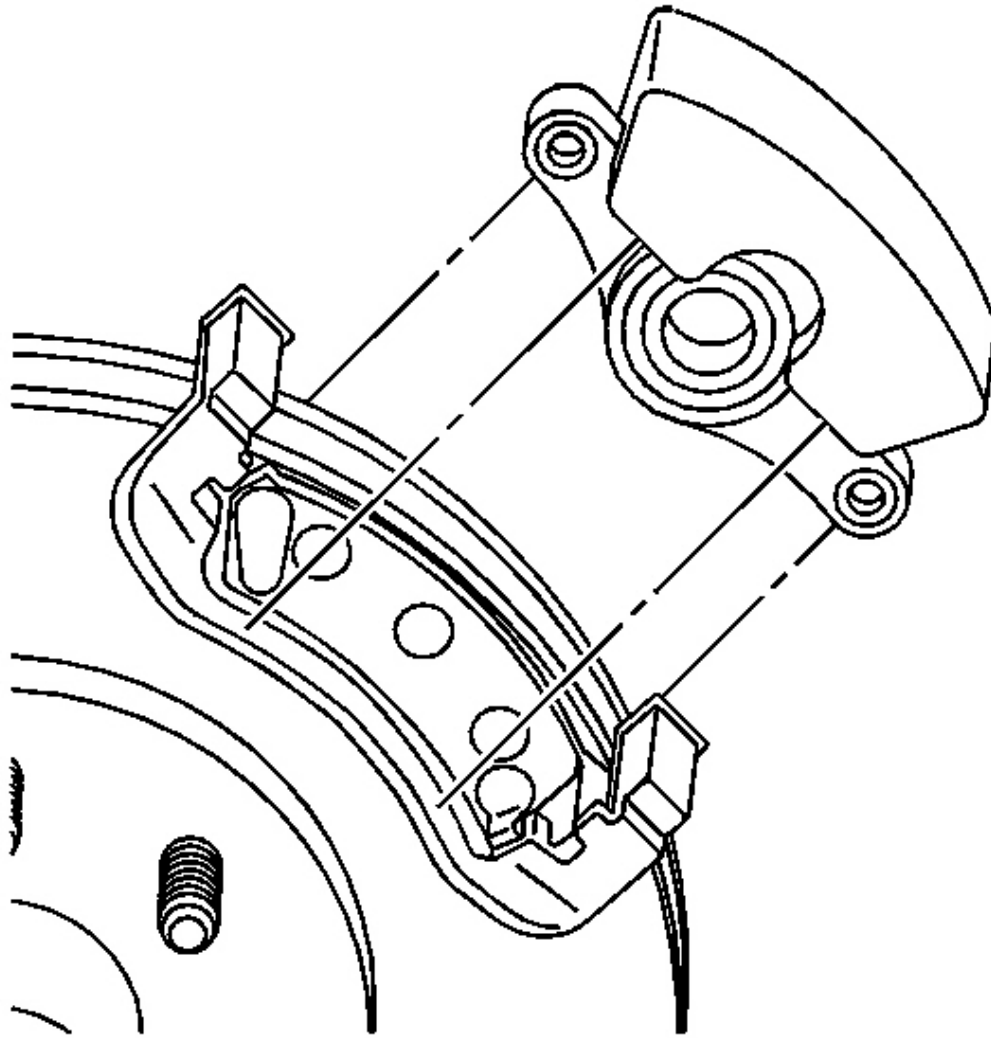


Fig. 43: View of Caliper & Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

4. Install the rear brake caliper assembly to the mounting bracket.

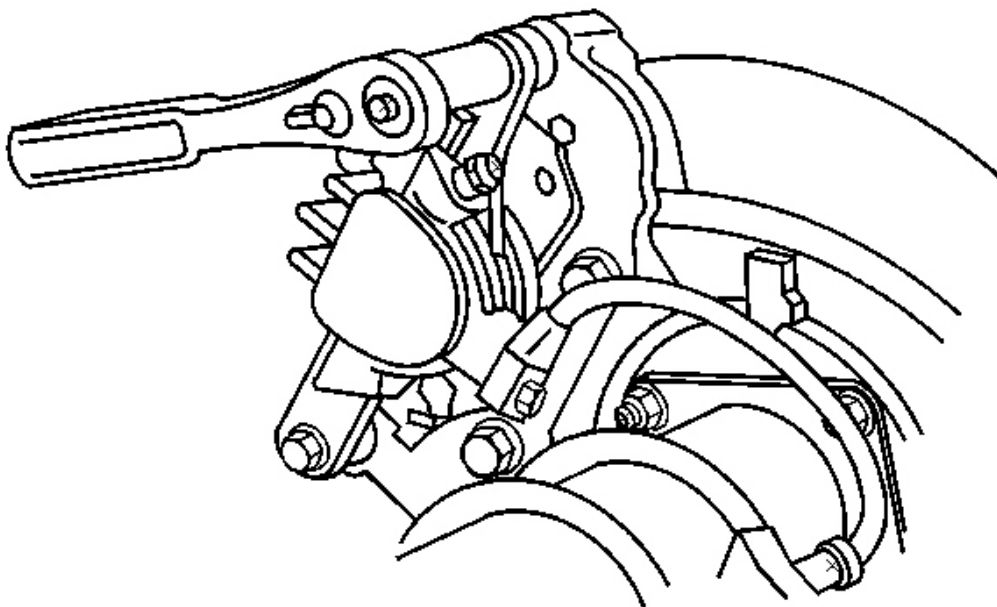


Fig. 44: Removing/Installing Upper Brake Caliper Mounting Bolt
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

5. Install the rear brake caliper on the mounting bracket.

Tighten: Tighten the brake caliper guide pins to 31 N.m (23 lb ft).

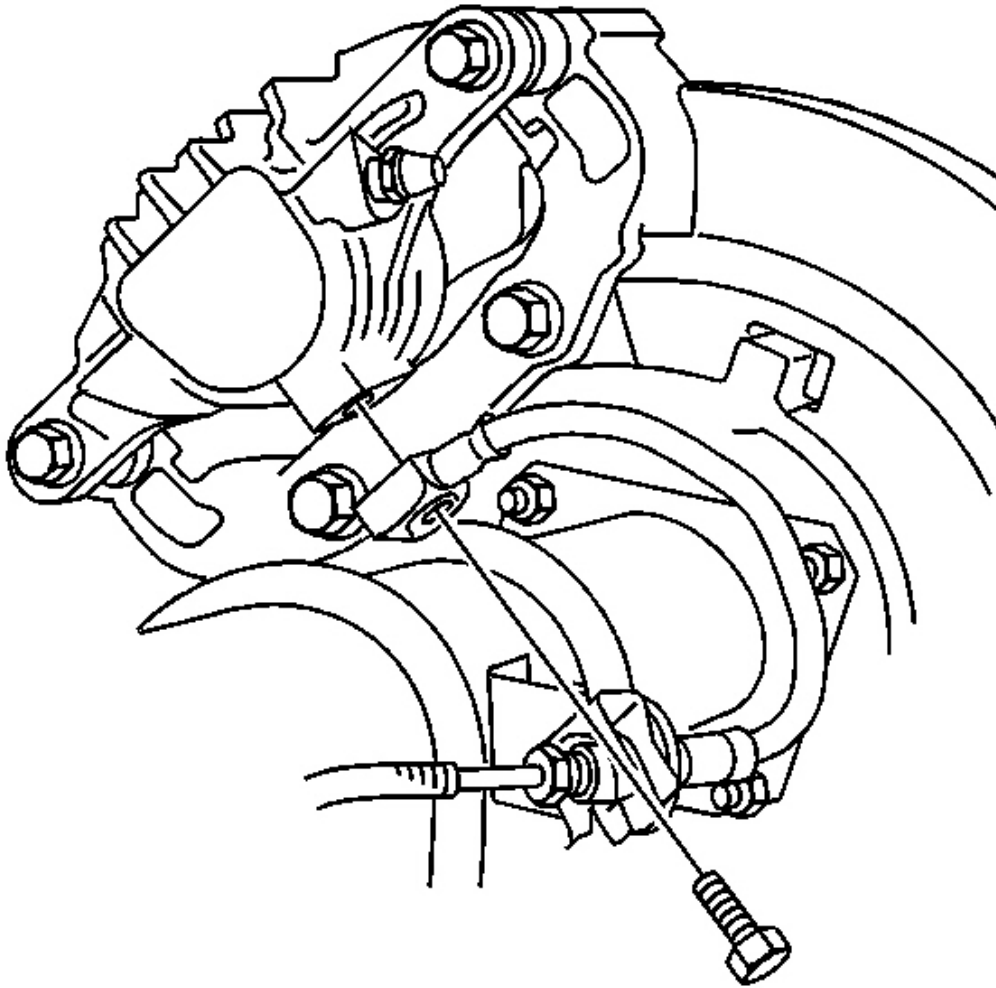


Fig. 45: Locating Brake Hose To Brake Caliper Bolt
Courtesy of GENERAL MOTORS CORP.

6. Install the NEW copper gaskets on the brake hose bolt.
7. Remove the plug from the brake hose end.
8. Install the brake hose bolt on the rear brake caliper.

Tighten: Tighten the brake hose bolt to 40 N.m (30 lb ft).

9. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Manual)** or **Hydraulic Brake System Bleeding (Pressure)** .

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10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
11. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

FRONT DISC BRAKE HARDWARE REPLACEMENT

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

Removal Procedure

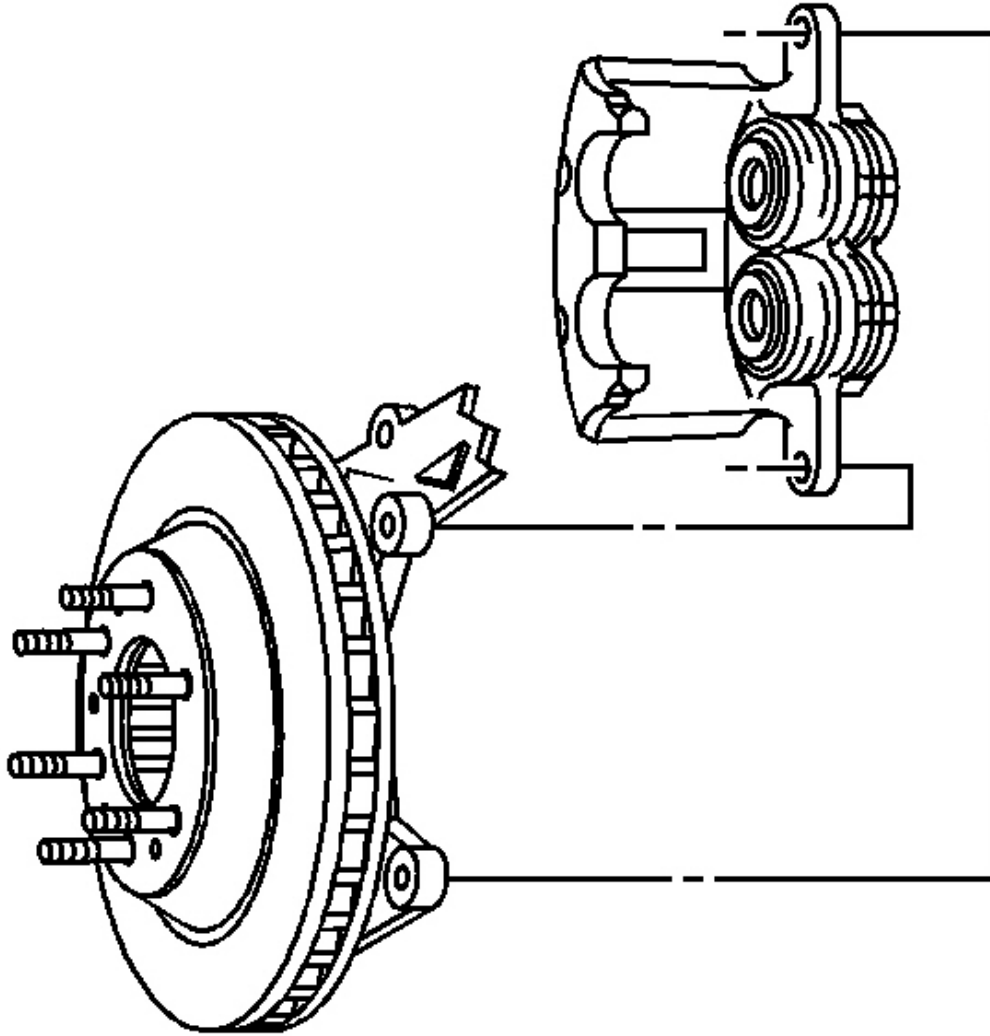


Fig. 46: View Of Rotor & Caliper
Courtesy of GENERAL MOTORS CORP.

1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the brake caliper assembly. Refer to **Front Brake Caliper Replacement**.
4. Inspect the brake caliper assembly. Refer to **Brake Caliper Inspection**.

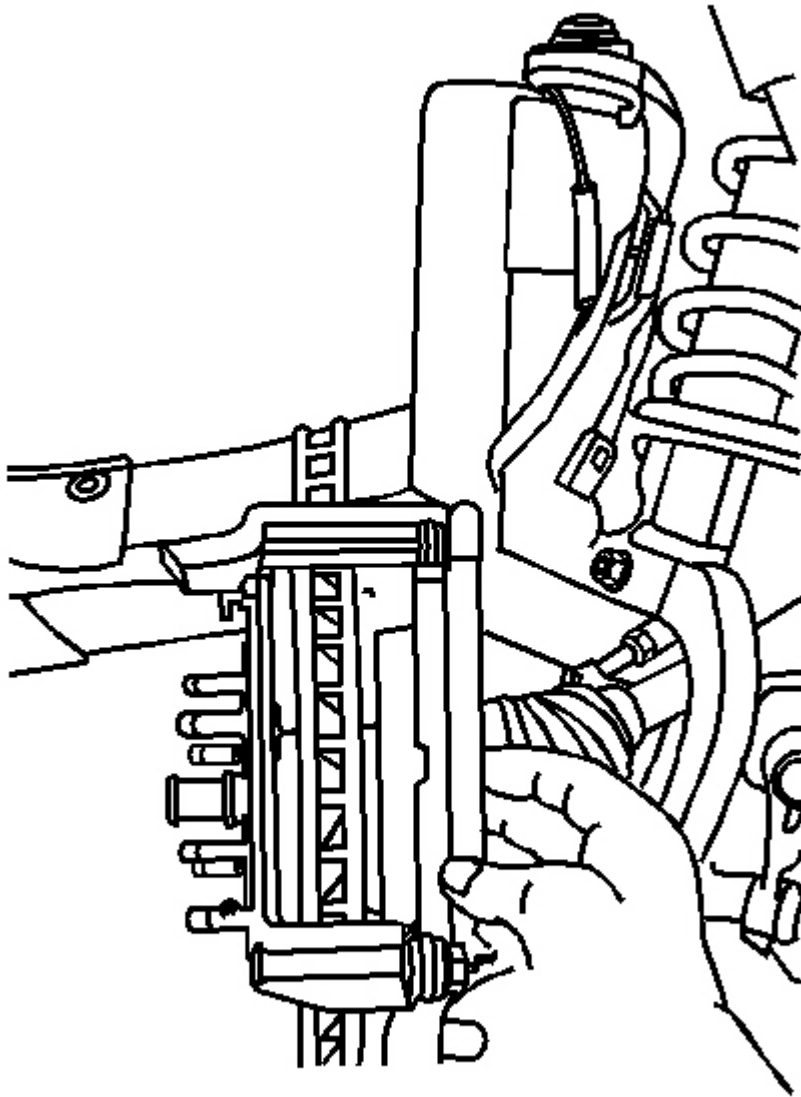


Fig. 47: Removing/Installing Brake Pads From Brake Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

5. Remove the brake pads from the brake mounting bracket.

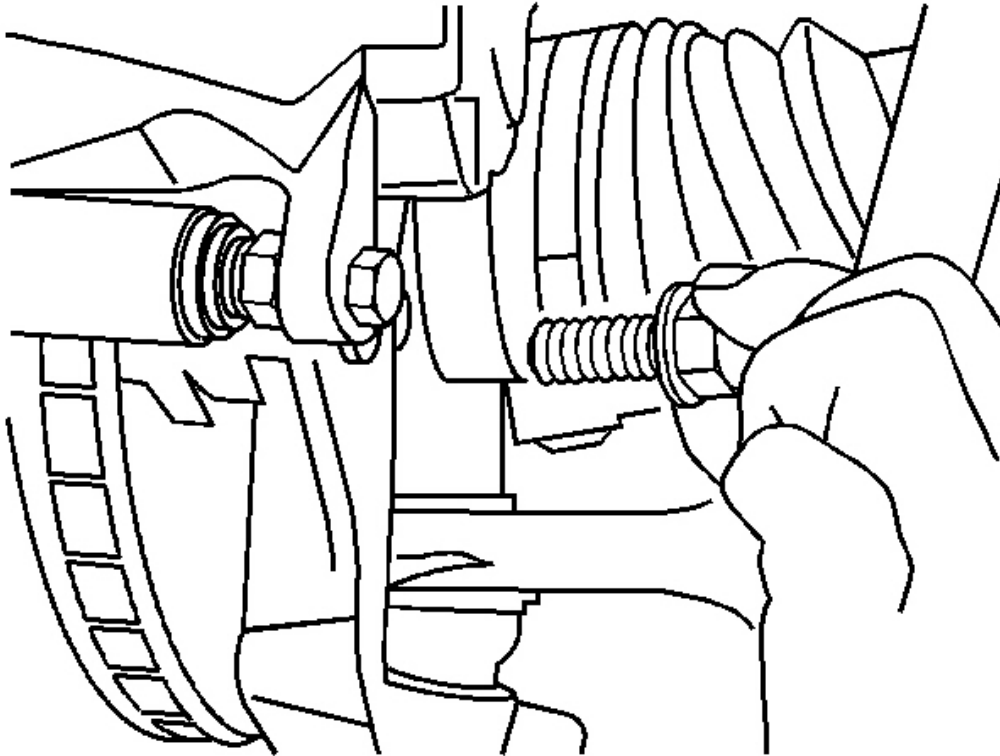


Fig. 48: View of Caliper Mounting
Courtesy of GENERAL MOTORS CORP.

6. Remove the brake caliper mounting bracket retaining bolts. Lower bolt shown.

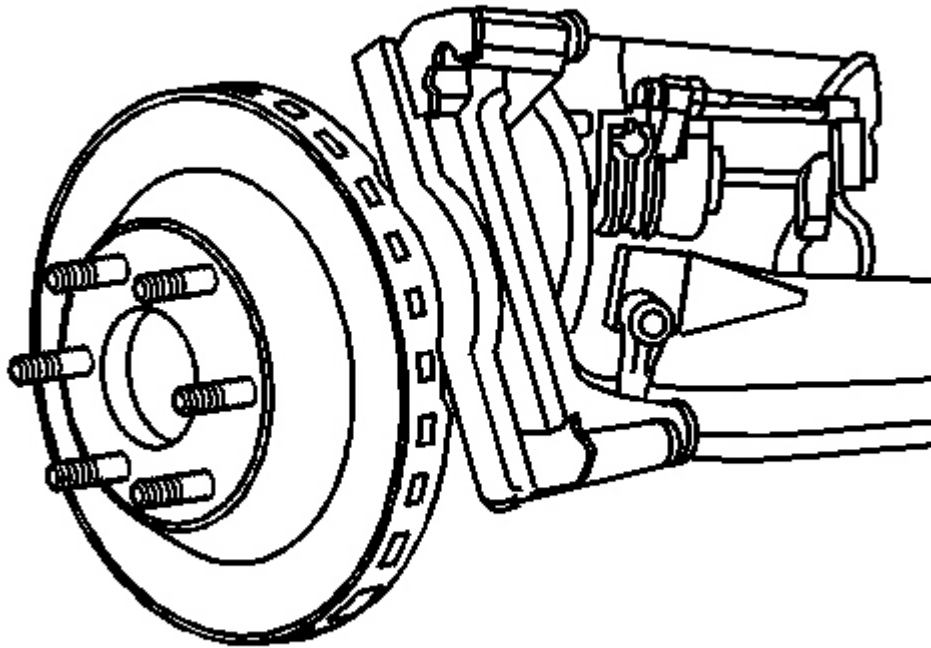


Fig. 49: Identifying Brake Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

7. Remove the brake caliper mounting bracket.

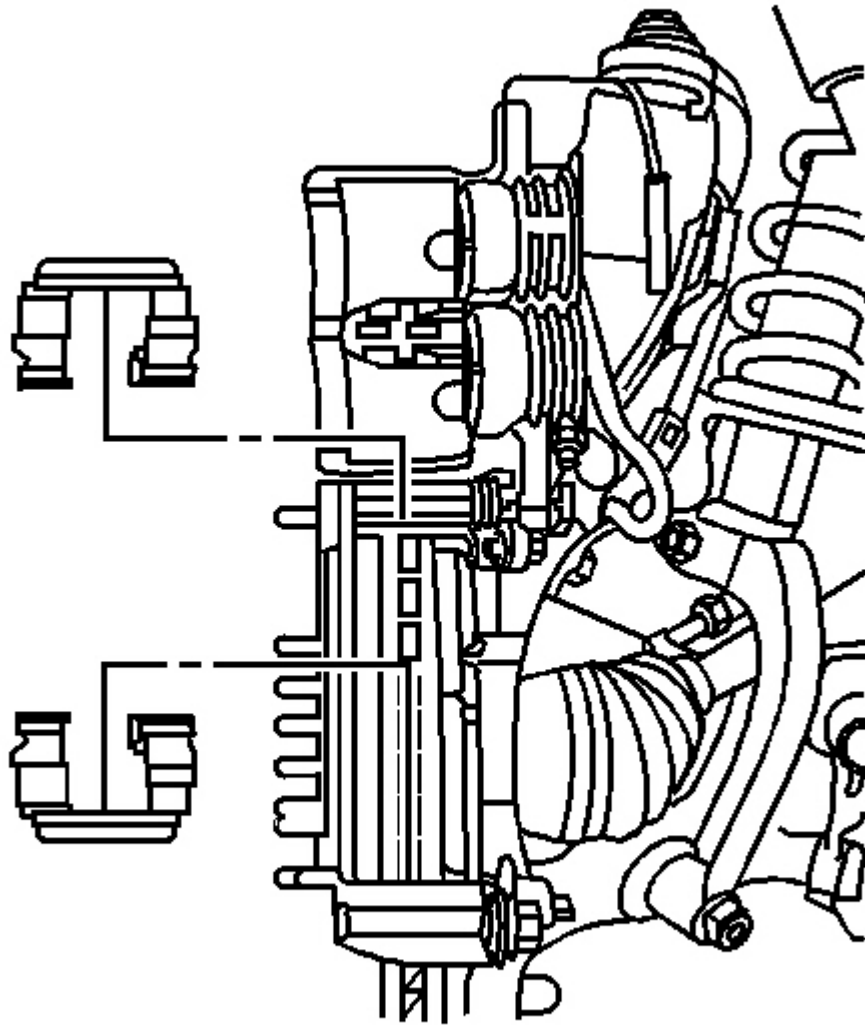


Fig. 50: View Of Caliper & Retaining Clips
Courtesy of GENERAL MOTORS CORP.

8. Remove the brake pad retaining clips from the mounting bracket.

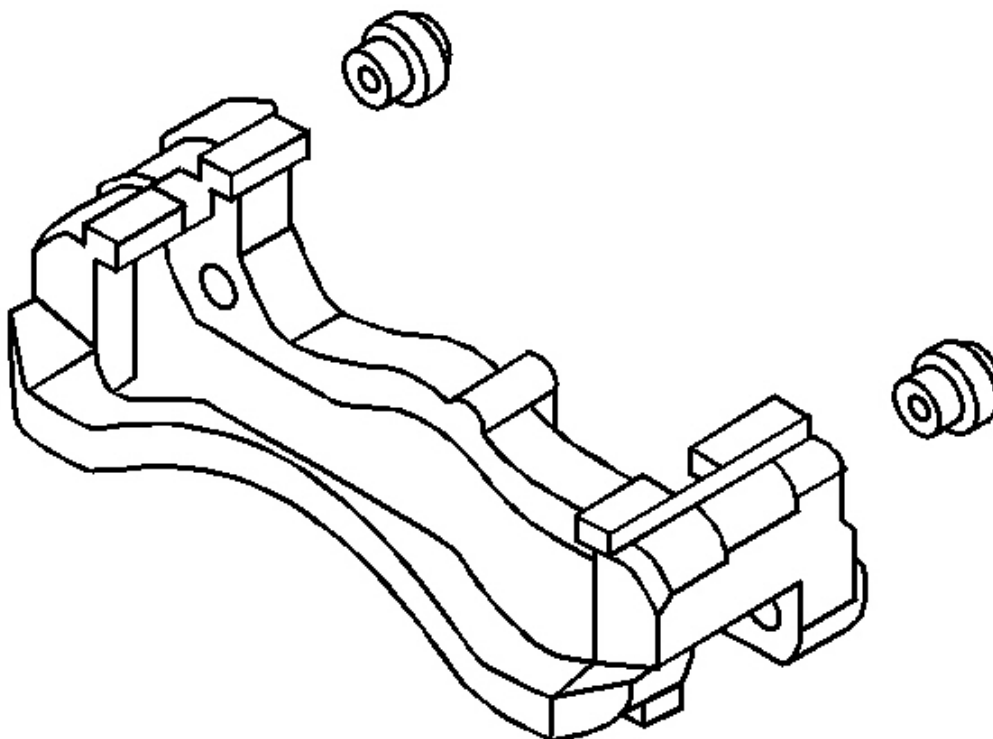


Fig. 51: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

9. Remove the guide pin bushing from the brake caliper mounting bracket.
10. Clean the brake caliper mounting bracket with denatured alcohol.
11. Dry the brake caliper mounting bracket using non-lubricated, filtered air.

Installation Procedure

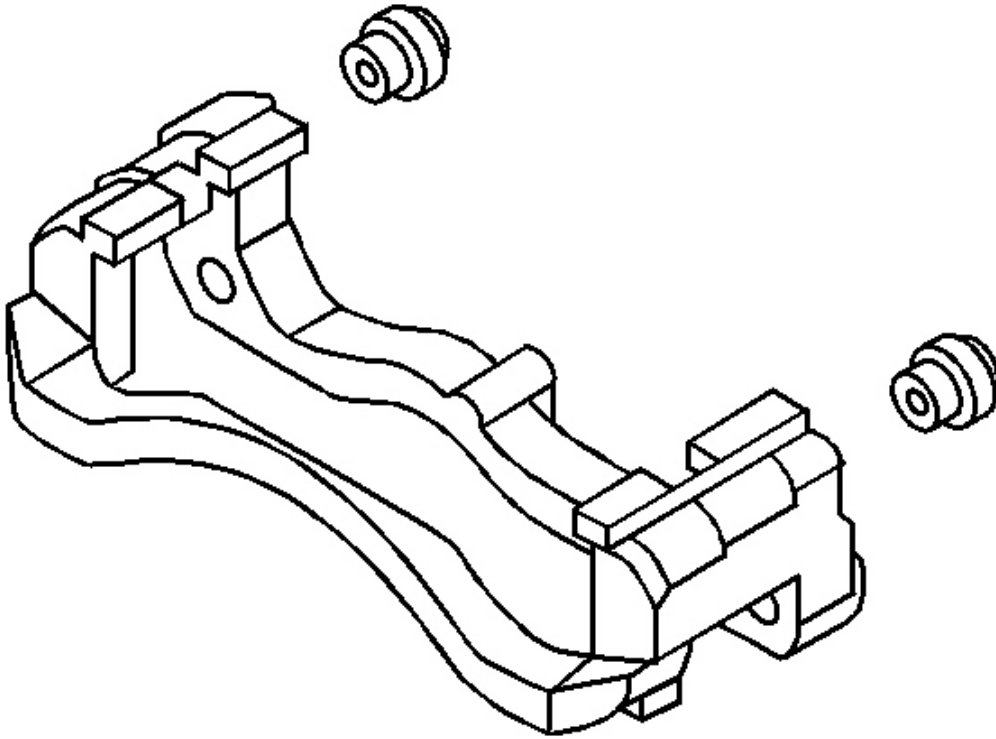


Fig. 52: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

1. Install the guide pin bushing on the brake caliper mounting bracket.

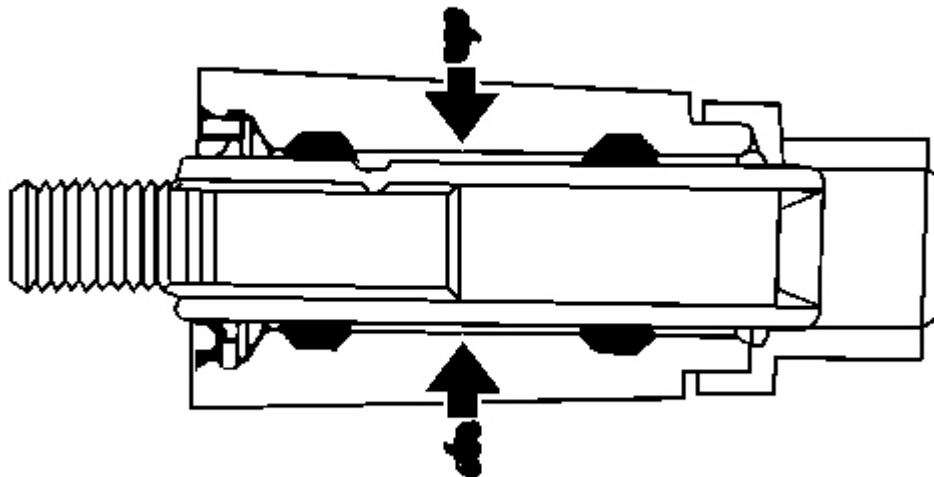


Fig. 53: View Of Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Install the solid steel pin in the leading position and the rubber bushed pin in the trailing position.

2. Install the guide pins in the brake caliper mounting bracket.
3. Apply high temperature silicone brake lubricant to the brake caliper guide pins. DO NOT apply lubricant to the brake pad hardware or retaining clips.

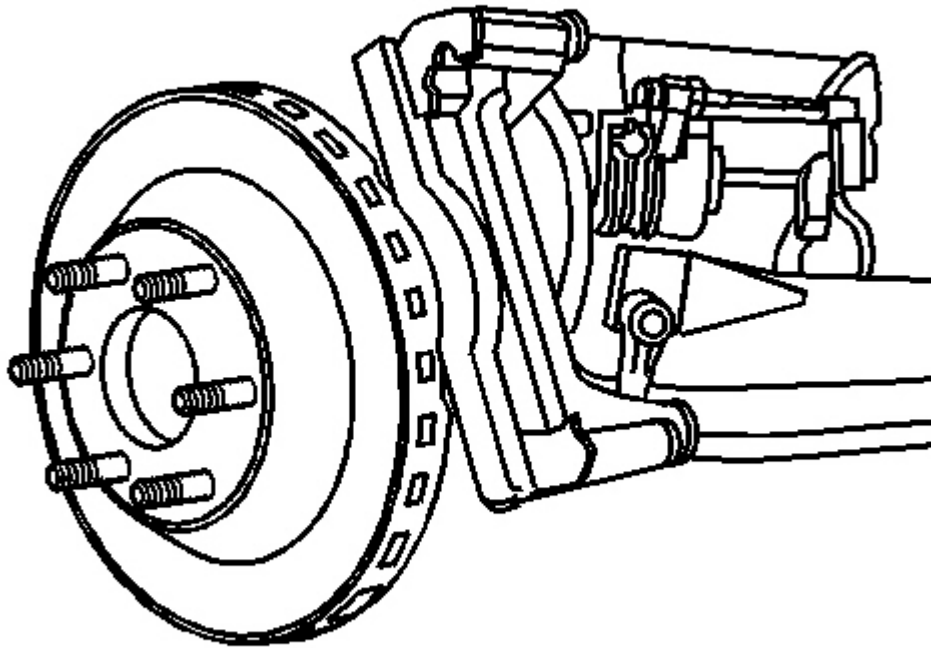


Fig. 54: Identifying Brake Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

4. Install the brake caliper mounting bracket.

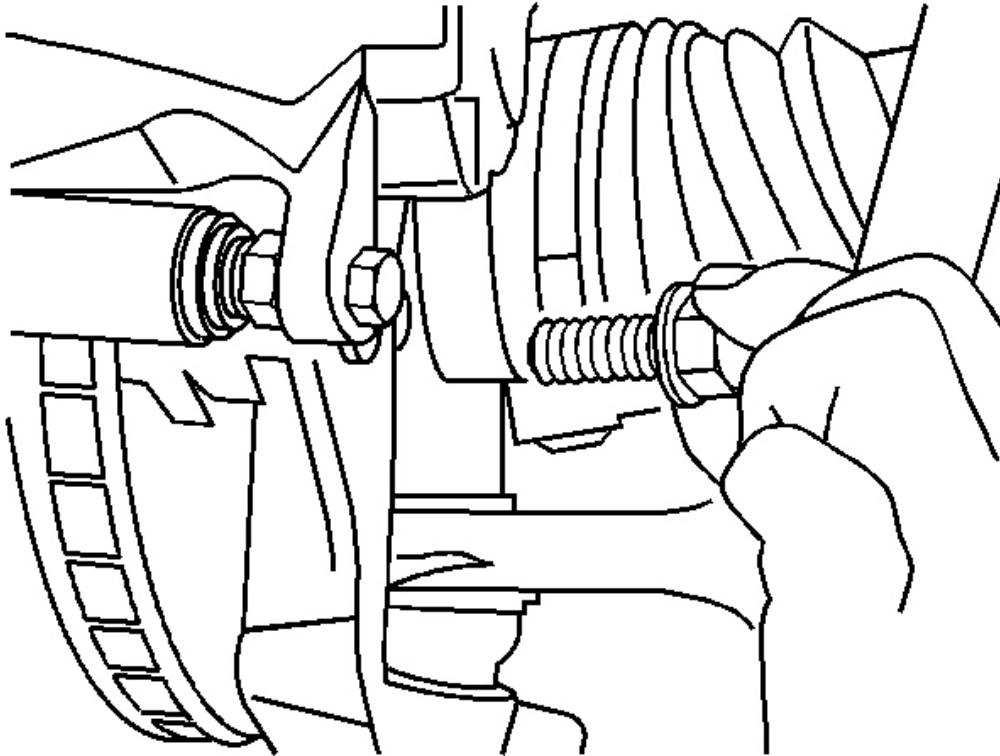


Fig. 55: View of Caliper Mounting
Courtesy of GENERAL MOTORS CORP.

5. Install the brake caliper mounting bracket bolts. Lower bolt shown.
6. Install the brake pad retaining clips to the brake caliper mounting bracket.

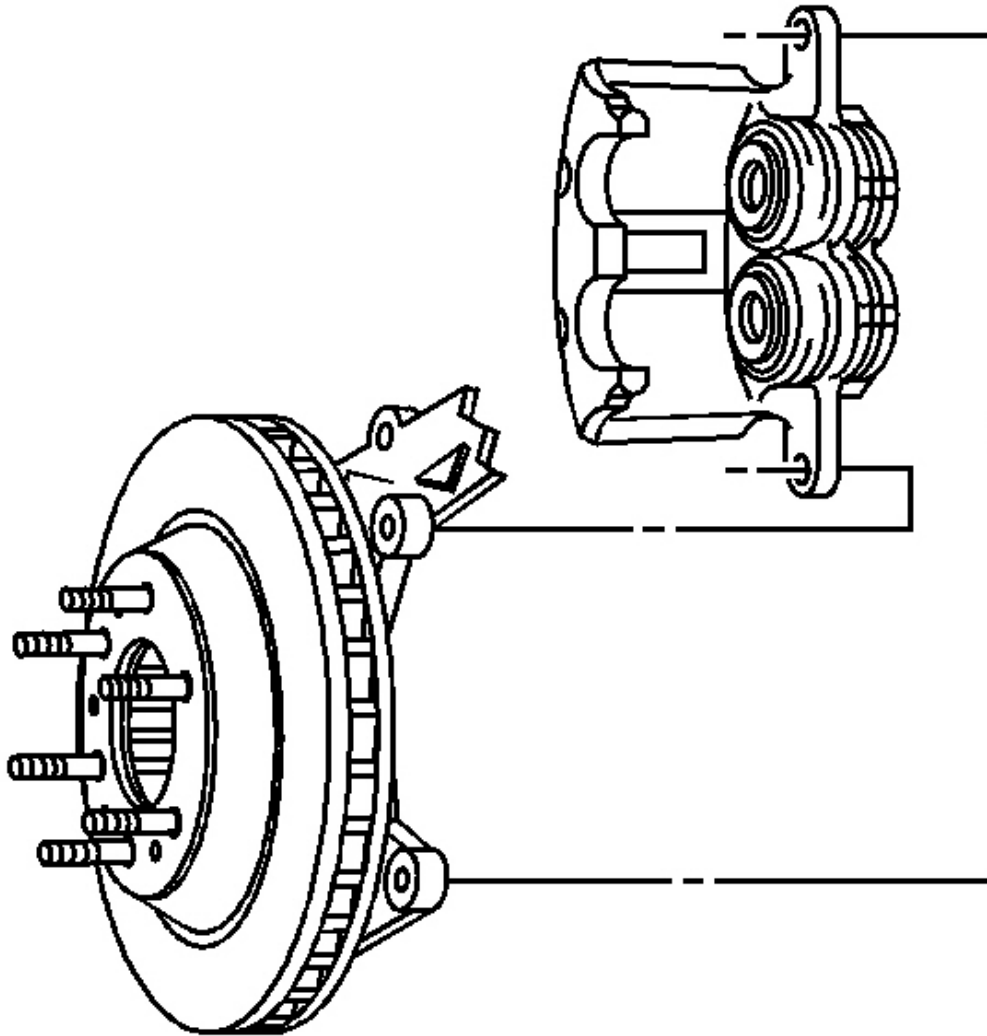


Fig. 56: View Of Rotor & Caliper
Courtesy of GENERAL MOTORS CORP.

7. Install the brake caliper assembly. Refer to **Front Brake Caliper Replacement**.
8. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation**.
9. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**.

REAR DISC BRAKE HARDWARE REPLACEMENT

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

Removal Procedure

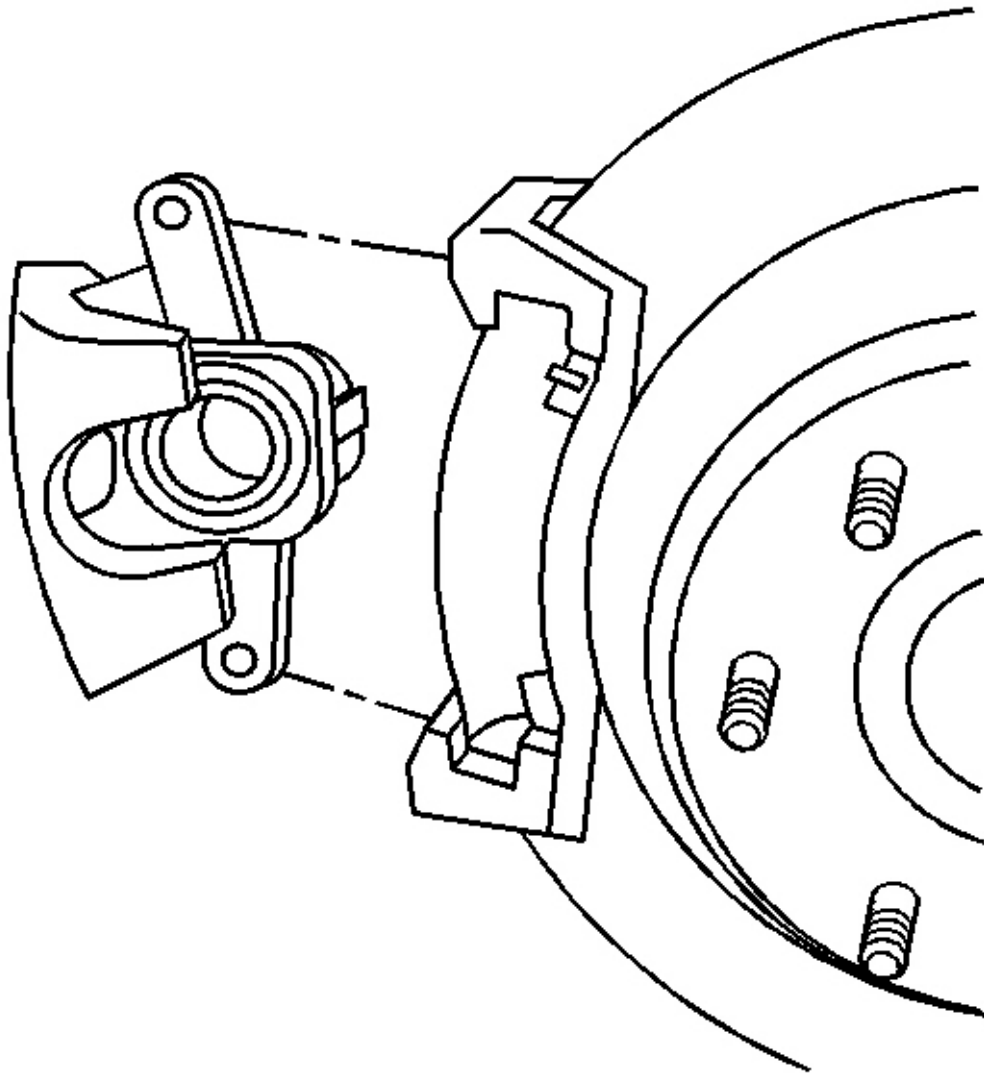


Fig. 57: View Of Caliper To Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .

2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the brake caliper assembly. Refer to **Rear Brake Caliper Replacement**.
4. Inspect the brake caliper assembly. Refer to **Brake Caliper Inspection**.

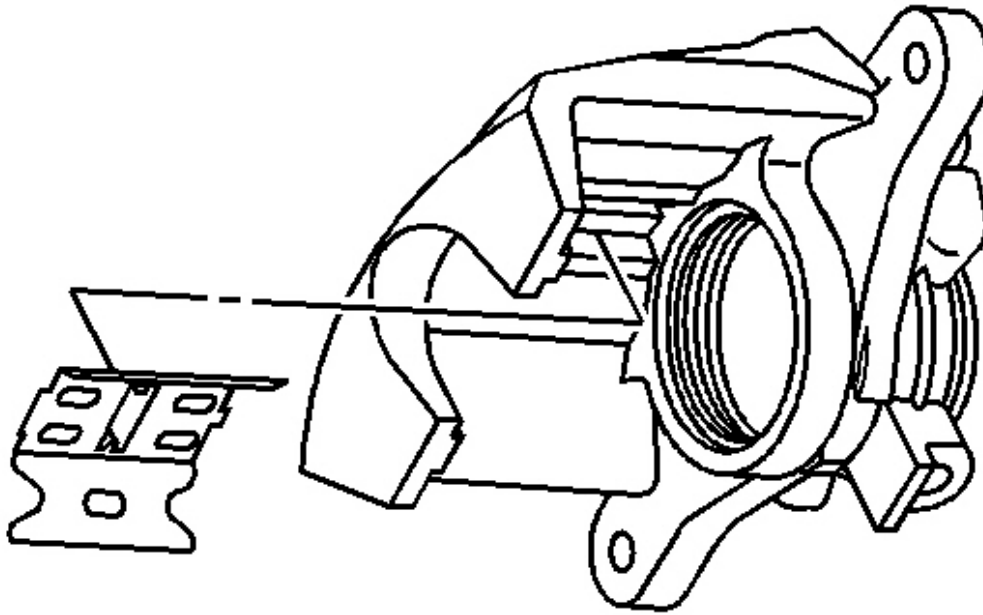


Fig. 58: View Of Caliper & Retaining Clip
Courtesy of GENERAL MOTORS CORP.

5. Remove the brake pad retaining clip from the brake caliper.

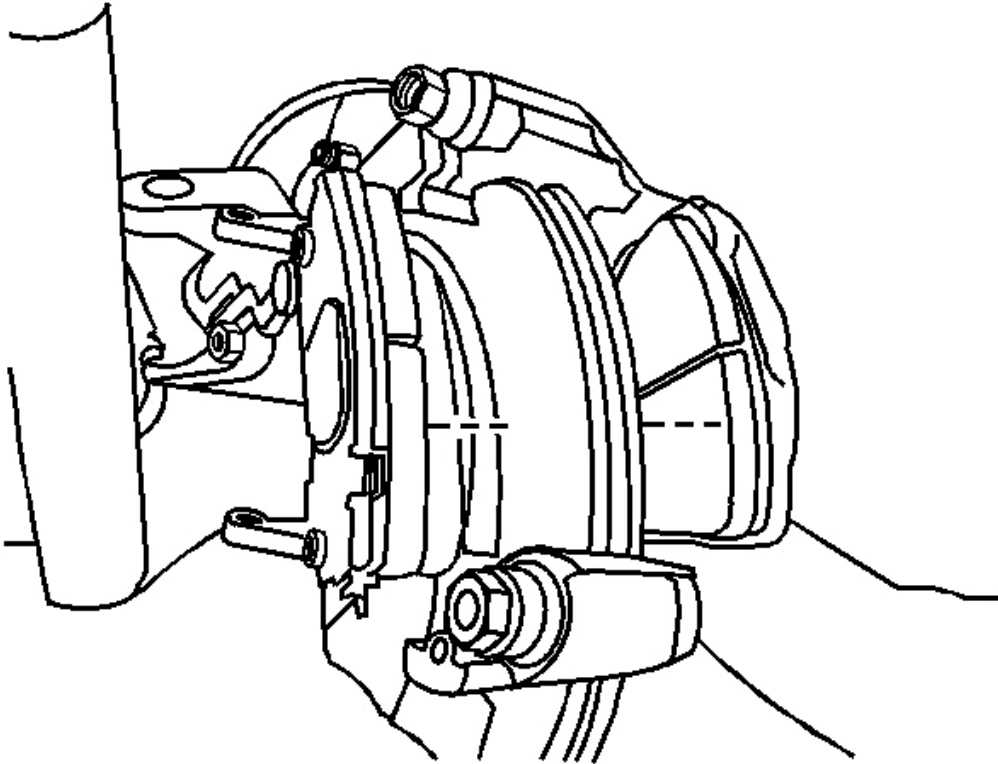


Fig. 59: View Of Caliper Mounting

Courtesy of GENERAL MOTORS CORP.

6. Remove the brake pads from the brake caliper mounting bracket.

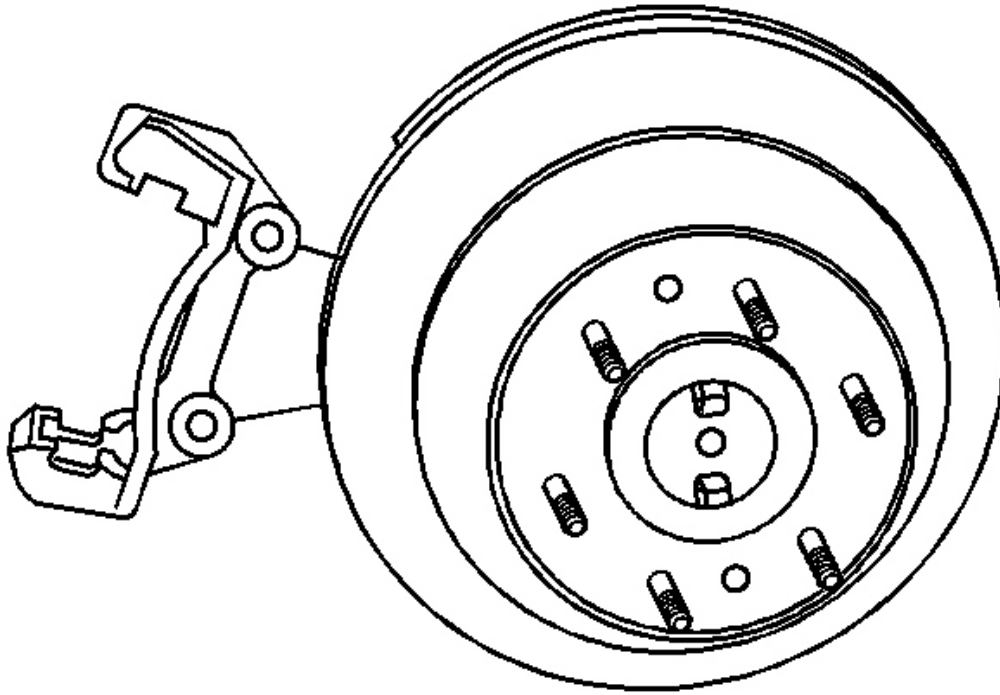


Fig. 60: View Of Caliper Mounting Bracket & Rotor
Courtesy of GENERAL MOTORS CORP.

7. Remove the brake caliper mounting bracket.

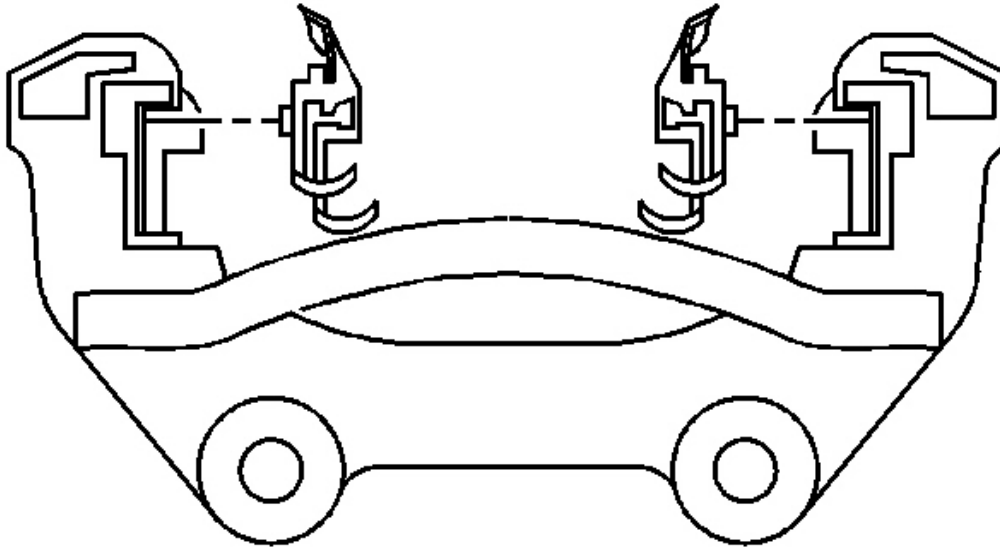


Fig. 61: View Of Caliper Bracket
Courtesy of GENERAL MOTORS CORP.

8. Remove the brake pad retaining clips from the brake caliper mounting bracket.

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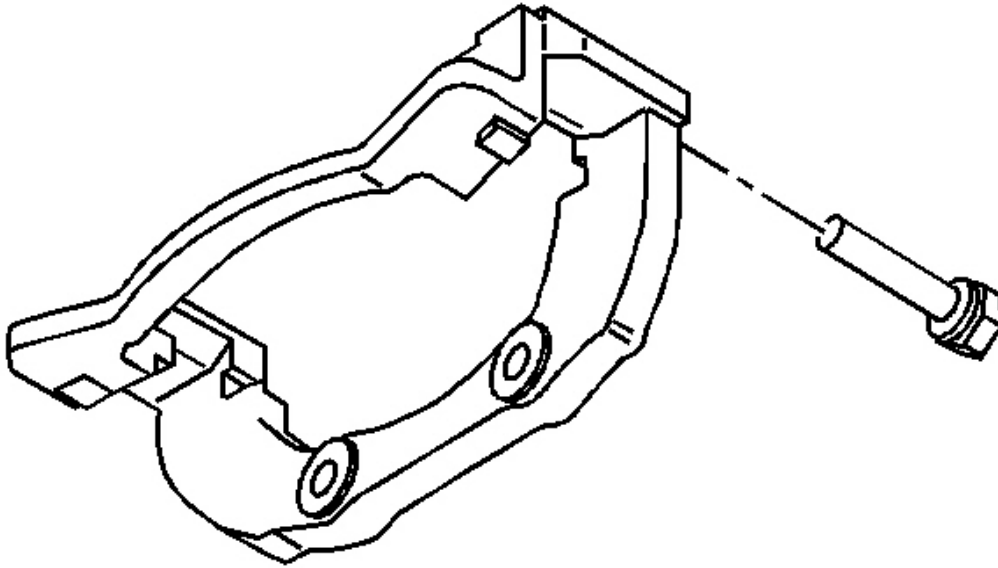


Fig. 62: View Of Brake Caliper Guide Pin & Brake Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

9. Remove the brake caliper guide pins from the brake caliper mounting bracket.

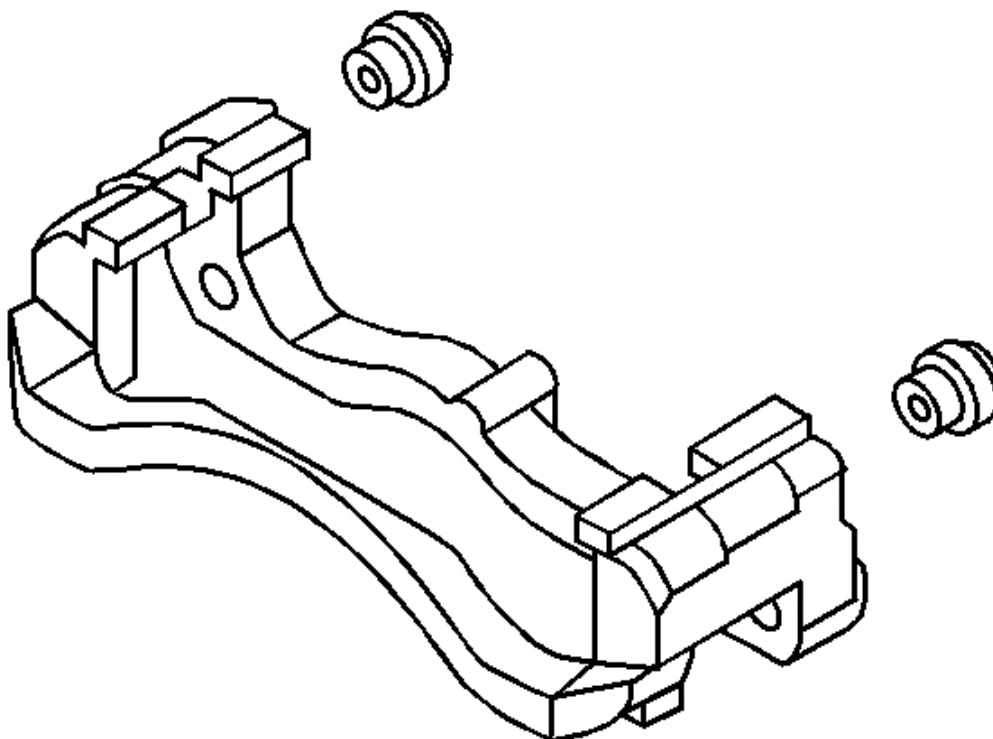


Fig. 63: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

10. Remove the guide pin bushing from the brake caliper mounting bracket.
11. Clean the brake caliper mounting bracket with denatured alcohol.
12. Dry the brake caliper mounting bracket using non-lubricated, filtered air.

Installation Procedure

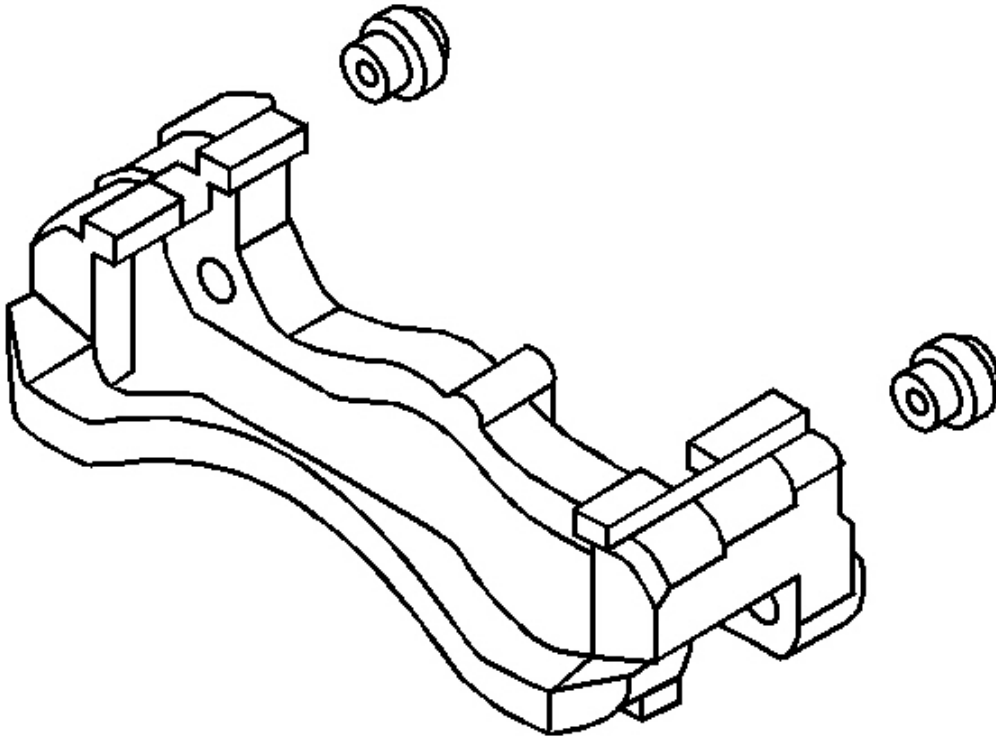


Fig. 64: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

1. Install the guide pin bushing in the brake caliper mounting bracket.

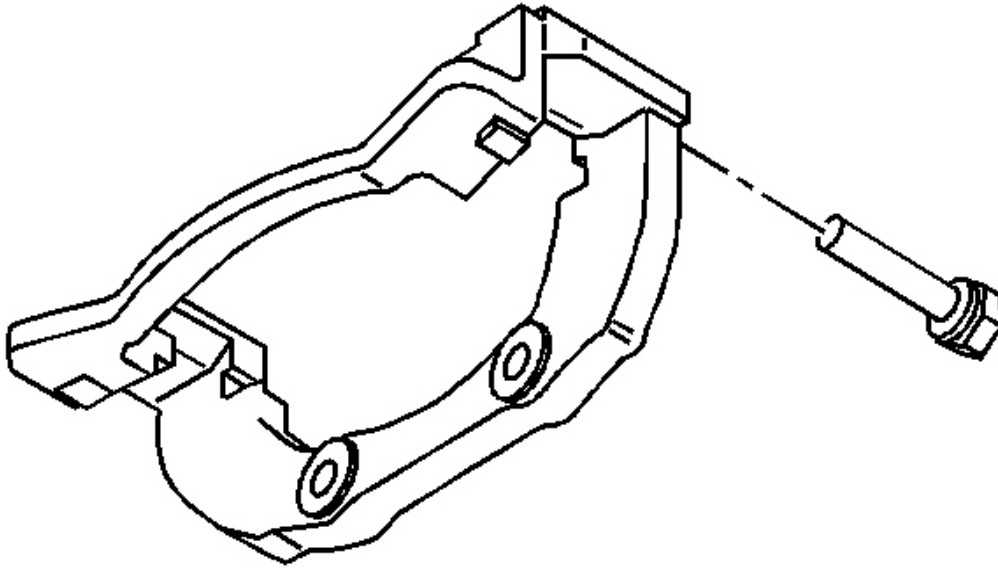


Fig. 65: View Of Brake Caliper Guide Pin & Brake Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

2. Install the brake caliper guide pins.

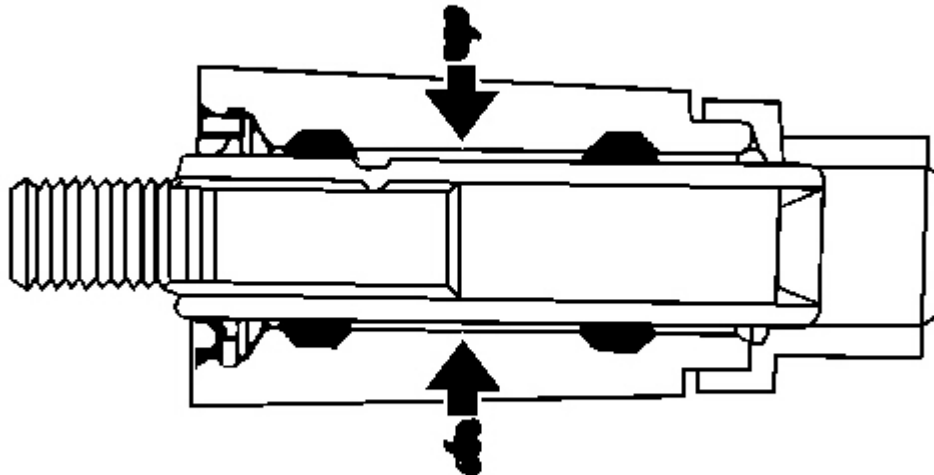


Fig. 66: View Of Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS CORP.

3. Apply high temperature silicone brake lubricant to the brake caliper guide pins. DO NOT apply to the brake caliper hardware or the retaining clips.

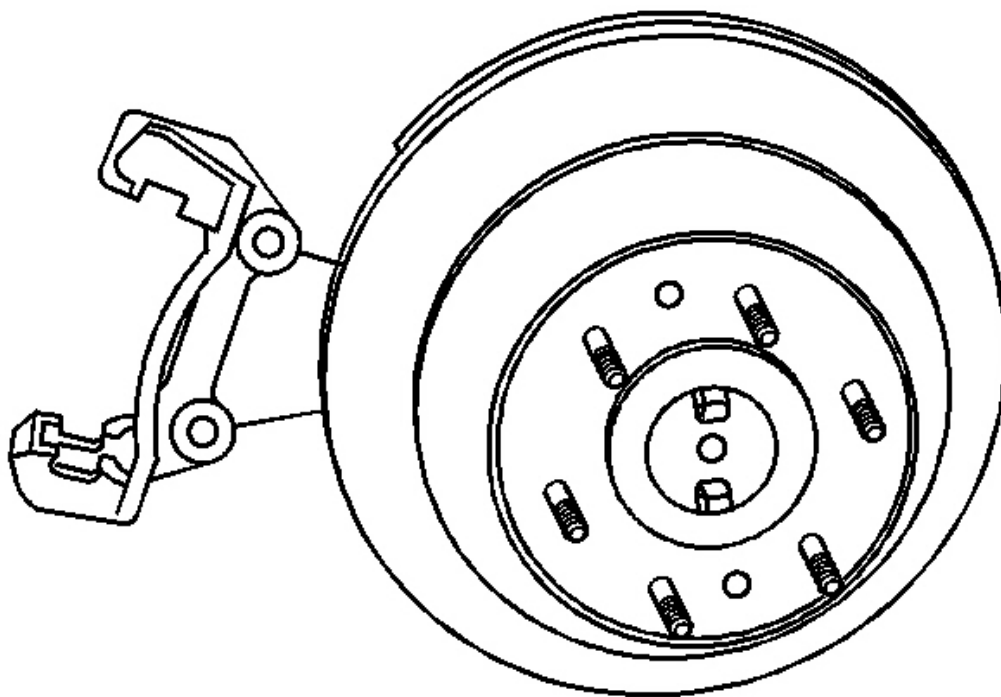


Fig. 67: View Of Caliper Mounting Bracket & Rotor
Courtesy of GENERAL MOTORS CORP.

4. Install the brake caliper mounting bracket.

NOTE: Refer to Fastener Notice .

5. Install the brake caliper mounting bolts.

Tighten: Tighten the disc brake caliper mounting bracket bolts to 200 N.m (148 lb ft).

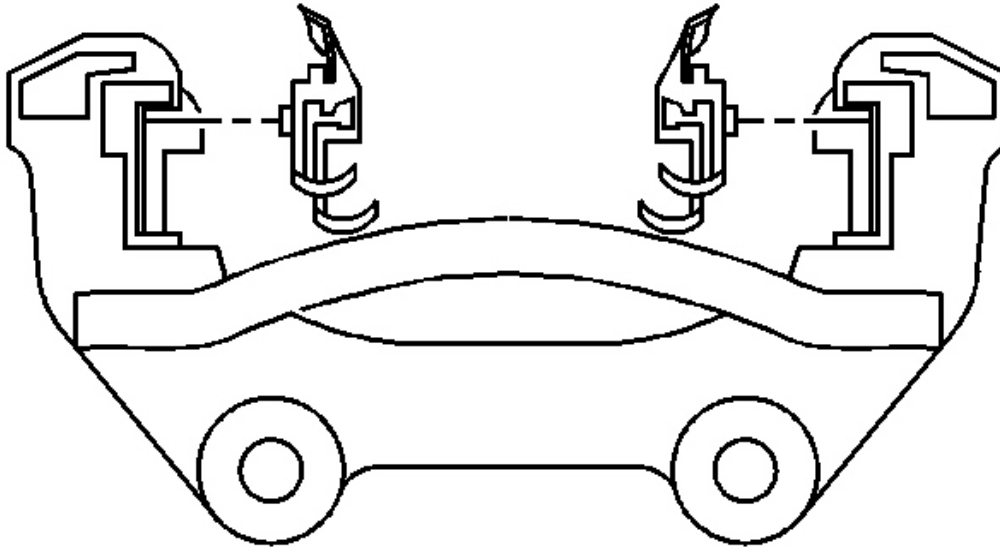


Fig. 68: View Of Caliper Bracket
Courtesy of GENERAL MOTORS CORP.

6. Install the brake pad retaining clips on the brake caliper mounting bracket.

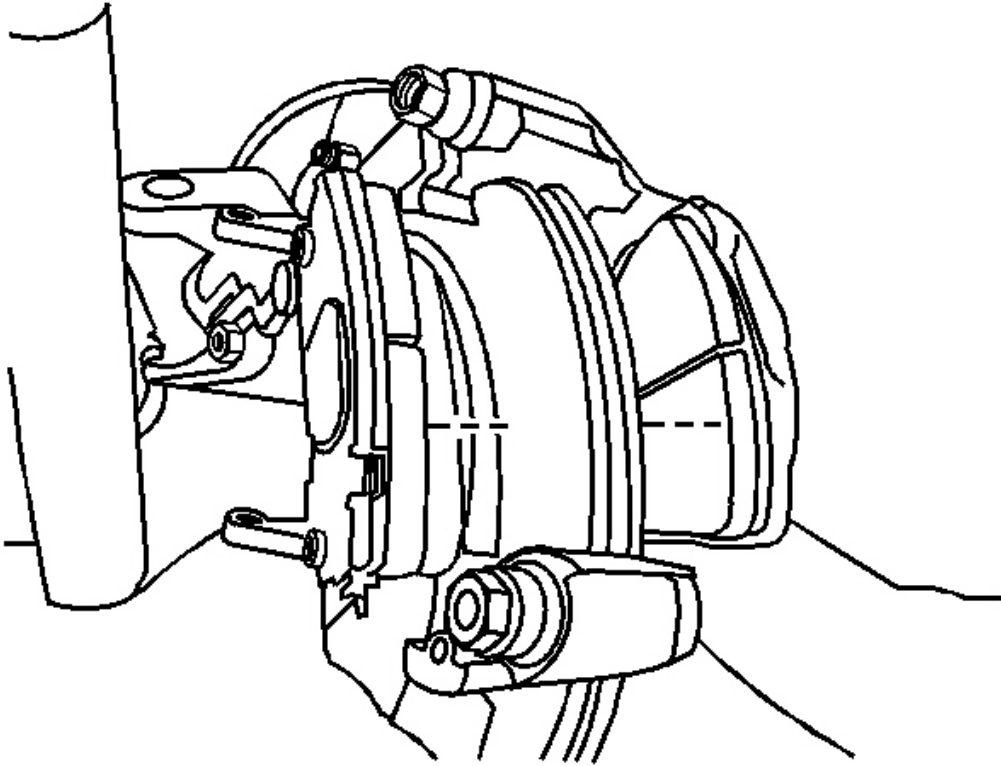


Fig. 69: View Of Caliper Mounting

Courtesy of GENERAL MOTORS CORP.

7. Install the brake pads to the brake caliper mounting bracket.

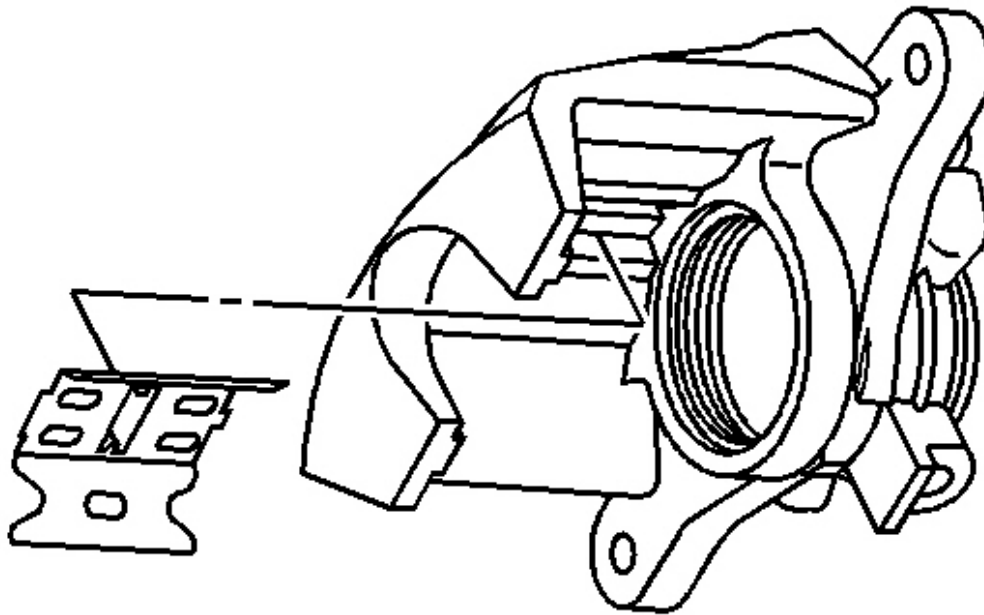


Fig. 70: View Of Caliper & Retaining Clip
Courtesy of GENERAL MOTORS CORP.

8. Install the brake pad retaining clip to the brake caliper.

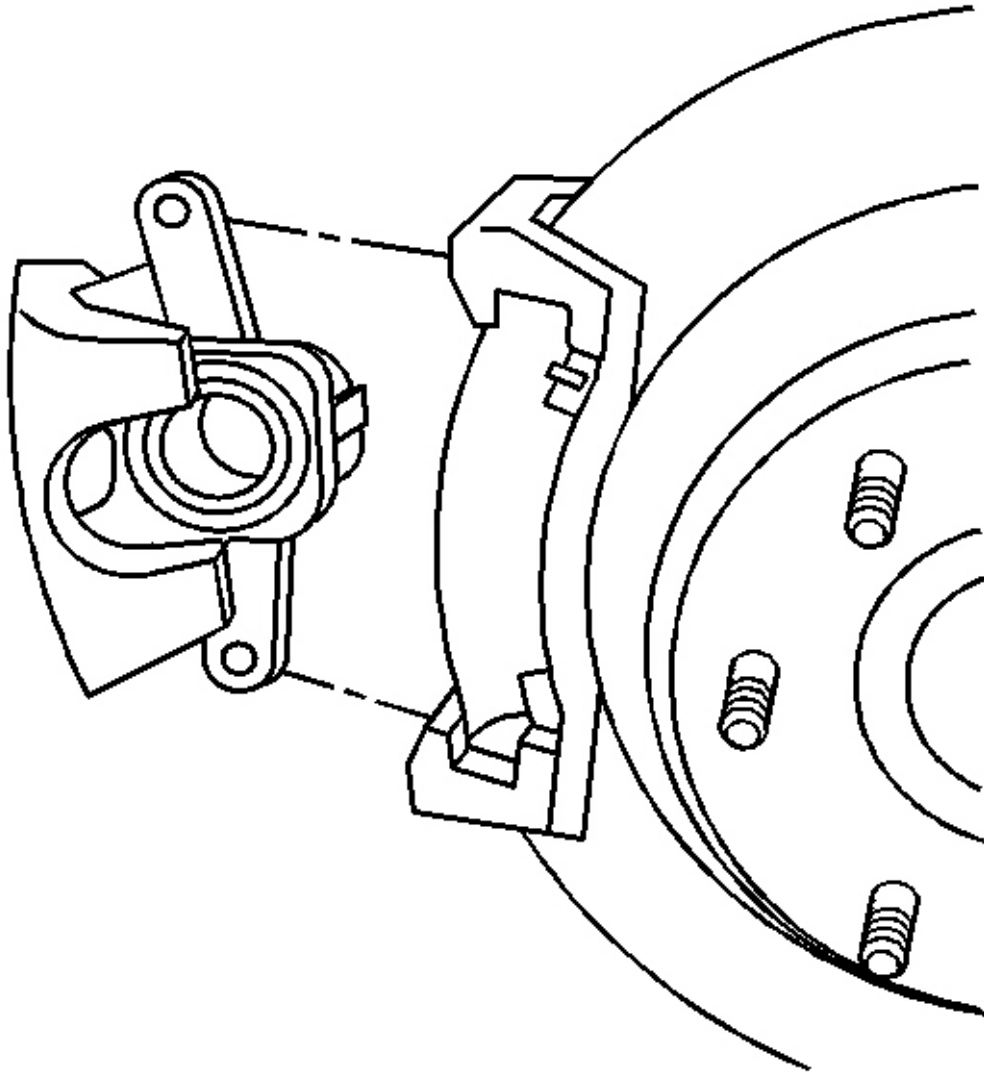


Fig. 71: View Of Caliper To Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

9. Install the brake caliper assembly. Refer to **Rear Brake Caliper Replacement**.
10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation**.
11. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**.

CAUTION: Do not move the vehicle until a firm brake pedal is obtained. Failure

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to obtain a firm pedal before moving vehicle may result in personal injury.

12. Pump the brake pedal slowly and firmly in order to seat the brake pads.

FRONT BRAKE CALIPER BRACKET REPLACEMENT

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

Removal Procedure

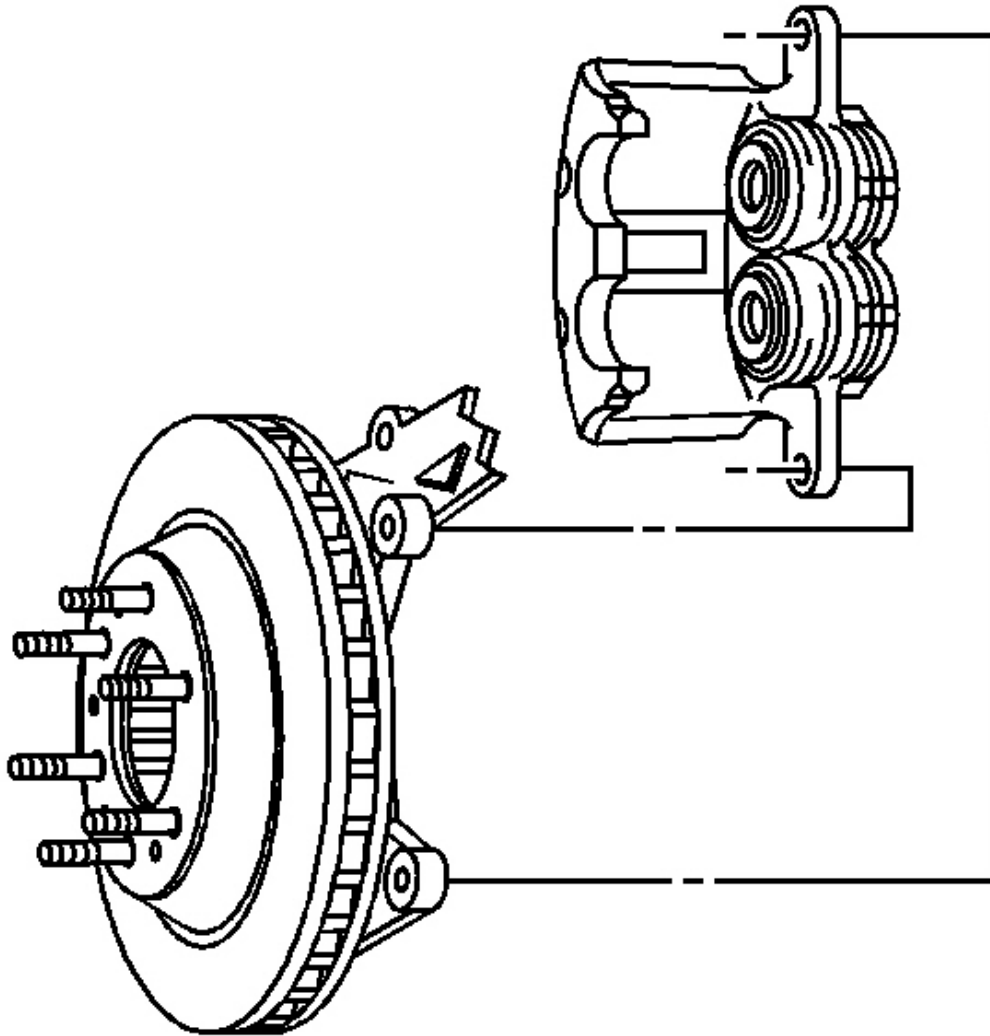


Fig. 72: View Of Rotor & Caliper
Courtesy of GENERAL MOTORS CORP.

1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Inspect the brake caliper assembly. Refer to **Brake Caliper Inspection**.

NOTE: Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will

cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

4. Remove the front brake caliper assembly. Relocate the brake caliper to the side. Refer to **Front Brake Caliper Replacement**.
5. Inspect the brake pads. Refer to **Brake Pad Inspection**.

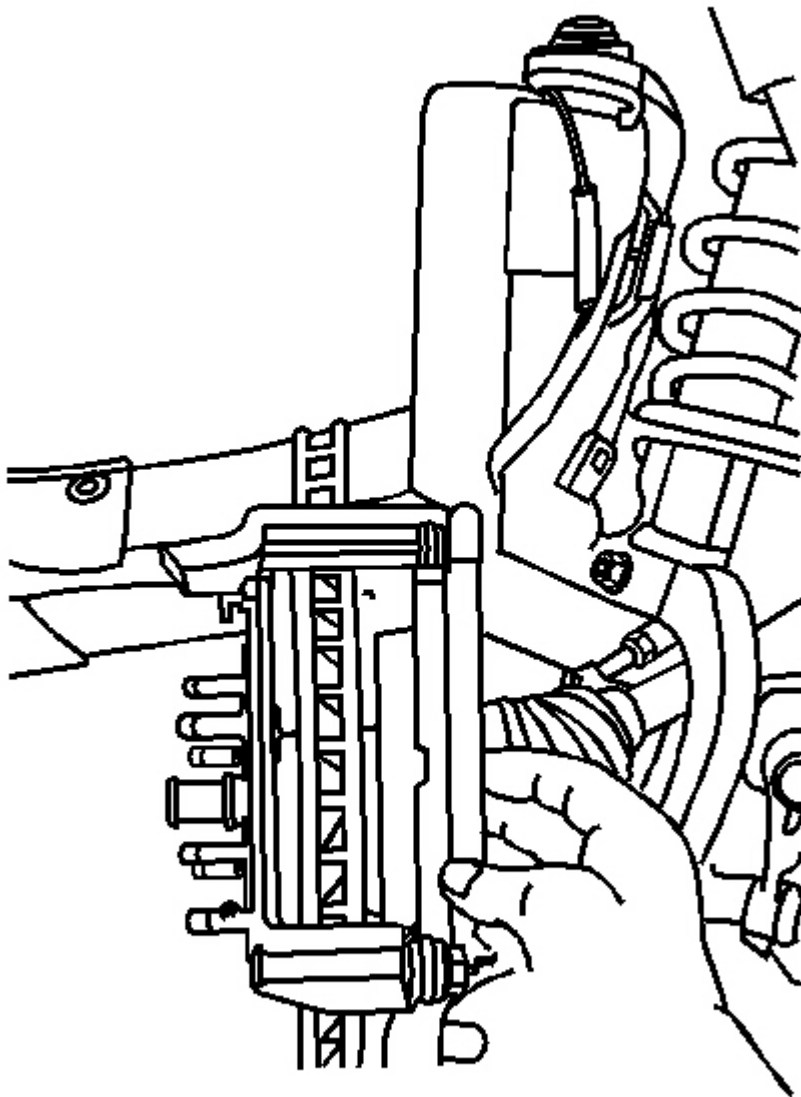


Fig. 73: Removing/Installing Brake Pads From Brake Mounting Bracket

Courtesy of GENERAL MOTORS CORP.

6. Remove the front brake pads from the mounting bracket. Inboard brake pad shown.
7. Inspect the brake hardware. Refer to **Front Disc Brake Mounting and Hardware Inspection**.

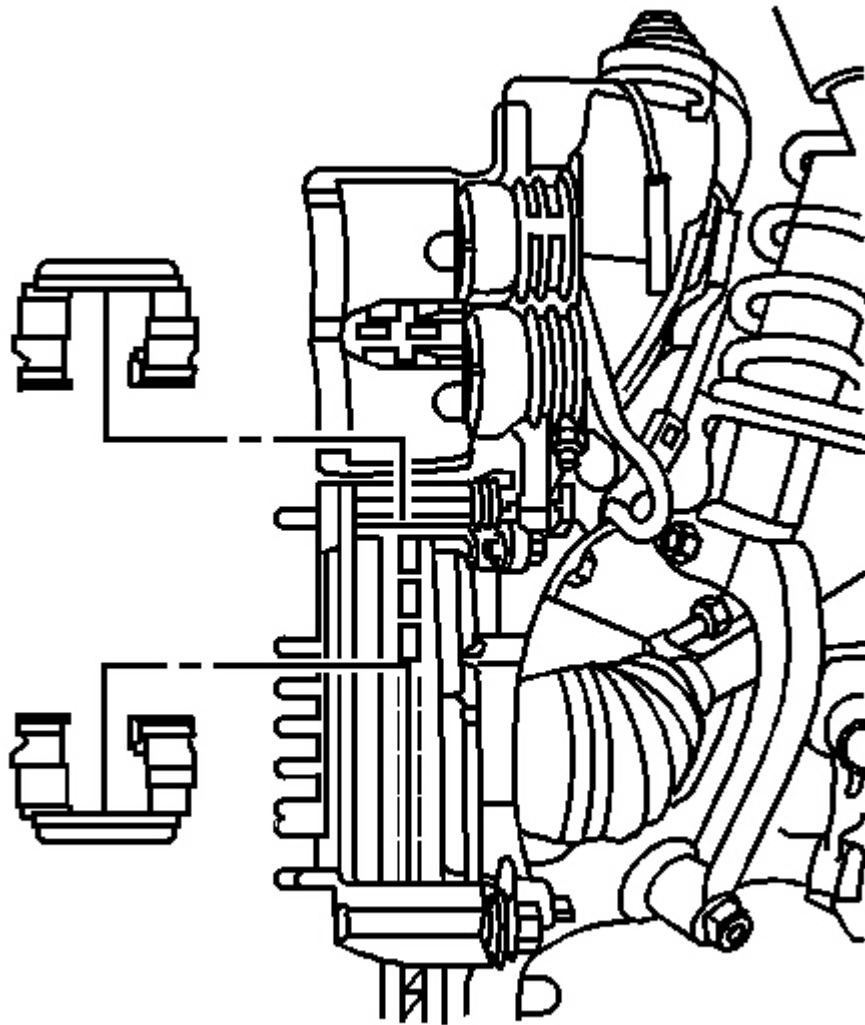


Fig. 74: View Of Caliper & Retaining Clips
Courtesy of GENERAL MOTORS CORP.

8. Remove the brake pad retaining clips from the mounting bracket. Inboard brake pad shown.

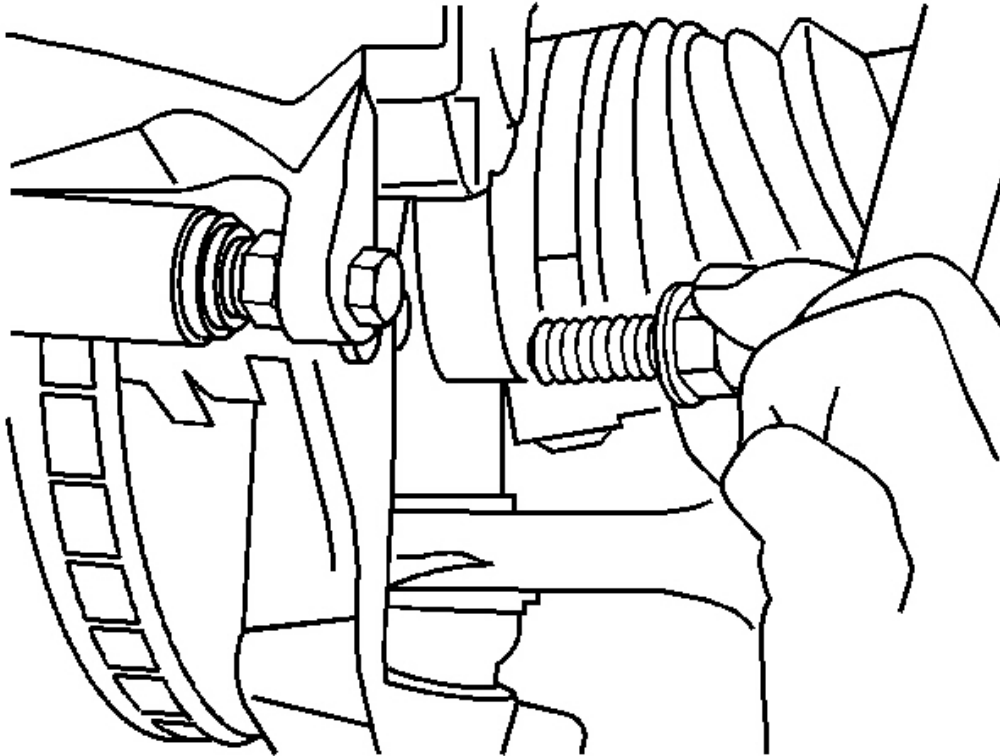


Fig. 75: View of Caliper Mounting
Courtesy of GENERAL MOTORS CORP.

9. Remove the brake caliper mounting bracket retaining bolts. Lower bolt shown.

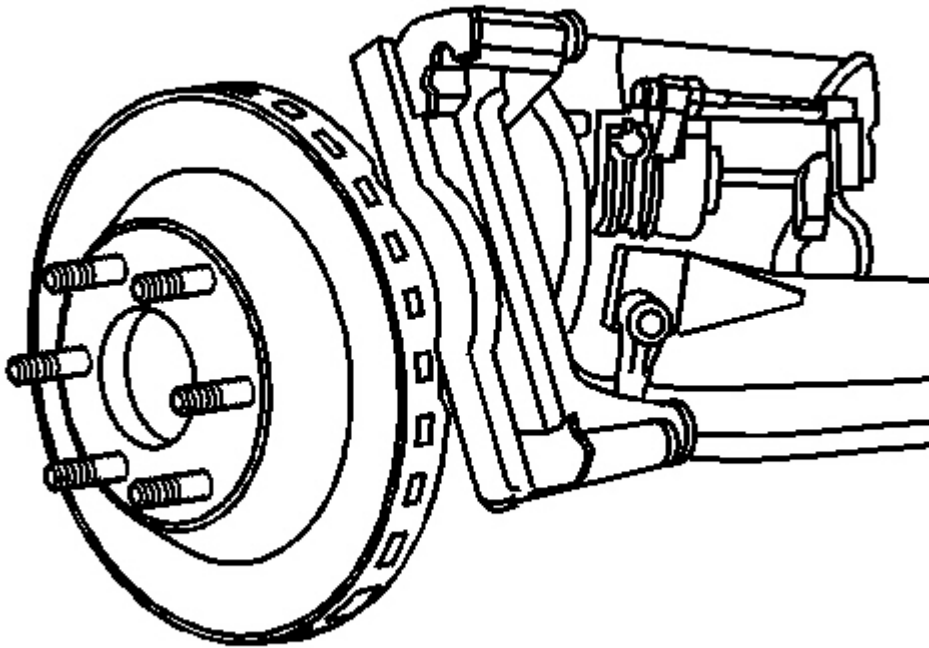


Fig. 76: Identifying Brake Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

10. Remove the brake caliper mounting bracket.

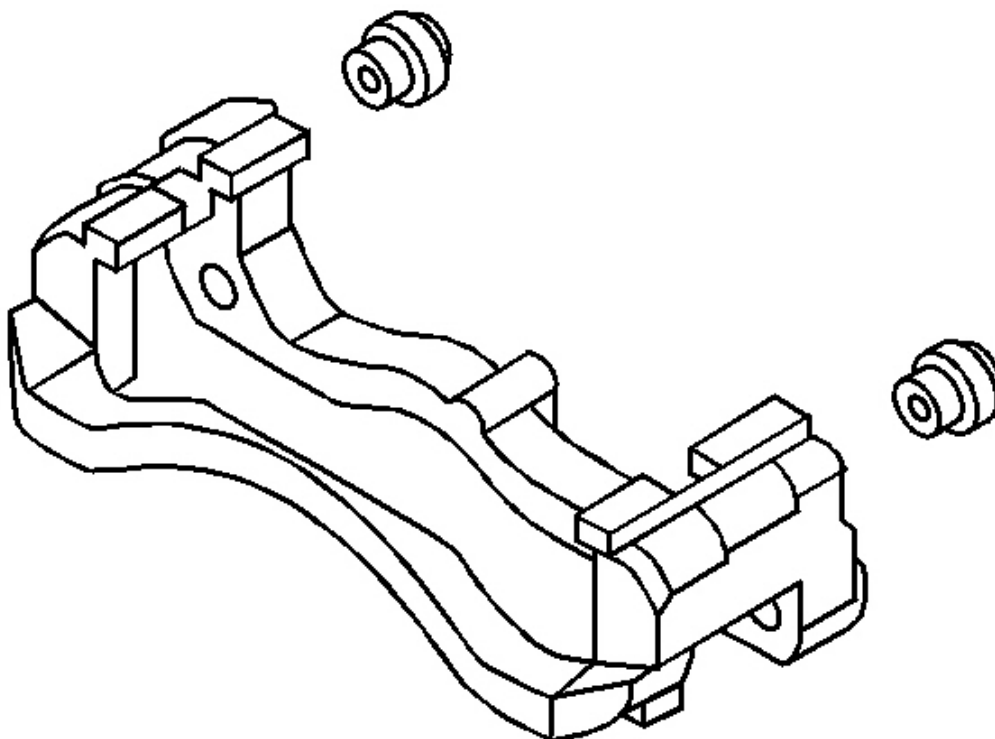


Fig. 77: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

11. Remove the guide pin seals from the brake caliper mounting bracket.
12. Inspect the brake rotor. Refer to **Brake Rotor Surface and Wear Inspection**.

Installation Procedure

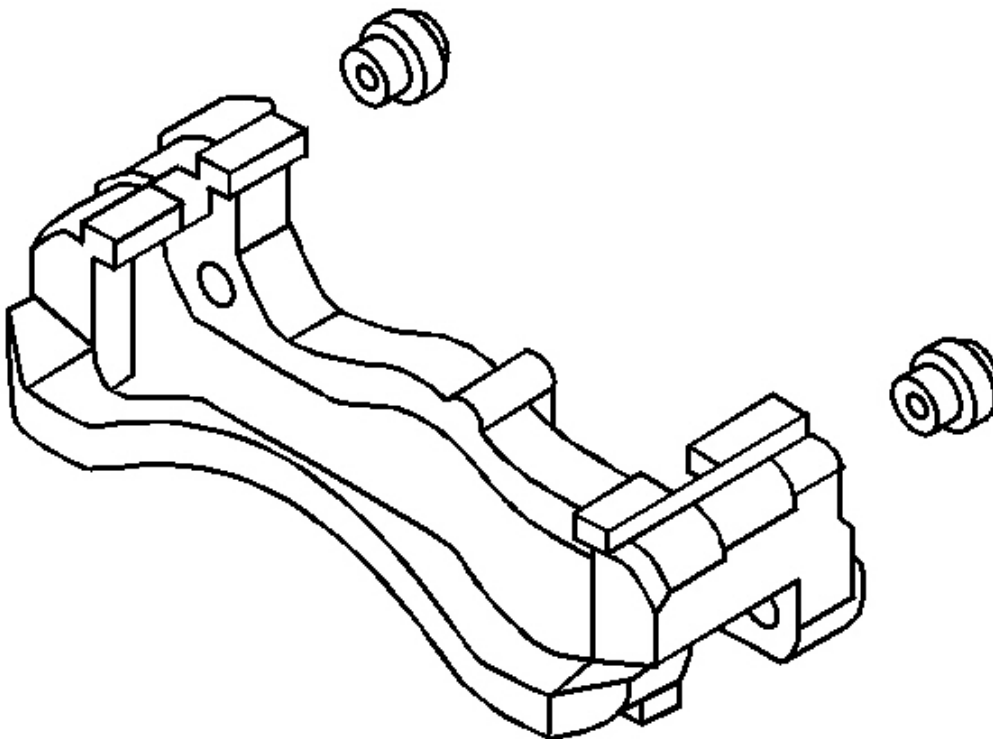


Fig. 78: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

1. Install the guide pin seals on the mounting bracket.
2. If the guide pins and brake pad retaining clips are to be reused, use denatured alcohol to clean them.
3. Dry the brake guide pins and brake pad retaining clips with non-lubricated, filtered air.

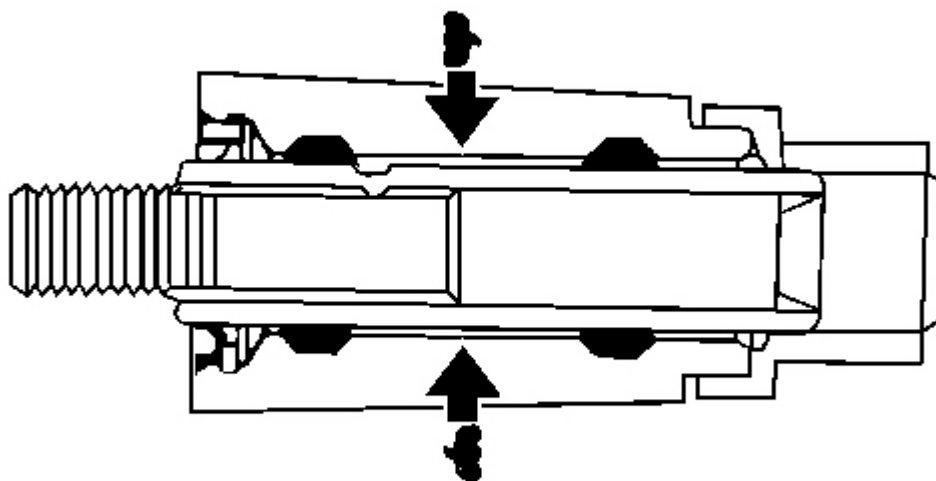


Fig. 79: View Of Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS CORP.

4. Apply high temperature silicone brake lubricant to the brake caliper guide pins. DO NOT apply the lubricant to the brake pad retaining clips.

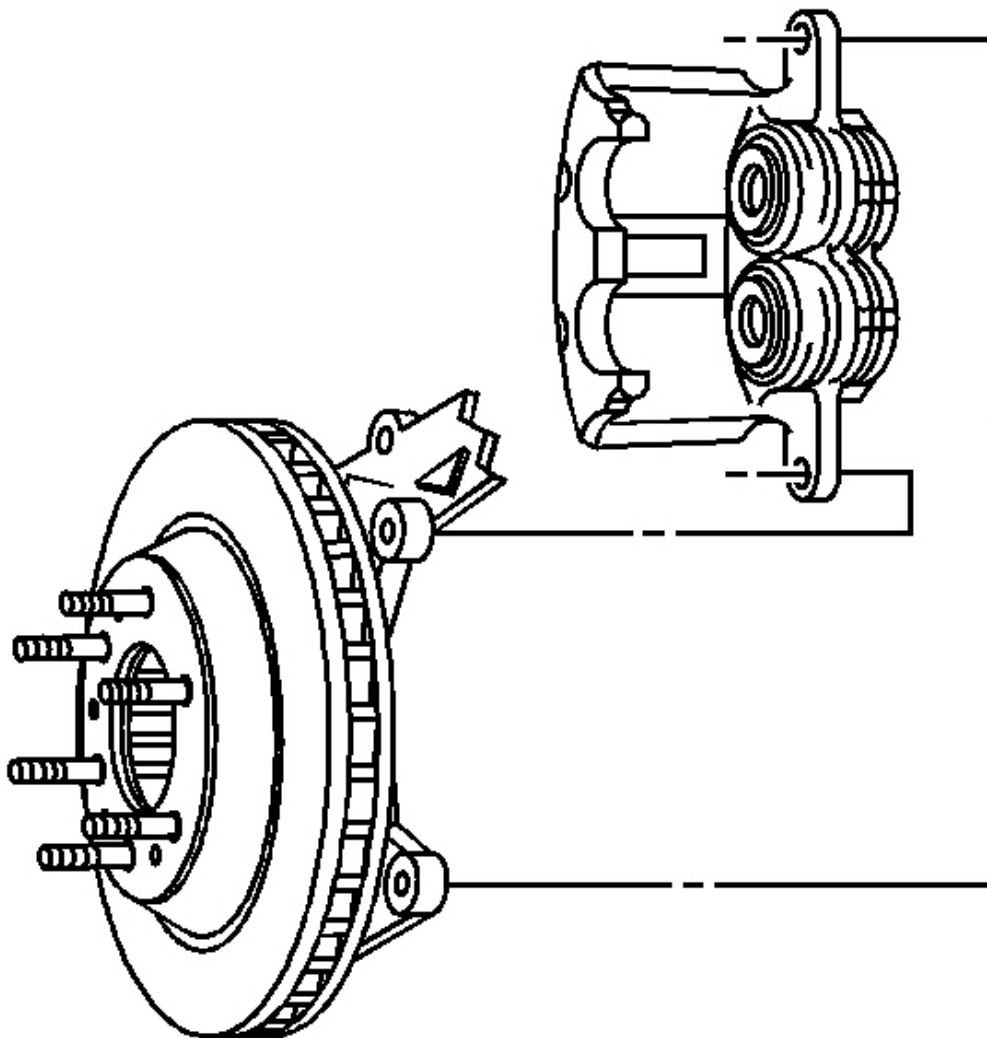


Fig. 80: View Of Rotor & Caliper
Courtesy of GENERAL MOTORS CORP.

5. Install the brake caliper mounting bracket.

NOTE: Refer to Fastener Notice .

6. Install the caliper mounting bracket bolts.

Tighten: Tighten the brake caliper mounting bracket bolts to 150 N.m (110 lb ft).

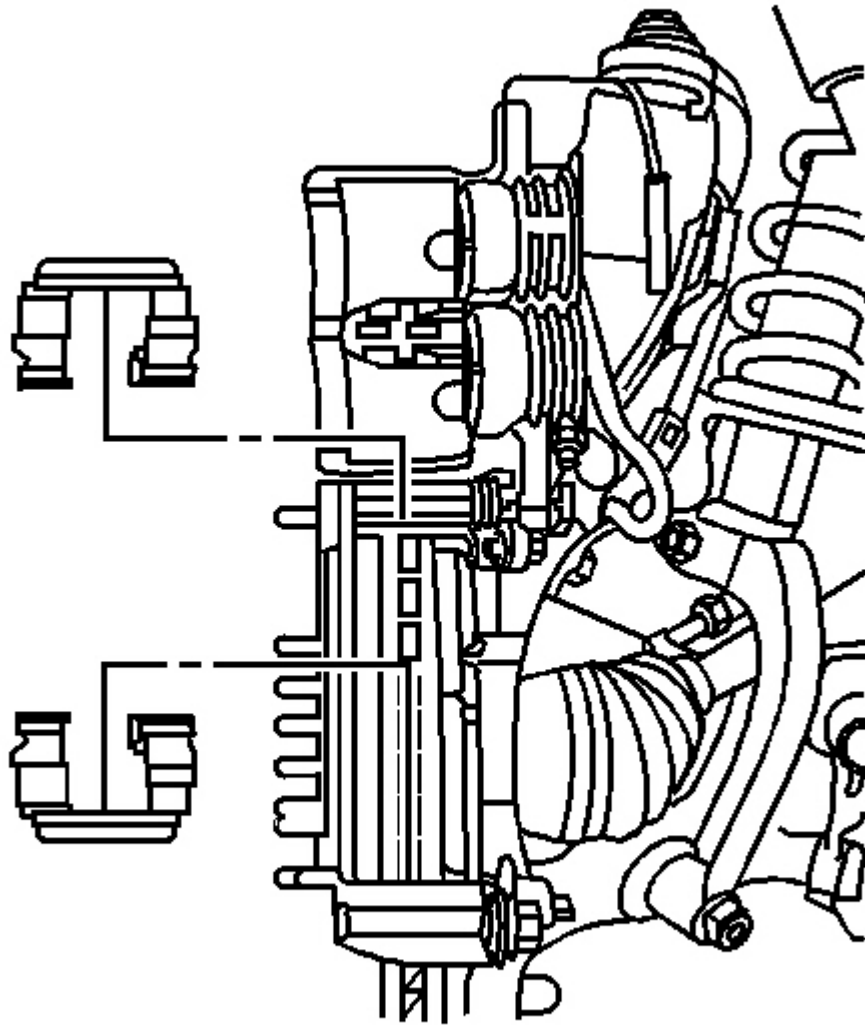


Fig. 81: View Of Caliper & Retaining Clips
Courtesy of GENERAL MOTORS CORP.

7. Install the front brake pad hardware to the brake caliper mounting bracket.

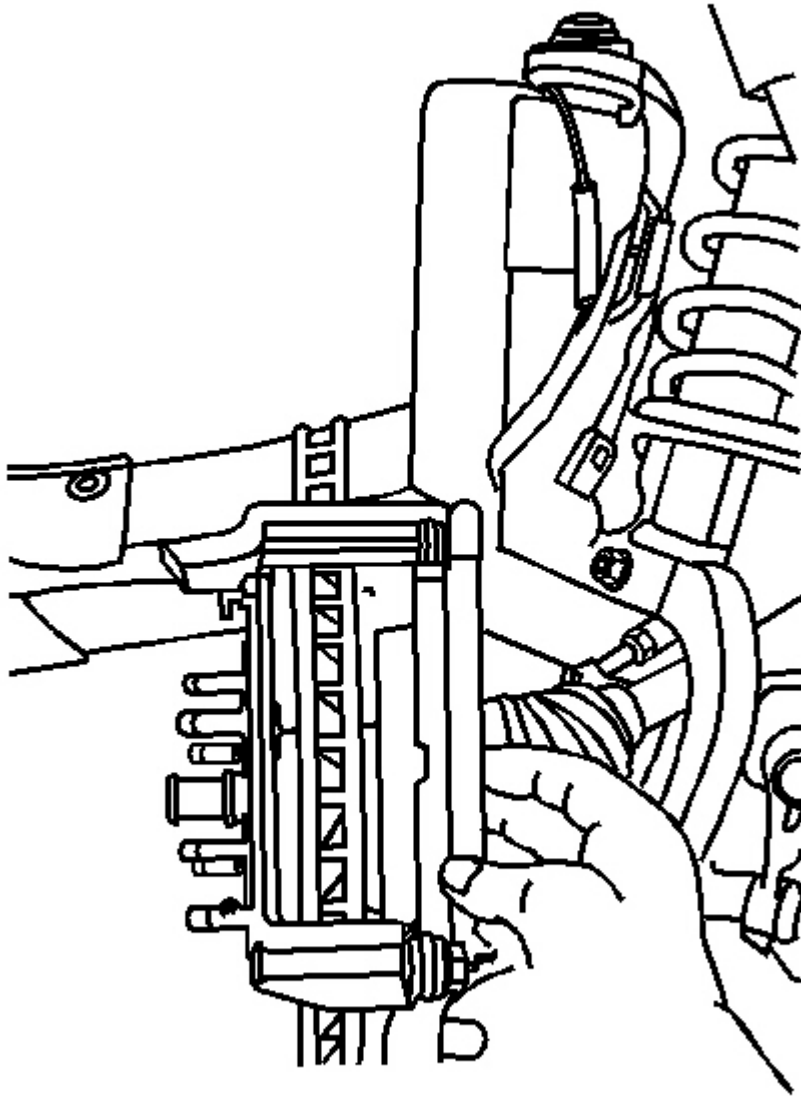


Fig. 82: Removing/Installing Brake Pads From Brake Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

8. Install the brake pads to the brake caliper mounting bracket.

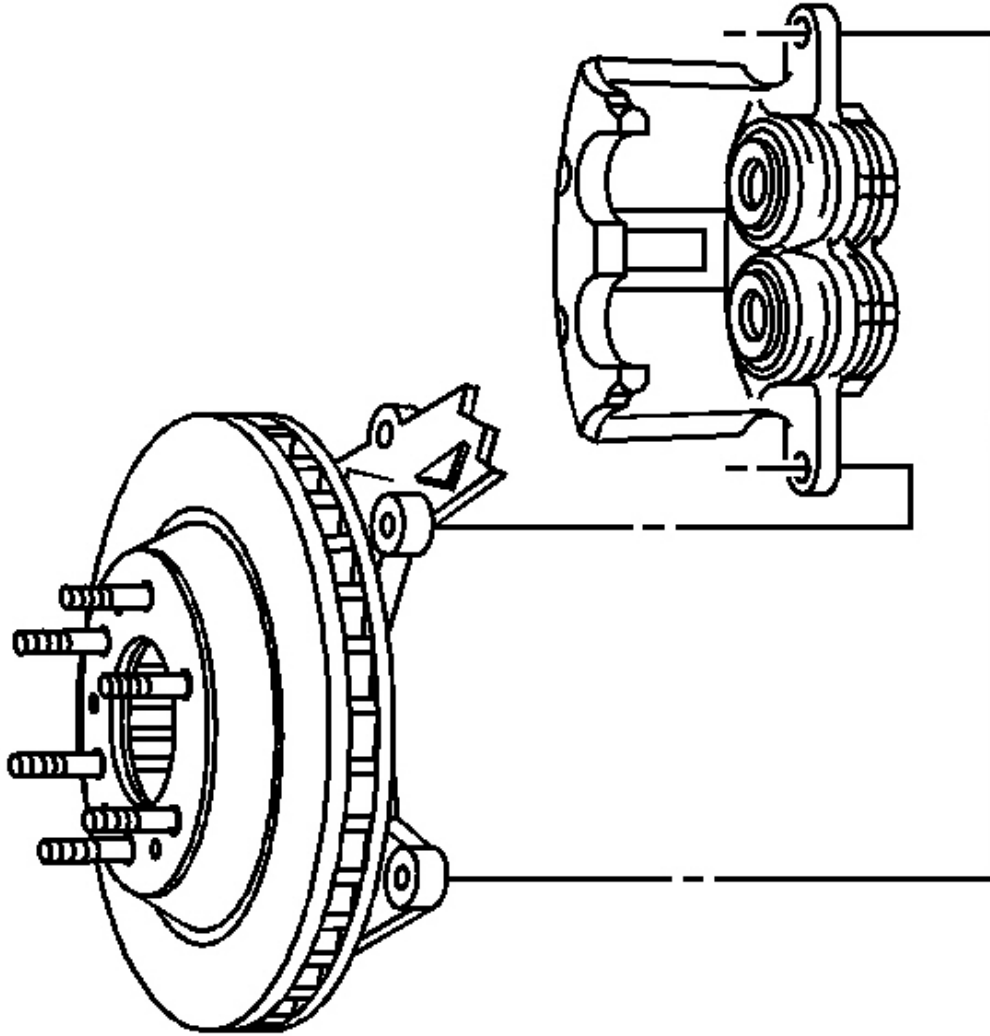


Fig. 83: View Of Rotor & Caliper
Courtesy of GENERAL MOTORS CORP.

9. Install the brake caliper assembly. Refer to **Front Brake Caliper Replacement**.
10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation**.
11. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**.

CAUTION: Refer to **Firm Brake Pedal Caution**.

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12. Pump the brake pedal slowly and firmly in order to seat the brake pads.

REAR BRAKE CALIPER BRACKET REPLACEMENT

CAUTION: Refer to Brake Dust Caution .

Removal Procedure

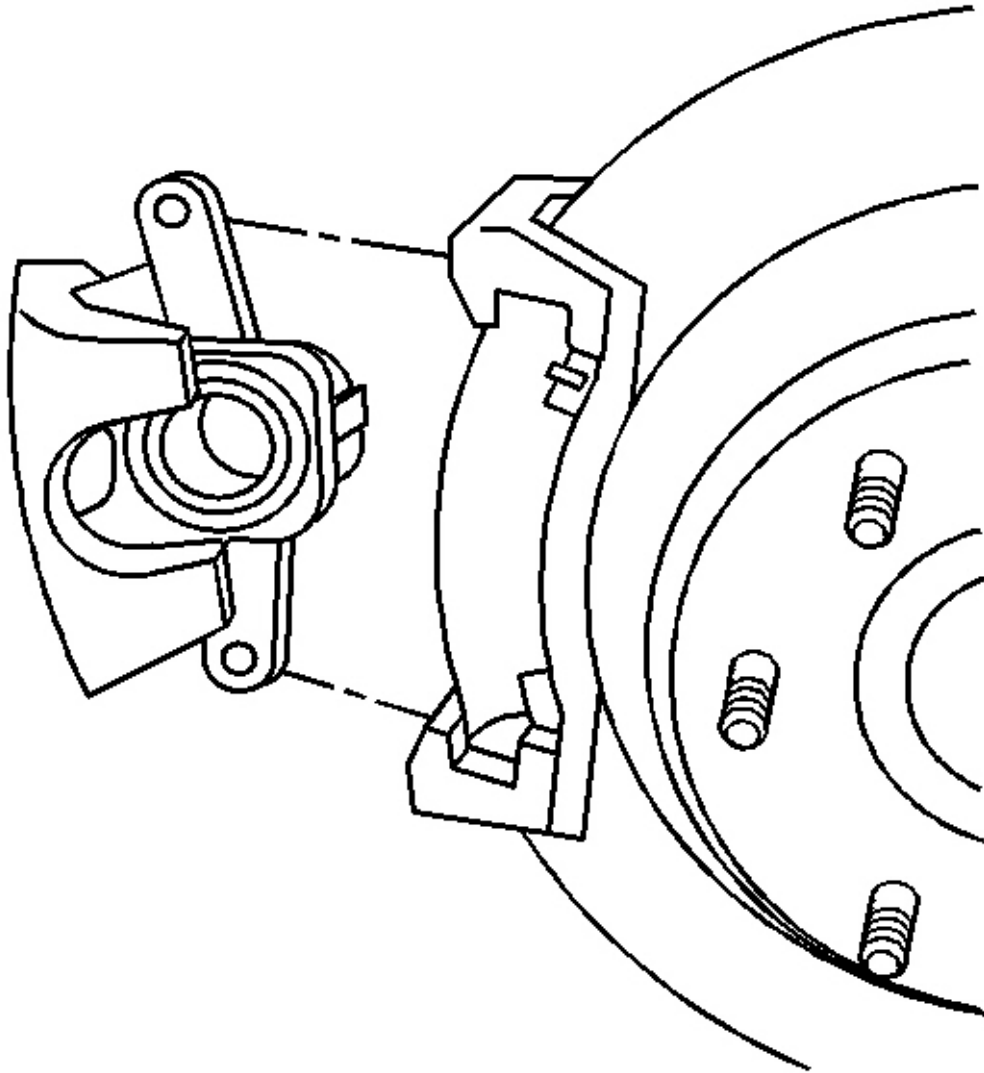


Fig. 84: View Of Caliper To Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Inspect the brake caliper assembly. Refer to **Brake Caliper Inspection**.

NOTE: Support the brake caliper with heavy mechanic wire, or equivalent,

whenever it is separated from its mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake fluid leak.

4. Remove the rear brake caliper assembly, relocate the brake caliper to the side. Refer to **Rear Brake Caliper Replacement**.
5. Inspect the brake pads. Refer to **Brake Rotor Surface and Wear Inspection**.

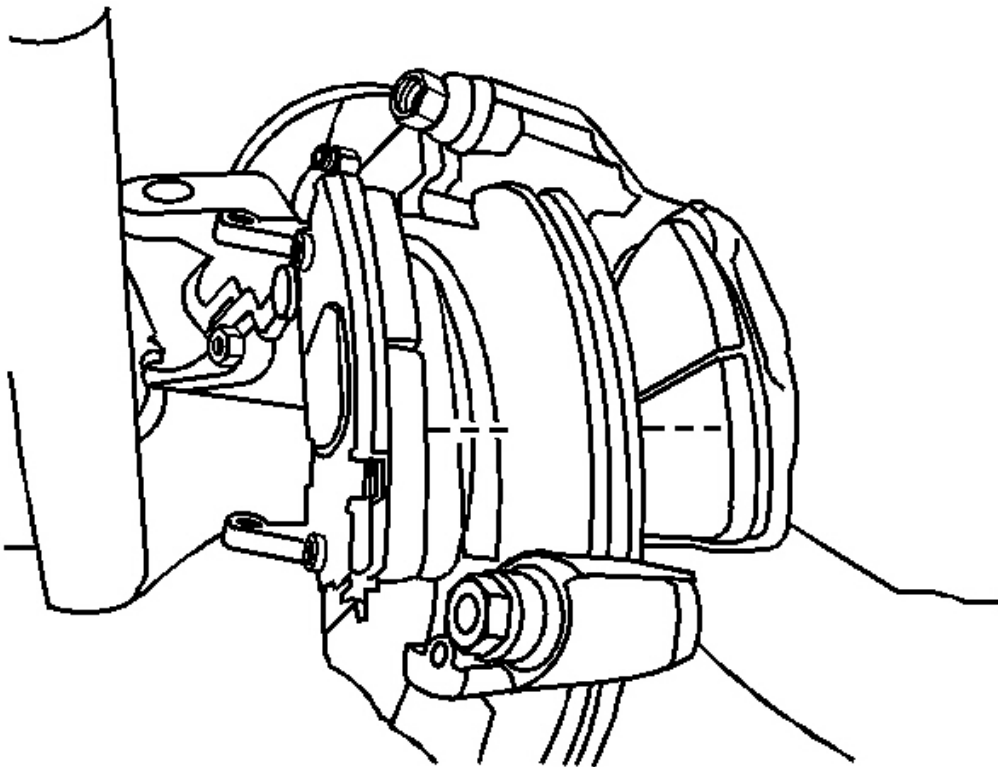


Fig. 85: View Of Caliper Mounting
Courtesy of GENERAL MOTORS CORP.

6. Remove the front brake pads from the mounting bracket.
7. Inspect the brake hardware. Refer to **Front Disc Brake Mounting and Hardware Inspection**.

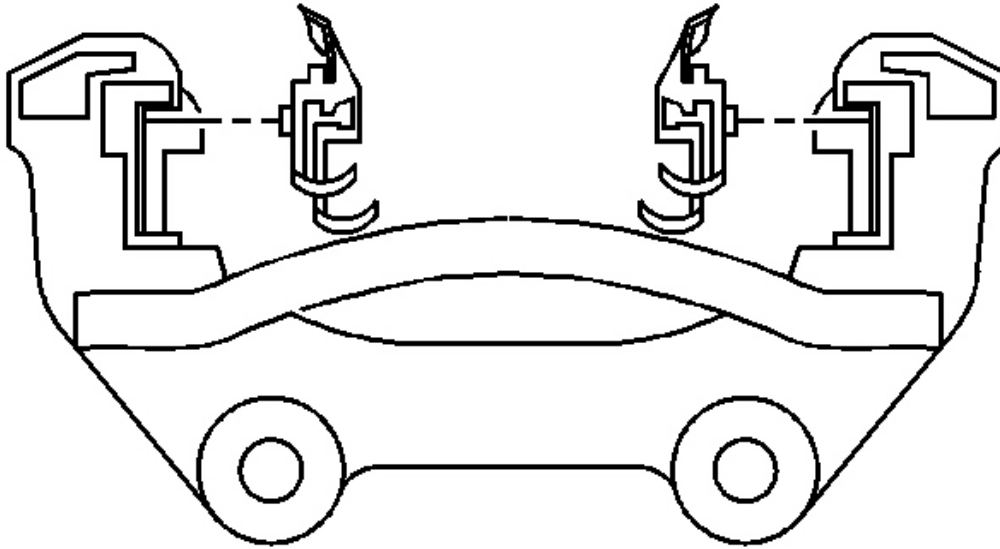


Fig. 86: View Of Caliper Bracket
Courtesy of GENERAL MOTORS CORP.

8. Remove the brake pad retaining clips from the mounting bracket.

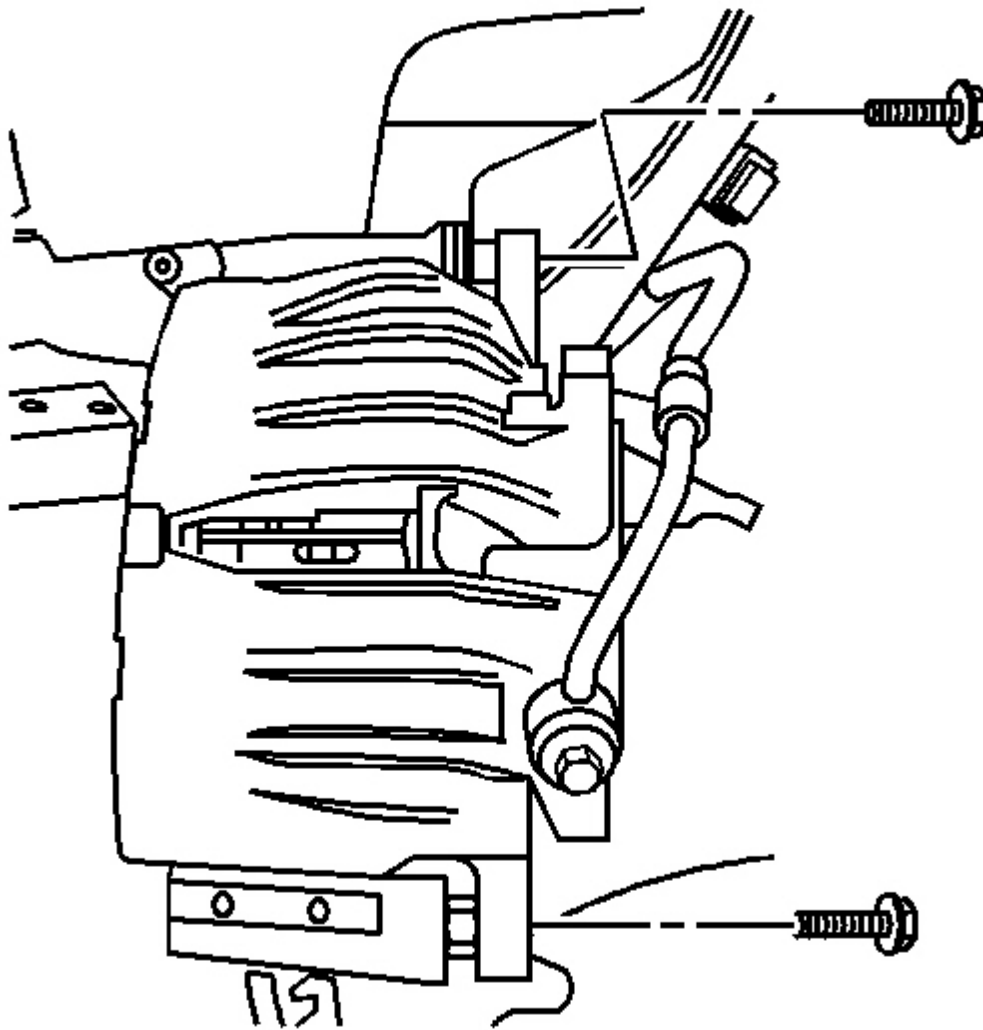


Fig. 87: Front Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS CORP.

9. Remove the brake caliper mounting bracket retaining bolts.

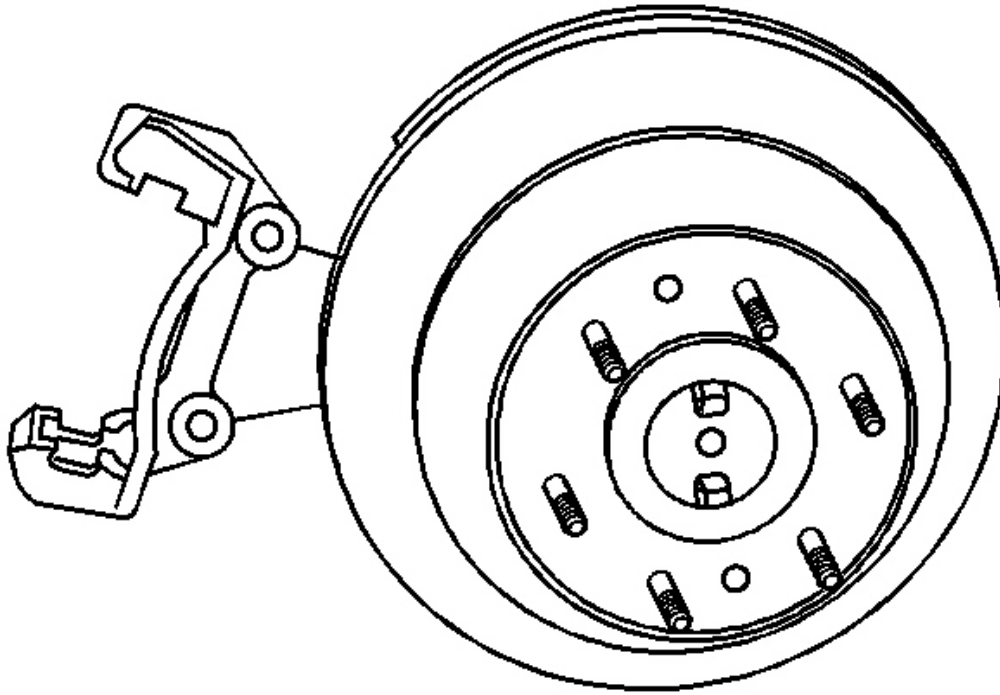


Fig. 88: View Of Caliper Mounting Bracket & Rotor
Courtesy of GENERAL MOTORS CORP.

10. Remove the brake caliper mounting bracket.

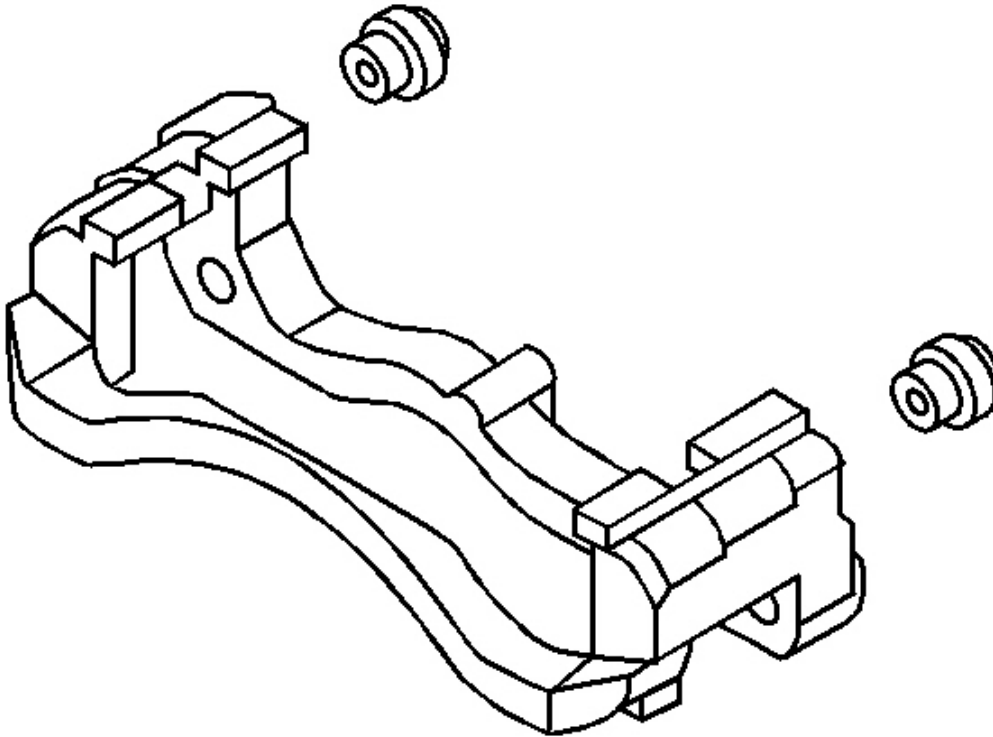


Fig. 89: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

11. Remove the guide pin seals from the brake caliper mounting bracket.
12. Inspect the brake rotor. Refer to **Brake Rotor Surface and Wear Inspection**.

Installation Procedure

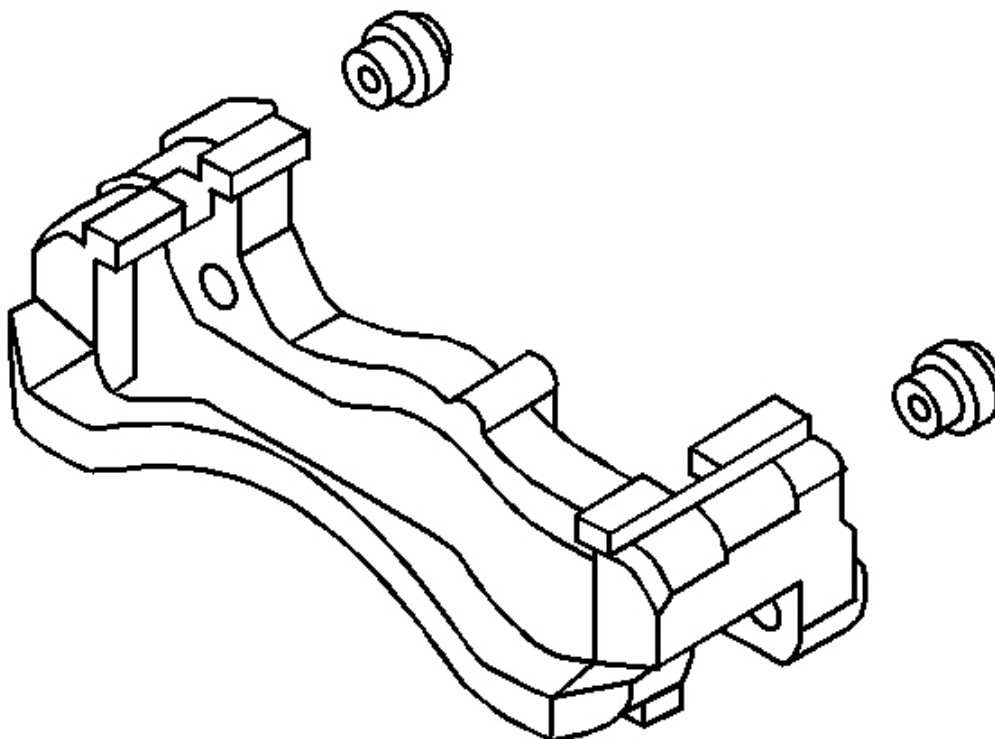


Fig. 90: View Of Caliper Bracket Bushings
Courtesy of GENERAL MOTORS CORP.

1. Install the guide pin seals on the mounting bracket.
2. If the guide pins and brake pad retaining clips are to be reused, use denatured alcohol to clean them.
3. Dry the brake guide pins and brake pad retaining clips with non-lubricated, filtered air.

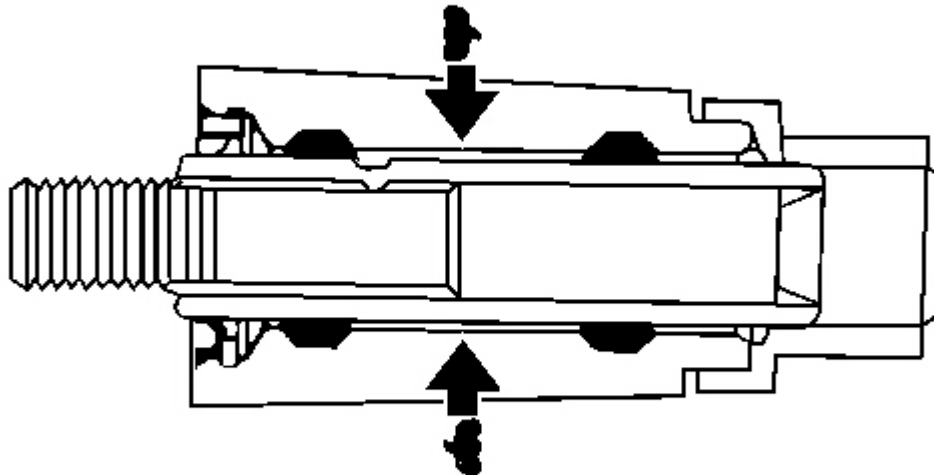


Fig. 91: View Of Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS CORP.

4. Apply high temperature silicone brake lubricant to the brake caliper guide pins. DO NOT apply the lubricant to the brake pad retaining clips.

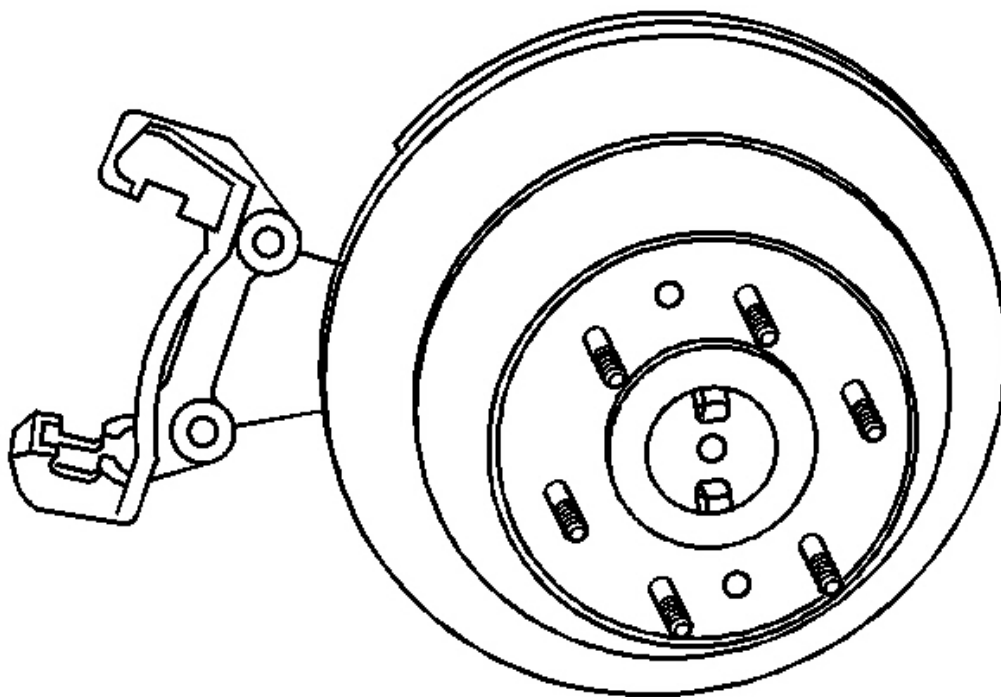


Fig. 92: View Of Caliper Mounting Bracket & Rotor
Courtesy of GENERAL MOTORS CORP.

5. Install the brake caliper mounting bracket.

NOTE: Refer to Fastener Notice .

6. Install the caliper mounting bracket bolts.

Tighten: Tighten the caliper mounting bracket bolts to 200 N.m (148 lb ft).

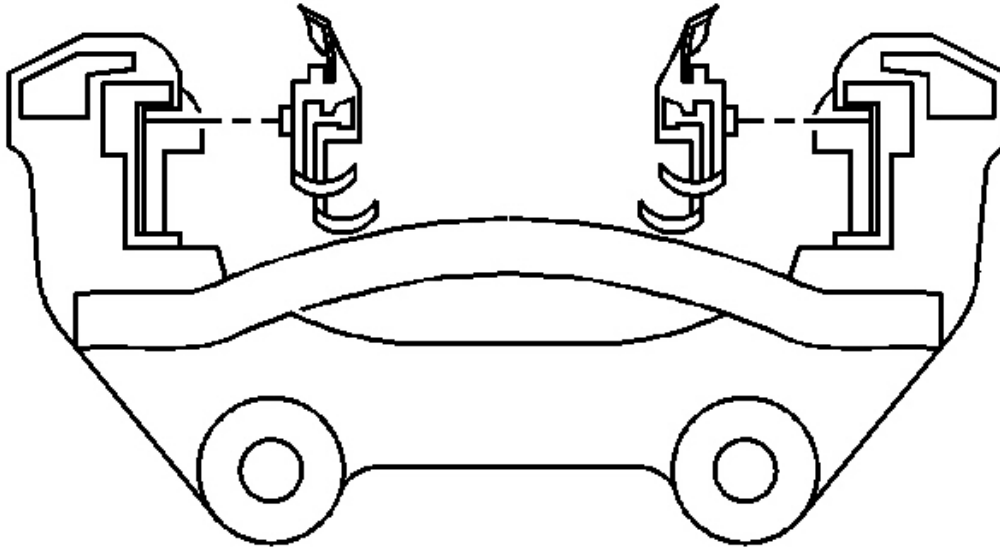


Fig. 93: View Of Caliper Bracket
Courtesy of GENERAL MOTORS CORP.

7. Install the rear brake pad hardware to the brake caliper mounting bracket.

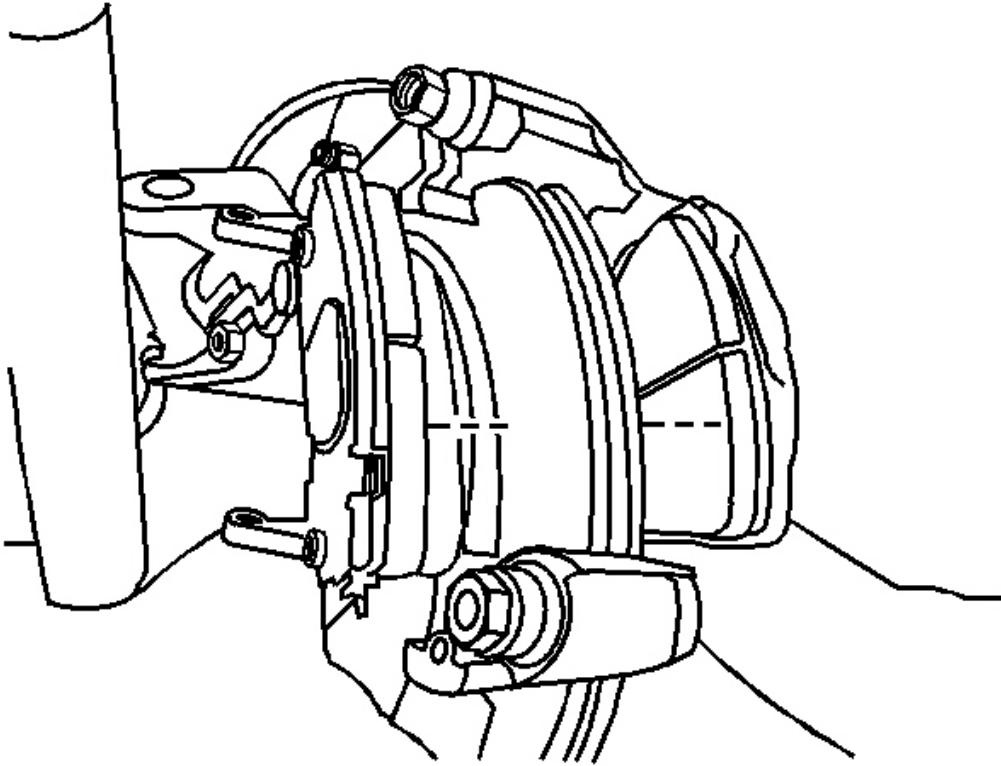


Fig. 94: View Of Caliper Mounting

Courtesy of GENERAL MOTORS CORP.

8. Install the brake pads to the brake caliper mounting bracket.

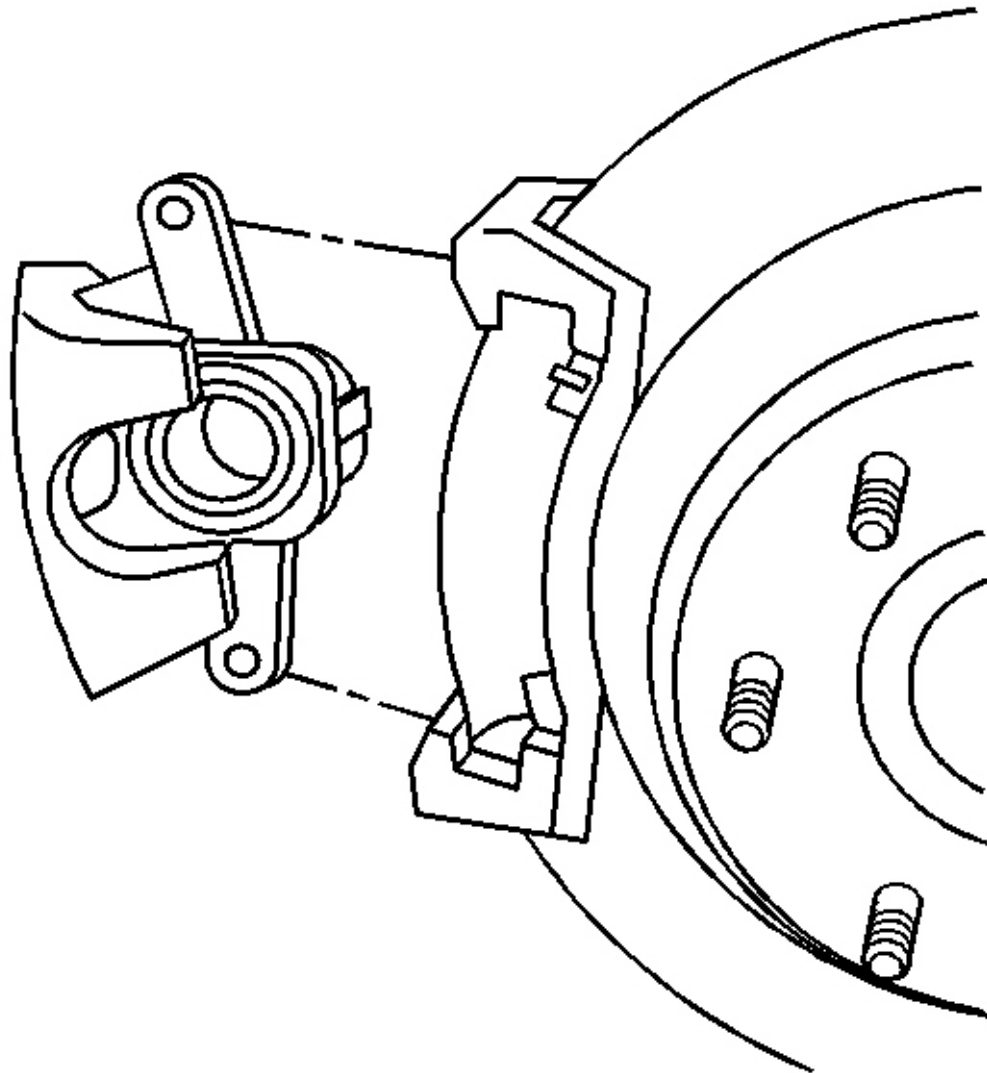


Fig. 95: View Of Caliper To Caliper Mounting Bracket
Courtesy of GENERAL MOTORS CORP.

9. Install the rear brake caliper assembly. Refer to **Rear Brake Caliper Replacement**.
10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation**.
11. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**.

CAUTION: Refer to **Firm Brake Pedal Caution**.

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12. Pump the brake pedal slowly and firmly in order to seat the brake pads.

FRONT BRAKE ROTOR REPLACEMENT

Tools Required

J 42450-A Wheel Hub Cleaning Kit. See **Special Tools**.

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

Removal Procedure

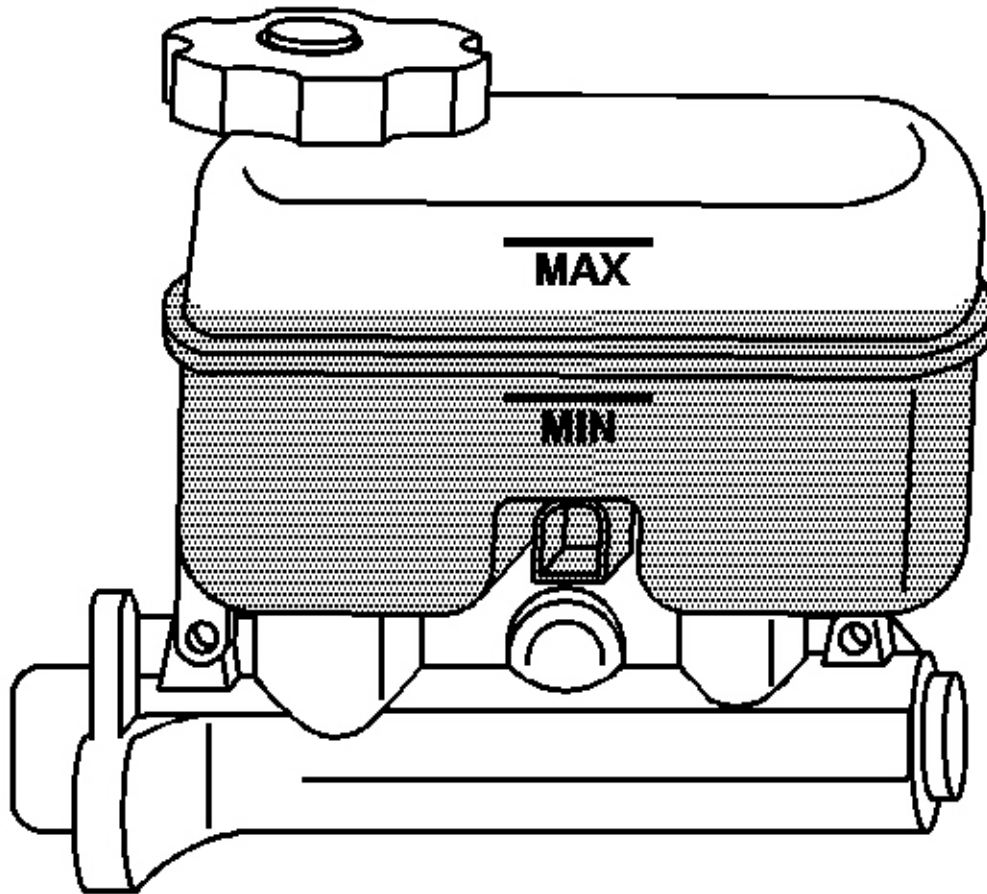


Fig. 96: View Of Half-Full Master Cylinder Reservoir
Courtesy of GENERAL MOTORS CORP.

1. Inspect the brake fluid level in the brake master cylinder reservoir.
2. If the brake fluid is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.

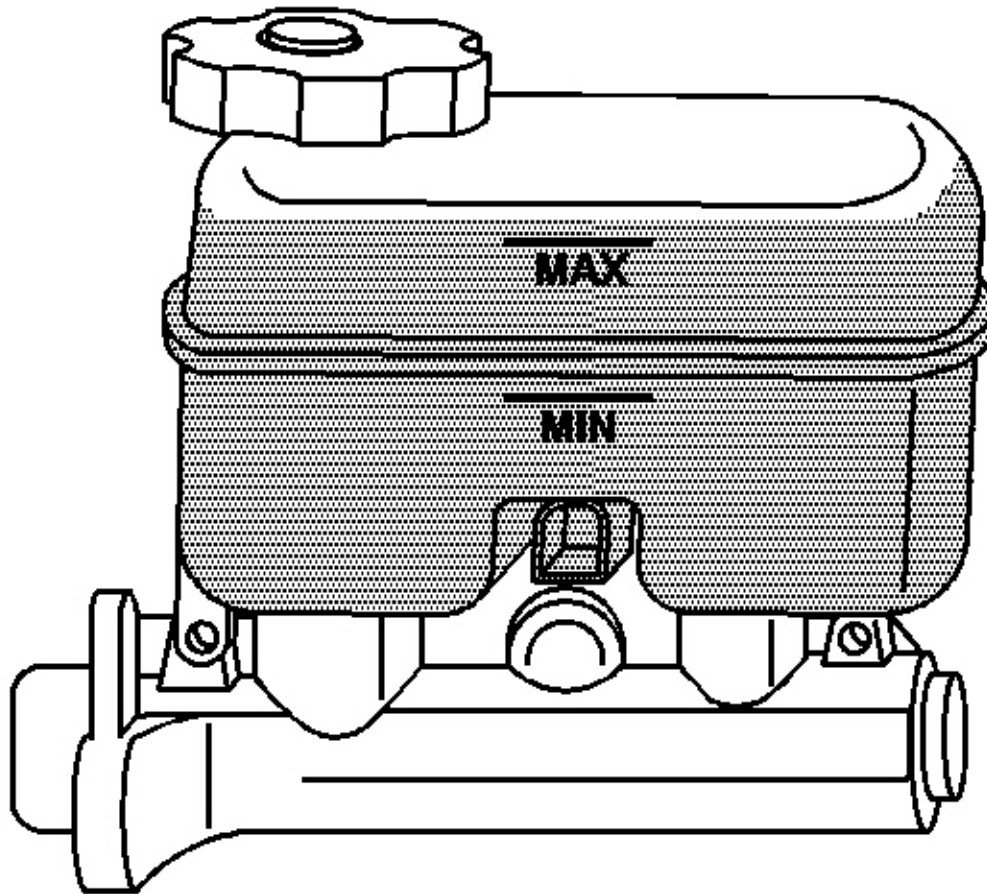


Fig. 97: View Of Full Master Cylinder Reservoir MAX & MIN Marks
Courtesy of GENERAL MOTORS CORP.

3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, using an appropriate tool, remove the brake fluid to the midway point before proceeding.
4. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

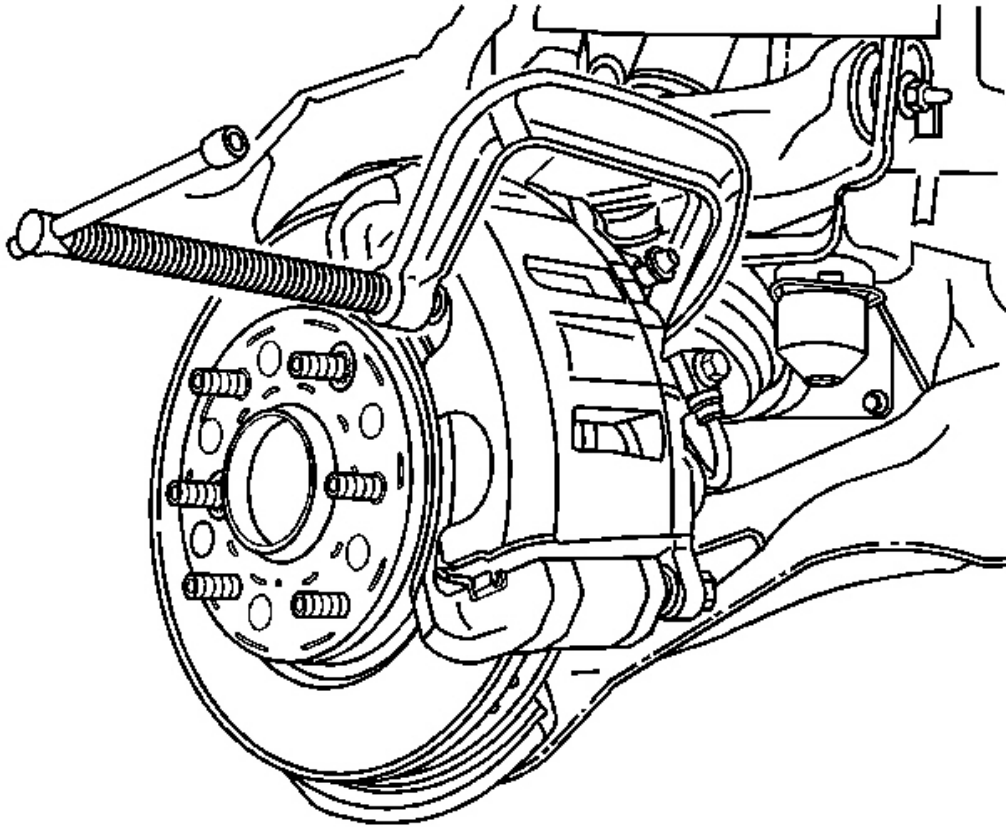


Fig. 98: View Of Large C-Clamp Over Brake Caliper Housing
Courtesy of GENERAL MOTORS CORP.

6. Compress the front brake caliper piston.
 1. Install a large C-clamp over the top of the brake caliper housing and against the back of the outboard brake pad.
 2. Slowly tighten the C-clamp until the piston pushes into the brake caliper enough to slide the brake caliper off the rotor.
 3. Remove the C-clamp from the brake caliper.

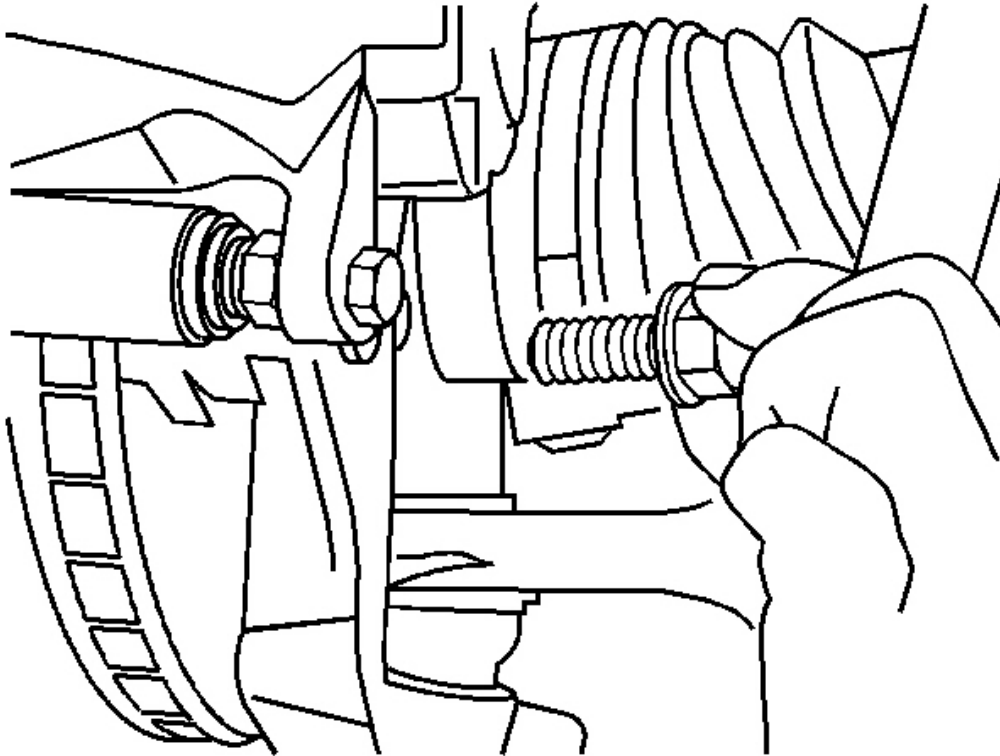


Fig. 99: View of Caliper Mounting
Courtesy of GENERAL MOTORS CORP.

7. Remove the mounting bolts from the brake caliper mounting bracket.

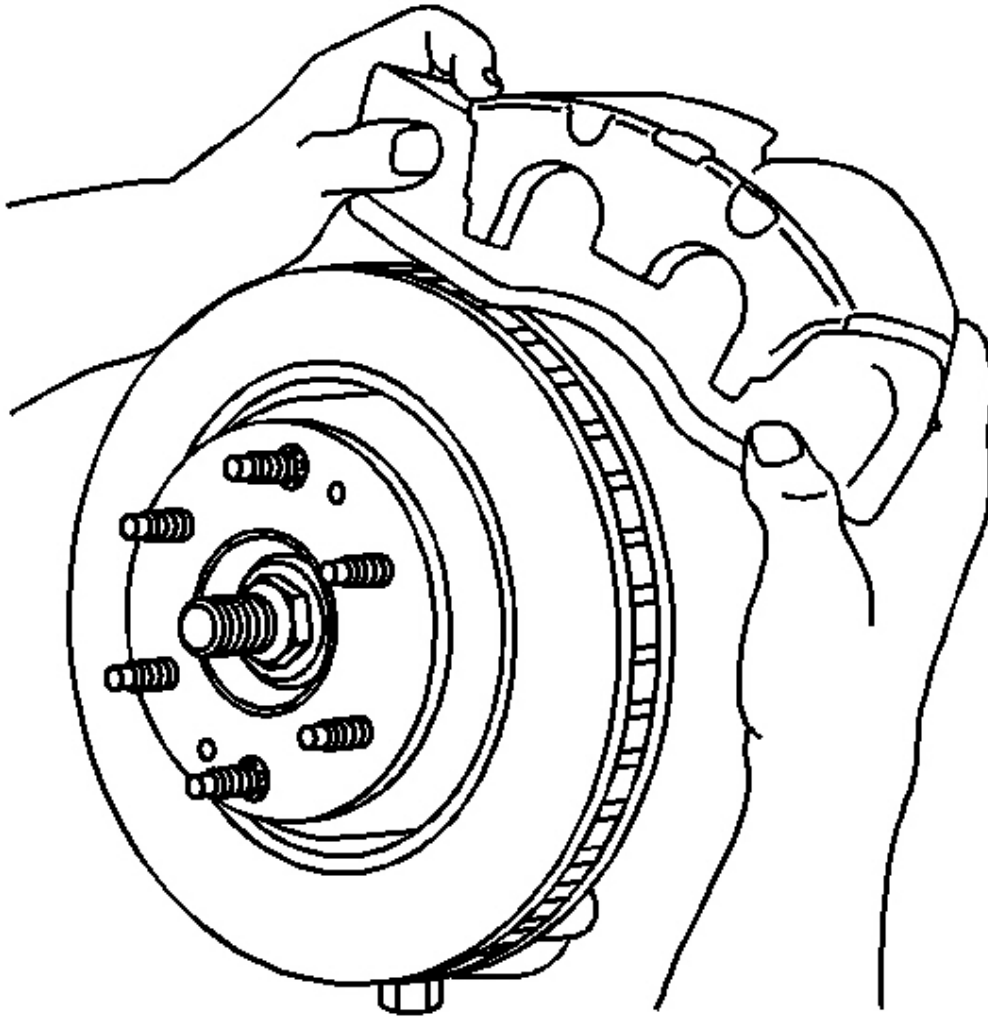


Fig. 100: Removing/Installing Brake Caliper & Mounting Bracket Assembly
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: When performing the following service procedure, the front brake caliper assembly and the front brake caliper mounting bracket can be removed as an assembly.

8. Remove the brake caliper and mounting bracket assembly. Refer to **Front Brake Caliper Bracket Replacement**.

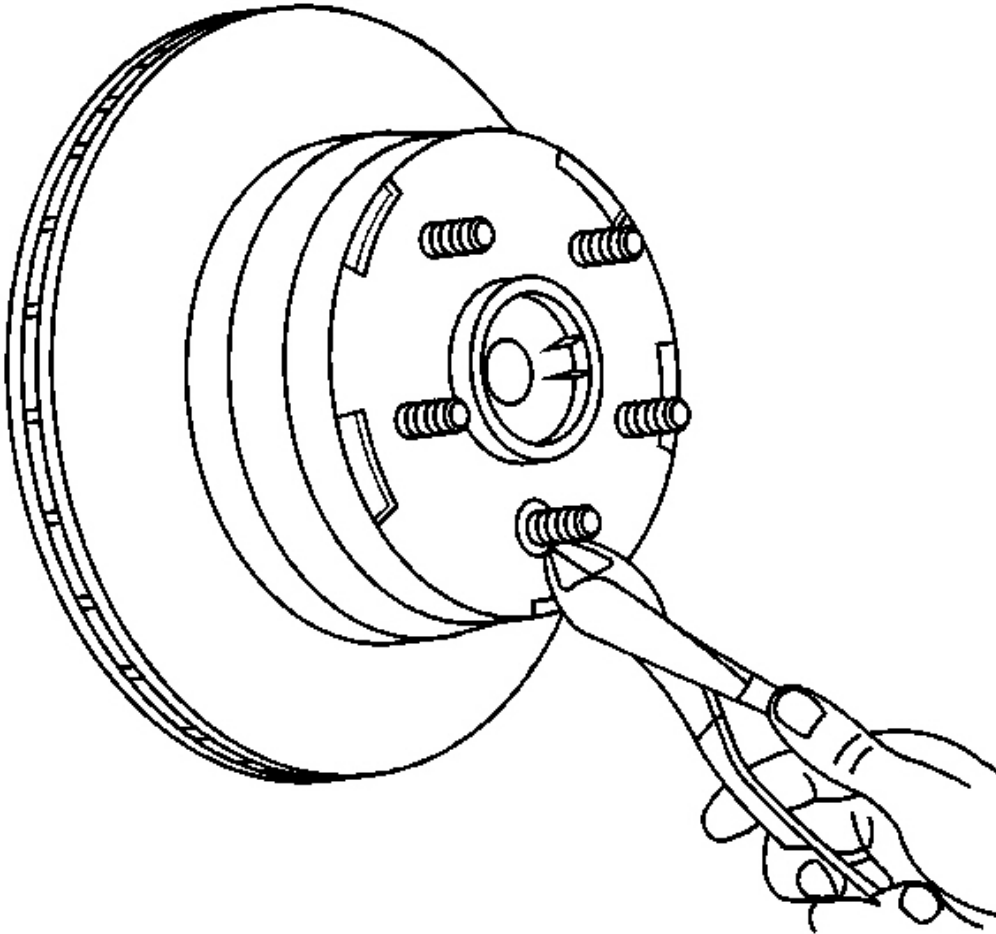


Fig. 101: Removing Brake Rotor Retaining Clips
Courtesy of GENERAL MOTORS CORP.

9. Remove the retaining clips from the brake rotor.

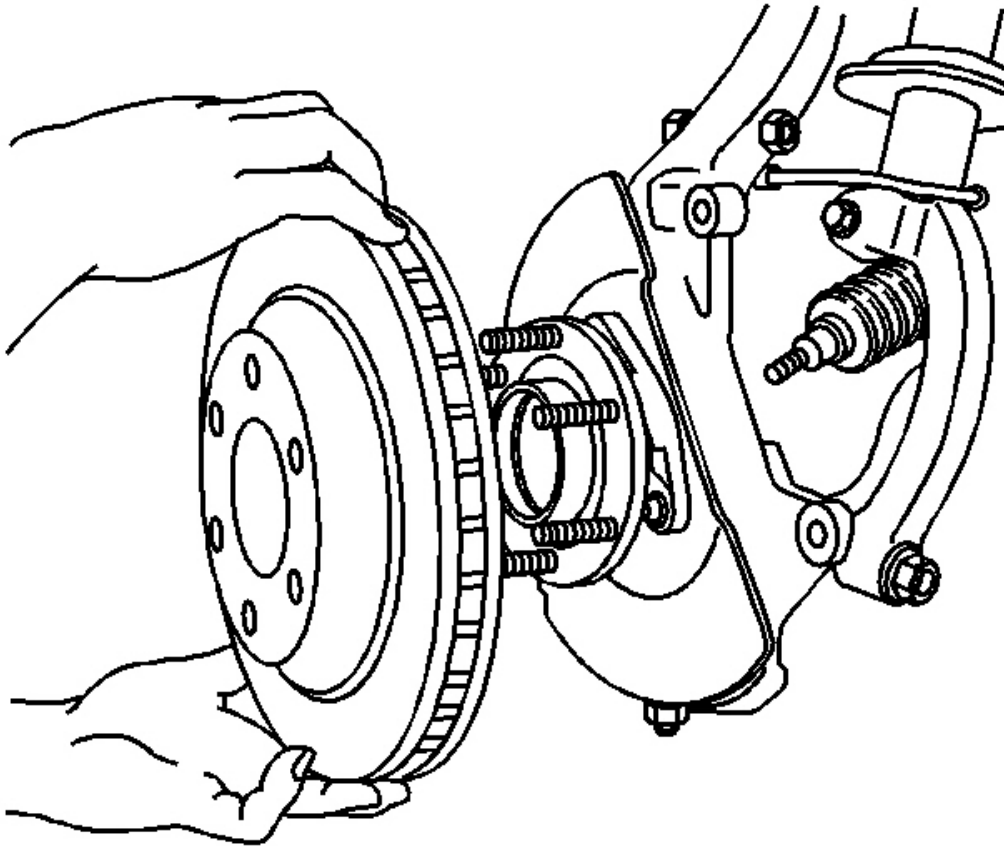


Fig. 102: Removing/Installing Front Brake Rotor To Wheel Hub
Courtesy of GENERAL MOTORS CORP.

NOTE: Whenever the brake rotor has been separated from the wheel bearing flange, clean any rust or foreign material from the mating surface of the rotor and flange with the J 42450 hub cleaning kit. Failure to do this may result in increased lateral runout of the rotor and brake pulsation.

IMPORTANT: If the brake rotor is not going to be replaced but just removed from the front hub, mark the relationship of the brake rotor and a wheel stud.

10. Remove the front brake rotor from the wheel hub.

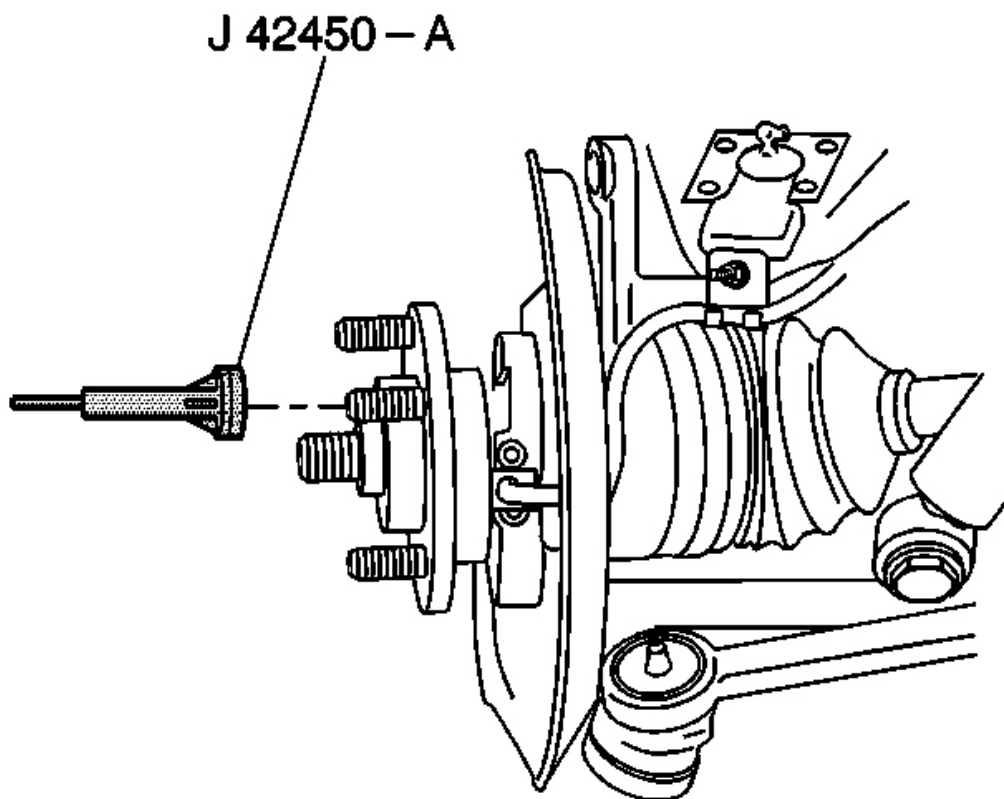


Fig. 103: Identifying Wheel Hub Resurfacing Kit (Front)
Courtesy of GENERAL MOTORS CORP.

11. Using the **J 42450-A** , clean the brake rotor contact area on the front hub. See **Special Tools**.

Installation Procedure

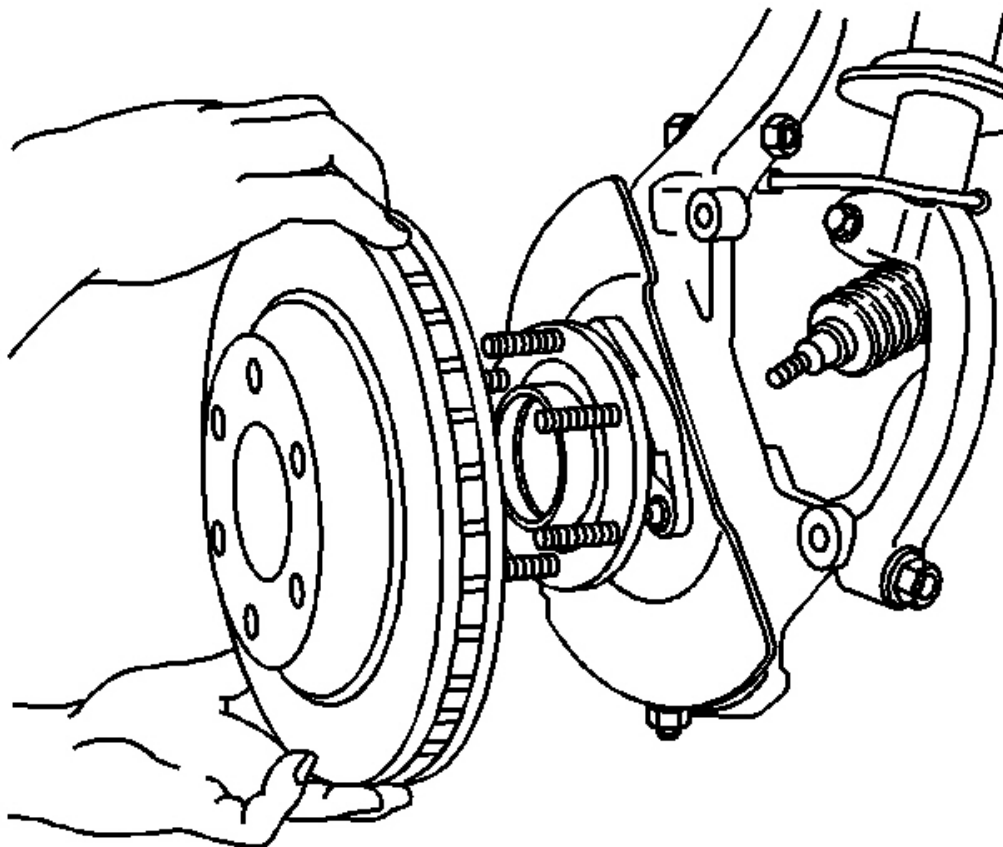


Fig. 104: Removing/Installing Front Brake Rotor To Wheel Hub
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure that the relationship marks on the brake rotor and the wheel stud are aligned before installing the brake rotor.

1. Install the brake rotor to the wheel hub.

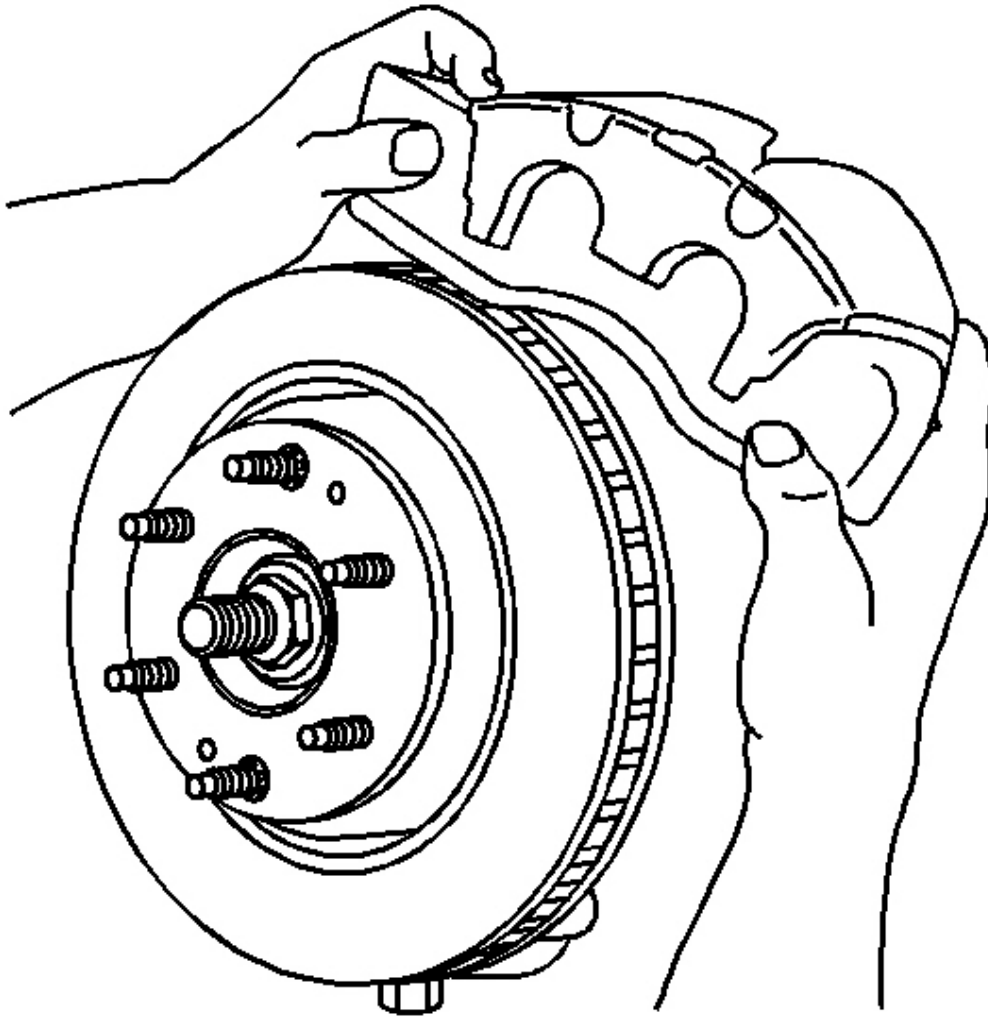


Fig. 105: Removing/Installing Brake Caliper & Mounting Bracket Assembly
Courtesy of GENERAL MOTORS CORP.

2. Install the brake caliper assembly to the steering knuckle.

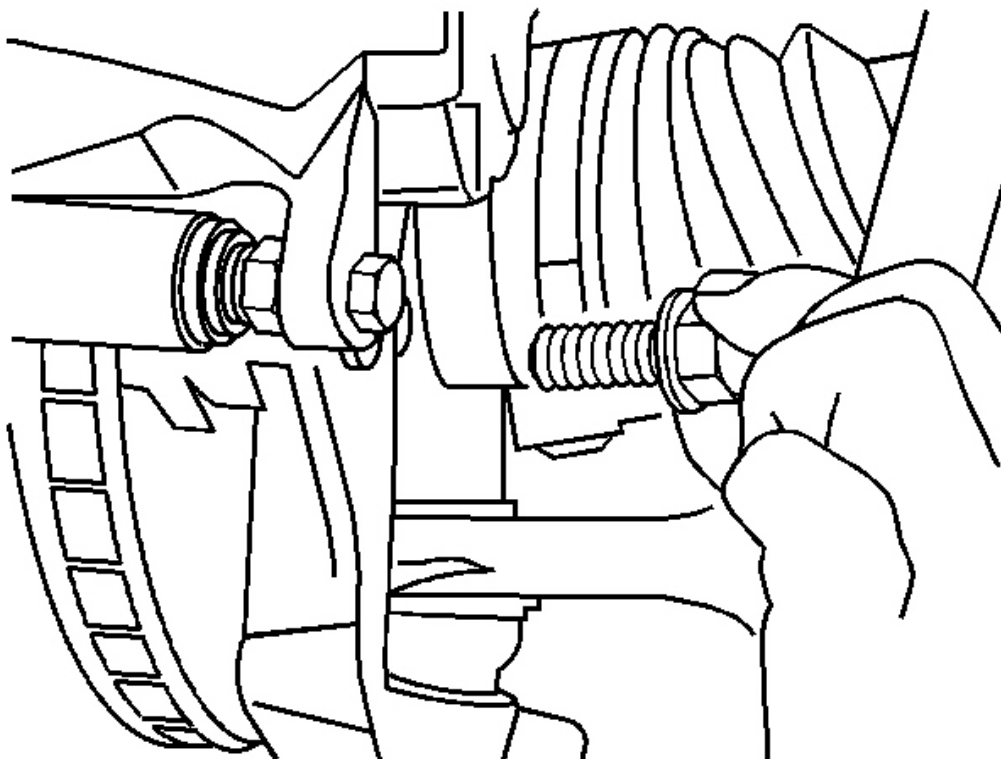


Fig. 106: View of Caliper Mounting
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

3. Install the brake caliper mounting bolt.

Tighten: Tighten the brake caliper bracket mounting bolt to 150 N.m (110 lb ft).

4. Install the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation .
5. Lower the vehicle. Refer to Lifting and Jacking the Vehicle .
6. Fill the brake master cylinder to the proper level. Refer to Master Cylinder Reservoir Filling .

CAUTION: Refer to Firm Brake Pedal Caution .

7. Pump the brake pedal slowly and firmly in order to seat the brake pads.

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8. Burnish the replaced or refinished rotors. Refer to **Brake Pad and Rotor Burnishing**.

REAR BRAKE ROTOR REPLACEMENT

Tools Required

- **J 2619-01** Slide Hammer
- **J 42450-A** Wheel Hub Resurfacing Kit. See **Special Tools**.
- **J 21177-A** Drum to Brake Shoe Clearance Gage. See **Special Tools**.
- **J-46277** Rotor Removal Tool. See **Special Tools**.

Removal Procedure

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

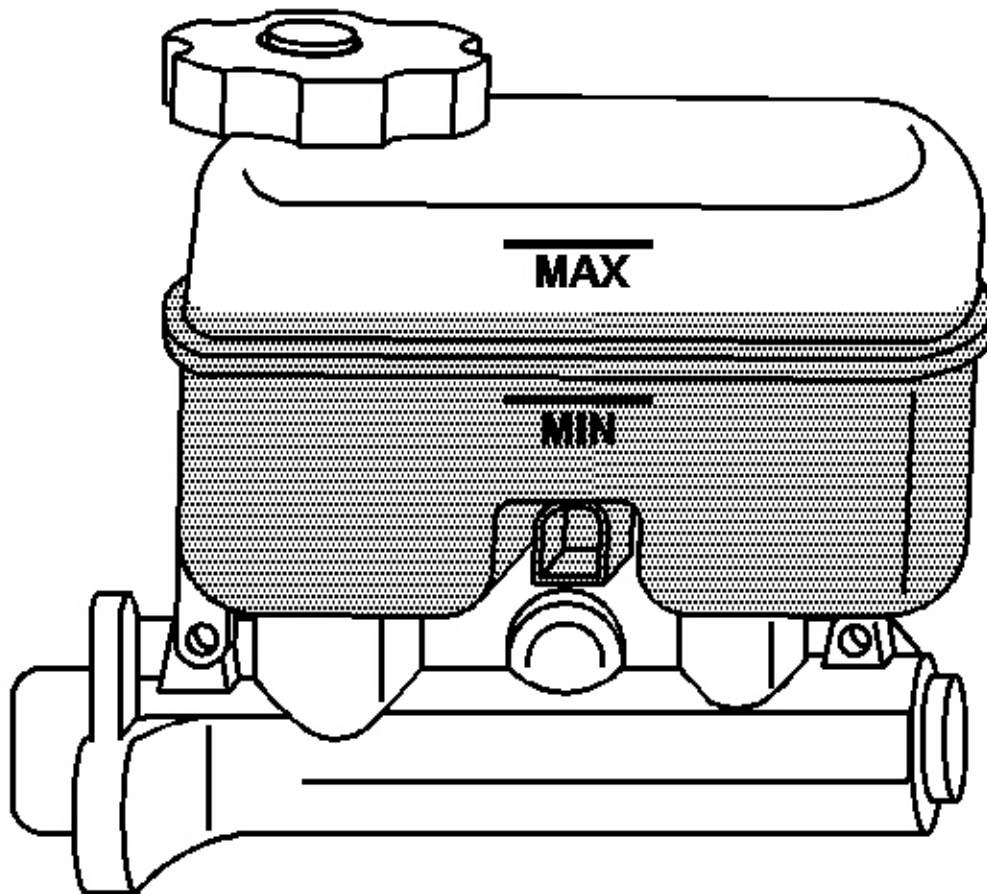


Fig. 107: View Of Half-Full Master Cylinder Reservoir
Courtesy of GENERAL MOTORS CORP.

1. Inspect the brake fluid level in the brake master cylinder reservoir.
2. If the brake fluid is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.

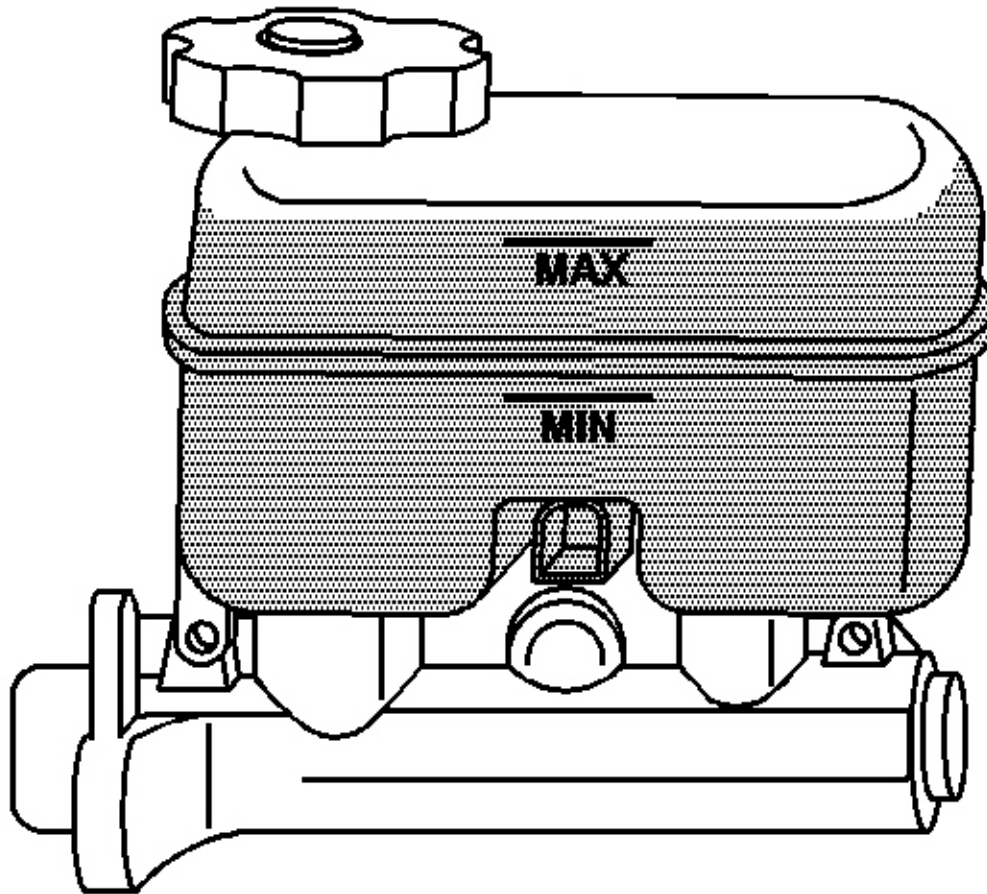


Fig. 108: View Of Full Master Cylinder Reservoir MAX & MIN Marks
Courtesy of GENERAL MOTORS CORP.

3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, using an appropriate tool, remove the brake fluid to the midway point before proceeding.
4. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

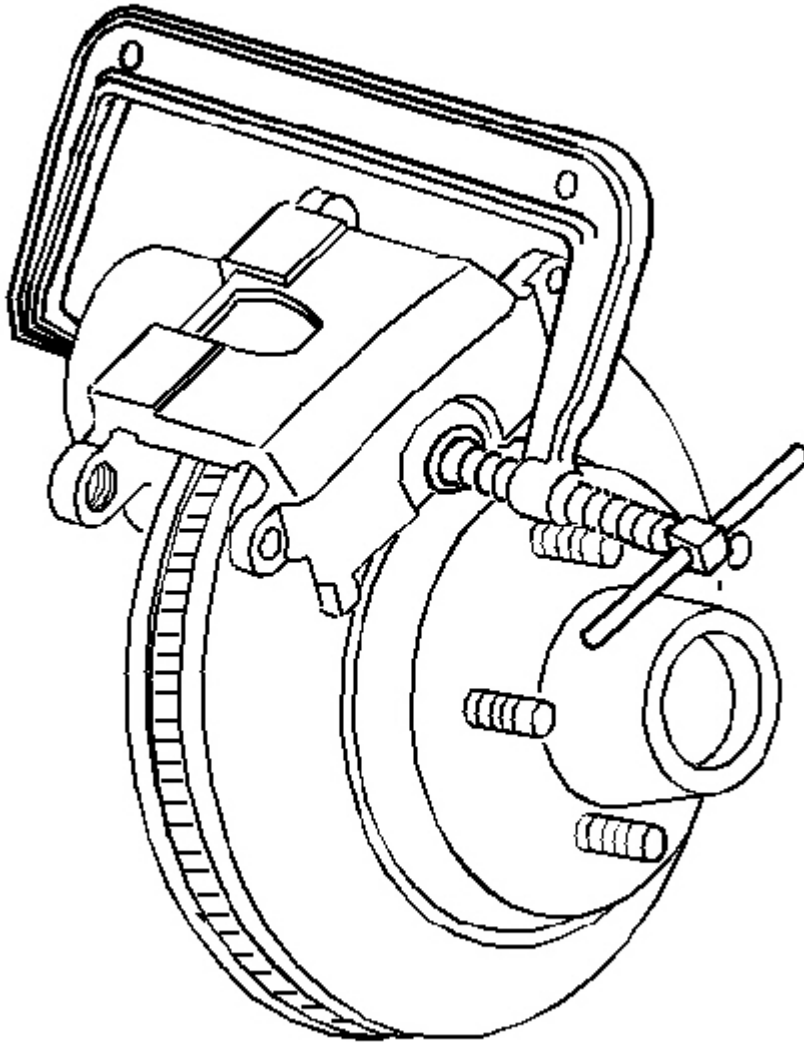


Fig. 109: View Of C-Clamp Over Brake Caliper Housing (Rear)
Courtesy of GENERAL MOTORS CORP.

6. Compress the rear brake caliper pistons.
 1. Install a large C-clamp over the top of the brake caliper housing and against the back of the outboard brake pad.
 2. Slowly tighten the C-clamp until the pistons push into the brake caliper enough to slide the brake caliper off the rotor.
 3. Remove the C-clamp from the brake caliper.

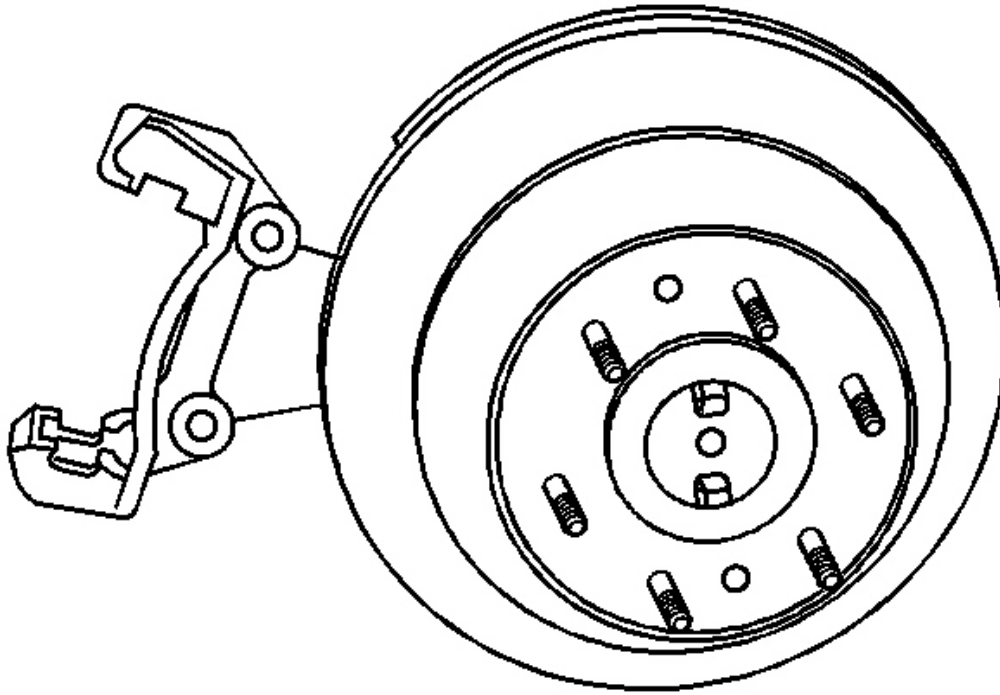


Fig. 110: View Of Caliper Mounting Bracket & Rotor
Courtesy of GENERAL MOTORS CORP.

7. Remove the rear brake caliper mounting bracket.

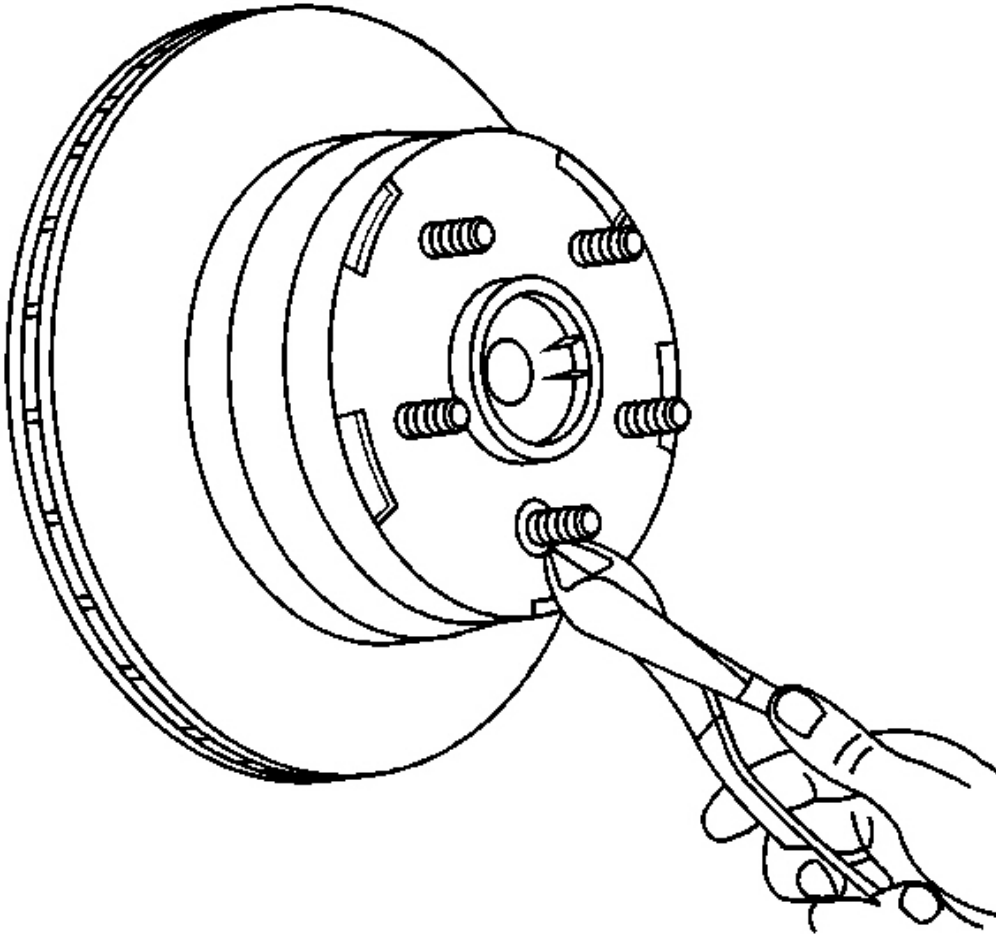


Fig. 111: Removing Brake Rotor Retaining Clips
Courtesy of GENERAL MOTORS CORP.

8. Remove the brake rotor retaining clips, if equipped.

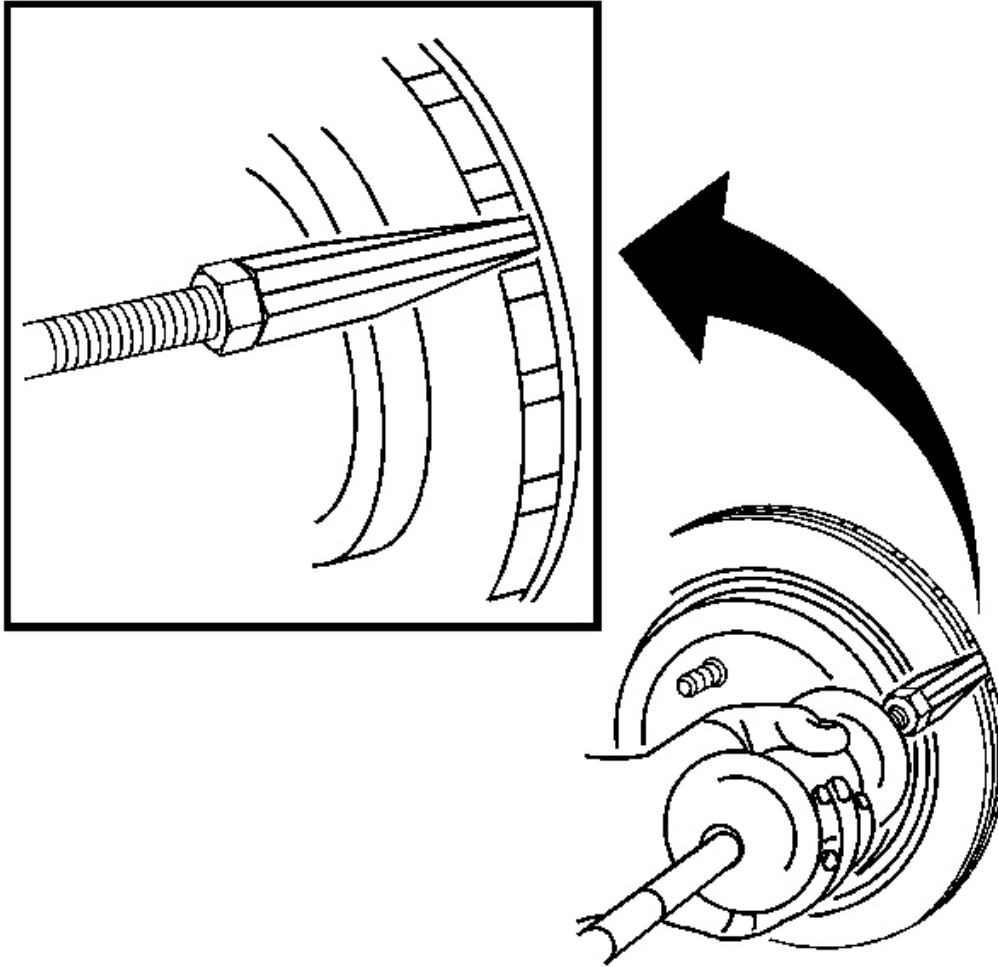


Fig. 112: J-46277 Rotor Removal Tool
Courtesy of GENERAL MOTORS CORP.

9. If the brake rotor is stuck, perform the following:
 1. Assemble **J-46277** to **J 2619-01** . See **Special Tools**.
 2. Insert **J-46277** between the rotor friction surfaces in the vent section of the rotor. See **Special Tools**. DO NOT place the **J-46277** on the rotor friction surface. See **Special Tools**.
 3. Using the **J-46277** and **J 2619-01** , release the rotor from the hub assembly. See **Special Tools**.

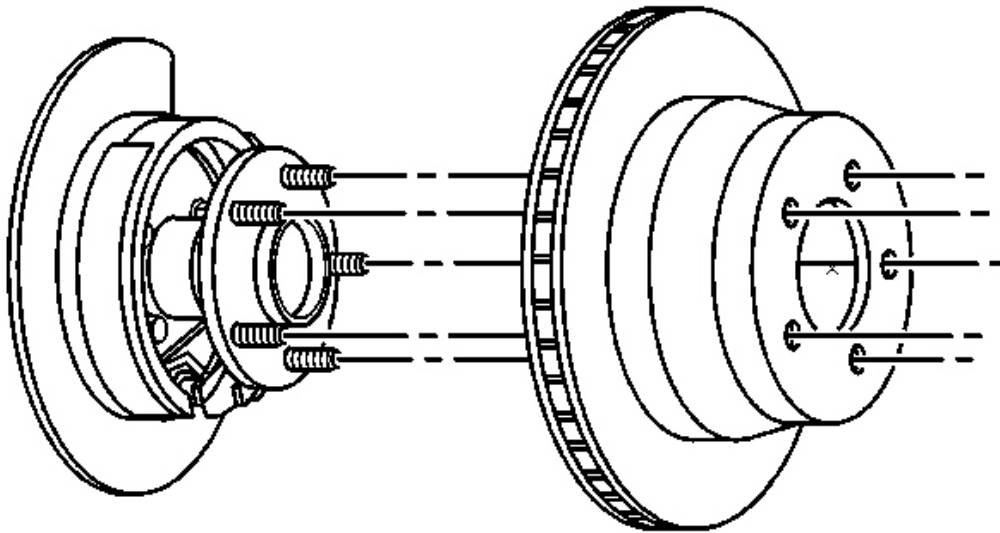


Fig. 113: Brake Rotor Removed From Hub
Courtesy of GENERAL MOTORS CORP.

NOTE: Whenever the rotor has been separated from the axle flange, clean any rust or foreign material from the mating surface of the axle flange and brake rotor. Failure to do this may result in increased lateral runout of the rotor and brake pulsation.

IMPORTANT: If the brake rotor is not going to be replaced but just removed from the front hub to be refinished, mark the brake rotor left or right and the relationship of the brake rotor and a wheel stud. In doing so, it will reduce the possibility of vibration in the brake system.

10. Remove the brake rotor.

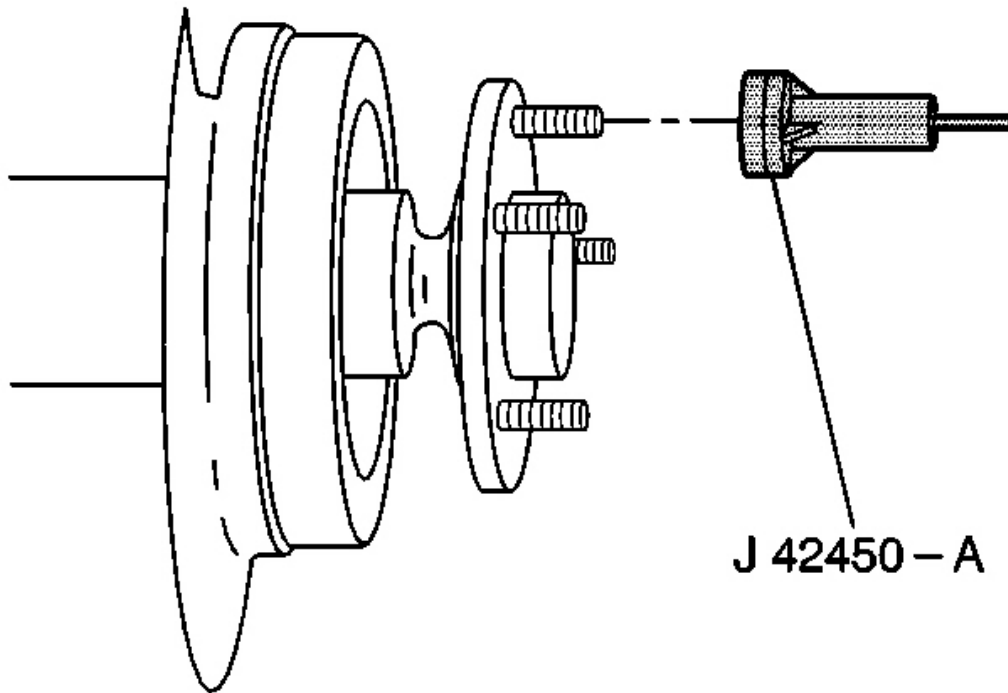


Fig. 114: Identifying Wheel Hub Resurfacing Kit (Rear)
Courtesy of GENERAL MOTORS CORP.

11. Using the **J 42450-A** , clean the brake rotor to the rear axle flange contact area. See **Special Tools**.
12. Refinish the rotor, if necessary. Refer to **Brake Rotor Refinishing**.
13. Inspect the park brake components. If any of the following conditions are found, replace the affected parts.
 - Bent or broken hold down spring
 - Broken, cracked, or worn brake shoe lining
 - Bent or damaged brake shoe
 - Worn, bent, or damaged backing plate

Installation Procedure

1. Clean the park brake shoes using denatured alcohol.
2. Dry the park shoes using non-lubricated, filtered air.
3. Lubricate the contact area between the park brake shoe and the backing plate with high temperature silicone brake lubricant.

IMPORTANT: It maybe necessary to readjust the park brake shoes to allow the brake rotor to be reinstalled.

4. Adjust the park brake. Refer to **Park Brake Adjustment** .

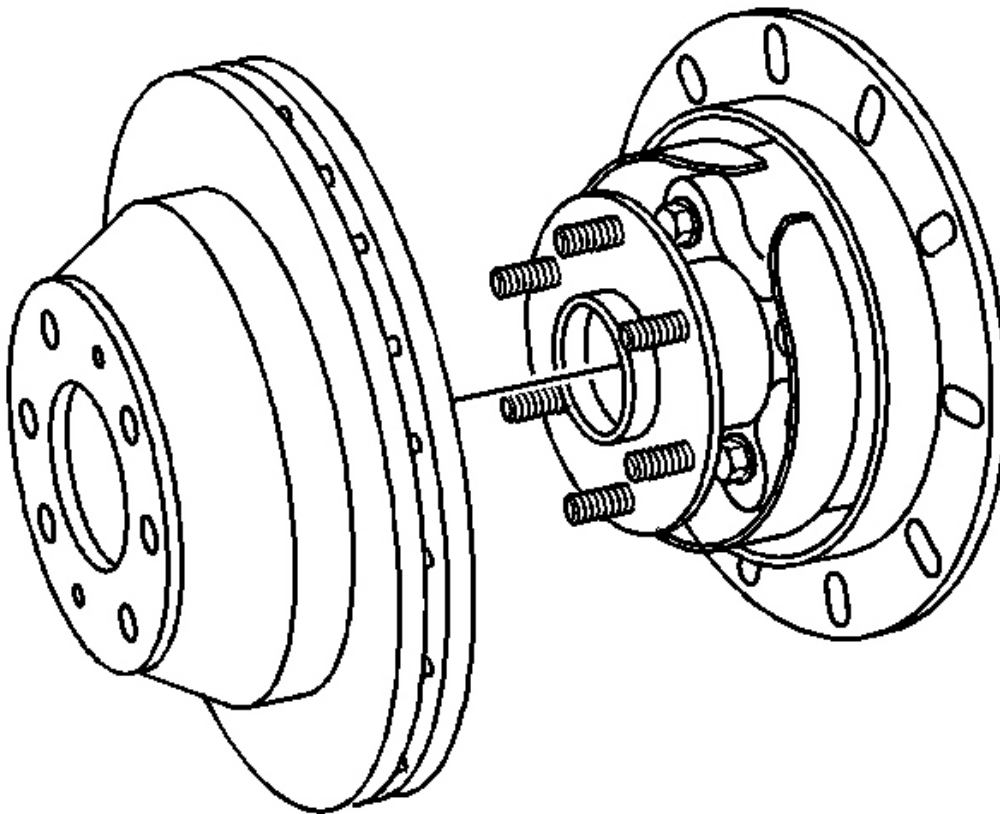


Fig. 115: View Of Rotor To Hub
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure that the rotor to axle flange relationships marks are aligned, if the brake rotor has been refinished, after the brake rotor is installed.

5. Install the brake rotor by slowly turning the rotor while pushing the rotor on the axle flange.

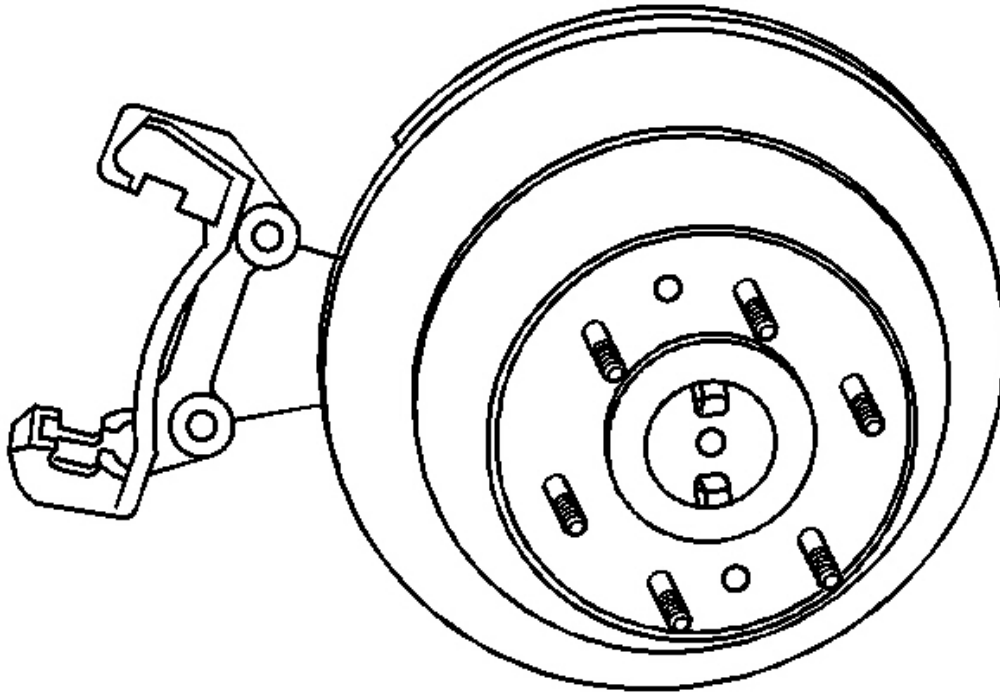


Fig. 116: View Of Caliper Mounting Bracket & Rotor
Courtesy of GENERAL MOTORS CORP.

6. Install the rear brake caliper mounting bracket. Refer to **Rear Brake Caliper Bracket Replacement**.
7. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation**.
8. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle**.
9. Refill the brake master cylinder reservoir, if needed. Refer to **Master Cylinder Reservoir Filling**.

CAUTION: Refer to **Firm Brake Pedal Caution**.

10. Pump the brake pedal slowly and firmly in order to seat the brake pads.
11. Burnish replaced or refinished rotors. Refer to **Brake Pad and Rotor Burnishing**.

FRONT BRAKE SHIELD REPLACEMENT

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

Removal Procedure

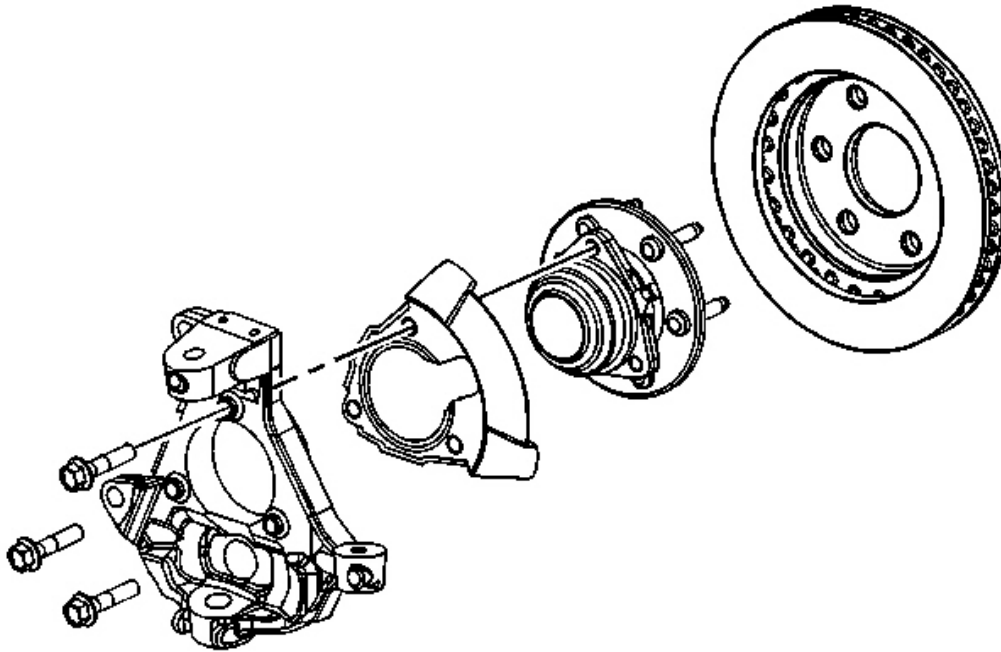


Fig. 117: Identifying Splash Shield (15 Series)
Courtesy of GENERAL MOTORS CORP.

1. Raise the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the front hub and bearing assembly. Refer to **Front Wheel Hub, Bearing, and Seal Replacement (RWD)** or **Front Wheel Hub, Bearing, and Seal Replacement (4WD)** .
4. Remove the retaining bolts for the splash shield.
5. Remove the splash shield.

Installation Procedure

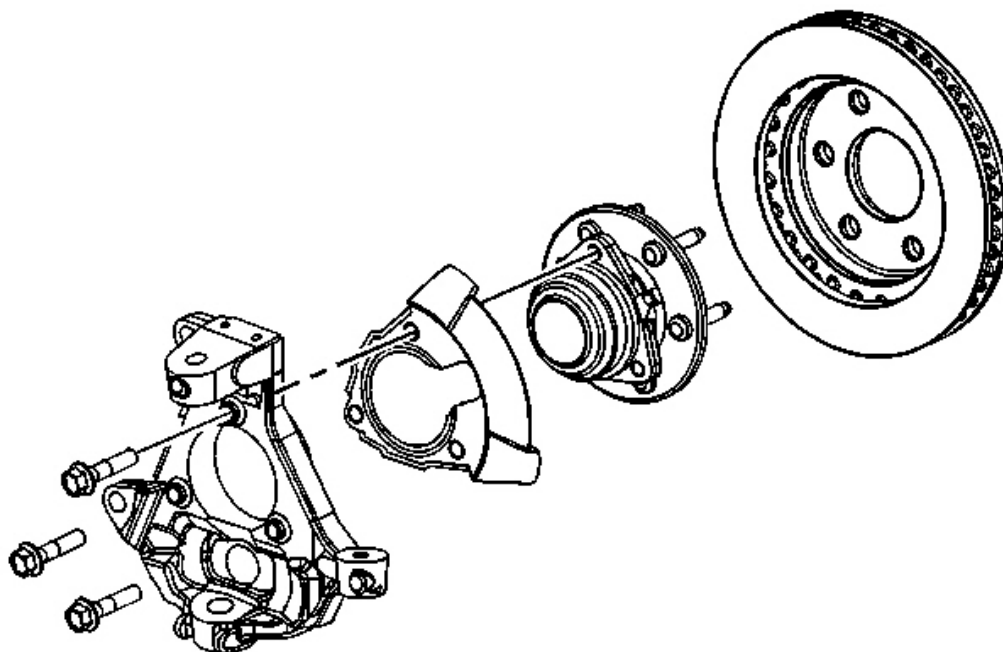


Fig. 118: Identifying Splash Shield (15 Series)
Courtesy of GENERAL MOTORS CORP.

1. Install the splash shield.
2. Install the splash shield retaining bolts, same as wheel hub and bearing.
3. Install the front hub and bearing assembly. Refer to **Front Wheel Hub, Bearing, and Seal Replacement (RWD)** or **Front Wheel Hub, Bearing, and Seal Replacement (4WD)** .
4. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
5. Lower the vehicle. Refer to **Lifting and Jacking the Vehicle** .

BRAKE ROTOR REFINISHING

Tools Required

- **J 41013** Rotor Resurfacing Kit. See **Special Tools**.
- **J 42450-A** Wheel Hub Resurfacing Kit. See **Special Tools**.

IMPORTANT: Do NOT refinish the brake rotors in order to correct any of the following complaints:

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- Growl or squeal brake noise
- Premature brake lining wear
- Cosmetic or superficial corrosion of the rotor braking surface
- Rotor discoloration

Refinish the brake rotors **ONLY** when 1 or more of the following conditions exist:

- Groove depth in excess of specification
- Severe scoring of the rotor braking surface
- Brake pulsation caused by the following:
 - Lateral runout in excess of specification
 - Brake rotor thickness variation in excess of specification
 - Corrosion or pitting that is deeper than the rotor braking surface

1. Use the **J 42450-A** in order to clean the wheel bearing/hub. See **Special Tools**.
2. Use a micrometer in order to measure the thinnest point of the brake rotor. If the thinnest point of the brake rotor exceeds the brake rotor minimum thickness, do NOT refinish the brake rotor. Replace the brake rotor.
3. Use the **J 41013** in order to THOROUGHLY clean the rust from the brake rotor flange. See **Special Tools**.
4. Refinish the brake rotor. Refer to the brake lathe manufacturer's operating instructions.

IMPORTANT: Failure to obtain the best possible braking surface finish may cause the vehicle to stop with difficulty.

5. After machining the rotor, use 120 grit aluminum oxide sandpaper and a non-directional rotor finisher, if available, in order to create a non-directional braking surface.
6. Clean the braking surfaces with GM P/N 12377981 (Canadian P/N 10953463) or equivalent, brake parts cleaner.

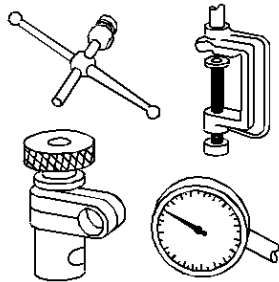
SPECIAL TOOLS & EQUIPMENT

SPECIAL TOOLS

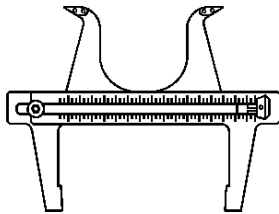
| Illustration | Tool Number/ Description |
|--------------|---------------------------|
| | J 2619-01 Slide Hammer |

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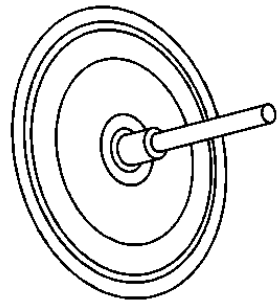
2008 BRAKES Disc Brakes - Ascender, Envoy & Trailblazer



J 8001
Dial Indicator Set



J 21177-A
Drum-to-Brake Shoe Clearance Gage

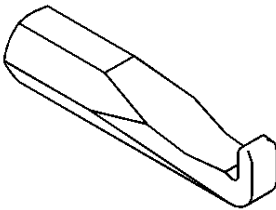
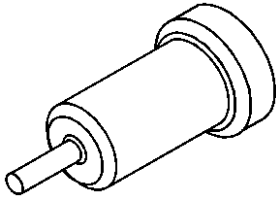


J 41013
Rotor Resurfacing Kit

J 42450-A
Wheel Hub Resurfacing Kit

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J 46277
Rotor Removal Tool