BRAKES

Disc Brakes - Escalade, Suburban, Tahoe, Yukon

SPECIFICATIONS

FASTENER SPECIFICATIONS

Application	Specification	
	Metric	English
Brake Caliper Bleeder Screw - Front JD9	14 N.m	124 lb in
Brake Caliper Bleeder Screw - Front and Rear J95	10 N.m	89 lb in
Brake Caliper Bleeder Screw - Rear JD9	12 N.m	106 lb in
Brake Caliper Bracket Bolt - Front JD9	230 N.m	170 lb ft
Brake Caliper Bracket Bolt - Front and Rear J95	300 N.m	221 lb ft
Brake Caliper Bracket Bolt - Rear JD9	200 N.m	148 lb ft
Brake Caliper Guide Pin Bolt - Front JD9	100 N.m	74 lb ft
Brake Caliper Guide Pin Bolt - Front and Rear J95	105 N.m	77 lb ft
Brake Caliper Guide Pin Bolt - Rear JD9	52 N.m	38 lb ft
Brake Hose Fitting Bolt - Front and Rear JD9, J95	40 N.m	30 lb ft
Brake Rotor Bolt - Front JD9, J95	12 N.m	106 lb in
Rear Brake Shield Bolt - JD9	9 N.m	80 lb in
Rear Brake Shield Bolt - J95	10 N.m	89 lb in

DISC BRAKE COMPONENT SPECIFICATIONS

Application	Specification	
	Metric	English
Front Brakes - JB1, JD9		
• Rotor Discard Thickness*	28.0 mm	1.102 in
• Rotor Minimum Allowable Thickness After Refinish	28.5 mm	1.122 in

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Application	Specification	
	Metric	English
• Rotor Thickness (new)	30.0 mm	1.181 in
• Rotor Maximum Allowable Assembled Lateral Runout	0.05 mm	0.002 in
• Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
• Rotor Maximum Allowable Thickness Variation	0.018 mm	0.0007 in
Front Brakes - J95		
• Rotor Discard Thickness*	38.5 mm	1.516 in
• Rotor Minimum Allowable Thickness After Refinish	39.0 mm	1.535 in
• Rotor Thickness (new)	40.0 mm	1.575 in
• Rotor Maximum Allowable Assembled Lateral Runout	0.05 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 - JB1, JD9		
• Rotor Discard Thickness*	18.5 mm	0.728 in
• Rotor Minimum Allowable Thickness After Refinish	19.0 mm	0.748 in
• Rotor Thickness (new)	20.0 mm	0.787 in
• Rotor Maximum Allowable Assembled Lateral Runout	0.05 mm	0.002 in

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Application	Specification	
	Metric	English
• Rotor Maximum Allowable Scoring	1.50 mm	0.059 in
• Rotor Maximum Allowable Thickness Variation	0.018 mm	0.0007 in
Rear Brakes - J95		
• Rotor Discard Thickness*	32.5 mm	1.280 in
• Rotor Minimum Allowable Thickness After Refinish	33.0 mm	1.299 in
• Rotor Thickness (new)	34.0 mm	1.339 in
• Rotor Maximum Allowable Assembled Lateral Runout	0.05 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 discard dimension cast into them. Replace any rotor that does not meet this specification. After refinishing the rotor, replace any rotor that does not meet the minimum thickness specifications.		

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number
Brake Caliper Bracket Bolt Brake Caliper Guide Pin	Threadlocker	89021297 (Canada 10953488)

DIAGNOSTIC INFORMATION AND PROCEDURES

BRAKE ROTOR THICKNESS MEASUREMENT

WARNING: Refer to Brake Dust Warning .

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1. If the inboard friction surface of the brake rotor is not accessible, reposition and support the caliper with the brake pads. Refer to **Front Disc Brake Pads Replacement (JD9)Front Disc Brake Pads Replacement (J95)**, and/or **Rear Disc Brake Pads Replacement (JD9)Rear Disc Brake Pads Replacement (J95)**.
2. Clean the friction surfaces of the brake rotor with denatured alcohol, or an equivalent approved brake cleaner.

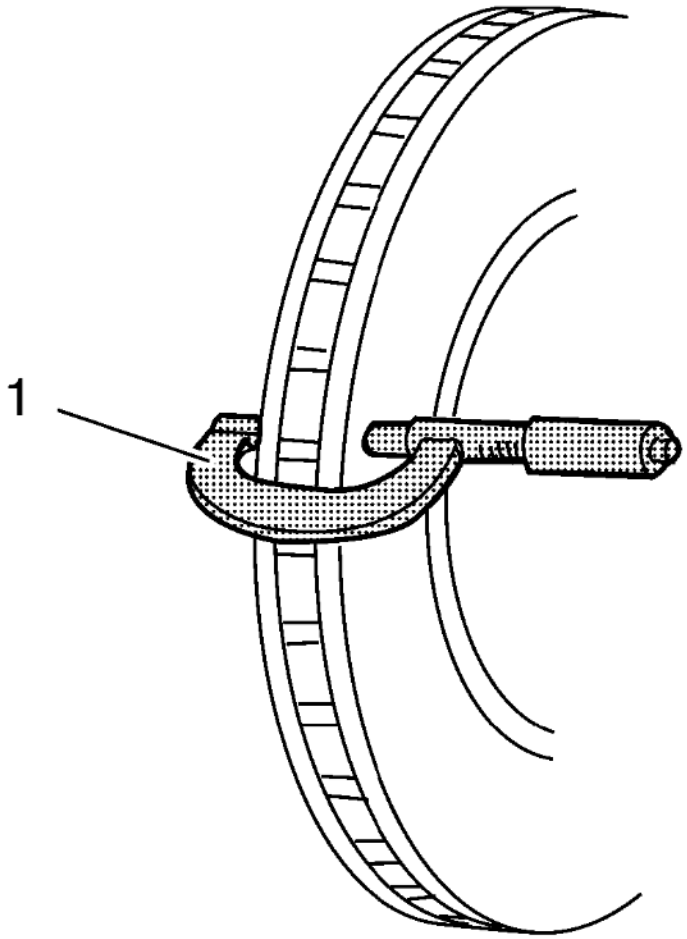


Fig. 1: Micrometer On Brake Rotor

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3. Using a micrometer (1) calibrated in thousandths-of-a-millimeter, or ten-thousandths-of-an-inch, measure and record the lowest thickness of the brake rotor at 4 or more points, equally spaced around the rotor.

   Ensure that the measurements are only taken within the friction surfaces and that the micrometer is positioned the same distance from the outside edge of the rotor, about 13 mm (1/2 in), for each measurement.

4. Compare the lowest thickness measurement recorded to the brake rotor discard thickness specifications. Refer to **Disc Brake Component Specifications**.
5. If the lowest thickness measurement of the brake rotor is above the discard thickness specification, the brake rotor may be refinished, depending upon surface and wear conditions which may be present.
6. If the lowest thickness measurement of the brake rotor is at or below the discard thickness specification, the rotor requires replacement. Refer to **Front Brake Rotor Replacement (JD9)Front Brake Rotor Replacement (J95)**, and/or **Rear Brake Rotor Replacement (JD9)Rear Brake Rotor Replacement (J95)**.

BRAKE ROTOR THICKNESS VARIATION MEASUREMENT

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

NOTE: **Any disc brake rotor that exhibits thickness variation exceeding the maximum acceptable level must be refinished or replaced. Thickness variation exceeding the maximum acceptable level can cause brake pulsation.**

1. If the inboard friction surface of the brake rotor is not accessible, reposition and support the caliper with the brake pads. Refer to **Front Disc Brake Pads Replacement (JD9)Front Disc Brake Pads Replacement (J95)**, and/or **Rear Disc Brake Pads Replacement (JD9)Rear Disc Brake Pads Replacement (J95)**.
2. Clean the friction surfaces of the brake rotor with denatured alcohol, or an equivalent approved brake cleaner.

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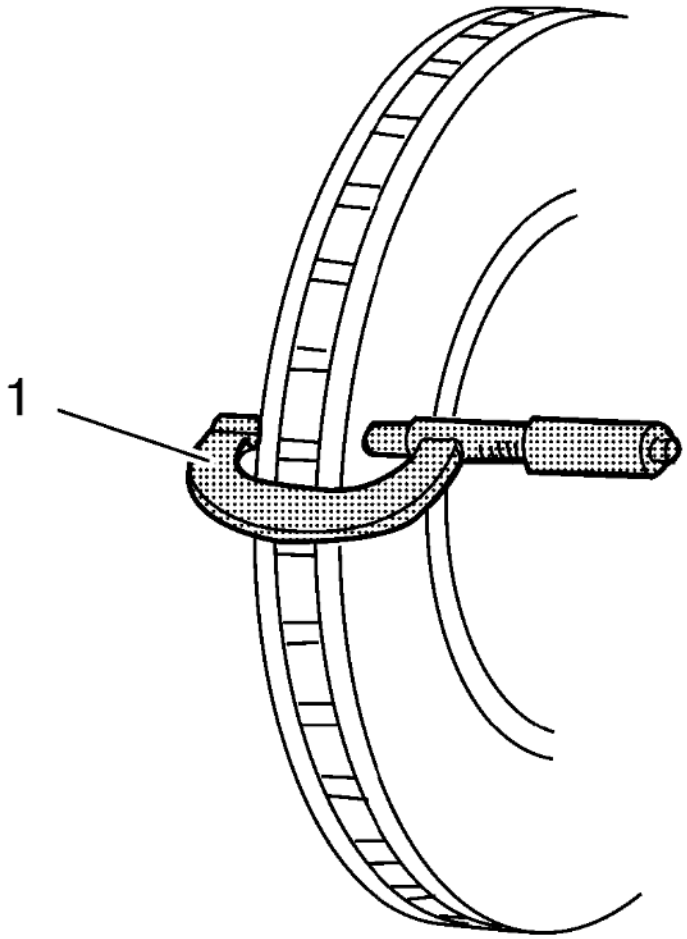


Fig. 2: Micrometer On Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

3. Using a micrometer (1) calibrated in thousanths-of-a-millimeter, or ten-thousanths-of-an-inch, measure and record the thickness of the brake rotor at four or more points, evenly spaced around the rotor.

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Ensure that the measurements are only taken within the friction surfaces and that the micrometer is positioned the same distance from the outer edge of the rotor, about 13 mm (1/2 in), for each measurement.

4. Calculate the difference between the highest and lowest thickness measurement recorded to obtain the amount of thickness variation.
5. Compare the thickness variation measurement to the following specifications:

Specification - Front and Rear

Brake rotor maximum allowable thickness variation: 0.018 mm (0.0007 in)

NOTE: **Whenever a brake rotor is refinished or replaced, the assembled lateral runout (LRO) of the rotor must be measured to ensure optimum performance of the disc brakes.**

6. If the brake rotor thickness variation measurement exceeds the specification, the rotor requires refinishing or replacement.

BRAKE ROTOR SURFACE AND WEAR INSPECTION

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

1. If the inboard friction surface of the brake rotor is not accessible, reposition and support the caliper with the brake pads. Refer to **Front Disc Brake Pads Replacement (JD9)Front Disc Brake Pads Replacement (J95)**, and/or **Rear Disc Brake Pads Replacement (JD9)Rear Disc Brake Pads Replacement (J95)**.
2. Clean the friction surfaces of the brake rotor with denatured alcohol, or an equivalent approved brake cleaner.
3. Inspect the friction 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
4. If the friction surfaces of the brake rotor exhibit one or more of the Braking Surface Conditions, the rotor requires refinishing or replacement.

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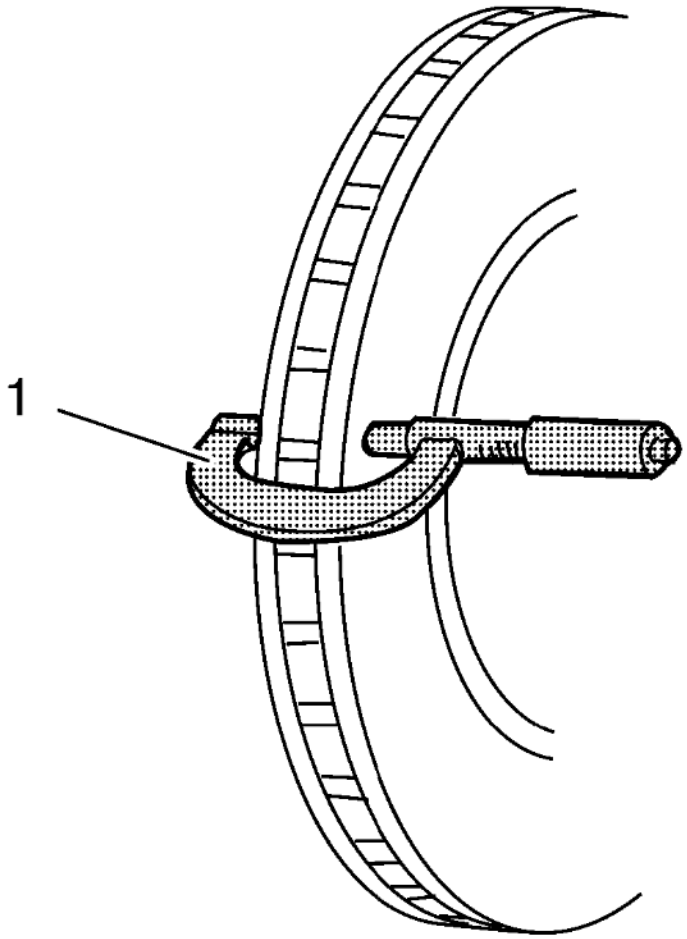


Fig. 3: Micrometer On Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

5. Using a micrometer (1) calibrated in thousandths-of-a-millimeter, or ten-thousandths-of-an-inch, measure and record the scoring depth of any grooves present on the rotor friction surfaces.
6. Compare the groove scoring depth recorded to the following specification:

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Specification

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

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

BRAKE ROTOR ASSEMBLED LATERAL RUNOUT MEASUREMENT

Special Tools

- **CH-41013** Rotor Resurfacing Kit
- **CH-42450-A** Wheel Hub Resurfacing Kit
- **CH-45101** Hub and Wheel Runout Gauge
- **CH-45101-100** Conical Brake Rotor Washers

For equivalent regional tools, refer to **Special Tools**.

WARNING: Refer to Brake Dust Warning .

NOTE:

- **Brake rotor assembled lateral runout (LRO) exceeding the maximum allowable specification can cause thickness variation to develop in the brake rotor over time, usually between 4, 800-11, 300 km (3, 000-7, 000 mi).**
- **Brake rotor thickness variation MUST be checked BEFORE checking for assembled lateral runout (LRO). Thickness variation exceeding the maximum acceptable level can cause brake pulsation. Refer to Brake Rotor Thickness Variation Measurement.**

1. Match-mark the position of the brake rotor to the wheel studs if this has not been done already.

NOTE: Whenever the brake rotor has been separated from the hub/axle flange, any rust or contaminants should be cleaned from the hub/axle flange and the brake rotor mating surfaces. Failure to do this may result in excessive assembled lateral runout (LRO) of the brake rotor, which could lead to brake pulsation.

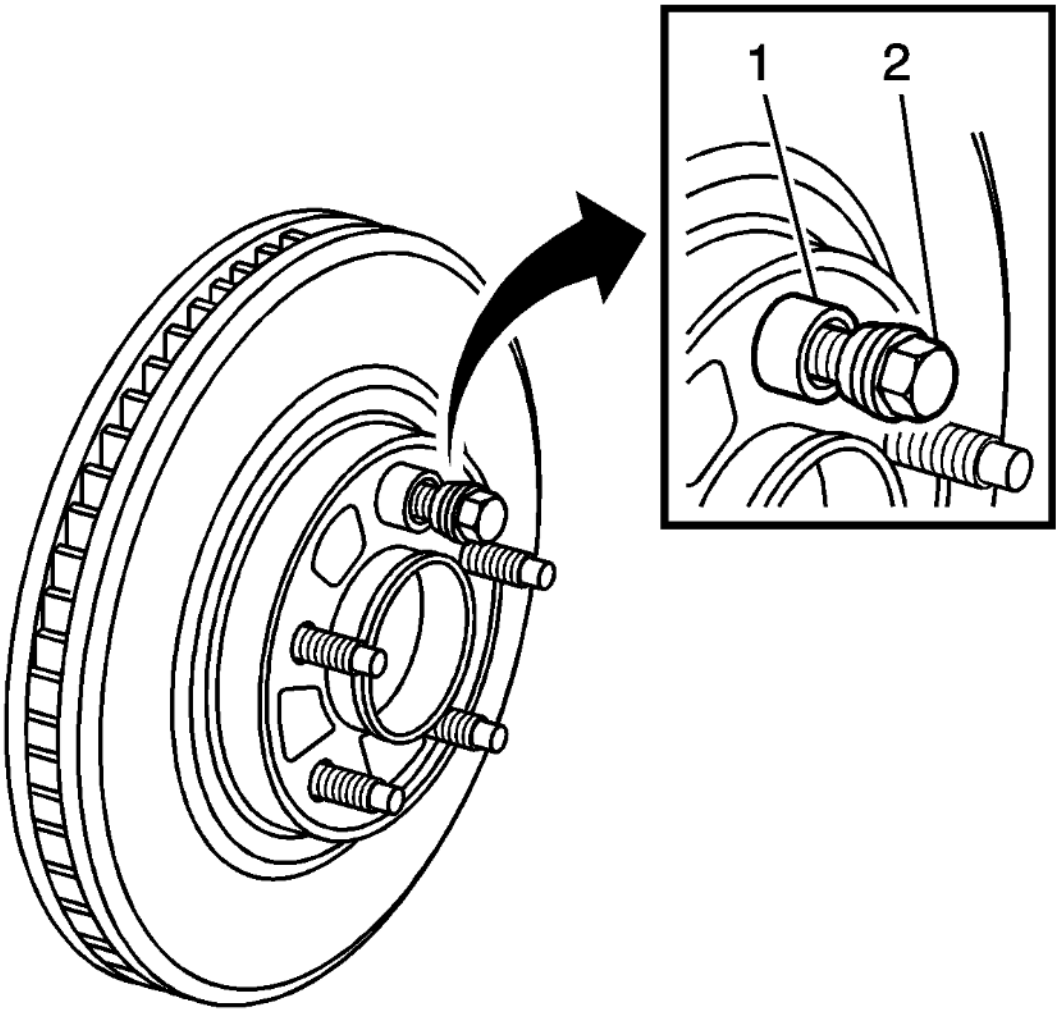
2. Inspect the mating surface of the hub/axle flange and the brake rotor to ensure that there are no foreign particles, corrosion, rust, or debris remaining. If the wheel hub/axle flange and/or if the brake rotor mating surfaces exhibit these conditions, perform the following steps:

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1. Remove the brake rotor from the vehicle. Refer to **Front Brake Rotor Replacement (JD9)Front Brake Rotor Replacement (J95)**, and/or **Rear Brake Rotor Replacement (JD9)Rear Brake Rotor Replacement (J95)**.
2. Using the **CH-42450-A** wheel hub resurfacing kit, thoroughly clean any rust or corrosion from the mating surface of the hub/axle flange.
3. Using the **CH-41013** rotor resurfacing kit, thoroughly clean any rust or corrosion from the mating surface of the brake rotor.
4. Clean the friction surfaces of the brake rotor with denatured alcohol, or an equivalent approved brake cleaner.

3. Install the rotor to the hub/axle flange using the match-mark made prior to removal.



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Fig. 4: Lug Nuts & Conical Washers
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4. Hold the rotor firmly in place against the hub/axle flange and install one of th **CH-45101-100** conical brake rotor washers (1), and one lug nut (2) onto the upper-most wheel stud.
5. Continue to hold the rotor secure and tighten the lug nut firmly by hand.

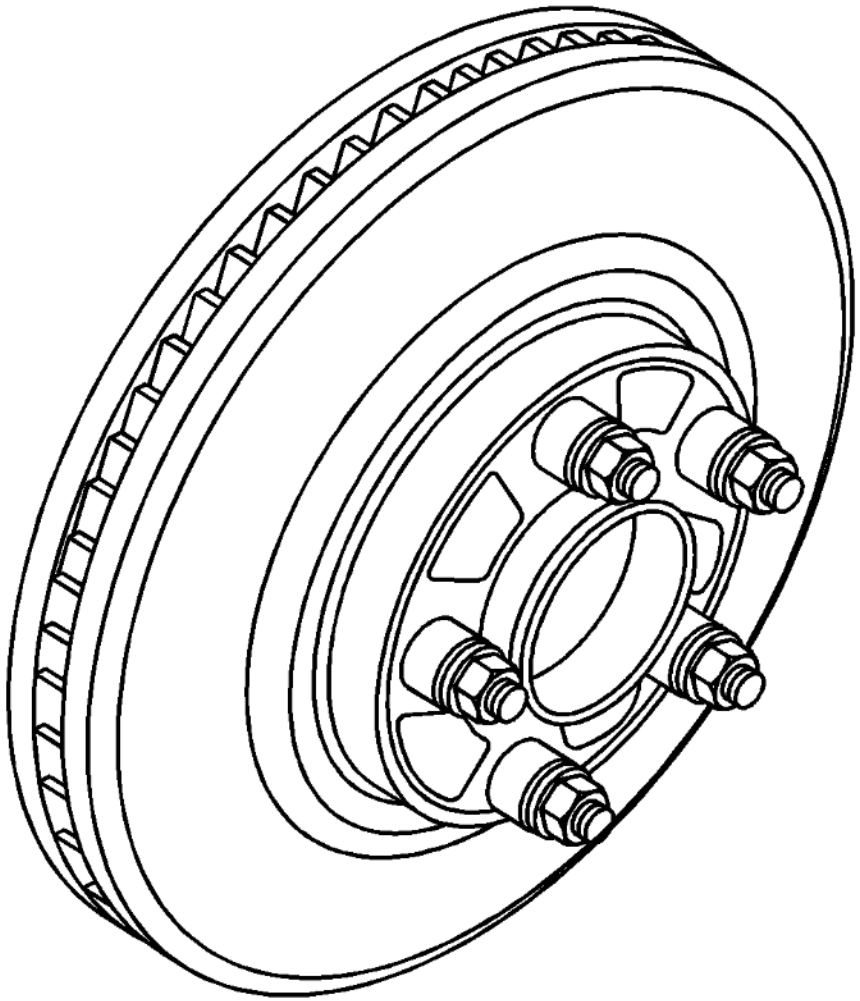


Fig. 5: Lug Nuts & Conical Washers

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6. Install the remaining **CH-45101-100** conical brake rotor washers and lug nuts onto the wheel studs and tighten the nuts firmly by hand in a star-pattern.
7. Tighten the lug nuts in a star-pattern to specification. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
8. If the brake rotor has been REFINISHED or REPLACED with a new rotor, proceed to step 14.
9. If the brake rotor meets the following criteria, proceed to step 10.
    - The rotor is within specifications and is being REUSED.
    - The rotor has NOT been refinished.
    - The rotor does NOT exhibit thickness variation exceeding the maximum allowable level.

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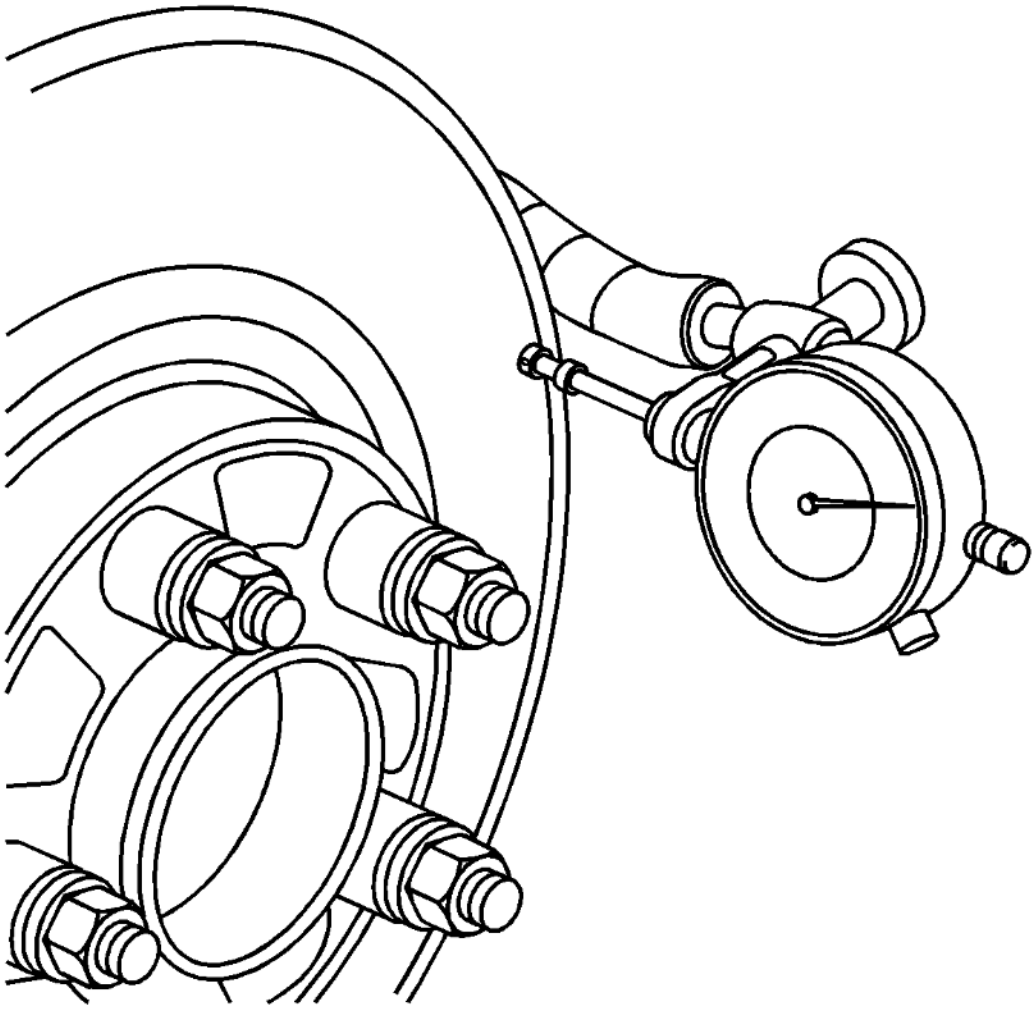


Fig. 6: Using Dial Indicator To Measure Lateral Runout
Courtesy of GENERAL MOTORS COMPANY

10. Mount a dial indicator, **CH-45101** hub and wheel runout gauge, or equivalent, to the steering knuckle and position the indicator button so it contacts the brake rotor friction surface at a 90 degree angle, approximately 13 mm (0.5 in) from the outer edge of the rotor.
11. Measure and record the assembled LRO of the brake rotor.
    1. Rotate the rotor until the lowest reading is displayed on the indicator dial, then set the dial to zero.

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2. Rotate the rotor until the highest reading is displayed on the dial.
3. Mark the location of the high spot relative to the nearest wheel stud, or studs.
4. Measure and record the amount of LRO.

12. Compare the brake rotor assembled LRO to the following specification:

    Specification

    - Front brake rotor maximum allowable assembled lateral runout: 0.05 mm (0.002 in)
    - Rear brake rotor maximum allowable assembled lateral runout: 0.05 mm (0.002 in)

13. If the brake rotor assembled LRO is within specifications, proceed to step 18.

    If the brake rotor assembled LRO exceeds the specification, refinish the rotor to ensure true parallelism. Refer to **Brake Rotor Refinishing**. After refinishing the rotor, proceed to step 14.

14. Mount a dial indicator, **CH-45101** hub and wheel runout gauge, or equivalent, to the steering knuckle and position the indicator button so it contacts the brake rotor friction surface at a 90 degree angle, approximately 13 mm (0.5 in) from the outer edge of the rotor.
15. Measure and record the assembled LRO of the brake rotor.
    1. Rotate the rotor until the lowest reading is displayed on the indicator dial, then set the dial to zero.
    2. Rotate the rotor until the highest reading is displayed on the dial.
    3. Mark the location of the high spot relative to the nearest wheel stud, or studs.
    4. Measure and record the amount of LRO.
16. Compare the brake rotor assembled LRO to the following specification:

    Specification

    - Front brake rotor maximum allowable assembled lateral runout: 0.05 mm (0.002 in)
    - Rear brake rotor maximum allowable assembled lateral runout: 0.05 mm (0.002 in)

17. If the brake rotor assembled LRO measurement exceeds the specification, bring the LRO to within specifications. Refer to **Brake Rotor Assembled Lateral Runout Correction**.
18. If the brake rotor assembled LRO measurement is within specification, install the brake caliper and depress the brake pedal several times to secure the rotor in place before removing the **CH-45101-100** conical brake rotor washers and the lug nuts.

BRAKE PAD INSPECTION

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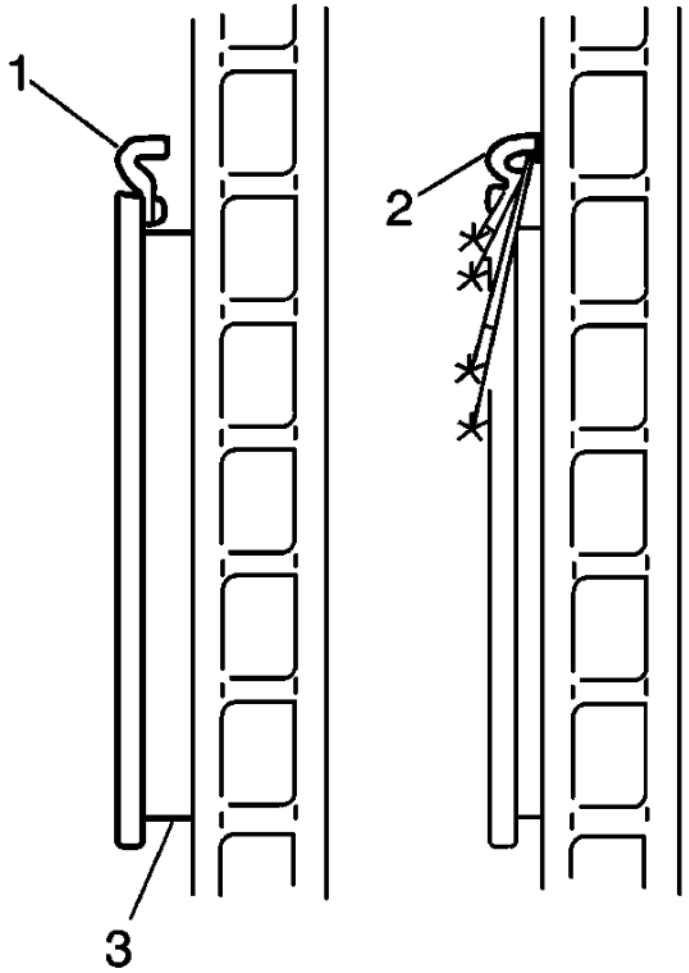


Fig. 7: View Of Brake Pads & Audible Wear Sensors
Courtesy of GENERAL MOTORS COMPANY

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

1. Inspect the disc brake pads at regular intervals, or whenever the tire and wheel assemblies are removed from the vehicle.

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2. If replacement is necessary, always replace disc brake pads in axle sets.

NOTE: **When replacing the disc brake pads, maintain the same disc brake pad wear sensor orientation.**

3. 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.
4. 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.
5. Inspect the thickness of the disc brake pads in order to ensure that they have not worn prematurely. The disc brake pad wear should be approximately even per axle set.
6. Replace the disc brake pads when the friction surface is worn to within 2.0 mm (0.079 in) of the mounting plates.
7. 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.
8. 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.
9. Replace the disc brake pads if any have separated from the mounting plates.
10. 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

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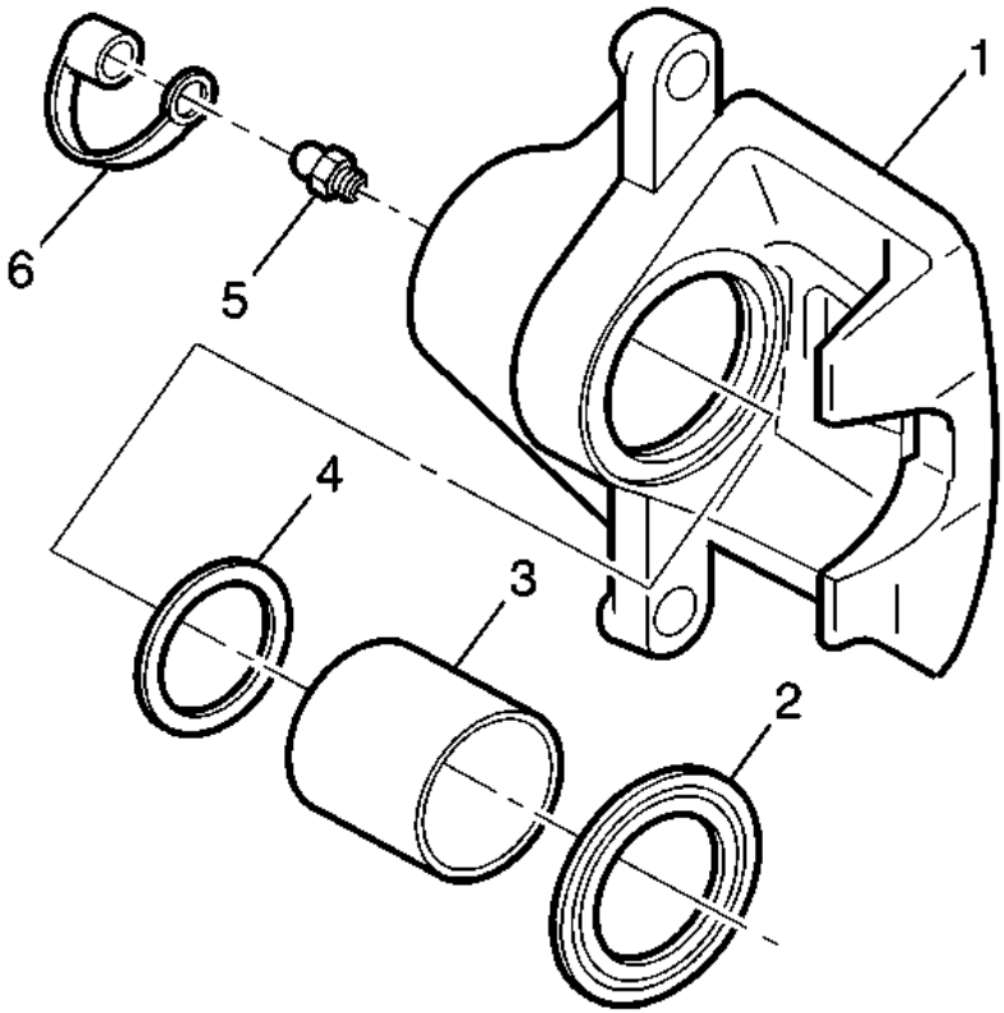


Fig. 8: Brake Caliper
Courtesy of GENERAL MOTORS COMPANY

WARNING: Refer to Brake Dust Warning .

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.

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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.

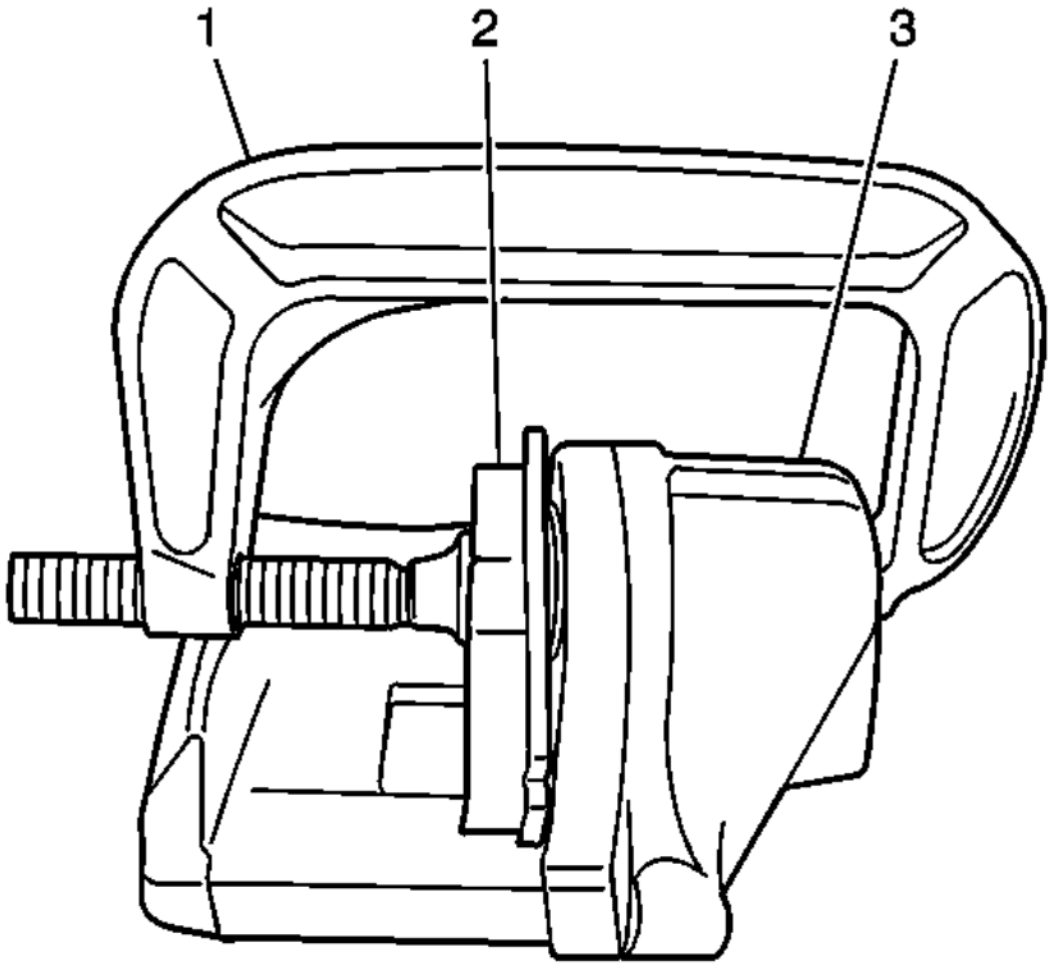


Fig. 9: Compressing Caliper Piston
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4. Inspect for smooth and complete travel of the caliper pistons into the caliper bores:

   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 AND HARDWARE INSPECTION

WARNING: Refer to Brake Dust Warning .

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level then no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level then remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
6. Grasp the brake caliper housing and try to move the brake caliper housing up/down and forward/reverse in relation to the brake caliper mounting bracket. If excessive looseness is observed the brake caliper bracket bushings and/or the brake caliper mounting bolts may need to be replaced.
7. Compress the front caliper pistons.
   - Install a large C-clamp over the top of the caliper housing and against the back of the outboard pad.
   - Slowly tighten the C-clamp until the pistons are pushed completely into the caliper bores.
   - Remove the C-clamp from the caliper.
8. With the pistons compressed into the caliper bores, grasp the brake caliper housing and slide it back and forth on the brake caliper mounting bolts. Check for smooth operation. If the brake caliper housing slide force is high or the brake caliper housing does not slide smoothly, inspect the brake caliper mounting bolts and/or the brake caliper mounting bracket bushings for wear or damage. If wear or damage conditions are

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found, replacement of the brake caliper mounting bolts and/or the brake caliper mounting bracket bushings is necessary.

9. Remove the brake caliper mounting bolts from the brake caliper mounting bracket and support the brake caliper using heavy mechanics wire. Do Not remove the hydraulic brake hose from the caliper. Refer to **Front Brake Caliper Replacement (JD9)Front Brake Caliper Replacement (J95)**.

NOTE: **When replacing the disc brake pads, maintain the same disc brake pad wear sensor orientation.**

10. Remove the disc brake pads from the brake caliper mounting bracket.
11. Inspect the disc brake pad mounting hardware for the following:
    - Missing mounting hardware
    - Excessive corrosion
    - Bent mounting tabs
    - Looseness at the brake caliper mounting bracket
    - Looseness at the disc brake pads
    - Excessive contaminants in the brake caliper mounting bracket surface and threads.
12. If any of the conditions listed are found, the disc brake pad mounting hardware requires replacement.
13. Ensure the disc brake pads are held firmly in place on the brake caliper mounting bracket, yet slide easily on the mounting hardware without binding.

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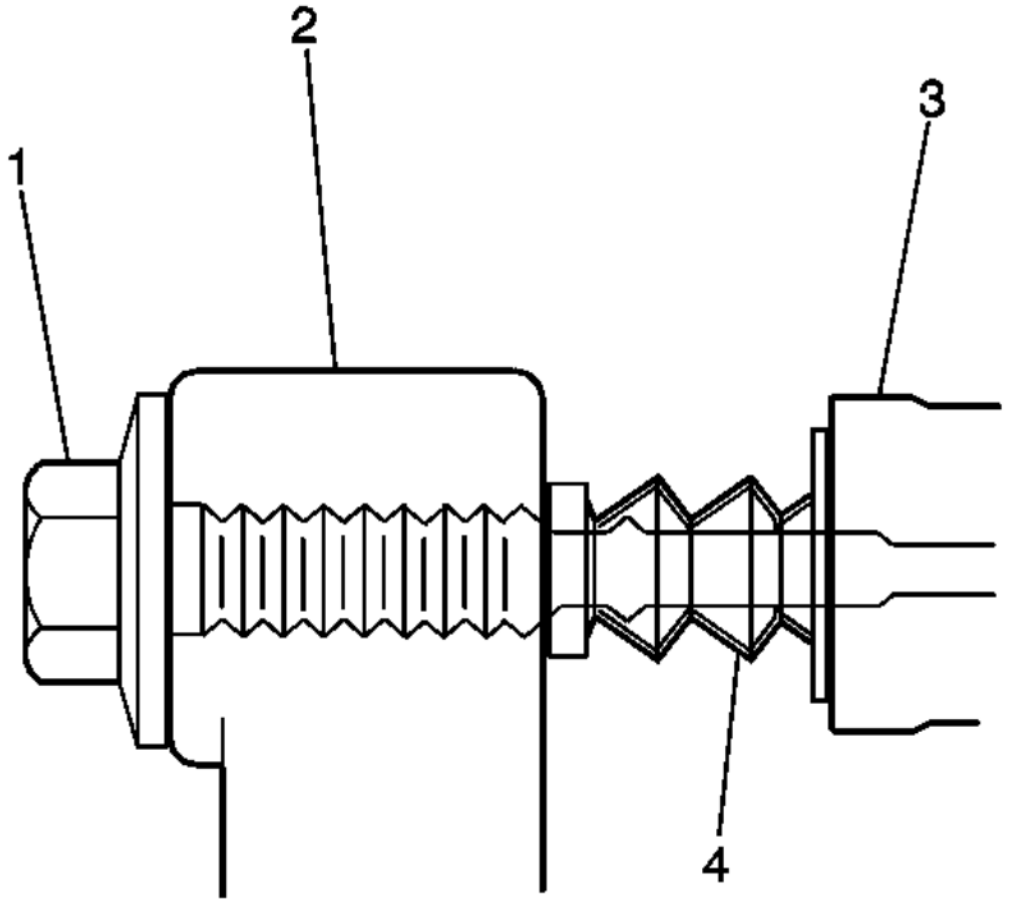


Fig. 10: View Of Caliper, Pin, Boots & Caliper Mounting Bracket
Courtesy of GENERAL MOTORS COMPANY

14. Inspect the brake caliper guide pin bolt (1), brake caliper (2), caliper bracket (3), and the guide pin seal (4) for the following:
    - Binding
    - Seizing

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- Looseness in the brake caliper mounting bracket
- Bent or damaged brake caliper mounting bolts
- Cracked or torn boots
- Missing boots
- Bent or damaged brake caliper mounting bracket

15. If any of the conditions listed are found then the brake caliper mounting hardware requires replacement.
16. Install the disc brake pads to the brake caliper mounting bracket.
17. Install the disc brake caliper to the brake caliper mounting bracket. Refer to **Front Brake Caliper Replacement (JD9)Front Brake Caliper Replacement (J95)**.

REAR DISC BRAKE MOUNTING AND HARDWARE INSPECTION

WARNING: Refer to Brake Dust Warning .

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

WARNING: Do not use a service jack in locations other than those specified to lift this vehicle. Lifting the vehicle with a jack in those other locations could cause the vehicle to slip off the jack and roll; this could cause injury or death.

4. Raise and support the vehicle. Refer **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel)** .
6. Grasp the brake caliper housing and try to move the brake caliper housing up/down and forward/reverse in relation to the brake caliper mounting bracket. If excessive looseness is observed the brake caliper bracket bushings and/or the brake caliper mounting bolts may need to be replaced.
7. Compress the rear caliper piston.
   - Install a large C-clamp over the top of the caliper housing and against the back of the outboard pad.
   - Slowly tighten the C-clamp until the piston is pushed completely into the caliper bores.

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- Remove the C-clamp from the caliper.

8. With the piston compressed into the caliper bore, grasp the brake caliper housing and slide it back and forth on the brake caliper mounting bolts. Check for smooth operation. If the brake caliper housing slide force is high or the brake caliper housing does not slide smoothly, inspect the brake caliper mounting bolts and/or the brake caliper mounting bracket bushings for wear or damage. If wear or damage conditions are found, replacement of the brake caliper mounting bolts and/or the brake caliper mounting bracket bushings is necessary.
9. Remove the brake caliper mounting bolts from the brake caliper mounting bracket and support the brake caliper using heavy mechanics wire. Do not disconnect the hydraulic brake hose from the caliper. Refer to **Rear Brake Caliper Replacement (JD9)Rear Brake Caliper Replacement (J95)**.
10. Remove the disc brake pads from the brake caliper mounting bracket.
11. Inspect the disc brake pad mounting hardware for the following:
    - Missing mounting hardware
    - Excessive corrosion
    - Bent mounting tabs
    - Looseness at the brake caliper mounting bracket
    - Looseness at the disc brake pads
    - Excessive contaminants in the brake caliper mounting bracket surface and threads.
12. If any of the conditions listed are found, the disc brake pad mounting hardware requires replacement.
13. Ensure the disc brake pads are held firmly in place on the brake caliper mounting bracket, yet slide easily on the mounting hardware without binding.

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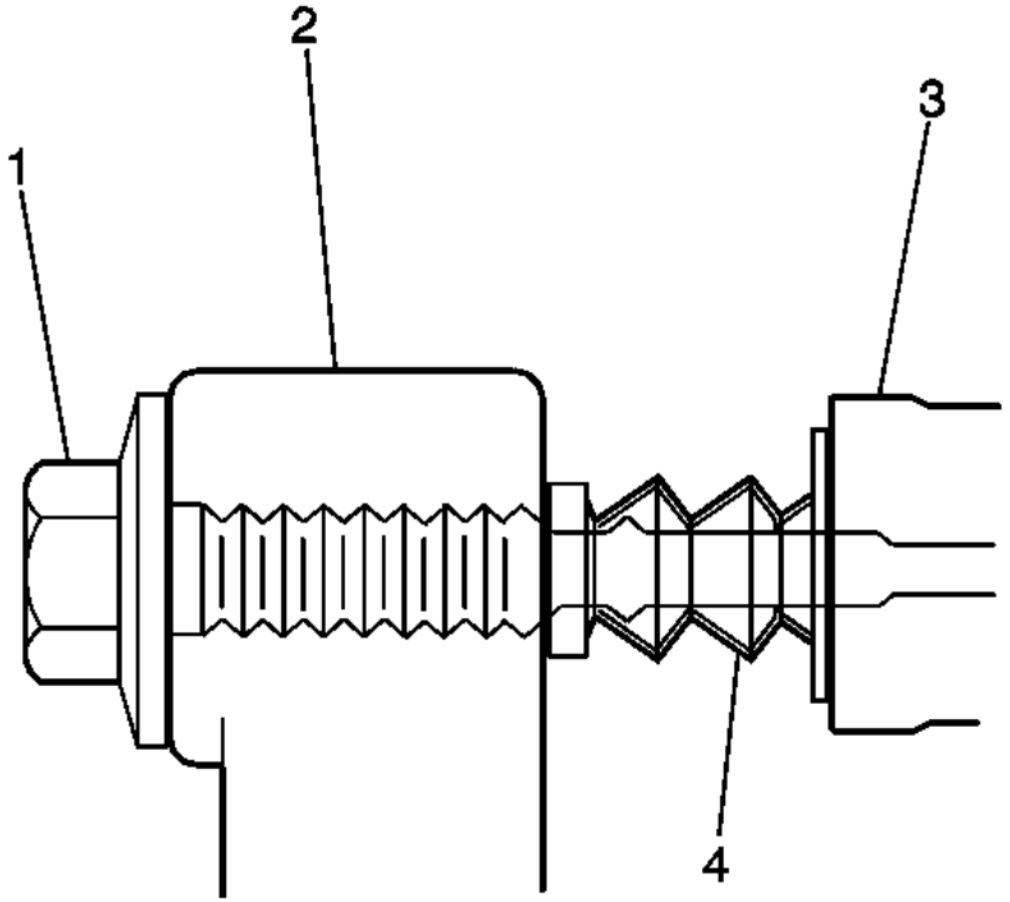


Fig. 11: View Of Caliper, Pin, Boots & Caliper Mounting Bracket
Courtesy of GENERAL MOTORS COMPANY

14. Inspect the caliper bolts (1) or guide pins for the following:
    - Binding
    - Seizing

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- Looseness in the brake caliper mounting bracket (3)
- Bent or damaged brake caliper mounting bolts or guide pins
- Cracked or torn boots (4)
- Missing boots
- Bent or damaged brake caliper mounting bracket (3)

15. If any of the conditions listed are found then the brake caliper mounting hardware requires replacement.
16. Install the disc brake pads to the brake caliper mounting bracket.

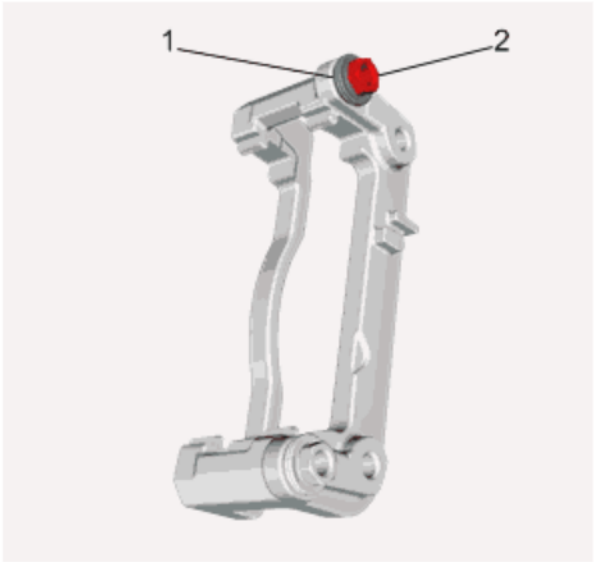


Fig. 12: Upper Guide Pin Seal And Guide Pin Seal
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Excess brake lubricant and trapped air must be expelled from the brake caliper guide pin bore to allow full caliper movement and prevent premature brake pad wear.**

17. Gently pull the edge of the upper guide pin seal (1) away from the brake caliper guide pin (2) while simultaneously pushing the brake caliper guide pin into the brake caliper bracket to expel any trapped air and excess brake lubricant.
18. Repeat step 17 for the lower guide pin seal and brake caliper guide pin.
19. With a clean shop towel, clean any excess brake lubricant from the guide pin seal and brake caliper guide pin.
20. Install the disc brake caliper to the brake caliper mounting bracket. Refer to **Rear Brake Caliper Replacement (JD9)Rear Brake Caliper**

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Replacement (J95).

REPAIR INSTRUCTIONS

FRONT DISC BRAKE PADS REPLACEMENT (JD9)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

NOTE: Always replace disc brake pads in axle sets.

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
5. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) .
6. Inspect the brake caliper guide pin seals for damage and replace, if necessary. Refer to Front Disc Brake Mounting and Hardware Inspection.
7. Install 2 large C-clamps against the outer brake pad and the rear of the brake caliper body.
8. Slowly and evenly tighten the C-clamps until the brake caliper pistons are compressed into the brake caliper bores.

NOTE: Do not tear the brake caliper guide pin seal. Damage to the brake caliper guide pin seal may allow corrosion to form on the brake caliper guide pin and the guide pin bores.

9. Install an open end wrench to the lower brake caliper guide pin to hold the guide pin in line with the brake caliper.

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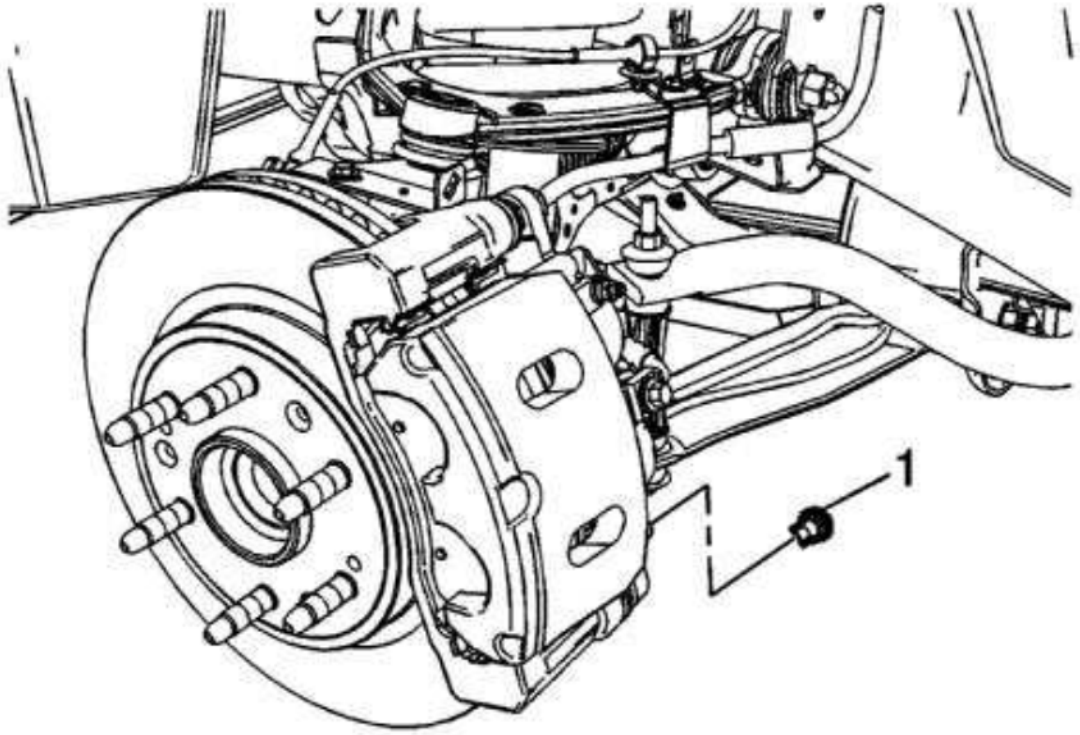


Fig. 13: Lower Brake Caliper Guide Pin Bolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not allow the open end wrench to contact the brake caliper when removing or installing the brake caliper guide pin bolt. Allowing the open end wrench to contact the brake caliper will cause a pulsation when the brakes are applied.**

10. Using a backup wrench on the brake caliper guide pin, remove the lower brake caliper guide pin bolt (1).

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CAUTION: 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.

11. Rotate the brake caliper upward and support with heavy mechanics wire.

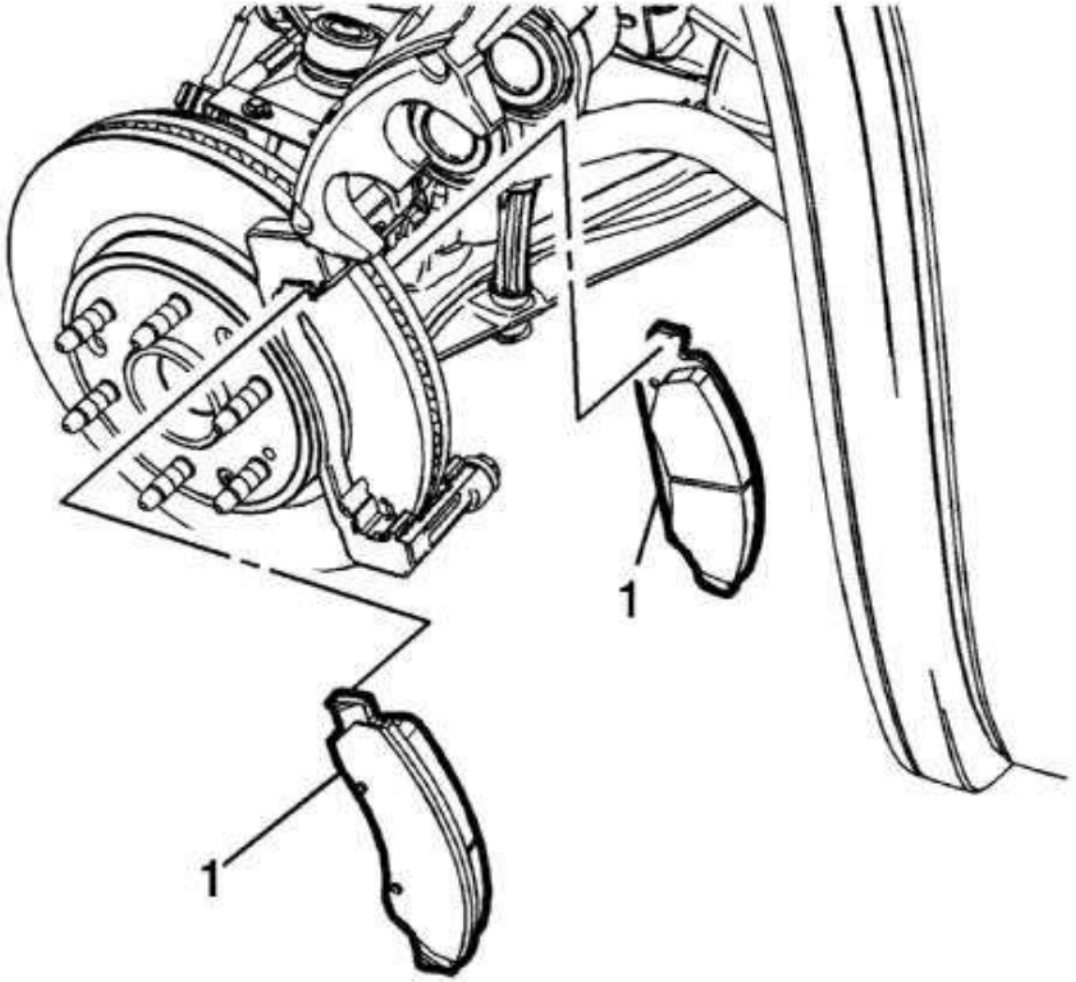


Fig. 14: Disc Brake Pads

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Courtesy of GENERAL MOTORS COMPANY

NOTE: **When replacing the disc brake pads, maintain the same disc brake pad wear sensor orientation.**

12. Remove the disc brake pads (1).

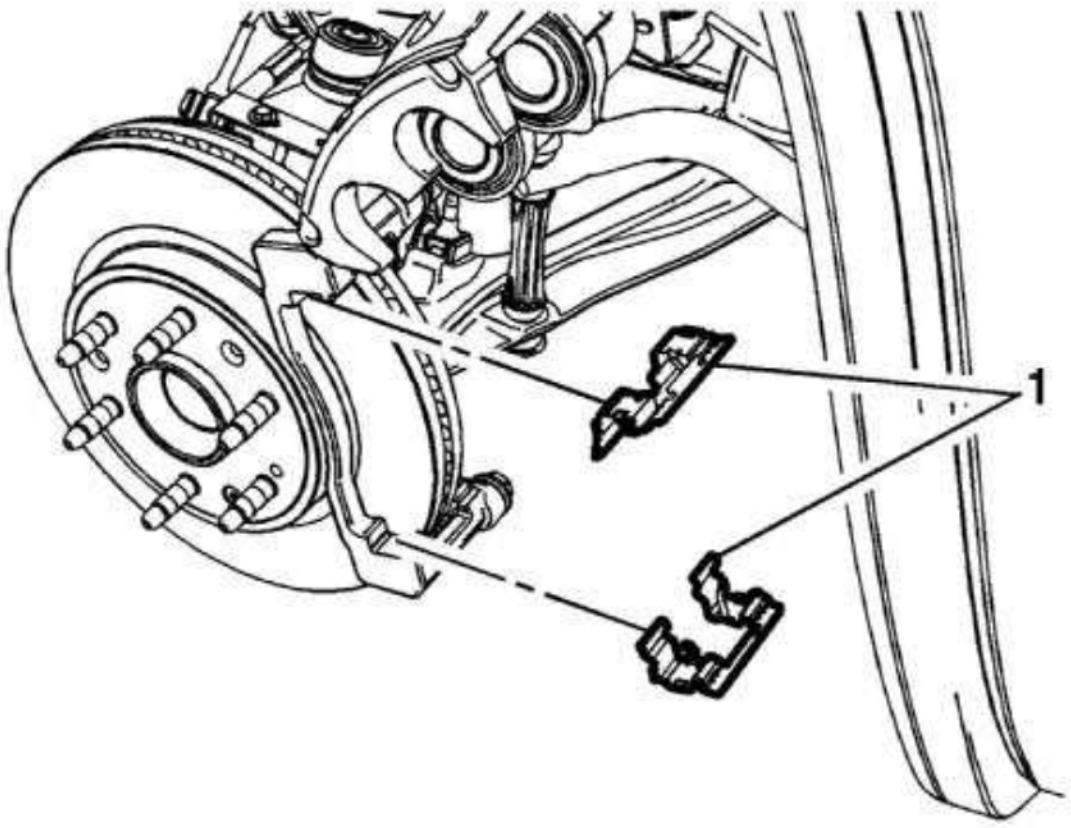


Fig. 15: Discard Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

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13. Remove and discard the brake pad springs (1).

Installation Procedure

1. Inspect the brake caliper for damage and/or corrosion and replace, if necessary. Refer to **Brake Caliper Inspection**.
2. Inspect the brake caliper guide pins and guide pin seals for damage and/or corrosion and replace, if necessary. Refer to **Front Disc Brake Mounting and Hardware Inspection**.

NOTE: **Use of a wire brush may be required to remove heavier corrosion and debris from the brake pad spring contact points and surfaces of the brake caliper bracket.**

3. Thoroughly clean the brake pad spring contact points and surfaces of the brake caliper bracket of any corrosion or debris.
4. Clean any remaining debris from the brake pad spring contact points and surfaces of the brake caliper bracket with denatured alcohol and allow to dry.

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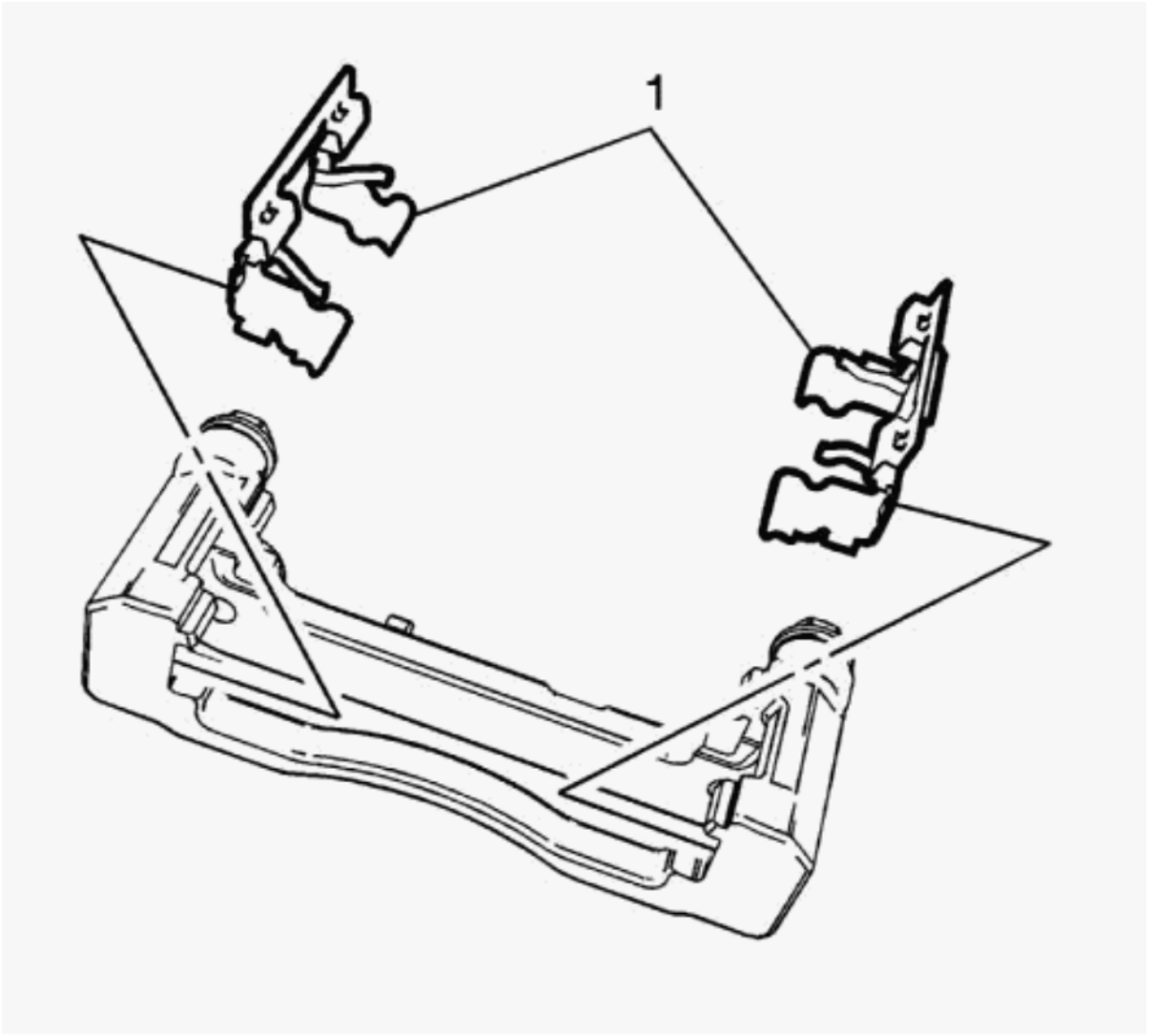


Fig. 16: Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

5. Do not apply any lubricant to either side of the brake pad springs (1) prior to installation to the brake caliper bracket.

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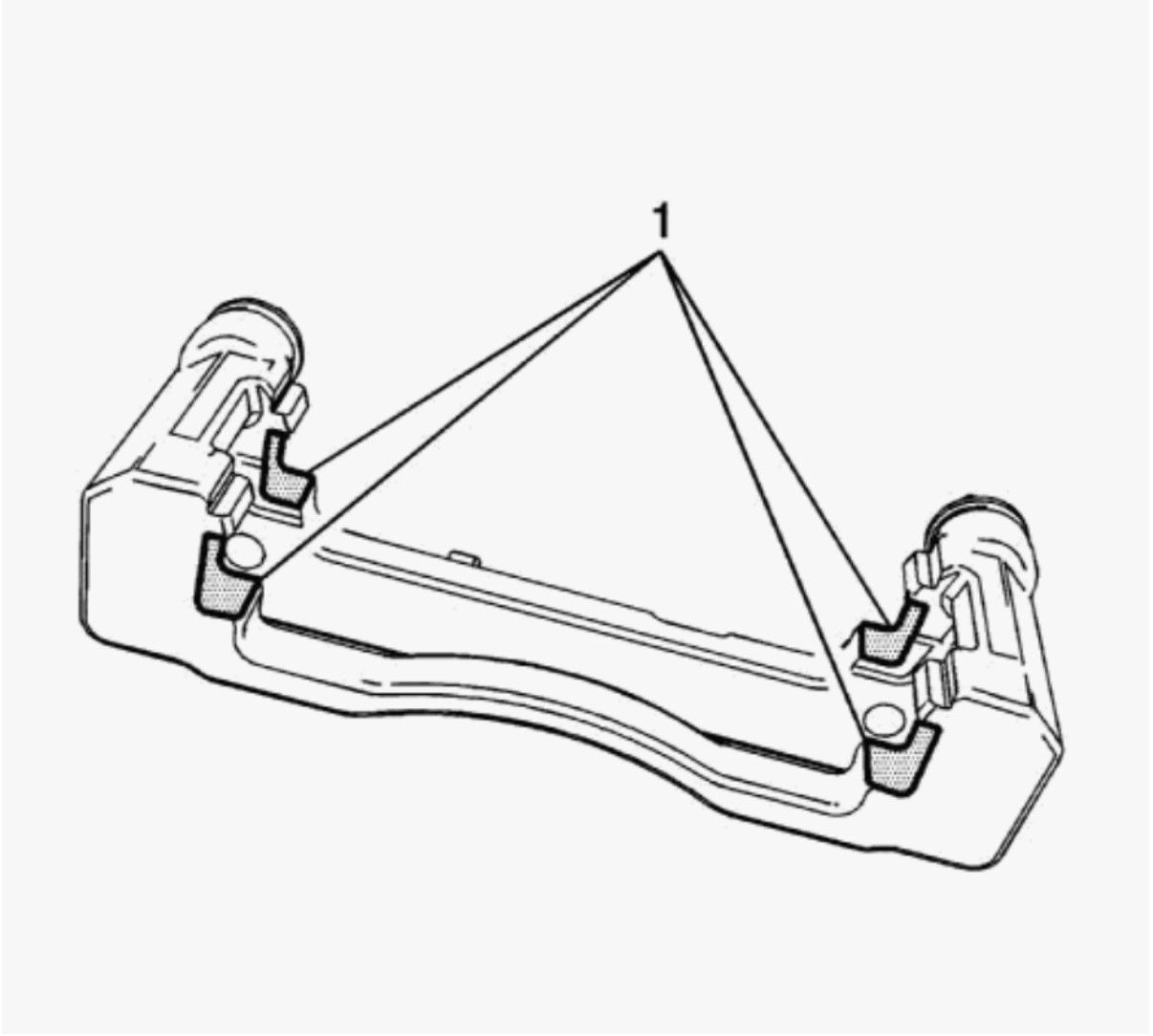


Fig. 17: Contact Surfaces And Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Apply a very thin coating of high temperature silicone brake lubricant to the contact surfaces (1) of the brake caliper bracket.

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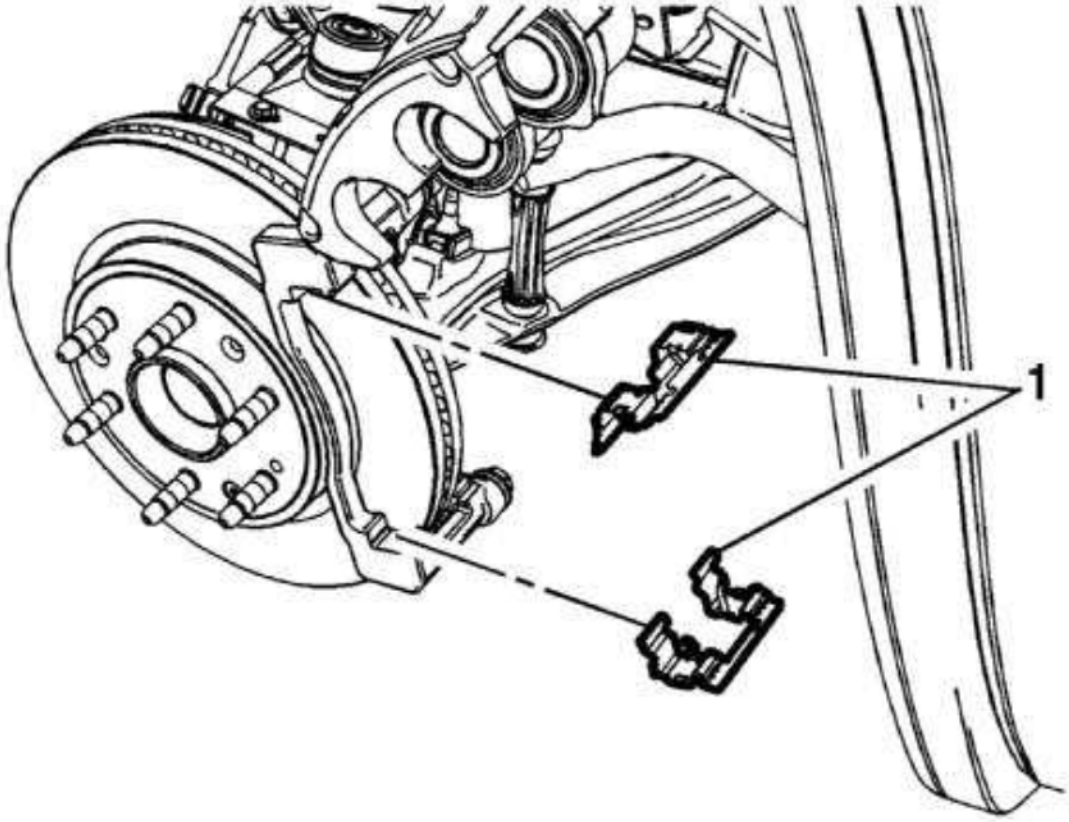


Fig. 18: Discard Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

7. Install new brake pad springs (1).

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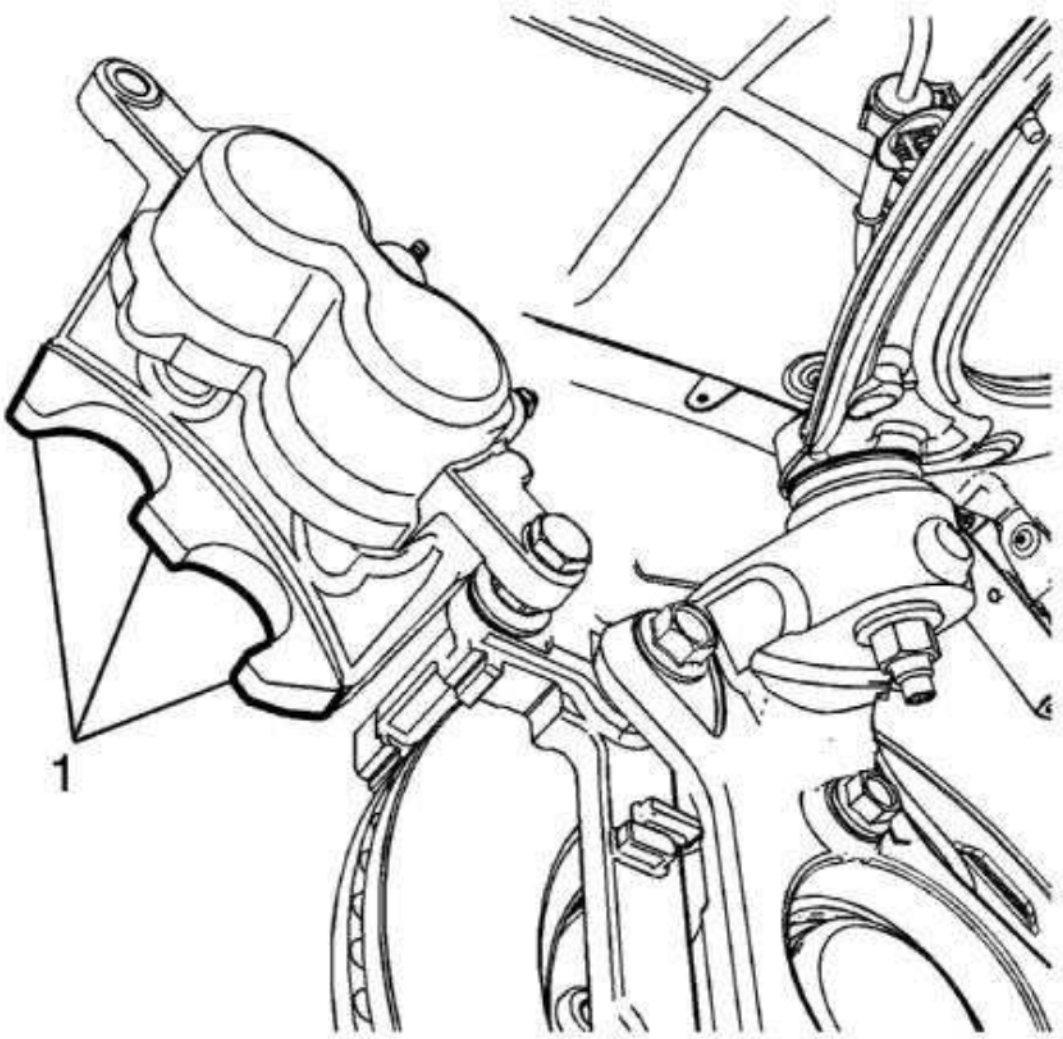


Fig. 19: Brake Caliper Housing
Courtesy of GENERAL MOTORS COMPANY

8. Thoroughly clean the brake caliper housing (1) of any adhesive residue from the removed disc brake pads.

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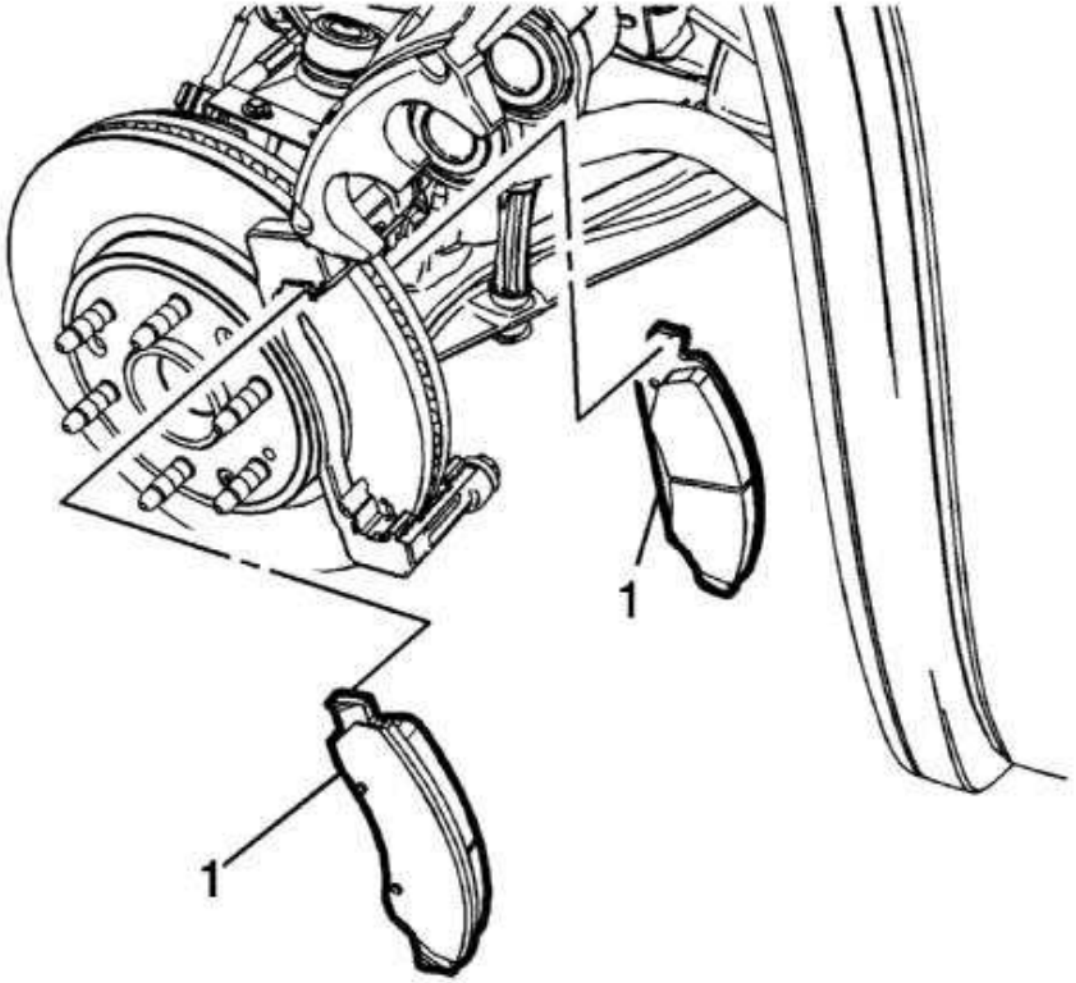


Fig. 20: Disc Brake Pads
Courtesy of GENERAL MOTORS COMPANY

9. Remove the adhesive backing paper from the new disc brake pads, if necessary.

NOTE: **When replacing the disc brake pads, maintain the same disc brake pad wear sensor orientation.**

10. Install the new disc brake pads (1) to the brake pad springs and caliper bracket.

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11. Rotate the brake caliper to the installed position.

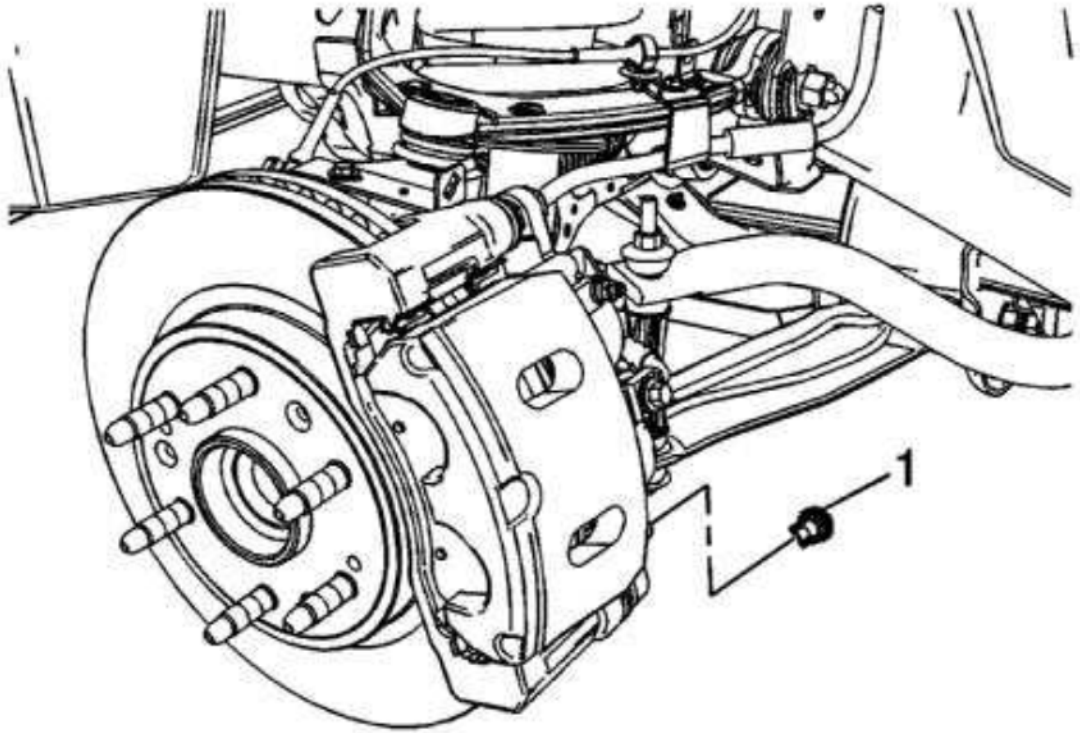


Fig. 21: Lower Brake Caliper Guide Pin Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

NOTE: **Do not tear the brake caliper guide pin seal. Damage to the brake caliper guide pin seal may allow**

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corrosion to form on the brake caliper guide pin and the guide pin bores.

12. Using a backup wrench on the brake caliper guide pin, install the brake caliper guide pin bolt (1) and tighten to 100 N.m (74 lb ft).
13. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
14. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
15. Slowly release the brake pedal.
16. Wait 15 seconds, then repeat steps 14 and 15 until a firm brake pedal apply is obtained. This will properly seat the brake caliper pistons and brake pads.
17. Fill the brake master cylinder reservoir to the proper level. Refer to **Master Cylinder Reservoir Filling** .
18. Firmly apply and maintain pressure on the brake pedal for 30 seconds to seat the brake pad insulators to the brake caliper pistons and brake caliper housing. Repeat this step 1 additional time.
19. Burnish the brake pads and rotors. Refer to **Brake Pad and Rotor Burnishing**.

FRONT DISC BRAKE PADS REPLACEMENT (J95)

Removal Procedure

WARNING: **Brake Dust Warning**

NOTE: **Always replace disc brake pads in axle sets.**

1. Inspect the brake fluid level in the master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
5. Remove Tire and Wheel. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
6. Compress the brake caliper pistons into the caliper housing bore.
   - Install 2 large C-clamps over the top of the caliper housing and against the back of the outer disc brake pad.
   - Slowly and evenly tighten the C-clamps until the brake caliper pistons are completely compressed into the brake caliper housing bores.

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- Remove the C-clamps.

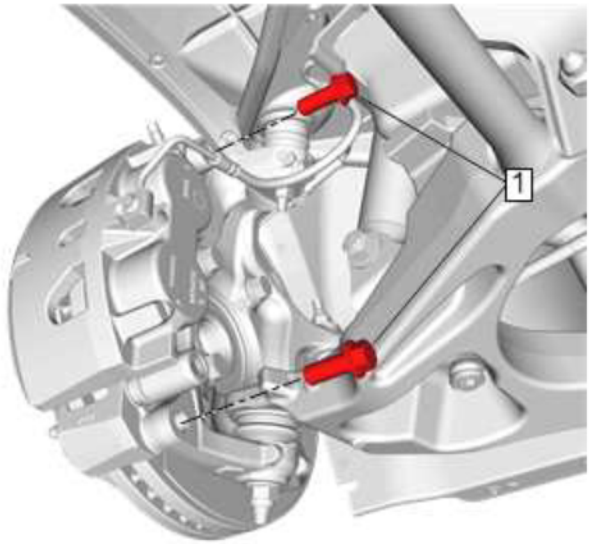


Fig. 22: Brake Caliper Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do NOT remove the brake caliper guide pins unless replacement is required.**

7. Remove Brake Caliper Bracket Bolt (1).

CAUTION: **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.**

8. Remove the brake caliper and bracket assembly and support with heavy mechanics wire.

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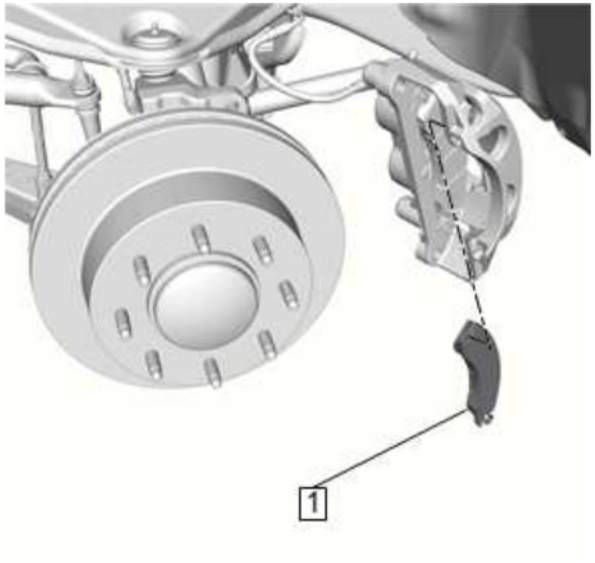


Fig. 23: Outer Disc Brake Pad
Courtesy of GENERAL MOTORS COMPANY

9. Outer Disc Brake Pad (1)

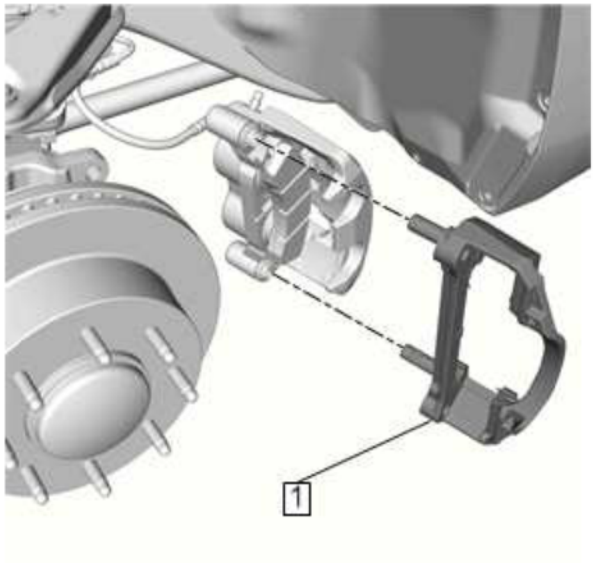


Fig. 24: Brake Caliper Bracket

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Courtesy of GENERAL MOTORS COMPANY

10. Brake Caliper Bracket (1)

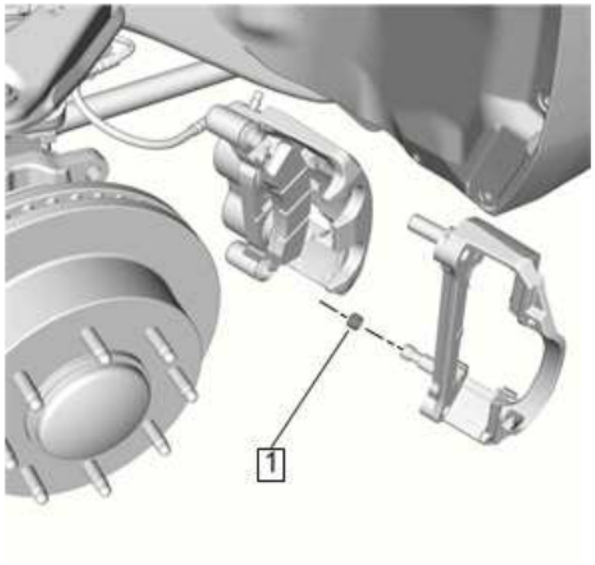


Fig. 25: Brake Caliper Guide Pin Bushing
Courtesy of GENERAL MOTORS COMPANY

11. Remove Brake Caliper Guide Pin Bushing (1)

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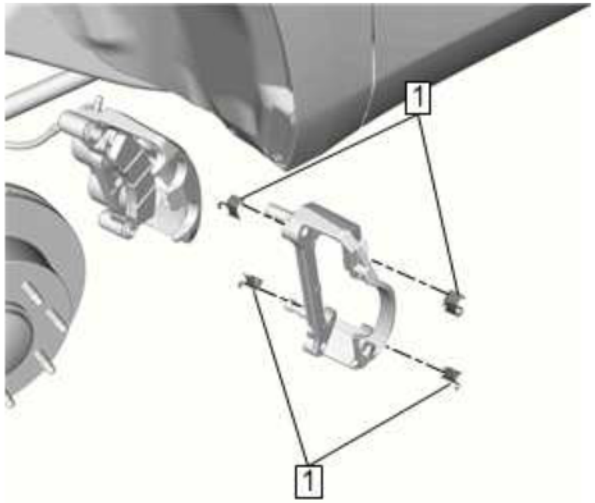


Fig. 26: Brake Pad Spring
Courtesy of GENERAL MOTORS COMPANY

12. Remove Brake Pad Spring (1)

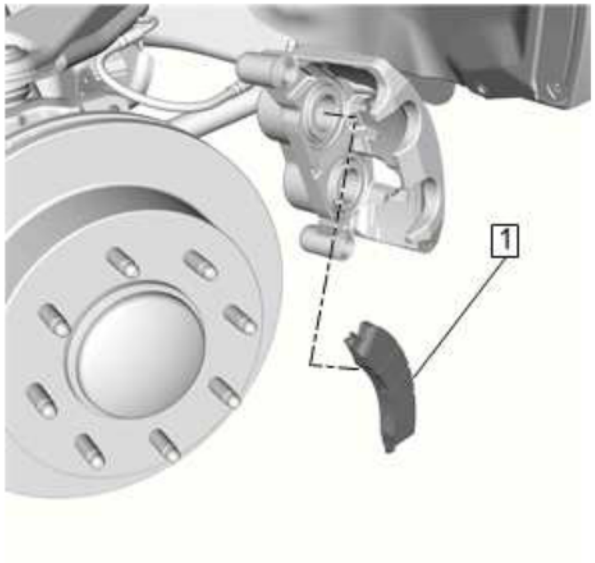


Fig. 27: Inner Disc Brake Pad

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Courtesy of GENERAL MOTORS COMPANY

13. Remove Inner Disc Brake Pad (1)

NOTE: **Do NOT lever against or pry between the disc brake pad and the brake caliper pistons.**

NOTE: **Do NOT strike or press directly against the face of the brake caliper pistons.**

14.

15. If the inner disc brake pad will not release, lever against the metal disc brake pad backing plate and the brake caliper housing.

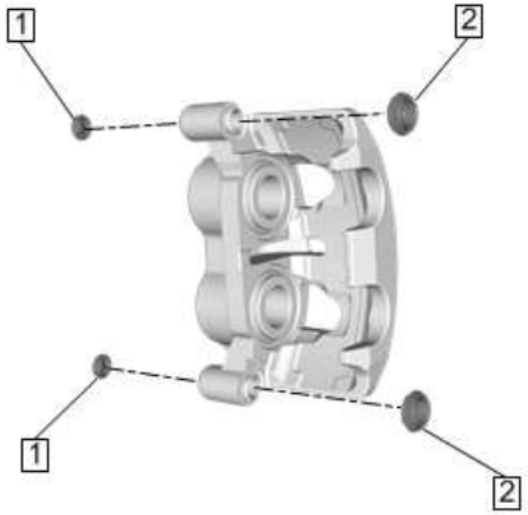


Fig. 28: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

16. Remove Seal (1)
17. Remove Boot (2)
18. Thoroughly clean the brake caliper housing guide pin bores with denatured alcohol and allow to dry.
19. Thoroughly clean the brake caliper guide pins with denatured alcohol and allow to dry.

Installation Procedure

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1. Inspect the front disc brake hardware for damage and replace, if necessary. **Front Disc Brake Mounting and Hardware Inspection**

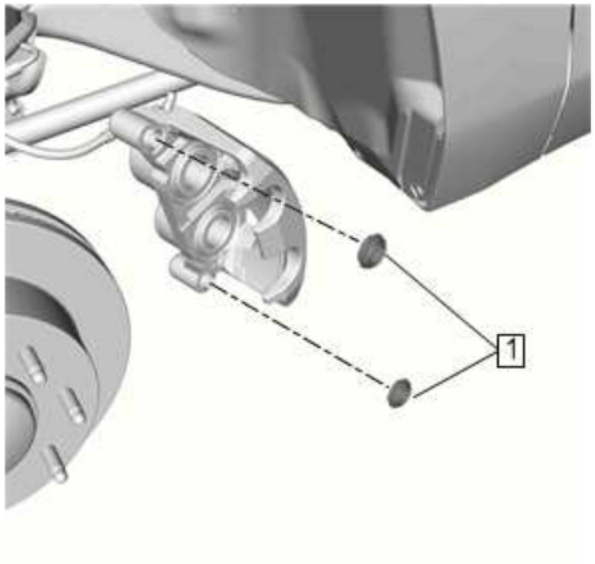
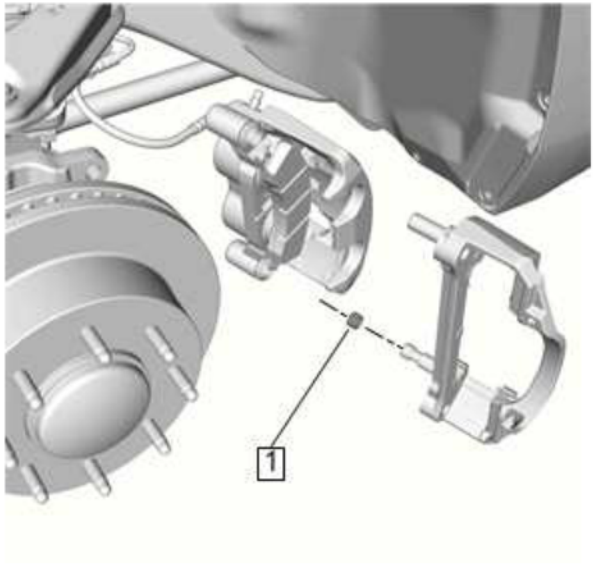


Fig. 29: Boot
Courtesy of GENERAL MOTORS COMPANY

2. Install Boot (1)



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Fig. 30: Brake Caliper Guide Pin Bushing
Courtesy of GENERAL MOTORS COMPANY

3. Install Brake CaliperGuide Pin Bushing (1)
4. Apply a light, even coating of the supplied lubricant to the disc brake caliper housing guide pin bores.
5. Apply a light, even coating of the supplied lubricant to the brake caliper guide pins.

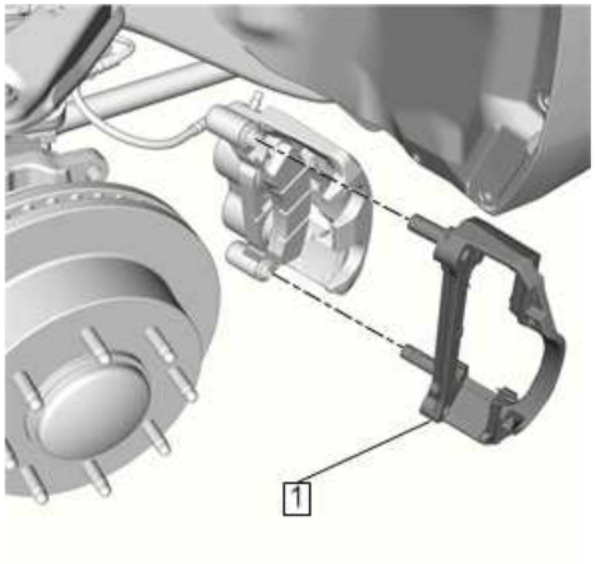


Fig. 31: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Install Brake Caliper Bracket (1)

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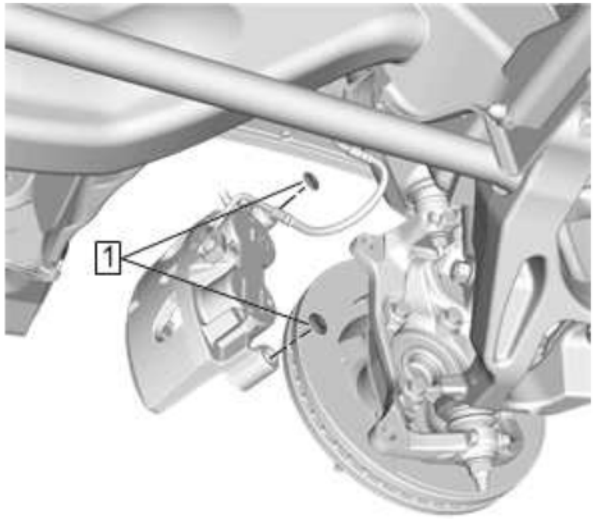


Fig. 32: Disc Brake Caliper Guide Pin Seals
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do NOT puncture the disc brake caliper guide pin seals.**

7. Install Seal (1)
8. Ensure the disc brake caliper guide pin seals are fully seated in the grooves of the disc brake caliper housing.

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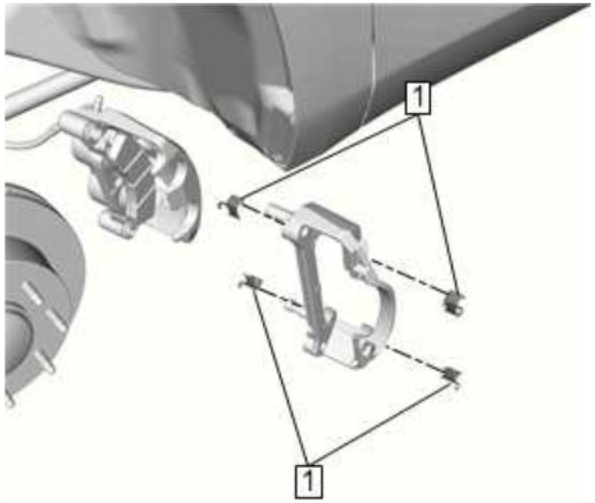


Fig. 33: Brake Pad Spring
Courtesy of GENERAL MOTORS COMPANY

9. Install Brake Pad Spring (1)

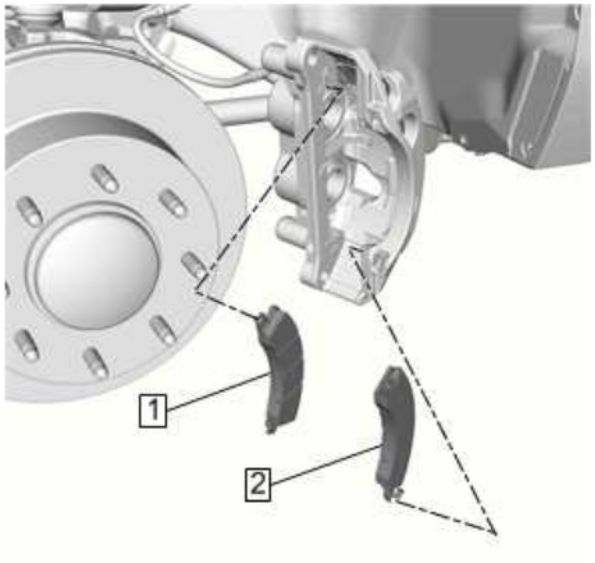


Fig. 34: Inner Disc Brake Pad

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10. Install Inner Disc Brake Pad (1)
11. Install Outer Disc Brake Pad (2)
12. Prepare the brake caliper bracket bolts and the threaded holes for assembly.
    - Thoroughly clean the brake caliper bracket bolts of any thread locking adhesive residue.
    - Thoroughly clean the steering knuckle threaded holes of any threadlocker residue with denatured alcohol and allow to dry.
13. Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolts. **Adhesives, Fluids, Lubricants, and Sealers**
14. Allow the threadlocker to cure approximately 10 minutes before assembly.
15. Install Brake Caliper and Bracket Assembly

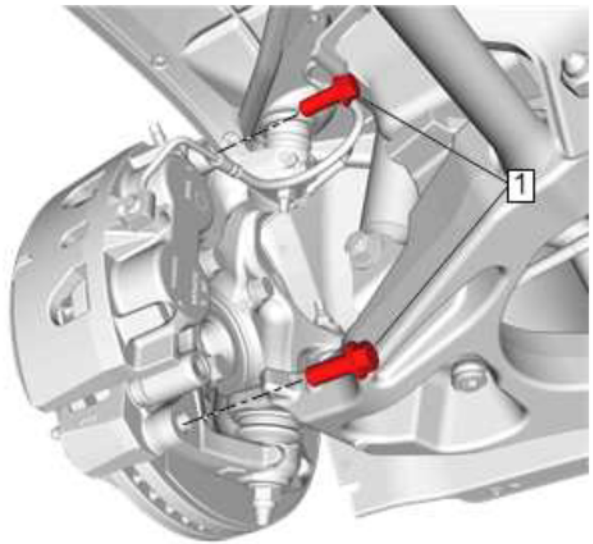


Fig. 35: Brake Caliper Bracket Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Fastener Caution**

16. Install Brake Caliper Bracket Bolt (1) and tighten 300 N.m (221 lb ft)
17. Install Tire and Wheel. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**

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18. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
19. Slowly release the brake pedal.
20. Wait 15 seconds, then repeat steps 18-19 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
21. Fill the master cylinder reservoir. **Master Cylinder Reservoir Filling**
22. Burnish the brake pads and rotors. **Brake Pad and Rotor Burnishing**

REAR DISC BRAKE PADS REPLACEMENT (JD9)

Removal Procedure

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

NOTE: **Always replace disc brake pads in axle sets.**

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
6. Install a large C-clamp against the outer brake pad and the rear of the brake caliper body.
7. Slowly and evenly tighten the C-clamp until the brake caliper piston is compressed into the brake caliper bore.

NOTE: **Do not allow the open end wrench to contact the brake caliper when removing or installing the brake caliper guide pin bolt. Allowing the open end wrench to contact the brake caliper will cause a pulsation when the brakes are applied.**

8. Install an open end wrench to the lower brake caliper guide pin to hold the guide pin in line with the brake caliper.

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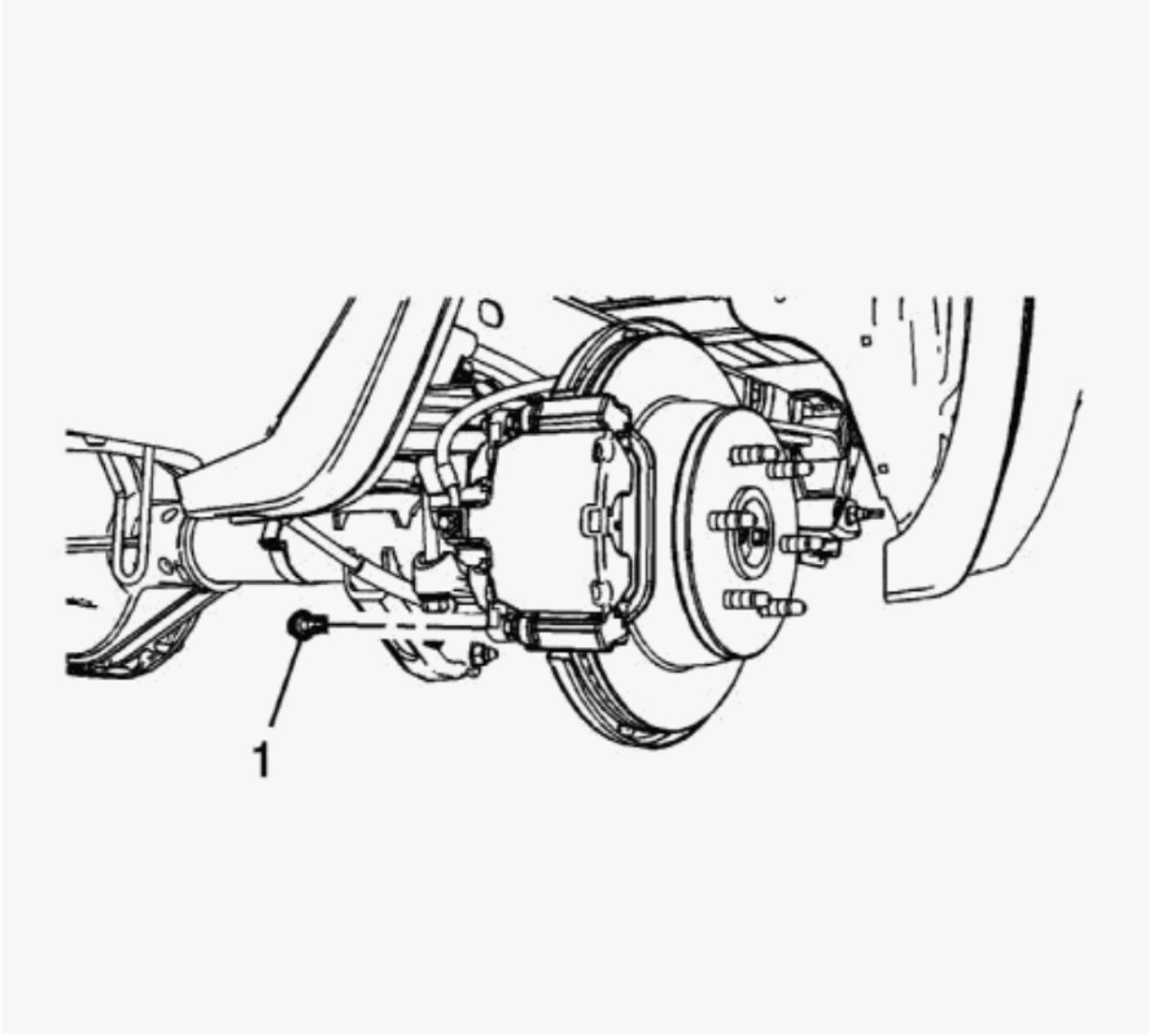


Fig. 36: Lower Brake Caliper Guide Pin Bolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not tear the brake caliper guide pin seal. Damage to the brake caliper guide pin seal may allow corrosion to form on the brake caliper guide pin and the guide pin bores.**

9. Using a backup wrench on the brake caliper guide pin, remove the lower brake caliper guide pin bolt (1).
10. Discard the brake caliper guide pin bolt.

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CAUTION: **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.**

11. Rotate the brake caliper upward and support with heavy mechanics wire.

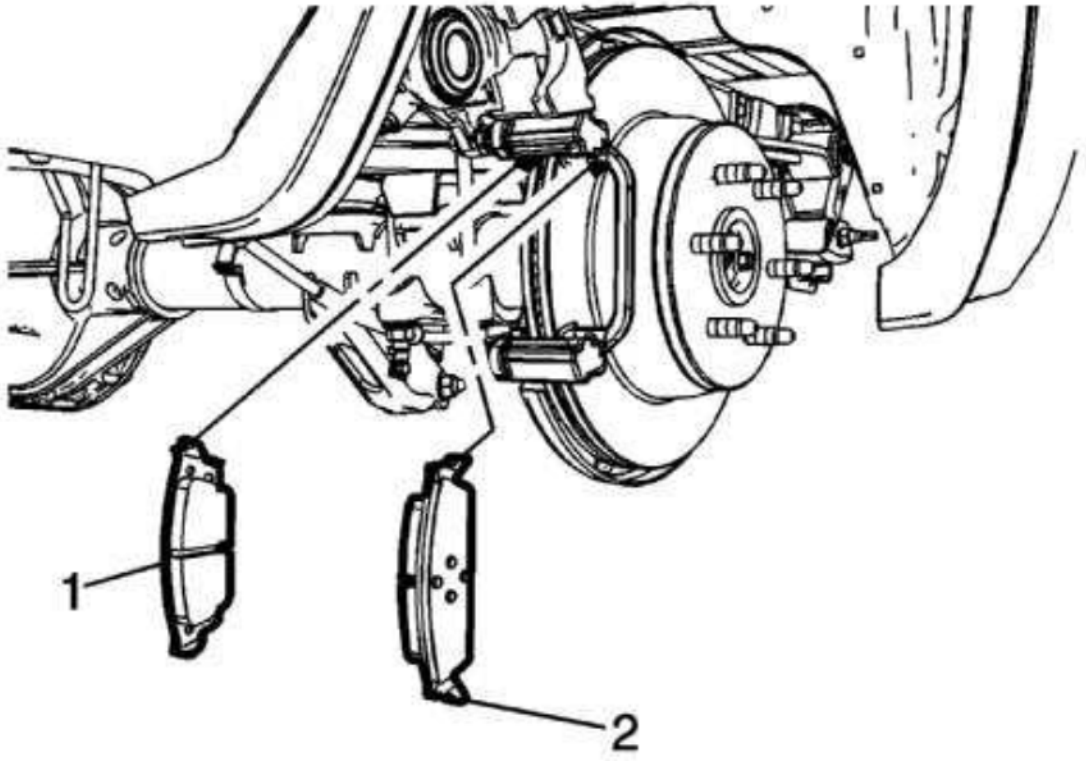


Fig. 37: Inner Disc Brake Pad

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NOTE: **If reinstalling the original disc brake pads, note the location of the brake pads for proper installation.**

12. Remove the inner disc brake pad (1).
13. Remove the outer disc brake pad (2).

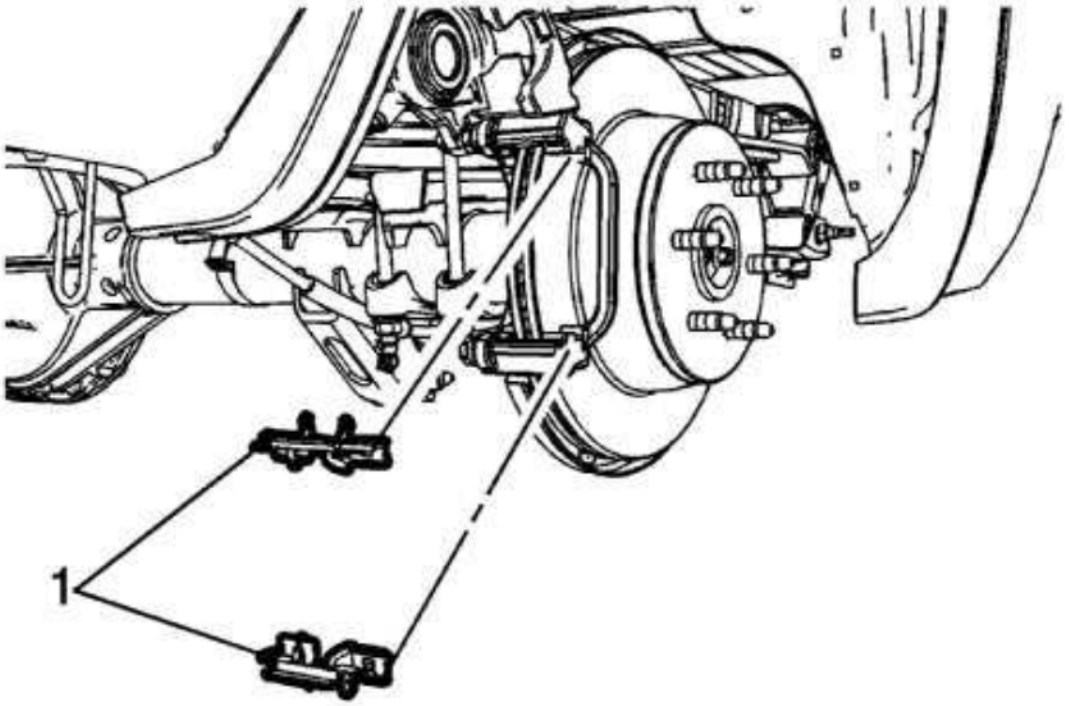


Fig. 38: Brake Pad Springs

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Courtesy of GENERAL MOTORS COMPANY

14. Remove the brake pad springs (1).

Installation Procedure

1. Inspect the brake caliper for damage and/or corrosion and replace, if necessary. Refer to **Brake Caliper Inspection**.
2. Inspect the brake caliper guide pins, seals and brake pad springs for damage and/or corrosion and replace, if necessary. Refer to **Rear Disc Brake Mounting and Hardware Inspection**.
3. Thoroughly clean the brake pad spring contact surfaces of the brake caliper bracket of any corrosion or debris.
4. Clean the brake pad spring contact points on the brake caliper bracket of any corrosion or debris.

NOTE: **Do not apply any lubricant to the disc brake pad contact surface of the brake pad springs.**

5. Apply a very thin coating of high temperature silicone brake lubricant to the mating surfaces of the brake pad springs and the brake caliper bracket.

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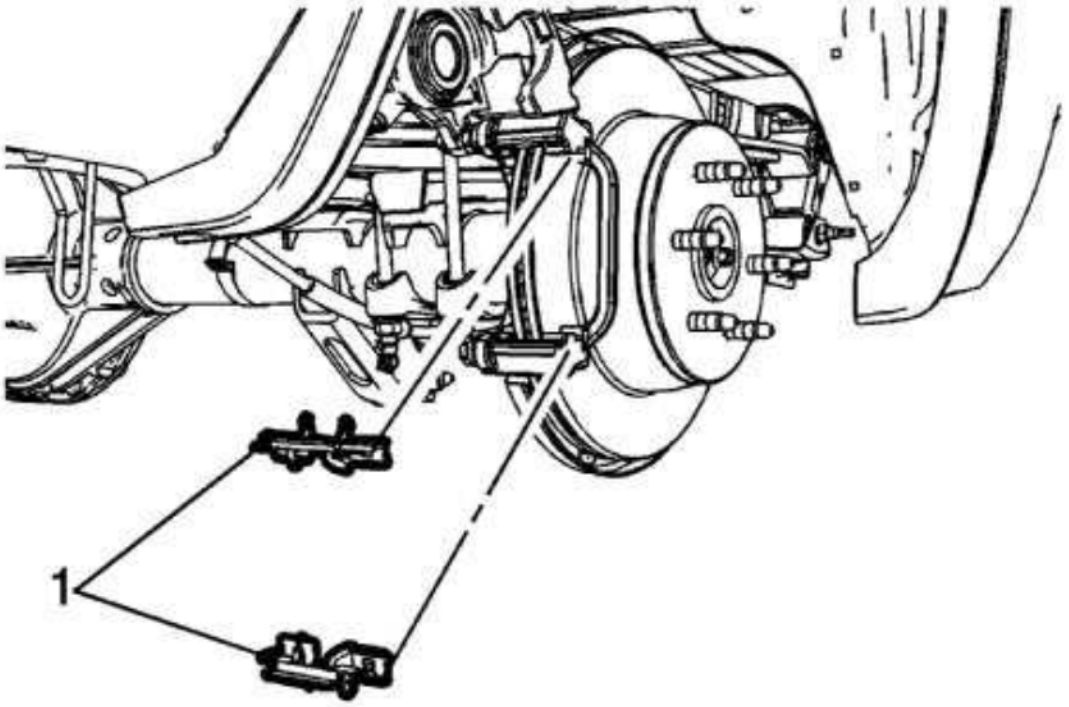


Fig. 39: Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

6. Install the brake pad springs (1).

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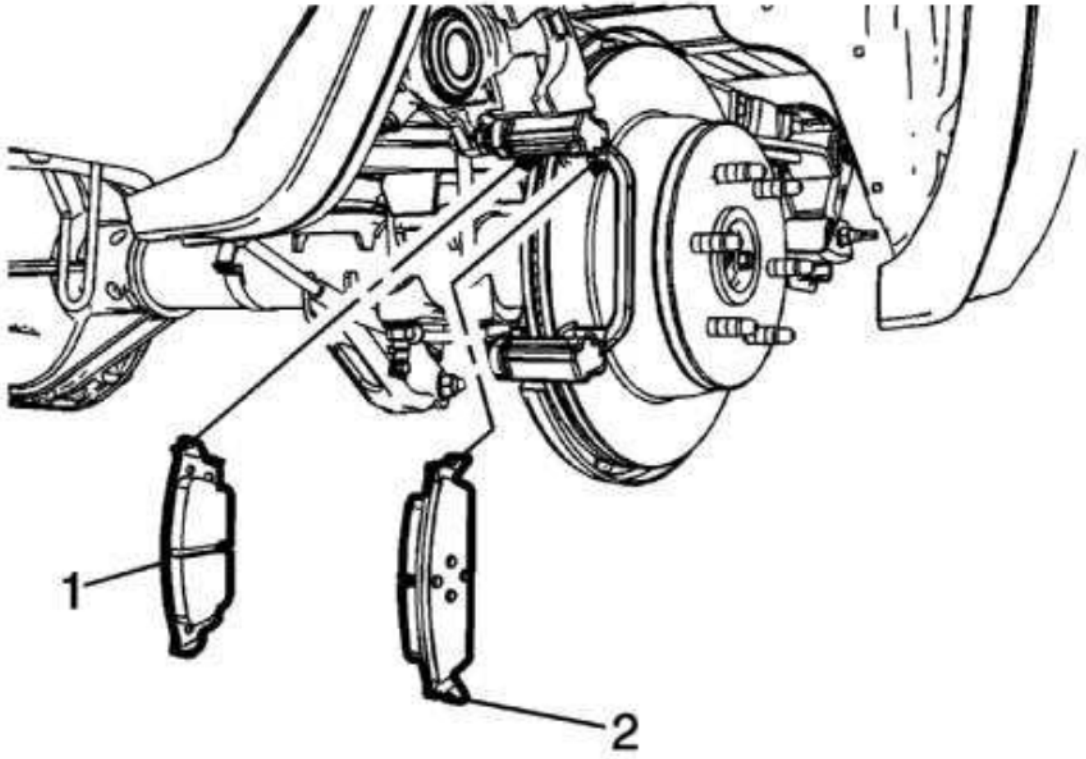


Fig. 40: Inner Disc Brake Pad
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If reinstalling the original disc brake pads, note the location of the brake pads for proper installation.**

7. Install the inner disc brake pad (1).
8. Install the outer disc brake pad (2).

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9. Rotate the brake caliper to the installed position.

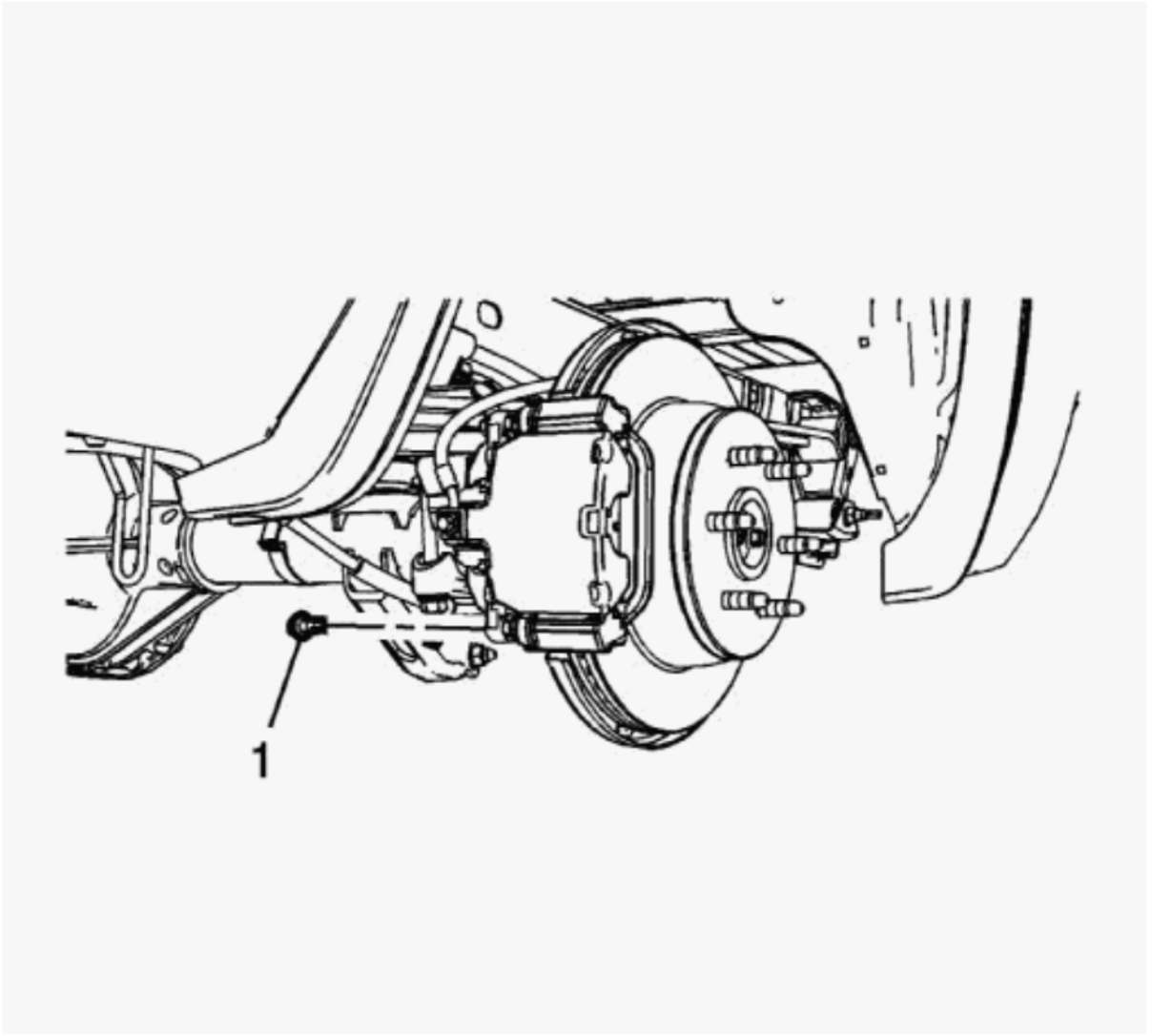


Fig. 41: Lower Brake Caliper Guide Pin Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

10. Using a backup wrench on the brake caliper guide pin, install a new brake caliper guide pin bolt (1) and tighten to 52 N.m (38 lb ft).

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11. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
12. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
13. Slowly release the brake pedal.
14. Wait 15 seconds, then repeat steps 12 and 13 until a firm brake pedal apply is obtained. This will properly seat the brake caliper pistons and brake pads.
15. Fill the brake master cylinder reservoir to the proper level. Refer to **Master Cylinder Reservoir Filling** .
16. Firmly apply and maintain pressure on the brake pedal for 30 seconds to seat the brake pad insulators to the brake caliper piston and brake caliper housing. Repeat this step 1 additional time.
17. Burnish the brake pads and rotors. Refer to **Brake Pad and Rotor Burnishing**.

REAR DISC BRAKE PADS REPLACEMENT (J95)

Removal Procedure

WARNING: **Brake Dust Warning**

NOTE: **Always replace disc brake pads in axle sets.**

1. Inspect the brake fluid level in the master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Remove Tire and Wheel. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
5. Compress the brake caliper pistons into the caliper housing bore.
    - Install 2 large C-clamps over the top of the caliper housing and against the back of the outer disc brake pad.
    - Slowly and evenly tighten the C-clamps until the brake caliper pistons are completely compressed into the brake caliper housing bores.
    - Remove the C-clamps.

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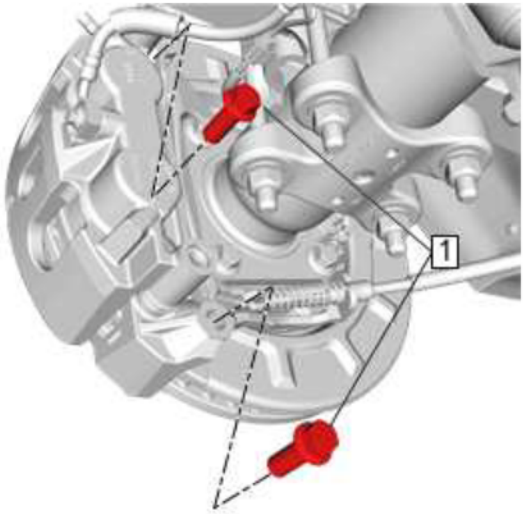


Fig. 42: Brake Caliper BracketBolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do NOT remove the brake caliper guide pins unless replacement is required.**

6. Remove Brake Caliper Bracket Bolt (1)

CAUTION: **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.**

7. Remove the brake caliper and bracket assembly and support with heavy mechanics wire.

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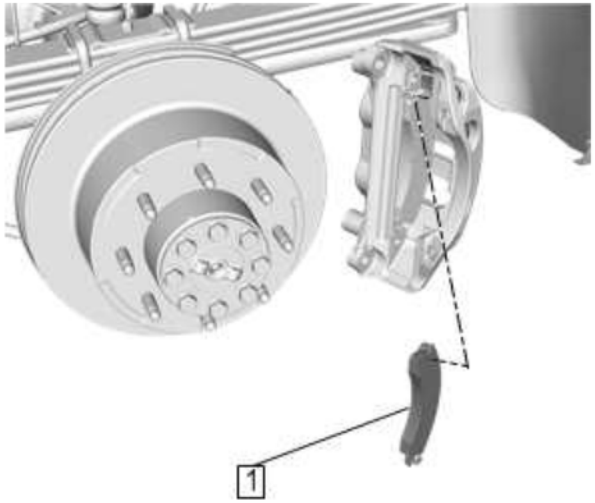


Fig. 43: Outer Disc Brake Pad
Courtesy of GENERAL MOTORS COMPANY

8. RemoveOuter Disc Brake Pad (1)

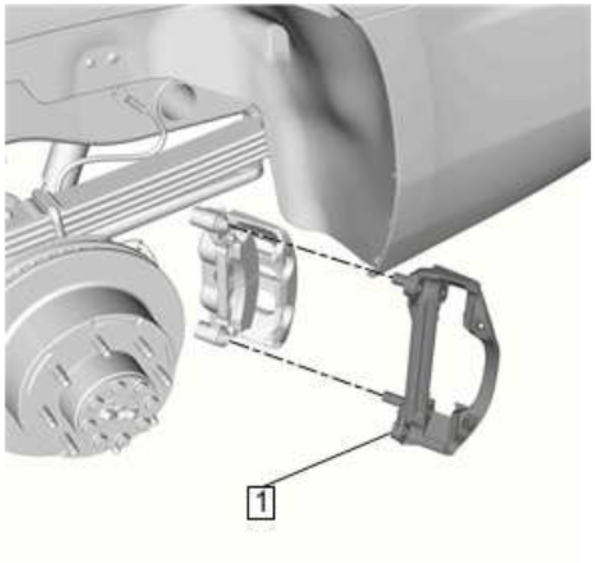


Fig. 44: Brake Caliper Bracket

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Courtesy of GENERAL MOTORS COMPANY

9. Remove Brake Caliper Bracket (1)

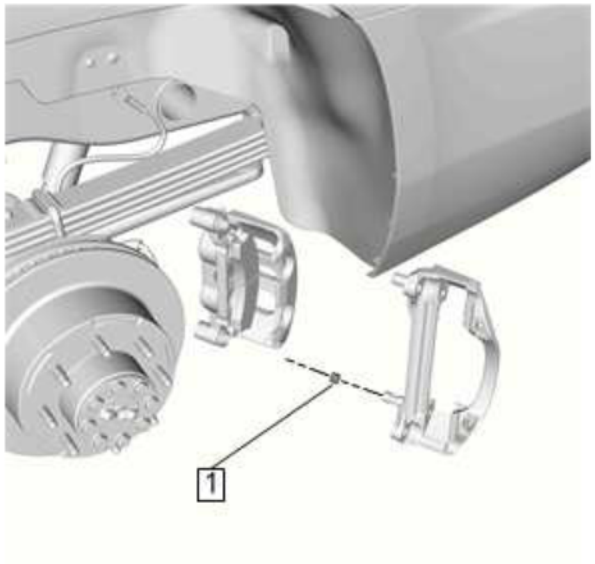


Fig. 45: Brake CaliperGuide Pin Bushing
Courtesy of GENERAL MOTORS COMPANY

10. Remove Brake CaliperGuide Pin Bushing (1)

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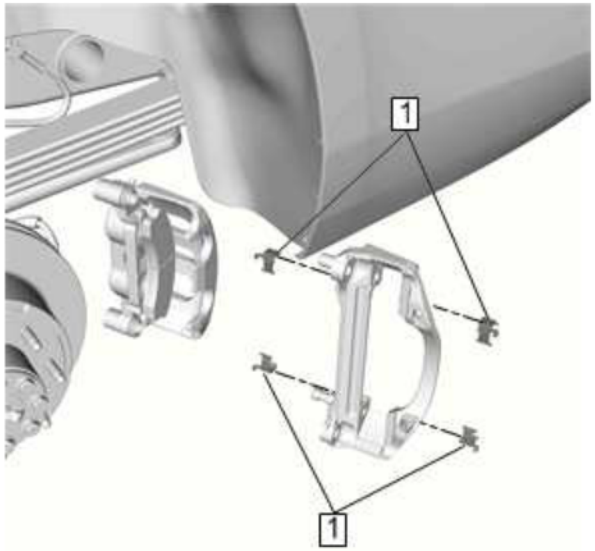


Fig. 46: Brake Pad Spring
Courtesy of GENERAL MOTORS COMPANY

11. Remove Brake Pad Spring (1)

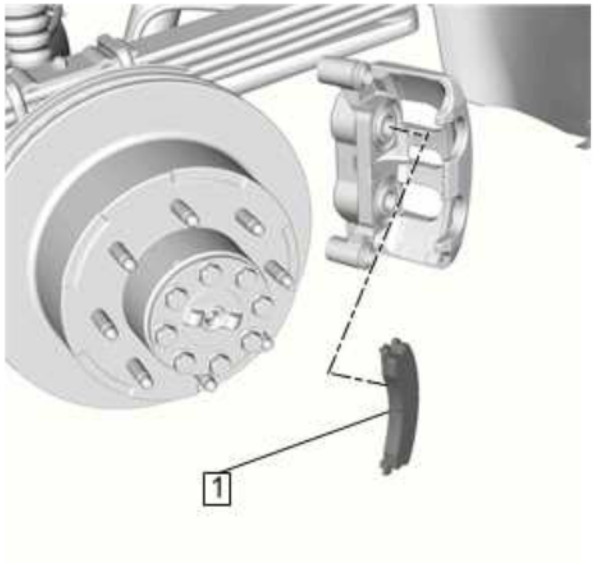


Fig. 47: Inner Disc Brake Pad

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Courtesy of GENERAL MOTORS COMPANY

12. Remove Inner Disc Brake Pad (1)

NOTE: **Do NOT lever against or pry between the disc brake pad and the brake caliper pistons.**

NOTE: **Do NOT strike or press directly against the face of the brake caliper pistons.**

13.

14. If the inner disc brake pad will not release, lever against the metal disc brake pad backing plate and the brake caliper housing.

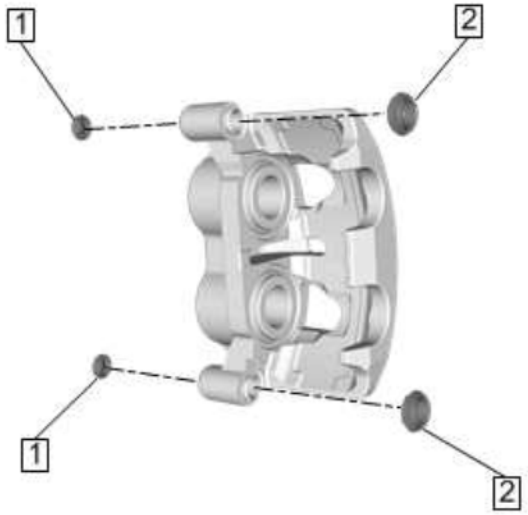


Fig. 48: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

15. Remove Seal (1)
16. Remove Boot (2)
17. Thoroughly clean the brake caliper housing guide pin bores with denatured alcohol and allow to dry.
18. Thoroughly clean the brake caliper guide pins with denatured alcohol and allow to dry.

Installation Procedure

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1. Inspect the rear disc brake hardware for damage and replace, if necessary. **Rear Disc Brake Mounting and Hardware Inspection**

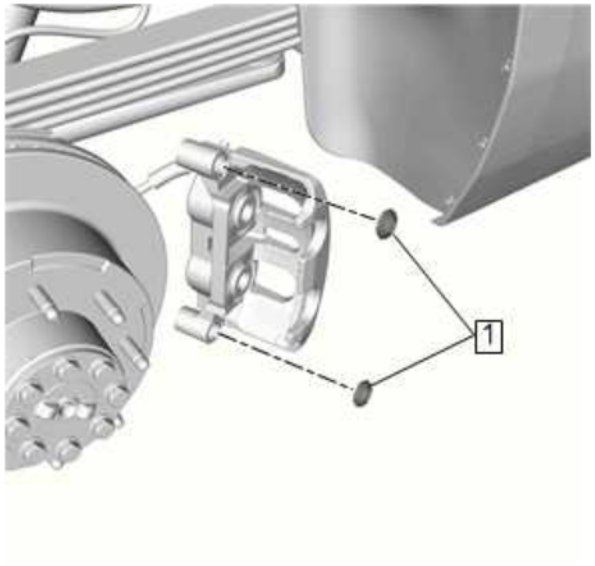
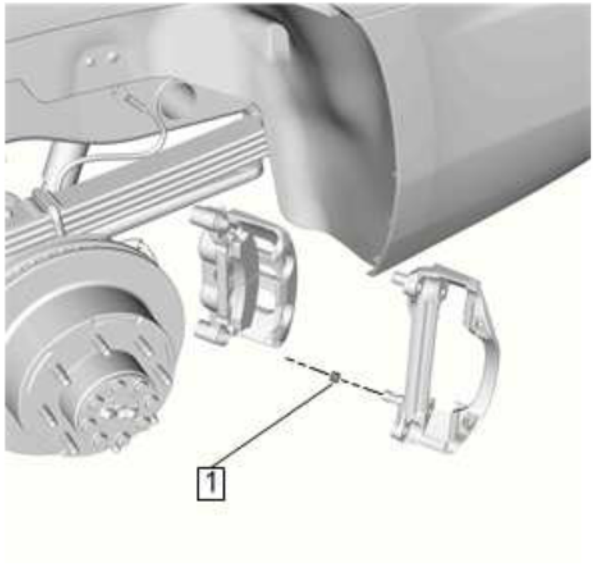


Fig. 49: Boot
Courtesy of GENERAL MOTORS COMPANY

2. Install Boot (2)



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Fig. 50: Brake CaliperGuide Pin Bushing
Courtesy of GENERAL MOTORS COMPANY

3. Install Brake Caliper Guide Pin Bushing (1)
4. Apply a light, even coating of the supplied lubricant to the disc brake caliper housing guide pin bores.
5. Apply a light, even coating of the supplied lubricant to the brake caliper guide pins.

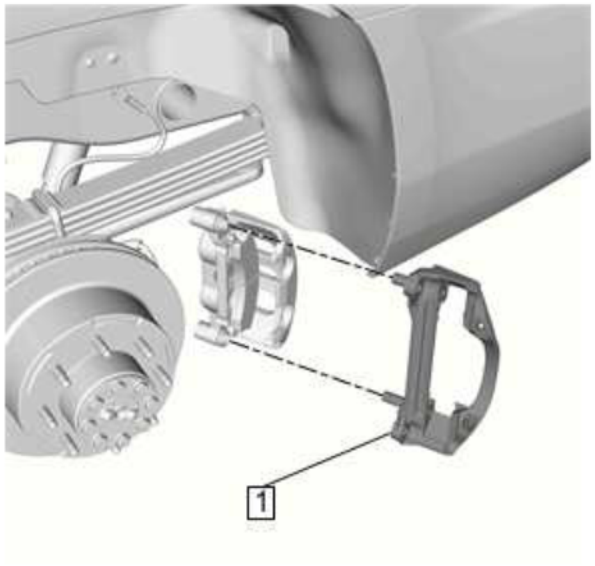


Fig. 51: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Install Brake Caliper Bracket (1)

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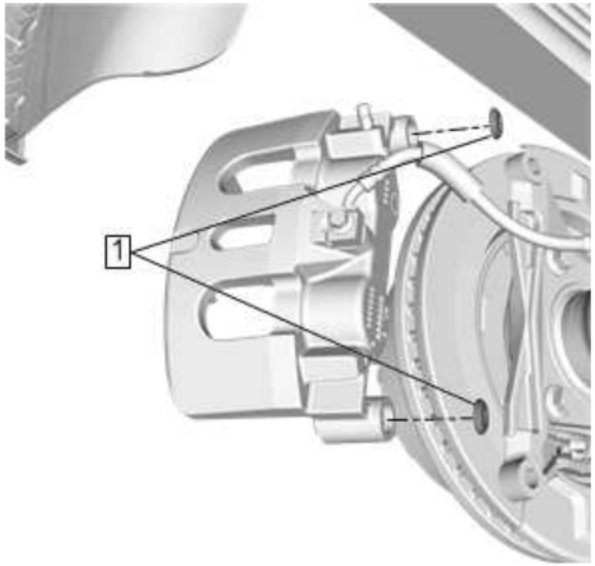


Fig. 52: Disc Brake Caliper Guide Pin Seals
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do NOT puncture the disc brake caliper guide pin seals.**

7. Install Seal (1)
8. Ensure the disc brake caliper guide pin seals are fully seated in the grooves of the disc brake caliper housing.

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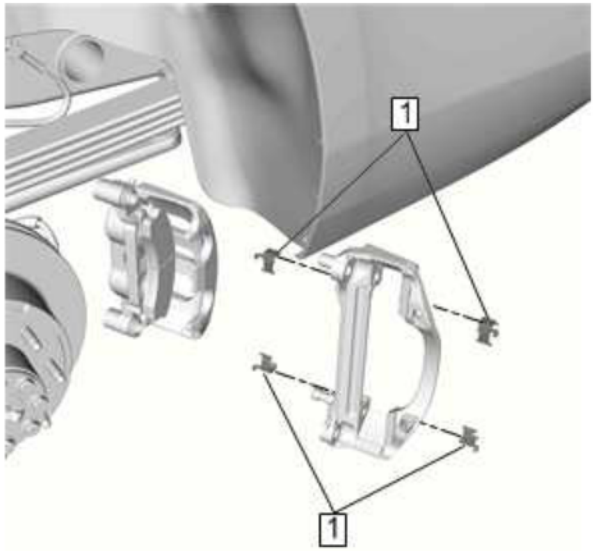


Fig. 53: Brake Pad Spring
Courtesy of GENERAL MOTORS COMPANY

9. Install Brake Pad Spring (1)

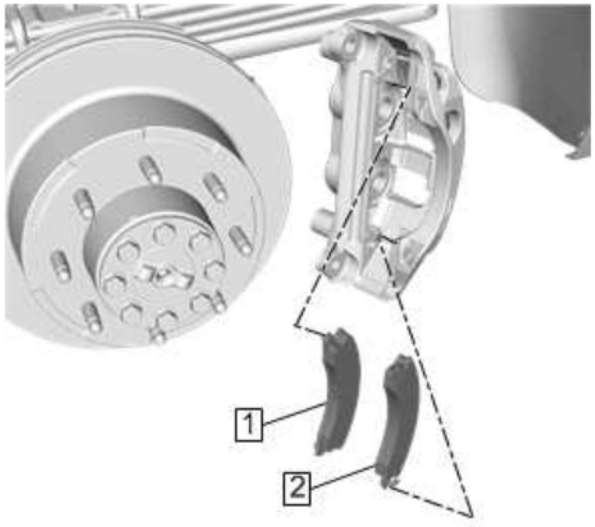


Fig. 54: Inner Disc Brake Pad

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Courtesy of GENERAL MOTORS COMPANY

10. Install Inner Disc Brake Pad (1)
11. Install Outer Disc Brake Pad (1)
12. Prepare the brake caliper bracket bolts and the threaded holes for assembly.
    - Thoroughly clean the brake caliper bracket bolts of any thread locking adhesive residue.
    - Thoroughly clean the caliper bracket threaded holes of any threadlocker residue with denatured alcohol and allow to dry.
    - Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolts. **Adhesives, Fluids, Lubricants, and Sealers**
13. Install Brake Caliper and Bracket Assembly

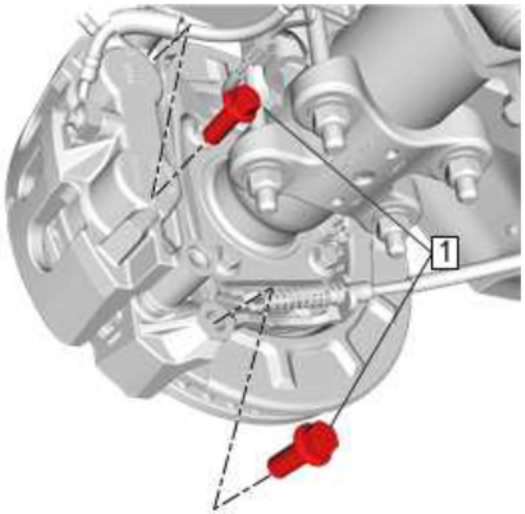


Fig. 55: Brake Caliper BracketBolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Fastener Caution**

14. Install Brake Caliper Bracket Bolt (1) and tighten 300 N.m (221 lb ft)
15. Install Tire and Wheel **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
16. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.

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17. Slowly release the brake pedal.
18. Wait 15 seconds, then repeat steps 16-17 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
19. Fill the master cylinder reservoir. **Master Cylinder Reservoir Filling**
20. Burnish the brake pads and rotors. **Brake Pad and Rotor Burnishing**

BRAKE PAD AND ROTOR BURNISHING

WARNING: Road test a vehicle under safe conditions and while obeying all traffic laws. Do not attempt any maneuvers that could jeopardize vehicle control. Failure to adhere to these precautions could lead to serious personal injury and vehicle damage.

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).

NOTE: 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 (JD9)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

WARNING: Refer to Brake Fluid Irritant Warning .

CAUTION: Refer to Brake Fluid Effects on Paint and Electrical Components Caution .

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1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the maximum full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
6. Install 2 C-clamps against the outer brake pad and the rear of the brake caliper body.
7. Slowly tighten the C-clamps until the brake caliper pistons are compressed into the brake caliper bores.

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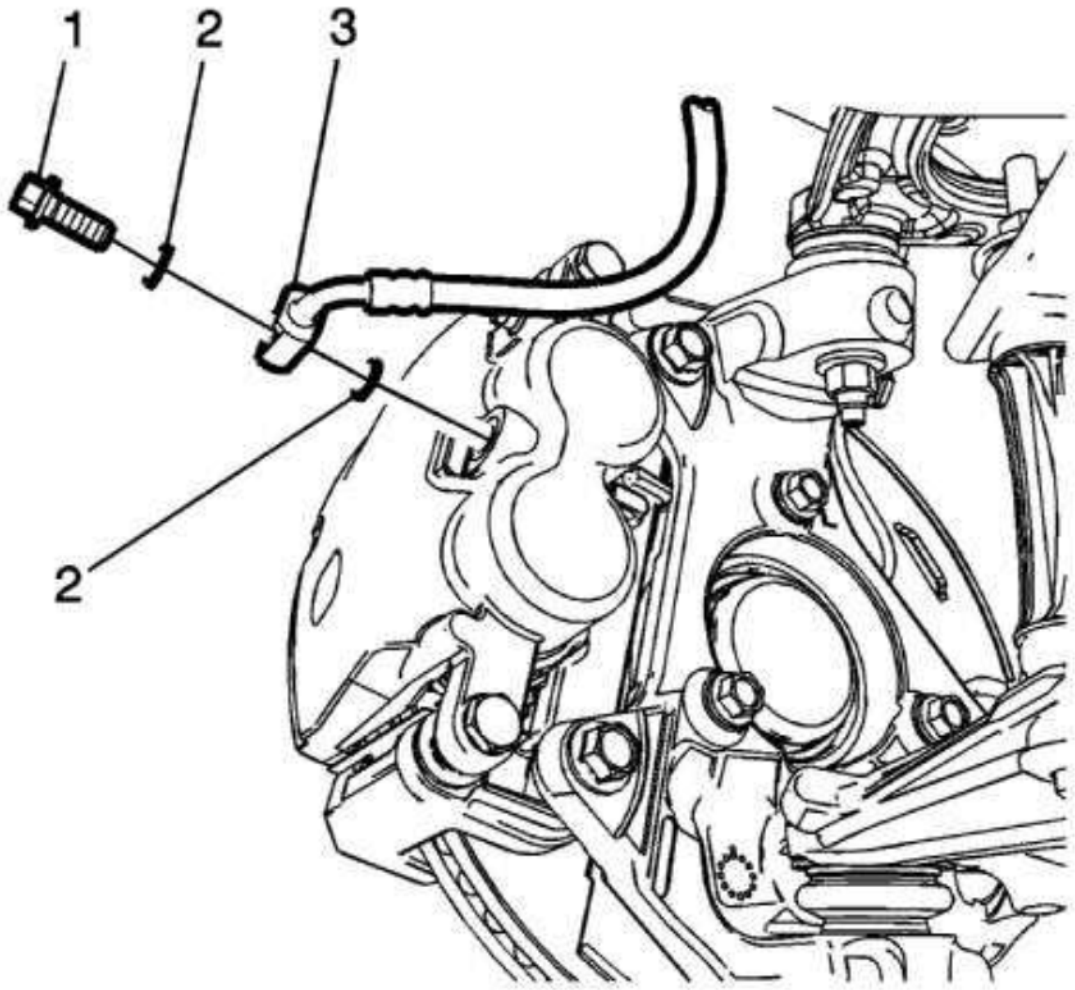


Fig. 56: Brake Hose Fitting Bolt
Courtesy of GENERAL MOTORS COMPANY

8. Remove the brake hose fitting bolt (1).
9. Remove the brake hose fitting gaskets (2) and the brake hose (3).
10. Cap the brake hose to prevent brake fluid loss and contamination.
11. Discard the brake hose fitting gaskets.

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NOTE: **Do not allow the open end wrench to contact the brake caliper when removing or installing the brake caliper guide pin bolt. Allowing the open end wrench to contact the brake caliper will cause a pulsation when the brakes are applied.**

12. Install an open end wrench to the brake caliper guide pin to hold the guide pin in line with the brake caliper.

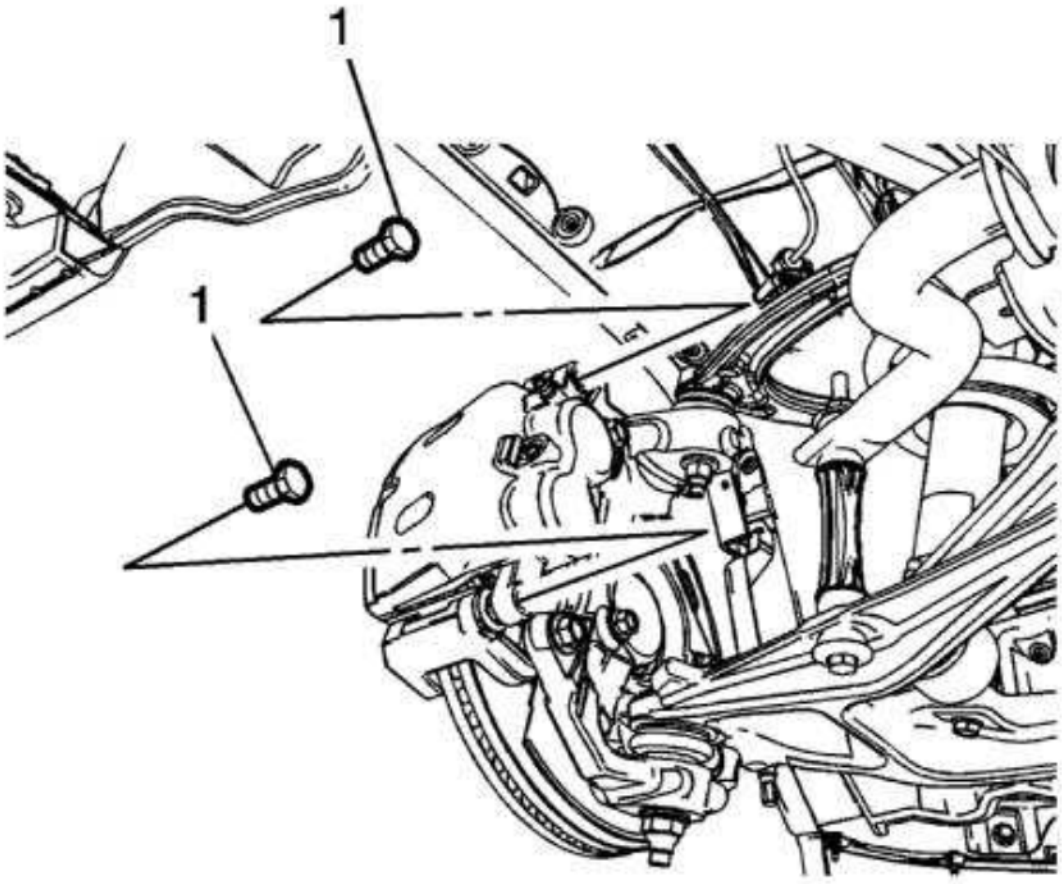


Fig. 57: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

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13. Using a backup wrench on the brake caliper guide pin, remove the brake caliper guide pin bolts (1).
14. Remove the brake caliper.

Installation Procedure

1. Inspect the brake pads for wear and/or damage. Refer to **Brake Pad Inspection**.
2. Inspect the brake caliper guide pins, seals and brake pad springs for damage and/or corrosion. Refer to **Brake Caliper Inspection**.
3. Install the brake caliper.

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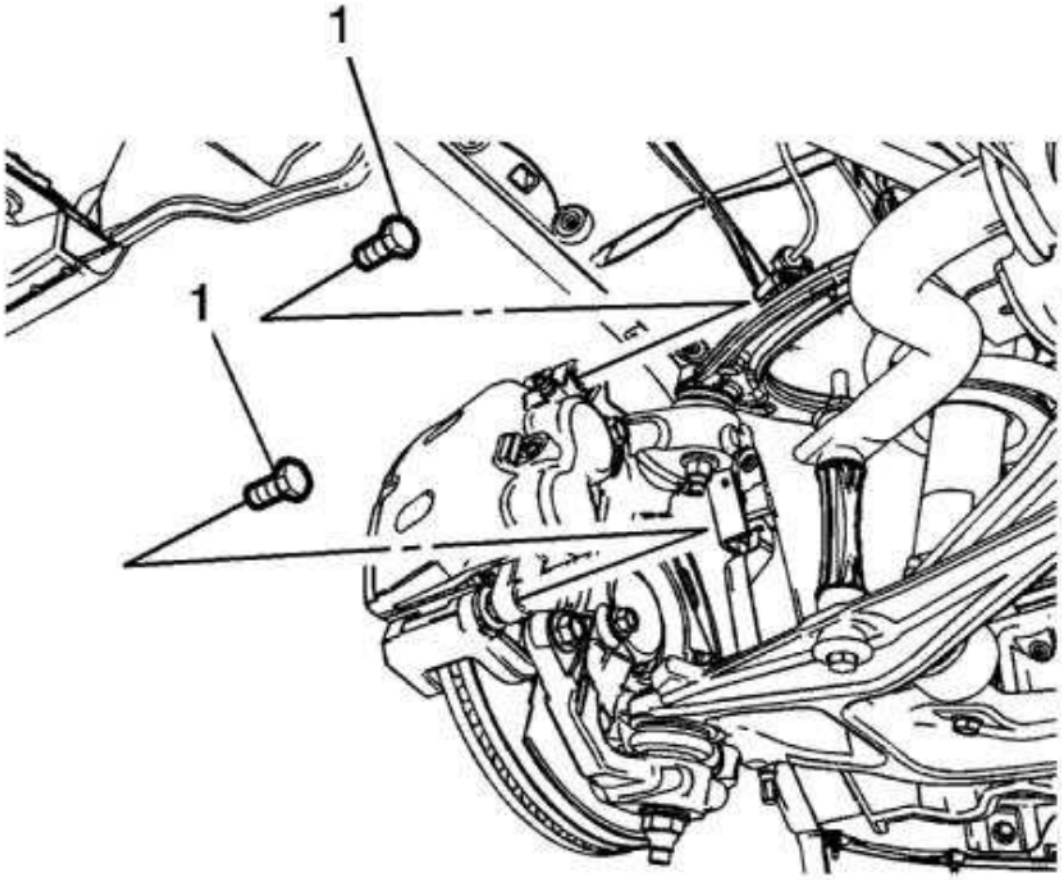


Fig. 58: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

NOTE: Do not tear the brake caliper guide pin seal. Damage to the brake caliper guide pin seal may allow corrosion to form on the brake caliper guide pin and the guide pin bores.

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4. Using a backup wrench on the brake caliper guide pin, install the brake caliper guide pin bolts (1) and tighten to 100 N.m (74 lb ft).
5. Ensure the brake caliper guide pin seals are fully seated in the groove of the brake caliper guide pin and the guide pin slides freely in the brake caliper bracket bore.

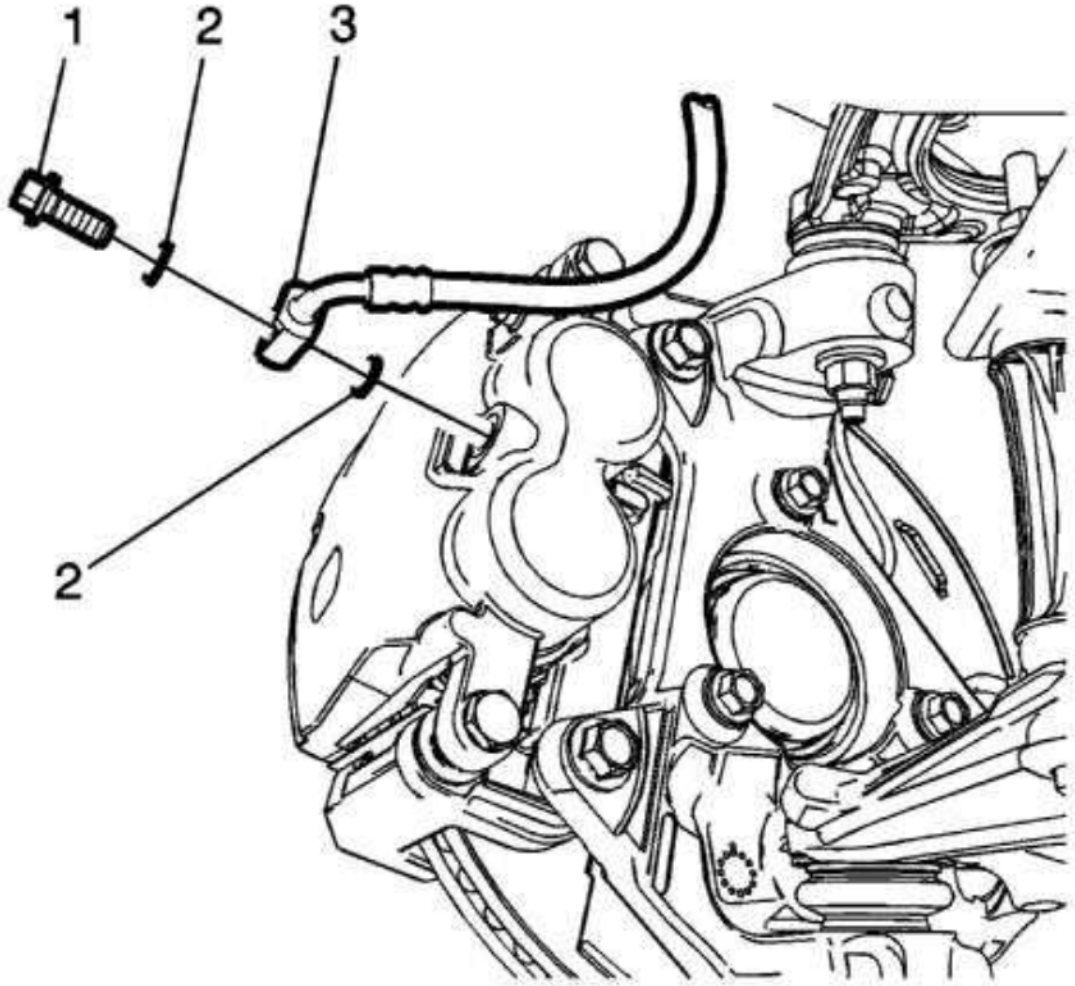


Fig. 59: Brake Hose Fitting Bolt
Courtesy of GENERAL MOTORS COMPANY

6. Assemble the brake hose fitting bolt (1) and 2 new brake hose fitting gaskets (2) to the brake hose (3) and tighten the fitting bolt to 40 N.m (30

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lb ft).

7. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Pressure)** **Hydraulic Brake System Bleeding (Manual)** .
8. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
9. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
10. Slowly release the brake pedal.
11. Wait 15 seconds, then repeat steps 9 and 10 until a firm brake pedal apply is obtained. This will properly seat the brake caliper pistons and brake pads.
12. Fill the brake master cylinder reservoir to the proper level. Refer to **Master Cylinder Reservoir Filling** .

FRONT BRAKE CALIPER REPLACEMENT (J95)

Removal Procedure

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

WARNING: **Refer to Brake Fluid Irritant Warning .**

CAUTION: **Refer to Brake Fluid Effects on Paint and Electrical Components Caution .**

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
6. Compress the brake caliper pistons into the caliper housing bore.
    - Install 2 large C-clamps over the top of the caliper housing and against the back of the outboard brake pad.
    - Slowly and evenly tighten the C-clamps until the caliper pistons are completely retracted into the brake caliper housing bores.
    - Remove the C-clamps.

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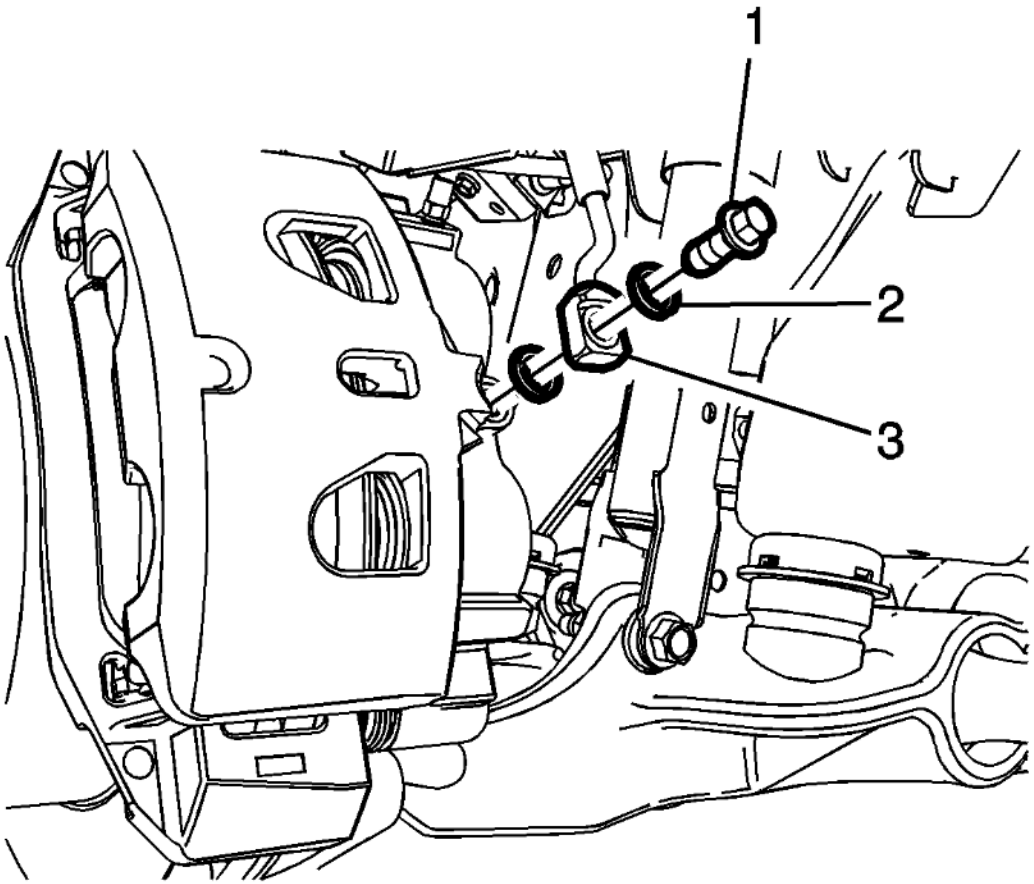


Fig. 60: Identifying Brake Hose Fitting Bolt
Courtesy of GENERAL MOTORS COMPANY

7. Remove the brake hose fitting bolt (1).

NOTE: **Do not reuse the brake hose fitting gaskets.**

8. Remove and discard the brake hose fitting gaskets (2) from the brake hose (3).

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9. Cap the brake hose fitting to prevent brake fluid loss and contamination.

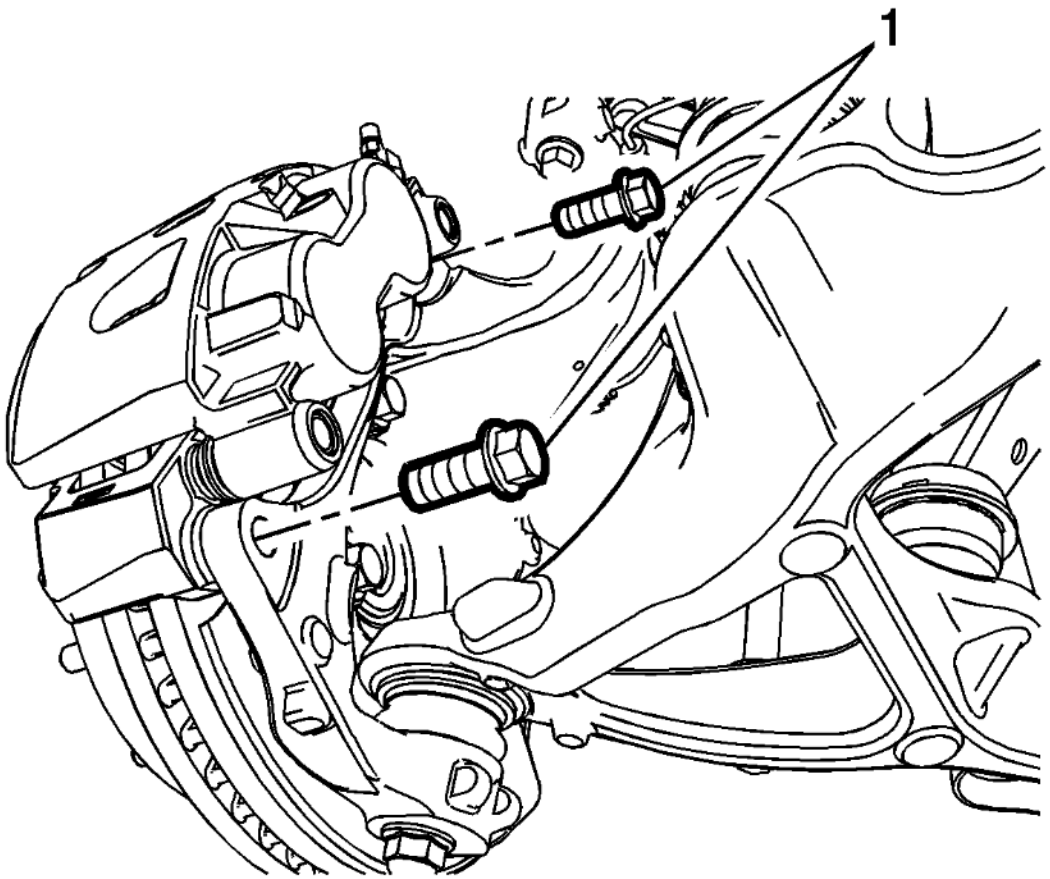


Fig. 61: Identifying Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

10. Remove the brake caliper bracket bolts (1).
11. Remove the brake caliper and bracket assembly.
12. Remove the disc brake pads and springs. Refer to **Front Disc Brake Pads Replacement (J95)**.

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13. Inspect the front disc brake mounting and hardware for damage and wear. Refer to **Front Disc Brake Mounting and Hardware Inspection**.

Installation Procedure

1. Apply a light coat of high temperature silicone brake lubricant to the brake caliper guide pins and brake caliper guide pin bores.
2. Inspect the brake caliper caps, bushings, and seals and replace if damaged or missing.

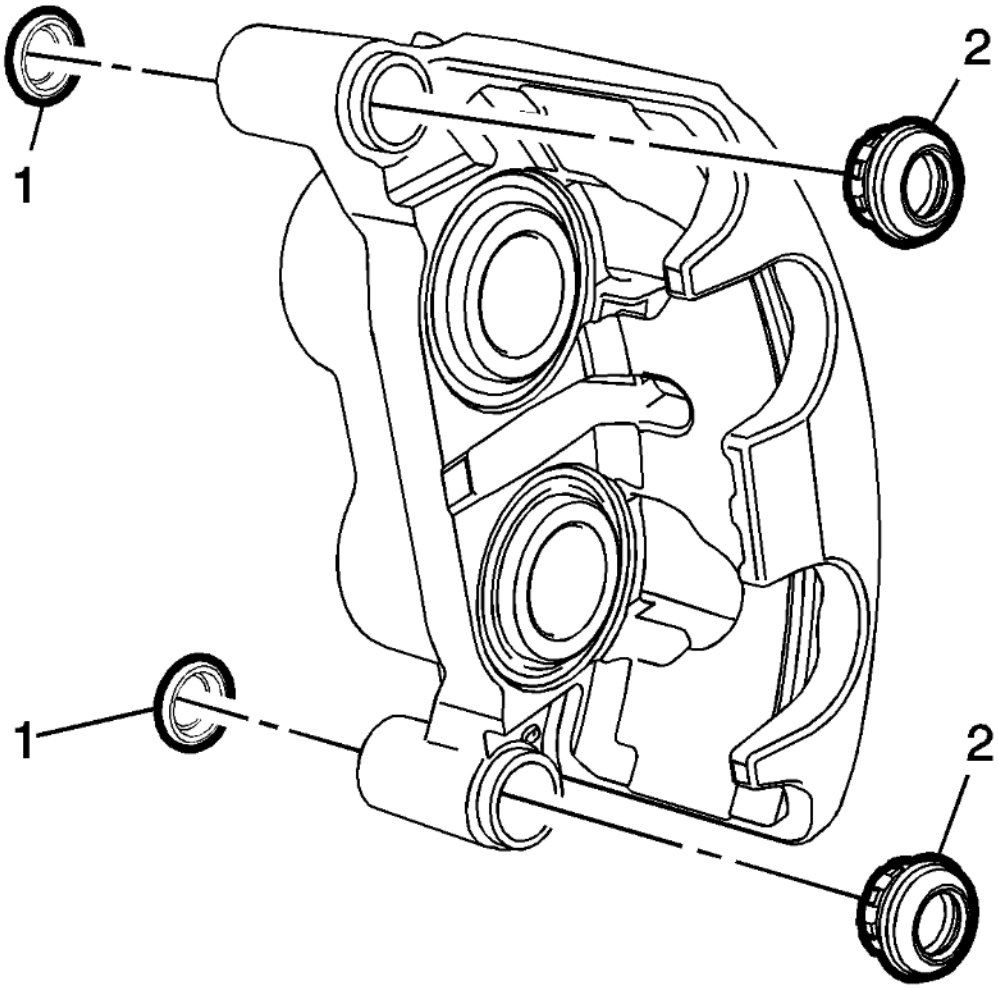


Fig. 62: Brake Caliper Guide Pin Seals

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Courtesy of GENERAL MOTORS COMPANY

3. Install the disc brake calliper guide pin seals (1) and boots (2).
4. Ensure the brake caliper guide pin seals and boots are fully seated in the grooves of the brake caliper housing.

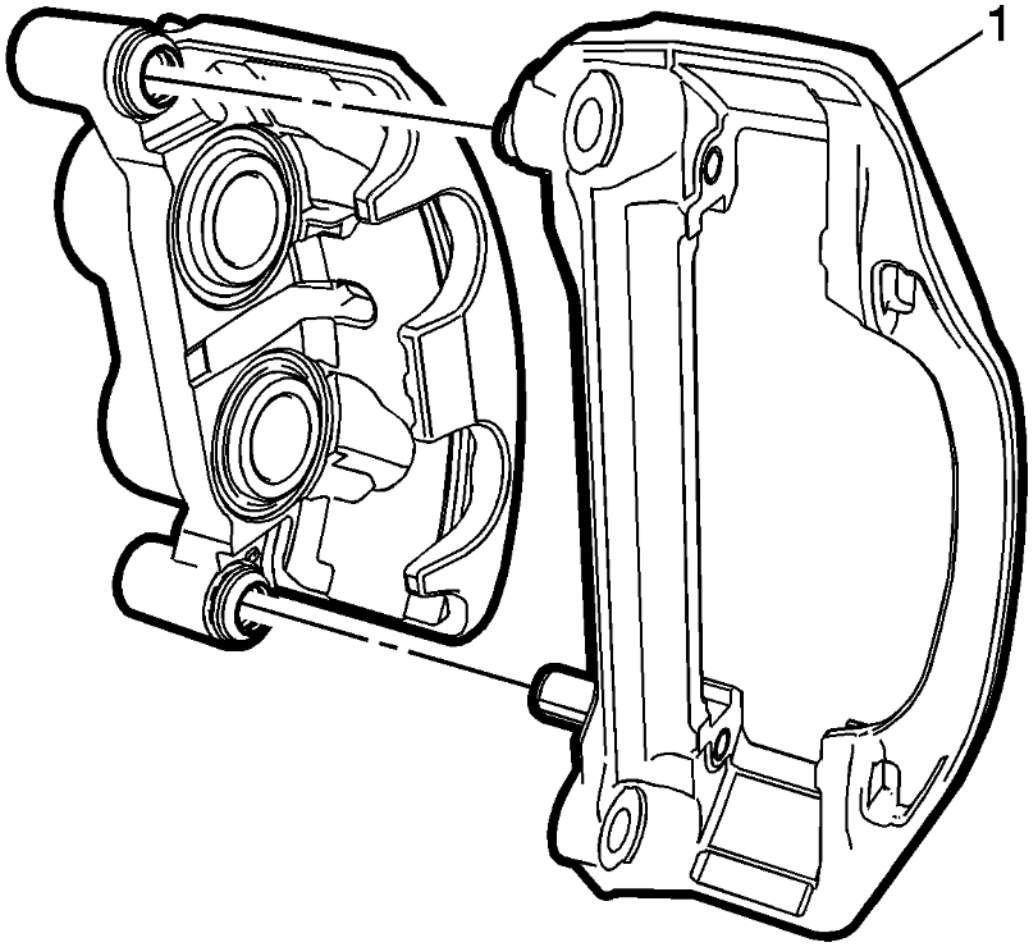


Fig. 63: Identifying Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

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5. Install the brake caliper bracket (1) to the disc brake caliper.
6. Ensure the brake caliper guide pin boots are fully seated in the groove of the brake caliper bracket.
7. Install the disc brake pads and springs. Refer to **Front Disc Brake Pads Replacement (J95)**.
8. Prepare the brake caliper bracket bolts and the rear axle threaded holes for assembly.
    - Thoroughly clean the brake caliper bracket bolts of any threadlocker residue.
    - Thoroughly clean the rear axle threaded holes of any threadlocker residue with denatured alcohol and allow to dry.
9. Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolt. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
10. Allow the threadlocker to cure approximately 10 minutes before assembly.
11. Install the brake caliper and bracket assembly to the steering knuckle.

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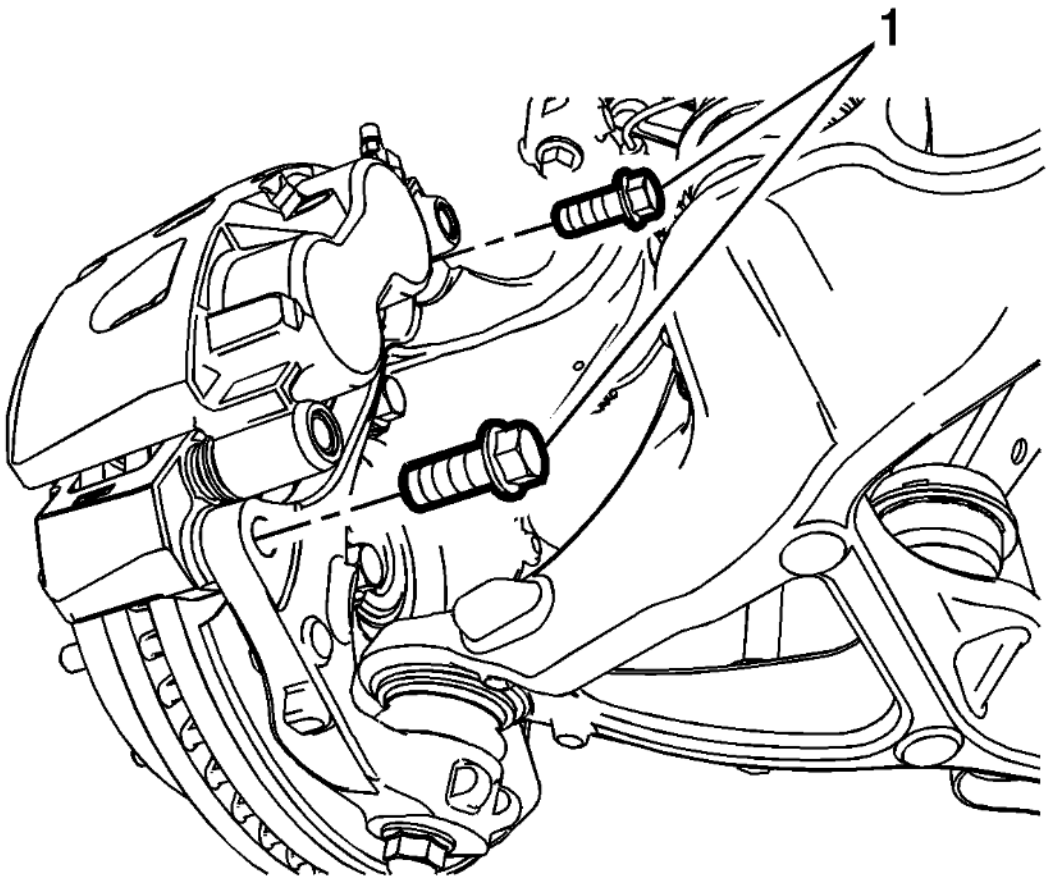


Fig. 64: Identifying Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

12. Install the brake caliper bracket bolts (1) and tighten to 300 N.m (221 lb ft).

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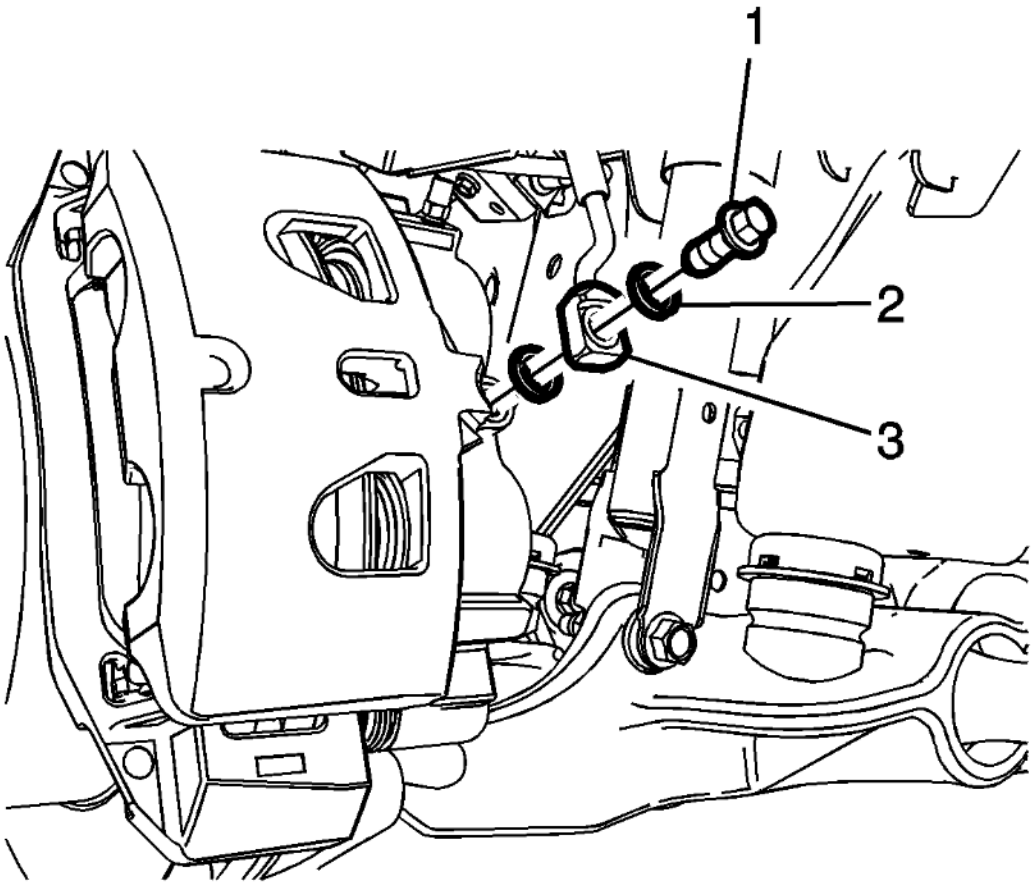


Fig. 65: Identifying Brake Hose Fitting Bolt
Courtesy of GENERAL MOTORS COMPANY

13. Assemble the brake hose fitting bolt (1) and 2 new brake hose fitting gaskets (2) to the brake hose fitting (3).
14. Install the brake hose assembly to the caliper inlet and tighten the brake hose fitting bolt to 40 N.m (30 lb ft).
15. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Pressure)** **Hydraulic Brake System Bleeding (Manual)** .
16. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and**

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Installation (8-Lug Wheel) .

FRONT BRAKE CALIPER GUIDE PIN REPLACEMENT (JD9)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

CAUTION: 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.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) .

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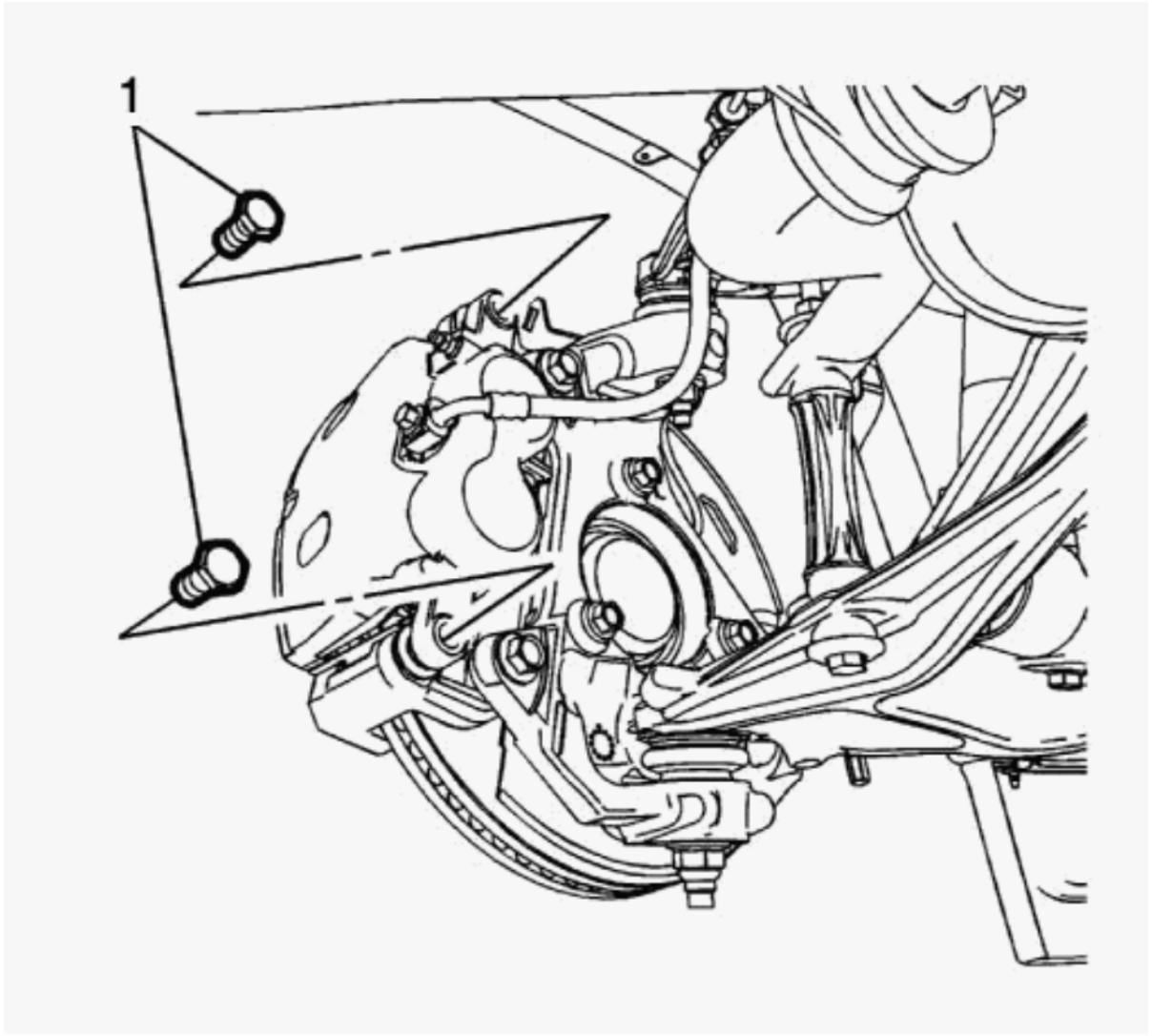


Fig. 66: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not allow the open end wrench to contact the brake caliper when removing or installing the brake caliper guide pin bolt. Allowing the open end wrench to contact the brake caliper will cause a pulsation when the brakes are applied.**

3. Using a backup wrench on the brake caliper guide pin, remove the brake caliper guide pin bolts (1).

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4. Remove the brake caliper and support with heavy mechanics wire or equivalent.

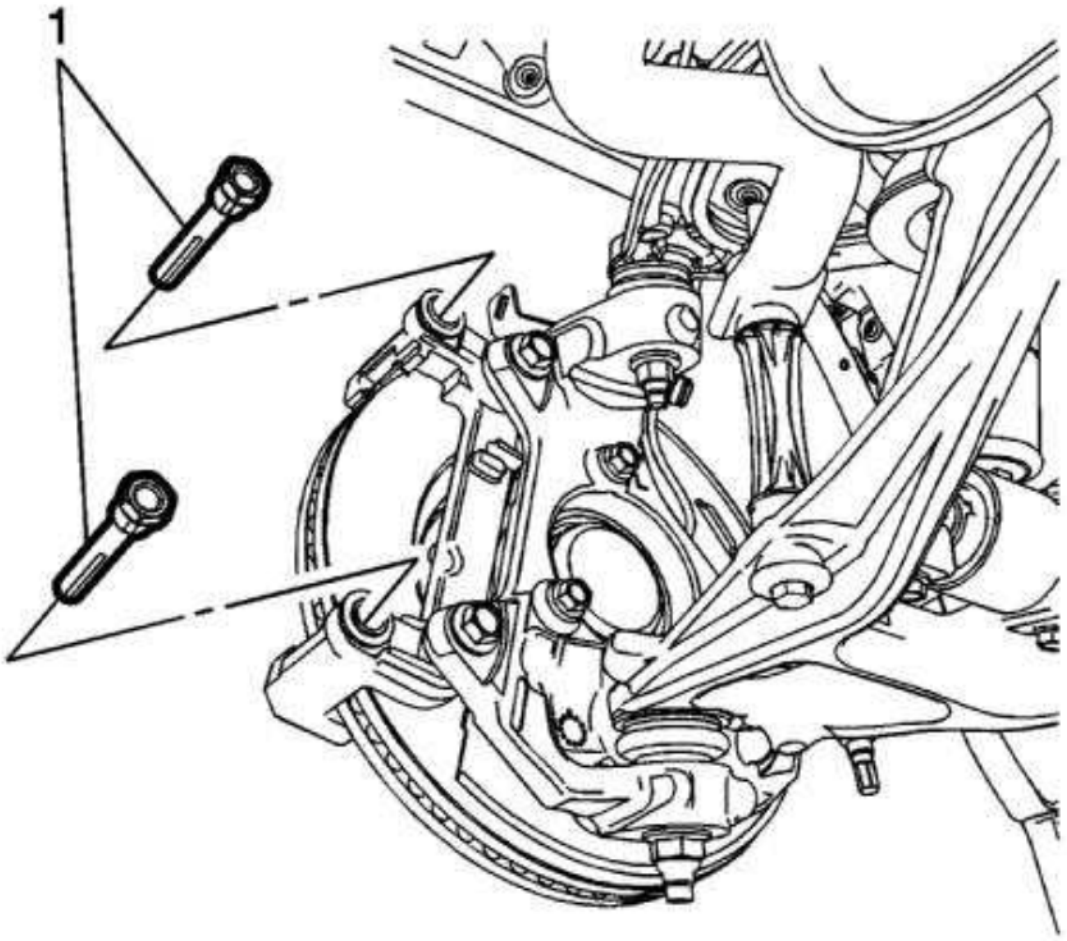


Fig. 67: Brake Caliper Guide Pins
Courtesy of GENERAL MOTORS COMPANY

5. Remove the brake caliper guide pins (1).

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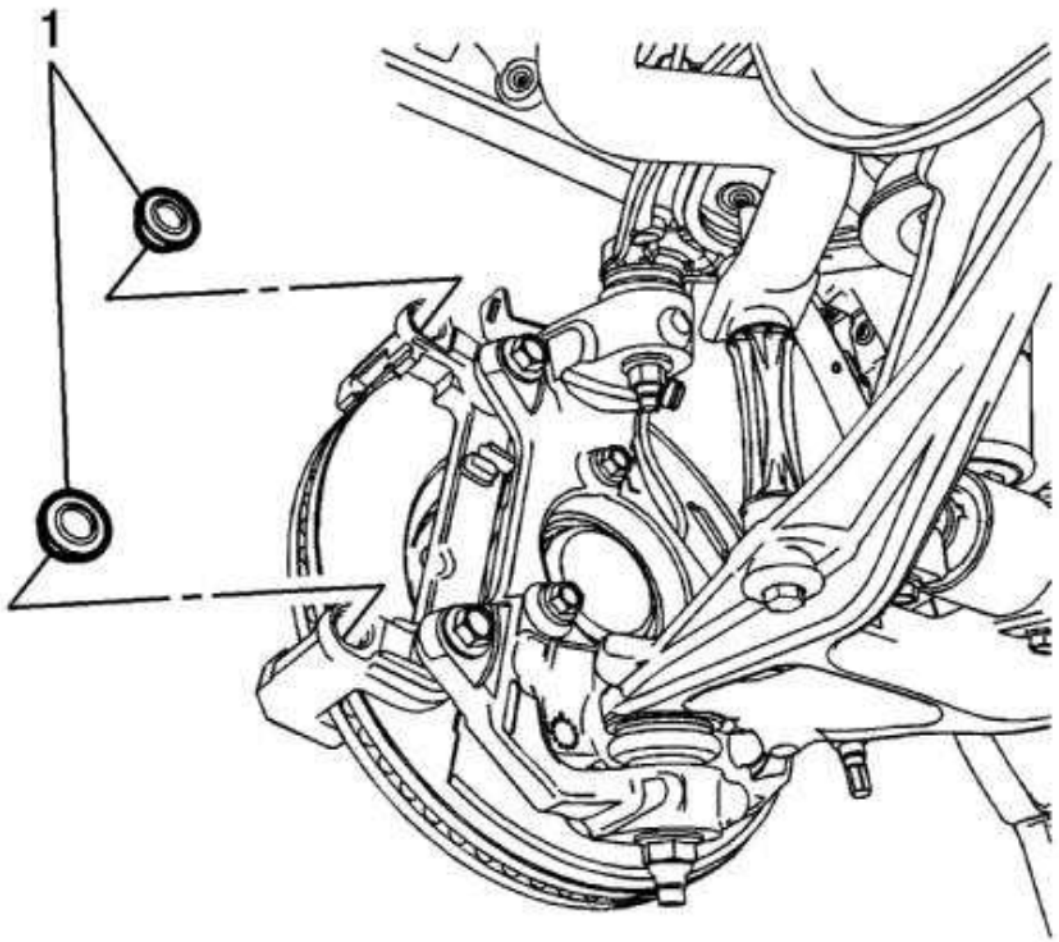


Fig. 68: Brake Caliper Guide Pin Seals
Courtesy of GENERAL MOTORS COMPANY

6. Remove the brake caliper guide pin seals (1).

Installation Procedure

1. Inspect the brake caliper guide pins and seals for damage and/or corrosion. Refer to **Front Disc Brake Mounting and Hardware Inspection**.

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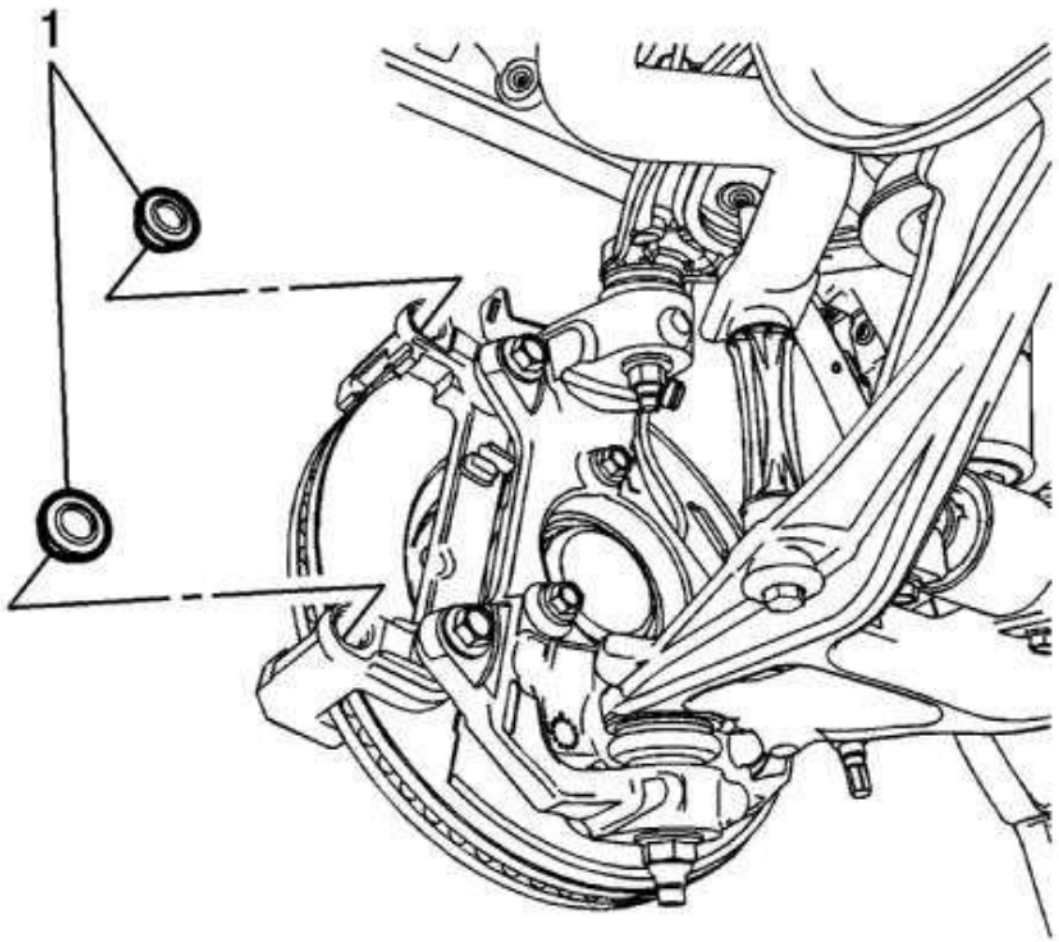


Fig. 69: Brake Caliper Guide Pin Seals
Courtesy of GENERAL MOTORS COMPANY

2. Install the brake caliper guide pin seals (1).

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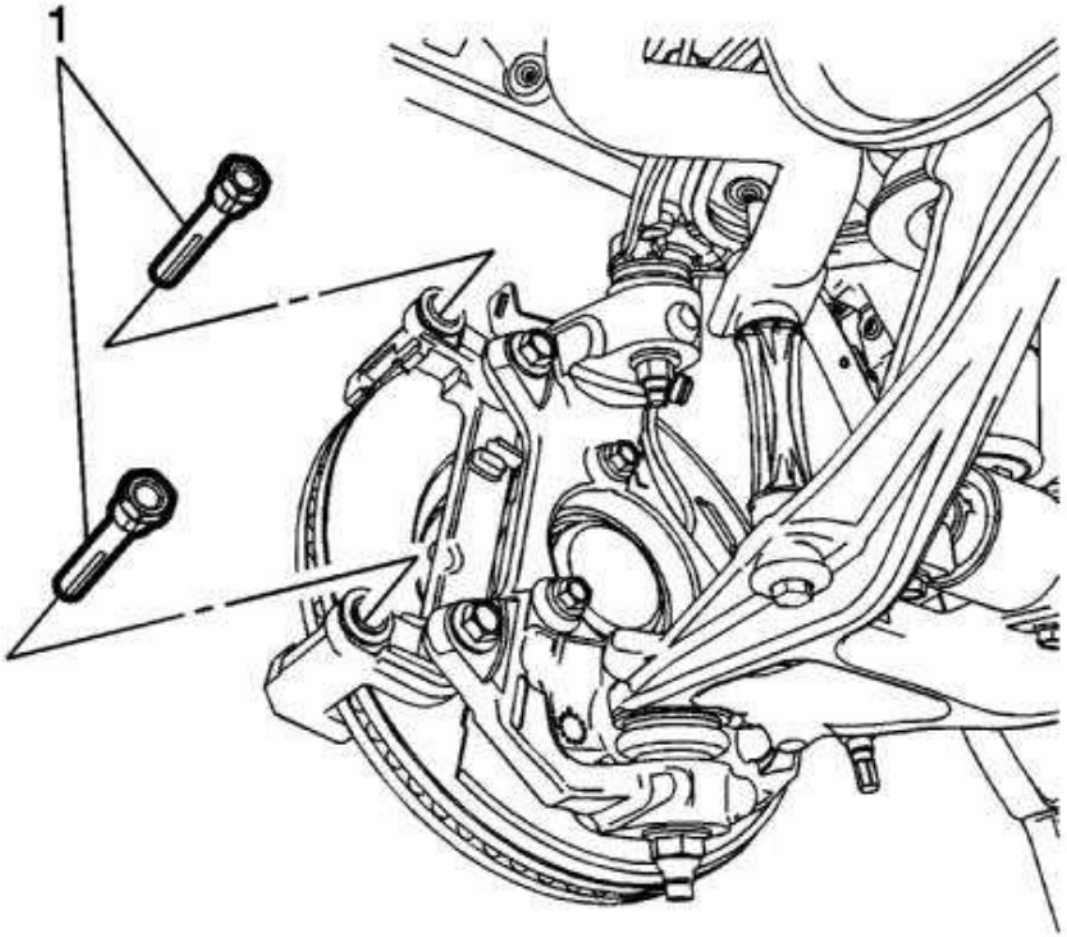


Fig. 70: Brake Caliper Guide Pins
Courtesy of GENERAL MOTORS COMPANY

3. Apply a thin coat of high temperature silicone brake lubricant the brake caliper guide pins.
4. Install the brake caliper guide pins (1) to the brake caliper bracket and guide pin seals.
5. Ensure the guide pin seal is fully seated in the groove of the brake caliper guide pin.
6. Ensure the guide pin seal is fully seated in the groove of the brake caliper bracket.

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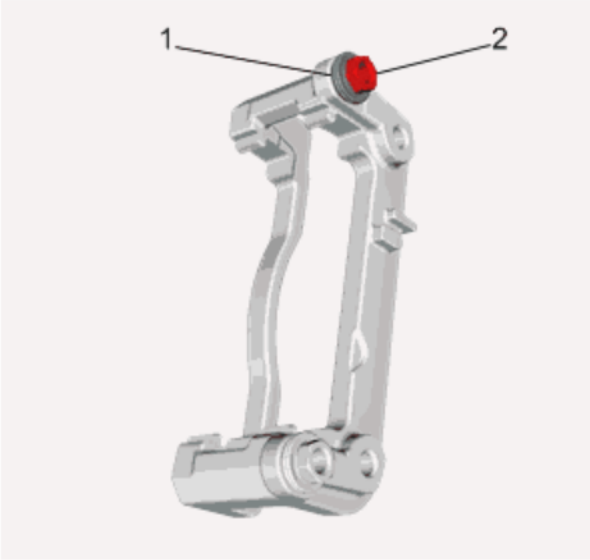


Fig. 71: Upper Guide Pin Seal And Guide Pin Seal
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Excess brake lubricant and trapped air must be expelled from the brake caliper guide pin bore to allow full caliper movement and prevent premature brake pad wear.**

7. Gently pull the edge of the upper guide pin seal (1) away from the brake caliper guide pin (2) while simultaneously pushing the brake caliper guide pin into the brake caliper bracket to expel any trapped air and excess brake lubricant.
8. Repeat step 7 for the lower guide pin seal and brake caliper guide pin.
9. With a clean shop towel, clean any excess brake lubricant from the guide pin seal and brake caliper guide pin.
10. Install the brake caliper to the caliper bracket.

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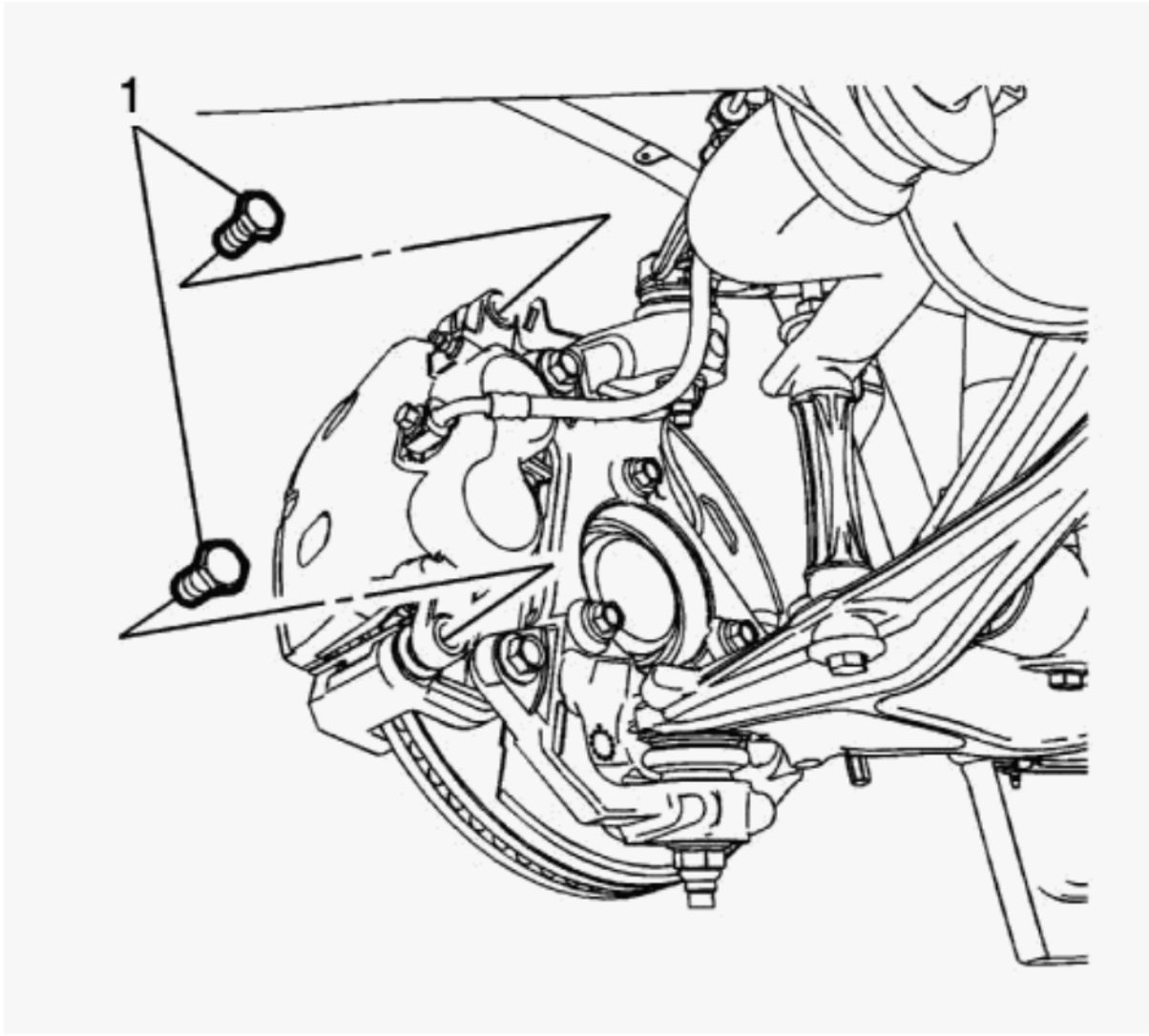


Fig. 72: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

11. Using a backup wrench on the brake caliper guide pins, install the brake caliper guide pin bolts (1) and tighten to 100 N.m (74 lb ft).
12. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

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FRONT BRAKE CALIPER GUIDE PIN REPLACEMENT (J95)

Removal Procedure

WARNING: **Brake Dust Warning**

1. Remove Front Brake Caliper Bracket **Front Brake Caliper Bracket Replacement (J95)**.

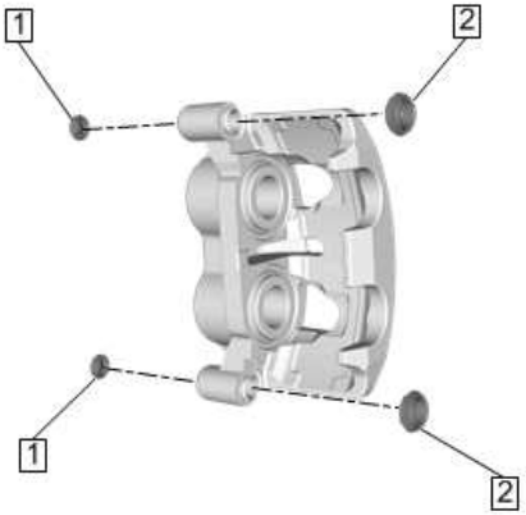


Fig. 73: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

2. Remove Seal (1)
3. Remove Boot (2)

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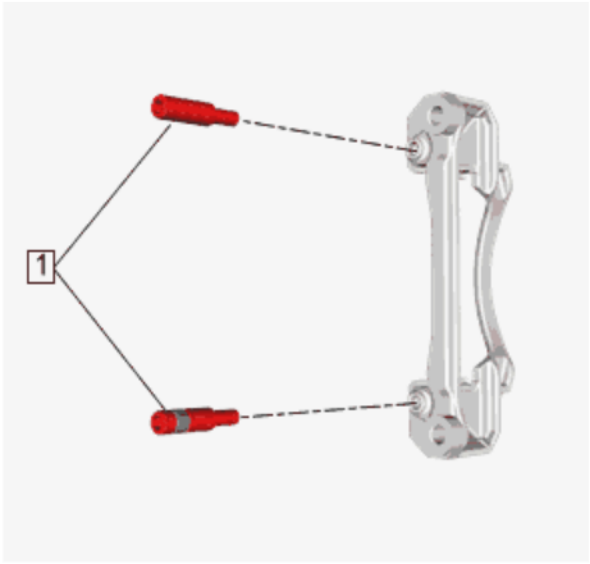
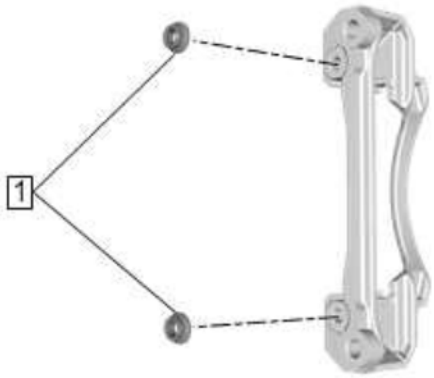


Fig. 74: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

4. Remove Brake Caliper Guide Pin (1)



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Fig. 75: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

5. Remove Brake Caliper Guide Pin Collar (1)
6. Inspect the front disc brake hardware for damage and replace, if necessary. **Front Disc Brake Mounting and Hardware Inspection**

Installation Procedure

1. Prepare the brake caliper guide pin threads and the brake caliper bracket threaded holes for assembly:
   - Thoroughly clean the brake caliper guide pin threads of any threadlocker residue.
   - Thoroughly clean the brake caliper bracket guide pin threaded holes of any threadlocker residue with denatured alcohol and allow to dry.
2. Apply threadlocker to the threads of the brake caliper guide pins. **Adhesives, Fluids, Lubricants, and Sealers**

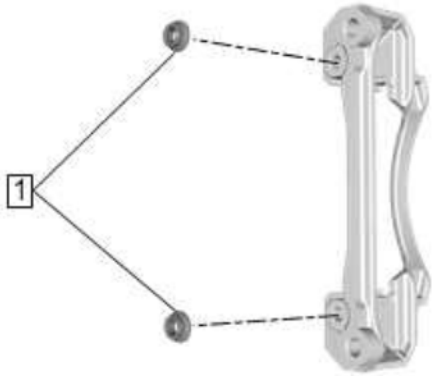


Fig. 76: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

3. Install Brake Caliper Guide Pin Collar (1)

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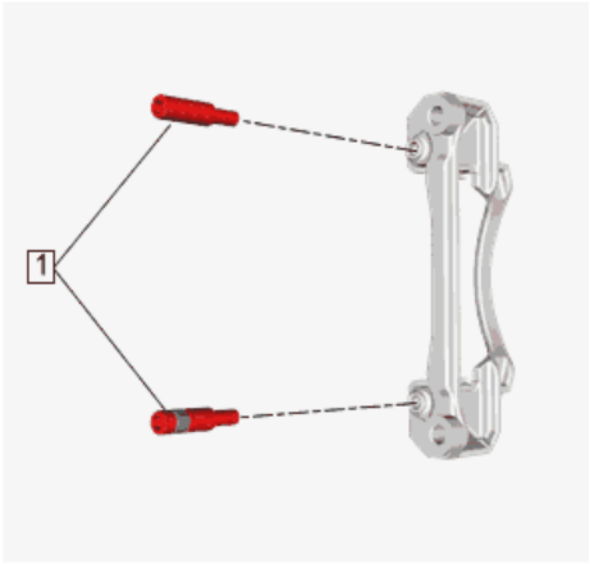


Fig. 77: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Fastener Caution**

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

4. Install Brake Caliper Guide Pin (1) and tighten 105 N.m (77 lb ft)

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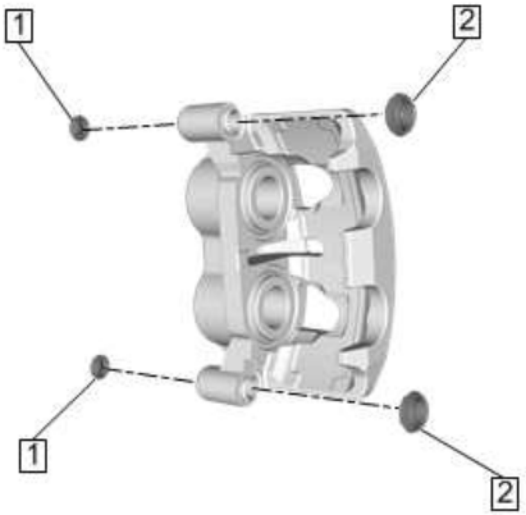


Fig. 78: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

5. Install Seal (1)
6. Install Boot (2)
7. Apply a light coating of commercially available, high temperature silicone brake lubricant to the brake caliper housing guide pin bores and guide pin surfaces:
    - Apply lubricant to the brake caliper guide pins.
    - Apply lubricant to the brake caliper guide pin seals.

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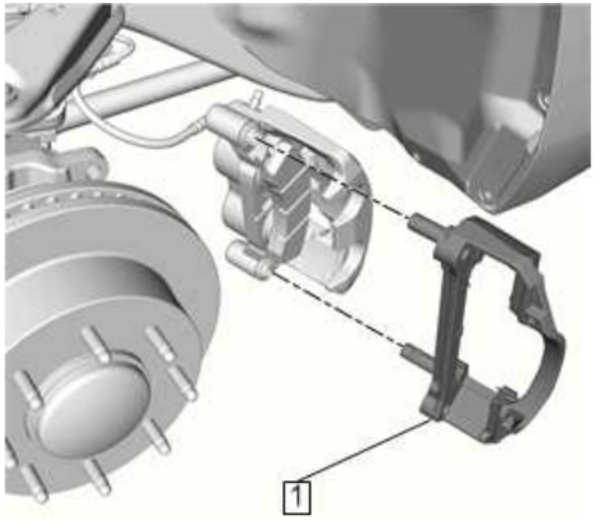


Fig. 79: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Install Brake Caliper Bracket (1)
9. Ensure the disc brake caliper guide pin seals are fully seated in the grooves of the disc brake caliper housing.
10. Install Front Brake Caliper Bracket. **Front Brake Caliper Bracket Replacement (J95)**.

REAR BRAKE CALIPER REPLACEMENT (JD9)

Removal Procedure

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

WARNING: Refer to **Brake Fluid Irritant Warning** .

CAUTION: Refer to **Brake Fluid Effects on Paint and Electrical Components Caution** .

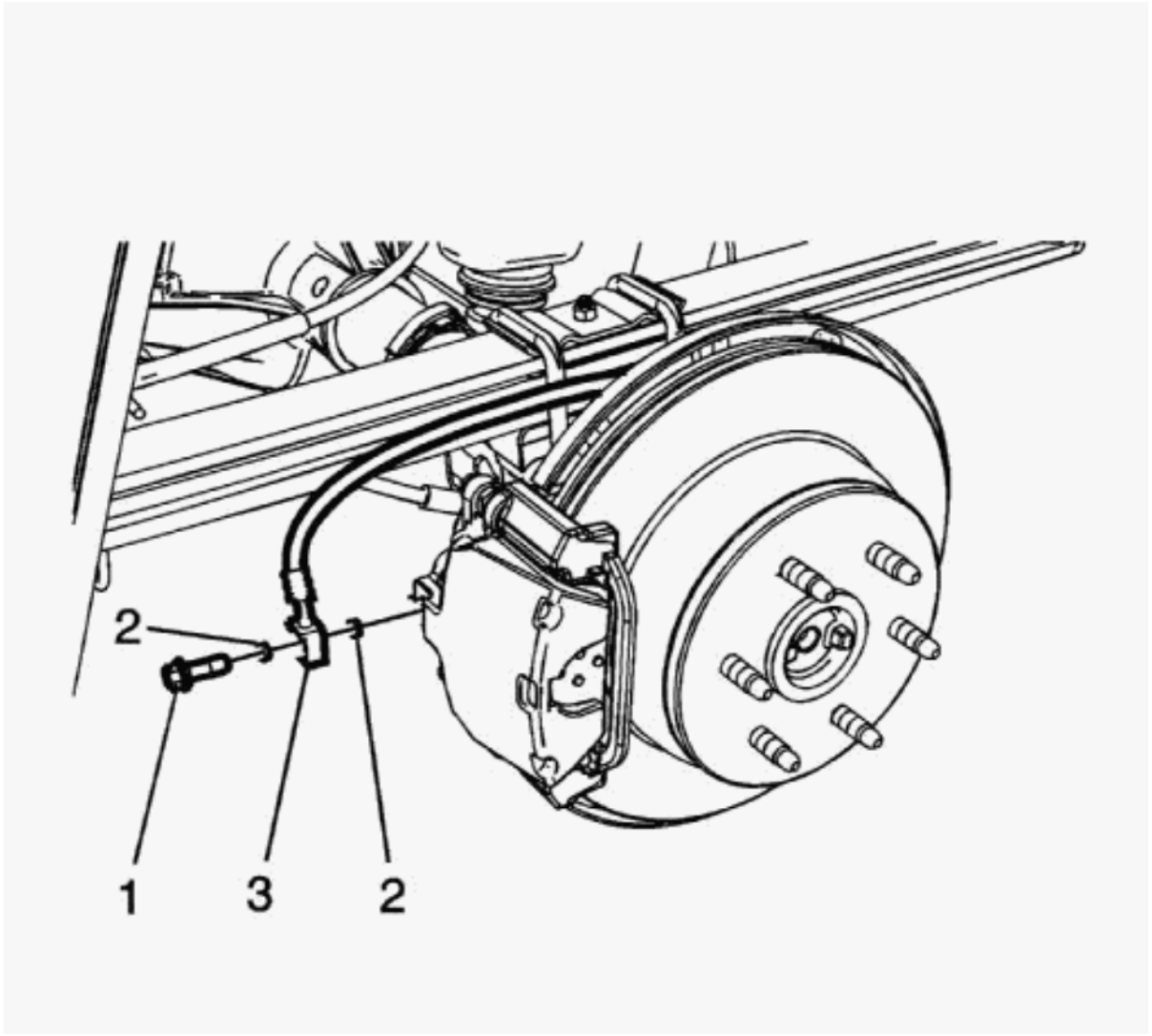
1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum full point and the minimum allowable level, no brake fluid needs to be removed from the reservoir before proceeding.
3. If the brake fluid level is higher than midway between the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

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midway point before proceeding.

4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
6. Install a C-clamp against the outer brake pad and the rear of the brake caliper body.
7. Slowly tighten the C-clamp until the brake caliper piston is compressed into the brake caliper bores.

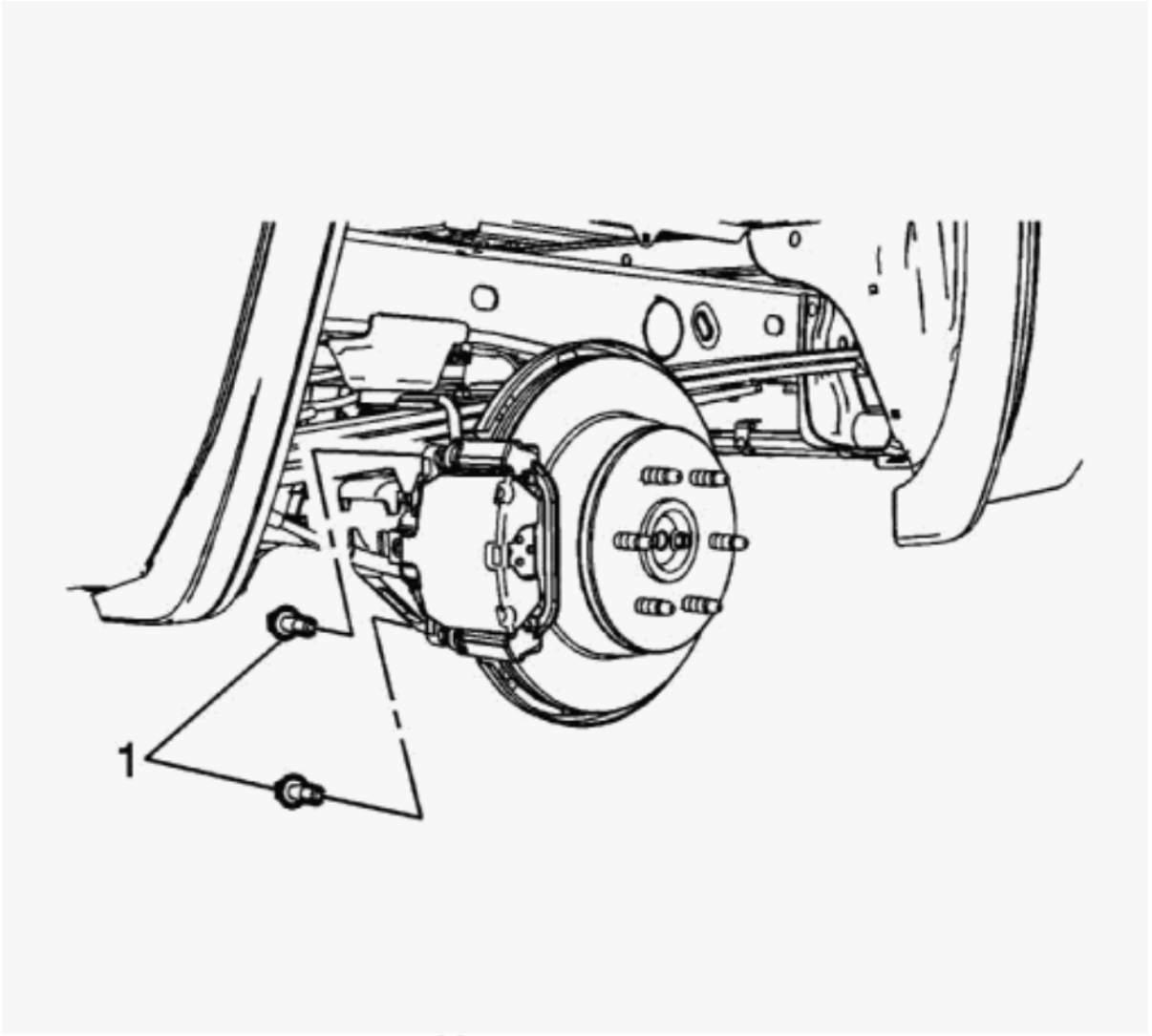


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Fig. 80: Brake Hose Fitting Bolt
Courtesy of GENERAL MOTORS COMPANY

8. Remove the brake hose fitting bolt (1).
9. Remove the brake hose fitting gaskets (2) and the brake hose (3).
10. Cap the brake hose to prevent brake fluid loss and contamination.
11. Discard the brake hose fitting gaskets.



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Fig. 81: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

12. Using a backup wrench on the brake caliper guide pin, remove the brake caliper guide pin bolts (1).
13. Discard the brake caliper guide pin bolts.
14. Remove the brake caliper.

Installation Procedure

1. Inspect the brake pads for wear and/or damage. Refer to **Brake Pad Inspection**.
2. Inspect the brake caliper guide pins, seals and brake pad springs for damage and/or corrosion. Refer to **Brake Caliper Inspection**.
3. Install the brake caliper.

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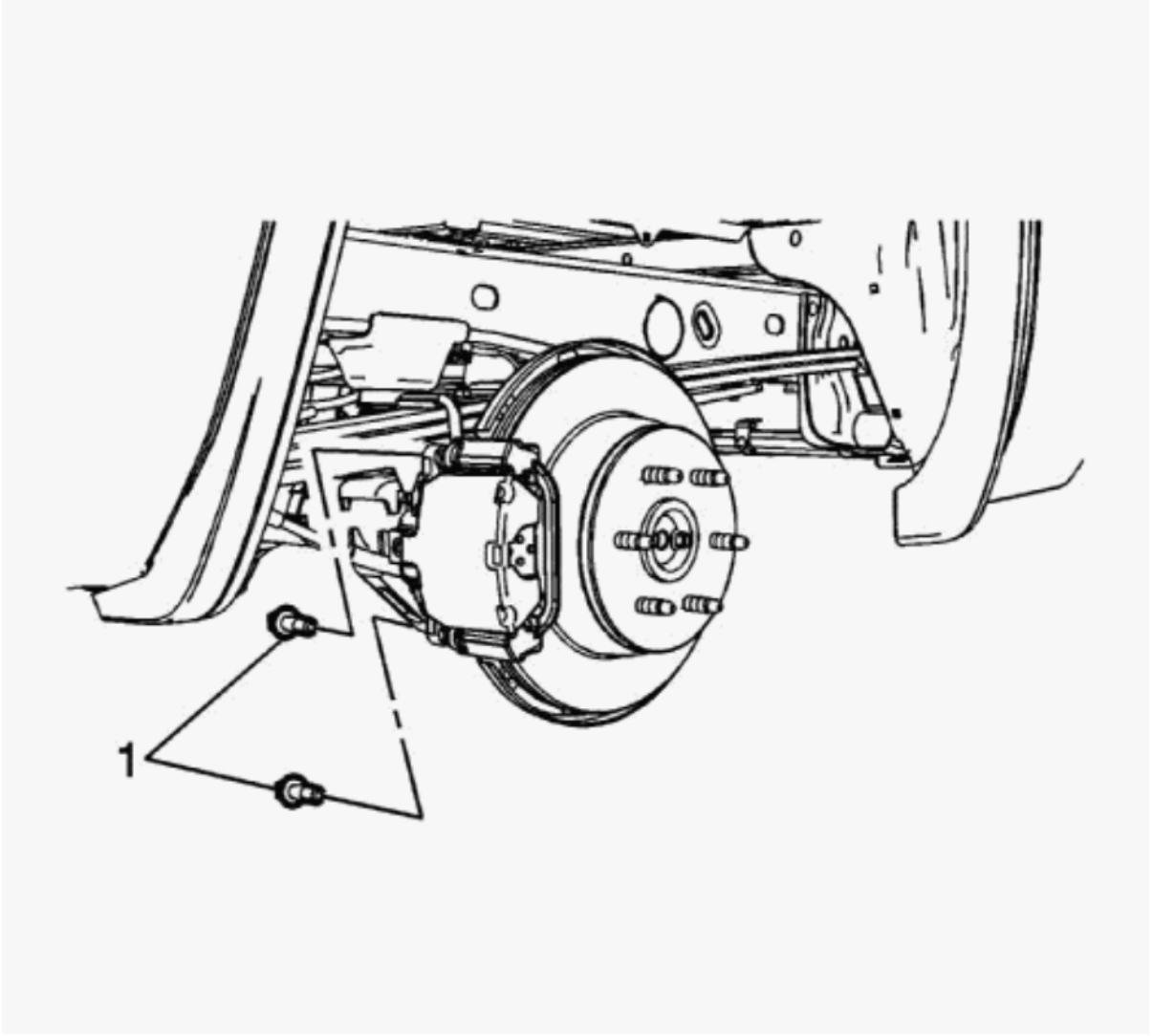


Fig. 82: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

4. Using a backup wrench on the brake caliper guide pin, install 2 new brake caliper guide pin bolts (1) and tighten to 52 N.m (38 lb ft).
5. Ensure the brake caliper guide pin seals are fully seated in the groove of the brake caliper guide pin and the guide pin slides freely in the brake caliper bracket bore.

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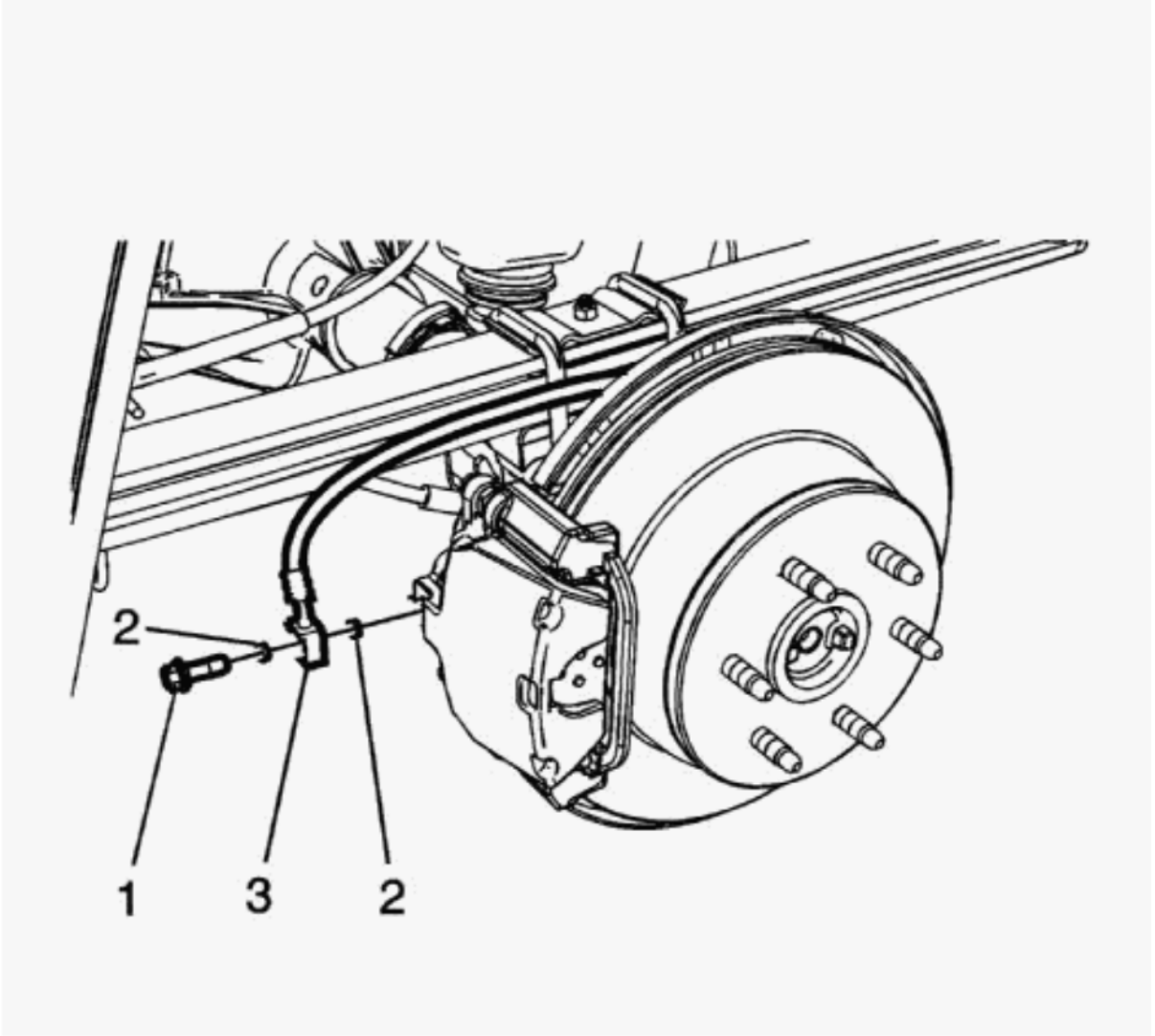


Fig. 83: Brake Hose Fitting Bolt
Courtesy of GENERAL MOTORS COMPANY

6. Assemble the brake hose fitting bolt (1) and 2 new brake hose fitting gaskets (2) to the brake hose (3) and tighten the fitting bolt to 40 N.m (30 lb ft).
7. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Pressure)** **Hydraulic Brake System Bleeding (Manual)** .
8. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and**

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Installation (8-Lug Wheel)

9. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
10. Slowly release the brake pedal.
11. Wait 15 seconds, then repeat steps 9 and 10 until a firm brake pedal apply is obtained. This will properly seat the brake caliper pistons and brake pads.
12. Fill the brake master cylinder reservoir to the proper level. Refer to **Master Cylinder Reservoir Filling** .

REAR BRAKE CALIPER REPLACEMENT (J95)

Removal Procedure

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

WARNING: **Refer to Brake Fluid Irritant Warning .**

CAUTION: **Refer to Brake Fluid Effects on Paint and Electrical Components Caution .**

1. Inspect the fluid level in the brake master cylinder reservoir.
2. If the brake fluid level is midway between the maximum-full point and the minimum allowable level, no brake fluid needs to be removed before proceeding.
3. If the brake fluid level is higher than midway between the maximum-full point and the minimum allowable level, remove brake fluid to the midway point before proceeding.
4. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
5. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
6. Compress the brake caliper pistons into the caliper housing bore.
   - Install 2 large C-clamps over the top of the caliper housing and against the back of the outboard brake pad.
   - Slowly and evenly tighten the C-clamps until the caliper pistons are completely retracted into the brake caliper housing bores.
   - Remove the C-clamps.

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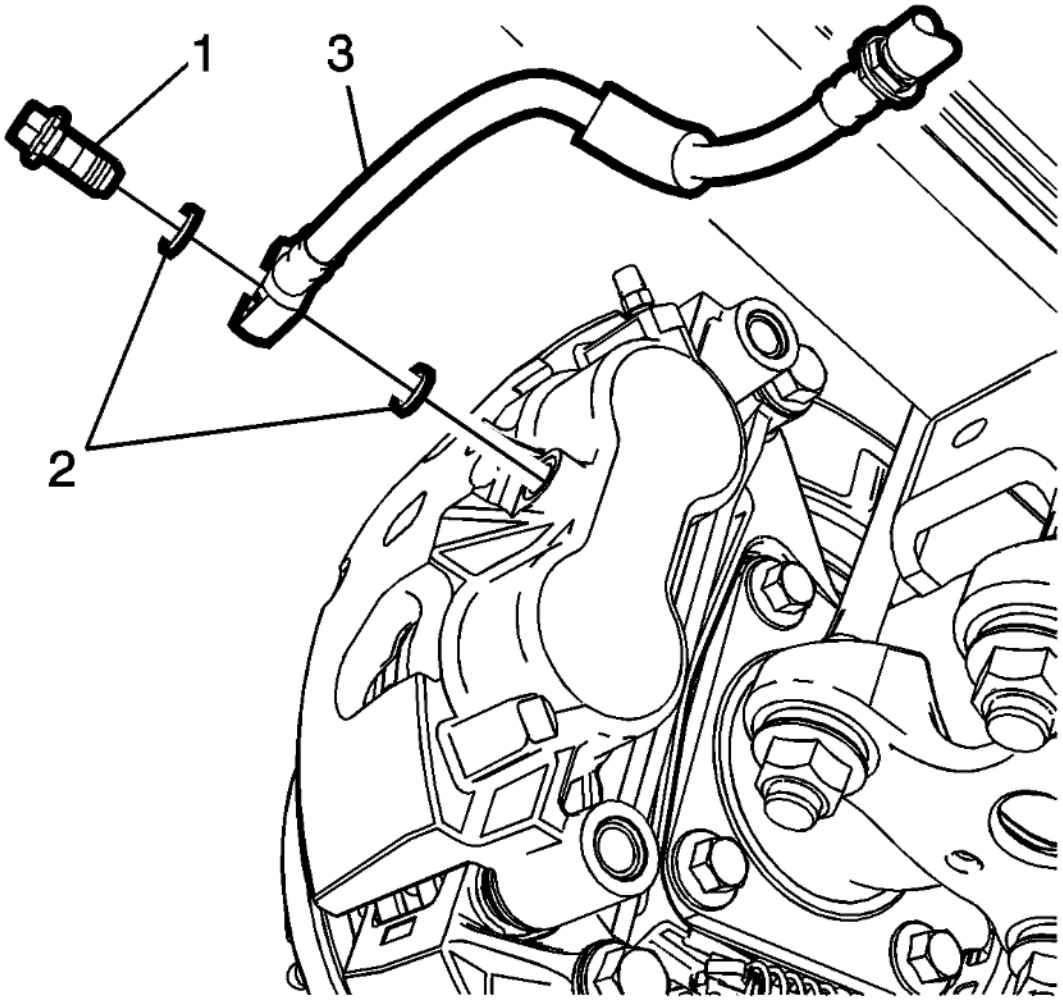


Fig. 84: Brake Hose Fitting, Gaskets And Bolts
Courtesy of GENERAL MOTORS COMPANY

7. Remove the brake hose fitting bolt (1).

NOTE: **Do not reuse the brake hose fitting gaskets.**

8. Remove and discard the brake hose fitting gaskets (2) from the brake hose (3).

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9. Cap the brake hose fitting to prevent brake fluid loss and contamination.

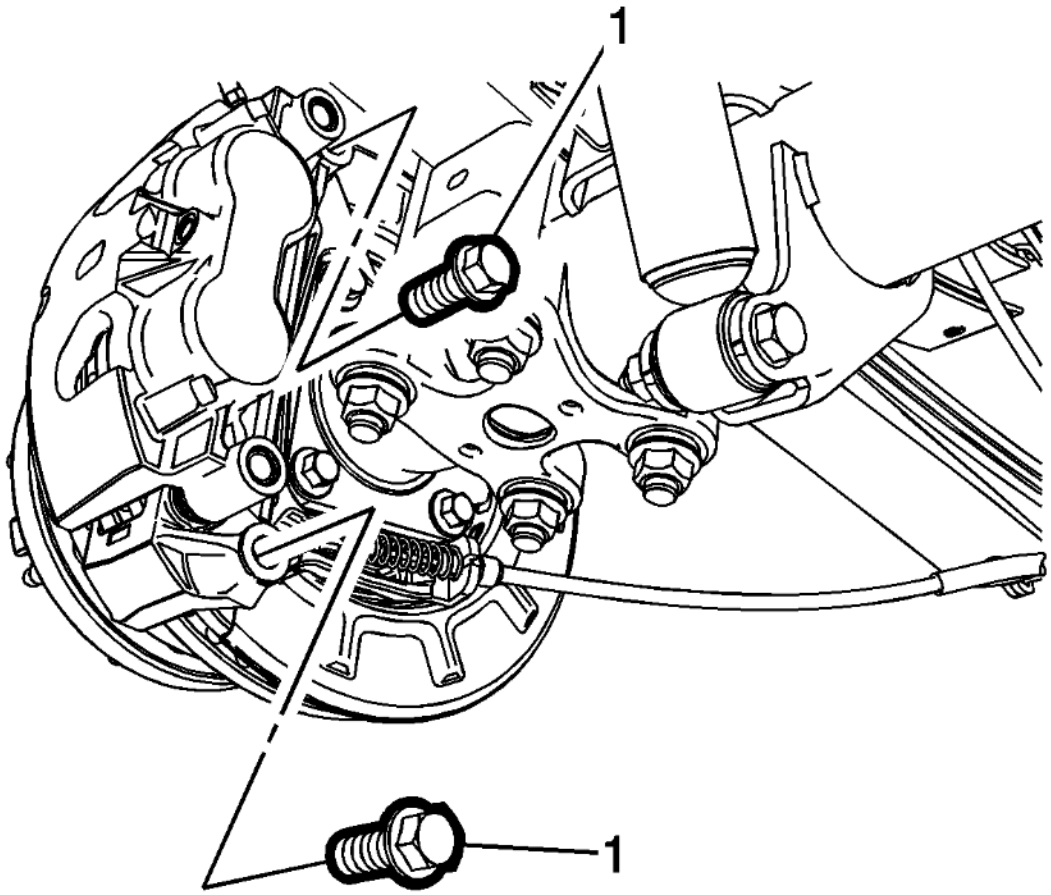


Fig. 85: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

10. Remove the brake caliper bracket bolts (1).

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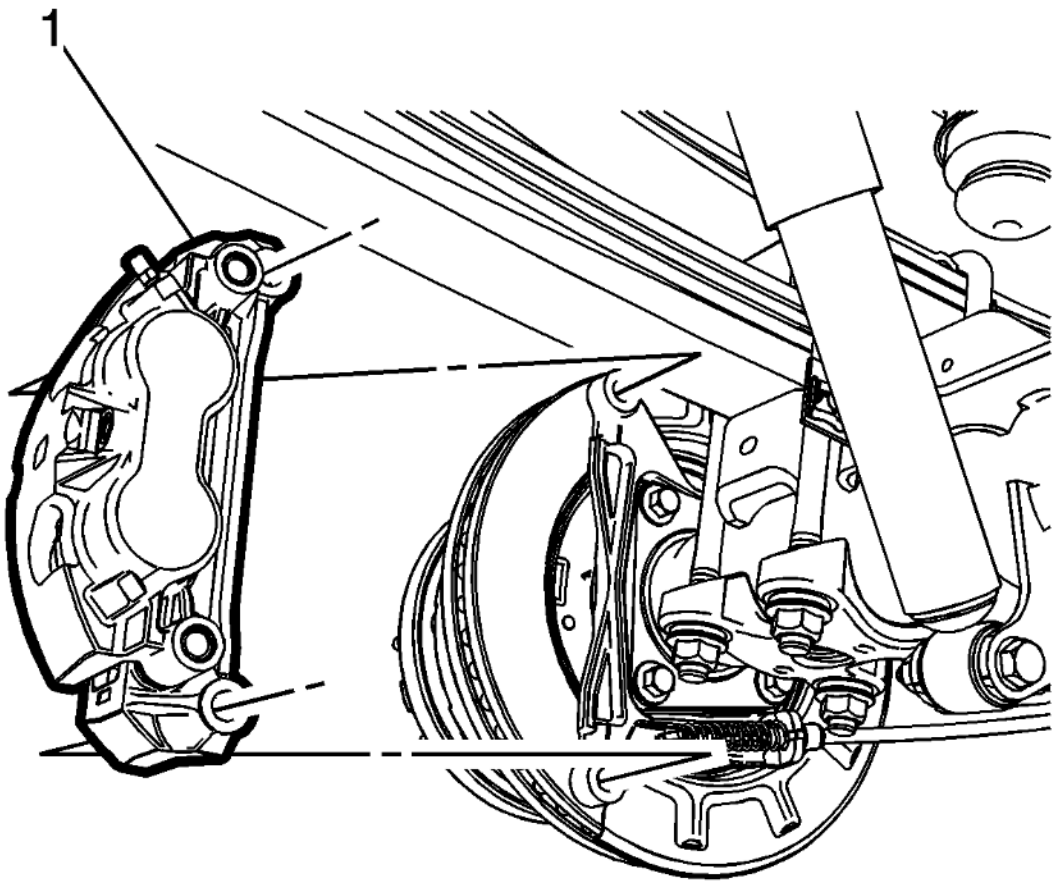


Fig. 86: Brake Caliper And Bracket Assembly
Courtesy of GENERAL MOTORS COMPANY

11. Remove the brake caliper and bracket assembly (1).
12. Remove the rear disc brake pads. Refer to **Rear Disc Brake Pads Replacement (J95)**.
13. Inspect the brake caliper mounting and hardware for damage and wear. Refer to **Rear Disc Brake Mounting and Hardware Inspection**.

Installation Procedure

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1. Apply a light coat of high temperature silicone brake lubricant to the brake caliper guide pins and guide pin bores.
2. Inspect the brake caliper seals, boots, and guide pin bushing and replace if damaged or missing.

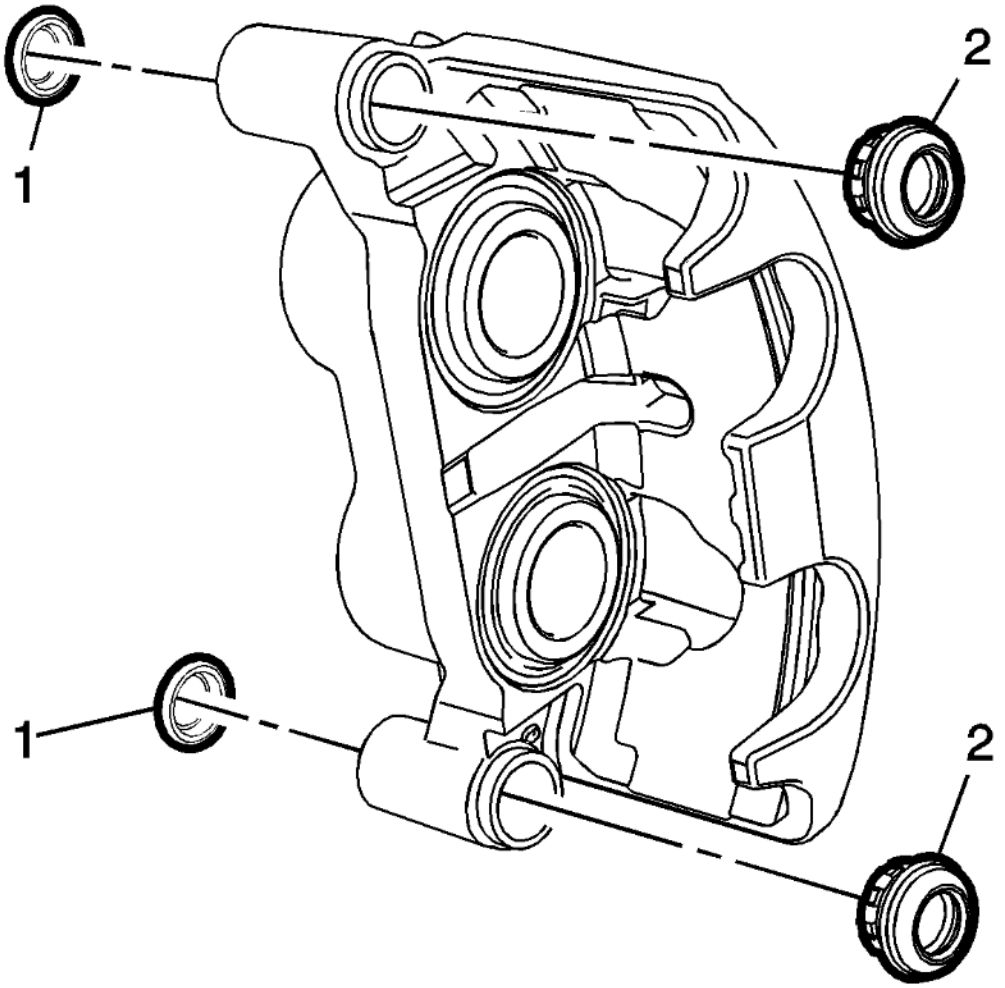


Fig. 87: Brake Caliper Guide Pin Seals
Courtesy of GENERAL MOTORS COMPANY

3. Install the disc brake calliper guide pin seals (1) and boots (2).
4. Ensure the brake caliper guide pin seals and boots are fully seated in the grooves of the brake caliper housing.

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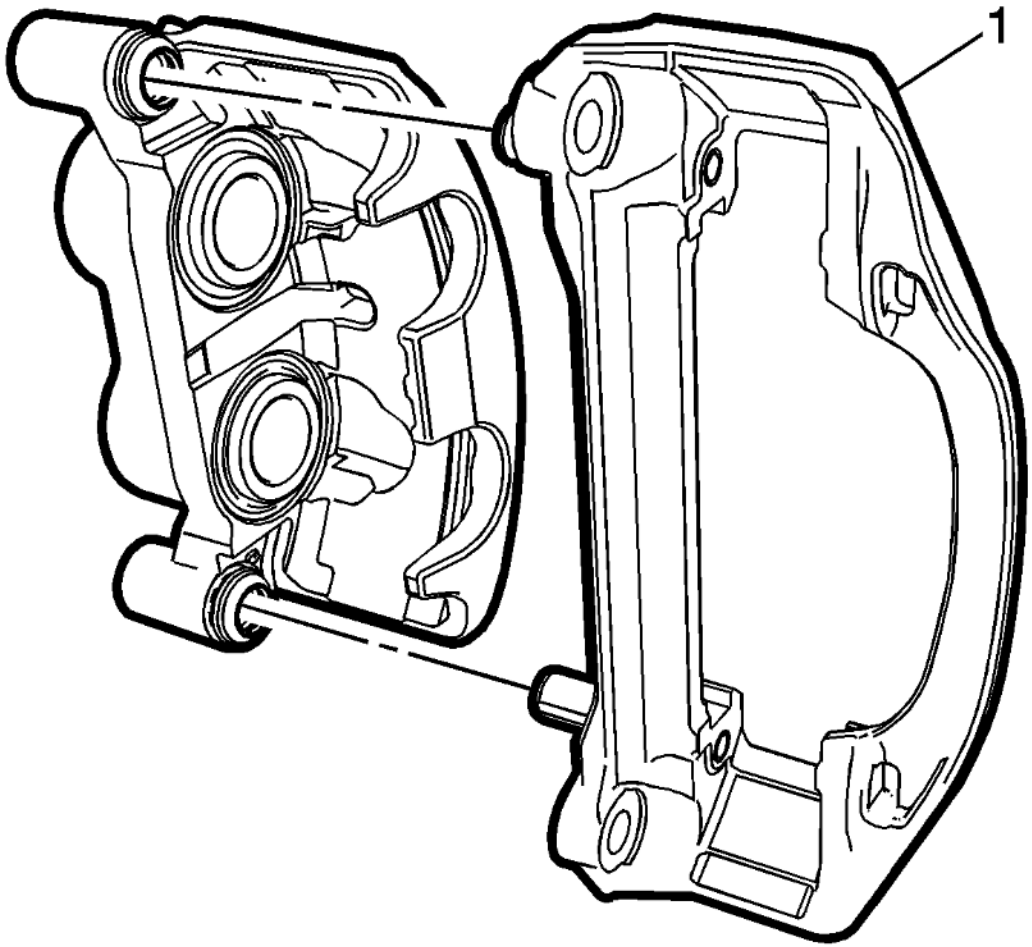


Fig. 88: Identifying Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

5. Install the brake caliper bracket (1) to the disc brake caliper.
6. Ensure the brake caliper guide pin boots are fully seated in the groove of the brake caliper bracket.
7. Install the rear disc brake pads. Refer to **Rear Disc Brake Pads Replacement (J95)**.
8. Prepare the brake caliper bracket bolts and the rear axle threaded holes for assembly.

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- Thoroughly clean the brake caliper bracket bolts of any threadlocker residue.
- Thoroughly clean the rear axle threaded holes of any threadlocker residue with denatured alcohol and allow to dry.

9. Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolt. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
10. Allow the threadlocker to cure approximately 10 minutes before assembly.

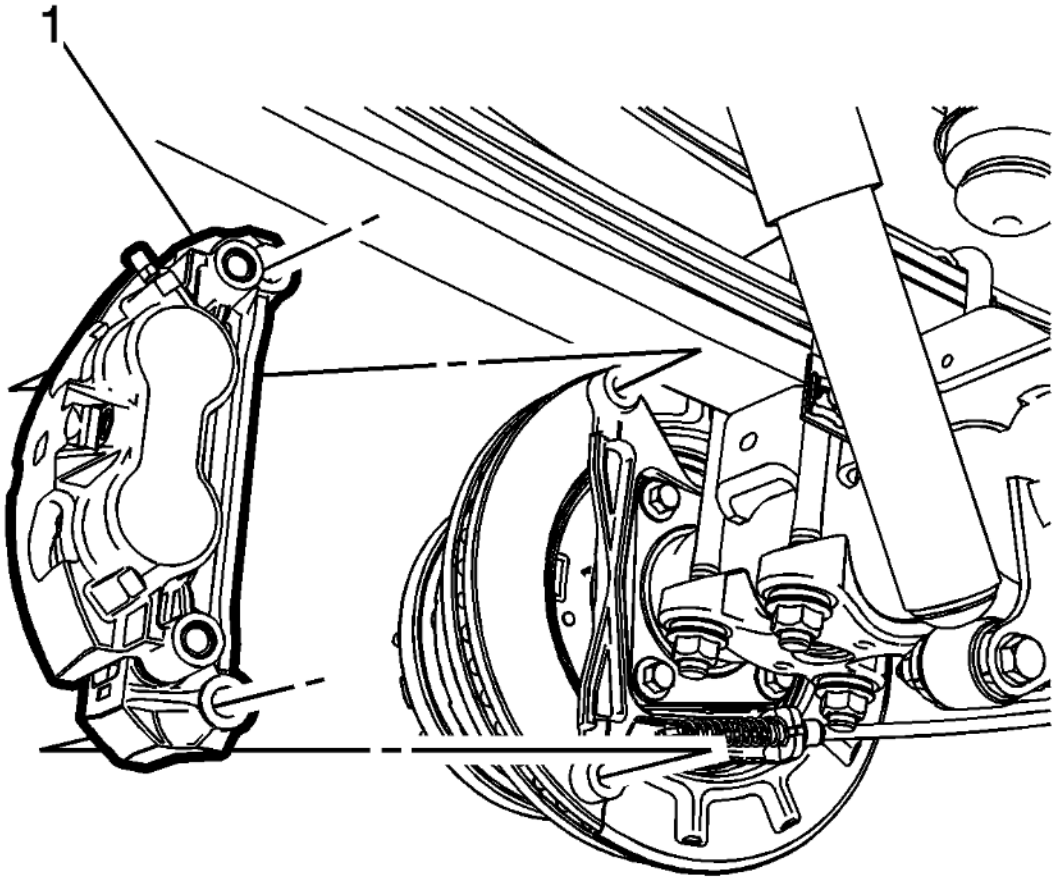


Fig. 89: Brake Caliper And Bracket Assembly
Courtesy of GENERAL MOTORS COMPANY

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11. Install the brake caliper and bracket assembly (1) to the rear axle.

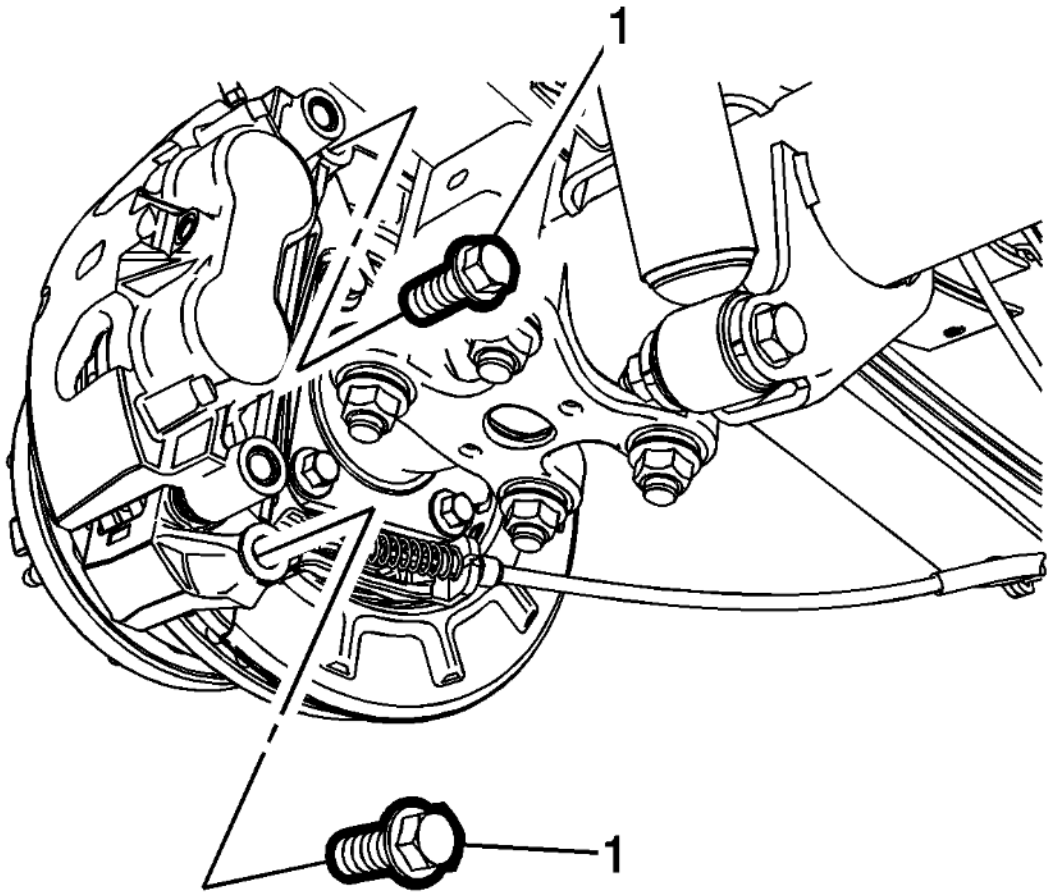


Fig. 90: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

12. Install the brake caliper bracket bolts (1) and tighten to 300 N.m (221 lb ft).

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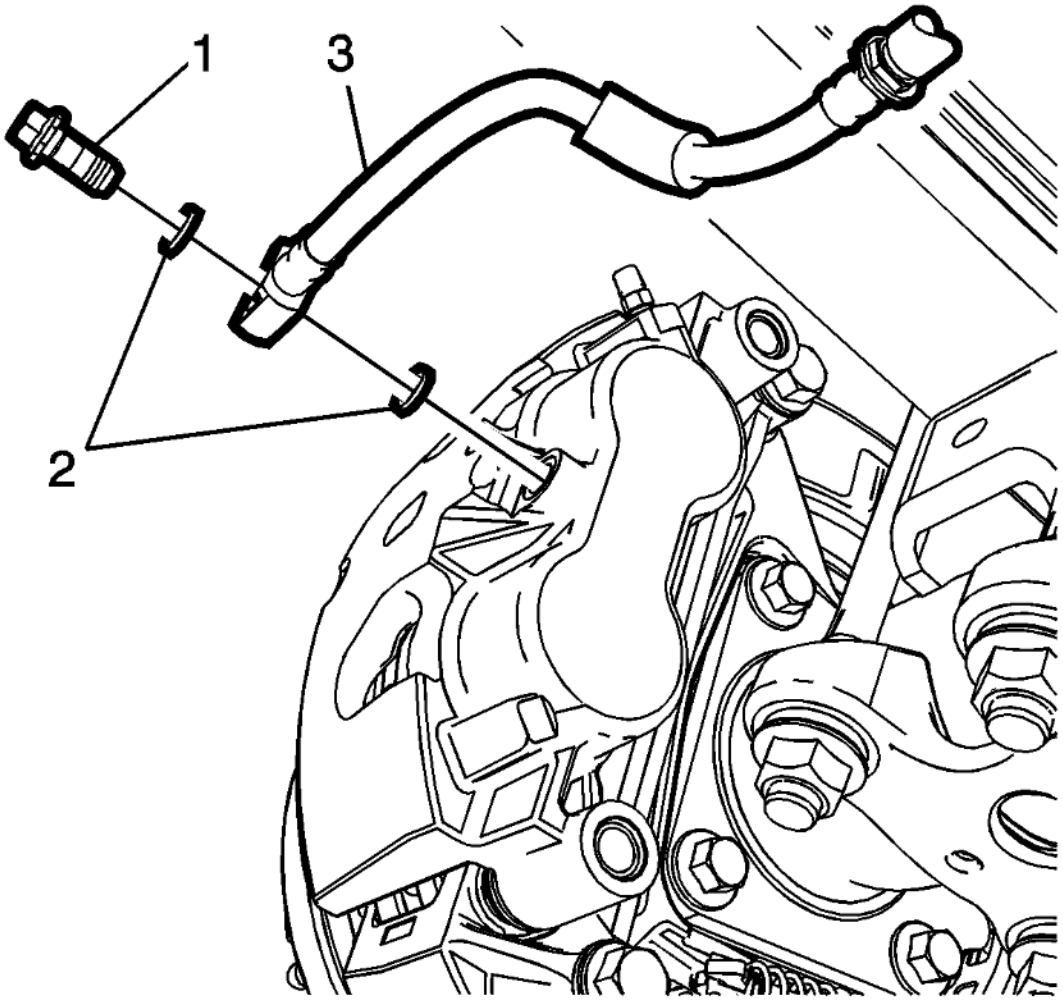


Fig. 91: Brake Hose Fitting, Gaskets And Bolts
Courtesy of GENERAL MOTORS COMPANY

13. Assemble the brake hose fitting bolt (1) and 2 new brake hose fitting gaskets (2) to the brake hose fitting (3).
14. Install the brake hose assembly to the caliper inlet and tighten the brake hose fitting bolt to 40 N.m (30 lb ft).
15. Bleed the hydraulic brake system. Refer to **Hydraulic Brake System Bleeding (Pressure)** **Hydraulic Brake System Bleeding (Manual)** .
16. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and**

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Installation (8-Lug Wheel) .

REAR BRAKE CALIPER GUIDE PIN REPLACEMENT (JD9)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

CAUTION: 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.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) .

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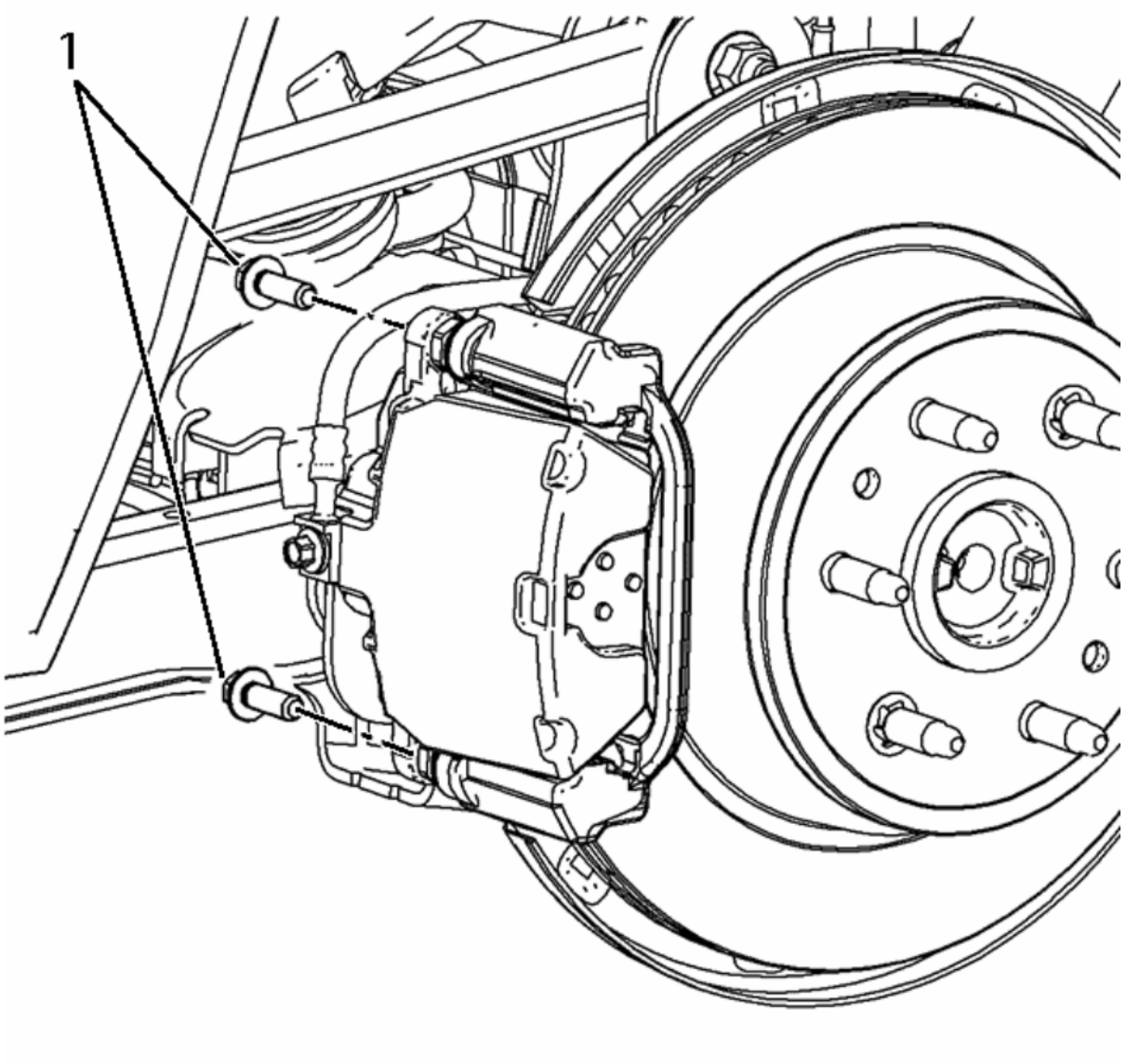


Fig. 92: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not allow the open end wrench to contact the brake caliper when removing or installing the brake caliper guide pin bolt. Allowing the open end wrench to contact the brake caliper will cause a pulsation when the brakes are applied.**

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3. Using a backup wrench on the brake caliper guide pins, remove the brake caliper guide pin bolts (1).
4. Remove the brake caliper and support with heavy mechanics wire or equivalent.

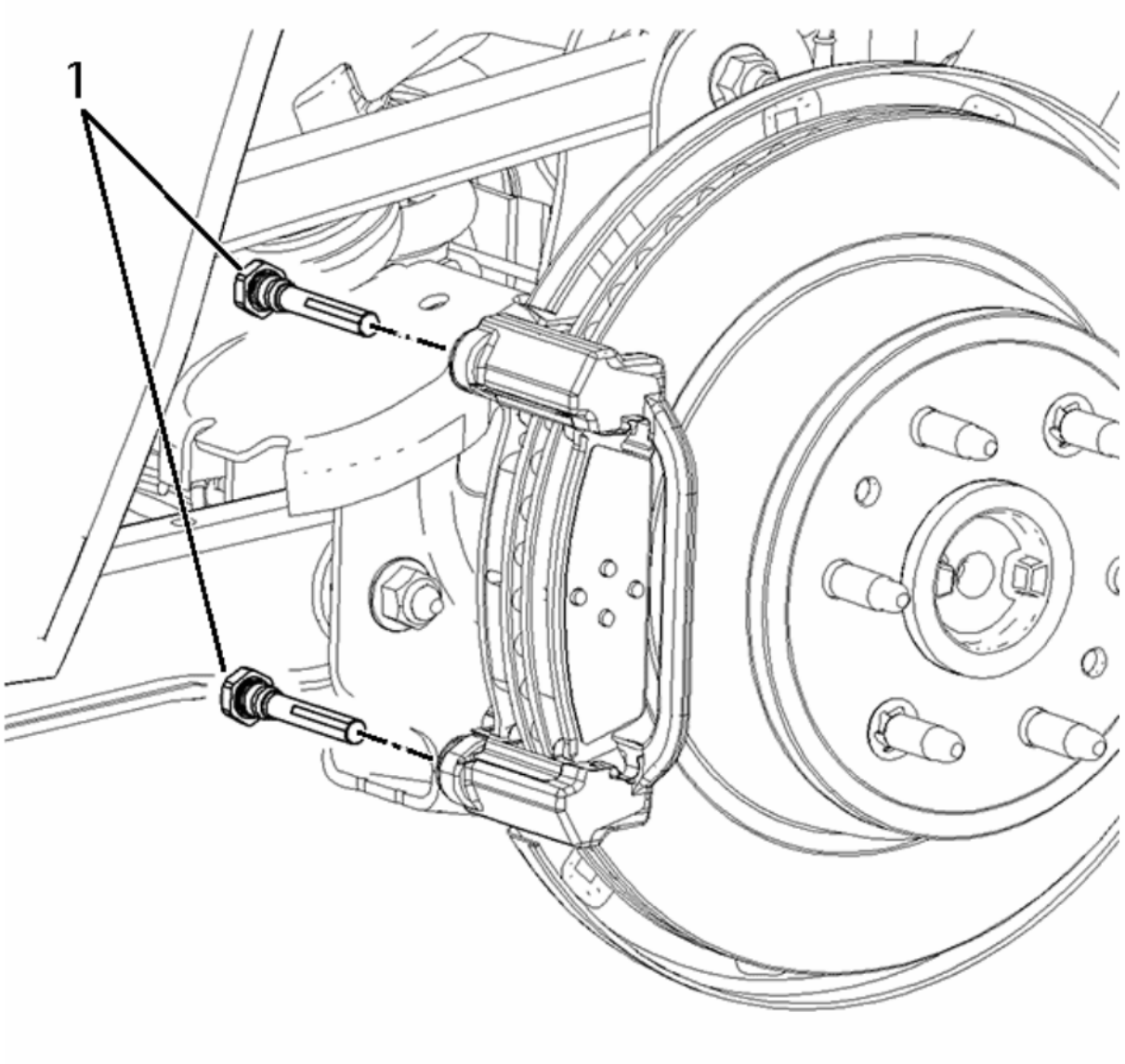


Fig. 93: Brake Caliper Guide Pins
Courtesy of GENERAL MOTORS COMPANY

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5. Remove the brake caliper guide pins (1).

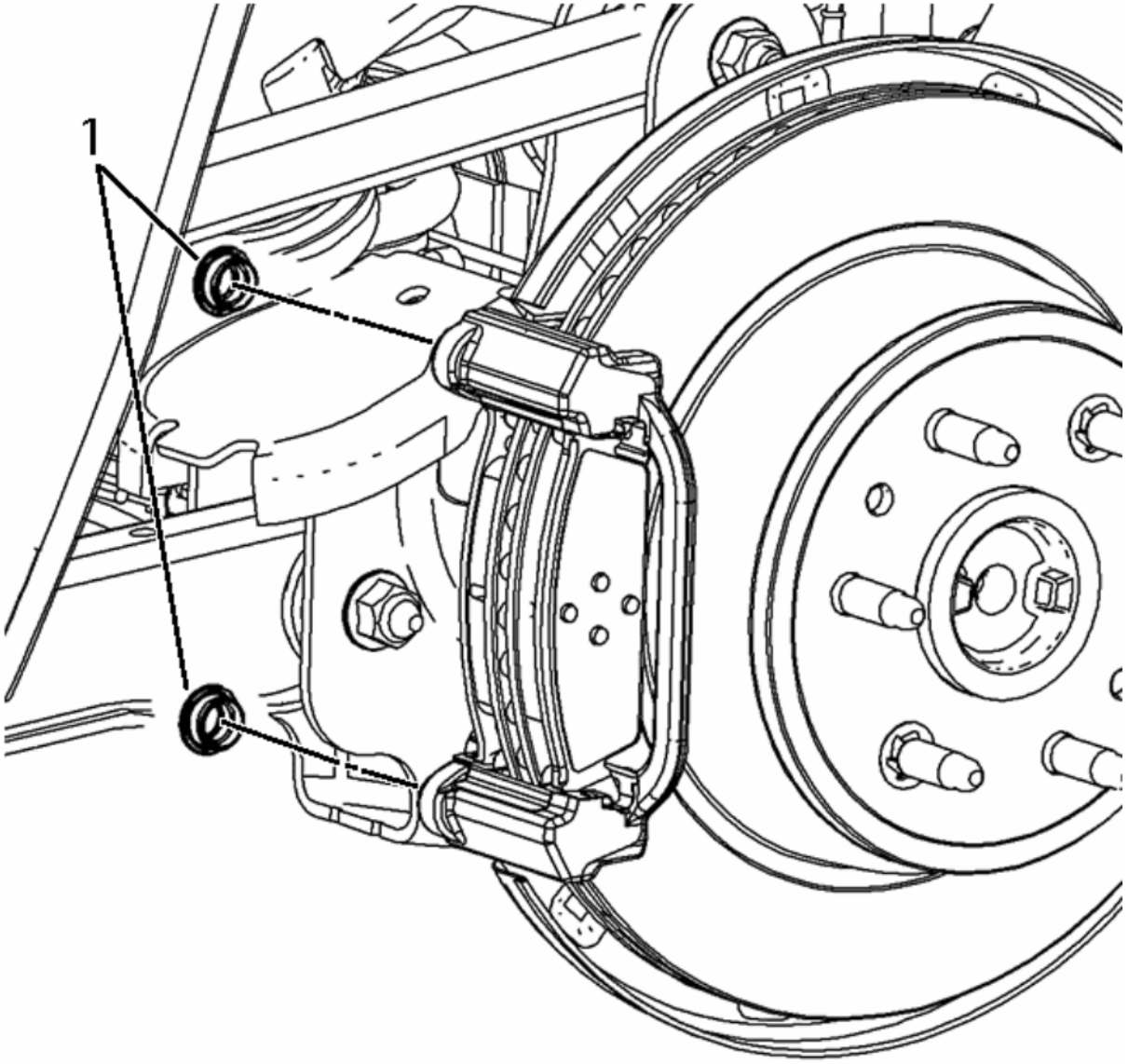


Fig. 94: Brake Caliper Guide Pin Seals
Courtesy of GENERAL MOTORS COMPANY

6. Remove the brake caliper guide pin seals (1).

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Installation Procedure

1. Inspect the brake caliper guide pins and seals for damage and/or corrosion. Refer to **Rear Disc Brake Mounting and Hardware Inspection**.

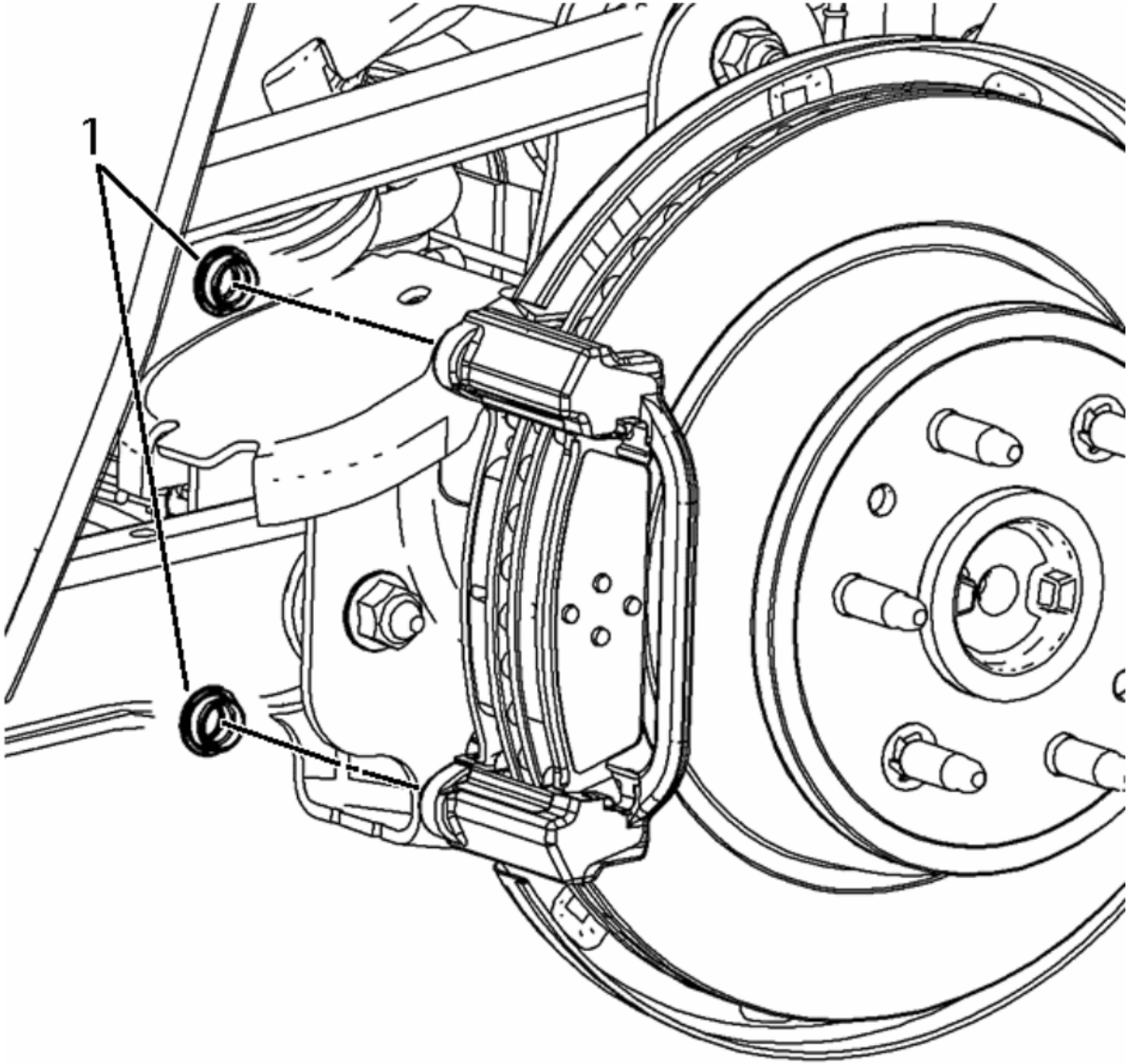


Fig. 95: Brake Caliper Guide Pin Seals
Courtesy of GENERAL MOTORS COMPANY

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2. Install the brake caliper guide pin seals (1).

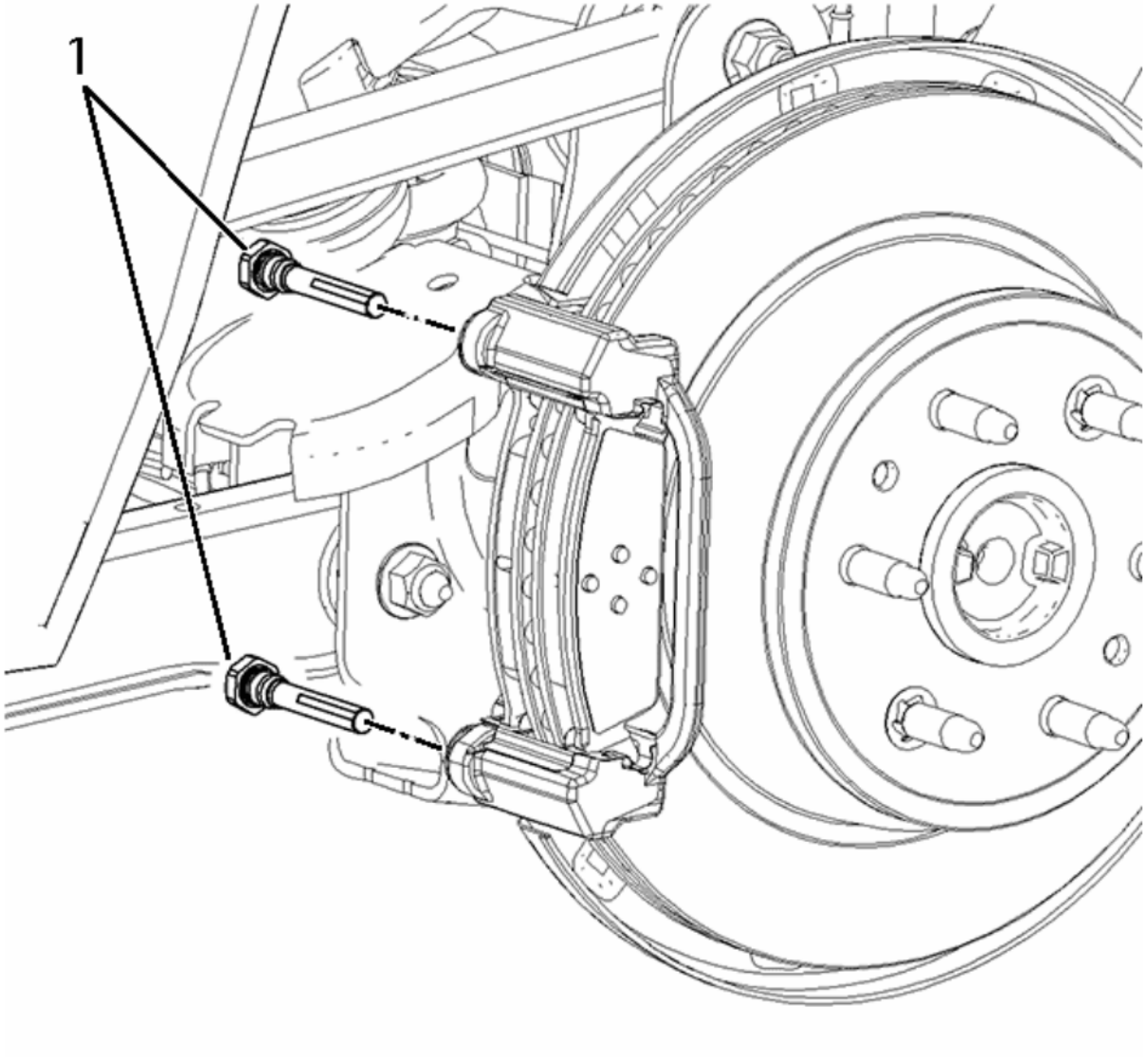


Fig. 96: Brake Caliper Guide Pins
Courtesy of GENERAL MOTORS COMPANY

3. Apply a thin coat of high temperature silicone brake lubricant the brake caliper guide pins.

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4. Install the brake caliper guide pins (1) to the brake caliper bracket and guide pin seals.
5. Ensure the guide pin seal is fully seated in the groove of the brake caliper guide pin.

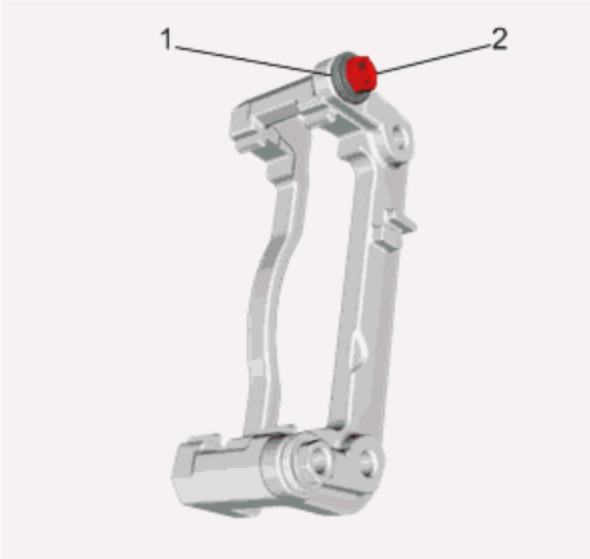


Fig. 97: Upper Guide Pin Seal And Guide Pin Seal
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Excess brake lubricant and trapped air must be expelled from the brake caliper guide pin bore to allow full caliper movement and prevent premature brake pad wear.**

6. Gently pull the edge of the upper guide pin seal (1) away from the brake caliper guide pin (2) while simultaneously pushing the brake caliper guide pin into the brake caliper bracket to expel any trapped air and excess brake lubricant.
7. Repeat step 6 for the lower guide pin seal and brake caliper guide pin.
8. With a clean shop towel, clean any excess brake lubricant from the guide pin seal and brake caliper guide pin.
9. Install the brake caliper to the caliper bracket.

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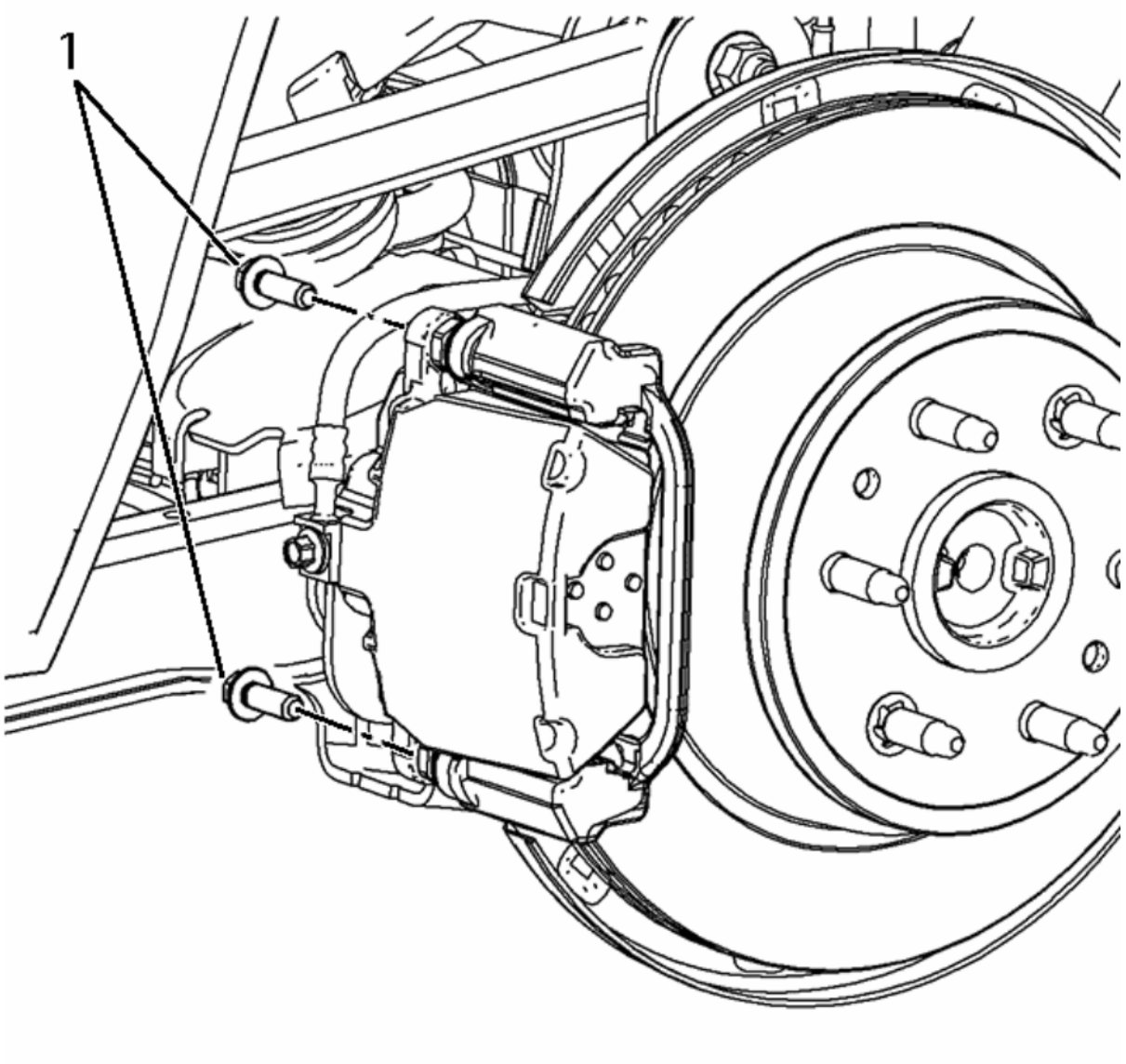


Fig. 98: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

10. Using a backup wrench on the brake caliper guide pins, install the brake caliper guide pin bolts (1) and tighten to 52 N.m (38 lb ft).

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11. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

REAR BRAKE CALIPER GUIDE PIN REPLACEMENT (J95)

Removal Procedure

WARNING: **Brake Dust Warning**

1. Remove Rear Brake Caliper Bracket **Rear Brake Caliper Bracket Replacement (J95)**

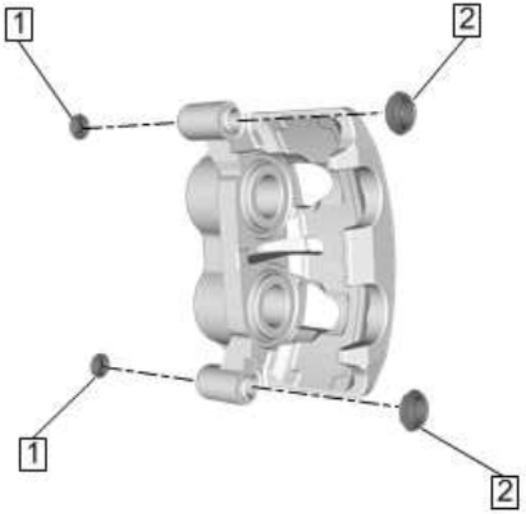


Fig. 99: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

2. Remove Seal (1)
3. Remove Boot (2)

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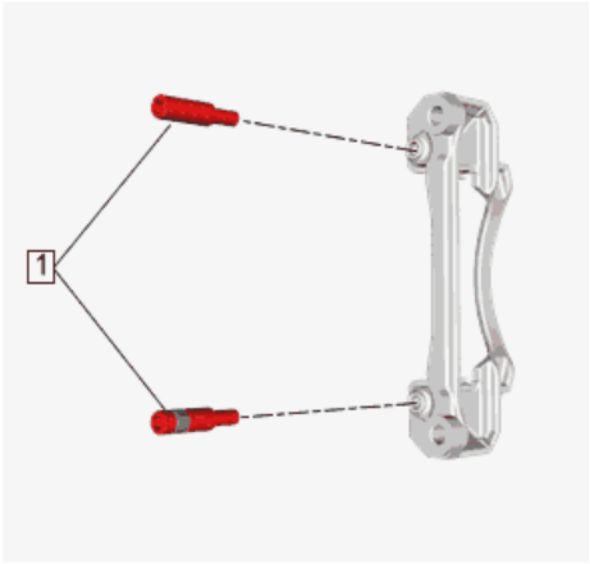
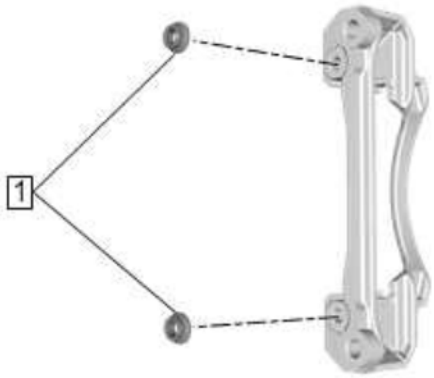


Fig. 100: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

4. Remove Brake Caliper Guide Pin (1)



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Fig. 101: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

5. Remove Brake Caliper Guide Pin Collar (1)
6. Inspect the rear disc brake hardware for damage and replace, if necessary. **Rear Disc Brake Mounting and Hardware Inspection**

Installation Procedure

1. Prepare the brake caliper guide pin threads and the brake caliper bracket threaded holes for assembly:
   - Thoroughly clean the brake caliper guide pin threads of any threadlocker residue.
   - Thoroughly clean the brake caliper bracket guide pin threaded holes of any threadlocker residue with denatured alcohol and allow to dry.
2. Apply threadlocker to the threads of the brake caliper guide pins. **Adhesives, Fluids, Lubricants, and Sealers**

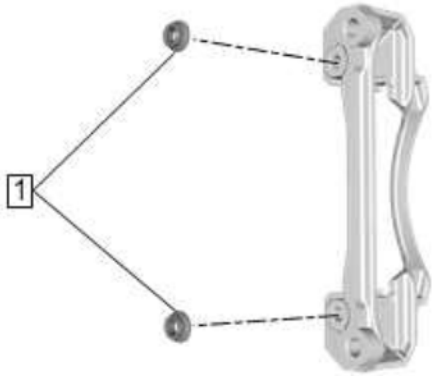


Fig. 102: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

3. Install Brake Caliper Guide Pin Collar (1).

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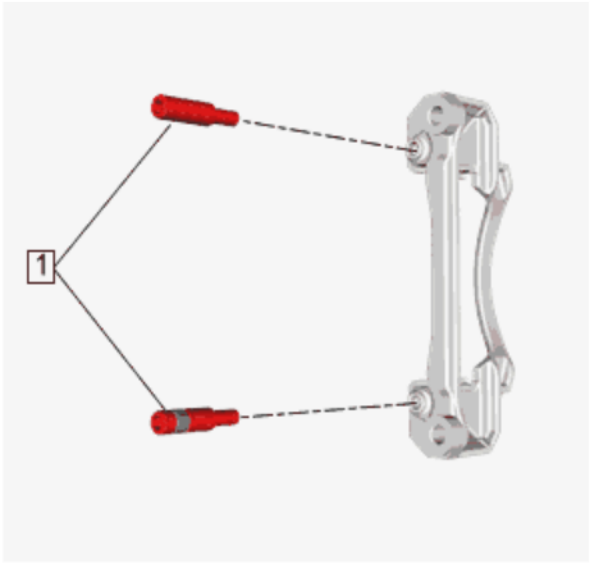


Fig. 103: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Fastener Caution**

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

4. Install Brake Caliper Guide Pin (1) and tighten 105 N.m (77 lb ft)

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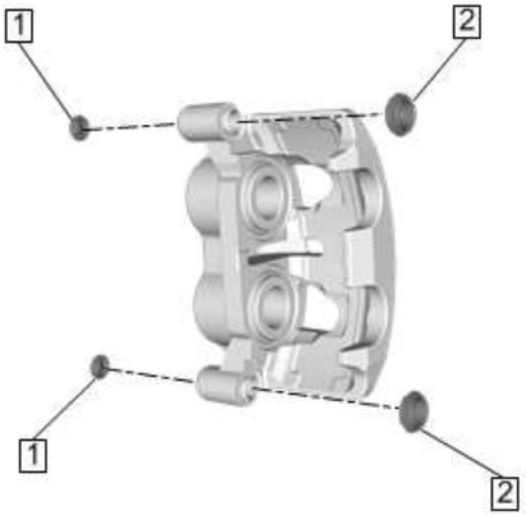


Fig. 104: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

5. Install Seal (1).
6. Install Boot (2).
7. Apply a light coating of commercially available, high temperature silicone brake lubricant to the brake caliper housing guide pin bores and guide pin surfaces:
    - Apply lubricant to the brake caliper guide pins.
    - Apply lubricant to the brake caliper guide pin seals.

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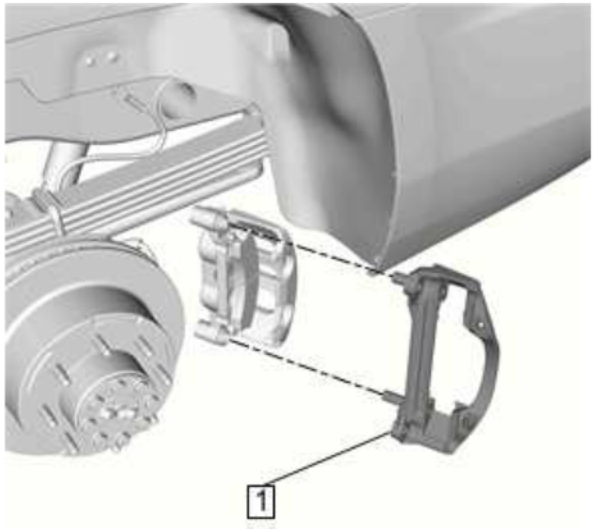


Fig. 105: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Install Brake Caliper Bracket (1)
9. Ensure the disc brake caliper guide pin seals are fully seated in the grooves of the disc brake caliper housing.
10. Install Rear Brake Caliper Bracket.**Rear Brake Caliper Bracket Replacement (J95)**

FRONT BRAKE CALIPER OVERHAUL (J95)

Disassembly Procedure

WARNING: Refer to Brake Dust Warning .

WARNING: Refer to Brake Fluid Irritant Warning .

NOTE: Replace all the components included in the repair kits used to overhaul the brake caliper.

1. Remove the brake caliper. Refer to **Front Brake Caliper Replacement (J95)**.
2. Place a wood block between the brake caliper pistons and the brake caliper housing bridge.

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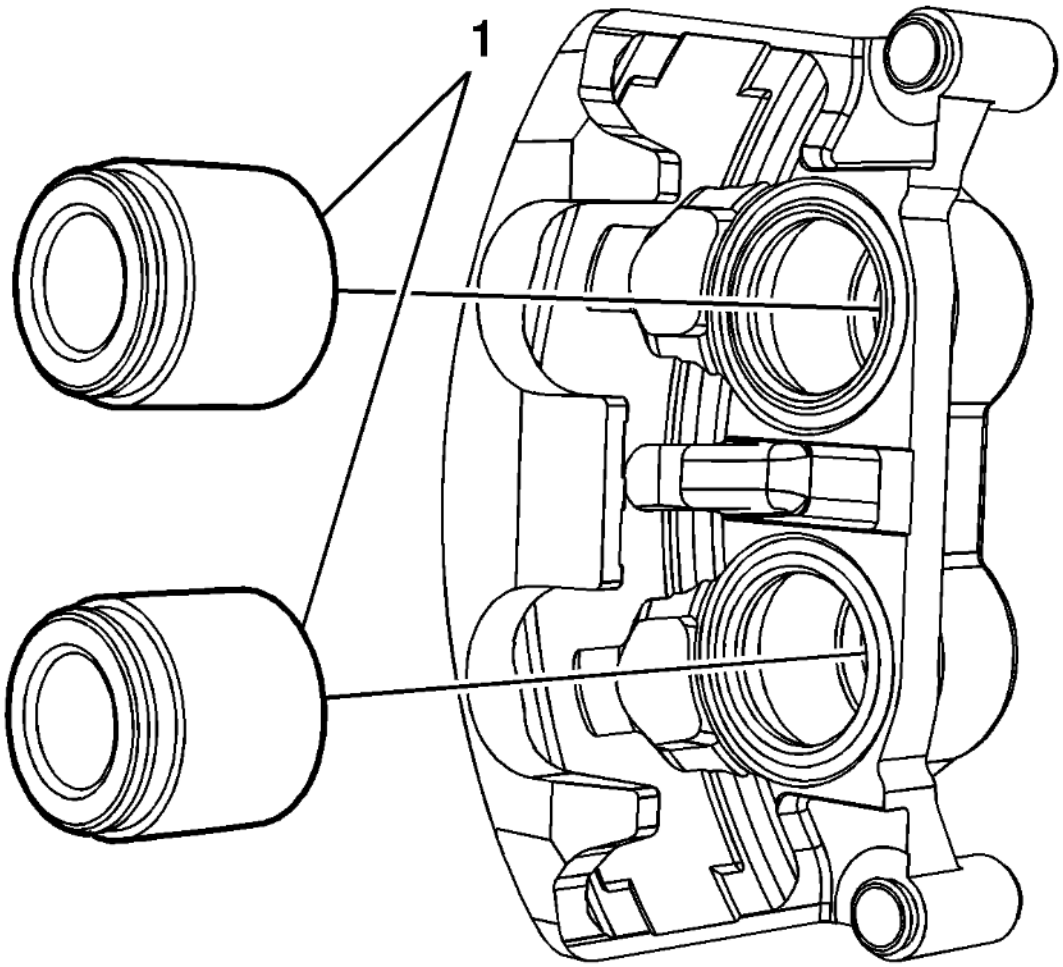


Fig. 106: Identifying Brake Caliper Pistons
Courtesy of GENERAL MOTORS COMPANY

WARNING: Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.

3. Place a clean shop towel between the brake caliper pistons and the block of wood.
4. Apply compressed air through the brake hose fitting inlet port and remove the brake caliper pistons (1).

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5. Remove the brake caliper bleeder screw.

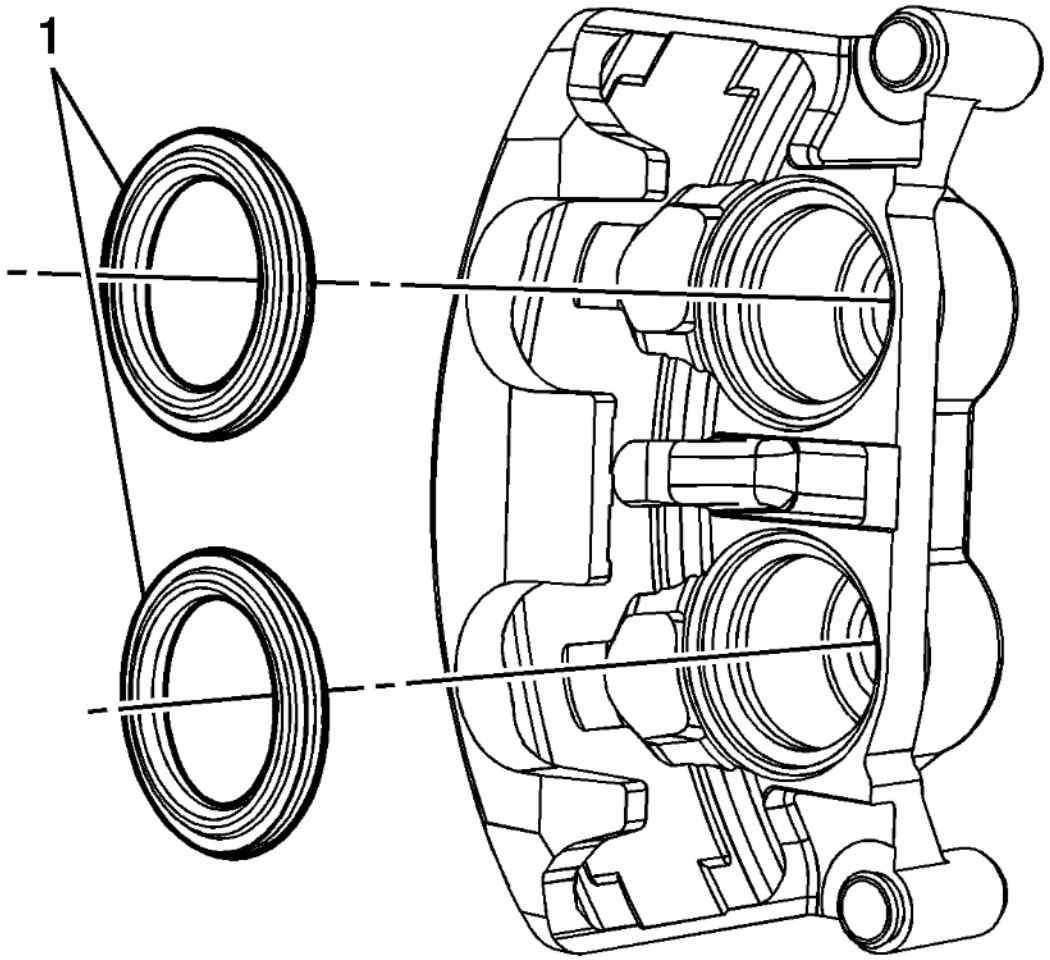


Fig. 107: Identifying Brake Caliper Piston Dust Seals
Courtesy of GENERAL MOTORS COMPANY

6. Using a blunt wooden or plastic tool, remove the brake caliper piston dust boot seals (1).

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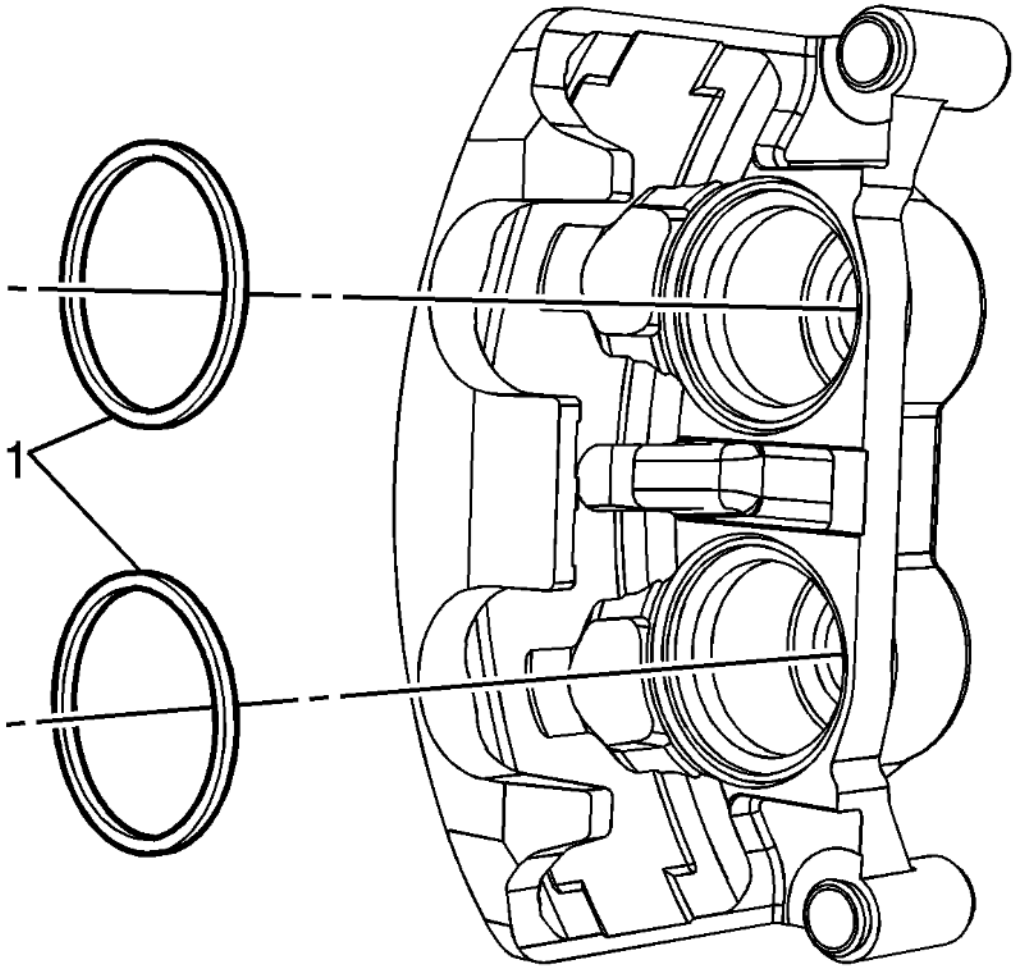


Fig. 108: Identifying Brake Caliper Piston Seals
Courtesy of GENERAL MOTORS COMPANY

7. Using a blunt wooden or plastic tool, remove the brake caliper piston seals (1).
8. Inspect the brake caliper bores for corrosion, grooves, and scoring.
    - Inspect the caliper piston bores
    - Inspect the caliper piston seal grooves

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If excessive corrosion, grooving, or scoring is found, replace the brake caliper.

9. Clean the brake caliper housing and any parts to be reused with denatured alcohol.
10. Dry all components with dry, filtered, non-lubricated compressed air.

Assembly Procedure

1. Apply a light coating of GM approved brake fluid from a clean, sealed brake fluid container to the brake caliper components:
    - Brake caliper piston bores
    - Brake caliper pistons
    - Brake caliper piston seals

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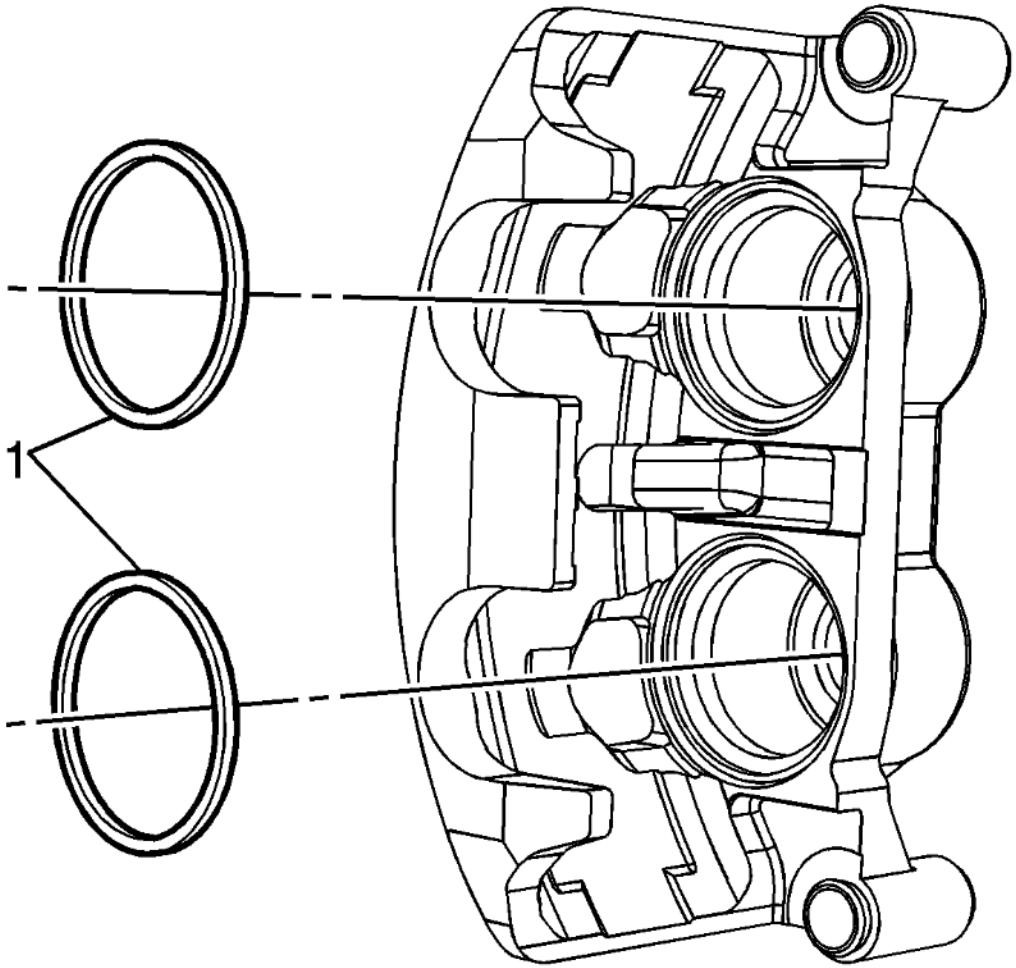


Fig. 109: Identifying Brake Caliper Piston Seals
Courtesy of GENERAL MOTORS COMPANY

2. Install the brake caliper piston seals (1) into the brake caliper piston bores.

   Ensure the brake caliper piston seals are fully seated in the groove of the caliper piston bores and are not distorted.

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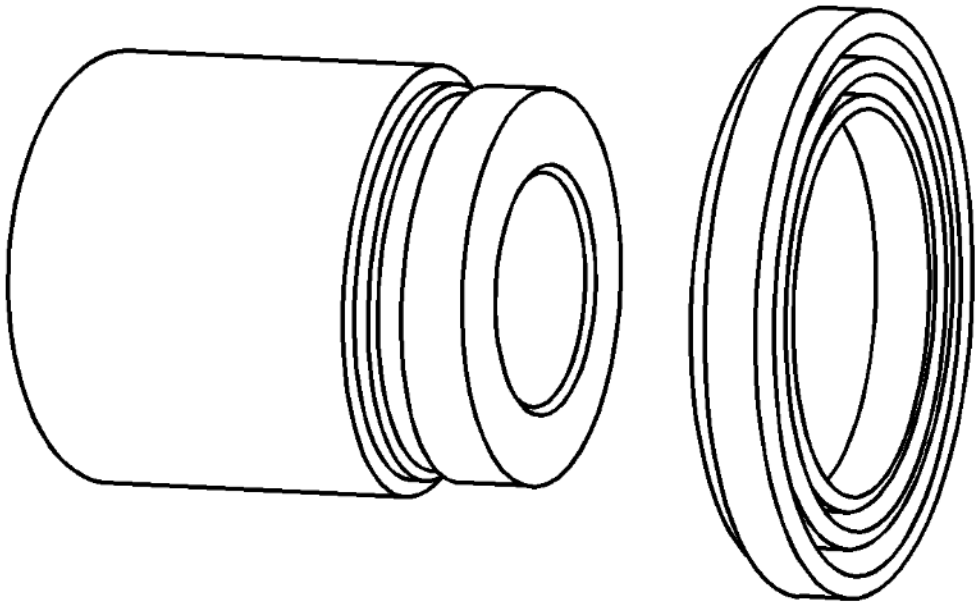


Fig. 110: View Of Piston Dust Seal
Courtesy of GENERAL MOTORS COMPANY

3. Install the brake caliper piston dust boot seal over the end of the piston so that the fold will face toward the brake caliper housing piston bore opening.

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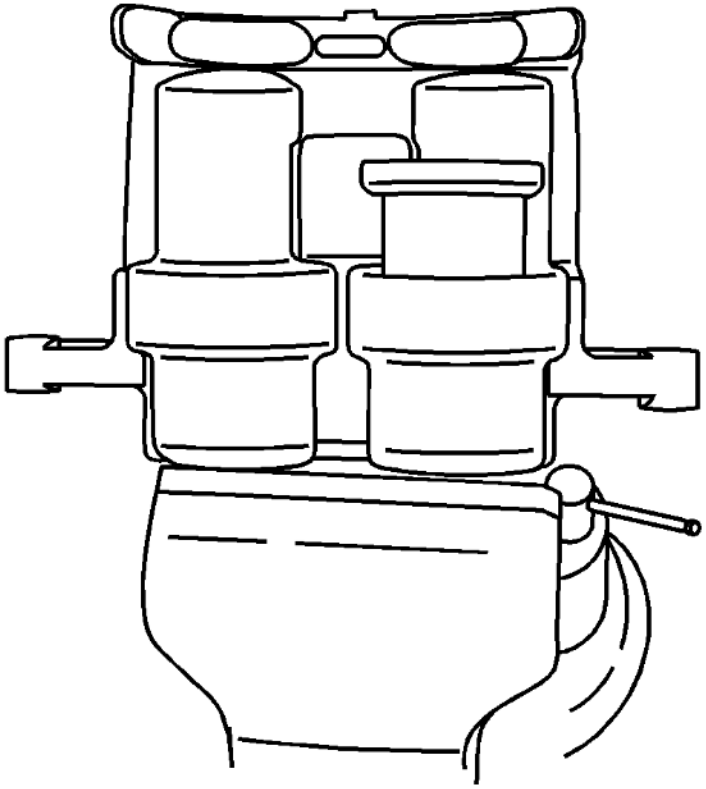


Fig. 111: Piston And Brake Caliper
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Position the piston in the bore so that it is straight and level.**

4. Position the piston to the brake caliper housing bore and seat the boot into the brake caliper housing bore.

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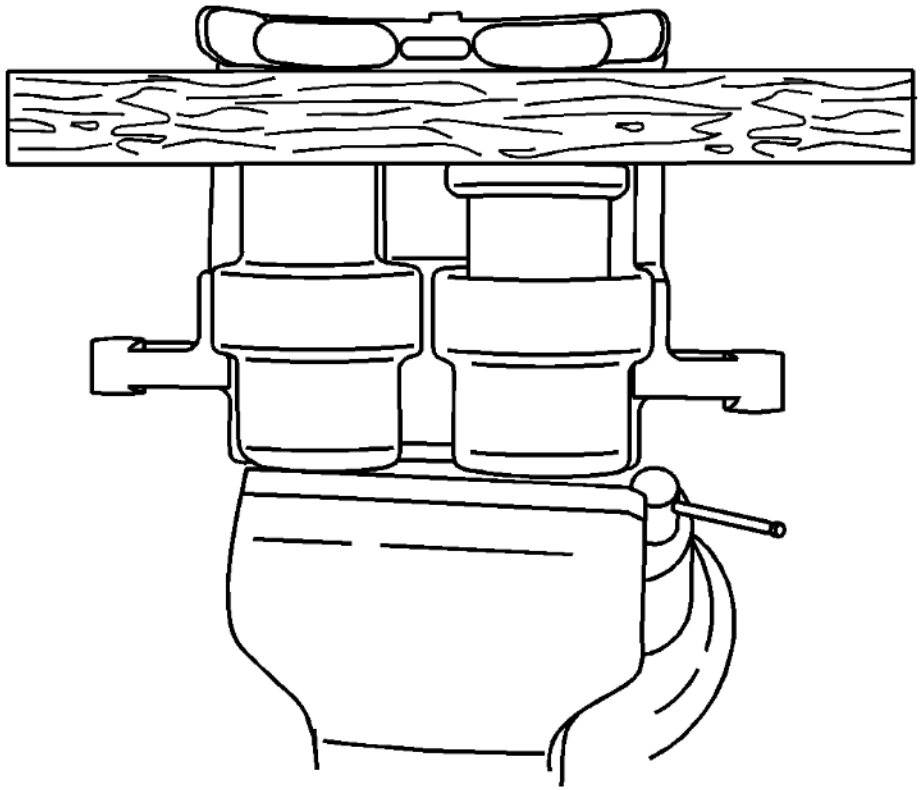


Fig. 112: Piston And Bore
Courtesy of GENERAL MOTORS COMPANY

5. Position a piece of wood across the piston to be installed.
6. Applying equal pressure by hand while pushing down, install the piston in the bore. Do not press on piston recess with any tool.
7. Remove the piece of wood.
8. Seat the edge of the brake caliper dust seals in the groove in the brake caliper piston.

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9. If necessary, carefully lift the edge of the brake caliper piston dust boot seals at the brake caliper piston to release any trapped air.

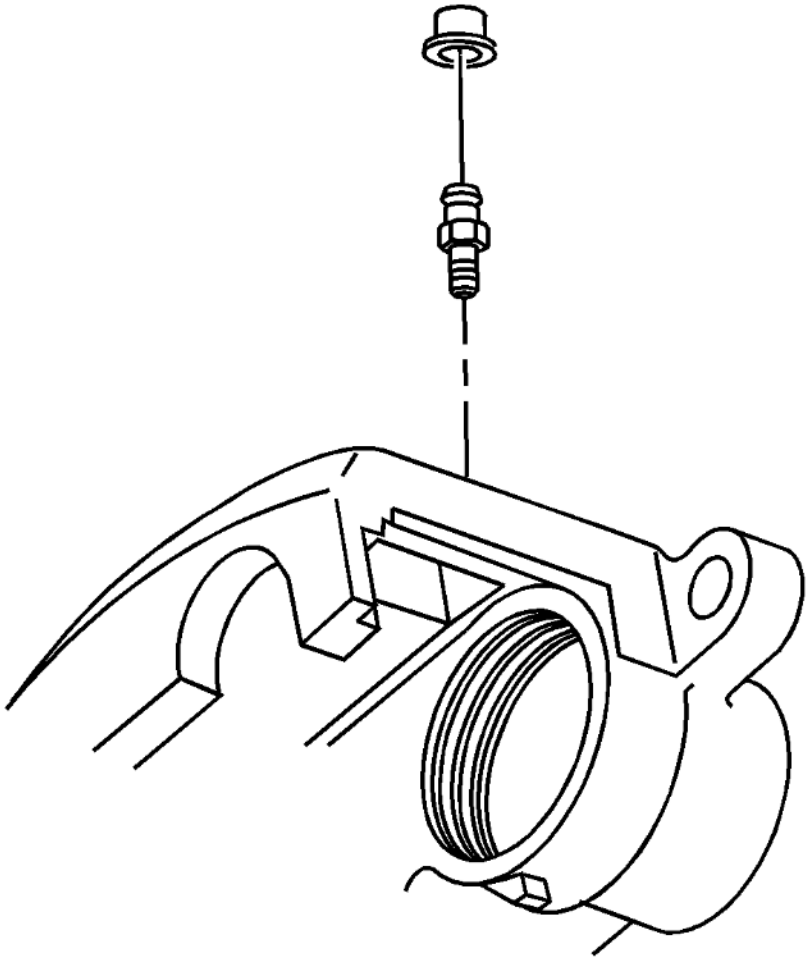


Fig. 113: View Of Bleeder Valve Cap
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

10. Install the bleeder valve in the brake caliper housing and tighten to 10 N.m (89 lb in).

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11. Install the bleeder valve cap.
12. Install the brake caliper. Refer to **Front Brake Caliper Replacement (J95)**.

FRONT BRAKE CALIPER OVERHAUL (JD9)

WARNING: **Refer to Brake Fluid Irritant Warning .**

CAUTION: **Refer to Brake Fluid Effects on Paint and Electrical Components Caution .**

Disassembly Procedure

WARNING: **Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.**

NOTE:

- **Replace all the components included in the repair kits used to service this brake caliper.**
- **Lubricate the rubber parts with GM approved brake fluid from a clean, sealed brake fluid container to make assembly easier.**
- **If any hydraulic component is removed or disconnected, it may be necessary to bleed all or part of the brake system.**
- **The torque values specified are for dry, non-lubricated fasteners.**
- **Perform the service operations on a clean bench, free from all mineral oil materials.**

1. Remove the brake caliper from the vehicle. Refer to **Front Brake Caliper Replacement (JD9)**.
2. Drain the brake fluid from the brake caliper.

CAUTION: **Use clean cloths to pad interior of caliper housing during piston removal. Use just enough air to ease the pistons out of the bores. If the pistons are blown out, even with the padding provided, it may be damaged.**

3. Place a 25 mm (1 in) block of wood between the caliper and the piston.
4. Install a large C-clamp over the body of the brake caliper with the C-clamp ends against the rear of the caliper body and against the block of wood.
5. Carefully remove the brake caliper piston by directing low pressure compressed air into the brake caliper inlet hole.
6. Remove the C-clamp from the caliper.

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7. Remove the block of wood from the caliper.
8. Install clean cloths to pad the interior of the caliper housing between the remaining caliper piston and the caliper body.
9. To cover the open caliper bore, place a 25 mm (1 in) block of wood between the caliper body and the brake caliper dust boot seal.
10. Install a large C-clamp over the body of the brake caliper with the C-clamp ends against the rear of the caliper body and against the block of wood.
11. Carefully remove the brake caliper piston by directing low pressure compressed air into the brake caliper inlet hole.
12. Remove the C-clamp form the caliper.
13. Remove the block of wood from the caliper.

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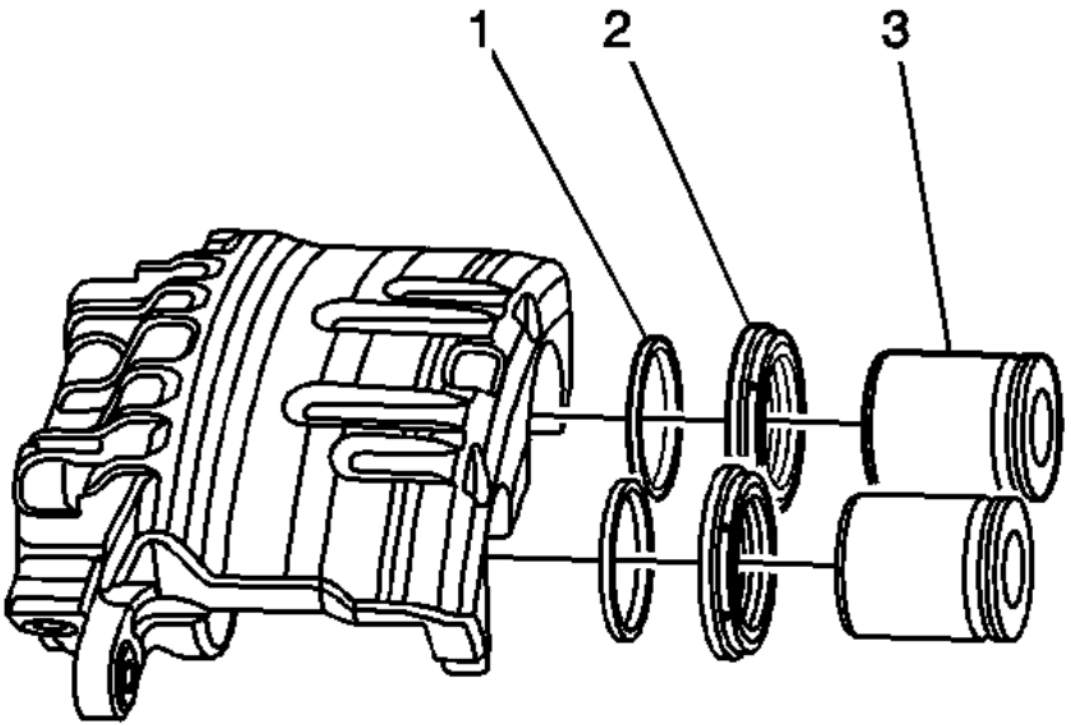


Fig. 114: View Of Piston Seals - Front
Courtesy of GENERAL MOTORS COMPANY

14. Remove the brake caliper piston dust boot seals (2) from the seal counter-bores in the brake caliper and discard the seals.
15. Using a small wooden or plastic tool, remove the brake caliper piston seals (1) from the brake caliper bores and discard the seals.

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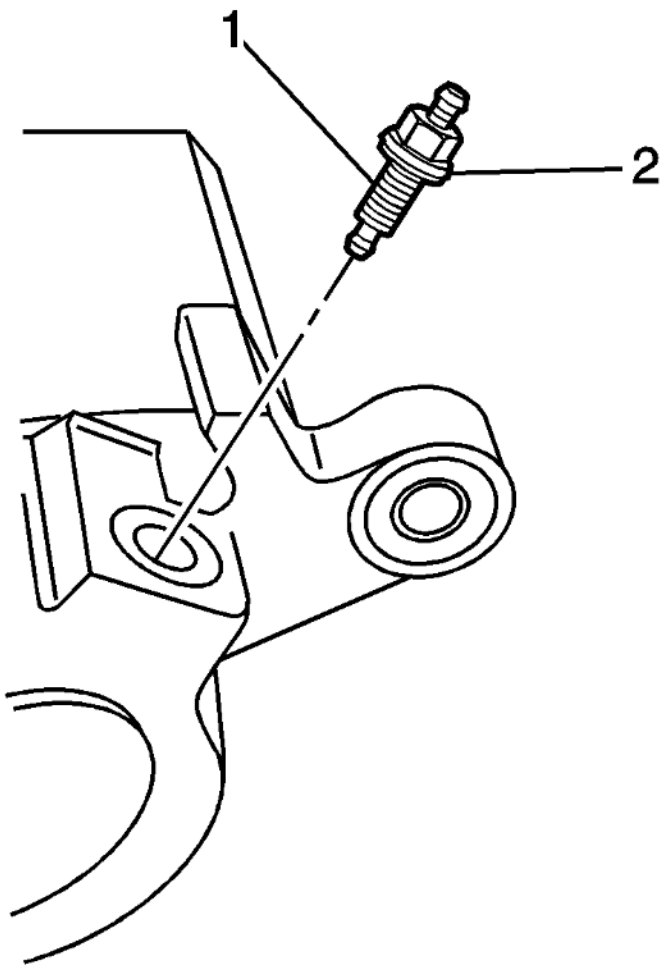


Fig. 115: View Of Brake Caliper Bleeder Valve
Courtesy of GENERAL MOTORS COMPANY

16. Remove the brake caliper bleeder valve cap.
17. Remove the brake caliper bleeder valve (1).

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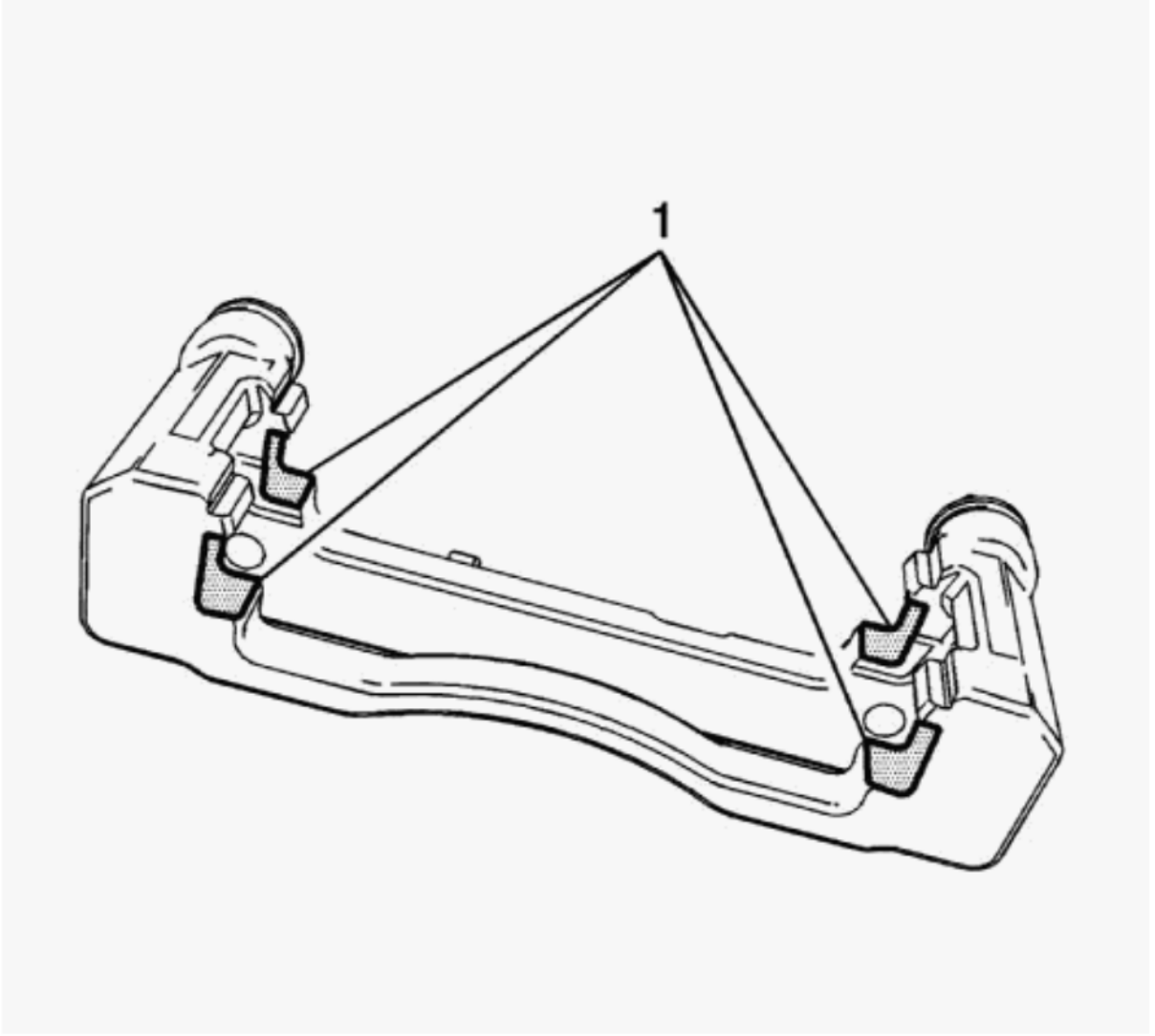


Fig. 116: Contact Surfaces And Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

18. Inspect the brake caliper bracket guide surfaces (1) for corrosion and wear.
19. Replace the brake caliper bracket if damaged or worn.
20. Clean the brake caliper piston bores and seal counter-bores with denatured alcohol, or equivalent.

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NOTE: **Do not use abrasives to clean the brake caliper pistons.**

21. Clean the brake caliper pistons with denatured alcohol, or equivalent.
22. Dry the caliper piston bores and counter-bores with non-lubricated, filtered air.
23. Dry the brake caliper pistons with non-lubricated, filtered air.
24. Inspect the caliper bores for cracks, scoring, pitting, excessive corrosion.
25. If light corrosion is present in the caliper bores, attempt to remove the imperfection with a fine emery paper. If the imperfection cannot be removed, replace the caliper assembly.
26. If cracks, scoring, pitting, and excessive corrosion are present in the caliper bores, replace the caliper assembly.
27. Inspect the caliper pistons for cracks, scoring, and/or damage. Replace the caliper pistons if any of these conditions exist.

Assembly Procedure

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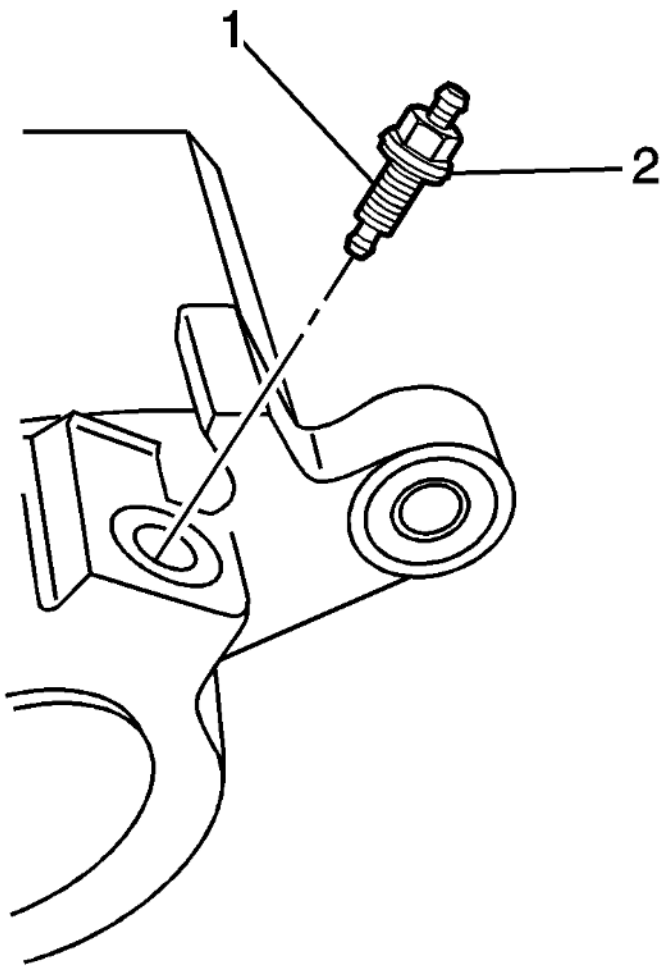


Fig. 117: View Of Brake Caliper Bleeder Valve
Courtesy of GENERAL MOTORS COMPANY

1. Install the valve stem seal (2) over the threaded end of the bleeder valve (1).

CAUTION: Refer to Fastener Caution .

2. Install the brake caliper bleeder valve (1) and tighten to 14 N.m (124 lb in).

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3. Install the brake caliper bleeder valve cap.

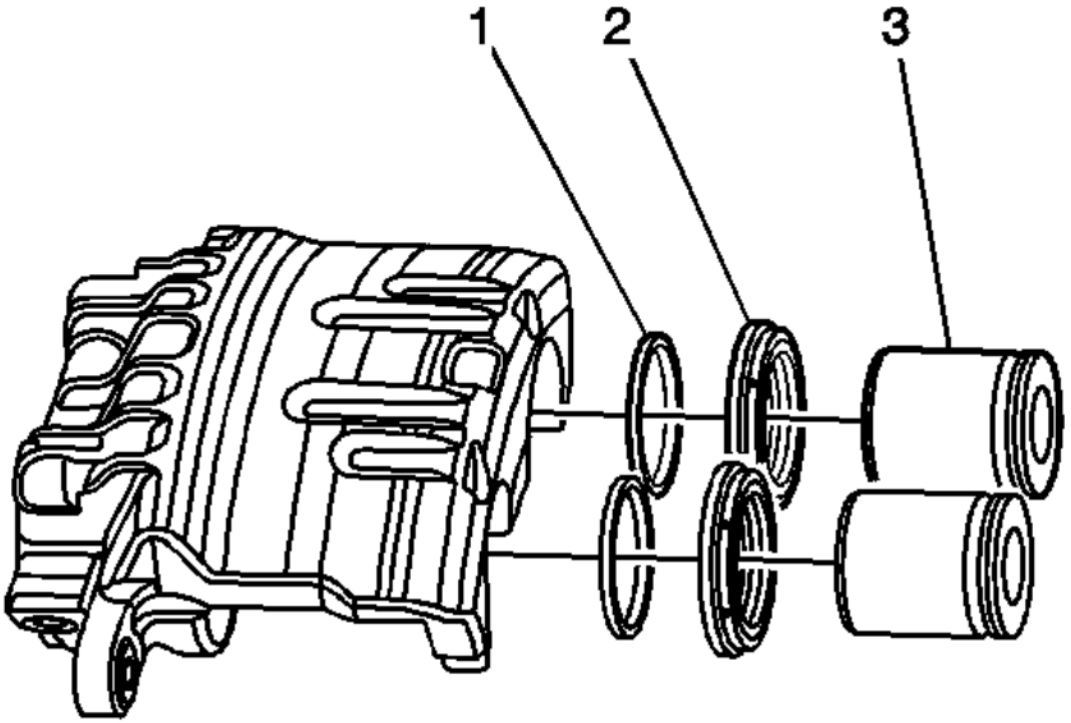


Fig. 118: View Of Piston Seals - Front
Courtesy of GENERAL MOTORS COMPANY

4. Lubricate the new brake caliper piston seals (1) with GM approved brake fluid from a clean, sealed brake fluid container.
5. Install lubricated brake caliper piston seals into the brake caliper bore seal grooves.
6. Make sure the seals are not twisted.

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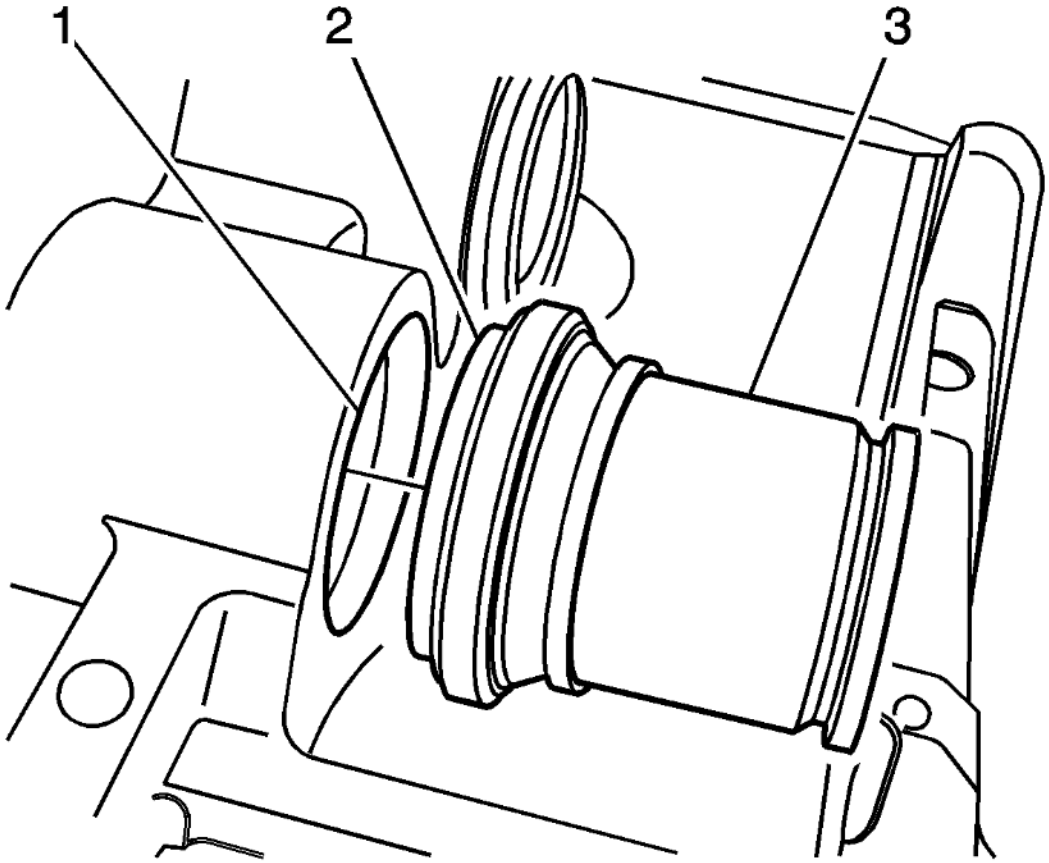


Fig. 119: View Of Piston & Dust Boot
Courtesy of GENERAL MOTORS COMPANY

7. Install the brake caliper piston dust boot seal (2) over the end of the piston (3) so that the fold will face toward the brake caliper housing piston bore opening.
8. Seat the brake caliper dust boot seal into the brake caliper bore groove (1) and slide the piston into the brake caliper bore.
9. Using your fingers, carefully push the piston to the bottom of the brake caliper bore.

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10. Ensure the brake caliper piston dust boot seal is properly seated into the piston groove and into the groove in the brake caliper bore.
11. Repeat steps 4 - 10 for the remaining piston.
12. Install the brake caliper to the vehicle. Refer to **Front Brake Caliper Replacement (JD9)**.

REAR BRAKE CALIPER OVERHAUL (J95)

Disassembly Procedure

WARNING: **Refer to Brake Dust Warning**

WARNING: **Refer to Brake Fluid Irritant Warning**

NOTE: **Replace all the components included in the repair kits used to overhaul the brake caliper.**

1. Remove the brake caliper. Refer to **Rear Brake Caliper Replacement (J95)**
2. Place a wood block between the brake caliper pistons and the brake caliper housing bridge.

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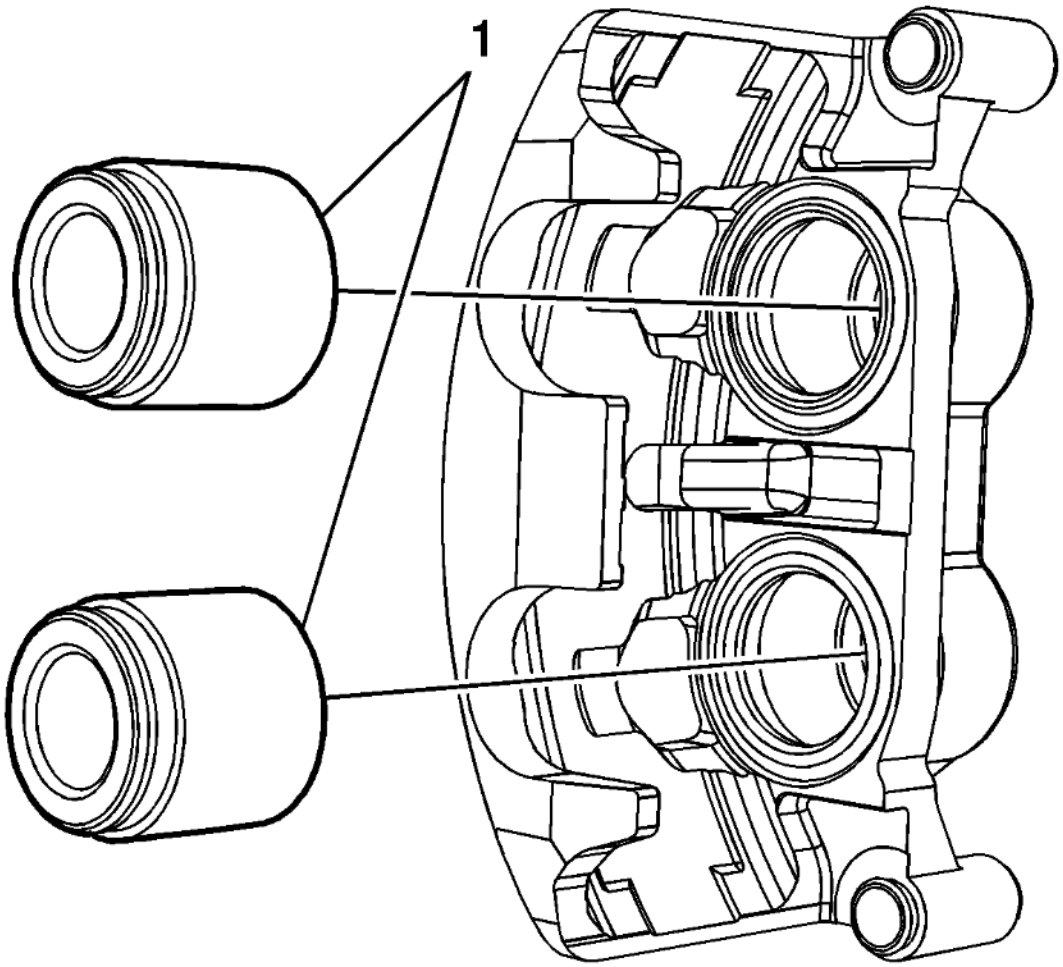


Fig. 120: Identifying Brake Caliper Pistons
Courtesy of GENERAL MOTORS COMPANY

WARNING: Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.

3. Place a clean shop towel between the brake caliper pistons and the block of wood.
4. Apply compressed air through the brake hose fitting inlet port and remove the brake caliper pistons (1).

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5. Remove the brake caliper bleeder.

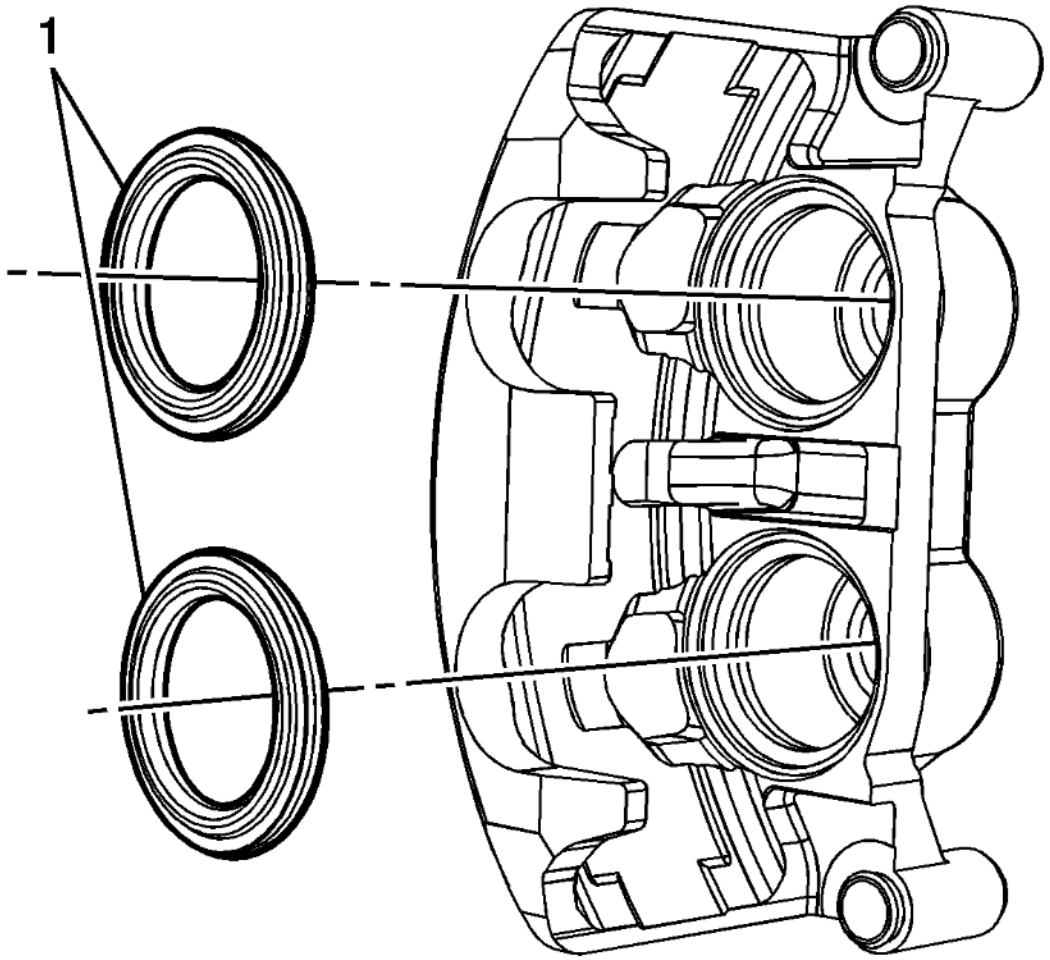


Fig. 121: Identifying Brake Caliper Piston Dust Seals
Courtesy of GENERAL MOTORS COMPANY

6. Using a blunt wooden or plastic tool, remove the brake caliper piston dust boot seals (1).

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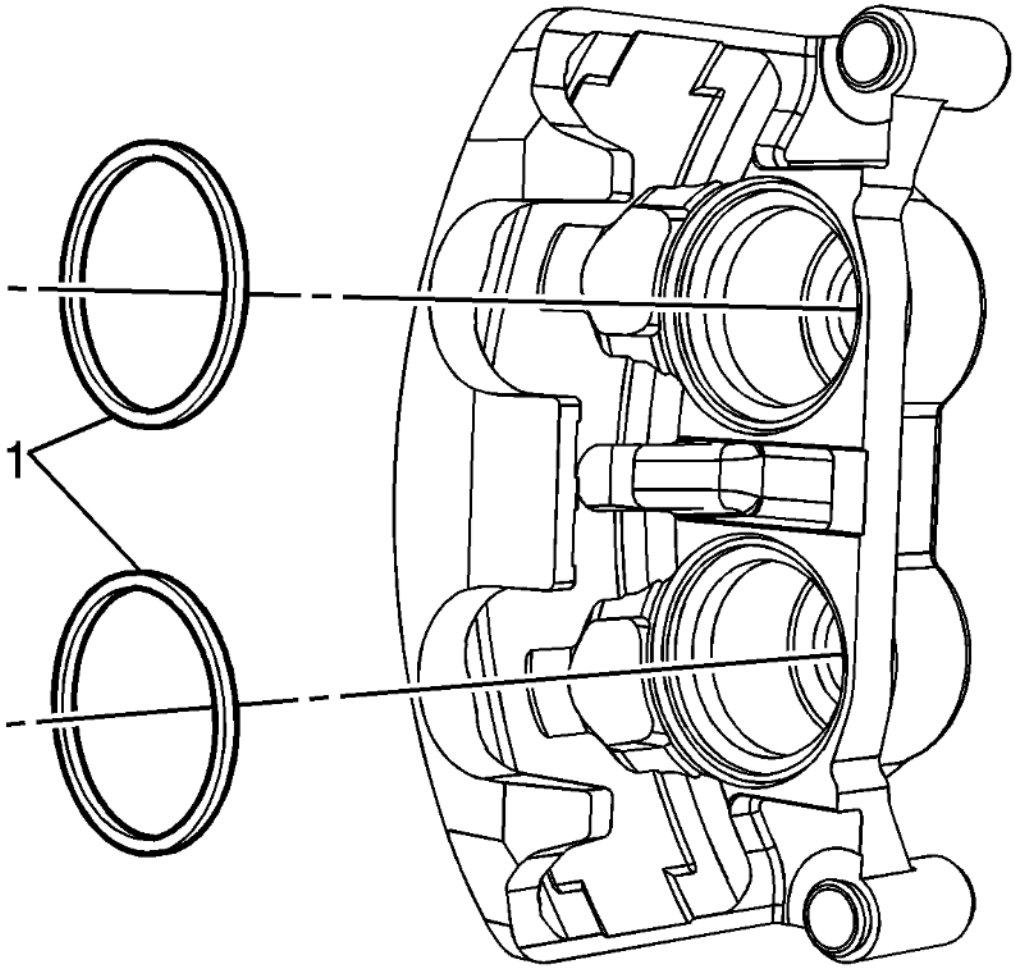


Fig. 122: Identifying Brake Caliper Piston Seals
Courtesy of GENERAL MOTORS COMPANY

7. Using a blunt wooden or plastic tool, remove the brake caliper piston seals (1).
8. Inspect the brake caliper bores for corrosion, grooves, and scoring.
    - Inspect the caliper piston bores
    - Inspect the caliper piston seal grooves

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If excessive corrosion, grooving, or scoring is found, replace the brake caliper.

9. Clean the brake caliper housing and any parts to be reused with denatured alcohol.
10. Dry all components with dry, filtered, non-lubricated compressed air.

Assembly Procedure

1. Apply a light coating of GM approved brake fluid from a clean, sealed brake fluid container to the brake caliper components:
    - Brake caliper piston bores
    - Brake caliper pistons
    - Brake caliper piston seals

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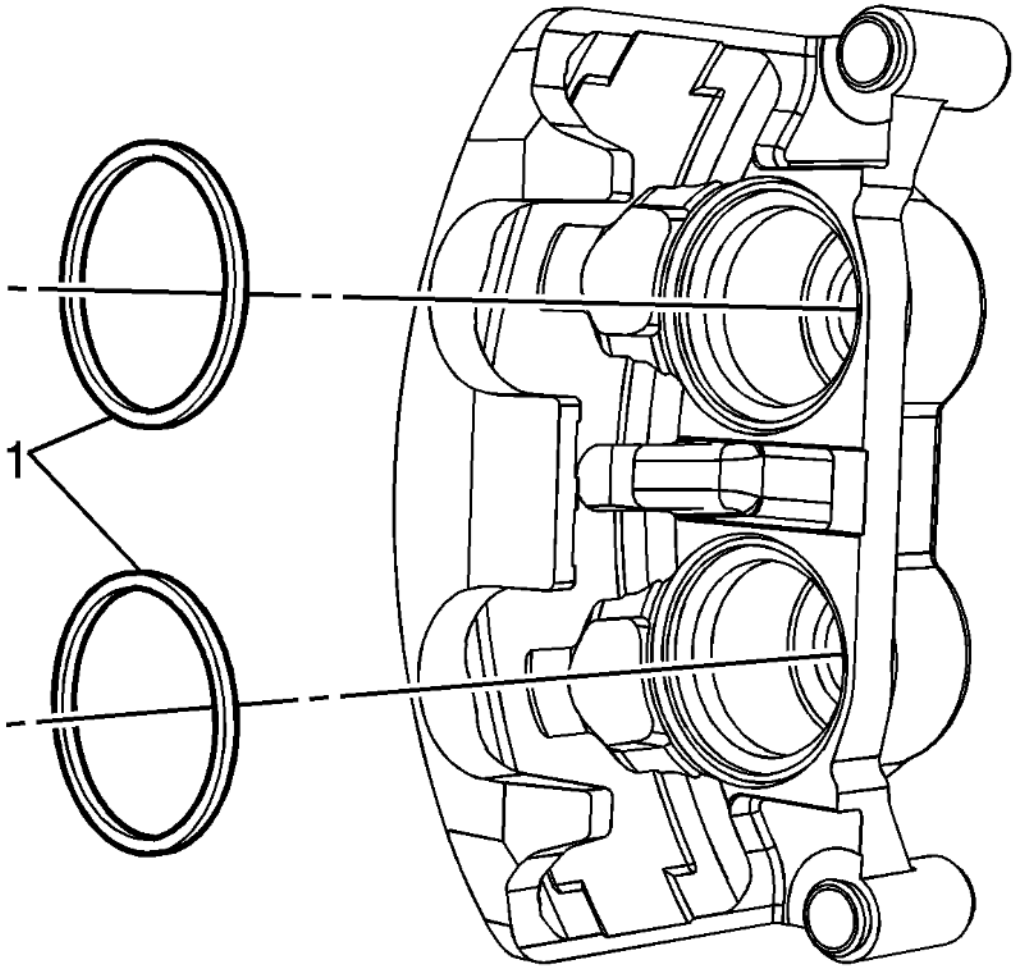


Fig. 123: Identifying Brake Caliper Piston Seals
Courtesy of GENERAL MOTORS COMPANY

2. Install the brake caliper piston seals (1) to the brake caliper piston bores.

   Ensure the brake caliper piston seals are fully seated in the groove of the caliper piston bores and are not distorted.

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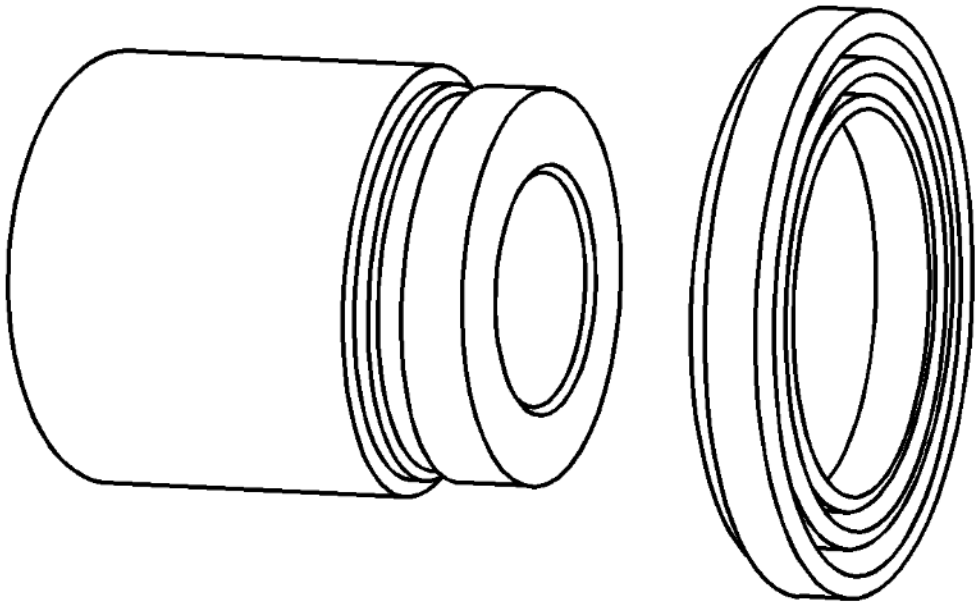


Fig. 124: View Of Piston Dust Seal
Courtesy of GENERAL MOTORS COMPANY

3. Install the brake caliper piston dust boot seal over the end of the piston so that the fold will face toward the brake caliper housing piston bore opening.

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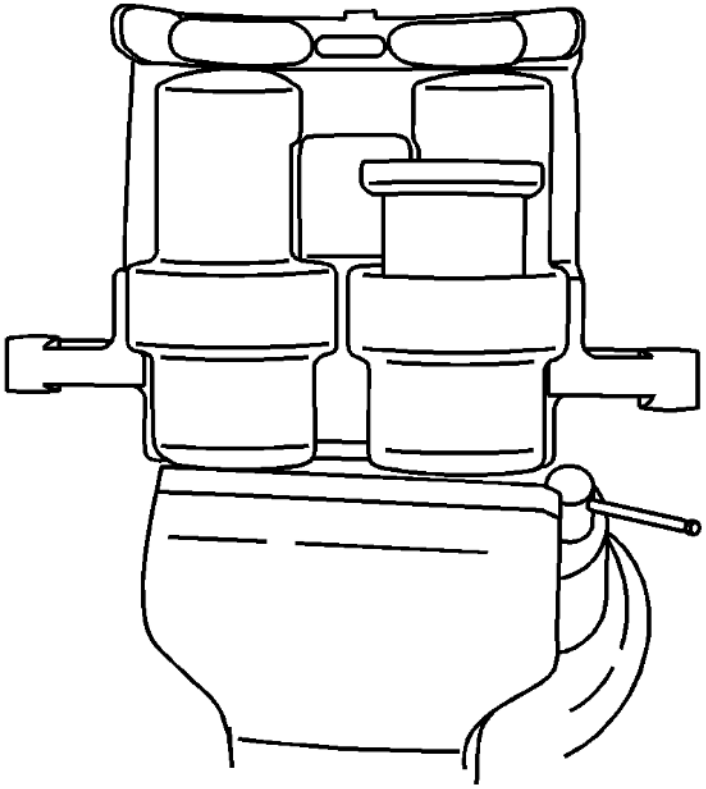


Fig. 125: Piston And Brake Caliper
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Position the piston in the bore so that it is straight and level.**

4. Position the piston to the brake caliper housing bore and seat the boot into the brake caliper housing bore.

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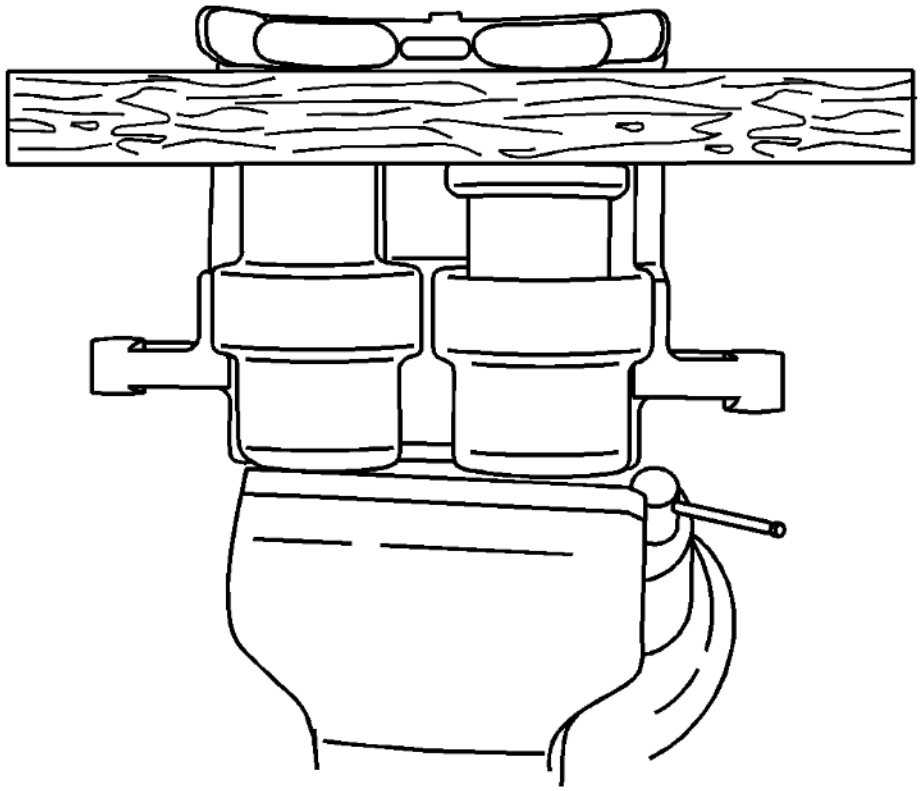


Fig. 126: Piston And Bore
Courtesy of GENERAL MOTORS COMPANY

5. Position a piece of wood across the piston to be installed.
6. Applying equal pressure by hand while pushing down, install the piston in the bore. Do not press on piston recess with any tool.
7. Remove the piece of wood.
8. Seat the edge of the brake caliper piston dust boot seals in the groove in the brake caliper piston.

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9. If necessary, carefully lift the edge of the brake caliper piston dust boot seals at the brake caliper piston to release any trapped air.

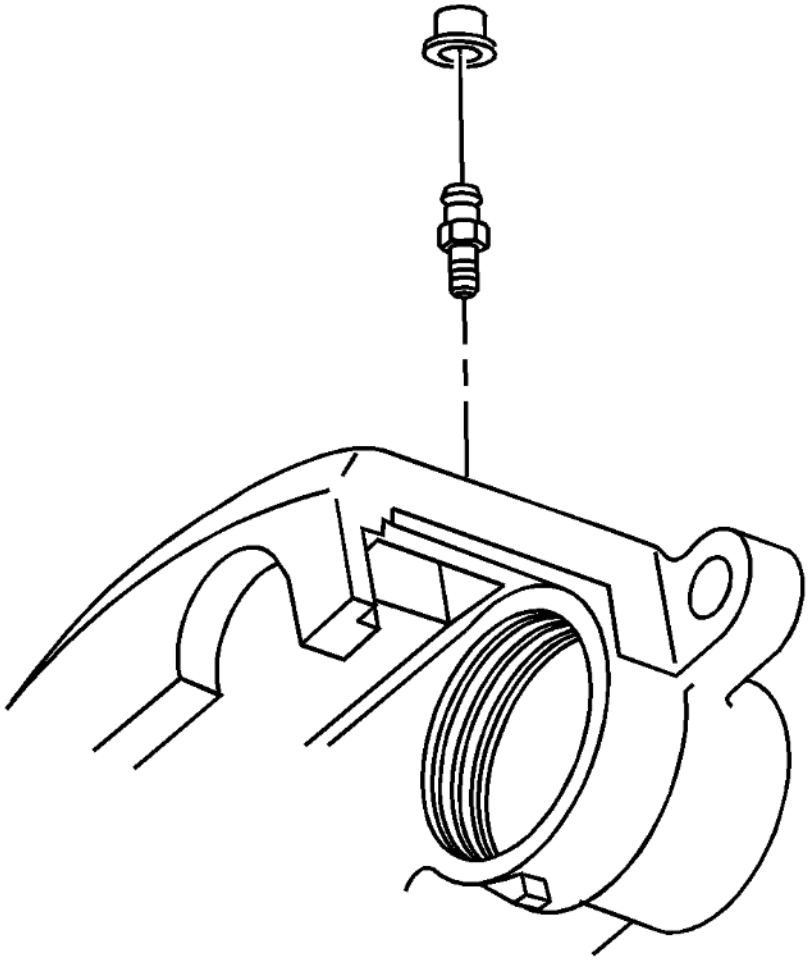


Fig. 127: View Of Bleeder Valve Cap
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

10. Install the bleeder valve in the brake caliper housing and tighten to 10 N.m (89 lb in).

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11. Install the bleeder valve cap.
12. Install the brake caliper. Refer to **Rear Brake Caliper Replacement (J95)**

REAR BRAKE CALIPER OVERHAUL (JD9)

WARNING: Refer to **Brake Fluid Irritant Warning** .

CAUTION: Refer to **Brake Fluid Effects on Paint and Electrical Components Caution** .

Disassembly Procedure

WARNING: Do not place fingers in front of the caliper piston(s) in an attempt to catch or protect it when applying compressed air. The piston(s) can fly out with force and could result in serious bodily injury.

NOTE:

- Replace all the components included in the repair kits used to service this brake caliper.
- Lubricate the rubber parts with GM approved brake fluid from a clean, sealed brake fluid container to make assembly easier.
- If any hydraulic component is removed or disconnected, it may be necessary to bleed all or part of the brake system.
- The torque values specified are for dry, non-lubricated fasteners.
- Perform the service operations on a clean bench, free from all mineral oil materials.

1. Remove the brake caliper from the vehicle. Refer to **Rear Brake Caliper Replacement (JD9)**.

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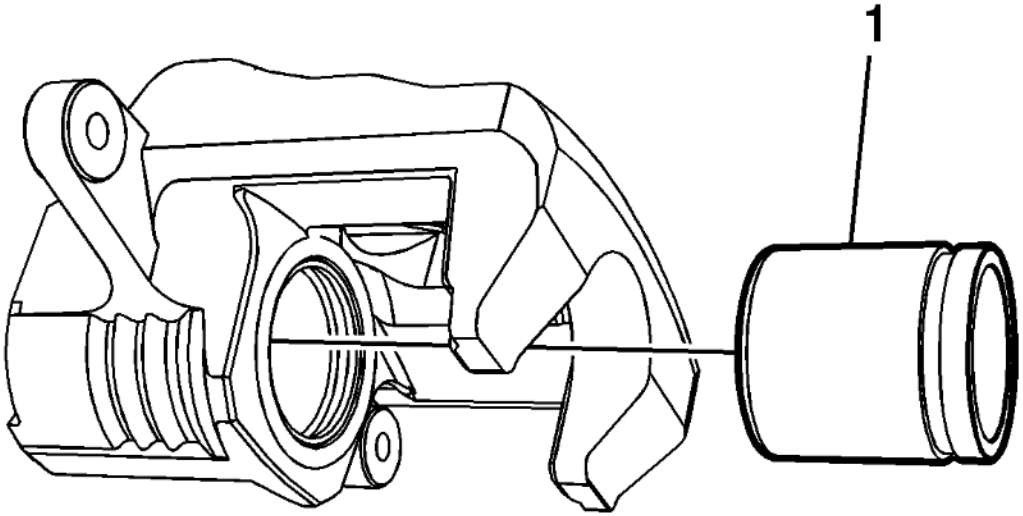


Fig. 128: Identifying Brake Caliper Piston
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Use clean cloths to pad interior of caliper housing during piston removal. Use just enough air to ease the pistons out of the bores. If the pistons are blown out, even with the padding provided, it may be damaged.

2. Remove the brake caliper piston (1) from the caliper bore by directing low pressure compressed air into the caliper bore through the brake hose inlet port.

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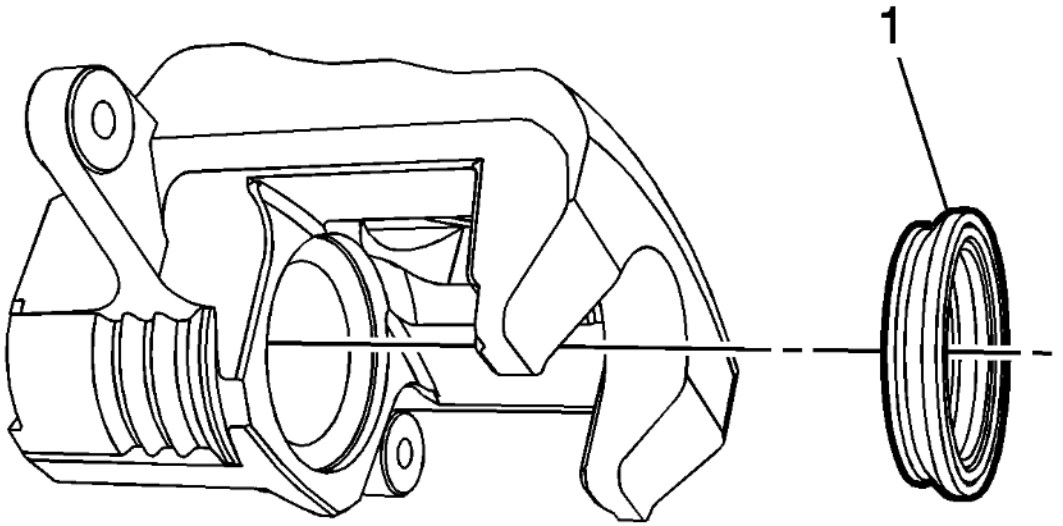


Fig. 129: Identifying Brake Caliper Piston Dust Boot Seal
Courtesy of GENERAL MOTORS COMPANY

3. Using a small wooden or plastic tool, remove the brake caliper piston dust boot seal (1) from the brake caliper housing.

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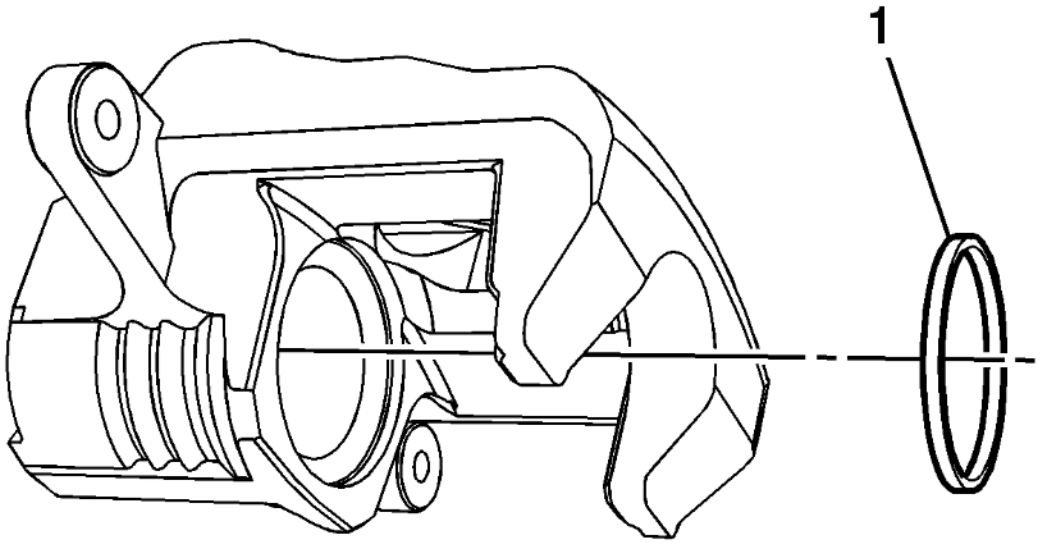


Fig. 130: Identifying Brake Caliper Piston Seal
Courtesy of GENERAL MOTORS COMPANY

4. Using a small wooden or plastic tool, remove the brake caliper piston seal (1) from the brake caliper housing.

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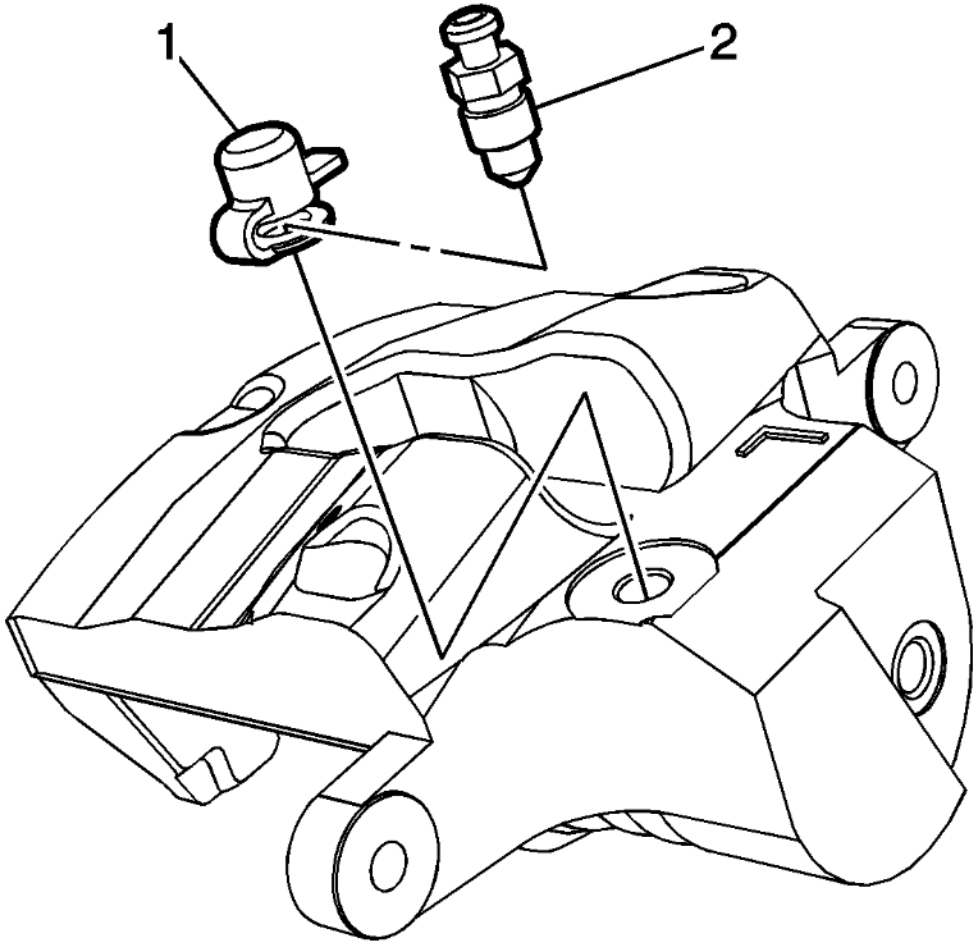


Fig. 131: Identifying Brake Caliper Bleeder Valve Cap & Bleeder Valve
Courtesy of GENERAL MOTORS COMPANY

5. Remove the bleeder valve cap (1) and the brake caliper bleeder valve (2).
6. Clean the brake caliper piston bore with denatured alcohol, or equivalent.
7. Inspect the caliper bore for cracks, scoring, pitting and excessive corrosion.
8. If light corrosion is present in the caliper bore, remove the corrosion with emery cloth, or equivalent.

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9. If excessive corrosion exists that cannot be removed, replace the brake caliper.

Assembly Procedure

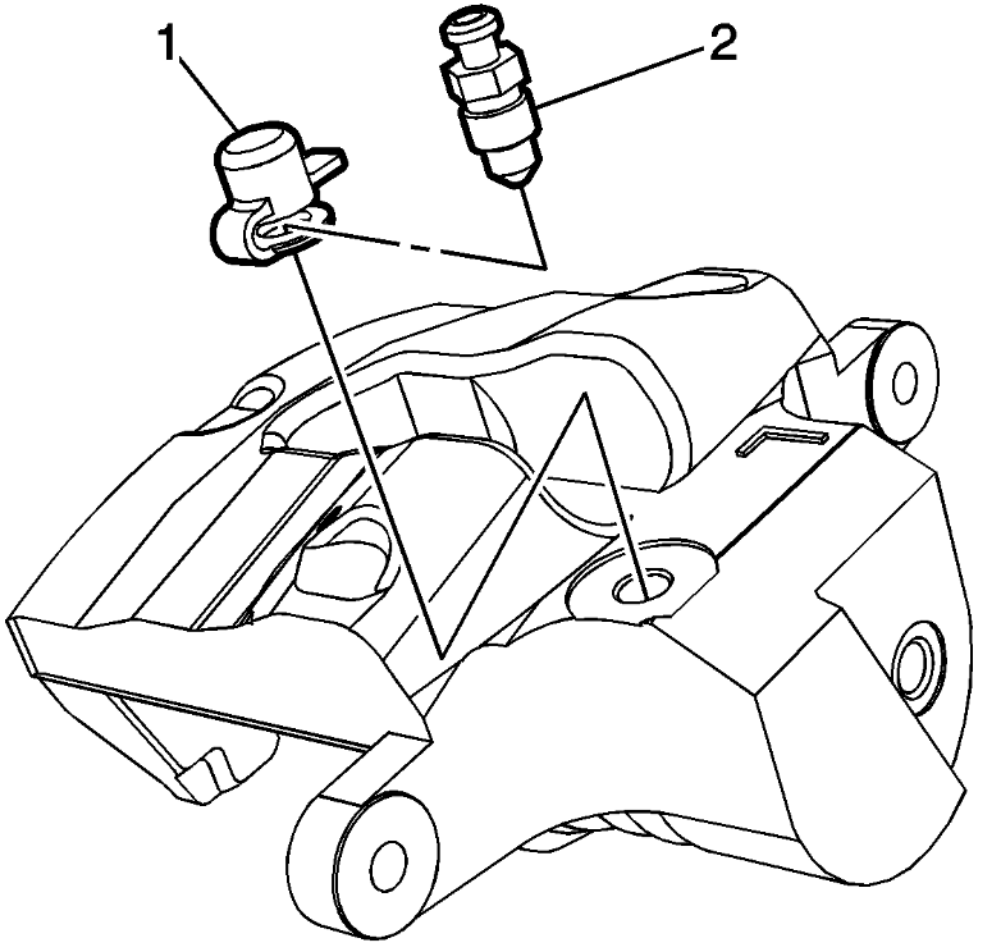


Fig. 132: Identifying Brake Caliper Bleeder Valve Cap & Bleeder Valve
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

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1. Install the bleeder valve cap (1) and the brake caliper bleeder valve (2) and tighten to 12 N.m (106 lb in).

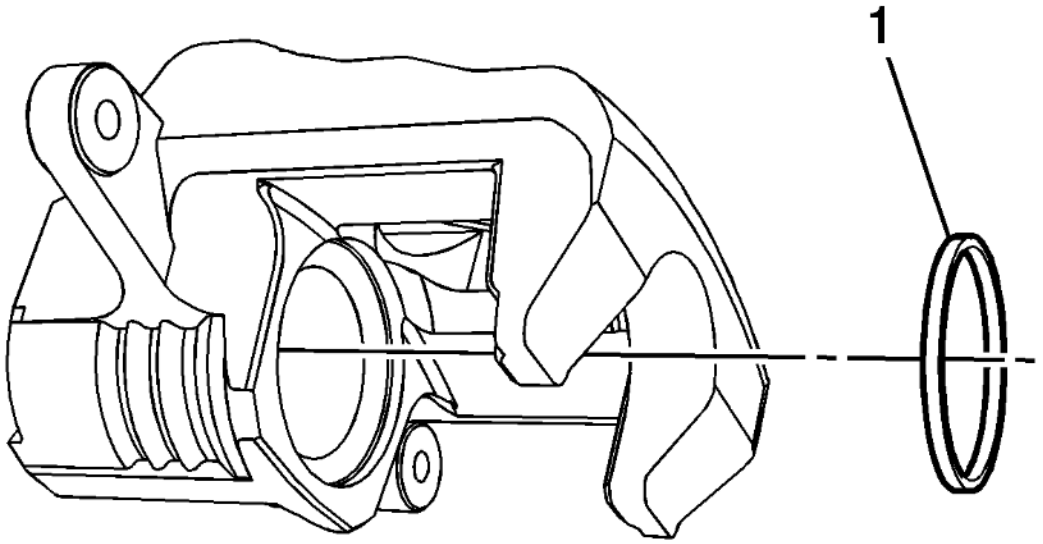


Fig. 133: Identifying Brake Caliper Piston Seal
Courtesy of GENERAL MOTORS COMPANY

2. Lubricate the brake caliper piston seal with GM approved brake fluid from a clean, sealed brake fluid container.
3. Install the brake caliper piston seal (1) into the brake caliper housing groove.

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Ensure the brake caliper piston seal is properly seated in the caliper housing groove and is not distorted.

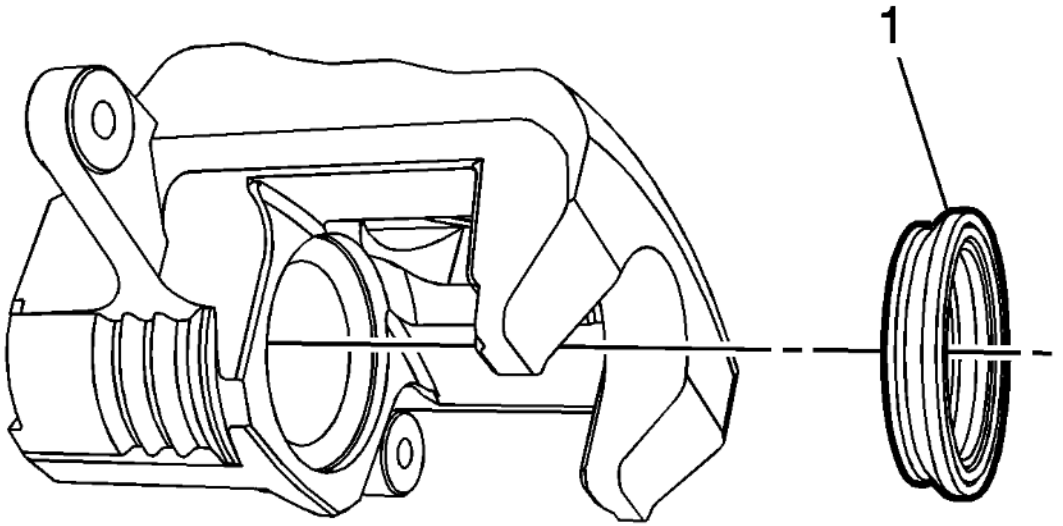


Fig. 134: Identifying Brake Caliper Piston Dust Boot Seal
Courtesy of GENERAL MOTORS COMPANY

4. Install the brake caliper piston dust boot seal (1) into the brake caliper housing.
5. Lightly lubricate the brake caliper piston dust boot seal lip with GM approved brake fluid from a clean, sealed brake fluid container.
6. Lightly lubricate the brake caliper piston with GM approved brake fluid from a clean, sealed brake fluid container.

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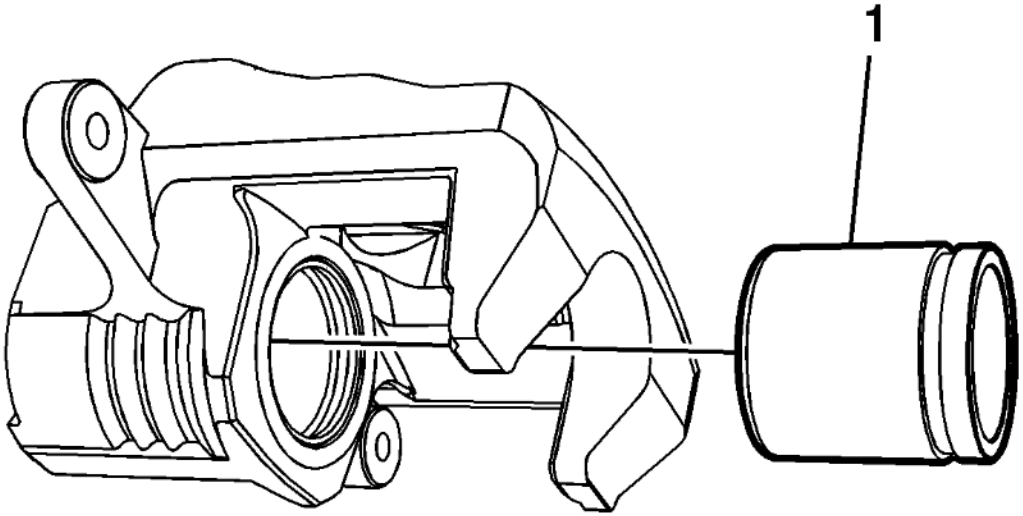


Fig. 135: Identifying Brake Caliper Piston
Courtesy of GENERAL MOTORS COMPANY

7. Place the brake caliper piston (1) in the brake caliper housing bore and press the brake caliper piston squarely into the brake caliper.
8. Install the brake caliper. Refer to **Rear Brake Caliper Replacement (JD9)**.

FRONT BRAKE CALIPER BRACKET REPLACEMENT (JD9)

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Removal Procedure

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

CAUTION: **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.**

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

NOTE: **Do not allow the open end wrench to contact the brake caliper when removing or installing the brake caliper guide pin bolt. Allowing the open end wrench to contact the brake caliper will cause a pulsation when the brakes are applied.**

3. Install an open end wrench to the brake caliper guide pins to hold the guide pins in line with the brake caliper.

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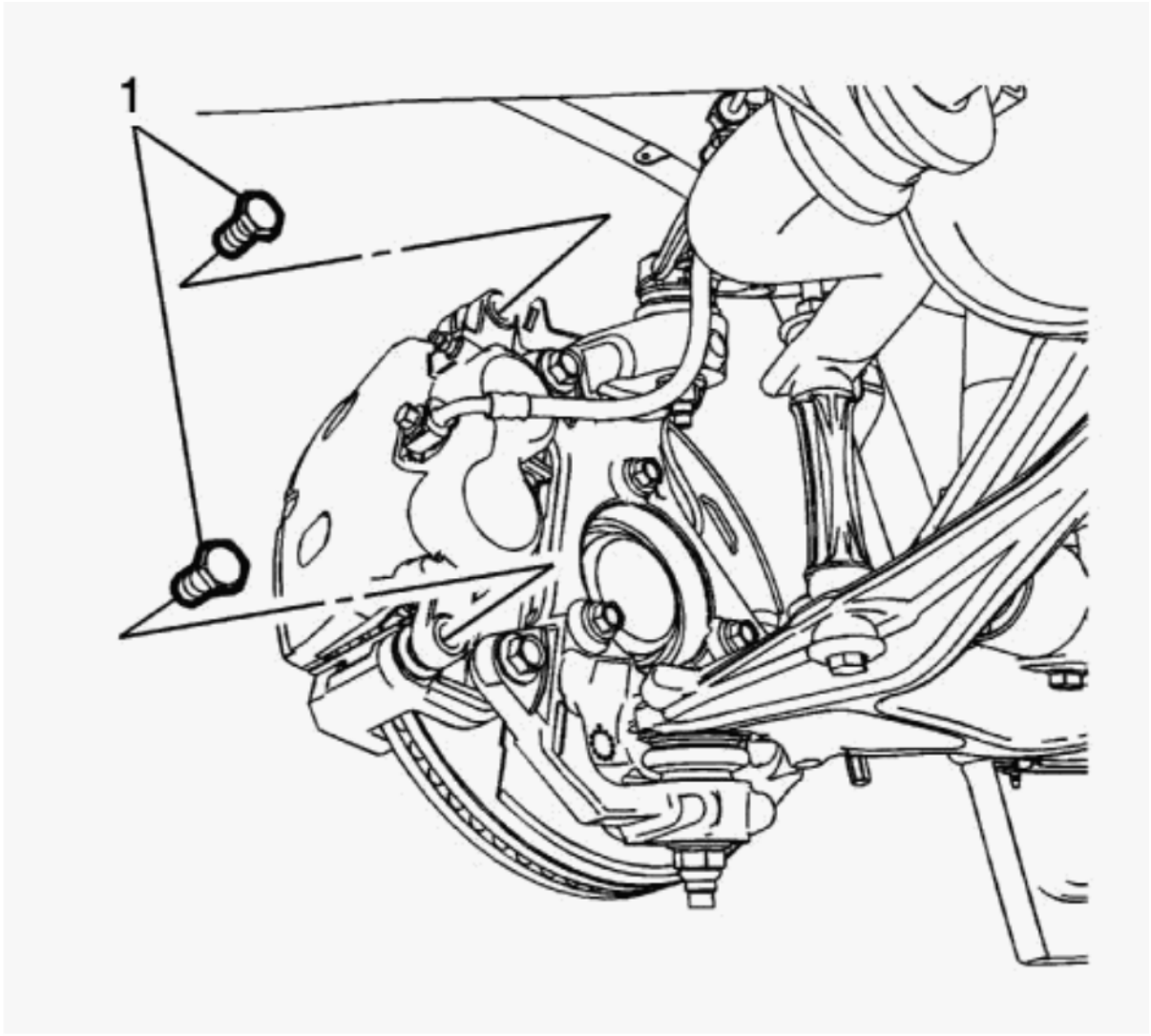


Fig. 136: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not tear the brake caliper guide pin seal. Damage to the brake caliper guide pin seal may allow corrosion to form on the brake caliper guide pin and the guide pin bores.**

4. Using a backup wrench on the brake caliper guide pins, remove the brake caliper guide pin bolts (1).
5. Remove the disc brake caliper and support with heavy mechanics wire or equivalent.

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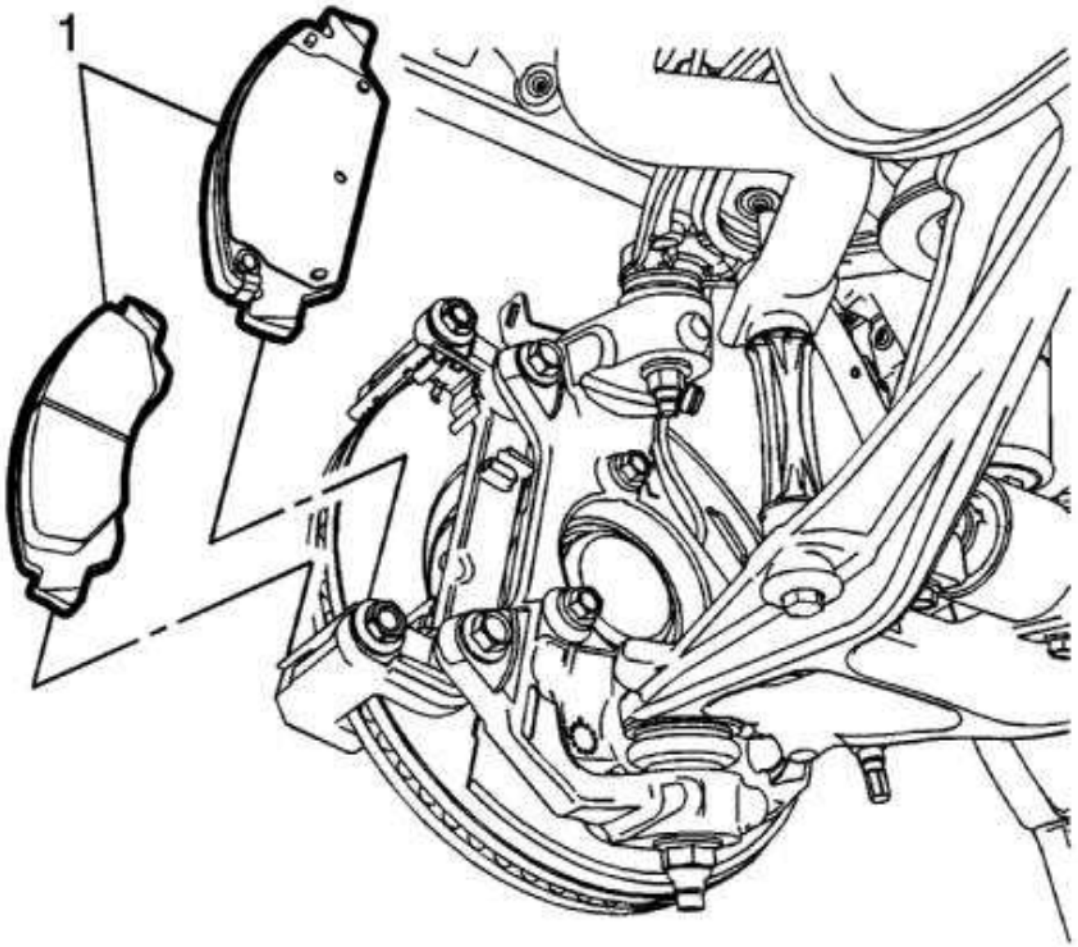


Fig. 137: Disc Brake Pads
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If reinstalling the original disc brake pads, note the location of the brake pads for proper installation.**

6. Remove the disc brake pads (1).

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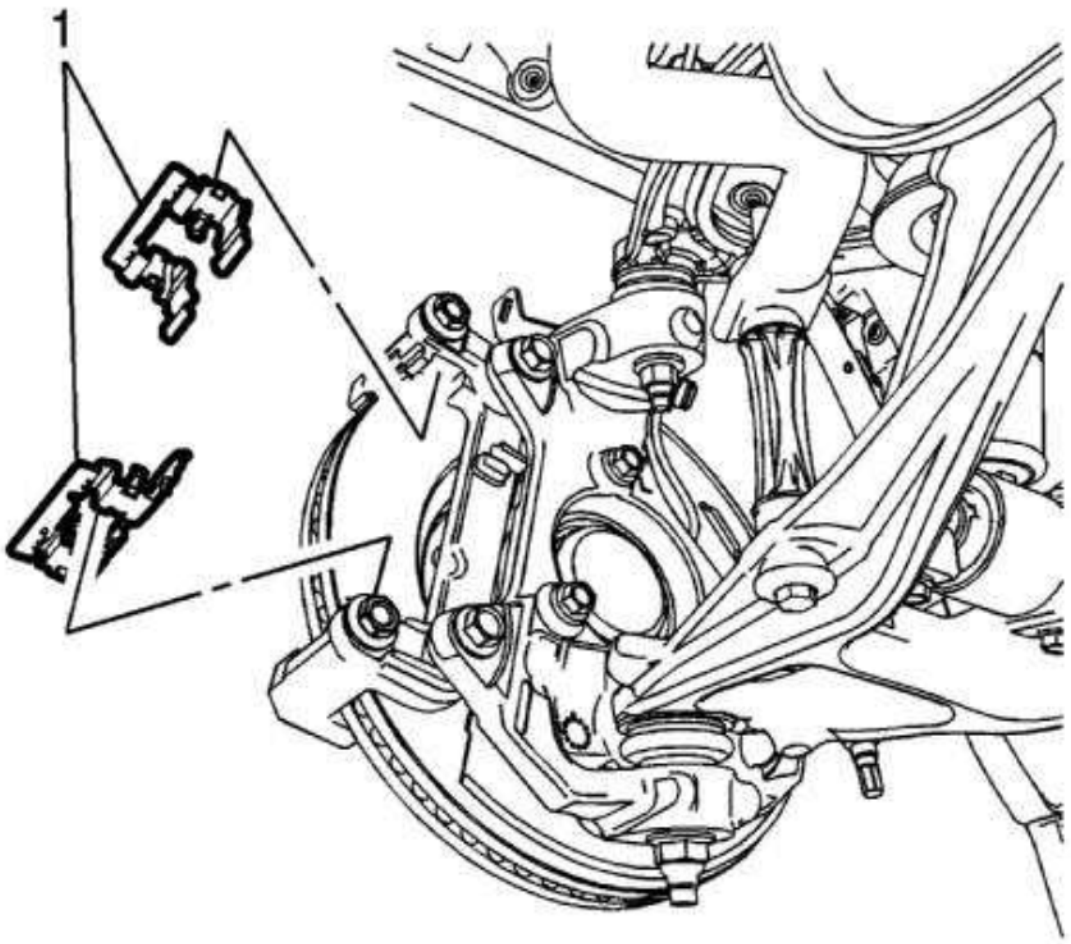


Fig. 138: Disc Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

7. Remove the disc brake pad springs (1).

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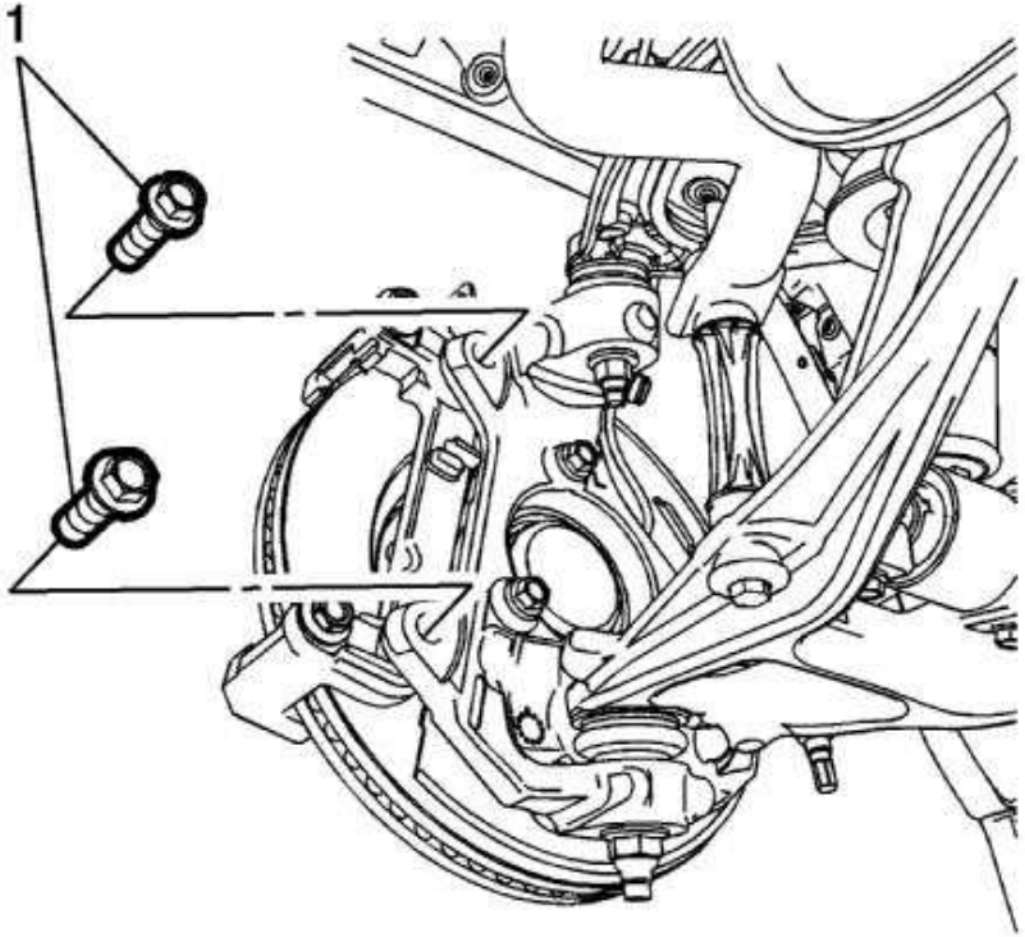


Fig. 139: Disc Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Remove the brake caliper bracket bolts (1).

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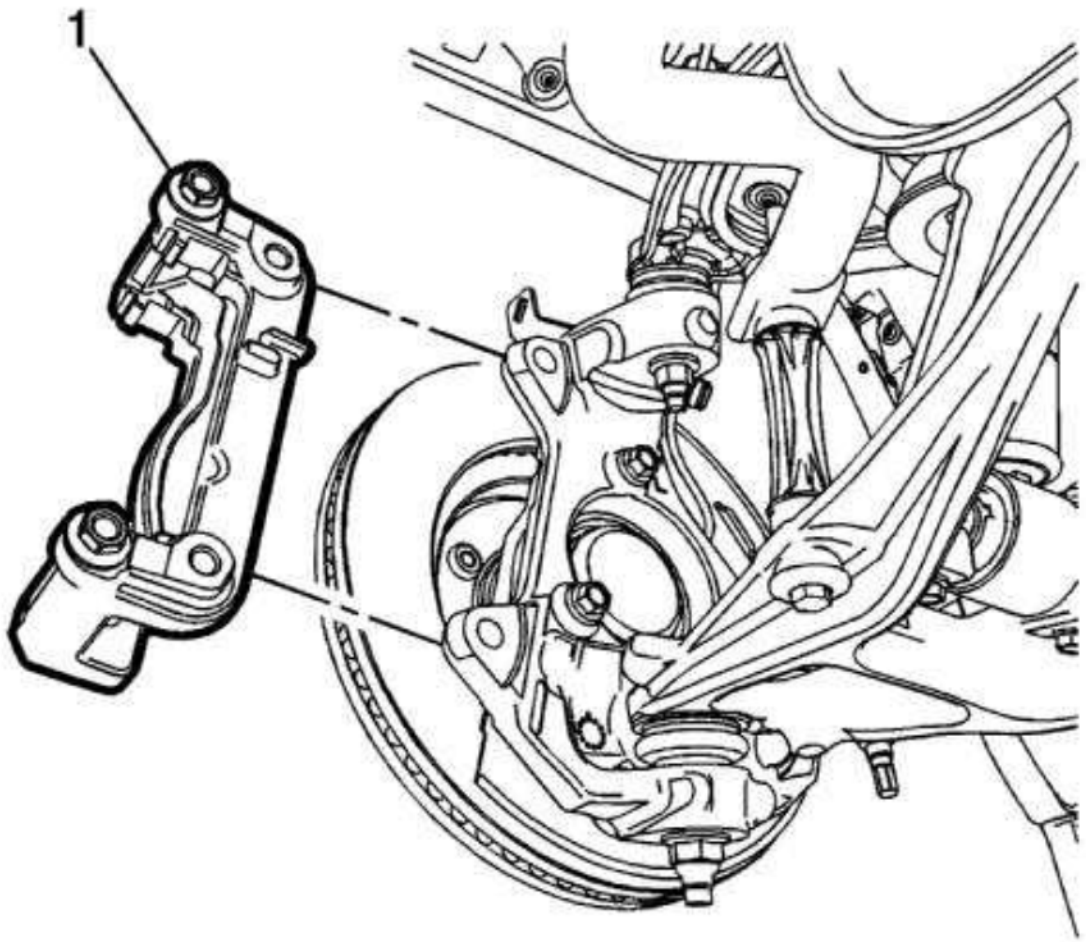


Fig. 140: Disc Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

9. Remove the disc brake caliper bracket (1).
10. Inspect the disc brake hardware. Refer to **Front Disc Brake Mounting and Hardware Inspection**.

Installation Procedure

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NOTE: **If reusing the brake caliper bracket bolts, the threads of the caliper bracket bolts and threaded holes of the caliper bracket must be free of residue and debris prior to the application of threadlocker to ensure proper adhesion and fastener retention.**

1. Prepare the brake caliper bracket bolts and bracket threaded holes for assembly:
   - Thoroughly clean the residue from the bolt threads with denatured alcohol and allow to dry.
   - Thoroughly clean the residue from the threaded holes of the caliper bracket with denatured alcohol and allow to dry.
   - Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolts. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
   - Ensure there are no gaps in the threadlocker along the filled area of the bolts.
   - Allow the threadlocker to cure approximately 10 minutes before installation.

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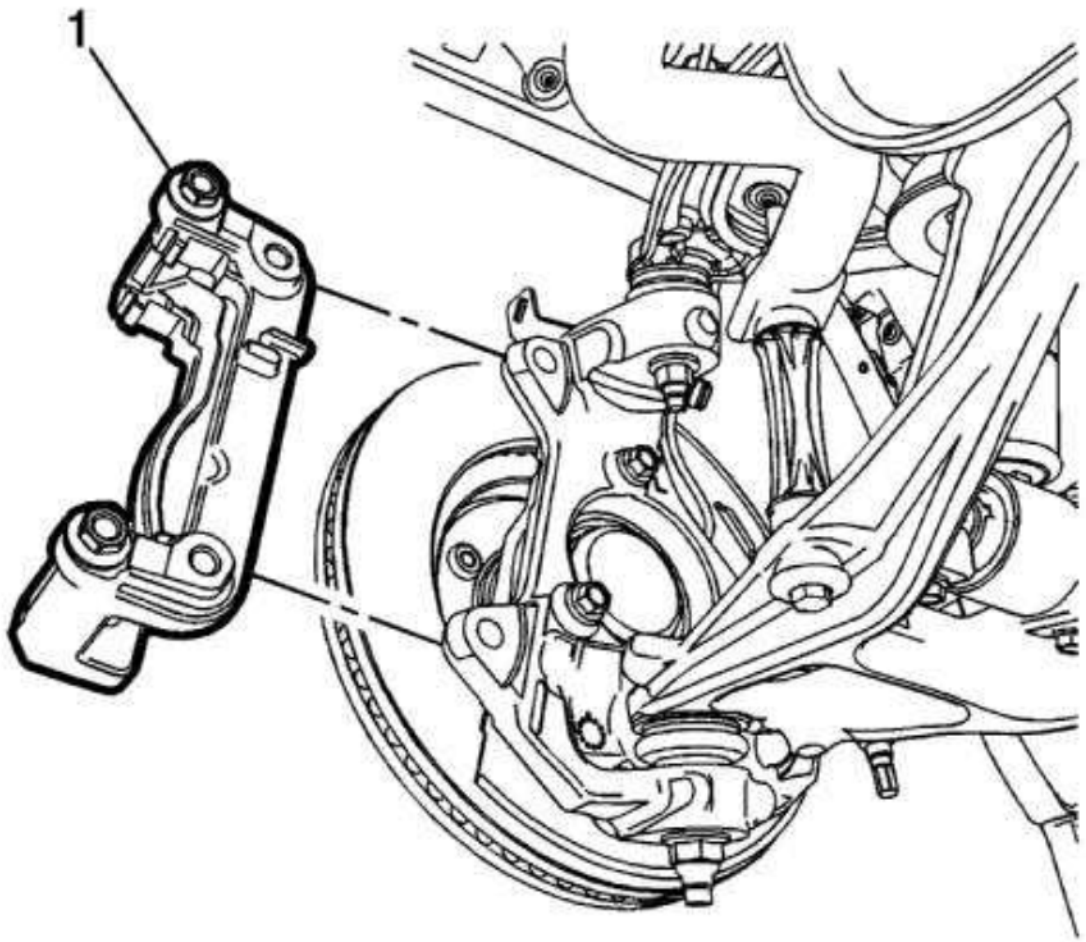


Fig. 141: Disc Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

2. Install the disc brake caliper bracket (1).

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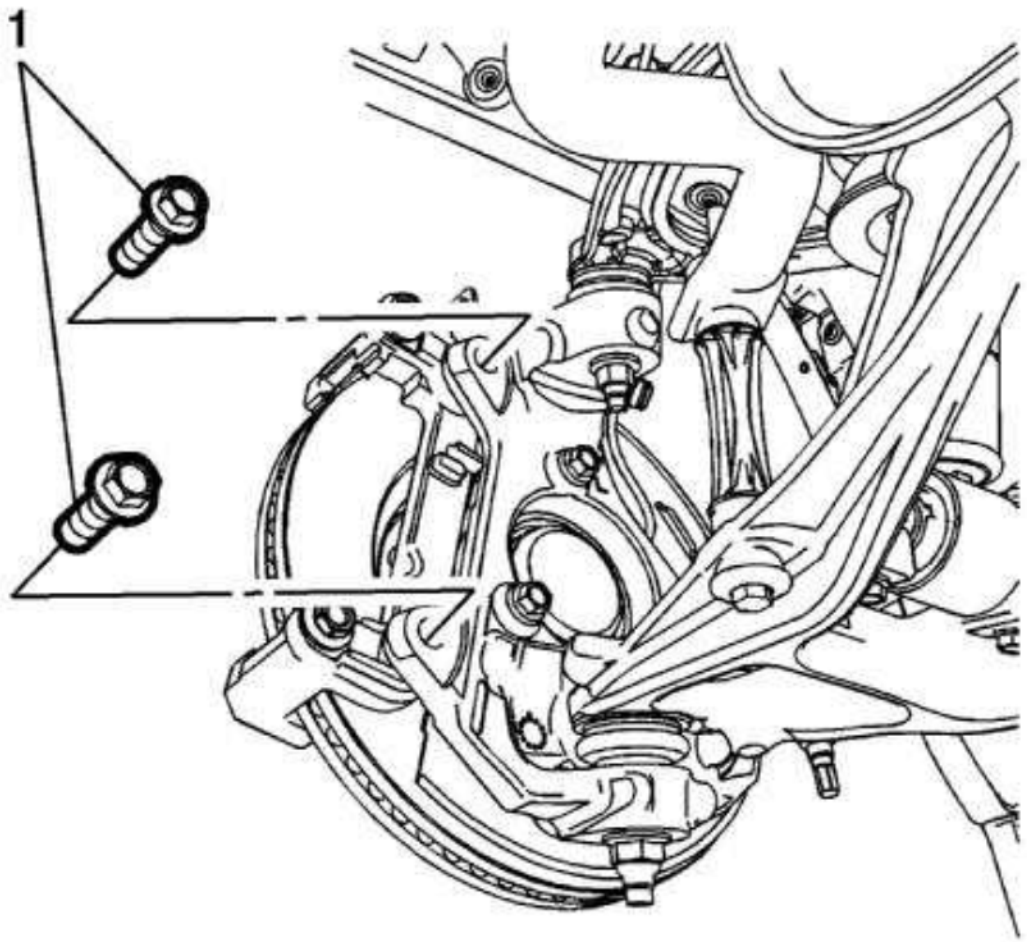


Fig. 142: Disc Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

3. Install the brake caliper bracket bolts (1) and tighten to 230 N.m (170 lb ft).
4. Thoroughly clean the brake pad hardware mating surfaces of the caliper bracket of any debris and corrosion.

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5. Apply a very thin coating of high temperature silicone brake lubricant to the mating surfaces of the bake caliper bracket only.

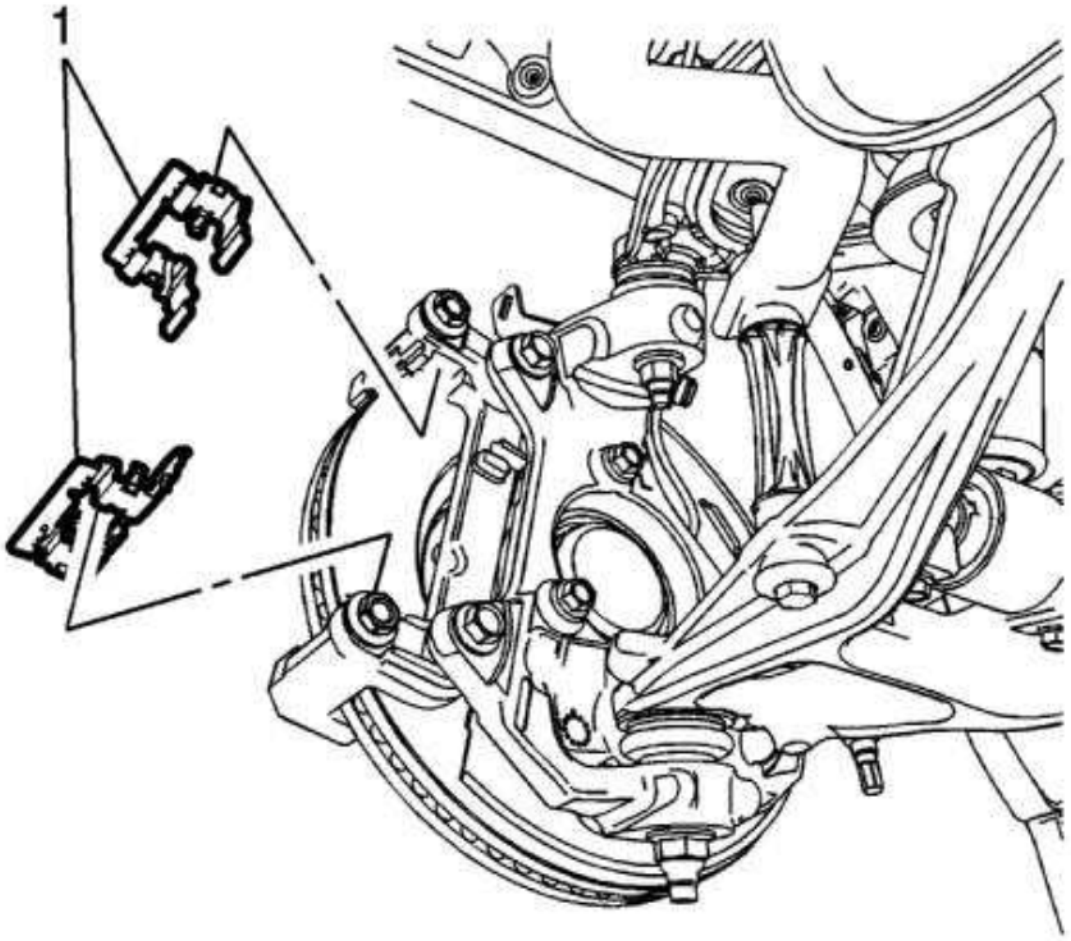


Fig. 143: Disc Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

6. Install the disc brake pad springs (1).

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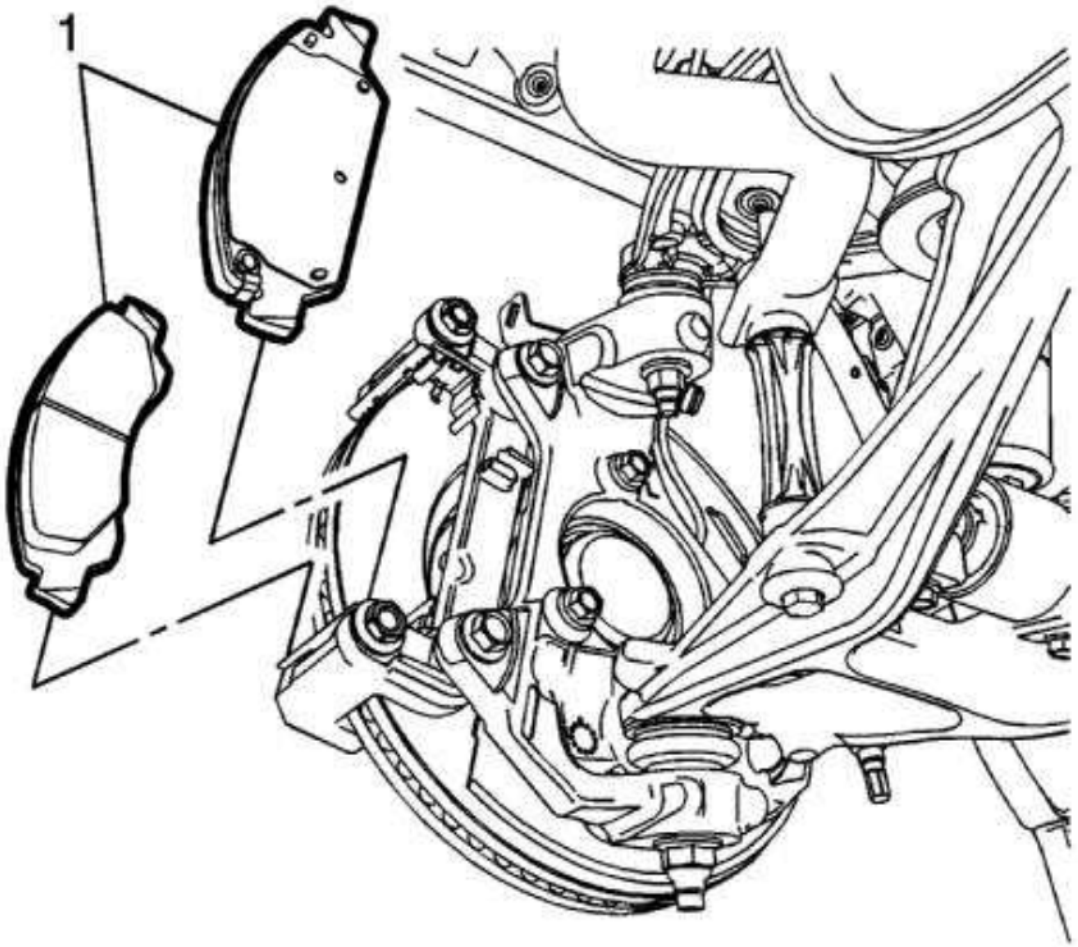


Fig. 144: Disc Brake Pads
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If reinstalling the original disc brake pads, note the location of the brake pads for proper installation.**

7. Install the disc brake pads (1).
8. Install the disc brake caliper.

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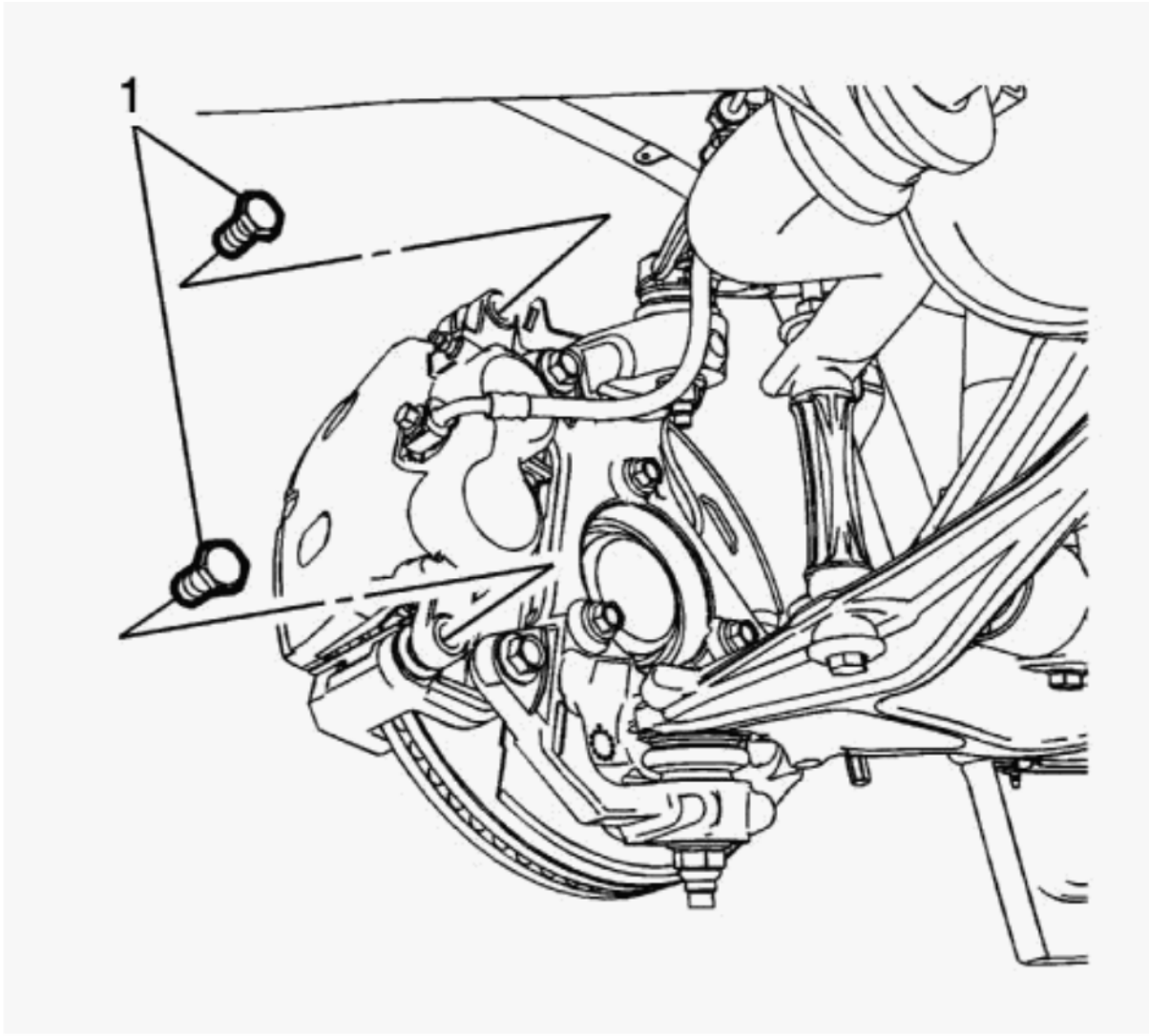


Fig. 145: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

9. Using a backup wrench on the brake caliper guide pins, install the brake caliper guide pin bolts (1) and tighten to 100 N.m (74 lb ft).
10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

FRONT BRAKE CALIPER BRACKET REPLACEMENT (J95)

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Removal Procedure

WARNING: **Brake Dust Warning**

1. Remove Front Disc Brake Pads. **Front Disc Brake Pads Replacement (J95)**

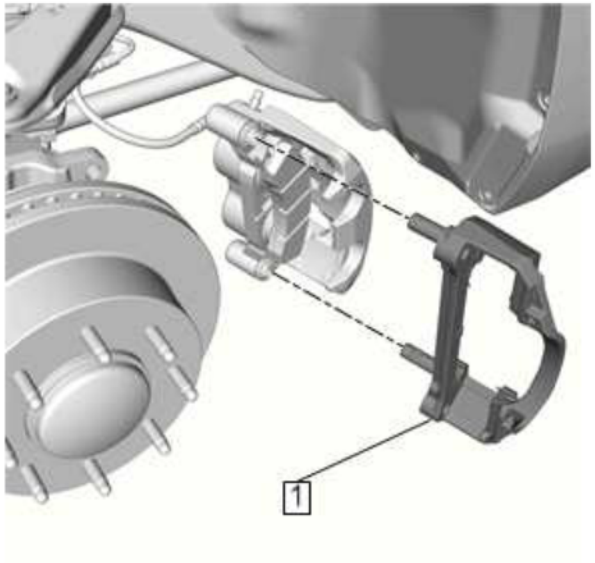


Fig. 146: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

2. Remove Brake Caliper Bracket (1)

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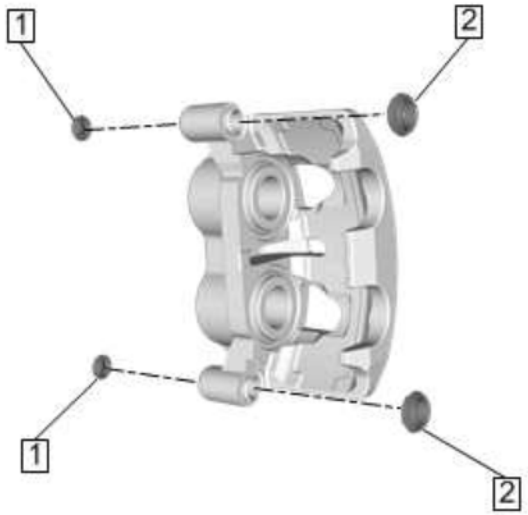
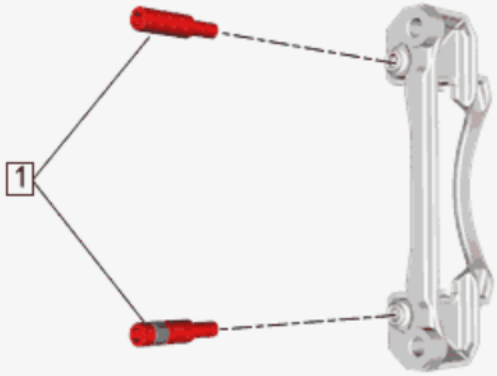


Fig. 147: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

3. Remove Seal (1)
4. Remove Boot (2)



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Fig. 148: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

5. Remove Brake Caliper Guide Pin (1).

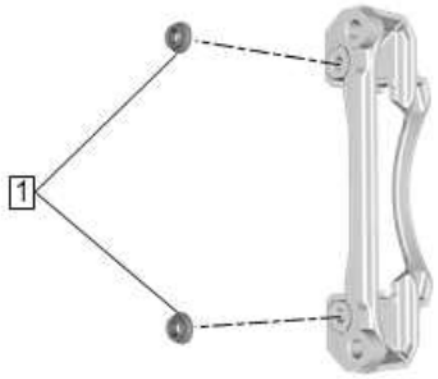


Fig. 149: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

6. Remove Brake Caliper Guide Pin Collar (1).
7. Inspect the front disc brake hardware for damage and replace, if necessary. **Front Disc Brake Mounting and Hardware Inspection**

Installation Procedure

1. Apply a light coating of commercially available, high temperature silicone brake lubricant to the brake caliper housing guide pin bores and guide pin surfaces:
   - Apply lubricant to the brake caliper guide pins.
   - Apply lubricant to the brake caliper guide pin seals.
2. Prepare the brake caliper guide pin threads and the brake caliper bracket threaded holes for assembly:
   - Thoroughly clean the brake caliper guide pin threads of any threadlocker residue.

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- Thoroughly clean the brake caliper bracket guide pin threaded holes of any threadlocker residue with denatured alcohol and allow to dry.

3. Apply threadlocker to the threads of the brake caliper guide pins. **Adhesives, Fluids, Lubricants, and Sealers**

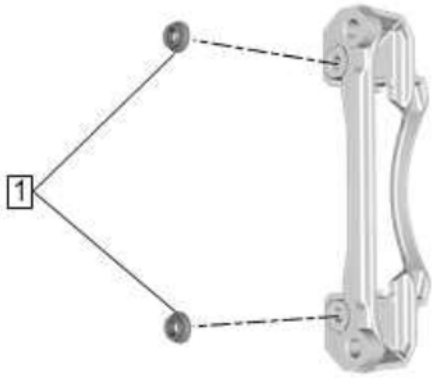


Fig. 150: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

4. Install Brake Caliper Guide Pin Collar (1).

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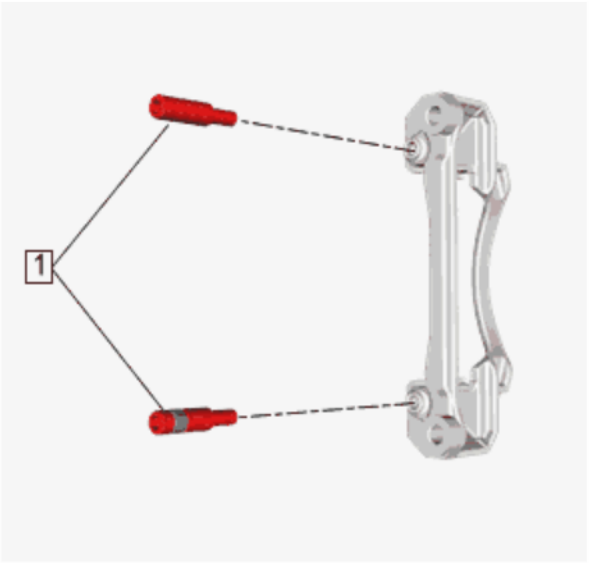


Fig. 151: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Fastener Caution**

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

5. Install Brake Caliper Guide Pin (1) and tighten 105 N.m (77 lb ft)

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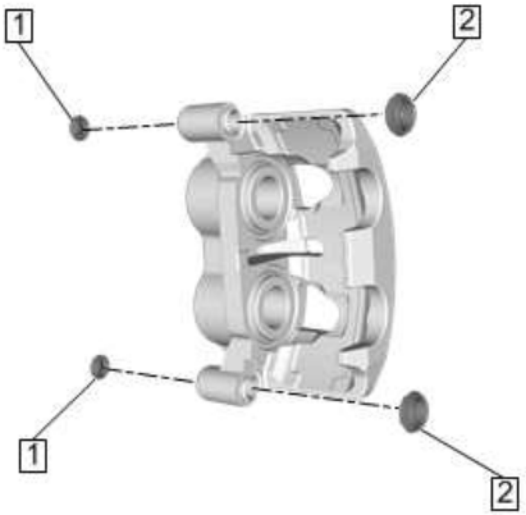
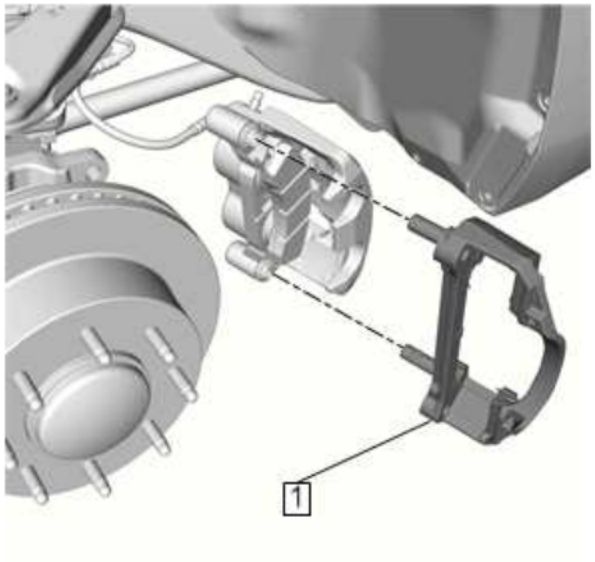


Fig. 152: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

6. Install Seal (1).
7. Install Boot (2).



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Fig. 153: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Install Brake Caliper Bracket (1).
9. Ensure the disc brake caliper guide pin seals are fully seated in the grooves of the disc brake caliper housing.
10. Install Front Disc Brake Pads.Front Disc Brake Pads Replacement (J95).

REAR BRAKE CALIPER BRACKET REPLACEMENT (JD9)

Removal Procedure

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

CAUTION: **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.**

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) .

NOTE: **Do not allow the open end wrench to contact the brake caliper when removing or installing the brake caliper guide pin bolt. Allowing the open end wrench to contact the brake caliper will cause a pulsation when the brakes are applied.**

3. Install an open end wrench to the brake caliper guide pins to hold the guide pins in line with the brake caliper.

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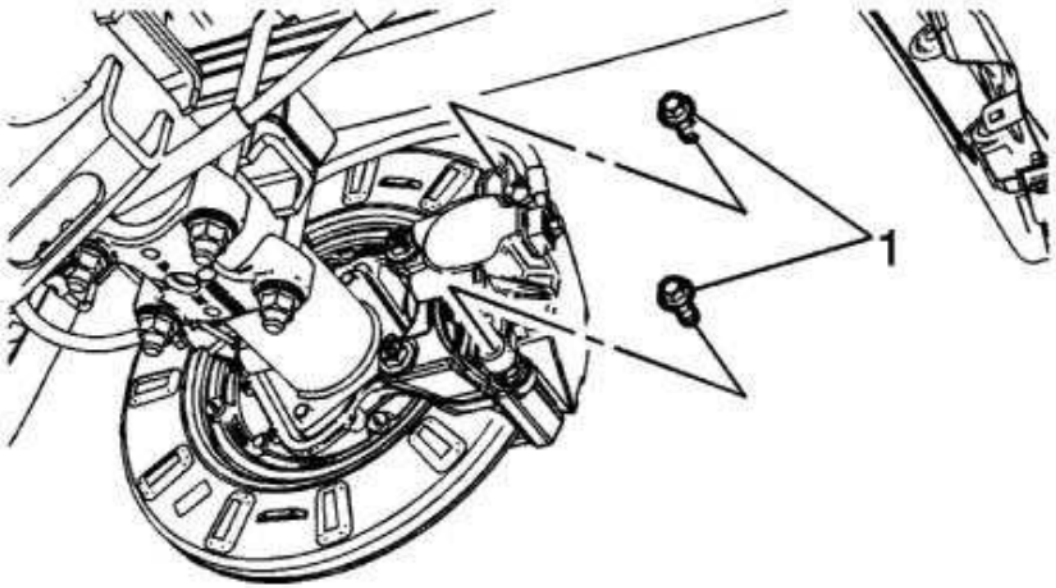


Fig. 154: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not tear the brake caliper guide pin seal. Damage to the brake caliper guide pin seal may allow corrosion to form on the brake caliper guide pin and the guide pin bores.**

4. Using a backup wrench on the brake caliper guide pins, remove the brake caliper guide pin bolts (1).
5. Remove the disc brake caliper and support with heavy mechanics wire or equivalent.

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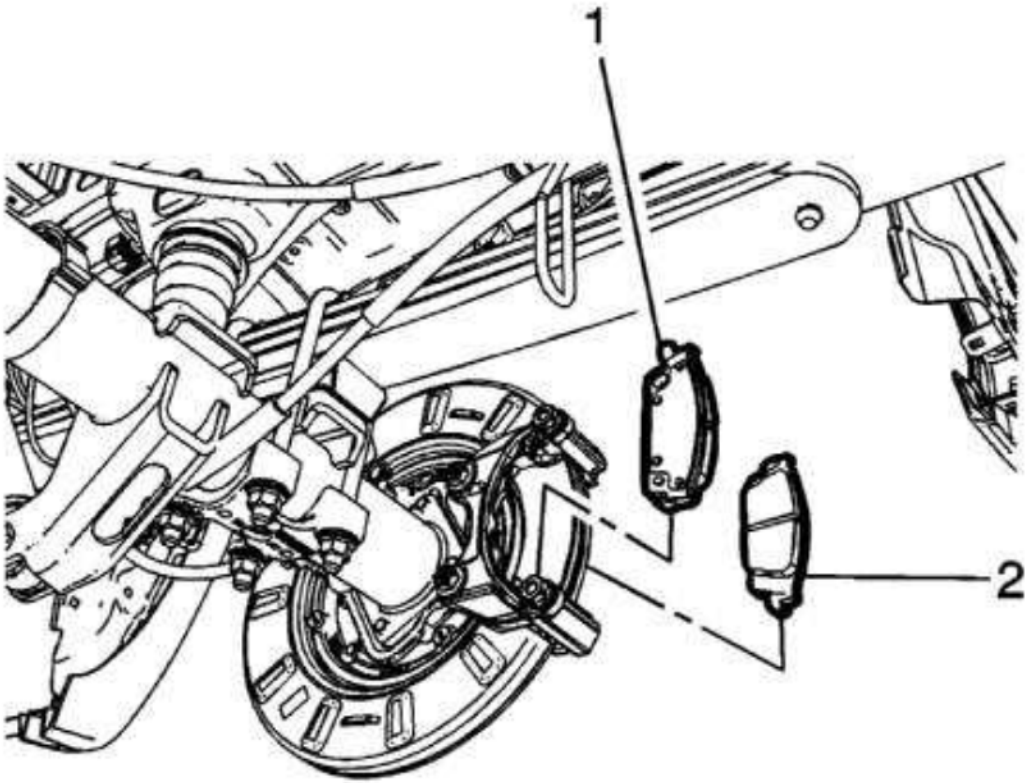


Fig. 155: Inner Disc Brake Pad
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If reinstalling the original disc brake pads, note the location of the brake pads for proper installation.**

6. Remove the inner disc brake pad (1) and the outer disc brake pad (2).

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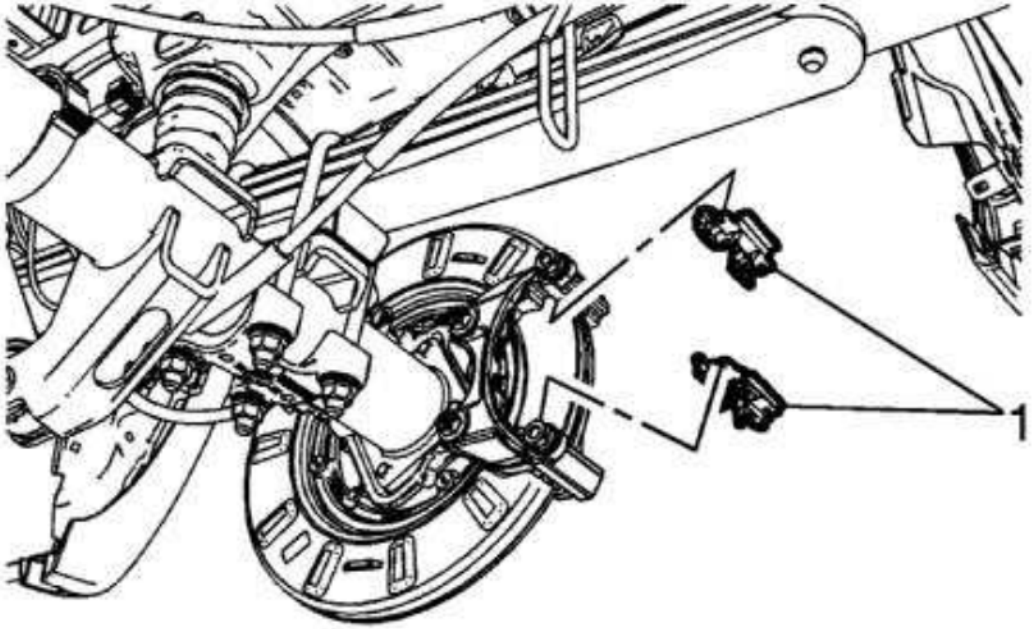


Fig. 156: Disc Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

7. Remove the disc brake pad springs (1).

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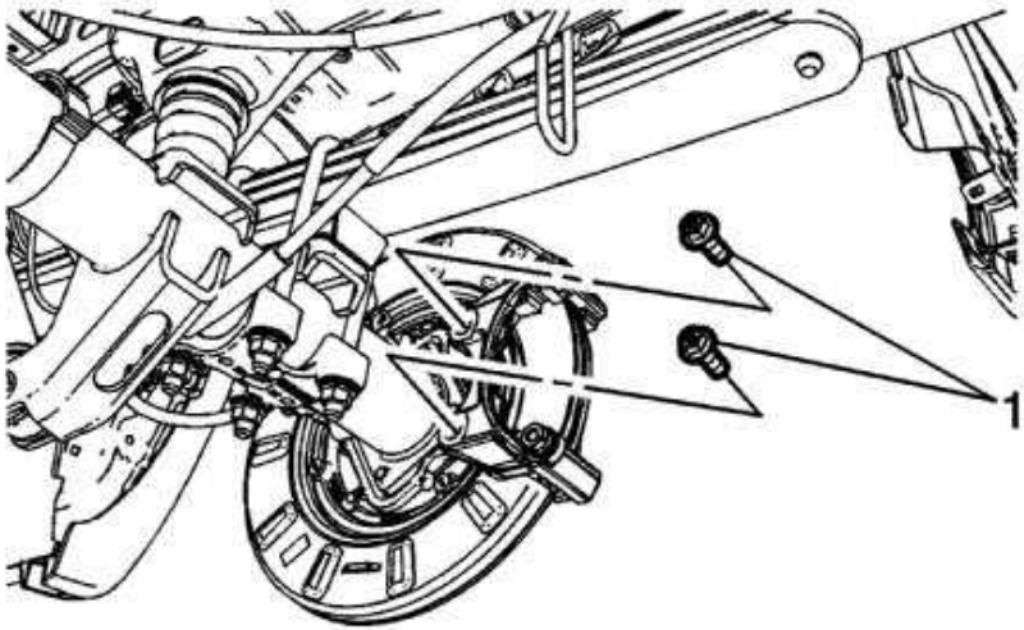


Fig. 157: Disc Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Remove the brake caliper bracket bolts (1).

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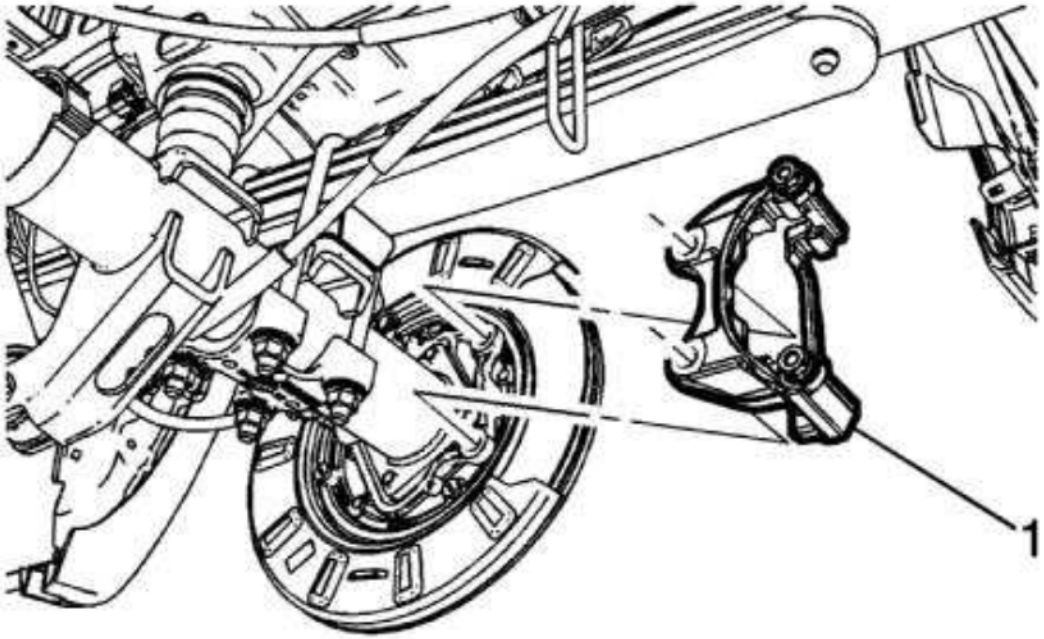


Fig. 158: Disc Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

9. Remove the disc brake caliper bracket (1).
10. Inspect the disc brake hardware. Refer to **Rear Disc Brake Mounting and Hardware Inspection**.

Installation Procedure

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NOTE: **If reusing the brake caliper bracket bolts, the threads of the caliper bracket bolts and threaded holes of the caliper bracket must be free of residue and debris prior to the application of threadlocker to ensure proper adhesion and fastener retention.**

1. Prepare the brake caliper bracket bolts and bracket threaded holes for assembly:
   - Thoroughly clean the residue from the bolt threads with denatured alcohol and allow to dry.
   - Thoroughly clean the residue from the threaded holes of the caliper bracket with denatured alcohol and allow to dry.
   - Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolts. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
   - Ensure there are no gaps in the threadlocker along the filled area of the bolts.
   - Allow the threadlocker to cure approximately 10 minutes before installation.

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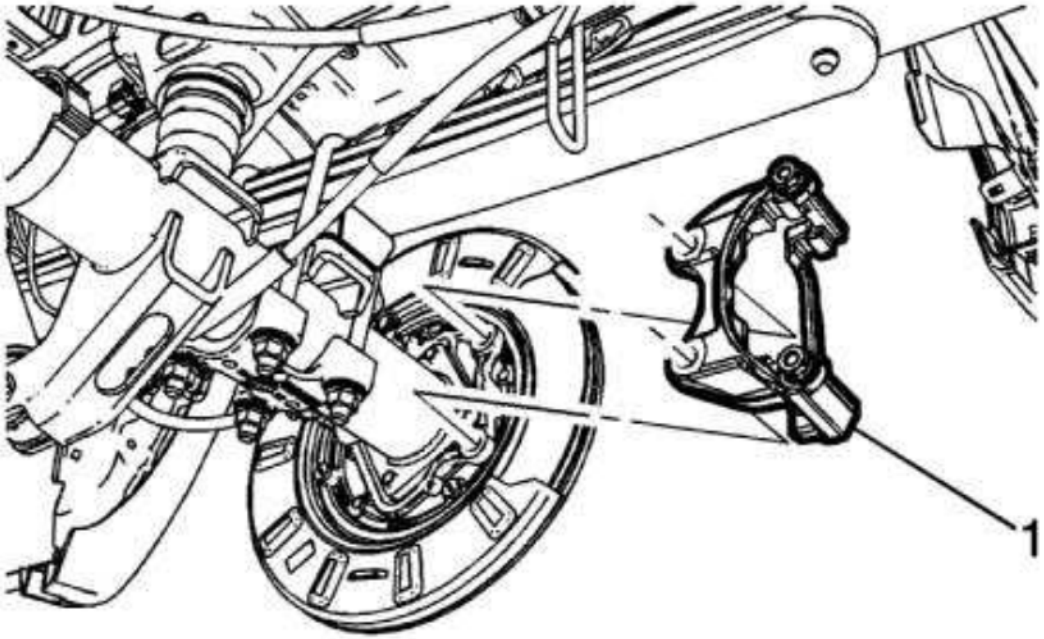


Fig. 159: Disc Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

2. Install the disc brake caliper bracket (1).

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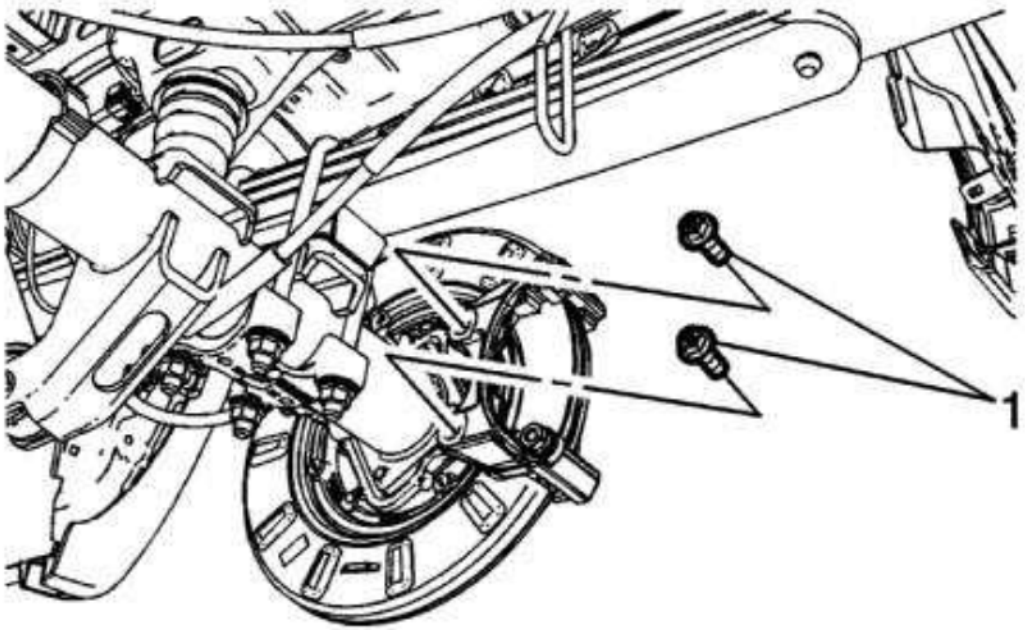


Fig. 160: Disc Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

3. Install the brake caliper bracket bolts (1) and tighten to 200 N.m (148 lb ft).
4. Thoroughly clean the brake pad hardware mating surfaces of the caliper bracket of any debris and corrosion.

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5. Apply a very thin coating of high temperature silicone brake lubricant to the mating surfaces of the bake caliper bracket only.

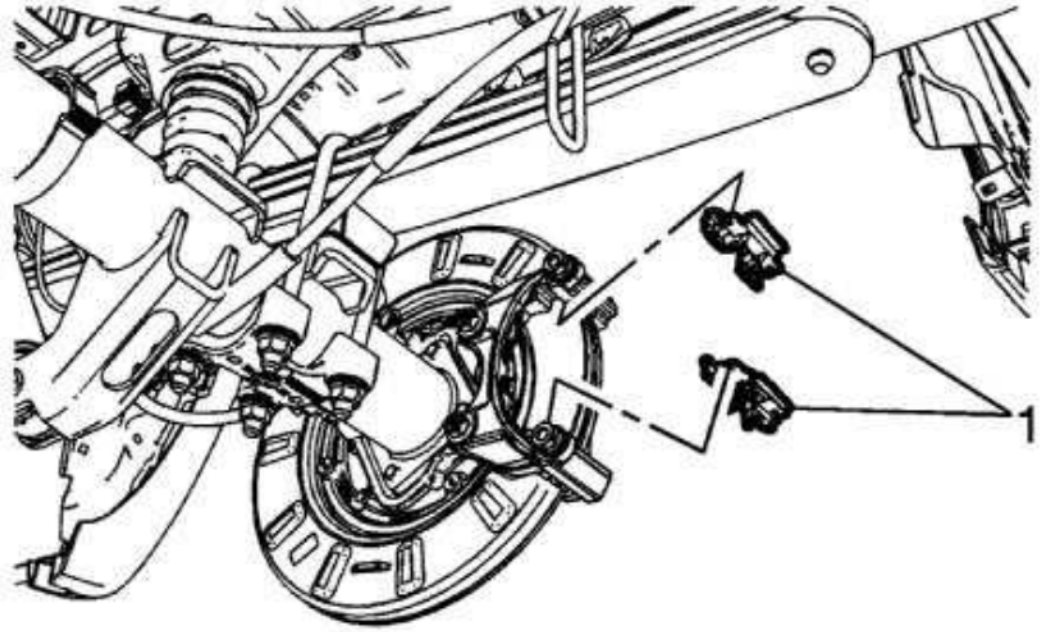


Fig. 161: Disc Brake Pad Springs
Courtesy of GENERAL MOTORS COMPANY

6. Install the disc brake pad springs (1).

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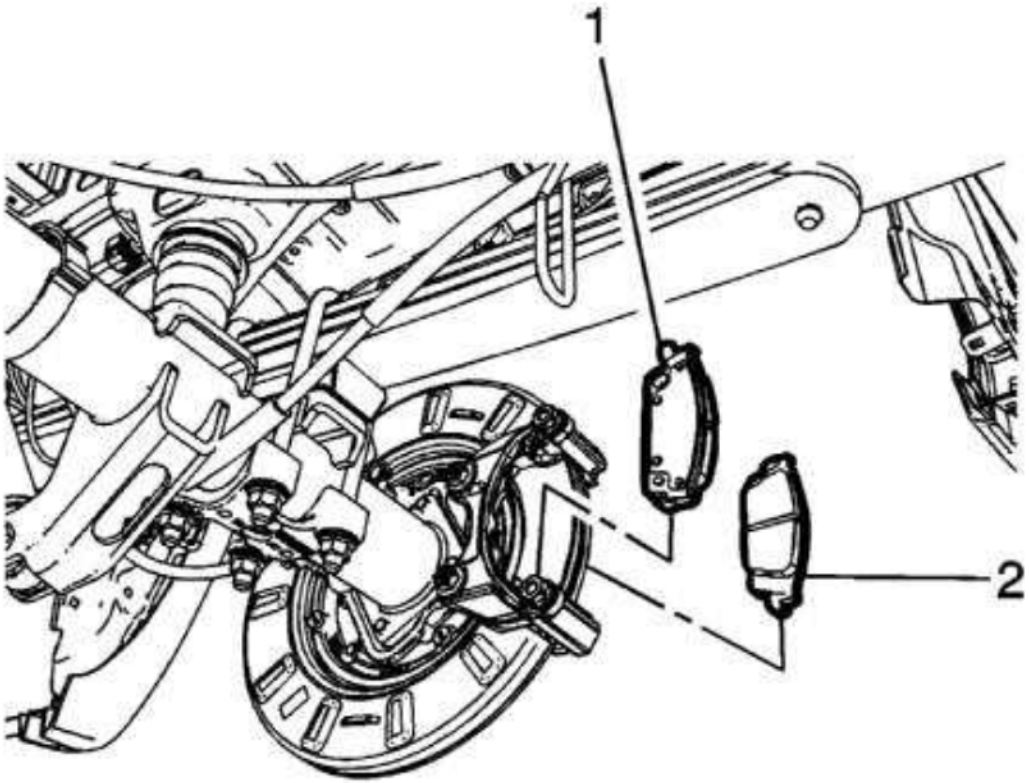


Fig. 162: Inner Disc Brake Pad
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If reinstalling the original disc brake pads, note the location of the brake pads for proper installation.**

7. Install the inner disc brake pad (1) and the outer disc brake pad (2).
8. Install the disc brake caliper.

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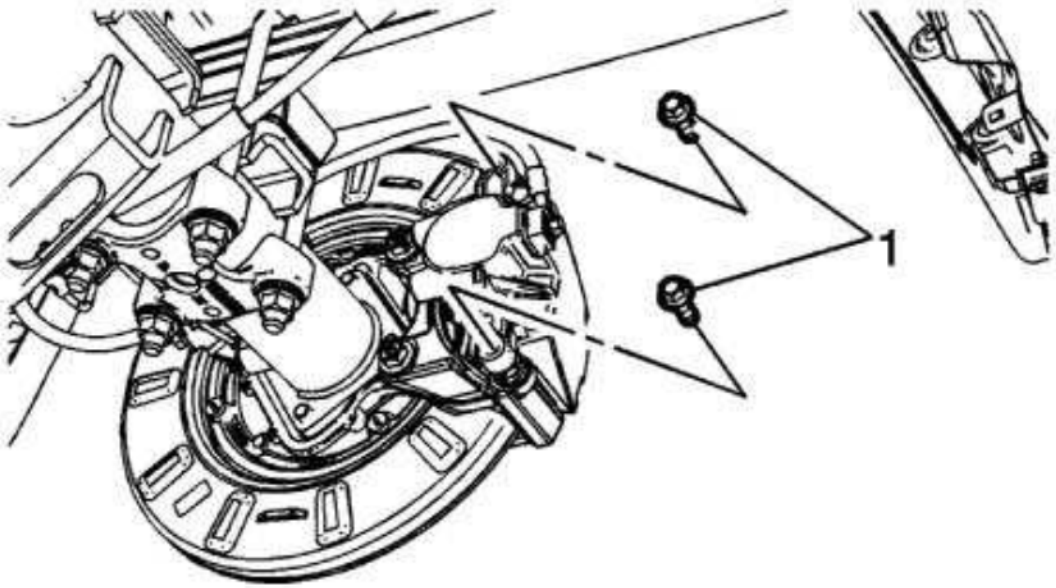


Fig. 163: Brake Caliper Guide Pin Bolts
Courtesy of GENERAL MOTORS COMPANY

9. Using a backup wrench on the brake caliper guide pins, install the brake caliper guide pin bolts (1) and tighten to 52 N.m (38 lb ft).
10. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

REAR BRAKE CALIPER BRACKET REPLACEMENT (J95)

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Removal Procedure

WARNING: **Brake Dust Warning**

1. Remove Rear Disc Brake Pads. **Rear Disc Brake Pads Replacement (J95)**

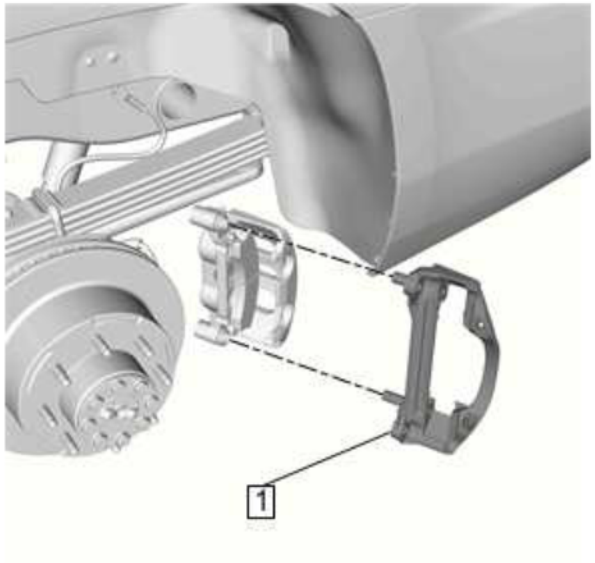


Fig. 164: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

2. Remove Brake Caliper Bracket (1).

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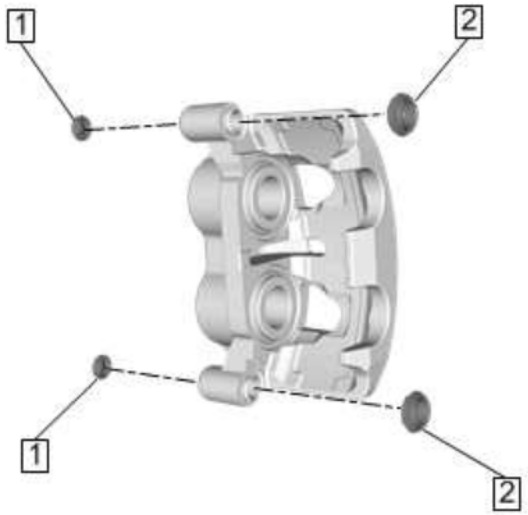
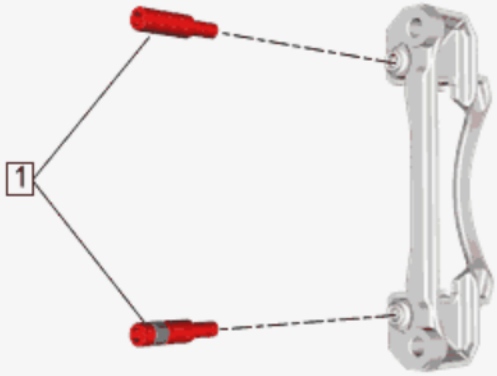


Fig. 165: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

3. Remove Seal (1).
4. Remove Boot (2).



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Fig. 166: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

5. Remove Brake Caliper Guide Pin (1).

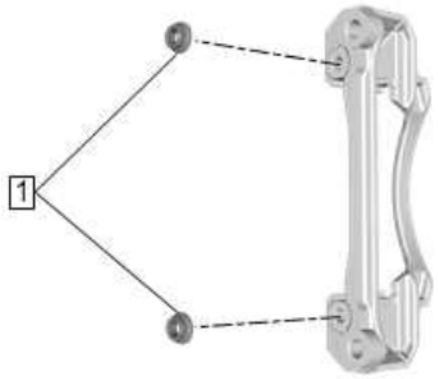


Fig. 167: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

6. Remove Brake Caliper Guide Pin Collar (1).
7. Inspect the rear disc brake hardware for damage and replace, if necessary. **Rear Disc Brake Mounting and Hardware Inspection**

Installation Procedure

1. Apply a light coating of commercially available, high temperature silicone brake lubricant to the brake caliper housing guide pin bores and guide pin surfaces:
   - Apply lubricant to the brake caliper guide pins.
   - Apply lubricant to the brake caliper guide pin seals.
2. Prepare the brake caliper guide pin threads and the brake caliper bracket threaded holes for assembly:
   - Thoroughly clean the brake caliper guide pin threads of any threadlocker residue.

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- Thoroughly clean the brake caliper bracket guide pin threaded holes of any threadlocker residue with denatured alcohol and allow to dry.

3. Apply threadlocker to the threads of the brake caliper guide pins. **Adhesives, Fluids, Lubricants, and Sealers**

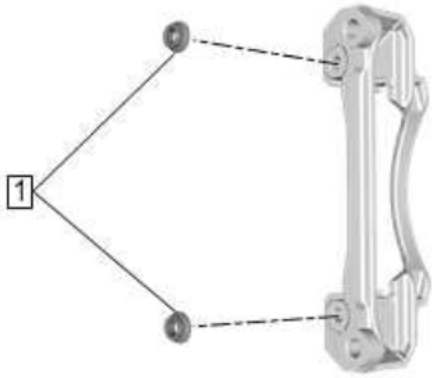


Fig. 168: Brake Caliper Guide Pin Collar
Courtesy of GENERAL MOTORS COMPANY

4. Install Brake Caliper Guide Pin Collar (1).

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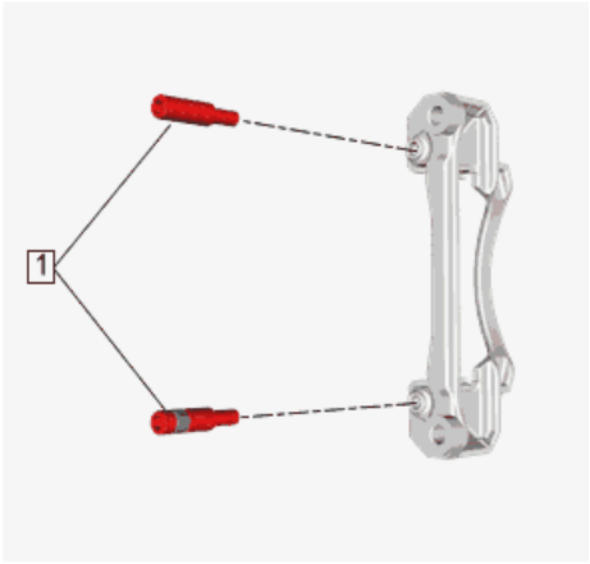


Fig. 169: Brake Caliper Guide Pin
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Fastener Caution**

NOTE: **The lower brake caliper guide pin is equipped with a bushing and must be installed in the same position.**

5. Install Brake Caliper Guide Pin (1) and tighten 105 N.m (77 lb ft)

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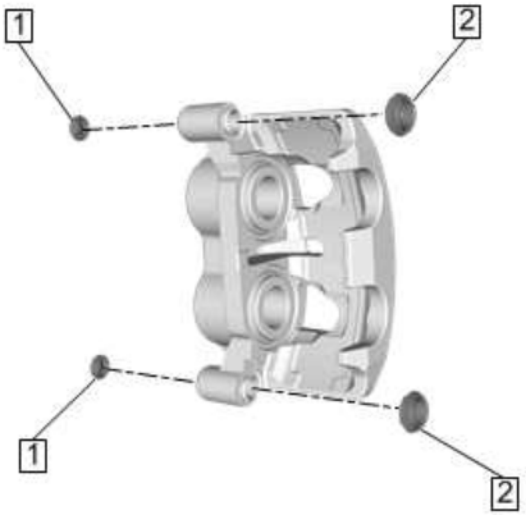
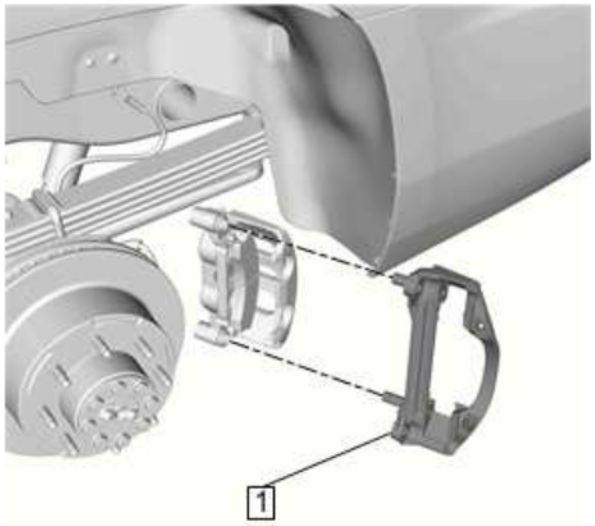


Fig. 170: Seal And Boot
Courtesy of GENERAL MOTORS COMPANY

6. Install Seal (1).
7. Install Boot (2).



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Fig. 171: Brake Caliper Bracket
Courtesy of GENERAL MOTORS COMPANY

8. Install Brake Caliper Bracket (1).
9. Ensure the disc brake caliper guide pin seals are fully seated in the grooves of the disc brake caliper housing.
10. Install Rear Disc Brake Pads. **Rear Disc Brake Pads Replacement (J95)**.

FRONT BRAKE ROTOR REPLACEMENT (JD9)

Special Tools

- **CH-41013** Rotor Resurfacing Kit
- **CH-42450-A** Wheel Hub Resurfacing Kit

For equivalent regional tools, refer to **Special Tools**.

Removal Procedure

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

CAUTION: **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.**

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

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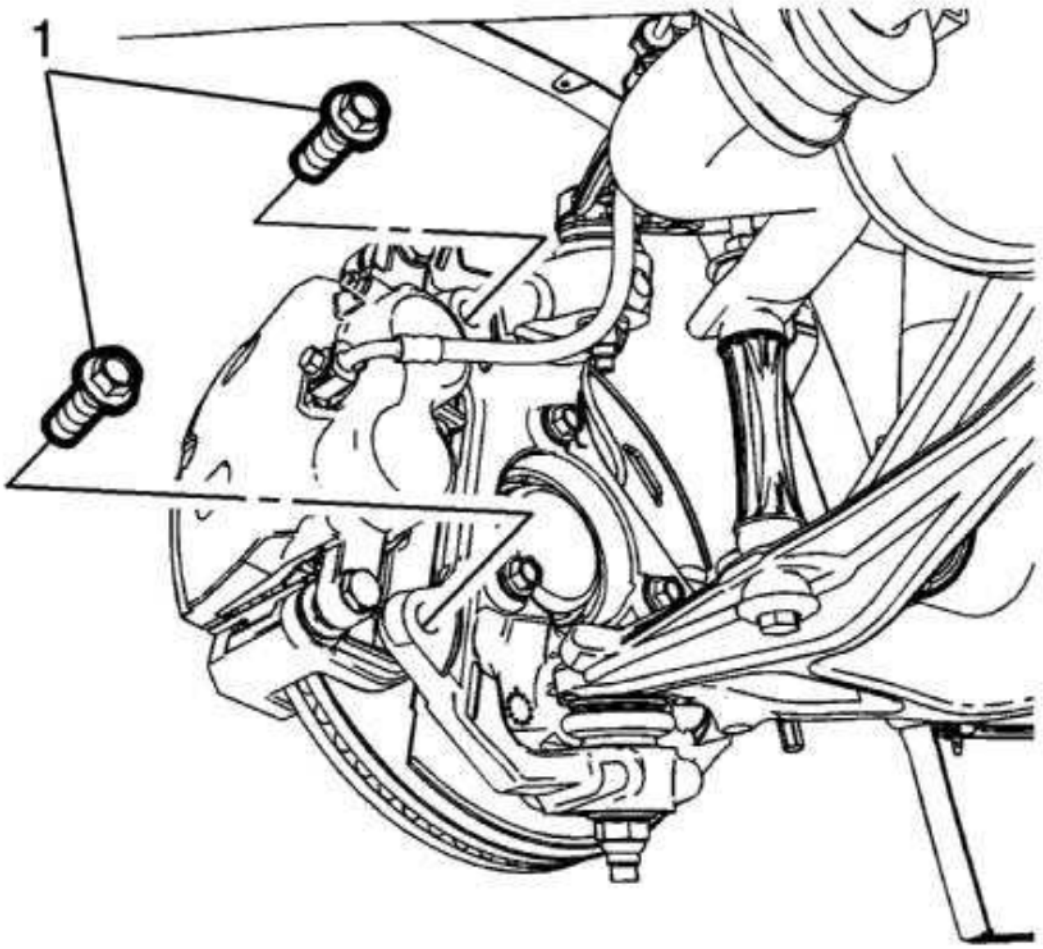


Fig. 172: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

3. Remove the brake caliper bracket bolts (1).
4. Remove the brake caliper and bracket assembly and support with heavy mechanics wire.

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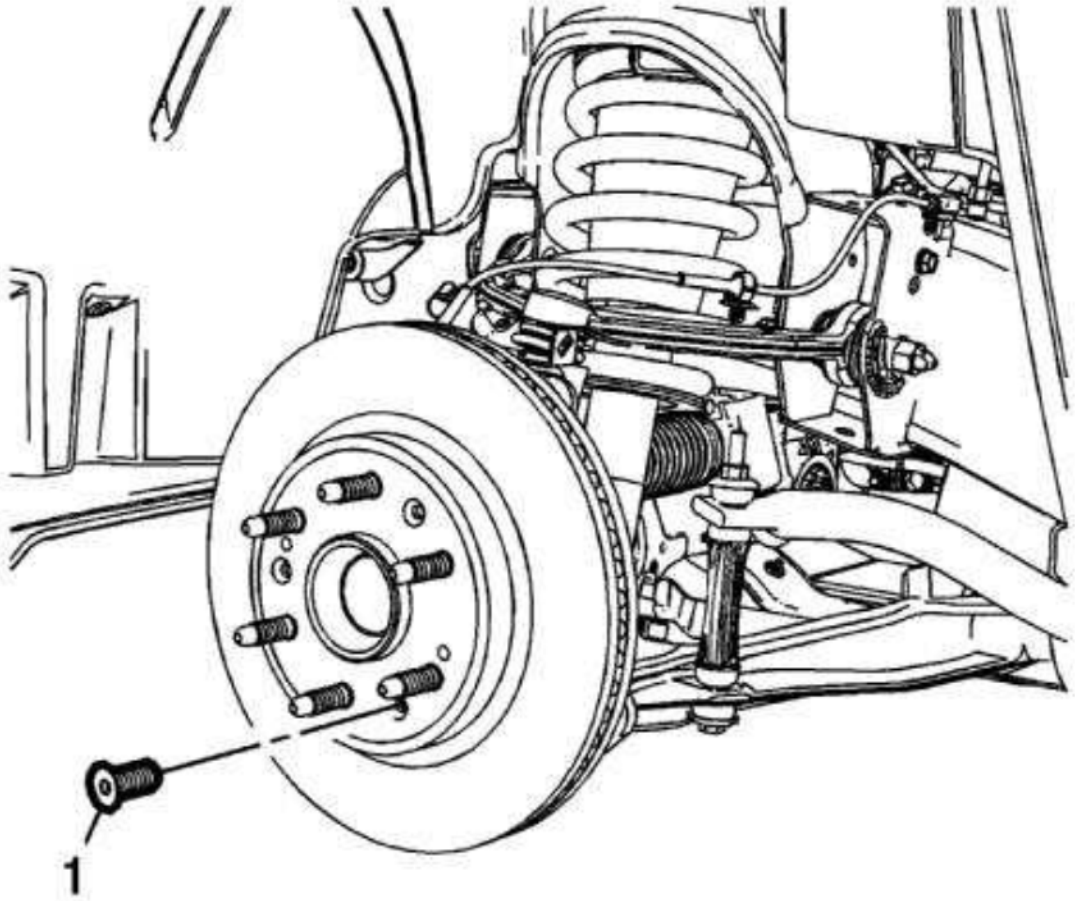


Fig. 173: Brake Rotor Bolt
Courtesy of GENERAL MOTORS COMPANY

5. Remove the brake rotor bolt (1).

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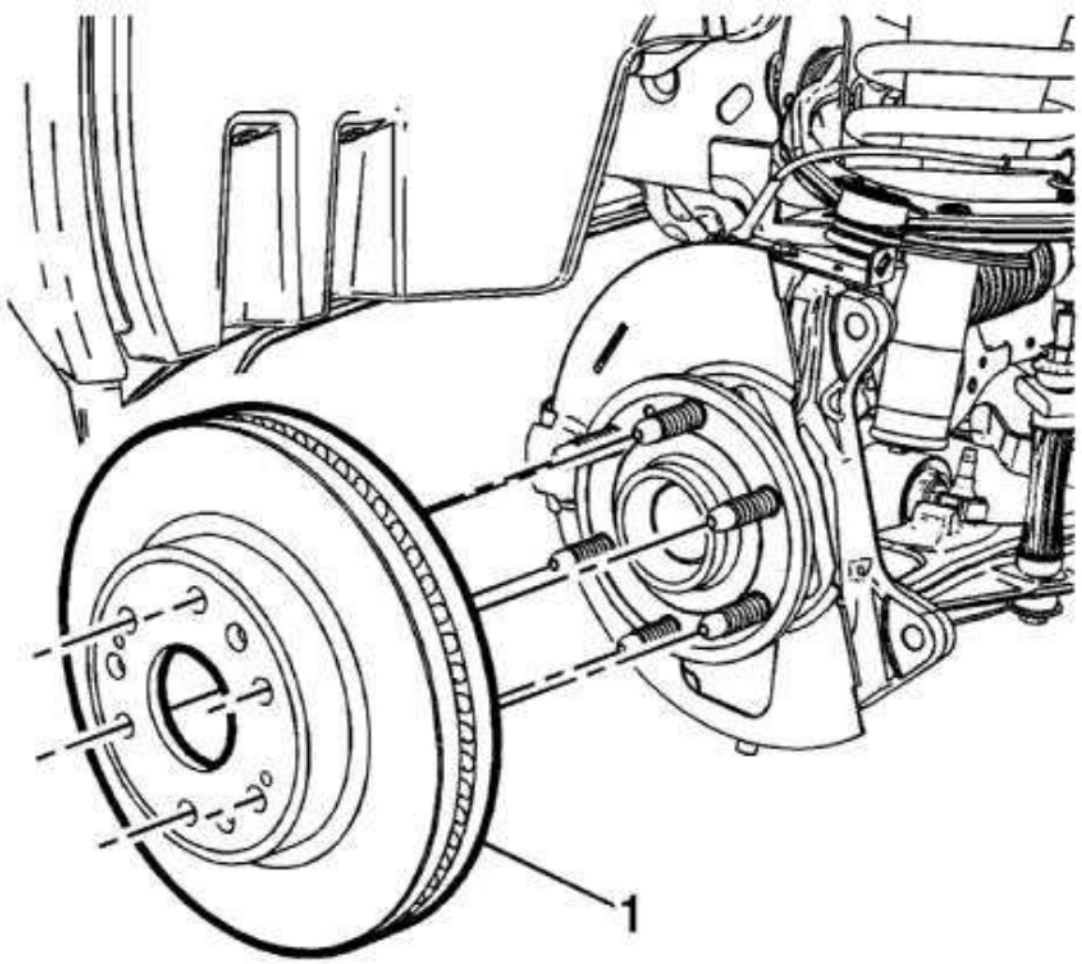


Fig. 174: Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

6. Remove the brake rotor (1).
7. If the brake rotor will not separate from the wheel hub, perform the following:
    1. Clean the brake rotor mating surface and the threaded holes in the brake rotor hub face of any accumulated corrosion.
    2. Apply a generous amount of commercially available penetrating oil or equivalent to the brake rotor mating surface, especially around the

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wheel stud holes and threaded holes in the brake rotor hub face.

3. Install 2 M10x1.5 bolts into the threaded holes in the brake rotor hub face.
4. Slowly and evenly tighten the M10x1.5 bolts to force the brake rotor from the wheel hub and bearing.

8. Using a stiff wire brush, clean any accumulated debris and corrosion from the mating surfaces of the wheel hub and brake rotor.
9. Remove any burrs or raised metal that may have been created by the M10x1.5 forcing bolts.

Installation Procedure

NOTE: **Whenever the brake rotor has been separated from the hub/axle flange, any rust or contaminants should be cleaned from the hub/axle flange and the brake rotor mating surfaces. Failure to do this may result in excessive assembled lateral runout (LRO) of the brake rotor, which could lead to brake pulsation.**

1. Using the **CH-42450-A** Wheel Hub Resurfacing Kit, thoroughly clean any rust or corrosion from the mating surface of the hub/axle flange.
2. Using the **CH-41013** Rotor Resurfacing Kit, thoroughly clean any rust or corrosion from the mating surface and mounting surface of the brake rotor.
3. Inspect the mating surfaces of the hub/axle flange and the rotor to ensure there are no foreign particles or debris remaining.

NOTE: **If reusing the brake caliper bracket bolts, the threads of the caliper bracket bolts and threaded holes of the caliper bracket must be free of residue and debris prior to the application of threadlocker to ensure proper adhesion and fastener retention.**

4. Prepare the brake caliper bracket bolts and bracket threaded holes for assembly:
   - Thoroughly clean the residue from the bolt threads with denatured alcohol and allow to dry.
   - Thoroughly clean the residue from the threaded holes of the caliper bracket with denatured alcohol and allow to dry.
   - Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolts. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
   - Ensure there are no gaps in the threadlocker along the filled area of the bolts.
   - Allow the threadlocker to cure approximately 10 minutes before installation.

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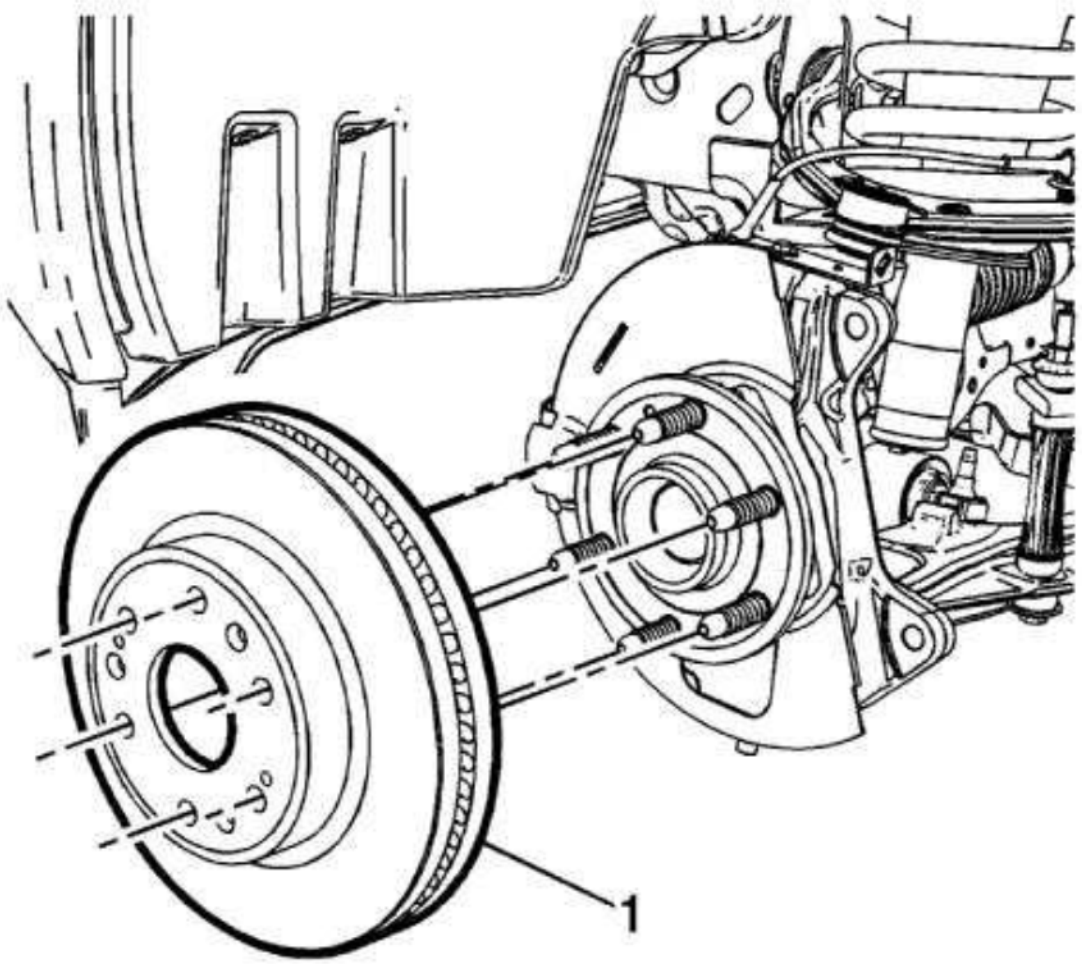


Fig. 175: Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

5. Install the brake rotor (1).

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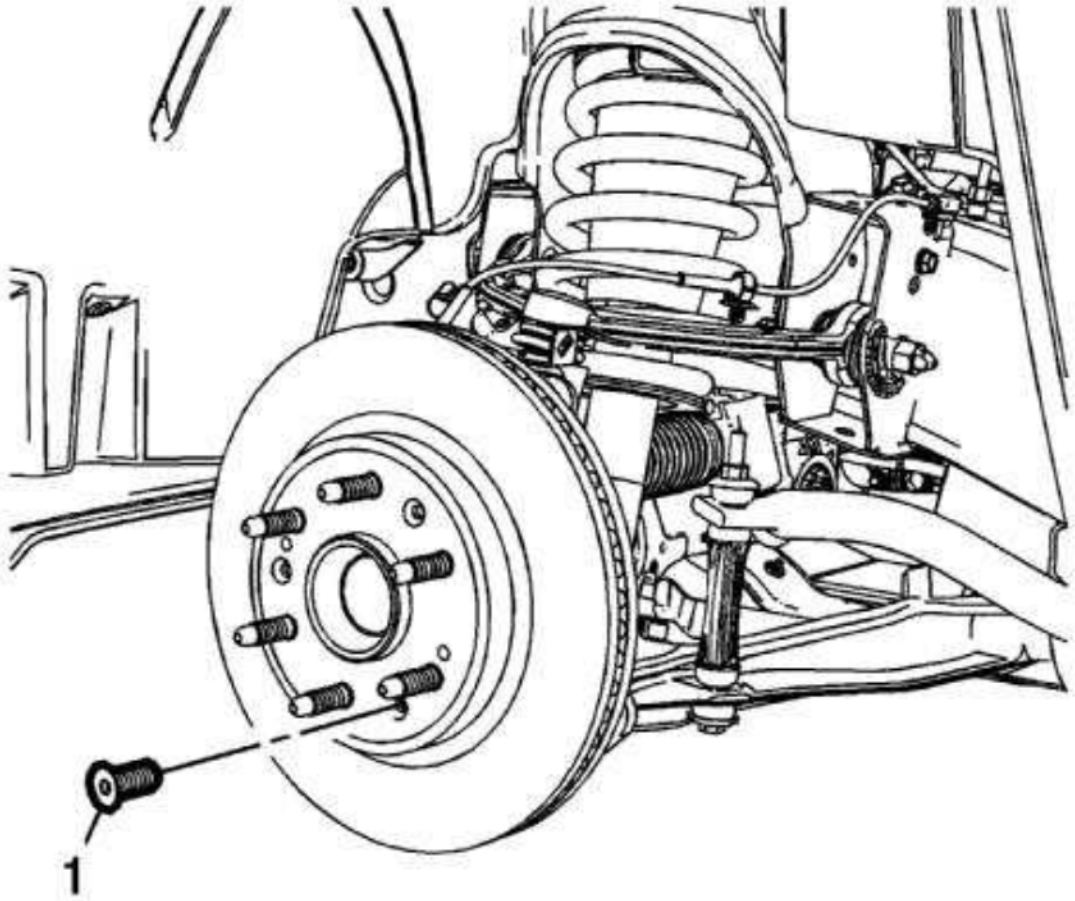


Fig. 176: Brake Rotor Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

6. Install the brake rotor bolt (1) and tighten to 12 N.m (106 lb in).
7. Install the disc brake caliper and bracket assembly.

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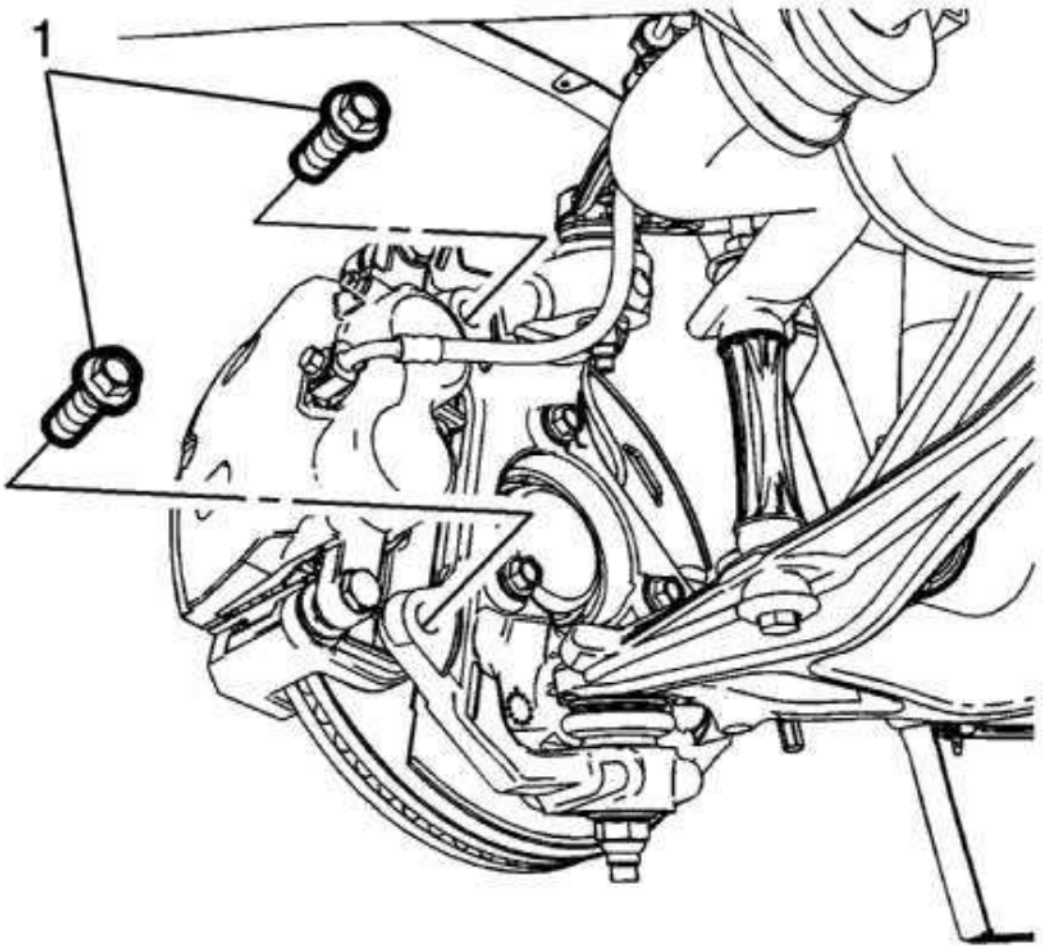


Fig. 177: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

8. Install the brake caliper bracket bolts (1) and tighten to 230 N.m (170 lb ft).
9. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
10. If the brake rotor was refinished or replaced, or if new brake pads were installed, burnish the pads and rotors. Refer to **Brake Pad and Rotor**

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Burnishing.

FRONT BRAKE ROTOR REPLACEMENT (J95)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel) .

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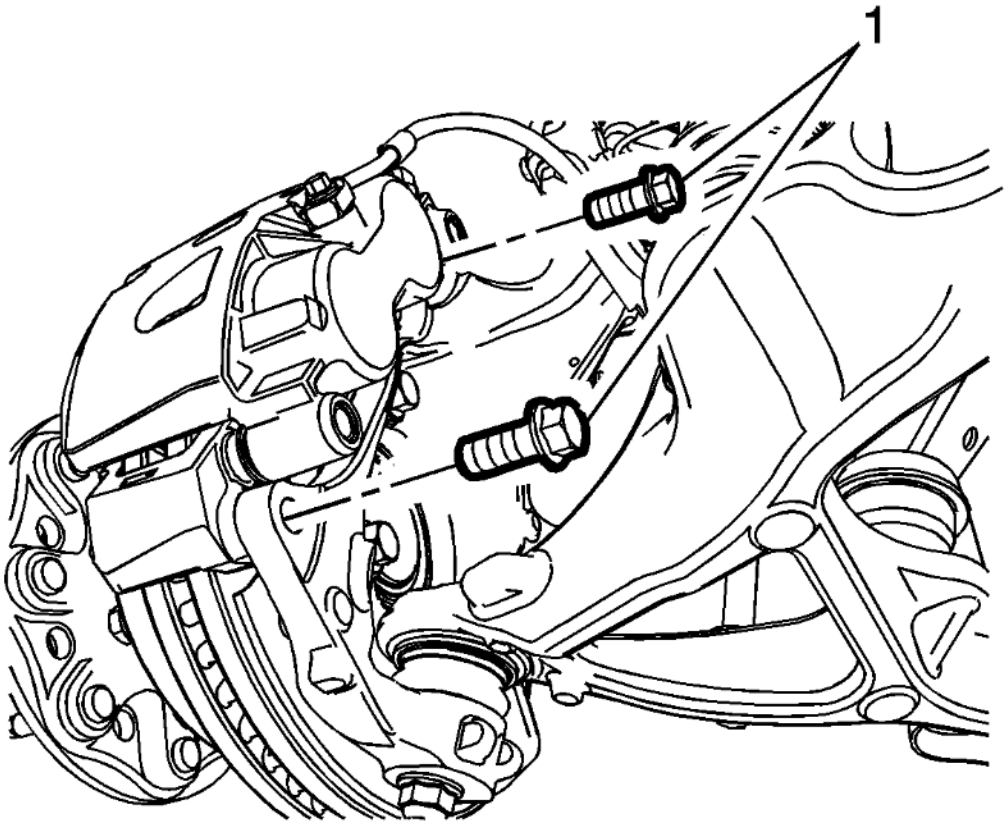


Fig. 178: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not remove the brake caliper guide pins unless replacement is required.**

3. Remove the brake caliper bracket bolts (1).

CAUTION: **Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its**

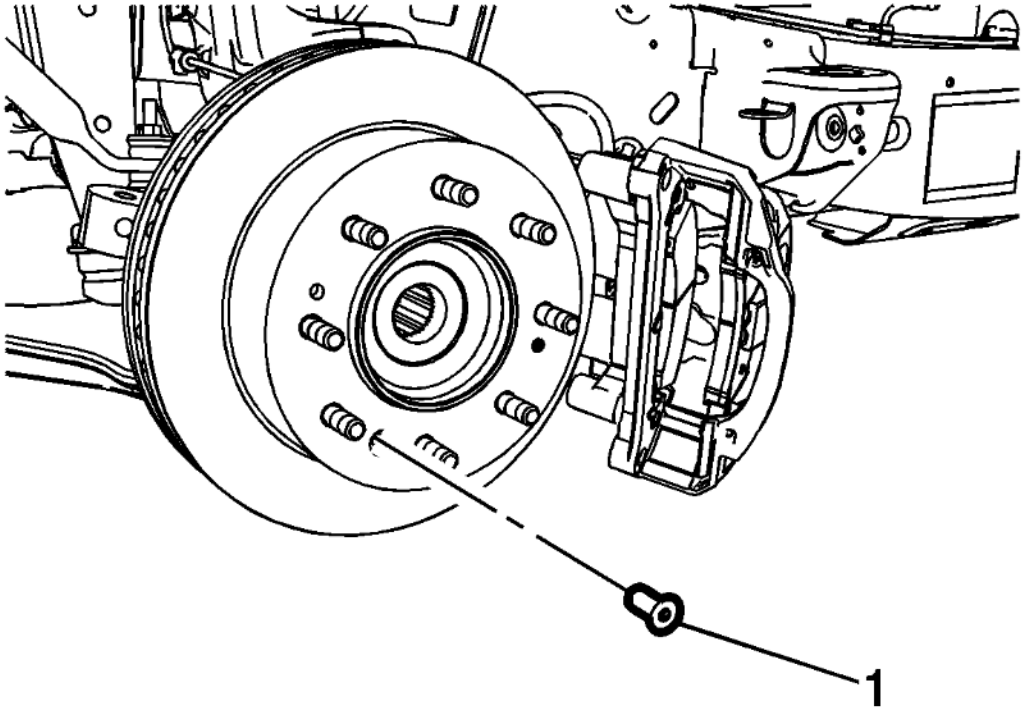
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mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake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

4. Remove the brake caliper and bracket assembly and support with heavy mechanics wire or equivalent.

   If necessary, use a large C-clamp to slightly compress the brake caliper pistons to ease removal.



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Fig. 179: Identifying Brake Rotor Bolt
Courtesy of GENERAL MOTORS COMPANY

5. Remove the brake rotor bolt (1).
6. If installing the original brake rotor, mark the relationship of the rotor to the hub.

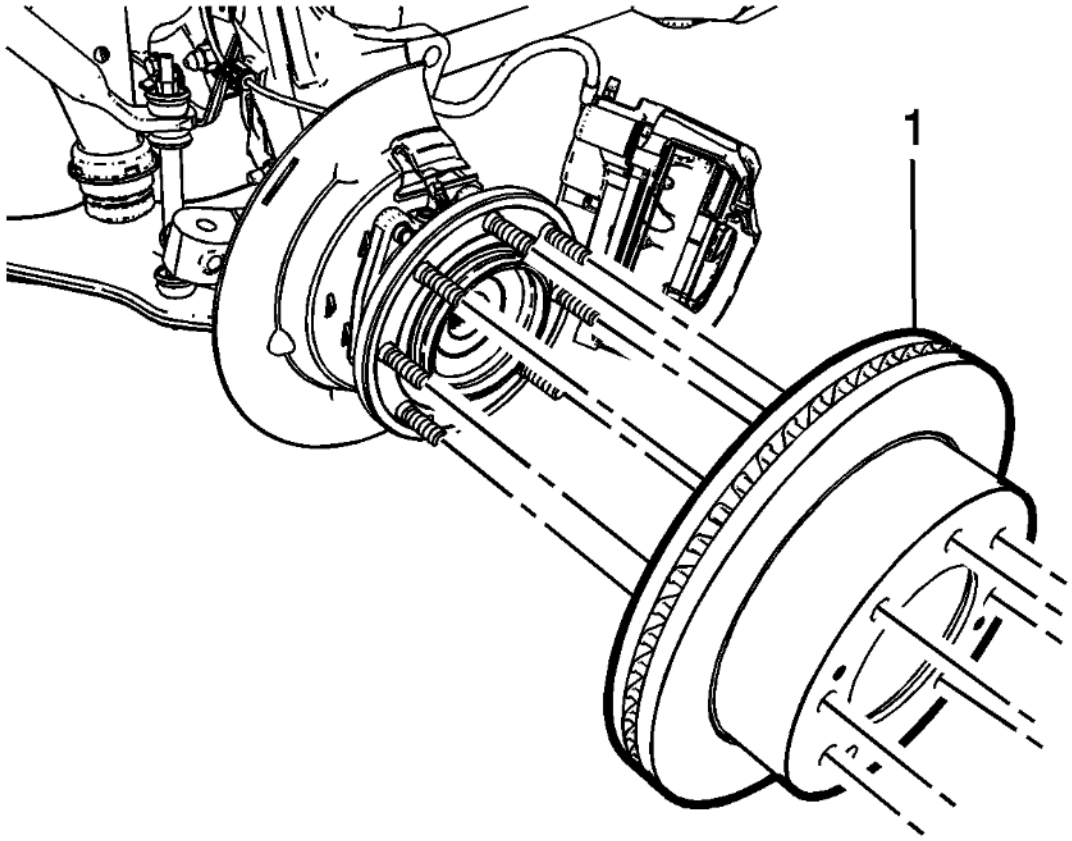


Fig. 180: Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

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7. Remove the rotor (1) from the hub.
8. If the brake rotor will not separate from the wheel hub, perform the following:
    1. Clean the brake rotor mating surfaces and the threaded holes on the brake rotor hub face of any accumulated corrosion.
    2. Apply a generous amount of penetrating oil or equivalent to the brake rotor mating surfaces, particularly around the wheel hub studs.
    3. Insert 2 M10 x1.5 bolts or jack screws into the threads holes of the brake rotor hub face.
    4. Tighten the bolts evenly to force the brake rotor from the wheel hub.
9. Using a stiff wire brush, clean any accumulated debris and corrosion from the mating surfaces of the hub and rotor.
10. Remove any burrs or raised metal created by the bolts or jack screws.

Installation Procedure

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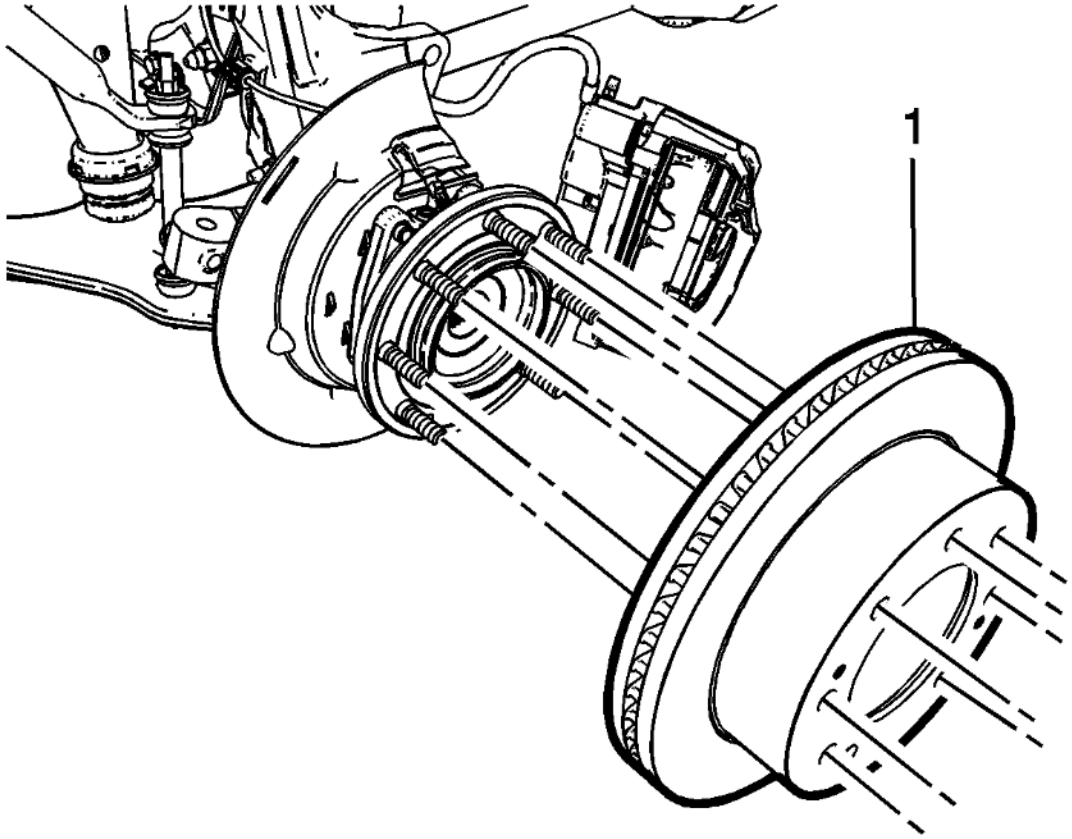


Fig. 181: Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If installing the original brake rotor, align the relationship mark made during removal.**

1. Install the rotor (1) to the hub.

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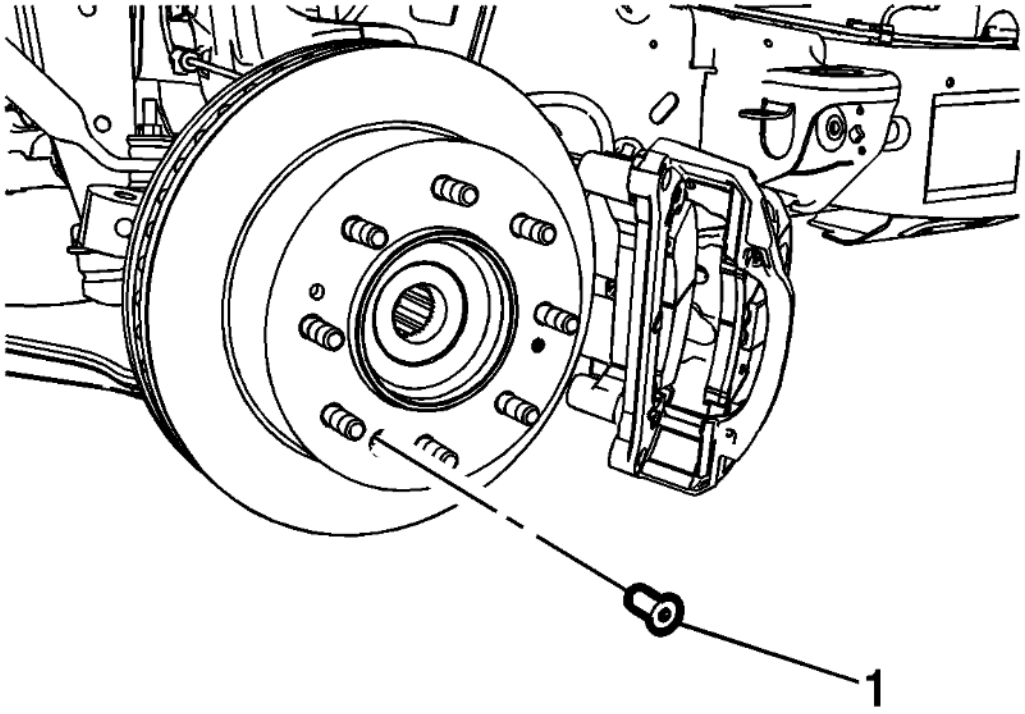


Fig. 182: Identifying Brake Rotor Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

2. Install the brake rotor bolt (1) and tighten to 12 N.m (106 lb in).
3. Prepare the brake caliper bracket bolts and the threaded holes for assembly.

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- Thoroughly clean the brake caliper bracket bolts of any threadlocker residue.
- Thoroughly clean the brake caliper bracket threaded holes of any threadlocker residue with denatured alcohol and allow to dry.

4. Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolt. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
5. Allow the threadlocker to cure approximately 10 minutes before assembly.
6. Install the brake caliper and bracket assembly.

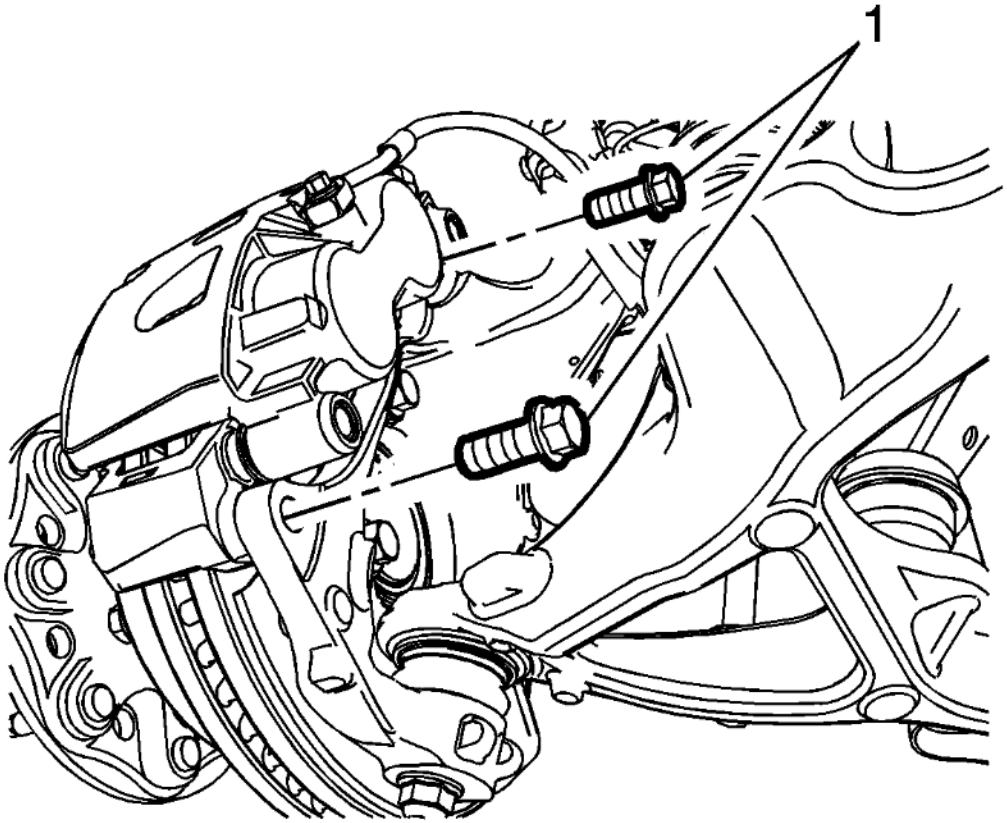


Fig. 183: Brake Caliper Bracket Bolts

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Courtesy of GENERAL MOTORS COMPANY

7. Install the brake caliper bracket bolts (1) and tighten to 300 N.m (221 lb ft).
8. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
9. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
10. Slowly release the brake pedal.
11. Wait 15 seconds, then repeat steps 9-10 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
12. If the brake rotor was refinished or replaced, burnish the brake pads and rotors. Refer to **Brake Pad and Rotor Burnishing**.

REAR BRAKE ROTOR REPLACEMENT (JD9)

Special Tools

- **CH-41013** Rotor Resurfacing Kit
- **CH-42450-A** Wheel Hub Resurfacing Kit

For equivalent regional tools, refer to **Special Tools**.

Removal Procedure

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

CAUTION: **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.**

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

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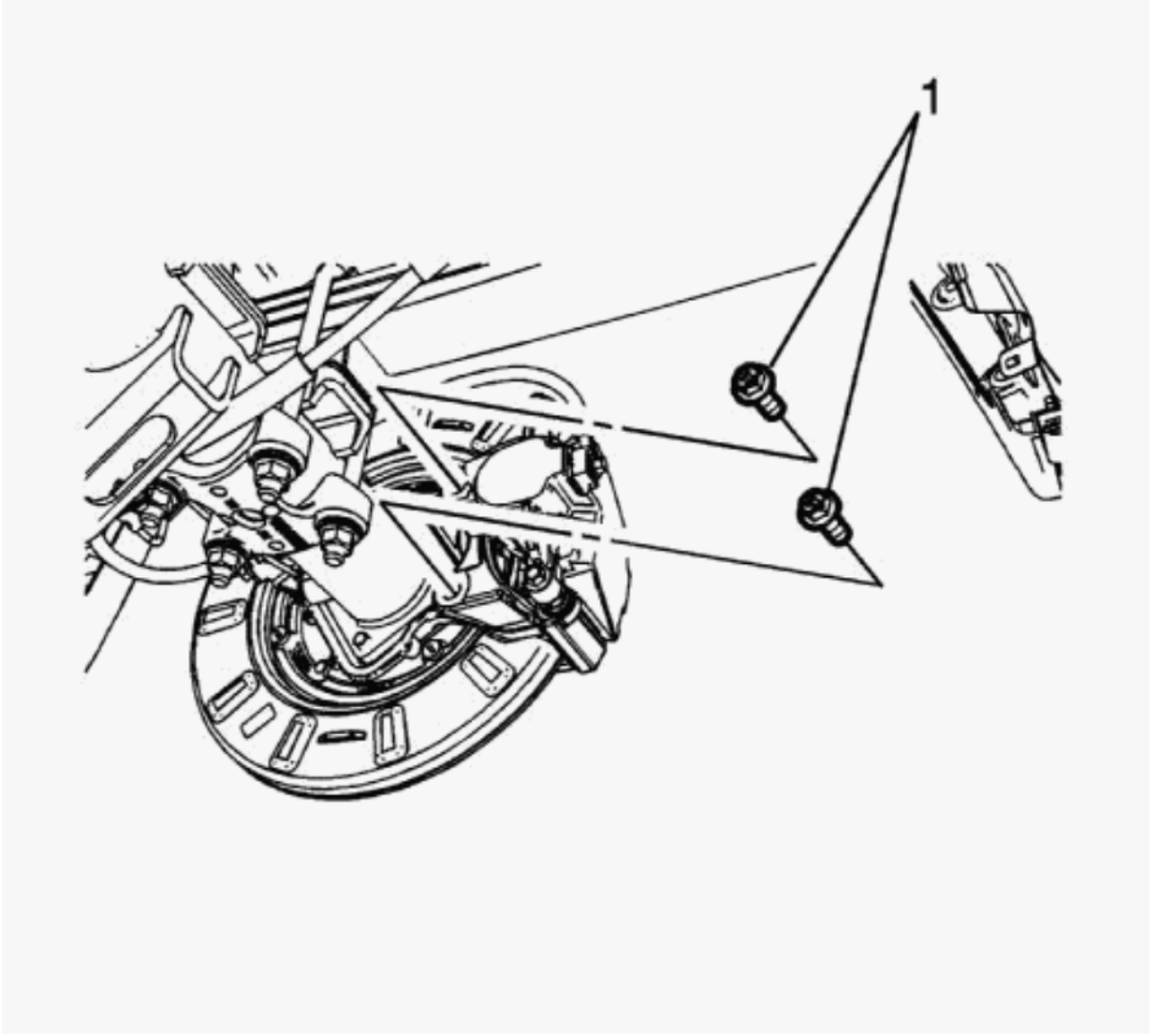


Fig. 184: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

3. Remove the brake caliper bracket bolts (1).
4. Remove the brake caliper and bracket assembly and support with heavy mechanics wire.

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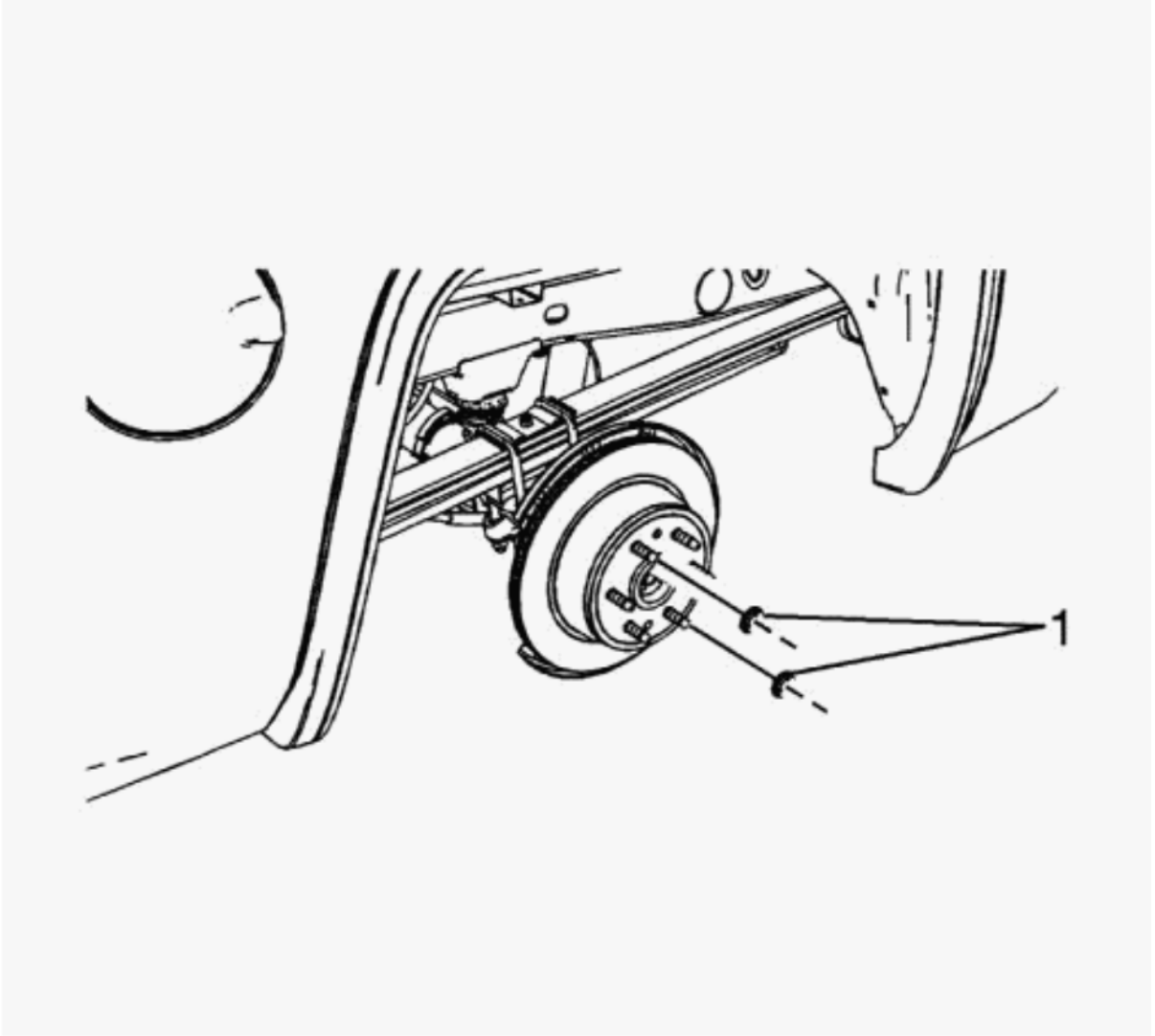


Fig. 185: Discard Brake Rotor Retainers
Courtesy of GENERAL MOTORS COMPANY

5. Remove and discard the brake rotor retainers (1).

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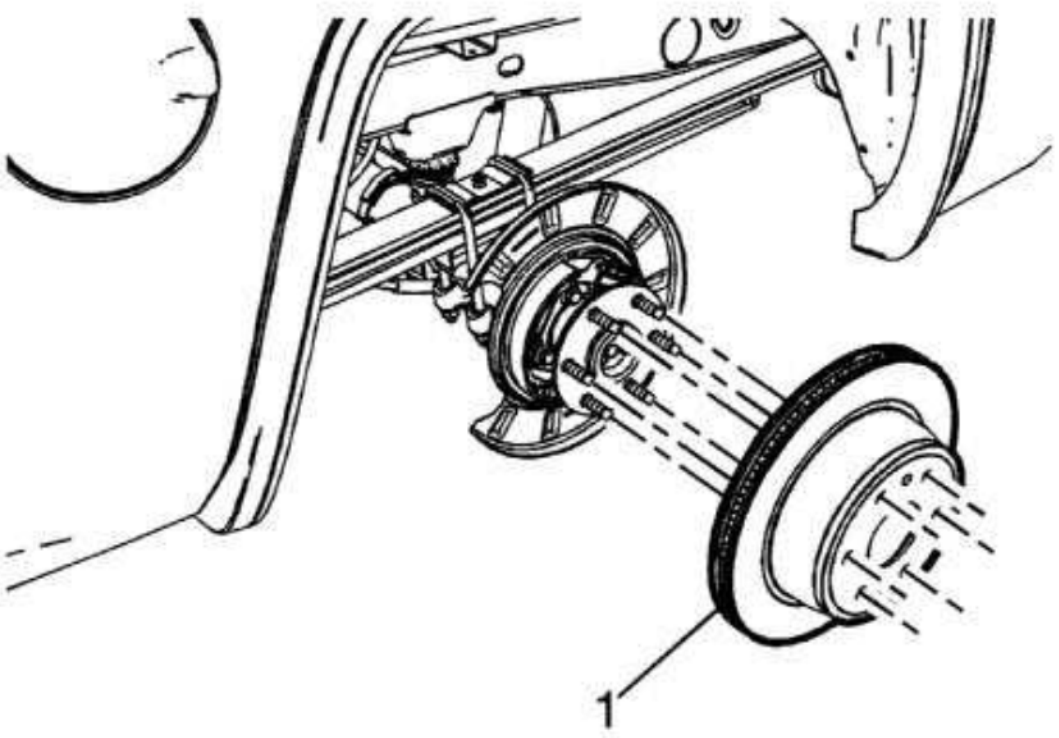


Fig. 186: Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

6. Remove the brake rotor (1).

Installation Procedure

NOTE: **Whenever the brake rotor has been separated from the hub/axle flange, any rust or contaminants should be**

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cleaned from the hub/axle flange and the brake rotor mating surfaces. Failure to do this may result in excessive assembled lateral runout (LRO) of the brake rotor, which could lead to brake pulsation.

1. Using the **CH-42450-A** Wheel Hub Resurfacing Kit, thoroughly clean any rust or corrosion from the mating surface of the hub/axle flange.
2. Using the **CH-41013** Rotor Resurfacing Kit, thoroughly clean any rust or corrosion from the mating surface and mounting surface of the brake rotor.
3. Inspect the mating surfaces of the hub/axle flange and the rotor to ensure there are no foreign particles or debris remaining.

NOTE: **If reusing the brake caliper bracket bolts, the threads of the caliper bracket bolts and threaded holes of the caliper bracket must be free of residue and debris prior to the application of threadlocker to ensure proper adhesion and fastener retention.**

4. Prepare the brake caliper bracket bolts and bracket threaded holes for assembly:
   - Thoroughly clean the residue from the bolt threads with denatured alcohol and allow to dry.
   - Thoroughly clean the residue from the threaded holes of the caliper bracket with denatured alcohol and allow to dry.
   - Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolts. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
   - Ensure there are no gaps in the threadlocker along the filled area of the bolts.
   - Allow the threadlocker to cure approximately 10 minutes before installation.

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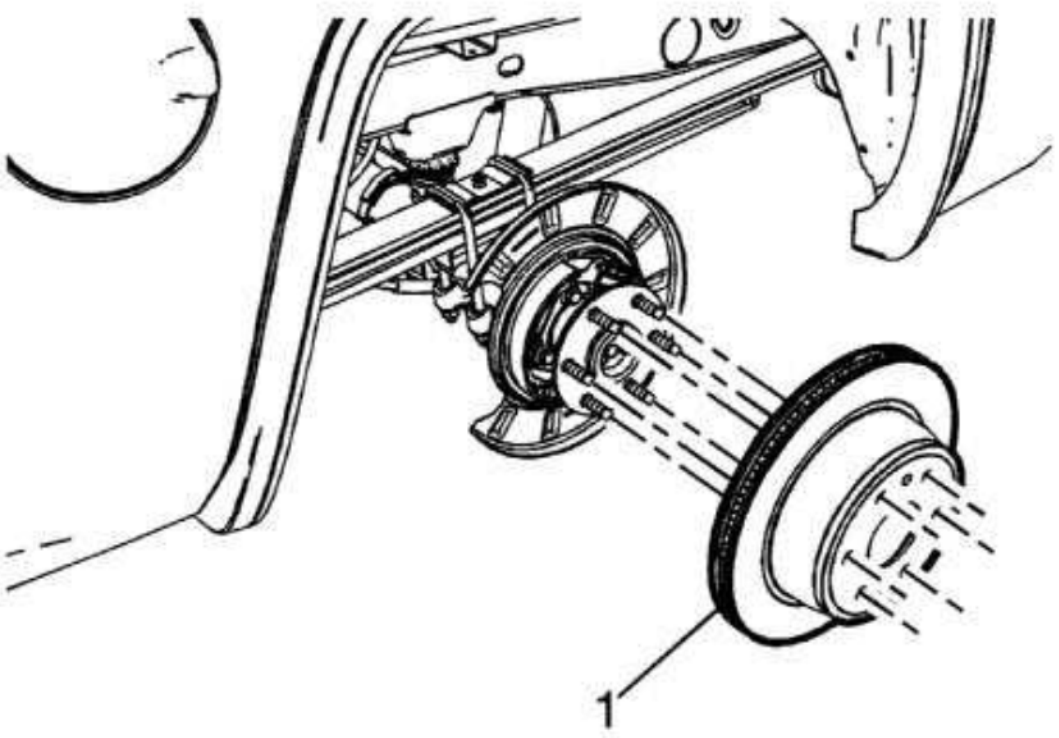


Fig. 187: Brake Rotor
Courtesy of GENERAL MOTORS COMPANY

5. Install the brake rotor (1).
6. Install the disc brake caliper and bracket assembly.

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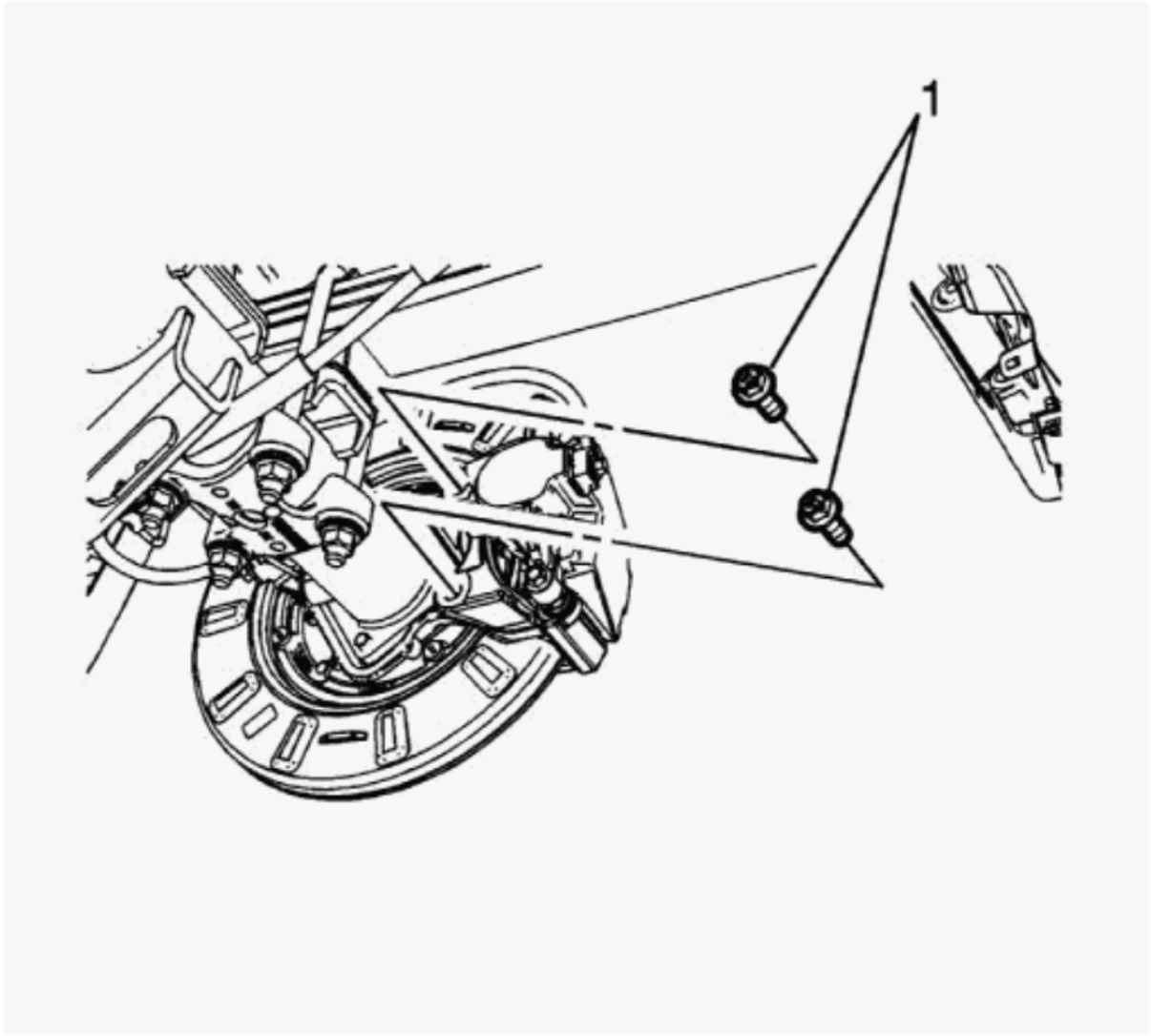


Fig. 188: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

7. Install the brake caliper bracket bolts (1) and tighten to 200 N.m (148 lb ft).
8. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

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9. If the brake rotor was refinished or replaced, or if new brake pads were installed, burnish the pads and rotors. Refer to **Brake Pad and Rotor Burnishing**.

REAR BRAKE ROTOR REPLACEMENT (J95)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

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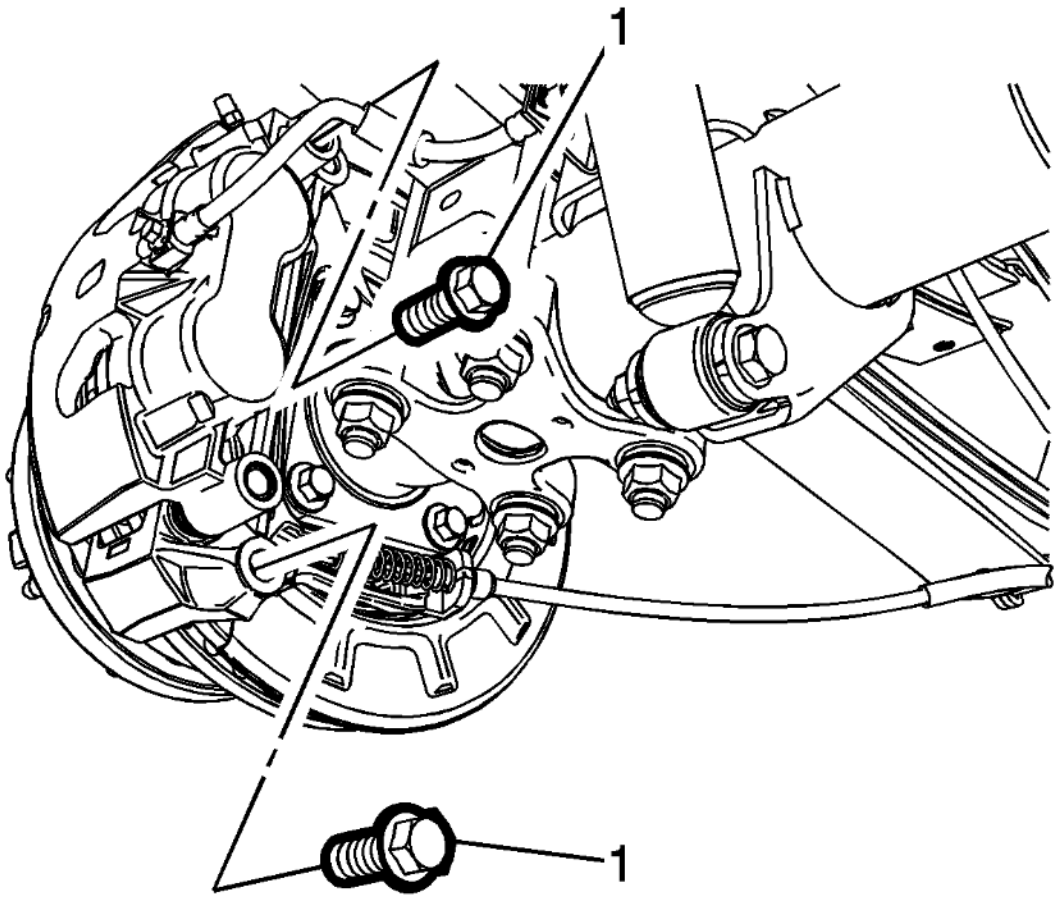


Fig. 189: Brake Caliper Bracket Bolts
Courtesy of GENERAL MOTORS COMPANY

NOTE: **Do not remove the brake caliper guide pins unless replacement is required.**

3. Remove the brake caliper bracket bolts (1).

CAUTION: **Support the brake caliper with heavy mechanic wire, or equivalent, whenever it is separated from its**

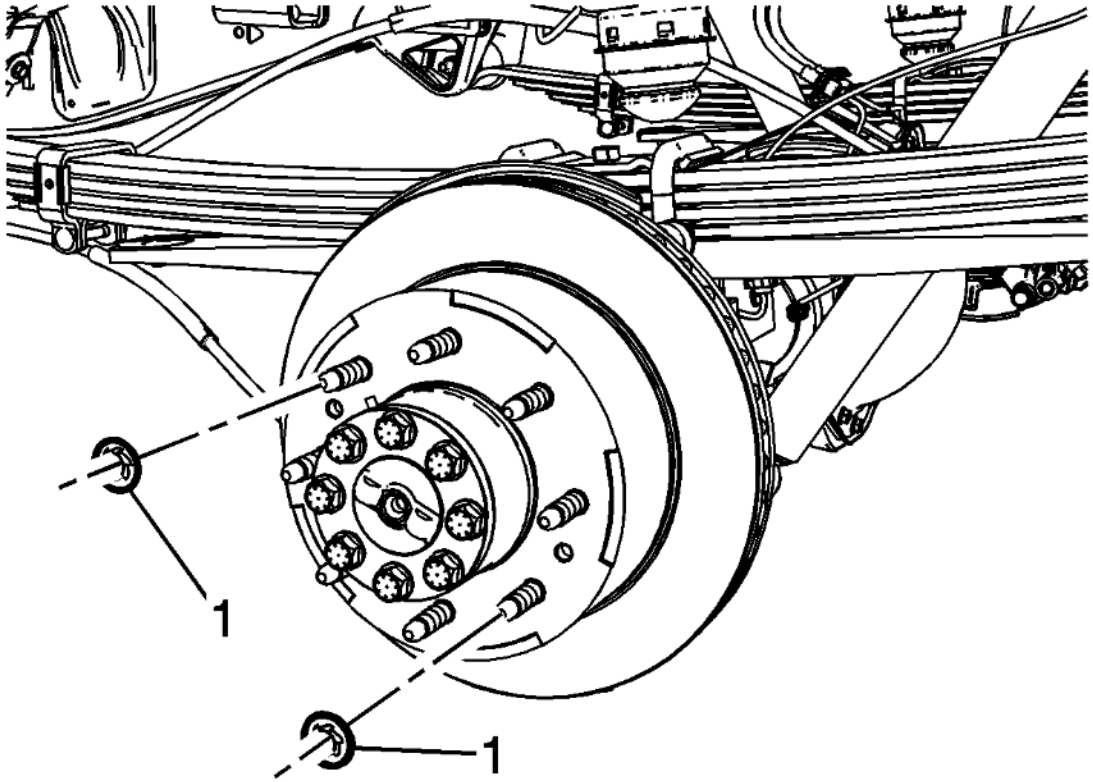
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mount and the hydraulic flexible brake hose is still connected. Failure to support the caliper in this manner will cause the flexible brake hose to bear the weight of the caliper, which may cause damage to the brake hose and in turn may cause a brake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

4. Remove the brake caliper and bracket assembly and support with heavy mechanics wire or equivalent.

   If necessary, use a large C-clamp to slightly compress the brake caliper pistons to ease removal.



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Fig. 190: Brake Rotor Pushnuts
Courtesy of GENERAL MOTORS COMPANY

5. Remove and discard the brake rotor pushnuts (1), if equipped.
6. If installing the original brake rotor, mark the relationship of the rotor to the hub.

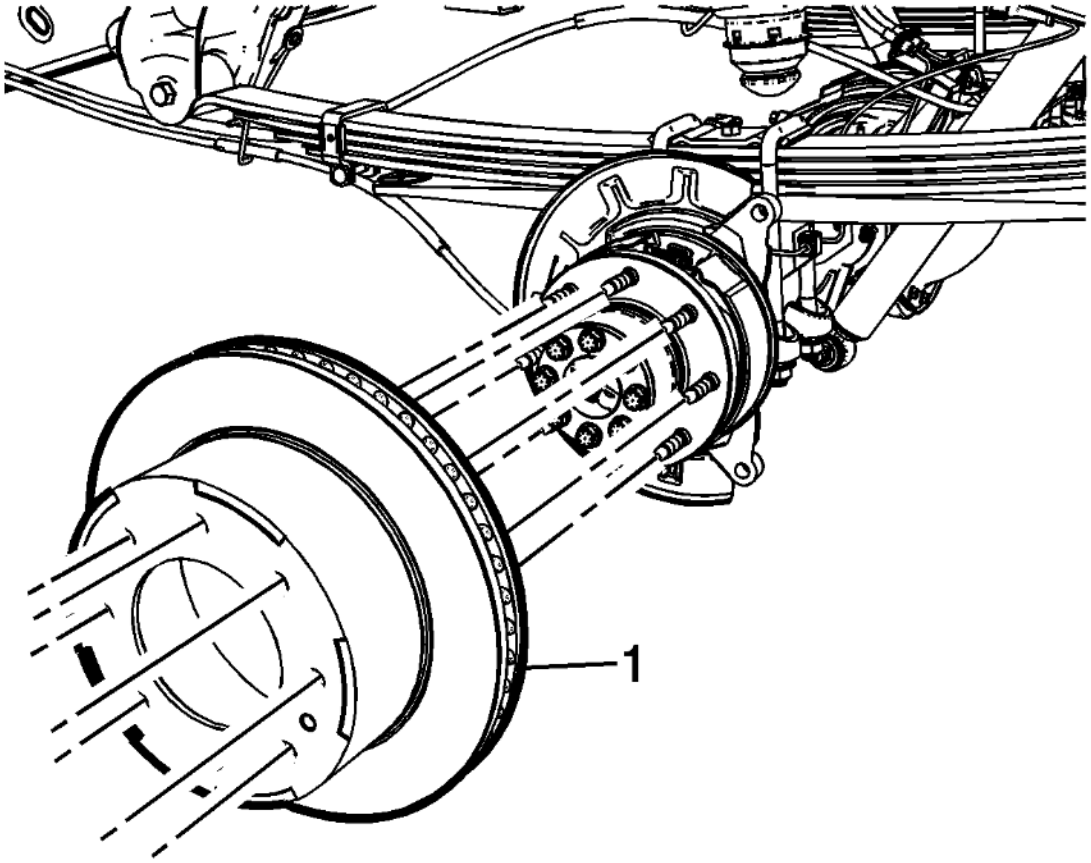


Fig. 191: Rotor
Courtesy of GENERAL MOTORS COMPANY

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7. Remove the rotor (1) from the hub.
8. If the brake rotor will not separate from the wheel hub, perform the following:
    1. Clean the brake rotor mating surfaces and threaded holes on the brake rotor hub face of any accumulated corrosion.
    2. Apply a generous amount of penetrating oil or equivalent to the brake rotor mating surfaces, particularly around the wheel hub studs.
    3. Insert 2 M10 x1.5 bolts or jack screws into the threads holes of the brake rotor hub face.
    4. Tighten the bolts evenly to force the brake rotor from the wheel hub.
9. Using a stiff wire brush, clean any accumulated debris and corrosion from the mating surfaces of the hub and rotor.
10. Remove any burrs or raised metal created by the bolts or jack screws.

Installation Procedure

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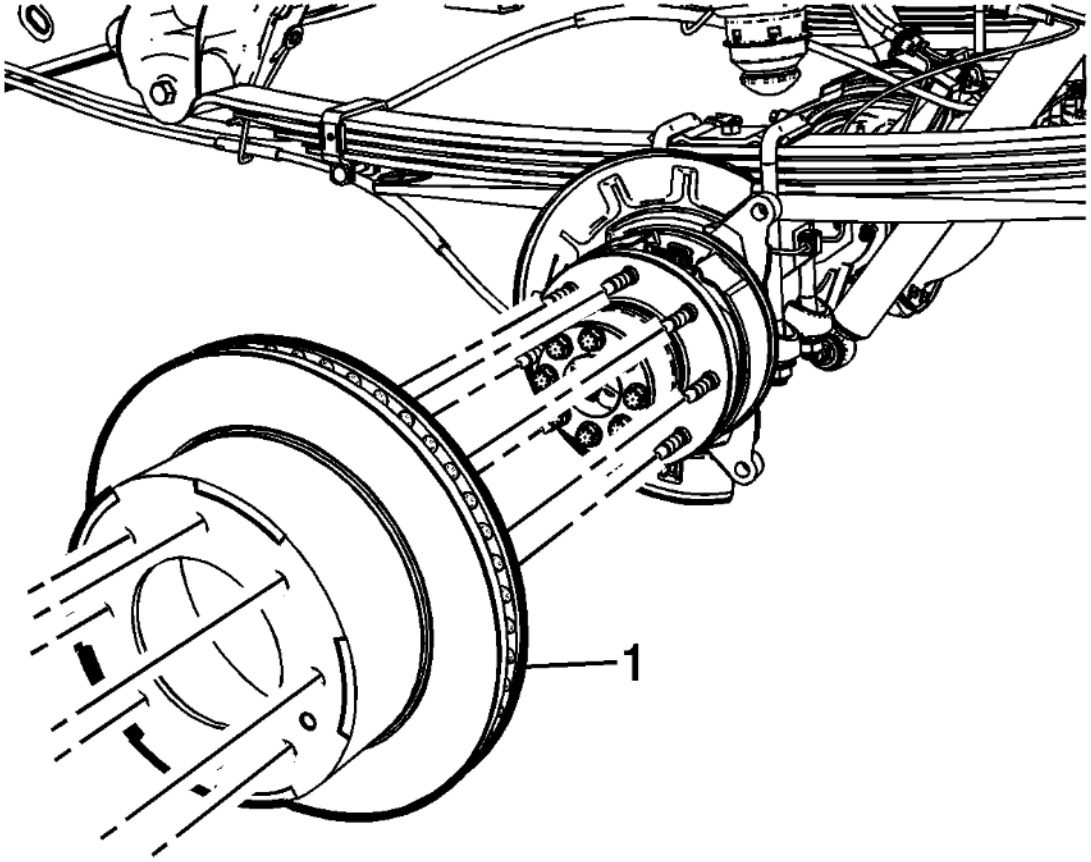


Fig. 192: Rotor
Courtesy of GENERAL MOTORS COMPANY

NOTE: **If installing the original brake rotor, align the relationship mark made during removal.**

1. Install the rotor (1) to the hub.
2. Prepare the brake caliper bracket bolts and the rear axle threaded holes for assembly.

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- Thoroughly clean the brake caliper bracket bolts of any threadlocker residue.
- Thoroughly clean the rear axle threaded holes of any threadlocker residue with denatured alcohol and allow to dry.

3. Apply threadlocker to 2/3 of the threaded length of the brake caliper bracket bolt. Refer to **Adhesives, Fluids, Lubricants, and Sealers**.
4. Allow the threadlocker to cure approximately 10 minutes before assembly.
5. Install the brake caliper and bracket assembly.

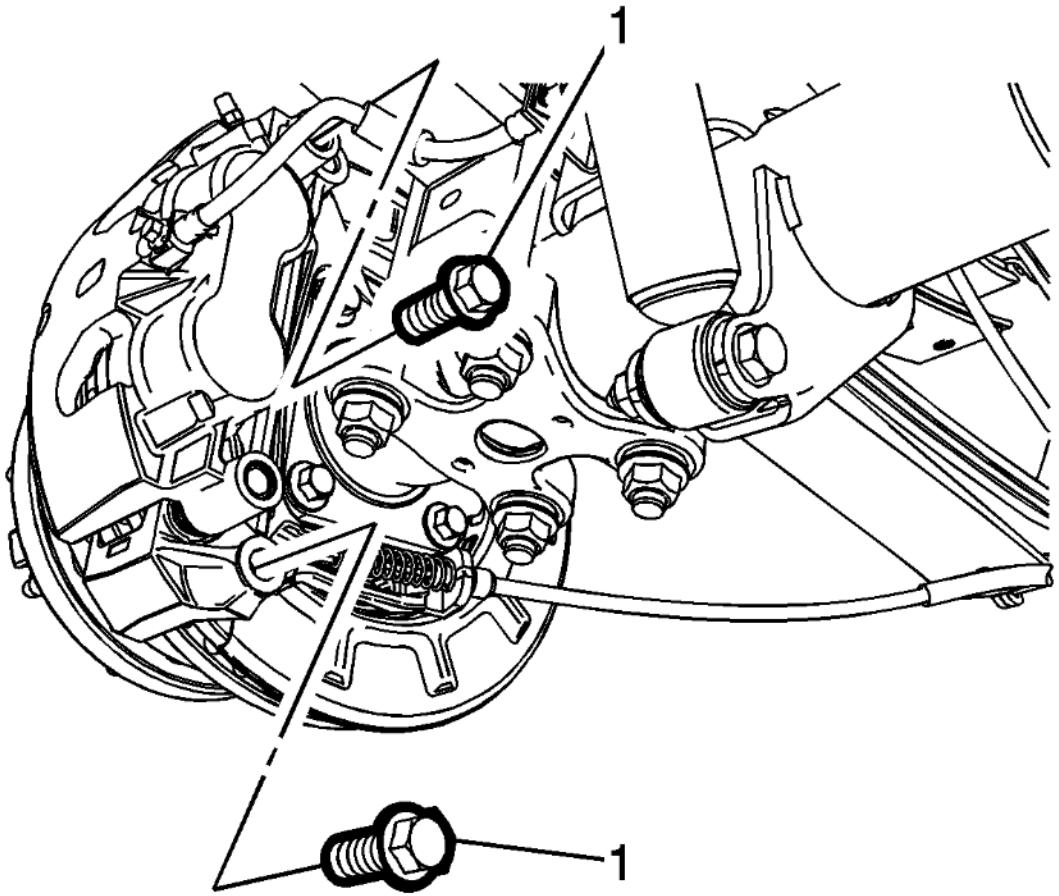


Fig. 193: Brake Caliper Bracket Bolts

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Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

6. Install the brake caliper bracket bolts (1) and tighten to 300 N.m (221 lb ft).
7. Adjust the parking brake, if necessary. Refer to **Parking Brake Adjustment** .
8. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
9. With the engine OFF, gradually apply the brake pedal to approximately 2/3 of its travel distance.
10. Slowly release the brake pedal.
11. Wait 15 seconds, then repeat steps 9-10 until a firm pedal is obtained. This will properly seat the brake caliper pistons and brake pads.
12. If the brake rotor was refinished or replaced, burnish the brake pads and rotors. Refer to **Brake Pad and Rotor Burnishing**.

FRONT BRAKE SHIELD REPLACEMENT (J95)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
3. Remove the wheel front wheel bearing and hub assembly. Refer to **Front Wheel Hub, Bearing, and Seal Replacement (Light Duty)** **Front Wheel Hub, Bearing, and Seal Replacement (Heavy Duty)** .

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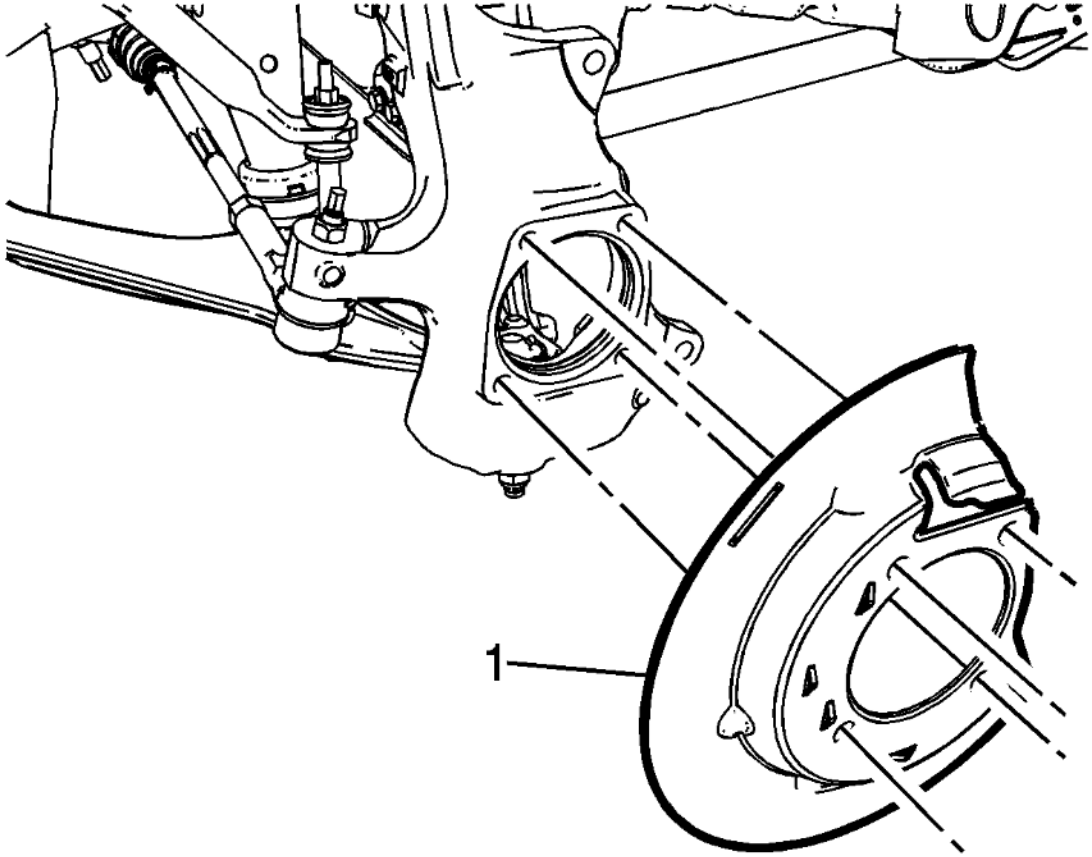


Fig. 194: Front Brake Shield
Courtesy of GENERAL MOTORS COMPANY

4. Remove the front brake shield (1).

Installation Procedure

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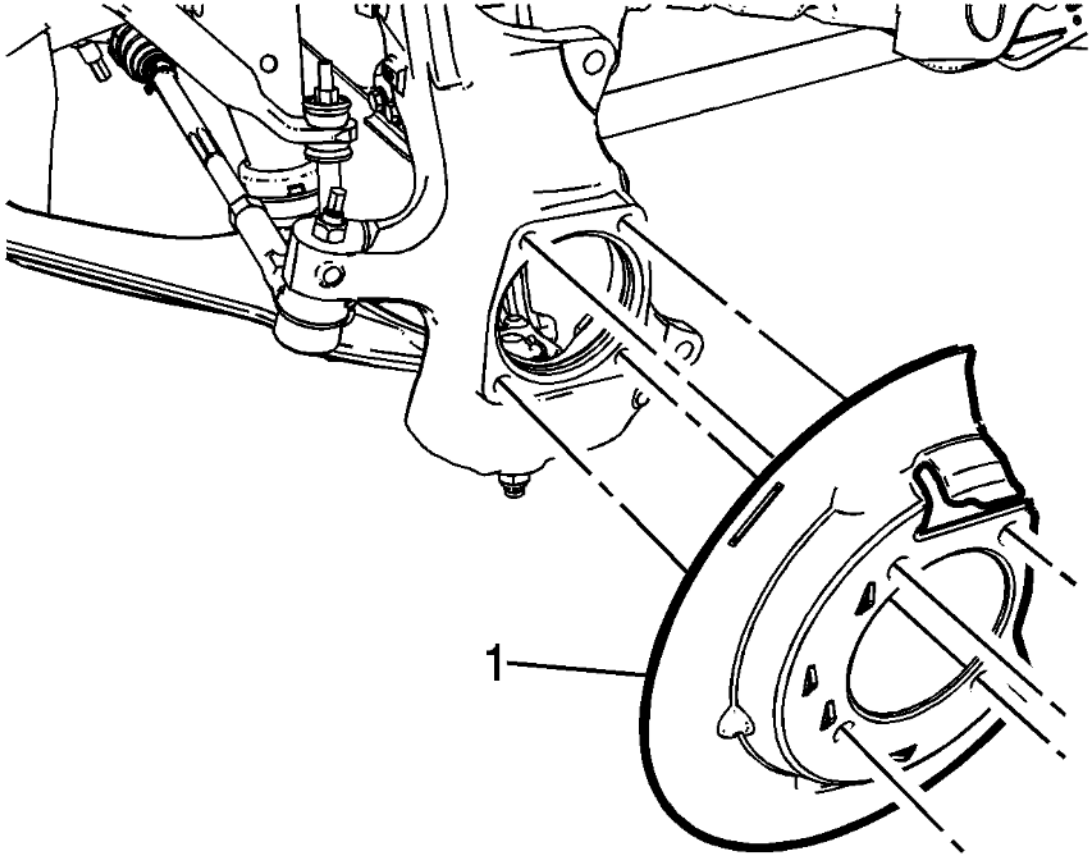


Fig. 195: Front Brake Shield
Courtesy of GENERAL MOTORS COMPANY

1. Install the front brake shield (1).
2. Install the wheel front wheel bearing and hub assembly. Refer to **Front Wheel Hub, Bearing, and Seal Replacement (Light Duty)** **Front Wheel Hub, Bearing, and Seal Replacement (Heavy Duty)** .
3. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and**

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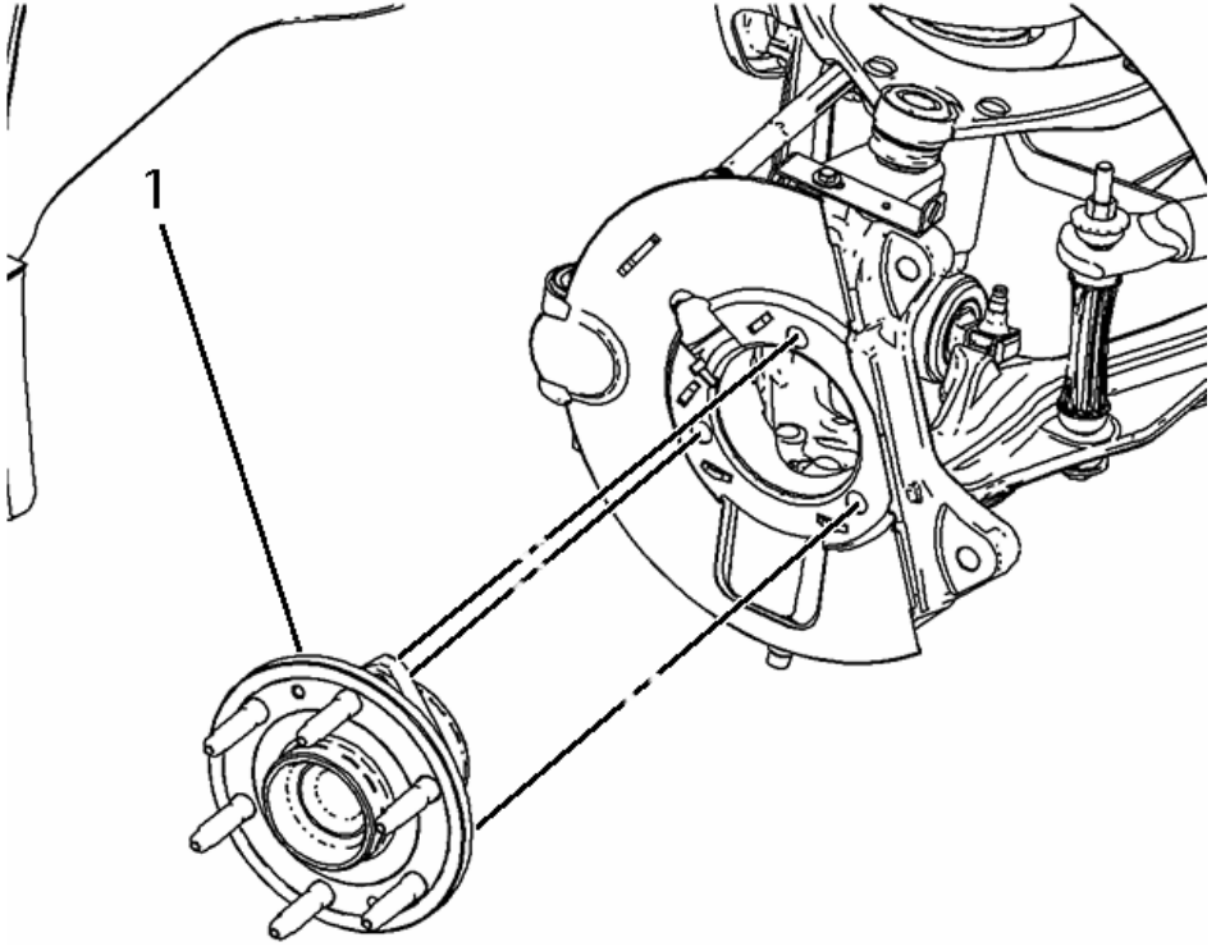
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Installation (8-Lug Wheel) .

FRONT BRAKE SHIELD REPLACEMENT (JD9)

Removal Procedure

WARNING: Refer to Brake Dust Warning .



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Fig. 196: Front Wheel Bearing And Hub
Courtesy of GENERAL MOTORS COMPANY

1. Remove the front wheel bearing and hub (1). Refer to **Front Wheel Hub, Bearing, and Seal Replacement (Light Duty)** **Front Wheel Hub, Bearing, and Seal Replacement (Heavy Duty)** .

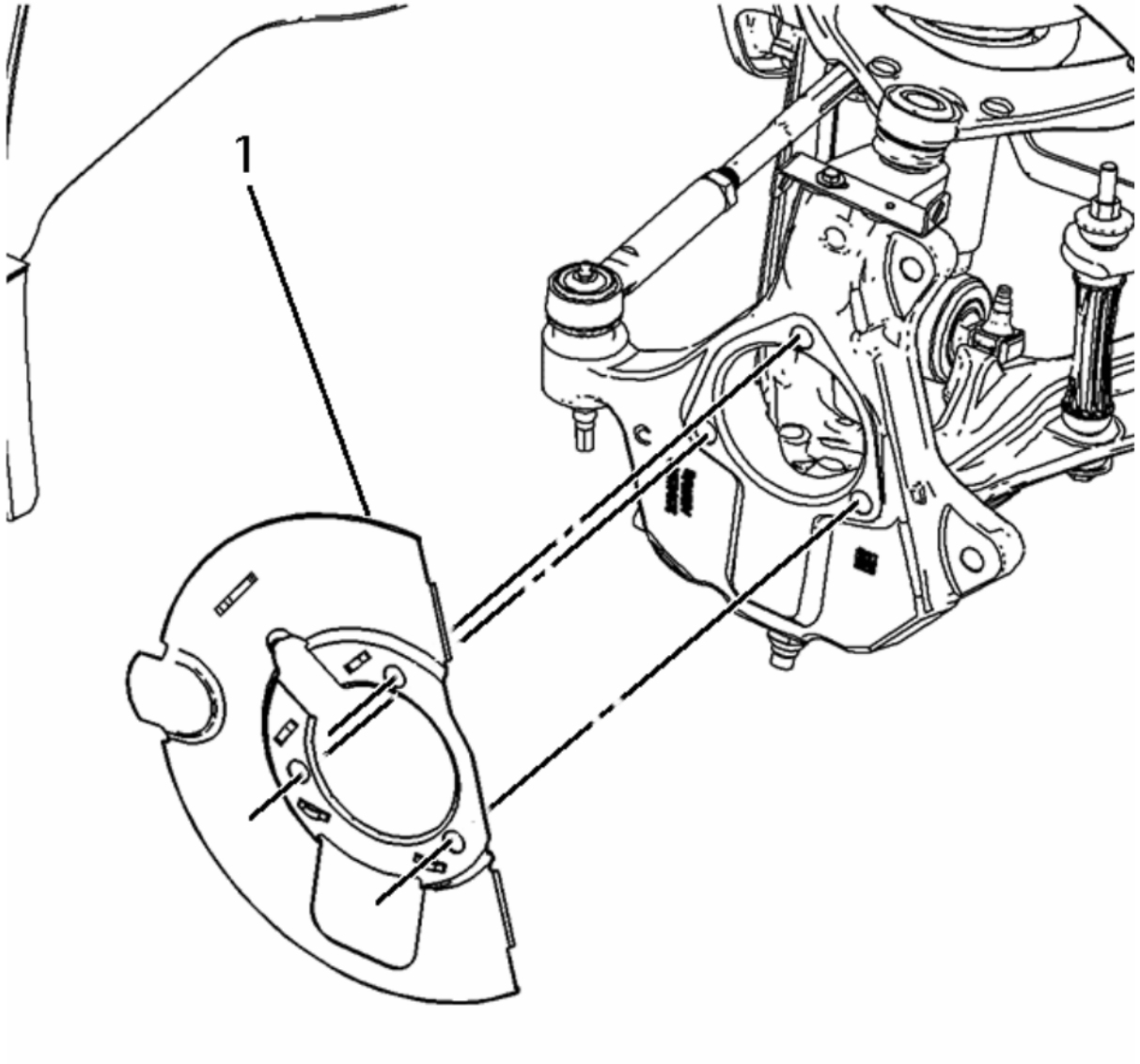


Fig. 197: Front Brake Shield

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Courtesy of GENERAL MOTORS COMPANY

2. Remove the front brake shield (1).

Installation Procedure

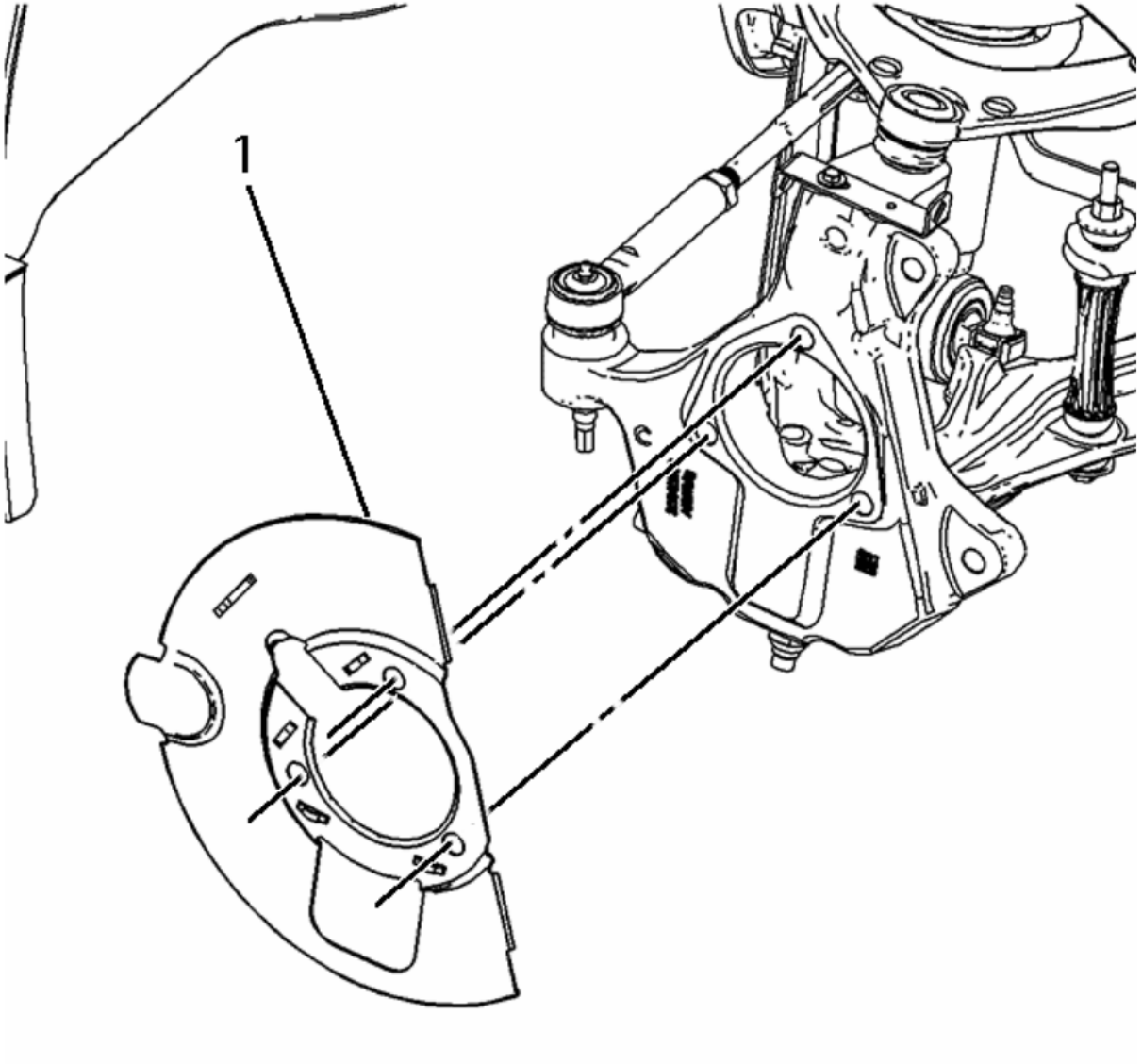


Fig. 198: Front Brake Shield

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Courtesy of GENERAL MOTORS COMPANY

1. Install the front brake shield (1).

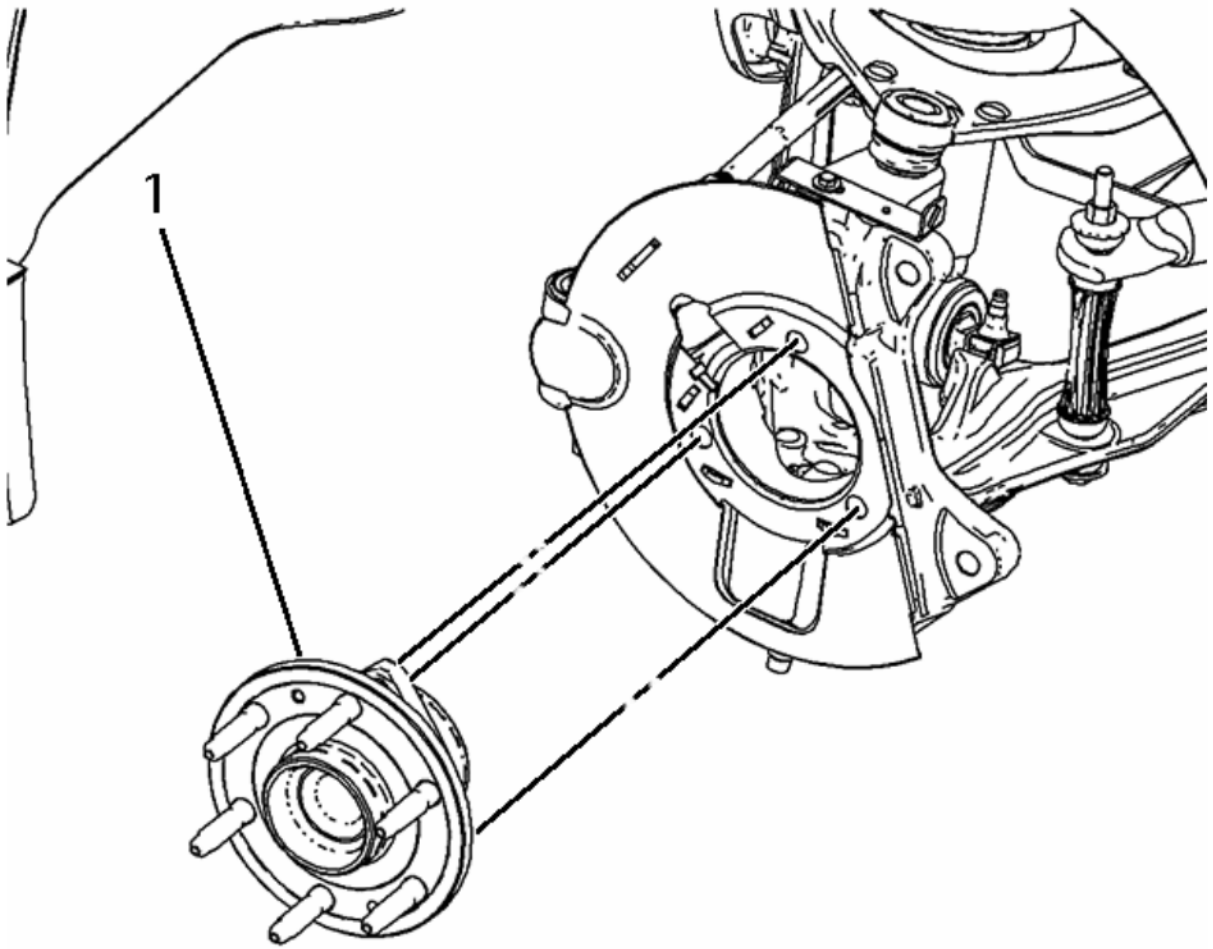


Fig. 199: Front Wheel Bearing And Hub
Courtesy of GENERAL MOTORS COMPANY

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2. Install the front wheel bearing and hub (1). Refer to **Front Wheel Hub, Bearing, and Seal Replacement (Light Duty)** **Front Wheel Hub, Bearing, and Seal Replacement (Heavy Duty)** .

REAR BRAKE SHIELD REPLACEMENT (JD9)

Removal Procedure

WARNING: Refer to Brake Dust Warning .

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .
3. Remove the park brake shoes. Refer to **Parking Brake Shoe Replacement (JD9)** .
4. Remove the rear axle shaft. Refer to **Rear Axle Shaft Replacement** .

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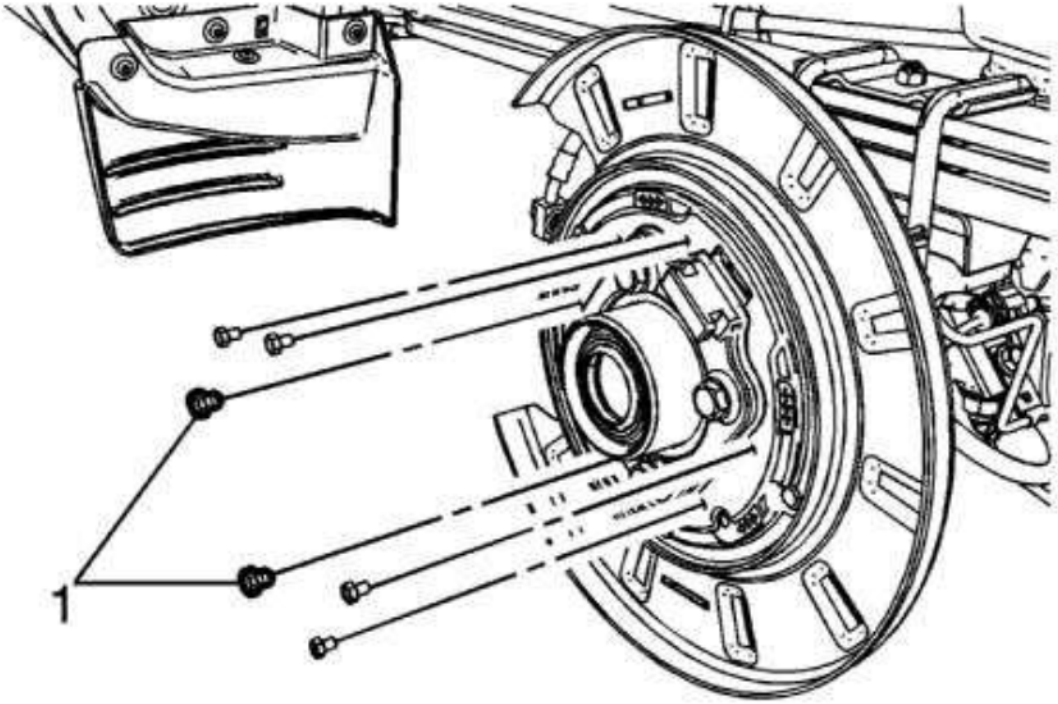


Fig. 200: Rear Brake Shield Bolts
Courtesy of GENERAL MOTORS COMPANY

5. Remove the 6 rear brake shield bolts (1).

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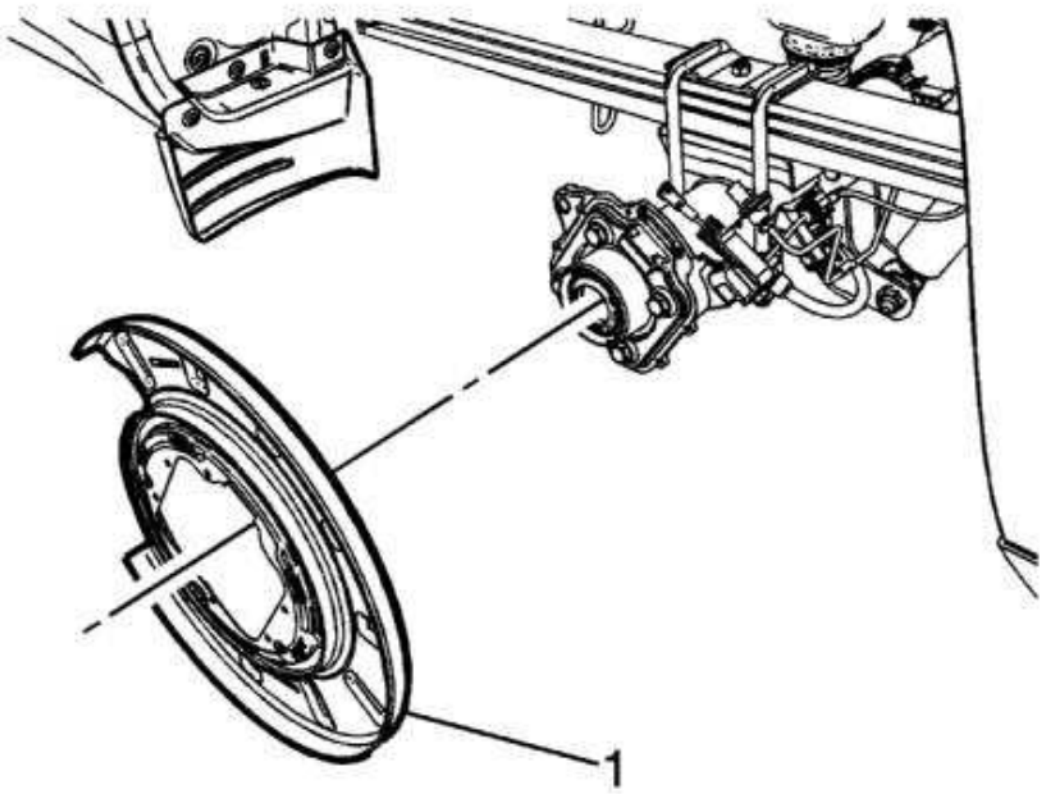


Fig. 201: Rear Brake Shield
Courtesy of GENERAL MOTORS COMPANY

6. Remove the rear brake shield (1).

Installation Procedure

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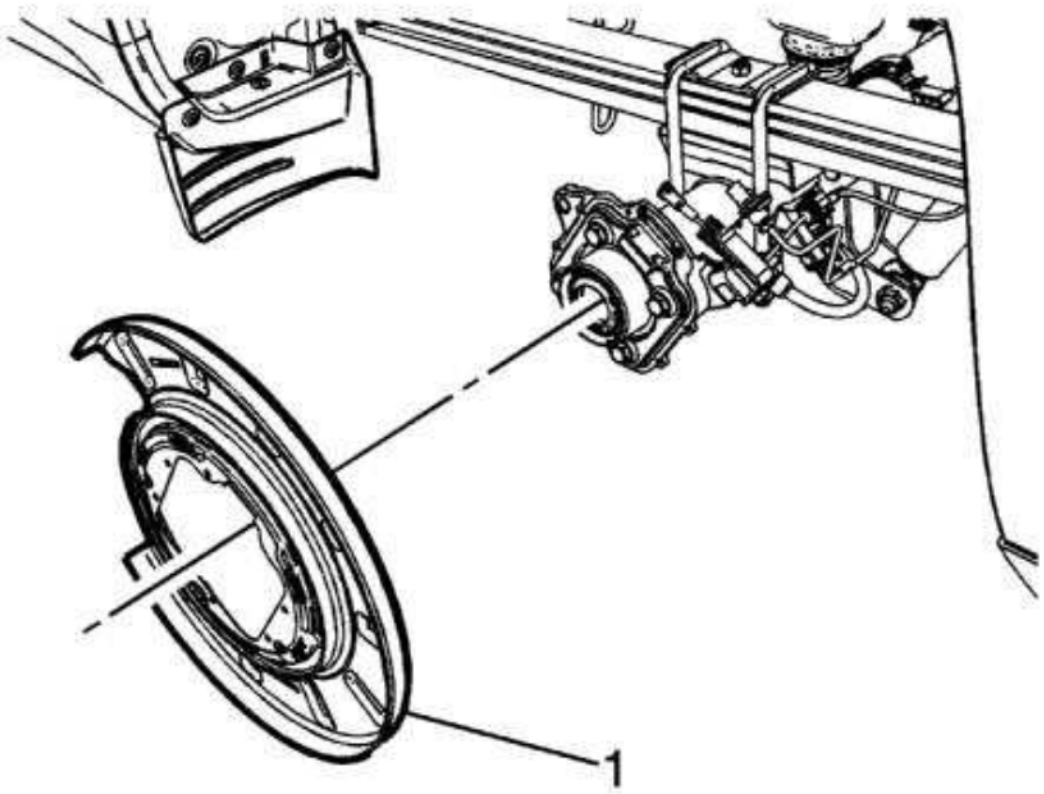


Fig. 202: Rear Brake Shield
Courtesy of GENERAL MOTORS COMPANY

1. Install the rear brake shield (1).

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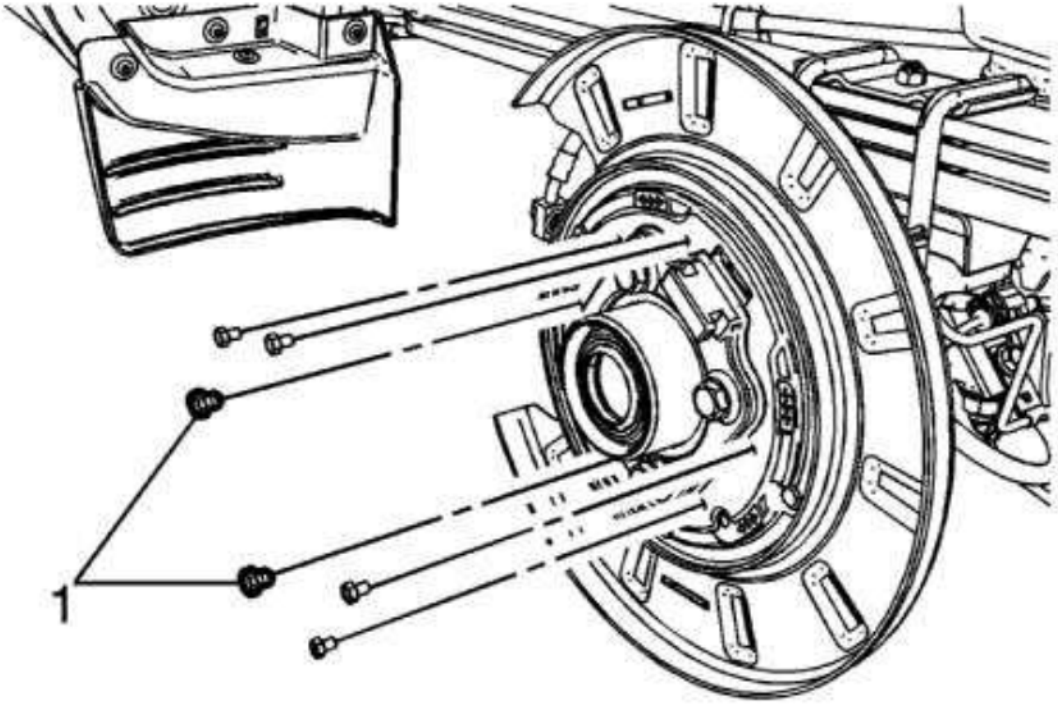


Fig. 203: Rear Brake Shield Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

2. Install the 6 rear brake shield bolts (1) and tighten to 9 N.m (80 lb in).
3. Install the rear axle shaft. Refer to **Rear Axle Shaft Replacement** .

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4. Install the park brake shoes. Refer to **Parking Brake Shoe Replacement (JD9)** .
5. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** .

REAR BRAKE SHIELD REPLACEMENT (J95)

Removal Procedure

WARNING: **Brake Dust Warning**

1. Raise and support the vehicle. **Lifting and Jacking the Vehicle**
2. Remove the tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
3. Remove Parking Brake Actuator.**Parking Brake Actuator Replacement (J95)**
4. Remove Rear Wheel Hub.**Rear Wheel Hub Replacement (10.5 Inch Axle)**

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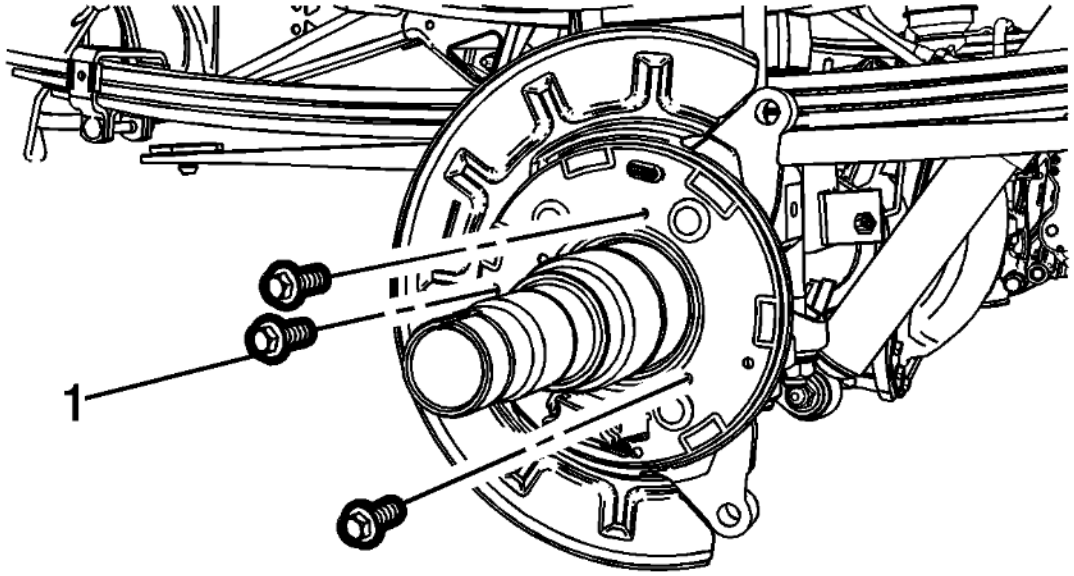


Fig. 204: Rear Brake Backing Plate Bolts
Courtesy of GENERAL MOTORS COMPANY

5. Remove Rear Brake Shield Bolt (1).

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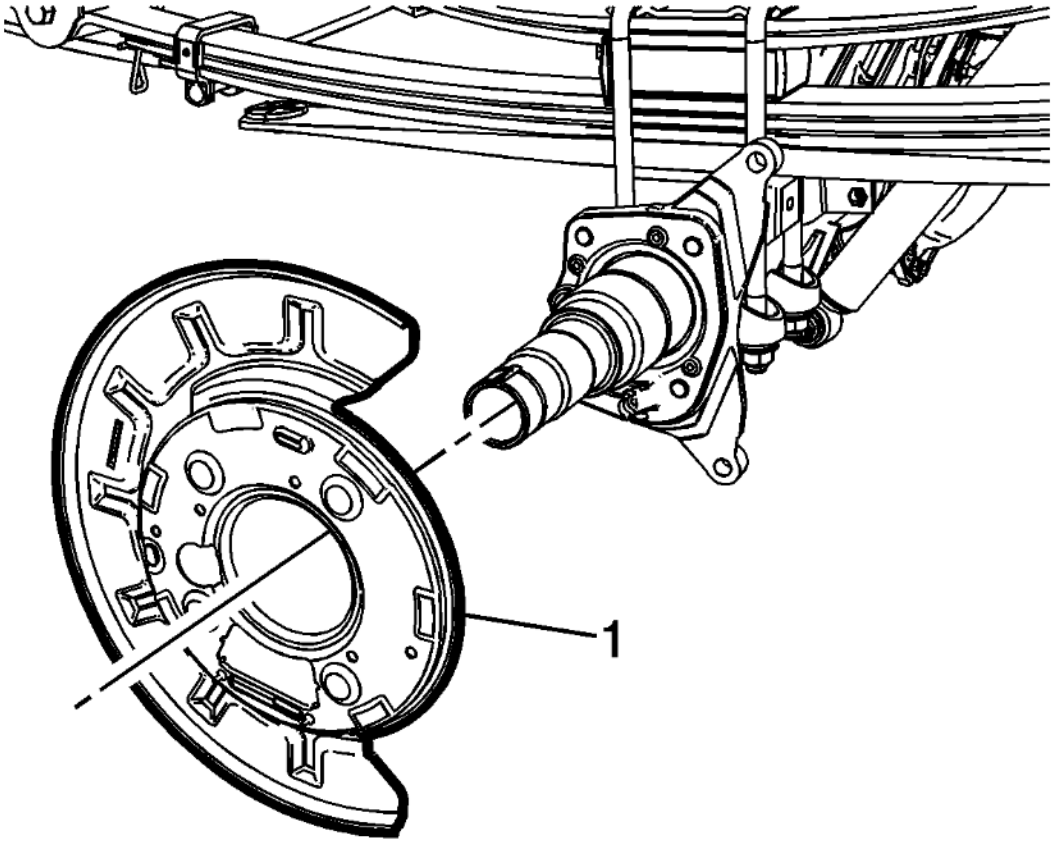


Fig. 205: Rear Brake Backing Plate
Courtesy of GENERAL MOTORS COMPANY

6. Remove Rear Brake Shield (1).

Installation Procedure

NOTE: **Do NOT damage the wheel speed sensor.**

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1. Carefully clean the rear axle flange mating surface of any debris or corrosion.

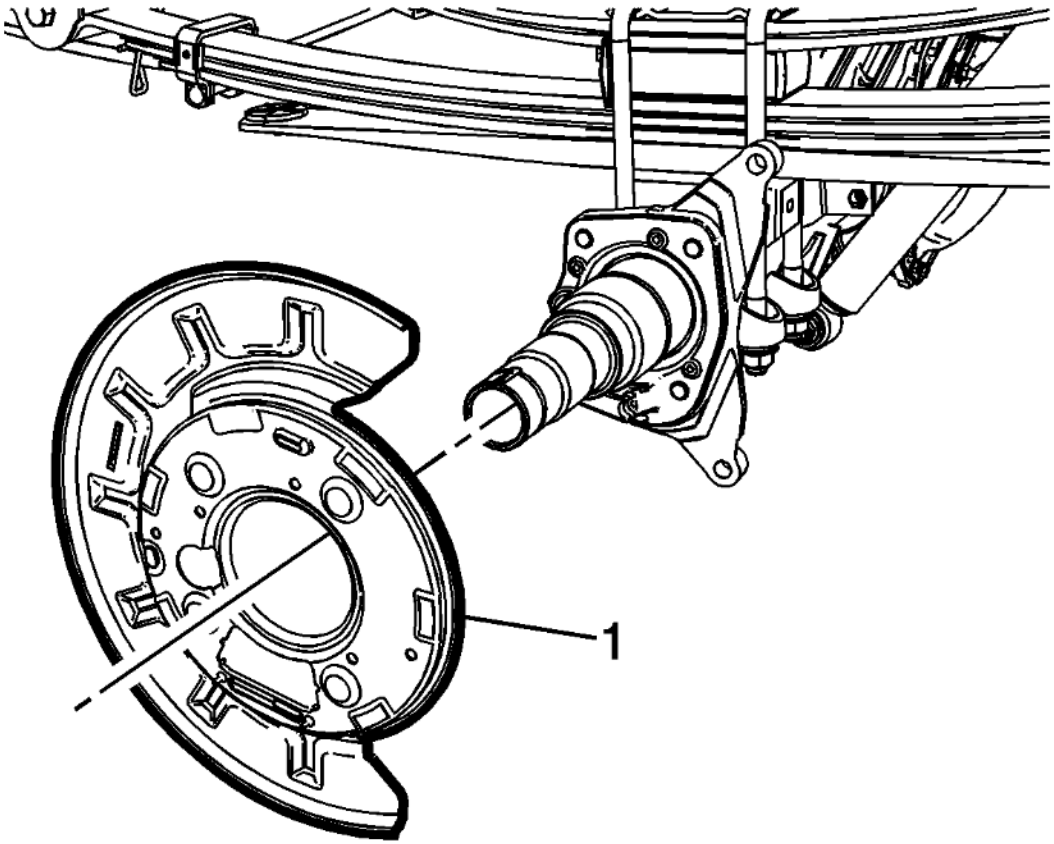


Fig. 206: Rear Brake Backing Plate
Courtesy of GENERAL MOTORS COMPANY

2. Install Rear Brake Shield (1).

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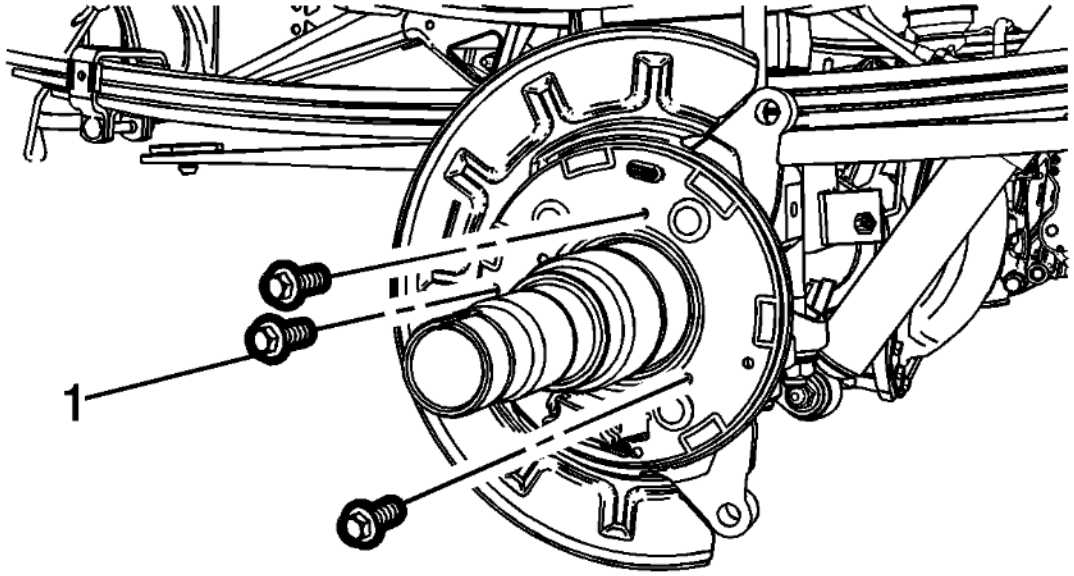


Fig. 207: Rear Brake Backing Plate Bolts
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Fastener Caution**

3. Install Rear Brake Shield Bolt (1) and tighten 10 N.m (89 lb in)
4. Install Rear Wheel Hub. **Rear Wheel Hub Replacement (10.5 Inch Axle)**

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5. Install Parking Brake Actuator. **Parking Brake Actuator Replacement (J95)**
6. Install the tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**

BRAKE ROTOR ASSEMBLED LATERAL RUNOUT CORRECTION

NOTE:

- **Brake rotor thickness variation MUST be checked BEFORE checking for assembled lateral runout (LRO). Thickness variation exceeding the maximum acceptable level can cause brake pulsation. Refer to Brake Rotor Thickness Variation Measurement.**
- **Brake rotor assembled lateral runout (LRO) exceeding the maximum allowable specification can cause thickness variation to develop in the brake rotor over time, usually between 4, 800-11, 300 km (3, 000-7, 000 mi). Refer to Brake Rotor Assembled Lateral Runout Measurement.**

Review the following acceptable methods for bringing the brake rotor assembled LRO to within specifications. Determine which method to use for the specific vehicle being repaired.

- The indexing method of correcting assembled LRO is most effective when the LRO specification is only exceeded by a relatively small amount: 0.025-0.127 mm (0.001-0.005 in). Indexing is used to achieve the best possible match of high spots to low spots between related components. Refer to **Brake Rotor Assembled Lateral Runout Correction - Indexing**.
- The on-vehicle brake lathe method is used to bring the LRO to within specifications through compensating for LRO while refinishing the brake rotor. Refer to **Brake Rotor Assembled Lateral Runout Correction - On Vehicle Lathe**.

If the assembled LRO cannot be corrected using these methods, then other components must be suspected as causing and/or contributing to the LRO concern.

BRAKE ROTOR ASSEMBLED LATERAL RUNOUT CORRECTION - INDEXING

NOTE: **This Procedure is not used in Europe**

Special Tools

CH-45101-100 Conical Brake Rotor Washers

For equivalent regional tools, refer to **Special Tools**.

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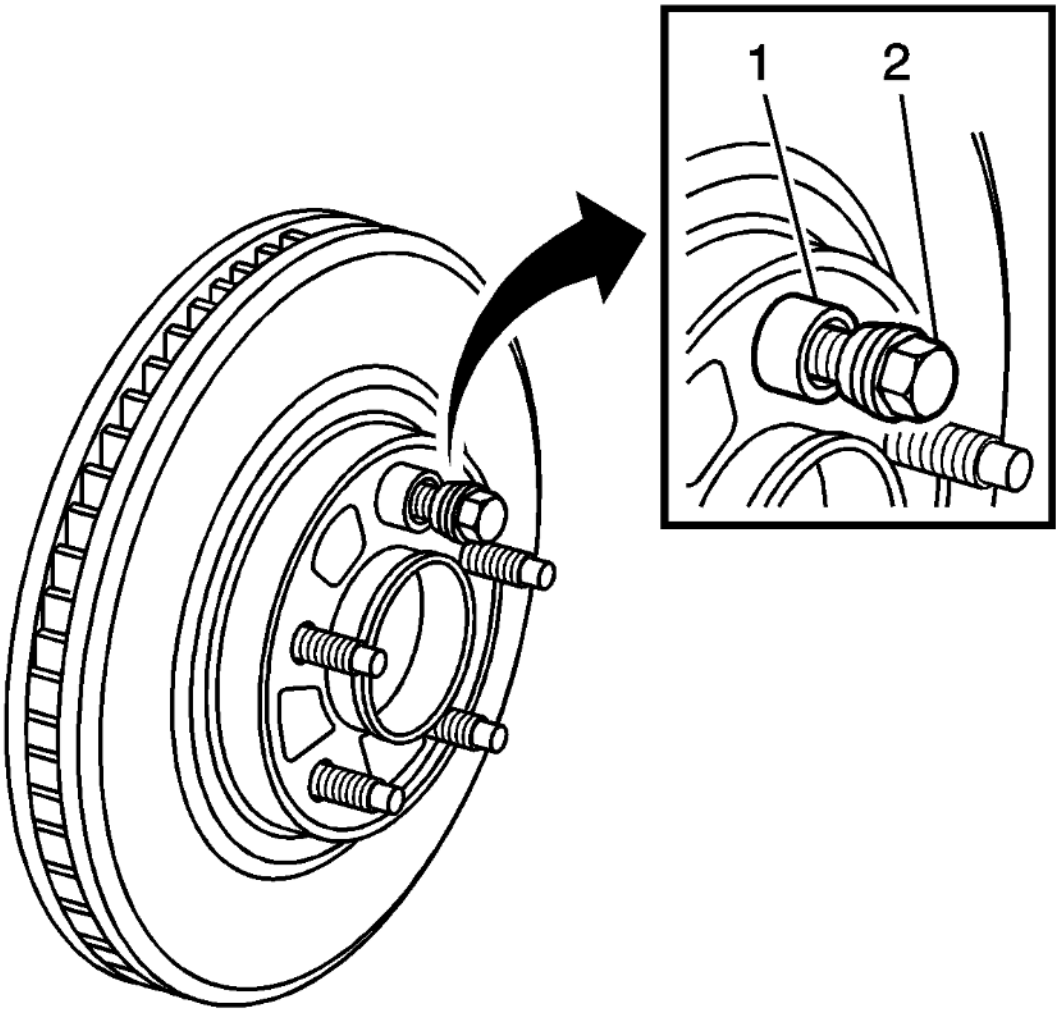


Fig. 208: Lug Nuts & Conical Washers
Courtesy of GENERAL MOTORS COMPANY

WARNING: Refer to Brake Dust Warning .

NOTE:

- Brake rotor thickness variation MUST be checked BEFORE checking for assembled lateral runout (LRO). Thickness variation exceeding the maximum acceptable level can cause brake pulsation.

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Brake Rotor Thickness Variation Measurement

- **Brake rotor assembled LRO exceeding the maximum allowable specification can cause thickness variation to develop in the brake rotor over time, usually between 4, 800-11, 300 km (3, 000-7, 000 mi).**

Brake Rotor Assembled Lateral Runout Measurement

1. Remove the **CH-45101-100** Conical Brake Rotor Washers and the lug nuts that were installed during the assembled LRO measurement procedure.
2. Inspect the mating surface of the hub/axle flange and the brake rotor to ensure that there are no foreign particles or debris remaining.
3. Index the brake rotor in a different orientation to the hub/axle flange.
4. Hold the rotor firmly in place against the hub/axle flange and install one of the **CH-45101-100** Conical Brake Rotor Washers (1) and one lug nut (2) onto the upper-most wheel stud.
5. Continue to hold the rotor secure and tighten the lug nut firmly by hand.

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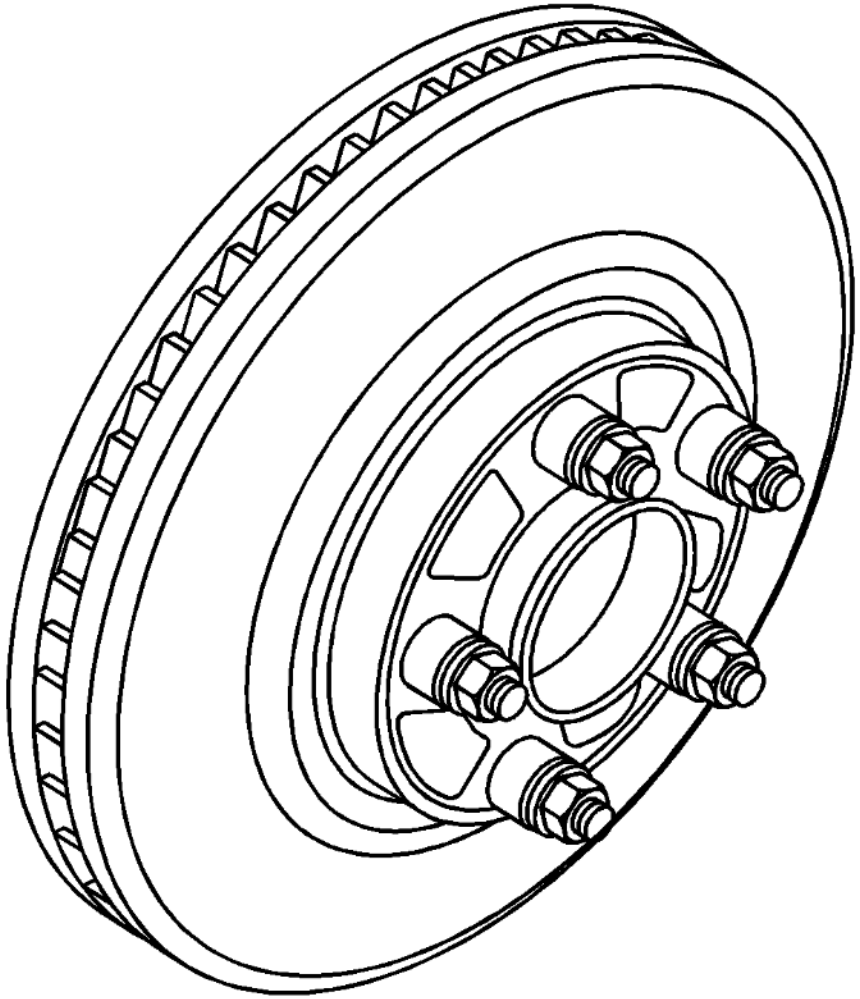


Fig. 209: Lug Nuts & Conical Washers
Courtesy of GENERAL MOTORS COMPANY

6. Install the remaining **CH-45101-100** Conical Brake Rotor Washers and lug nuts onto the wheel studs and tighten the nuts firmly by hand in a star-pattern.
7. Tighten the lug nuts in a star-pattern to specification, in order to properly secure the rotor. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**

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8. Measure the assembled LRO of the brake rotor. **Brake Rotor Assembled Lateral Runout Measurement**
9. Compare the amount of change between this measurement and the original measurement.
10. If this measurement is within specifications, proceed to step 14.
11. If this measurement still exceeds specifications, repeat steps 1-9 until the best assembled LRO measurement is obtained.
12. Matchmark the final location of the rotor to the wheel studs if the orientation is different than it was originally.
13. If the brake rotor assembled LRO measurement still exceeds the maximum allowable specification, refer to **Brake Rotor Assembled Lateral Runout Correction**.
14. If the brake rotor assembled LRO is within specification, install the brake caliper and depress the brake pedal several times to secure the rotor in place before removing the **CH-45101-100** Conical Brake Rotor Washers and the lug nuts.

BRAKE ROTOR ASSEMBLED LATERAL RUNOUT CORRECTION - ON VEHICLE LATHE

NOTE: **This procedure is not used in Europe.**

Special Tools

CH-45101-100 Conical Brake Rotor Washers

For equivalent regional tools, refer to **Special Tools**.

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

NOTE:

- **Brake rotor thickness variation MUST be checked BEFORE checking for assembled lateral runout (LRO). Thickness variation exceeding the maximum acceptable level can cause brake pulsation. Brake Rotor Thickness Variation Measurement**
- **Brake rotor assembled LRO exceeding the maximum allowable specification can cause thickness variation to develop in the brake rotor over time, usually between 4 800-11 300 km (3, 000-7, 000 mi). Brake Rotor Assembled Lateral Runout Measurement**

1. Ensure that the caliper and caliper bracket that are already being supported, are clear from contacting any rotating components, such as the brake rotor.
2. Remove the **CH-45101-100** Conical Brake Rotor Washers and the lug nuts that were installed during the assembled LRO measurement procedure and/or the indexing correction procedure.
3. Inspect the mounting surface of the hub/axle flange and the brake rotor to ensure that there are no foreign particles or debris remaining.

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4. Set up the lathe, following the manufacturer's instructions.
5. Refinish the brake rotor, following the brake lathe manufacturer's instructions.
6. After each successive cut, inspect the brake rotor thickness. **Brake Rotor Thickness Measurement**
7. If at any time the brake rotor exceeds the minimum allowable thickness after refinish specification, the brake rotor must be replaced. After replacing the rotor, proceed to step 10.
8. After refinishing the brake rotor, 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 rotor with denatured alcohol, or an equivalent approved brake cleaner.
9. Remove the lathe from the vehicle.
10. Measure the assembled LRO of the brake rotor. **Brake Rotor Assembled Lateral Runout Measurement**
11. If the brake rotor assembled LRO measurement still exceeds the maximum allowable specification, refer to **Brake Rotor Assembled Lateral Runout Correction**.
12. If the brake rotor assembled LRO is within specification, install the brake caliper and depress the brake pedal several times to secure the rotor in place before removing the **CH-45101-100** Conical Brake Rotor Washers and the lug nuts.

BRAKE ROTOR REFINISHING

Special Tools

- **CH-41013** Rotor Resurfacing Kit
- **CH-42450-A** Wheel Hub Resurfacing Kit

For equivalent regional tools, refer to **Special Tools**.

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

NOTE:

- **The disc brake rotors do not require refinishing as part of routine brake system service. New disc brake**

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rotors do not require refinishing.

Do not refinish disc brake rotors in an attempt to correct the following conditions:

- **Brake system noise - squeal, growl, groan**
- **Uneven and/or premature disc brake pad wear**
- **Superficial or cosmetic corrosion/rust of the disc brake rotor friction surface**
- **Scoring of the disc brake rotor friction surface less than the maximum allowable specification**

- **Before refinishing a brake rotor, the rotor MUST first be checked for adequate thickness to allow the rotor to be refinished and remain above the minimum allowable thickness after refinish specification. Brake Rotor Thickness Measurement**

  Disc brake rotors should only be refinished if they have adequate thickness to be refinished and if one or more of the following conditions exist:

  - **Thickness variation in excess of the maximum allowable specification**
  - **Excessive corrosion/rust and/or pitting**
  - **Cracks and/or heat spots**
  - **Excessive blueing discoloration**
  - **Scoring of the disc brake rotor surface in excess of the maximum allowable specification**
- **Disc brake rotors may need to be refinished as part of the process for correcting brake rotor assembled lateral runout (LRO) that exceeds the maximum allowable specification.**

NOTE: **If the vehicle is equipped with cross-drilled rotors, use a lathe with positive rake tooling. This setup requires less cutting pressure, which will result in less vibration, and a better surface finish. Also, use a vibration dampener when cutting. Otherwise, refinish according to the following instructions.**

NOTE: **Whenever the brake rotor has been separated from the hub/axle flange, clean any rust or contaminants from the hub/axle flange and the brake rotor mating surfaces. Failure to do this may result in increased assembled lateral runout (LRO) of the brake rotor, which could lead to brake pulsation.**

1. Using the **CH-42450-A** Wheel Hub Resurfacing Kit, thoroughly clean any rust or corrosion from the mating surface of the hub/axle flange.
2. Using the **CH-41013** Rotor Resurfacing Kit, thoroughly clean any rust or corrosion from the mating surface and mounting surface of the brake rotor.

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3. Inspect the mating surfaces of the hub/axle flange and the rotor to ensure that there are no foreign particles or debris remaining.
4. Mount the brake rotor to the brake lathe according to the lathe manufacturer's instructions, ensuring that all mounting attachments and adapters are clean and free of debris.
5. Ensure that any vibration dampening attachments are securely in place.
6. With the brake lathe running, slowly bring in the cutting tools until they just contact the brake rotor friction surfaces.
7. Observe the witness mark on the brake rotor. If the witness mark extends approximately three-quarters or more of the way around the brake rotor friction surface on each side, the brake rotor is properly mounted to the lathe.
8. If the witness mark does not extend three-quarters or more of the way around the brake rotor, re-mount the rotor to the lathe.
9. Following the brake lathe manufacturer's instructions, refinish the brake rotor.
10. After each successive cut, inspect the brake rotor thickness. **Brake Rotor Thickness Measurement**
11. If at any time the brake rotor exceeds the minimum allowable thickness after refinish specification, the brake rotor must be replaced.
12. After refinishing the brake rotor, 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.

    NOTE: **Thoroughly cleaning the brake rotor will prevent the possible transfer of finite metal dust left as a by-product of machining to the brake pad material during the burnishing process, thereby reducing the possibility for brake squeal or other brake noises to occur.**

    3. After applying a non-directional finish, clean each friction surface of the brake rotor with a solution of mild dish washing detergent and water, or a GM approved brake cleaner and a clean shop towel to remove metal particles remaining from machining. Repeat the cleaning process if necessary to remove all metal particles.
13. Remove the brake rotor from the brake lathe.
14. Measure the assembled LRO of the brake rotor to ensure optimum performance of the disc brakes. **Brake Rotor Assembled Lateral Runout Measurement**
15. If the brake rotor assembled LRO measurement exceeds the specification, bring the LRO to within specifications. **Brake Rotor Assembled Lateral Runout Correction**

DESCRIPTION AND OPERATION

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DISC BRAKE SYSTEM DESCRIPTION AND OPERATION

System Component Description

The disc brake system consists of the following components:

Disc Brake Pads

Applies mechanical output force from the hydraulic brake calipers to friction surfaces of brake rotors.

Disc Brake Rotors

Uses mechanical output force applied to friction surfaces from the disc brake pads to slow speed of tire and wheel assembly rotation.

Disc Brake Pad Hardware

Secures disc brake pads firmly in proper relationship to the hydraulic brake calipers. Enables a sliding motion of brake pads when mechanical output force is applied.

Disc Brake Caliper Hardware (Floating Caliper)

Provides mounting for hydraulic brake caliper and secures the caliper firmly in proper relationship to caliper bracket. Enables a sliding motion of the brake caliper to the brake pads when mechanical output force is applied.

System Operation (Floating Caliper)

Mechanical output force is applied from the hydraulic brake caliper pistons to the inner brake pads. As the pistons press the inner brake pads outward, the caliper housings draw the outer brake pads inward. This allows the output force to be equally distributed. The brake pads apply the output force to the friction surfaces on both sides of the brake rotors, which slows the rotation of the tire and wheel assemblies. The correct function of both the brake pad and brake caliper hardware is essential for even distribution of braking force.

System Operation (Fixed Caliper)

Mechanical output force is applied from the hydraulic brake caliper inboard and outboard pistons to the inner and outer brake pads. The brake calipers are a fixed, opposed-piston design, allowing the output force to be equally distributed through the distribution of the pressurized brake fluid within the caliper. The brake pads apply the output force to the friction surfaces on both sides of the brake rotors, which slows the rotation of the tire and wheel assemblies. The correct function of the brake pad hardware and of the brake caliper inboard and outboard pistons is essential for even distribution of braking force.

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System Characteristics

Brake Noise

Brake noise can occur and to a degree, some brake noise is normal. Variations in driving conditions such as the weather, environment, driving patterns, differences in vehicle loading, and type or style of driving, can affect brake wear. Any one of these variations can cause brake noise to become apparent. Inspect and verify that all metal-to-metal contact areas of the brake pads, brake pad guides or springs, brake caliper housing, caliper bracket and/or suspension knuckle, as applicable, are clean and free of corrosion and scale.

Brake noise is a "slip-stick" vibration of disc brake components and, if it occurs intermittently, can be considered normal. Most brake noise may be eliminated or temporarily reduced by performing 3 or 4 aggressive brake applications. If the brake noise persists or consistently recurs, application of a damping compound to the brake pad mounting plate where it contacts the caliper can lessen the vibration as the components move relative to each other. Refer to Adhesives, Fluids, Lubricants, and Sealers in this section for recommended compounds.

The following brake noises are characteristic of all brake systems. These noises cannot be avoided, and may not indicate improper operation of the brake system.

Squeak/Squeal Noise

A squeak or squeal noise can occur on vehicles with front semi-mettalic brake pads during light to medium brake pedal application at low to moderate vehicle speeds. Occasionally this noise may appear from the front or rear brakes after a period of non-use such as overnight, or cold brakes and/or in high humidity conditions.

Grinding Noise

Common occurrence for rear brakes and some front disc brakes during initial brake applications after the vehicle has been parked overnight. Caused by light corrosion forming on the metal brake component friction surfaces during vehicle non-use. Typically disappears after the first few brake applications.

Groan Noise

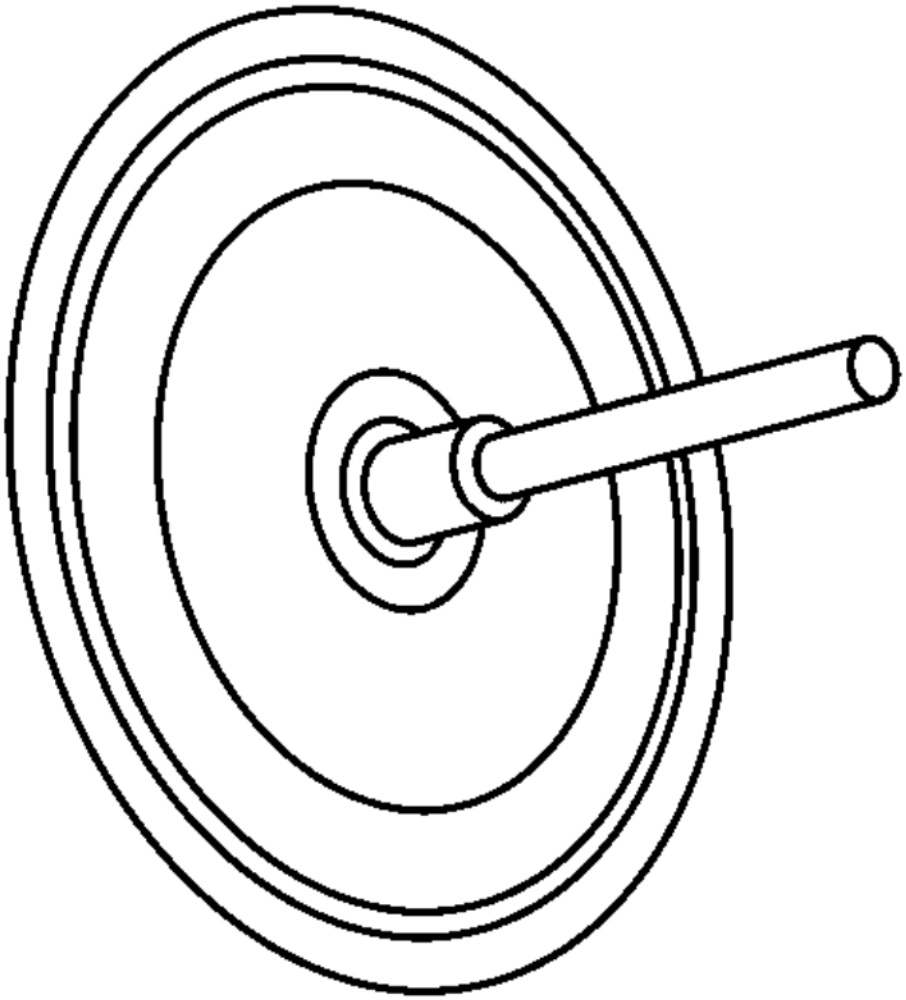
A groan type noise may be heard during a quick stop, or when slowly moving forward from a complete stop. On vehicles equipped with antilock brake systems (ABS), a groan or moan noise may occur during heavy brake application or on road surfaces with compromised traction such as loose gravel, or on wet or icy roads. This is a normal function of ABS activation.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

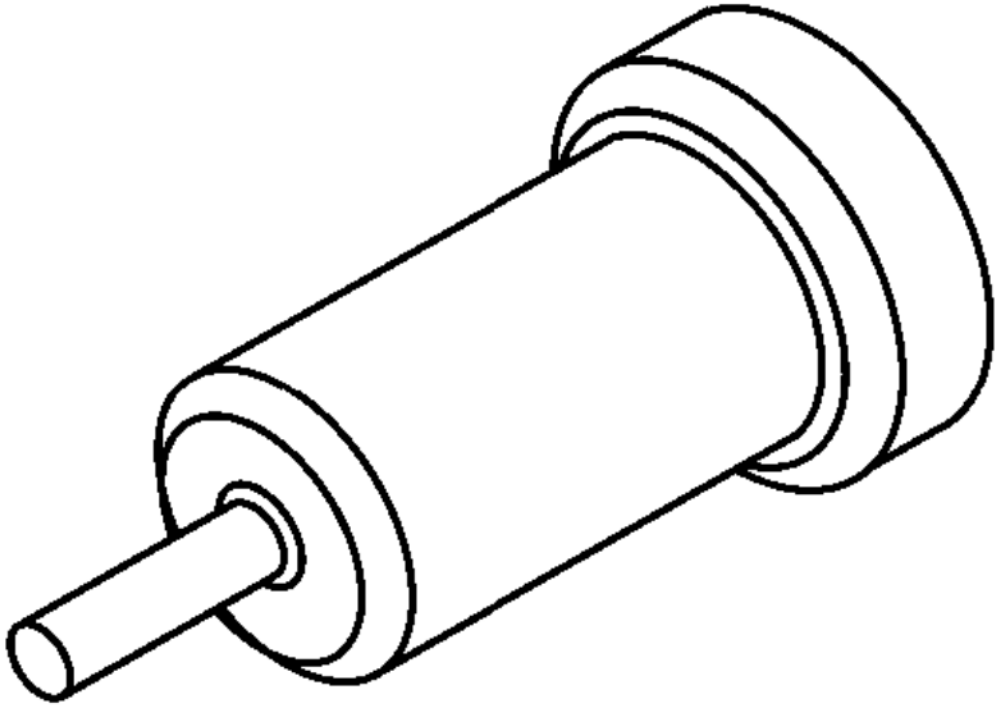
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Illustration	Tool Number/Description
	CH-41013 J 41013 Rotor Resurfacing Kit

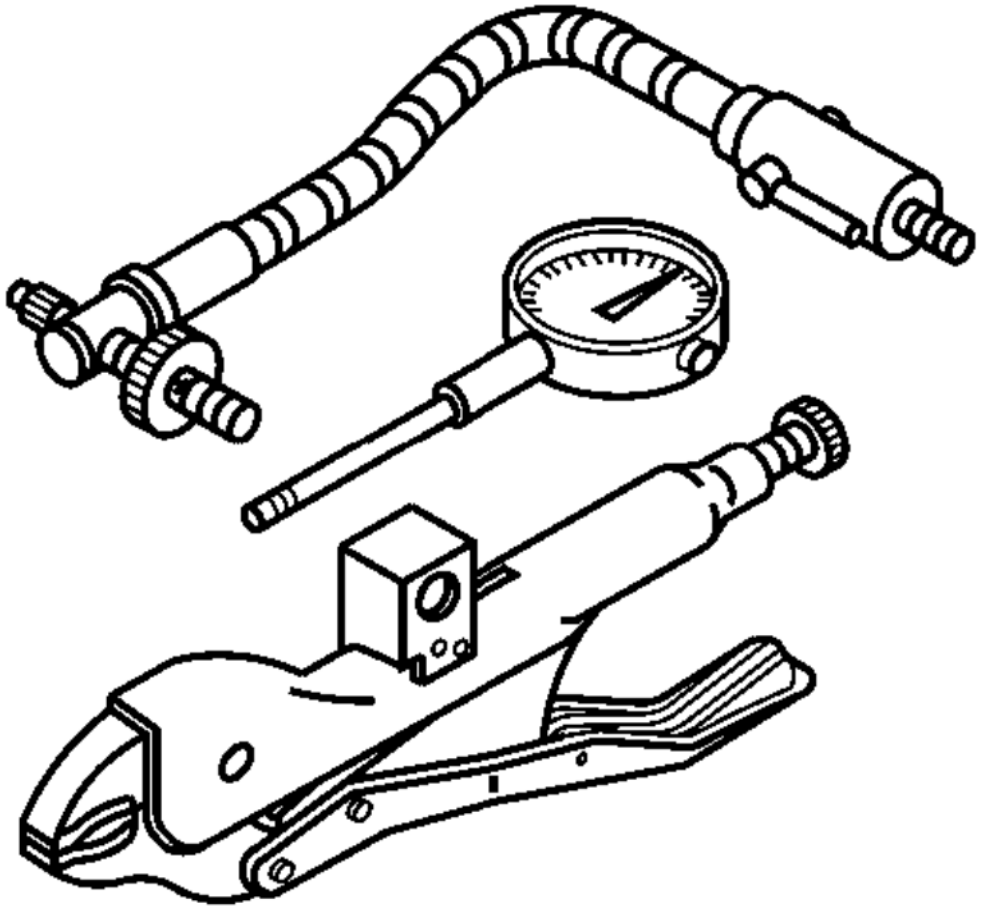
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Illustration	Tool Number/Description
	CH-42450-A J 42450-A Wheel Hub Resurfacing Kit

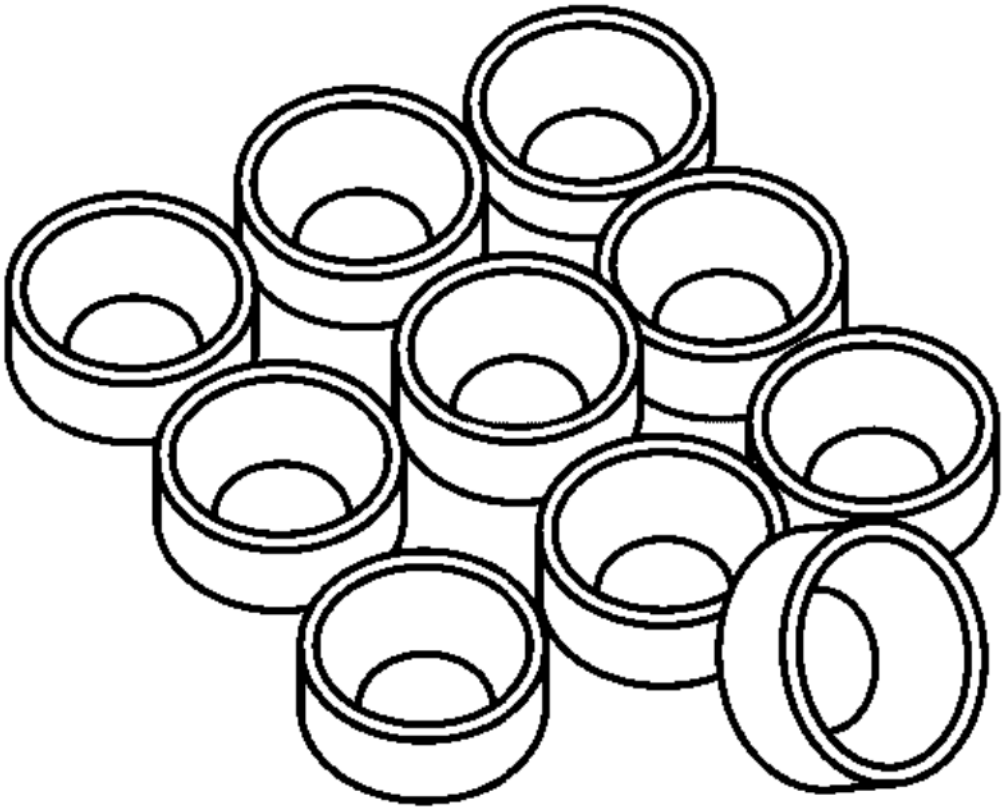
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Illustration	Tool Number/Description
	CH-45101 J 45101 Hub and Wheel Runout Gauge

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Illustration	Tool Number/Description
	CH-45101-100 J 45101-100 Conical Brake Rotor Washers

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