

SECTION 5B2

REAR DISC BRAKES

CAUTION: When servicing brake parts, do not create dust by grinding, sanding brake linings, or by cleaning brake parts with a dry brush or compressed air. Many brake parts contain asbestos fibers which can become airborne if dust is created during servicing. Breathing dust containing asbestos fibers may cause serious bodily harm. A water dampened cloth or water based solution should be used to remove any dust on brake parts. Equipment is commercially available to perform this washing function. These wet methods will prevent asbestos fibers from becoming airborne.

CAUTION: Brake fluid may irritate eyes and skin. In case of contact, take the following actions:

- Eye contact – rinse thoroughly with water.
- Skin contact – wash with soap and water.

NOTICE: Avoid spilling brake fluid on any of the vehicle's painted surfaces, wiring cables or electrical connectors. Brake fluid will damage paint and electrical connections. If any fluid is spilled on the vehicle, flush the area with water to lessen damage.

NOTICE: When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread locking compound will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

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GENERAL DESCRIPTION

The rear disc brake caliper assembly has a single piston in an aluminum housing which is suspended in the anchor bracket on two guide pins. Hydraulic pressure, created by applying force to the brake pedal assembly, acts equally against the piston and the bottom of the caliper bore to move the piston outward and to slide the caliper inward resulting in a clamping action on the rotor. This clamping action forces the linings against the rotor

creating friction to stop the vehicle. When the parking brake is applied, the lever on the caliper causes the pushrod, the actuating collar and the clamp rod assembly to be moved outward and the caliper to slide inward, mechanically forcing the pad assemblies against the rotor assembly. Parking brake application is completely independent of the hydraulic braking system.

The rear disc brake rotor assembly is a composite cast iron type vented rotor assembly. It has a stamped sheet metal flange which is insert cast.

DIAGNOSIS

REAR DISC BRAKE INNER AND OUTER PAD ASSEMBLIES INSPECTION

Figure 1



Inspect

- Inner and outer pad assemblies at least twice a year when the wheels are removed (tire rotation, etc.). When inspecting rear disc brakes, check both ends of the outer pad assembly by looking in at each end of the caliper assembly. These are the points at which the highest rate of wear normally occurs. Also, check the lining thickness of the inner pad assembly to make sure that it has not worn prematurely. Look through the hole in the top of the caliper assembly to view the inner pad assembly. Inner and outer pad assemblies should be replaced when the thickness of any lining is worn to within 0.76 mm (0.030 inch) of the shoe. All inner and outer pad assemblies should be replaced in axle sets.

All rear disc brakes have a wear indicator that makes a noise when the pad assembly linings wear to a degree where replacement is required. The wear indicator is an integral part of the inner pad assembly. When the pad assembly lining is worn, the clip indicator contacts the rotor assembly and produces a warning noise.



Measure

- Flatness of inner and outer pad assembly linings. Place inner and outer pad assembly surfaces together and check for gap between surfaces. If more than 0.13 mm (0.005 inch) gap is measured midway between attaching lugs, inner and outer pad assemblies must be replaced.

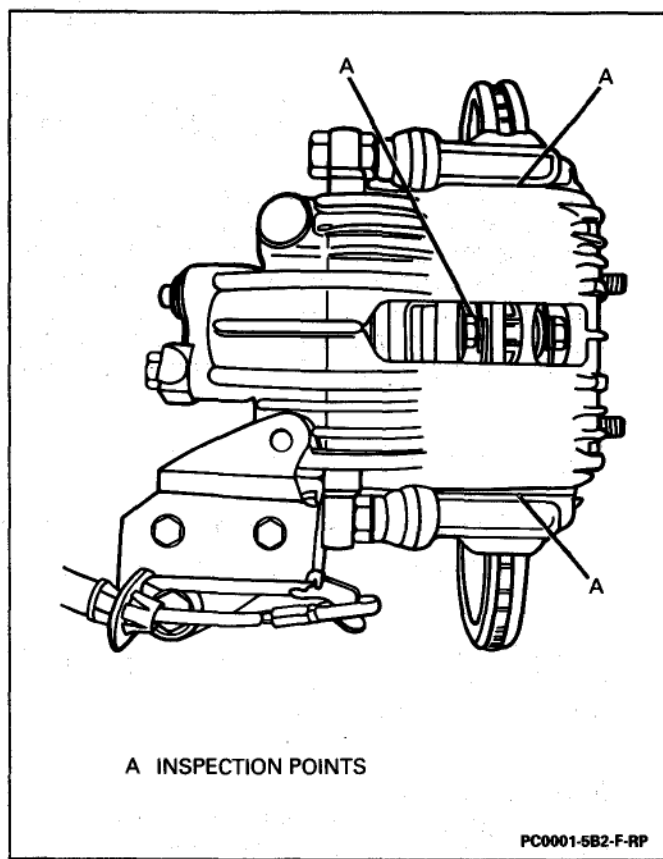
REAR BRAKE ROTOR ASSEMBLY INSPECTION

Rear Brake Rotor Assembly Tolerance and Surface Finish

In manufacturing the rotor assembly, tolerances of the braking surfaces for flatness, thickness variation and lateral runout are held very close. The maintenance of close tolerances on the shape of the braking surfaces is necessary to prevent brake roughness.

In addition to these tolerances, the surface finish must be held to a specified range of 60 R_a roughness or less. A new rotor assembly falls into this surface range, as will a rotor assembly that is refinished exactly as directed in "Refinishing Rear Brake Rotor Assemblies" in this section. The control of the braking surface finish is necessary to avoid problems of hard pedal-apply, excessive brake fade, pulls and erratic performance and to extend lining life.

Light scoring of the rotor assembly surfaces not exceeding 1.5 mm (0.06 inch) in depth, which may result from normal use, will not affect brake operation.



A INSPECTION POINTS

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Figure 1 – Rear Disc Brake Inner and Outer Pad Assemblies Inspection

Thickness Variation Check

Thickness variation can be checked by measuring the thickness of the rear brake rotor assembly at four or more points around its circumference. All measurements must be made at the same distance in from the edge of the rotor assembly. A rotor assembly that varies by more than 0.013 mm (0.0005 inch) can cause brake pedal assembly pulsation and/or rear end vibration during brake applications. A rotor assembly that does not meet these specifications should be refinished to specifications or replaced.

Lateral Runout Check

Figure 2

Tool Required:

J 8001 Dial Indicator Set

1. Fasten J 8001 to rear brake caliper housing so that indicator button contacts rotor assembly surface about 13 mm (0.5 inch) from rotor edge.
2. Set J 8001 to zero.
 - Push in rear axle assembly while setting J 8001 to eliminate endplay.
3. Turn rotor assembly (39) one complete revolution, and observe total indicated runout (TIR).
 - Push in rear axle assembly while turning rotor assembly to eliminate endplay.
 - Total indicated runout (TIR) should not be more than 0.15 mm (0.006 inch).

4. In some cases, excessive lateral runout of rotor assembly (39) can be improved by indexing rotor assembly (39).
 - A. Remove tire and wheel assembly. Refer to SECTION 3E.
 - B. Remove rear brake caliper assembly. Refer to "Rear Brake Caliper Assembly" under "On-Vehicle Service" in this section.
 - C. Index rotor assembly (39) on hub one or two bolt positions from original position.
5. Check lateral runout of rotor assembly (39).
6. If lateral runout of rotor assembly (39) still exceeds 0.15 mm (0.006 inch), check rear axle shaft flange for excessive lateral runout or looseness.
 - A. Reposition J 8001 so button contacts surface of axle shaft flange.
 - B. Push axle shaft flange inward while turning the axle shaft flange one full revolution.
 - C. Continue pushing in axle shaft flange while setting J 8001 to zero.
 - D. While maintaining inward pressure, rotate axle shaft flange and note lateral runout.
 - E. If axle shaft flange lateral runout exceeds 0.05 mm (0.002 inch), replace rear axle shaft. Refer to SECTION 4B.
 - F. If axle shaft flange lateral runout is within specifications, refinish or replace rotor assembly (39) as necessary. Refer to "Refinishing Rear Brake Rotor Assemblies" under "Unit Repair" in this section.

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

- G. A rotor assembly that does not meet the lateral runout specification should be resurfaced or replaced as necessary.

REAR BRAKE CALIPER ASSEMBLY INSPECTION

The rear brake caliper assembly must be disassembled for inspection. Refer to "Rear Brake Caliper Assembly" under "Unit Repair" in this section.

ON-VEHICLE SERVICE

NOTICE: Do not use lubricated compressed air on brake parts as damage to rubber components may result.

Important

- Replace all components included in repair kits used to service this caliper assembly.
- Lubricate rubber parts with clean brake fluid to ease assembly.

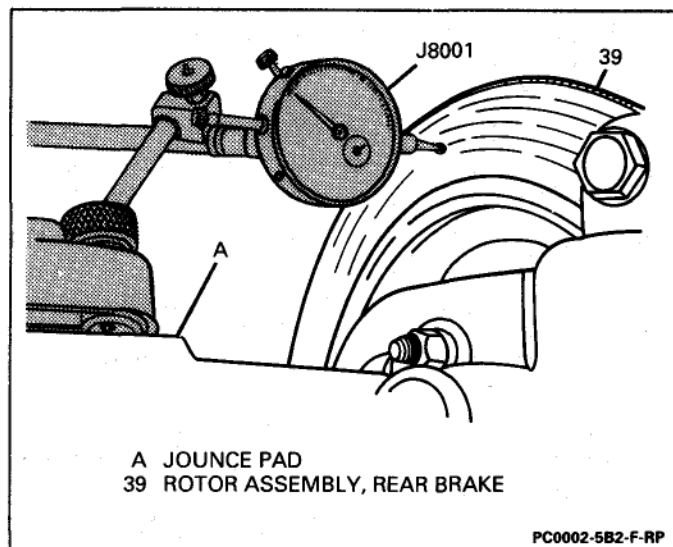


Figure 2 - Checking Lateral Runout

- If any hydraulic component is removed or disconnected, it may be necessary to bleed all or part of the brake hydraulic system.
- Replace pad assemblies in axle sets only.
- The torque values specified are for dry, unlubricated fasteners.
- Perform service operations on a clean bench, free from all mineral oil materials.

REAR BRAKE CALIPER ASSEMBLY

Figures 3 through 6

Remove or Disconnect

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Parking brake cable assembly at equalizer. Refer to SECTION 5F.
3. Tire and wheel assembly. Refer to SECTION 3E.
 - Install wheel nuts to retain rotor assembly (39).
4. Brake hose fitting bolt/screw (32), brake hose fitting (33) and two gaskets (34) only if caliper assembly is being removed for overhaul.
 - A. Discard old gaskets (34).
 - B. Plug hole in caliper housing (14) and brake hose fitting (33).
5. Actuator lever return spring (4) only if defective.
 - Discard actuator lever return spring (4) if coils are opened.
6. Parking brake cable assembly (35) from parking brake actuator lever (5) and parking brake cable bracket (8).

7. Vibration dampener nut (41) and vibration dampener assembly (40) from parking brake cable bracket (8), if necessary.
8. Upper caliper guide pin bolt/screw (13) and discard.
9. Lower caliper guide pin bolt/screw (9) and discard, only if removing caliper assembly from vehicle.
10. Caliper housing (14) from rotor assembly (39) and anchor bracket (17).
 - If caliper overhaul or replacement is not required, hang caliper housing (14) from suspension to avoid damage to brake hose assembly.
11. Inner and outer pad assemblies (29 and 30) only if they are being replaced or if anchor bracket (17) is being removed.
12. Shim (10), if inner and outer pad assemblies (29 and 30) were removed.

Inspect

1. Guide pins (15) for free movement in anchor bracket (17). Replace guide pins (15) or guide pin boots (16) if corroded, worn or damaged.
2. Inner and outer pad assemblies (29 and 30) for wear and maximum taper of 0.15 mm (0.006 inch).
 - Replace with new inner and outer pad assemblies (29 and 30) if they are tapered beyond specification.
 - Replace inner and outer pad assemblies (29 and 30) in sets of four.
3. Brake hose fitting bolt/screw (32).
 - If through-hole in brake hose fitting bolt/screw (32) is blocked, remove blockage or replace brake hose fitting bolt/screw (32).

Install or Connect

NOTICE: See "Notice" on page 5B2-1 of this section.

1. New shim (10), if removed.
2. Inner and outer pad assemblies (29 and 30), if removed.

Important

- Whenever rear disc brake inner and outer pad assemblies are replaced, immediately check the parking brake free-travel. Adjust as necessary. Refer to "Parking Brake Free-Travel Adjustment" in this section.
- A. Outer pad assembly (30) with insulator is installed toward caliper housing (14). Inner pad assembly (29) with wear sensor is installed nearest to piston (19).
 - B. Wear sensor must be in leading position with forward wheel rotation. If not, use other inner pad assembly (29) in replacement kit.
3. Caliper housing (14) over rotor assembly (39) and into anchor bracket (17).
 4. New upper caliper guide pin bolt/screw (13).

Tighten

- Upper caliper guide pin bolt/screw (13) to 37 N•m (27 lb. ft.).
5. New lower caliper guide pin bolt/screw (9), if removed.

Tighten

- Lower caliper guide pin bolt/screw (9) to 37 N•m (27 lb. ft.).
6. Brake hose fitting (33), two new gaskets (34) and brake hose fitting bolt/screw (32), if removed.

Tighten

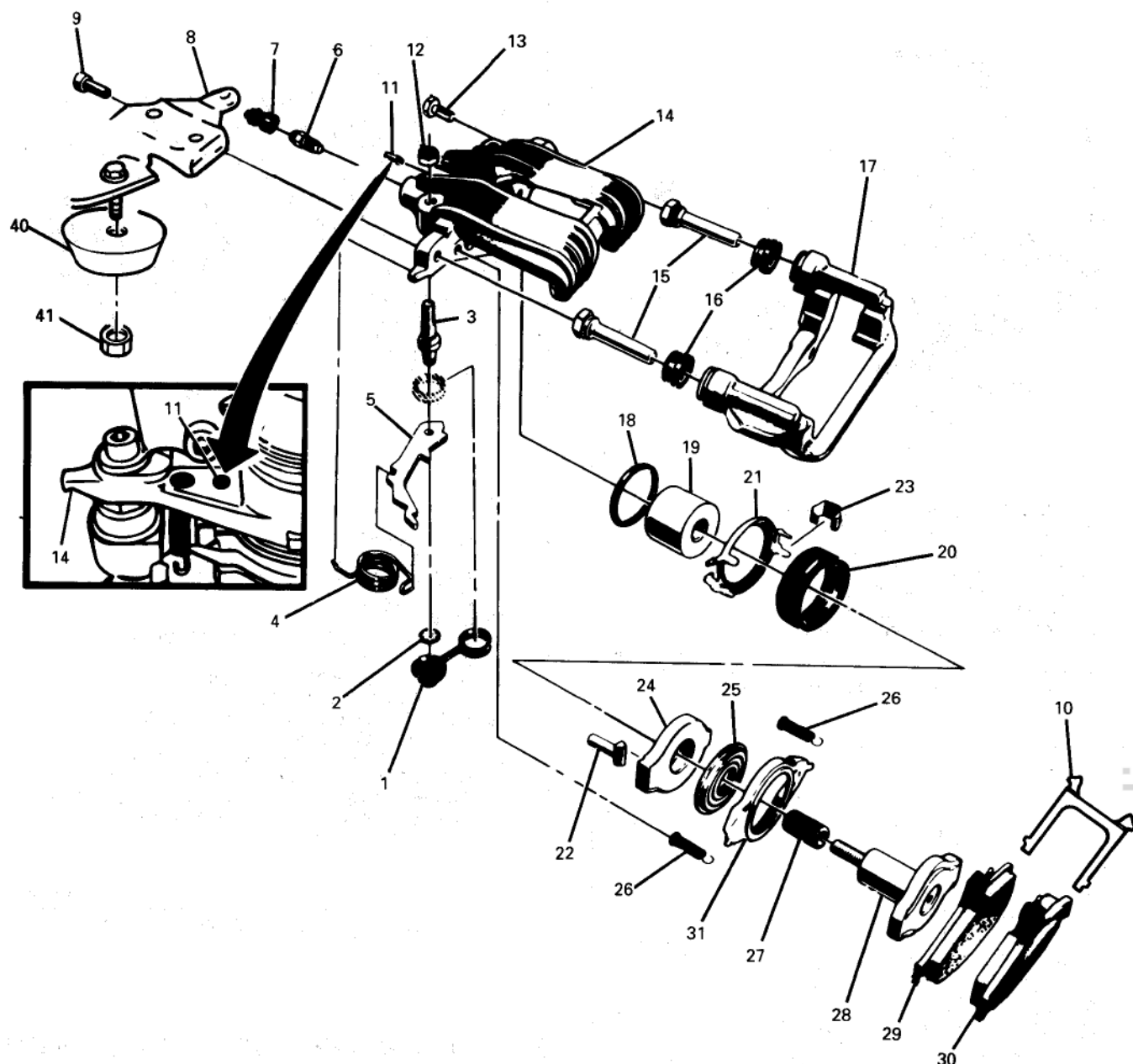
- Brake hose fitting bolt/screw (32) to 30 N•m (22 lb. ft.).
7. Vibration dampener assembly (40) and vibration dampener nut (41) to parking brake cable bracket (8), if removed.

Tighten

- Vibration dampener nut (41) to 50 N•m (37 lb. ft.).
8. Parking brake cable assembly (35) to parking brake cable bracket (8) and parking brake actuator lever (5), and parking brake cable equalizer.
 9. Actuator lever return spring (4), if removed.
 10. Bleed brake hydraulic system, if brake hose fitting was removed. Refer to SECTION 5E1.
 11. Lower vehicle.
 12. Cycle parking brake assembly.
 13. Raise and suitably support vehicle. Refer to SECTION 0A.

Inspect

- Parking brake actuator levers to make sure they are against stops on caliper housing (14). If parking brake actuator levers are not on their stops, make sure actuator lever return spring (4) is correctly installed, then refer to SECTION 5F for parking brake linkage repairs.
14. Tire and wheel assembly. Refer to SECTION 3E.
 - Remove wheel nuts securing rotor assembly (39).
 15. Lower vehicle.
 16. With engine running, pump brake pedal assembly slowly and firmly three times to seat inner and outer pad assemblies (29 and 30).
 17. Check brake hydraulic system for leaks.



- | | |
|---|--|
| 1 SEAL, REAR PARKING BRAKE LEVER PIVOT PIN | 16 BOOT, REAR BRAKE CALIPER GUIDE PIN |
| 2 CLIP, REAR PARKING BRAKE LEVER SPRAG | 17 BRACKET, REAR BRAKE CALIPER ANCHOR |
| 3 PIN, REAR PARKING BRAKE LEVER PIVOT | 18 SEAL, REAR BRAKE CALIPER PISTON |
| 4 SPRING, REAR CALIPER PARKING BRAKE ACTUATOR LEVER RETURN | 19 PISTON, REAR BRAKE CALIPER |
| 5 LEVER, REAR PARKING BRAKE ACTUATOR | 20 BOOT, ACTUATING COLLAR |
| 6 VALVE, REAR BRAKE CALIPER BLEEDER, 11 N·m (97 LB. IN.) | 21 RETAINER, ACTUATING COLLAR BOOT |
| 7 CAP, REAR BRAKE CALIPER BLEEDER VALVE | 22 PUSHROD |
| 8 BRACKET, PARKING BRAKE CABLE | 23 SPRING, PRELOAD |
| 9 BOLT/SCREW, LOWER CALIPER GUIDE PIN, 37 N·m (27 LB. FT.) | 24 COLLAR, ACTUATING |
| 10 SHIM | 25 BOOT, ACTUATING COLLAR |
| 11 SCREW, PARKING BRAKE LEVER ADJUSTER | 26 SPRING, REAR CALIPER PARKING BRAKE COLLAR RETURN |
| 12 NUT, REAR PARKING BRAKE LEVER PIVOT PIN, 22 N·m (16 LB. FT.) | 27 BUSHING |
| 13 BOLT/SCREW, UPPER CALIPER GUIDE PIN, 37 N·m (27 LB. FT.) | 28 ROD, CLAMP |
| 14 HOUSING, REAR BRAKE CALIPER | 29 PAD ASSEMBLY, REAR DISC BRAKE INNER |
| 15 PIN, REAR BRAKE CALIPER GUIDE | 30 PAD ASSEMBLY, REAR DISC BRAKE OUTER |
| | 31 RETAINER, ACTUATING COLLAR BOOT |
| | 40 DAMPENER ASSEMBLY, REAR BRAKE VIBRATION |
| | 41 NUT, REAR BRAKE VIBRATION DAMPENER, 50 N·m (37 LB. FT.) |

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Figure 3 – Rear Brake Caliper Assembly Components

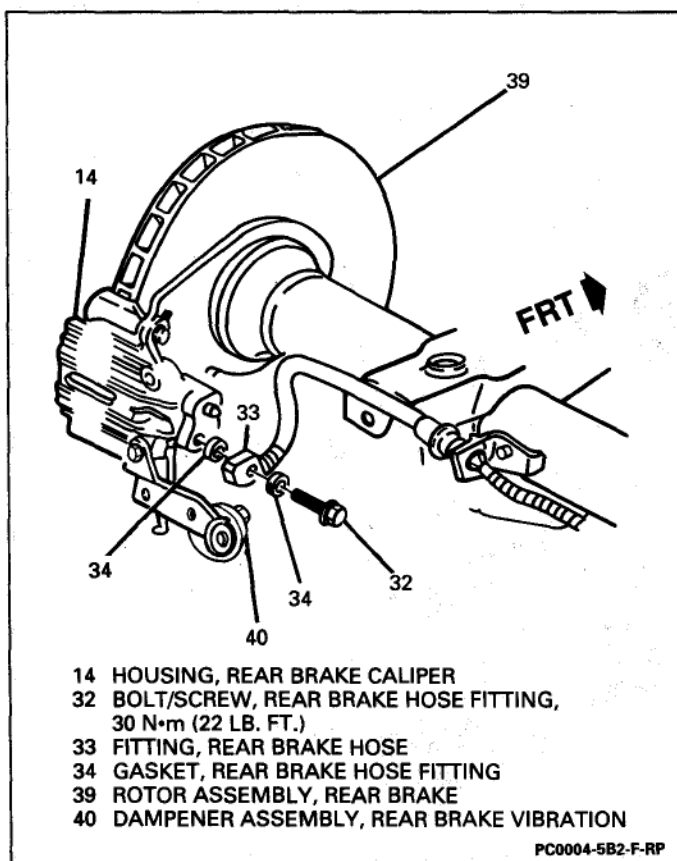


Figure 4 – Removing Rear Brake Hose Fitting

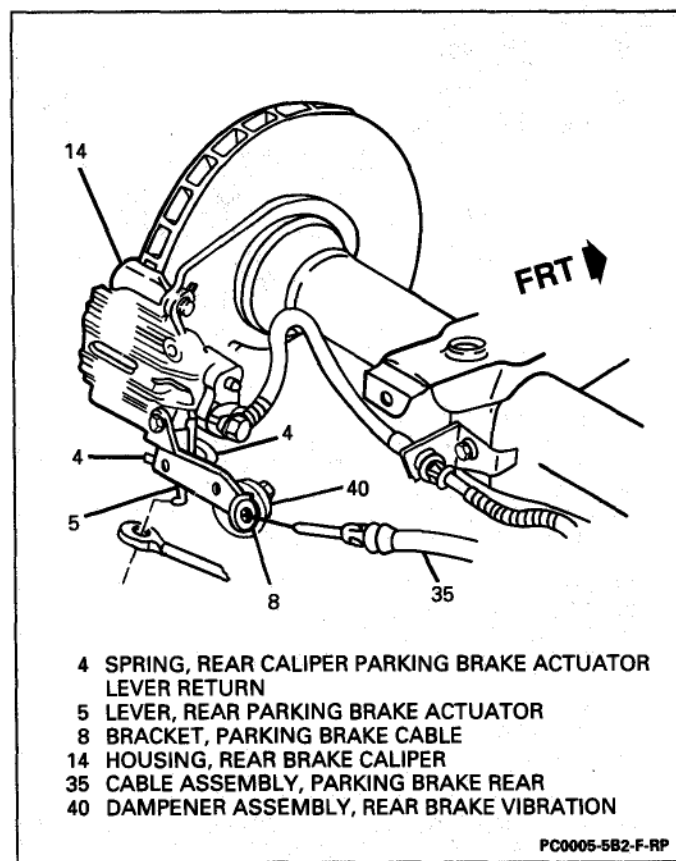


Figure 5 – Parking Brake Cable Assembly Attachment

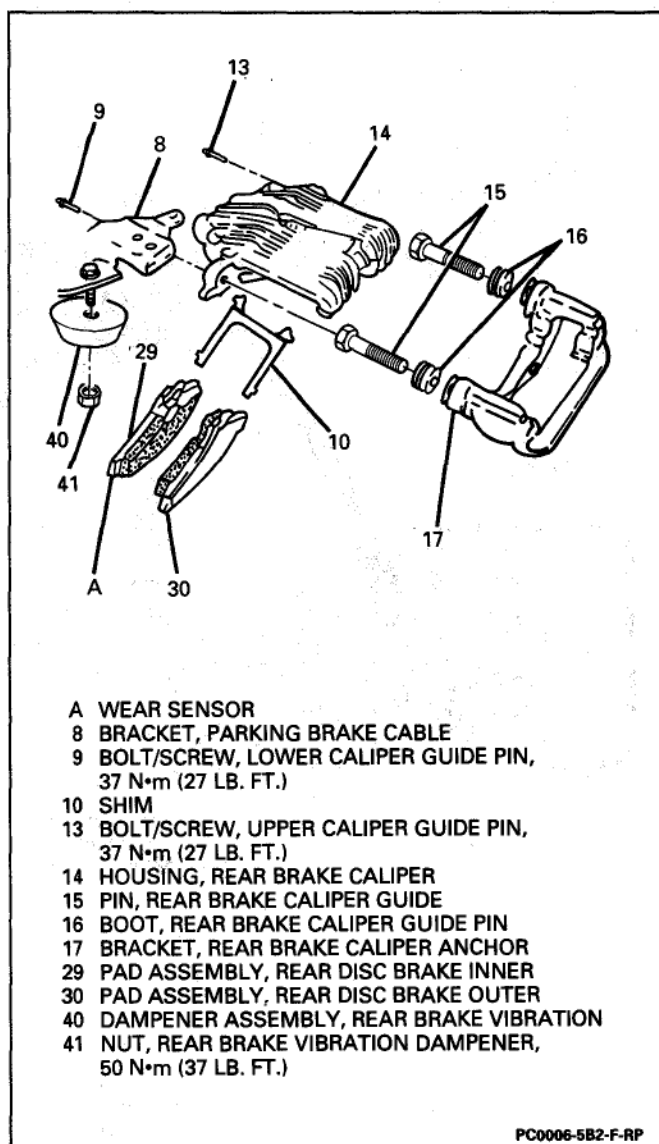


Figure 6 – Rear Brake Caliper Assembly

REAR DISC BRAKE INNER AND OUTER PAD ASSEMBLIES

Figures 3, 7 and 8

↔ Remove or Disconnect

- Two-thirds of brake fluid from master cylinder reservoir.
- Raise and suitably support vehicle. Refer to SECTION 0A.
- Tire and wheel assembly. Refer to SECTION 3E.
 - Install wheel nuts to retain rotor assembly.
- Position a C-clamp and tighten until piston (19) bottoms in base of caliper housing (14).
 - Make sure one end of C-clamp rests on brake hose fitting bolt/screw (32) and other end against outer pad assembly (30).

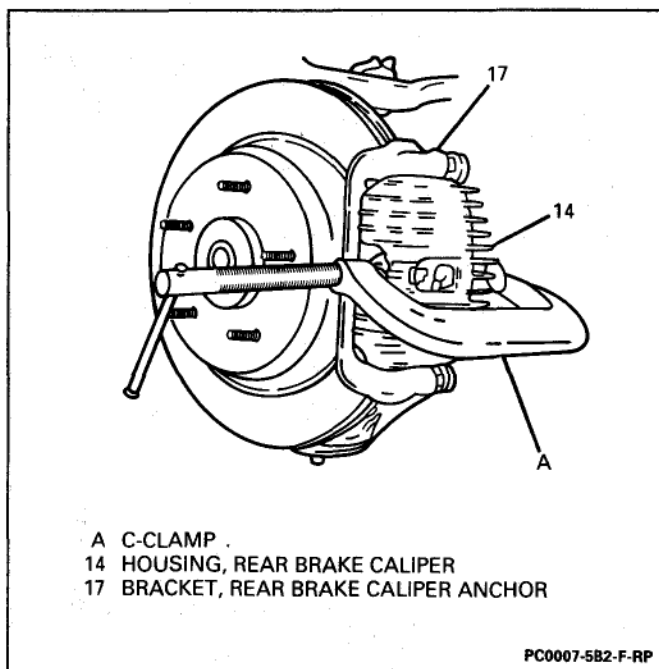


Figure 7 – Compressing Rear Brake Caliper Piston

Important

- It is not necessary to remove the actuator lever return spring (4) to replace the inner and outer pad assemblies (29 and 30).
5. Upper caliper guide pin bolt/screw (13).
 - Discard upper caliper guide pin bolt/screw (13).
 6. Inner and outer pad assemblies (29 and 30).
 - A. Rotate caliper housing (14) about lower caliper guide pin bolt/screw (9) and guide pin (15). Be careful not to strain hose or cable conduit.
 - B. Lift out inner and outer pad assemblies (29 and 30).
 7. Shim (10).
 - Discard shim (10).

Clean

- All residue from shoe guide surfaces on anchor bracket (17) and caliper housing (14).

Inspect

- Guide pins (15) for free movement in anchor bracket (17).
 - Replace guide pins (15) or guide pin boots (16) if corroded or damaged. Refer to “Rear Brake Caliper Assembly” in this section.

Install or Connect

NOTICE: See “Notice” on page 5B2-1 of this section.

1. New shim (10).
2. New inner and outer pad assemblies (29 and 30).

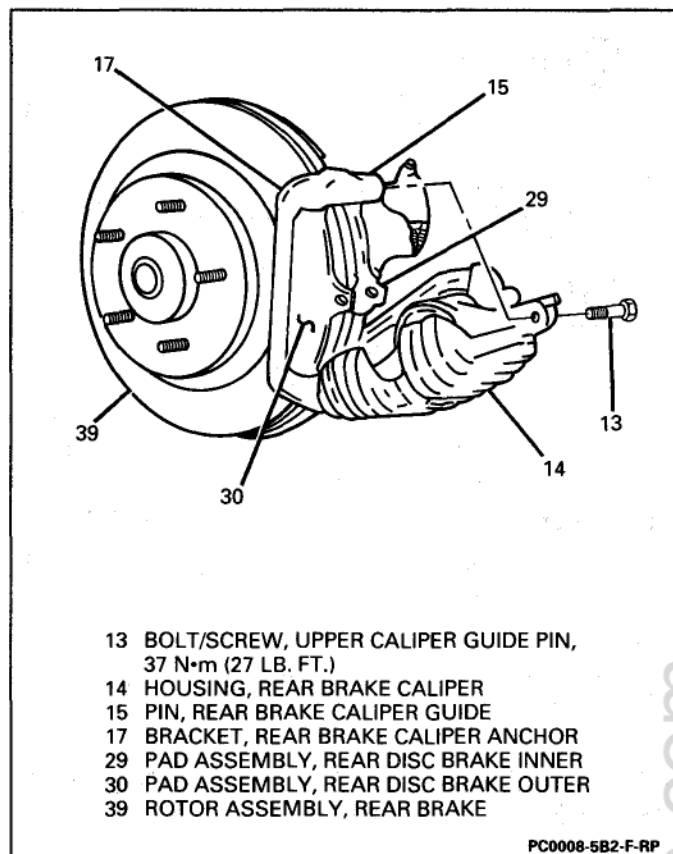


Figure 8 – Rear Disc Brake Inner and Outer Pad Assembly Replacement

Important

- Whenever rear disc brake inner and outer pad assemblies are replaced, immediately check the parking brake free-travel. Adjust as necessary. Refer to “Parking Brake Free-Travel Adjustment” in this section.
- A. Outer pad assembly (30) with insulator is installed toward caliper housing (14). Inner pad assembly (29) with wear sensor is installed nearest the piston (19).
 - B. Wear sensor must be on leading edge of inner pad assembly (29) with forward wheel rotation. If not, use other inner pad assembly (29) in replacement kit.
 - C. Replace inner and outer pad assemblies (29 and 30) in axle sets only.
3. Rotate caliper housing (14) into its operating position.
 - Springs on outer pad assembly (30) must not stick through inspection hole in caliper housing (14). If springs are sticking through inspection hole in caliper housing (14), lift caliper housing (14) and reposition outer pad assembly (30).
 4. New upper caliper guide pin bolt/screw (13).

Tighten

- Upper caliper guide pin bolt/screw (13) to 37 N•m (27 lb. ft.).
5. With engine running, pump brake pedal assembly slowly and firmly to seat inner and outer pad assemblies (29 and 30).

Inspect

- Parking brake actuator levers (5) to ensure they are against stops on caliper housing (14).
 - If parking brake actuator levers are not on their stops, refer to SECTION 5F for parking brake linkage repairs.
6. Tire and wheel assembly. Refer to SECTION 3E.
 - Remove wheel nuts securing rotor assembly (39).
 7. Lower vehicle.
 8. Fill master cylinder reservoirs. Refer to SECTION 5A.

REAR BRAKE CALIPER ANCHOR BRACKET AND MOUNTING PLATE

Figure 9

Remove or Disconnect

1. Caliper assembly. Refer to "Rear Brake Caliper Assembly" under "On-Vehicle Service" in this section.

Important

- Remove anchor bracket (17) only if it is damaged or if rotor assembly (39) is being removed for refinishing or other service operations.
2. Two mounting plate bolts/screws (36).
 - Discard mounting plate bolts/screws (36).
 3. Anchor bracket (17) from mounting plate (38).

Install or Connect

NOTICE: See "Notice" on page 5B2-1 of this section.

1. Anchor bracket (17) to mounting plate (38).
2. Two new mounting plate bolts/screws (36).

Tighten

- Mounting plate bolts/screws (36) to 100 N•m (74 lb. ft.).
 - Check torque on both mounting plate bolts/screws (36) immediately.
3. Caliper assembly. Refer to "Rear Brake Caliper Assembly" under "On-Vehicle Service" in this section.

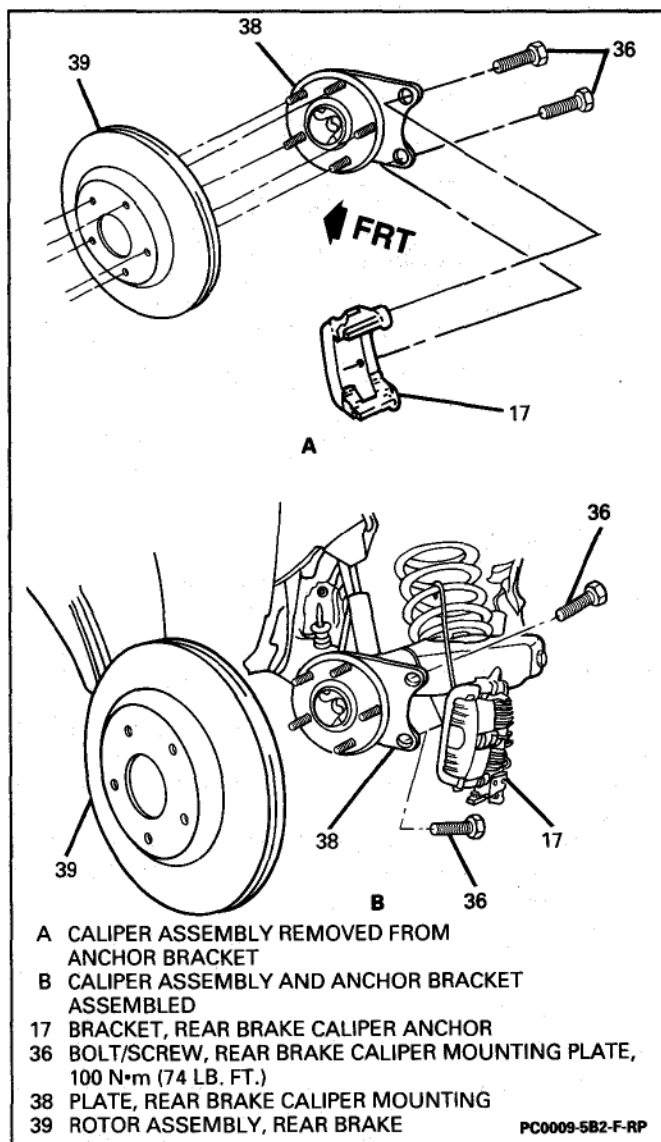


Figure 9 – Rear Brake Rotor Assembly, Caliper Anchor Bracket, and Mounting Plate

REAR BRAKE ROTOR ASSEMBLY

Figure 9

Rear brake rotor assembly can be removed without removal of caliper assembly from anchor bracket.

Remove or Disconnect

1. Raise and suitably support vehicle. Refer to SECTION 0A.
2. Tire and wheel assembly. Refer to SECTION 3E.
3. Two mounting plate bolts/screws (36).
 - Discard mounting plate bolts/screws (36).
4. Anchor bracket (17) with assembled caliper assembly from mounting plate (38) and suspend them from rear suspension out of the way using locally fabricated wire hook.
5. Rotor assembly (39).

Install or Connect

NOTICE: See "Notice" on page 5B2-1 of this section.

1. Rotor assembly (39).
2. Anchor bracket (17) with assembled caliper assembly to mounting plate (38).
3. Two new mounting plate bolts/screws (36).

Tighten

- Mounting plate bolts/screws (36) to 100 N•m (74 lb. ft.).
 - Check torque on both mounting plate bolts/screws (39) immediately.
- 4. Tire and wheel assembly. Refer to SECTION 3E.
- 5. Lower vehicle.

PARKING BRAKE FREE-TRAVEL ADJUSTMENT

Figure 10

The adjustment process requires a second person to apply a light brake pedal load. Parking brake lever free-travel is set by the position of the adjuster screw (11). Turning the adjuster screw (11) clockwise increases the free-travel; turning the adjuster screw (11) counterclockwise decreases the free-travel.

NOTICE: Inner and outer pad assemblies must be new or parallel to within 0.15 mm (0.006 inch). Parking brake adjustment is not valid with heavily tapered pad assemblies and may cause caliper/parking brake binding.

Important

- Inspect old inner and outer pad assemblies and replace with new ones if they are tapered.
 - Parking brake free-travel should only be changed if the caliper has been taken apart, or when the pad assemblies are replaced.
 - This adjustment will not correct a condition where parking brake actuator levers will not return to their stops.
1. Disconnect parking brake cable assembly and remove actuator lever return spring (4).
 2. Have an assistant apply light brake pedal load, enough to stop rotor from turning by hand.
 - This takes up all clearances and ensures that components are correctly aligned.
 3. Apply light pressure to parking brake actuator lever (5).

Measure

- Free-travel between parking brake actuator lever (5) and caliper housing (14) at point B.
 - Free-travel must be 0.61 mm to 0.71 mm (0.024 inch to 0.028 inch).
- 4. If free-travel is incorrect, do the following:

- A. Remove adjuster screw (11).
 - B. Clean thread adhesive residue from threads.
 - C. Coat threads with adhesive.
 - D. Screw in adjuster screw (11) far enough to obtain 0.61 mm to 0.71 mm (0.024 inch to 0.028 inch) free-travel between parking brake actuator lever (5) and caliper housing (14) at point B.
5. Have assistant release brake pedal assembly, then apply brake pedal assembly firmly three times.
 6. Recheck free-travel as described in steps 2 and 3 and adjust as necessary.
 7. Install actuator lever return spring (4) and parking brake cable assembly

UNIT REPAIR

REFINISHING REAR BRAKE ROTOR ASSEMBLIES

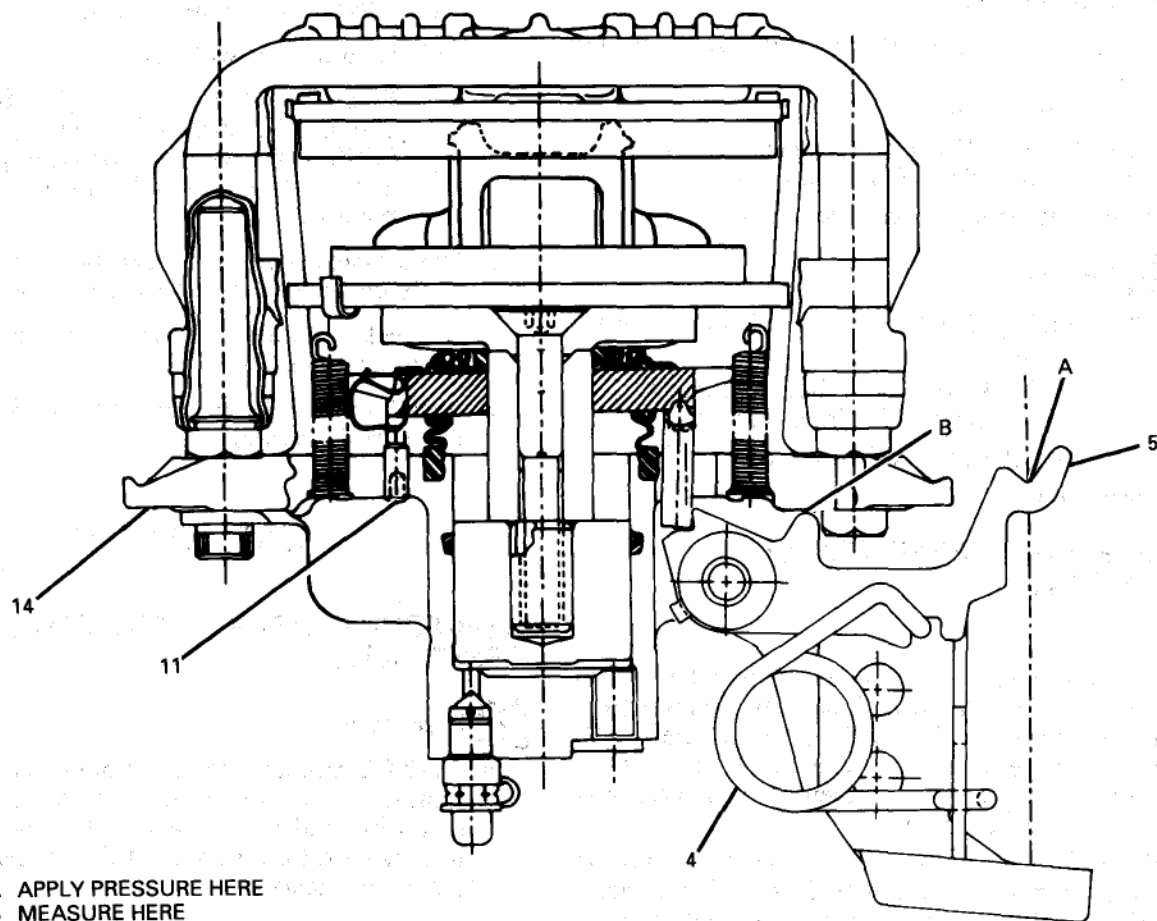
Important

- DO NOT refinish rotor assemblies when performing routine brake maintenance such as replacing worn rear disc brake inner and outer pad assemblies. Refinish a rotor assembly ONLY under the following circumstances:
 - There is a complaint of brake pulsation.
 - There is scoring greater than 1.5 mm (0.06 inch).

All rotor assemblies have a minimum thickness dimension cast into them. This dimension is the minimum wear dimension and not a refinish dimension. The minimum refinish dimension is greater than the discard dimension. Do not use a rotor assembly that will not meet specifications. A rotor assembly that has been refinished too thin will not have proper heat transfer capabilities. Replace with a new rotor assembly. Refer to "Specifications" in this section.

Since accurate control of the rotor assembly tolerances is necessary for proper performance of the rear disc brakes, the rotor assembly should be machined only with precision equipment. Equipment should be serviced on a regular basis following the manufacturer's recommended maintenance procedure.

When refinishing rotor assemblies, the attaching adapters, tool holders, vibration dampeners and tool bits must be in good condition. Always use sharp cutting tools or bits and use only replacement cutting bits recommended by the equipment manufacturer. Dull or worn tools leave a poor surface finish which will affect braking performance. Vibration dampening attachments should always be used when refinishing braking surfaces. These attachments eliminate tool chatter and will result in better surface finish. Make sure these adapters are clean and free of nicks.



- A APPLY PRESSURE HERE
 B MEASURE HERE
 4 SPRING, REAR CALIPER PARKING BRAKE ACTUATOR LEVER RETURN
 5 LEVER, REAR PARKING BRAKE ACTUATOR
 11 SCREW, PARKING BRAKE LEVER ADJUSTER
 14 HOUSING, REAR BRAKE CALIPER

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Figure 10 - Parking Brake Free-Travel Adjustment

On-Vehicle

Tool Required:

On-Vehicle Brake Lathe, such as Kent-Moore
 J 37704 On Disc Brake Lathe
 J 37160-A Brake Rotor Mounting Adapter

In the cases where rotors are being refinished to correct a problem with brake pulsation, it is recommended that an on-vehicle brake lathe be used to achieve best results. Follow the equipment manufacturer's recommended specifications and procedure.

Off-Vehicle

Tool Required:

J 37160-A Brake Rotor Mounting Adapter



Important

- Remove rust and scale from rotor assembly and rear axle shaft flange mating surfaces. Failure to do so may introduce excessive lateral runout when the rotor assembly is mounted on the brake lathe, or

when the rotor assembly is reinstalled on the rear axle shaft flange.

Following are two recommended procedures that achieve adequate results using two different off-vehicle drum/disc brake lathes. (If any other lathe is used, follow that lathe's instructions and recommendations.)

Ammco Brake Lathe

(Two-cut refinishing procedure)

	ROUGH CUT	FINISH CUT
Spindle Speed	150 rpm	150 rpm
Depth of Cut (per side)	0.15 mm to 0.64 mm (0.006 inch to 0.025 inch)	0.10 mm to 0.15 mm (0.004 inch to 0.006 inch)
Tool Cross Feed (per rev.)	0.25 mm (0.010 inch)	0.05 mm (0.002 inch)
Vibration Dampener	Yes	Yes
Sand Rear Brake Rotor Assembly (Swirl Pattern)	No	Yes

Accuturn Brake Lathe, GM Dealer Equipment (One-cut refinishing procedure)

Locate the deepest score and turn the rotor micrometer knob until the tool bit bottoms out at the deepest point of the score. Zero the scale and back out the tool bit (repeat for opposite side of rotor). Advance the cutter handwheel until the bits have cleared the inner edges of the rotor face. Adjust the micrometer knobs for approximately 0.13 mm (0.005 inch) more than the first reading. This will ensure resurfacing the rotor in one cut.

Spindle Speed	105 rpm
Depth of Cut	As necessary
Tool Cross Feed (per revolution)	0.08 mm (0.003 inch)
Tool Bit Nose Radius	1/64
Vibration Dampener	Yes

Non-Directional Finishing

It is very important that the rotor surface be made non-directional by dressing the rotor surfaces with a sanding disc tool such as Ammco 8750 Safe Swirl Disc Rotor Grinder, Accuturn 433179 Non-Directional Swirl Finisher, or equivalent, using 120 grit aluminum oxide sandpaper. Sand each rotor surface with moderate pressure for a minimum of 60 seconds. If the brake lathe is not equipped with an adequate non-directional finishing tool, an alternate method is to use a sanding block with 150 grit aluminum oxide sandpaper. With the rotor turning at the equipment manufacturer's highest recommended cutting speed, sand each rotor surface for a minimum of 60 seconds using moderate pressure. After the rotor has been sanded, clean each surface with denatured alcohol or a suitable brake cleaner.

The finished rotor assembly surface should be as close to that of a new rear brake rotor assembly as possible. Failure to obtain the best possible finish may affect braking performance.

Important

- Rear brake rotor assemblies should always be replaced if turning will result in a rear brake rotor assembly that does not meet manufacturer specifications for minimum thickness. When installing new brake rotor assemblies, do not refinish the surfaces of these parts. New brake rotor assemblies have the correct level of surface finish.

Burnishing Rear Brake Rotor Assemblies

After rear brake pad assemblies have been replaced, it is very important that the new braking surface be broken in, or burnished. In addition, light corrosion on the rotors can be removed by burnishing the new parking brake surface. This can be accomplished by making 20 stops from 48 km/h (30 mph), using medium to firm brake pedal assembly pressure. Allow 0.8 km (0.5 mile) to 1.6 km (1.0 mile) between stops to avoid overheating the brakes.

REAR BRAKE CALIPER ASSEMBLY

Figures 3, 11 and 12

Disassemble

1. Remove caliper assembly. Refer to "Rear Brake Caliper Assembly" under "On-Vehicle Service" in this section.
2. Two collar return springs (26) from actuating collar boot retainer (31).
3. Actuating collar (24) with assembled parts.
 - Firmly but gently pull actuating collar (24) with assembled parts out of caliper housing (14) by pulling on both ends of actuating collar boot retainer (31).
4. Clamp rod (28) and bushing (27) from actuating collar (24).
 - Discard bushing (27).
5. Actuating collar boot retainers (21 and 31), actuating collar boots (20 and 25) and pushrod (22) from actuating collar (24).
 - A. Bend back actuating collar boot retainer tabs and take apart.
 - B. Remove preload spring (23) from actuating collar boot retainer (21).
 - C. Remove pushrod (22) from actuating collar boot retainer (21).
 - D. Remove and discard actuating collar boot retainers (21 and 31) and actuating collar boots (20 and 25).

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

Important

- Use clean shop towels to pad the inside of the caliper housing (14) during rear brake caliper piston removal.

NOTICE: To prevent damage, be careful when handling rear brake caliper piston.

6. Piston (19) by directing dry, filtered compressed air into brake hose port of caliper housing (14).

Inspect

- Piston (19) for scoring, nicks, corrosion and wear.
 - Replace piston (19) if necessary.

NOTICE: Do not use a metal tool to remove piston seal. Metal tools may damage the caliper housing bore or the piston seal groove.

7. Piston seal (18).
 - Use small wood or plastic tool.
8. Bleeder valve cap (7) and bleeder valve (6).
 - Discard bleeder valve cap (7).

9. Parking brake lever pivot pin seal (1), sprag clip (2), actuator lever return spring (4) and parking brake actuator lever (5) from parking brake lever pivot pin (3).

- Discard sprag clip (2).

Inspect

- Contact points on parking brake actuator lever (5) and parking brake lever pivot pin (3) for wear and corrosion.
 - Replace if necessary.

10. Parking brake lever pivot pin (3) and pivot pin nut (12), if worn.

11. Adjuster screw (11) from caliper housing (14).

- Discard if damaged or worn.

Inspect

- Caliper anchor bracket (17) for wear and damage.
 - Replace if necessary. Refer to “Rear Brake Caliper Anchor Bracket and Mounting Plate” in this section.

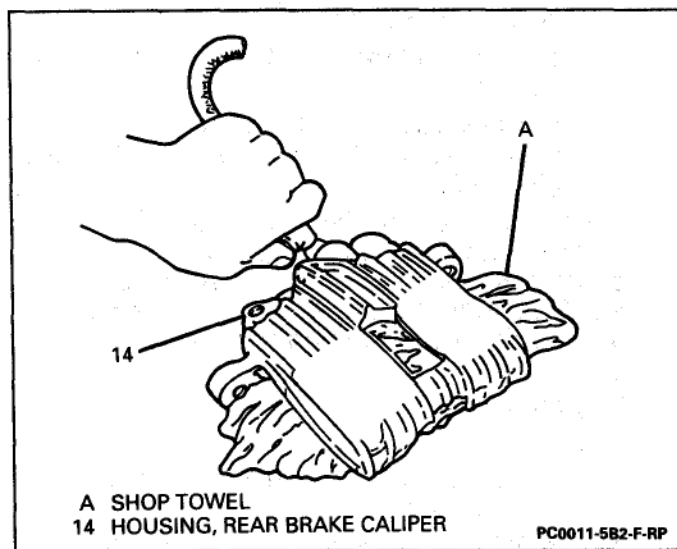


Figure 11 – Removing Rear Brake Caliper Piston

Clean

- Pad assembly contact area on anchor bracket (17).

12. Two guide pins (15) and guide pin boots (16) from anchor bracket (17).

Clean

1. All parts not included in repair kit in denatured alcohol.
2. Use dry, filtered compressed air to dry parts.
3. Blow out all passages in caliper housing (14) and bleeder valve (6).

Inspect

- Caliper housing bore for scoring and corrosion. Replace caliper housing (14) if badly scored or corroded around seal area.

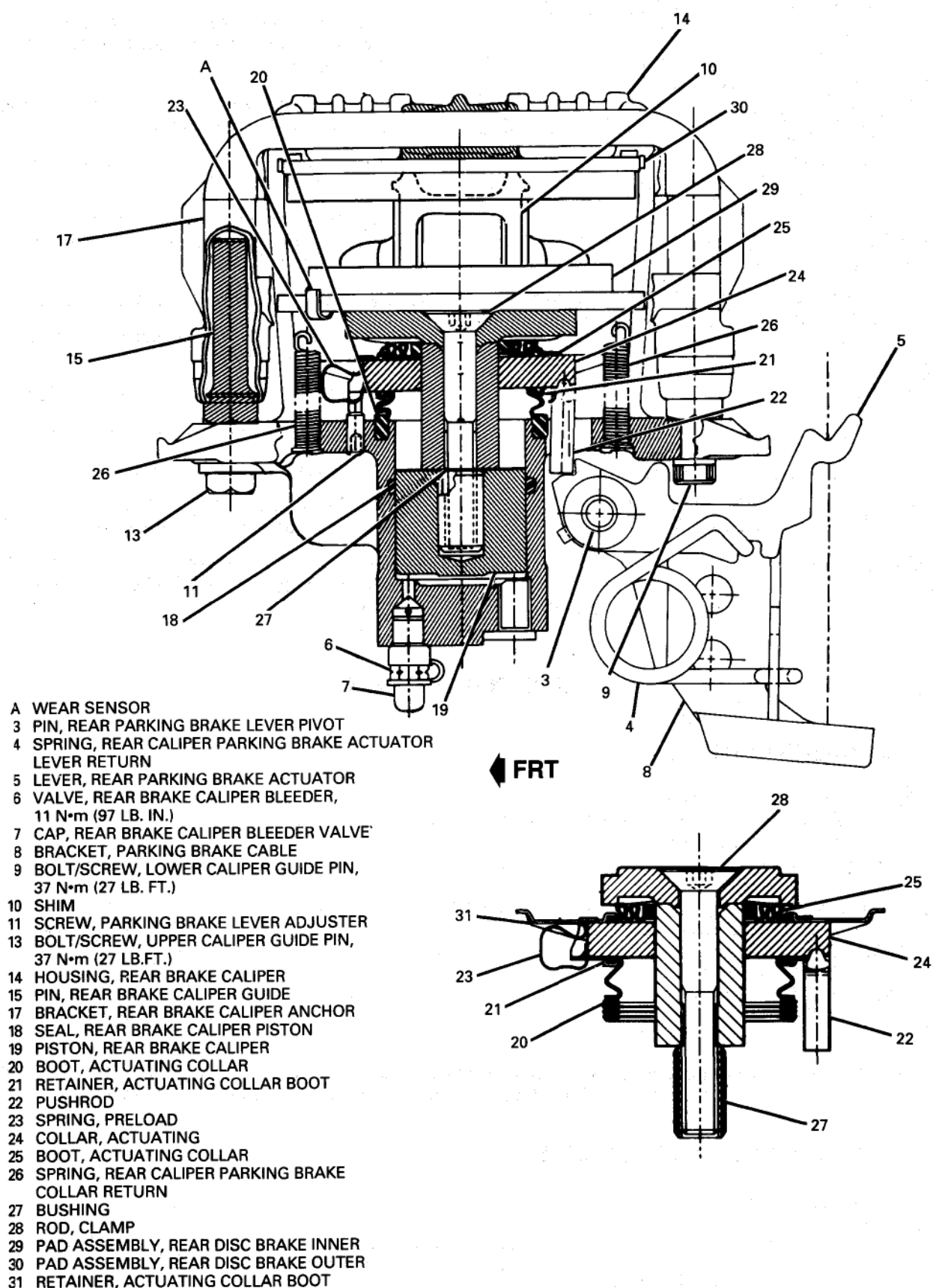
Assemble

NOTICE: See “Notice” on page 5B2-1 of this section.

1. Lubricate new piston seal (18) and caliper housing bore seal groove with silicone grease or clean brake fluid.
2. New piston seal (18) into caliper housing seal groove.
 - Make sure piston seal (18) is not twisted.
3. Lubricate bore of caliper housing (14) and piston (19) with clean brake fluid.
4. Piston (19) into bore of caliper housing (14).
 - Push down by hand to bottom of bore.

Inspect

- Actuating collar (24) and clamp rod (28) for corrosion and excessive wear on working faces.
 - If corrosion or excessive wear is present, replace actuating collar assembly.
5. Pushrod (22), new inner and outer actuating collar boots (20 and 25) and new actuating collar boot retainers (21 and 31) to actuating collar (24).
 - A. Lightly coat actuating collar (24) with liquid lubricant provided in repair kit. Do not use any other fluid or grease.
 - B. Install preload spring (23) into new actuating collar boot retainer (21).
 - C. Install new inner and outer actuating collar boots (20 and 25) into new actuating collar boot retainers (21 and 31).
 - D. Install pushrod (22) to new actuating collar boot retainer (21).
 - E. Clamp new actuating collar boot retainers (21 and 31) firmly against actuating collar (24).
 - F. Bend tabs on new actuating collar boot retainer (21) to hold actuating collar assembly together.
 6. Clamp rod (28) to actuating collar (24) and actuating collar boot (25).
 - A. Lightly coat clamp rod (28) with liquid lubricant provided in repair kit.
 - B. Slide clamp rod (28) through holes in actuating collar boot (25) and actuating collar (24).
 - C. Actuating collar boot (25) must be against reaction plate on clamp rod (28).
 7. New bushing (27) to clamp rod (28).
 - Lubricate outside of bushing (27) with provided lubricant.
 8. Clamp rod (28) with assembled parts into connecting hole in piston (19).



- A. Lubricate grooved bead of actuating collar boot (20) and boot groove in caliper housing (14) with provided lubricant. Use remaining liquid lubricant to coat actuating collar (24), especially around center hole.
 - B. Push clamp rod (28) firmly to bottom of connecting hole in piston (19).
 - C. Pull on actuating collar (24) and seat actuating collar boot (20) into boot groove in caliper housing (14).
 - D. Make sure that pushrod (22) enters hole in caliper housing (14).
9. Two collar return springs (26) to actuating collar boot retainer (31).
 - Actuating collar boot retainer (31) must enter collar return springs (26) at end of second spring coil.
 10. New bleeder valve cap (7) and bleeder valve (6) into caliper housing (14).

 **Tighten**
 - Bleeder valve (6) to 11 N•m (97 lb. in.).
 11. Parking brake lever pivot pin (3) and new pivot pin nut (12) to caliper housing (14), if removed.

 **Tighten**
 - Pivot pin nut (12) to 22 N•m (16 lb. ft.).
 12. Lubricate parking brake actuator lever (5) and parking brake lever pivot pin (3) with grease provided in repair kit.
 13. Pivot pin seal (1), parking brake actuator lever (5), new sprag clip (2) and actuator lever return spring (4), in that order.
 - A. Teeth of sprag clip (2) must face away from parking brake actuator lever (5).
 - B. Snap pivot pin seal cap over parking brake lever pivot pin (3).
 14. Adjuster screw (11) into caliper housing (14) until actuating collar (24) is about parallel to piston bore face of caliper housing (14).
 15. New guide pin boots (16) and guide pins (15).
 - A. Lubricate two guide pins (15) with grease provided in repair kit.
 - B. Slide guide pin boots (16) on guide pins (15).
 - C. Fill guide pin boots (16) with provided grease.
 - D. Assemble to anchor bracket (17).
 - E. Make sure guide pin boots (16) fit into grooves of guide pins (15) and anchor bracket (17).
 16. Install caliper assembly. Refer to "Rear Brake Caliper Assembly" under "On-Vehicle Service" in this section.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Rear Brake Caliper Assembly	
Rear Brake Caliper Housing Bore Diameter (Nominal)	40.50 mm (1.595")
Rear Brake Rotor Assembly	
Rotor Diameter (Nominal)	293.00 mm (11.535")
Lateral Runout	
Rear Brake Rotor Assembly (On-Vehicle Condition)	0.15 mm (0.006")
Rear Axle Shaft Flange	0.05 mm (0.002")
Thickness Variation	0.013 mm (0.0005")
Rotor Thickness (Maximum)	20.00 mm (0.787")
Minimum Thickness After Refinish	18.63 mm (0.733")
Discard Thickness	18.40 mm (0.724")

All rear brake rotor assemblies have a discard dimension cast into them. This is a wear dimension and not a refinish dimension. Any rear brake rotor assembly which does not meet the specifications should be replaced.

ROTOR REFINISHING SPECIFICATIONS

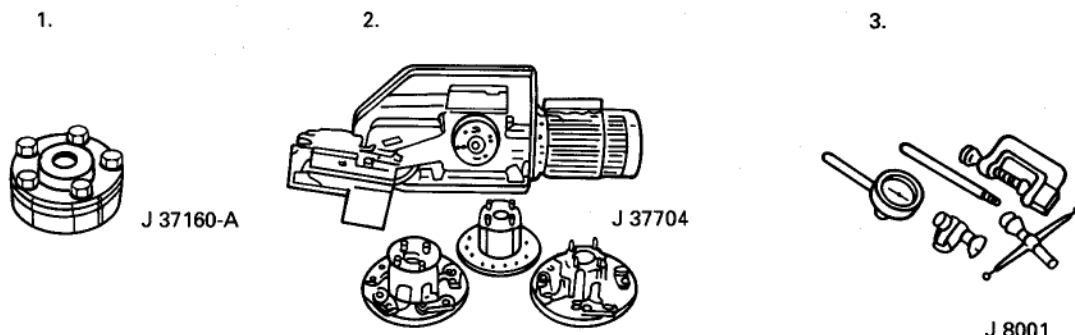
Ammco Brake Lathe	
Rough Cut	
Spindle Speed	150 rpm
Depth of Cut (Per Side)	0.15 mm to 0.64 mm (0.006" to 0.025")
Tool Crossfeed (Per Revolution)	0.25 mm (0.010")
Vibration Dampener	Yes
Sand Front Brake Rotor Assembly (Swirl Pattern)	No

Finish Cut	
Spindle Speed	150 rpm
Depth of Cut (Per Side)	0.10 mm to 0.15 mm (0.004" to 0.006")
Tool Crossfeed (Per Revolution)	0.05 mm (0.002")
Vibration Dampener	Yes
Sand Front Brake Rotor Assembly (Swirl Pattern)	Yes
Accuturn Brake Lathe	
Spindle Speed	105 rpm
Depth of Cut	As necessary
Tool Crossfeed (Per Revolution)	0.08 mm (0.003")
Vibration Dampener	Yes

FASTENER TIGHTENING SPECIFICATIONS

Lower Caliper Guide Pin Bolt/Screw	37 N•m (27 lb. ft.)
Rear Brake Caliper Bleeder Valve	11 N•m (97 lb. in.)
Rear Brake Caliper Mounting Plate Bolt/Screw	100 N•m (74 lb. ft.)
Rear Brake Hose Fitting Bolt/Screw	30 N•m (22 lb. ft.)
Rear Brake Vibration Dampener Nut	50 N•m (37 lb. ft.)
Rear Parking Brake Lever Pivot Pin Nut	22 N•m (16 lb. ft.)
Upper Caliper Guide Pin Bolt/Screw	37 N•m (27 lb. ft.)

SPECIAL TOOLS



1. BRAKE ROTOR MOUNTING ADAPTER
2. ON DISC BRAKE LATHE
3. DIAL INDICATOR SET

