

**Needed:**

- Vehicle Jack
- Jack Stands
- A Socket or Wrench Set
- 4" or Larger C-Clamp

- Large Screwdriver or Pry Bar
- Hammer
- Punch
- Haynes Manual
- Large Pliers
- Hex or Torx Bit Set

- Safety Glasses
- Shop Towels
- Dust Mask
- Caliper Guide Pins
- Torque Wrench
- Caliper Piston Tool

- Brake Fluid
- Spray Brake Degreaser
- Disc Brake Pads • Hand Cleaner
- Caliper Hardware Kit
- Disc Brake Grease
- Hand Cleaner

**REPLACING YOUR DISC BRAKES**

Some symptoms that may indicate your disc brakes need service include: Squeal or screeching sound when braking, a pull toward one side during stopping, and brake pedal pulsing while brakes are applied.

**Note:** The brakes operate in a harsh environment. Metal pieces corrode, rubber parts dry out and crack, and the cycles of heat and cold take the temper out of springs and clips. We recommend replacing the brake hardware with each brake job to ensure safe driving proper operation of the calipers and to prevent uneven or premature disc brake pad wear.

1

**PREPARATION AND DISASSEMBLY**

1. Park the vehicle on the ground and block the wheels at the opposite end from where you will be working.

2. Remove the hub caps, if any.

3. Loosen the lug nuts about half a turn but do not remove them yet.

4. Raise the vehicle until the bottom of the tires are off the ground. Support the frame of the vehicle with jack stands.

**CAUTION:** Never perform brake repairs on the vehicle without the support of jack stands! Always wear eye protection. Use a good quality dust mask to filter out harmful brake dust.

5. Finish removing the lug nuts and remove the tires.

6. Remove the caliper mounting hardware. It is best to work on one side at a time and use the other side as a guide (Fig. 1).

**Caution:** There are many different types of fasteners used to mount disc brake calipers. Whether it is internal or external hex head, star or torx bit, or metric, use the correct tool to prevent injury to yourself or damage of the fastener.

7. Most calipers that are mounted on guide pins can be gently pried loose and lifted off the rotor at this point (Fig. 2). Some calipers have guide plates or a combination of guide plate and tension spring that is wedged between the caliper and the caliper mount (Fig. 3). This type requires using a hammer and punch to drive the plate out. It is normally easier to drive the guide plate in toward the vehicle.

8. Once the caliper is removed from the mount, suspend it from any convenient point on the suspension or inner fender panel with a piece of wire or coat hanger. This will help prevent damage to the brake line and free both hands to remove the disc brake pads.

9. Carefully pry the inner brake pad away from the caliper piston. It is commonly held in place by a metal clip that is fastened to the brake pad and pressed into the hollow part of the caliper piston.

10. Examine how the outer brake pad is fastened to the caliper. There are a variety of methods used. Some have guide pins and spring clips, while others may have locating tabs and metal ears that must be bent into place. In any case, make sure you understand how the pads are held in place to insure the new pads are installed the same way as the old ones.

11. Remove the outer brake pad.

**BRAKE INSPECTION**

Compare the old pads to the chart on the backside of this page (Fig. 5). Matching your old pads to the examples in the chart can help you determine if there are problems in the brake system that need to be corrected.

**CAUTION:** If the pads are not worn evenly, find and correct the problem that is causing uneven pad wear. Do not install new pads on a brake system that is not functioning correctly. Rapid pad wear, pulling to one side, overheating of brake components and brake failure could result.

2

1. Examine the brake calipers for damage such as broken ears, elongated or worn guide pins or mounting holes, cracks in the casting, worn mounting surfaces, rubber boot damage or leaks. If any damage is found, replace the calipers.

**Note:** Moisture build-up causes corrosion inside the caliper where it can not be seen. In addition, heat from brake operation dries out the internal rubber seals. The effects of this damage will not become apparent until the caliper piston is pushed back into its bore to accommodate the new thicker pads. If the brake system has not been flushed and the calipers have 30,000 miles or more of use, they should be replaced. To maintain a balanced brake system, always replace parts like calipers, wheel cylinders, and brake hoses, in pairs.

2. Examine the rubber brake hoses. If there are any cracks or worn spots in the rubber brake hoses, they should be replaced.

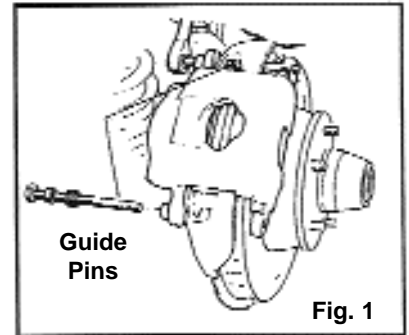
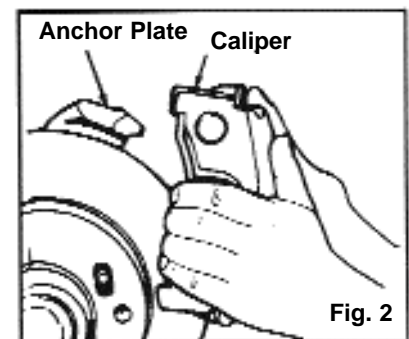
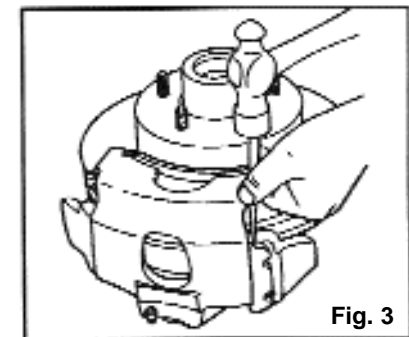
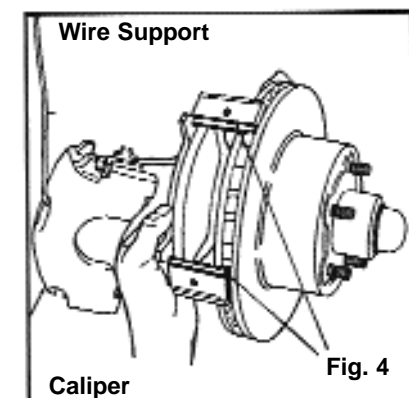
3. Examine the area that the caliper mounts on (Fig. 4). Use a wire brush to remove any rust from the sliding surfaces the caliper moves on and lubricate the slide areas with disc brake grease.

4. Examine calipers, guide pins or bolts, for rust and corrosion. If corrosion is present, those bolts or guide pins should be replaced. Do not wire brush and reuse pitted brake bolts or guide pins.

5. Remove any anti-rattle clips or plates from the old pads and clean the clips or plates of any grime or old vibration damping material.

6. To prepare for the next step, open the air bleed valve on the caliper. The next step will be to push the caliper piston back into its bore.

**CAUTION:** If you are working on rear disc brakes (also some import front disc systems), a parking brake mechanism is incorporated into the calipers. The caliper pistons on these brake systems cannot be simply pushed back into the caliper. A screwtype assembly rotates the piston outward to keep the pads adjusted. The piston must be rotated in the opposite direction to retract the piston. There are several types of special tools available to accomplish this such as the one shown (Fig. 6). Refer to a Haynes repair manual for the correct procedures.

**REMOVING GUIDE PINS****REMOVING CALIPER****DRIVING OUT GUIDE PLATE****CLEAN MACHINED AREAS**

<b>VIEW 4</b>	Grooves in the surface of the friction material.	Rotor surface is irregular.	Rotors should be machined or replaced. Brake pads must be replaced.
<b>VIEW 5</b>	Cracked linings or clipped corners on friction material.	Excessive heat build-up in brake system. Caliper or caliper piston hanging up creating friction. Rear brakes not effective.	Replace calipers and mounting hardware. Inspect and repair rear brakes.
<b>VIEW 6</b>	Brake linings completely worn out, exposed rivets, rotor damaged.	Brake pads are worn beyond safe and normal wear points.	Replace brake pads, mounting hardware, and machine or replace rotors.
<b>VIEW 7</b>	Stop in lining.	Pads were not installed properly, Pads were not in full contact with the brake rotor.	Replace brake pads, guide pin mounting bolt bushings, caliper hardware.

7. Except for the caliper types mentioned above, use a large c-clamp and one of the old pads to slowly compress the caliper piston all the way into the caliper (Fig. 7). Keep the c-clamp aligned with the piston to prevent it from being lodged at an angle in the bore. Be careful not to pinch and tear the rubber dust boot around the piston.

8. Close the air bleed screws.

**NOTE:** Regarding resurfacing or replacing disc brake rotors; we recommend removing the brake rotors following the procedures outlined in a Haynes repair manual and bring them to the nearest auto store for a complete evaluation.

3

### REASSEMBLY

1. Compare the new brake pads and components to the old ones to assure correct replacement. Be sure to check the placement of any locating pins, attachment points for clips, wear indicators, or wear sensors.

**Note:** Be sure that you are using the correct brake pads for your application. It is possible to upgrade from organic pads to semi-metallic and get improved braking. DO NOT downgrade a brake system designed to use semi-metallic pads. Organic pads do not perform well in the higher heat and pressure brake systems that semi-metallic pads were designed for. Your salesperson can tell you which type of brake pads are required on your vehicle.

2. Apply a vibration/noise suppressing compound to the back of the brake pads as shown (Fig. 8).

3. While the compound is drying, apply disc brake lubricant to the sliding surfaces of the caliper. Locate the specific areas that need to be lubricated by referring to a Haynes service manual. Lubrication is extremely important to the proper operation of the brake system. Do not use anything other than disc brake lubricant for this!

4. Once the noise suppression compound is dry (most can be installed while still tacky), the pads can be installed into the caliper.

5. Perform a final check of the assembled pads and caliper. Match the finished side to the original. Check that all the components are in the correct position and any locking tabs are tight.

6. After reinstalling the brake rotor, place the caliper over the rotor and fasten it in its mounting position. Lubricate the guide pins or slides with disc brake grease being careful not to get any of the lubricant on the pads.

7. Once you are sure the pads and caliper are correctly installed, repeat the same careful steps to repair the other side.

8. Clean any grease and grime from the brake rotor with a spray brake degreaser.

9. Adjust the fluid level in the brake master cylinder to the correct amount.

10. Gently pump the brake pedal until it is firm.

11. On most rear disc brake equipped vehicles, the parking brake must be operated after installing new disc pads to adjust the rear brakes.

**Note:** If hydraulic brake components such as calipers or hoses were replaced, the brake system must be bled of air by following the correct bleeding procedure. To review those procedures, pick up a copy of Tech Tip #29 "How To Bleed Your Brakes".

12. Recheck the fluid level in the master cylinder, top off if necessary, and reinstall the master cylinder cover.

13. Reinstall the wheels and install the lug nuts firmly.

14. Remove the vehicle from the jackstands and finish tightening the lug nuts. Use the correct sequence and torque setting found in your owner's manual or a Haynes repair manual.

15. A proper break-in period is needed to seat the pads quickly and quietly against the rotor surface. To properly break in the new pads, make 15 to 20 slow stops from about 30 miles an hour with light to moderate brake pedal pressure. All at least 30 seconds between stops for cooling. Avoid heavy braking, except in an emergency, for the first 150 to 200 miles to prevent glazing.

### REAR DISC BRAKE TOOL

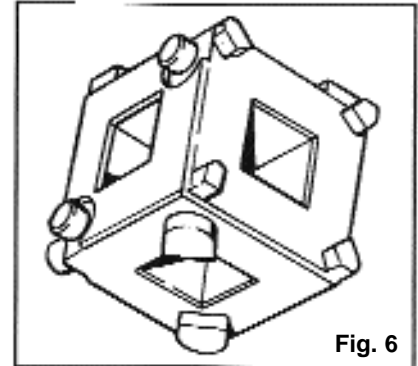


Fig. 6

### PUSHING THE CALIPER PISTON BACK INTO THE CALIPER

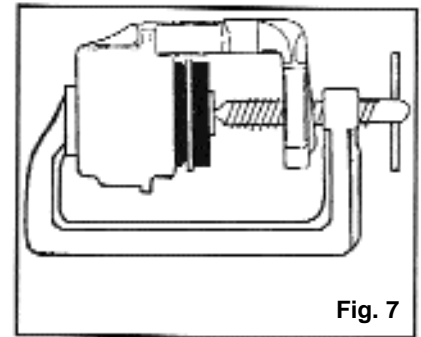


Fig. 7

### PREPARING BRAKE PADS WITH NOISE SUPPRESSOR

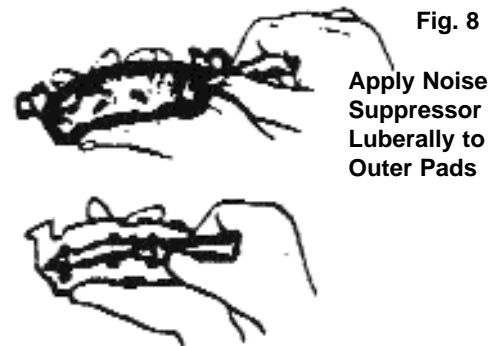


Fig. 8

Apply Noise Suppressor Liberally to Outer Pads

Apply Strip of Noise Suppressor to Backs of Inner Pads. Allow 20 Minutes for Curing. May Install While Tacky.