

SECTION 06-03 Brakes, Front Disc

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION		REMOVAL AND INSTALLATION (Cont'd.)	
Brake Pads	06-03-2	Caliper	06-03-5
DISASSEMBLY AND ASSEMBLY		Rotor	06-03-7
Caliper	06-03-9	Service Precautions.....	06-03-3
MAJOR SERVICE OPERATIONS		SPECIAL SERVICE TOOLS	06-03-11
Brake Rotor Refinishing	06-03-11	SPECIFICATIONS	06-03-11
REMOVAL AND INSTALLATION		VEHICLE APPLICATION	06-03-1
Brake Pads	06-03-3		

VEHICLE APPLICATION

Capri.

DESCRIPTION

WARNING: CONTAINS ASBESTOS FIBERS. AVOID BREATHING DUST. BREATHING ASBESTOS DUST MAY CAUSE ASBESTOSIS AND CANCER.

BREATHING ASBESTOS DUST IS HAZARDOUS TO YOUR HEALTH.

DUST AND DIRT PRESENT ON WHEEL BRAKE AND CLUTCH ASSEMBLIES MAY CONTAIN ASBESTOS FIBERS THAT ARE HAZARDOUS TO YOUR HEALTH WHEN MADE AIRBORNE BY CLEANING WITH COMPRESSED AIR OR BY DRY BRUSHING.

WHEEL BRAKE ASSEMBLIES AND CLUTCH FACINGS SHOULD BE CLEANED USING A VACUUM CLEANER RECOMMENDED FOR USE WITH ASBESTOS FIBERS. DUST AND DIRT FROM THE VACUUM SHOULD BE DISPOSED OF IN A MANNER THAT PREVENTS DUST EXPOSURE, SUCH AS SEALED BAGS. THE BAG MUST BE LABELED PER OSHA INSTRUCTIONS AND THE TRASH HAULER NOTIFIED AS TO THE BAG'S CONTENTS.

IF A VACUUM SUITABLE FOR ASBESTOS IS NOT AVAILABLE, CLEANING SHOULD BE DONE WET. IF DUST GENERATION IS STILL POSSIBLE, TECHNICIANS SHOULD WEAR GOVERNMENT-APPROVED TOXIC DUST PURIFYING RESPIRATORS.

GRINDING OR SANDING ON BRAKE LININGS, PADS, ROTORS, DRUMS OR CLUTCH FACINGS SHOULD BE DONE ONLY WHILE USING PROPERLY EXHAUST-VENTILATED EQUIPMENT.

OSHA REQUIRES AREAS WHERE ASBESTOS DUST GENERATION IS POSSIBLE TO BE ISOLATED AND POSTED WITH WARNING SIGNS. ONLY TECHNICIANS CONCERNED WITH PERFORMING BRAKE OR CLUTCH SERVICE SHOULD BE PRESENT IN THE AREA.

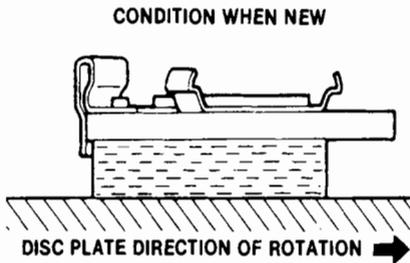
WARNING: BRAKE FLUID CONTAINS POLYGLYCOL ETHERS AND POLYGLYCOLS. AVOID CONTACT WITH EYES. WASH HANDS THOROUGHLY AFTER HANDLING. IF BRAKE FLUID CONTACTS EYES, FLUSH EYES WITH RUNNING WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. IF TAKEN INTERNALLY, DRINK WATER AND INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.

Front braking is provided by a single piston, floating caliper, and disc brakes. The caliper slides on hollow, stainless steel guide pin bushings. Caliper bolts attach the guide pin bushings and the caliper to the anchor plate. The pads are held in the caliper by two pins and may be replaced without removing the caliper.

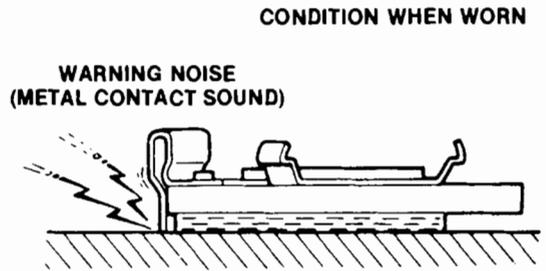
DESCRIPTION (Continued)

Brake Pads

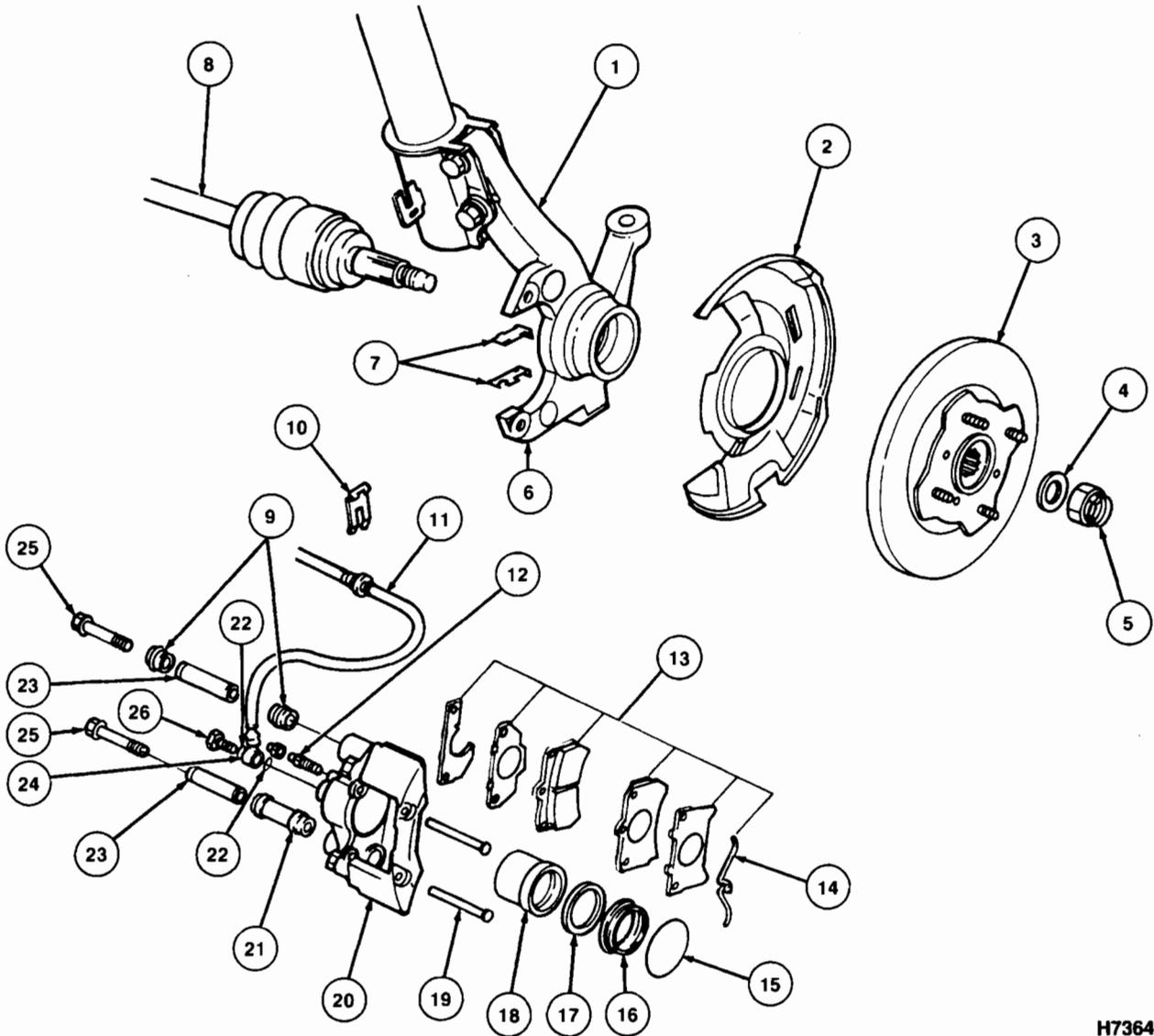
The brake pads are equipped with a wear indicator that will make a squealing noise when the pads are worn. This is a warning to service the brakes before any rotor damage occurs.



H5354-A



H5355-A

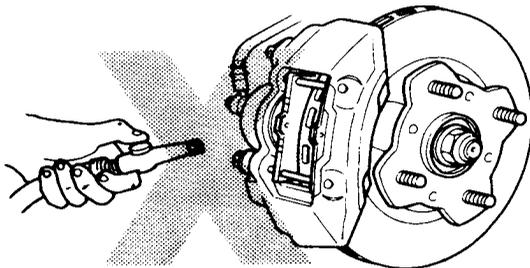


H7364-B

DESCRIPTION (Continued)

Item	Part Number	Description	Item	Part Number	Description
1	18124	Steering Knuckle	14	—	Pad Retainer Spring
2	—	Dust Shield	15	—	Garter Spring
3	BF368 3325 1A BG95 3325 1A	Rotor	16	—	Dust Boot
4	B001 33042	Washer	17	—	Piston Seal
5	B001 33043	Axle Nut	18	B092 3365 1A	Piston
6	—	Anchor Plate	19	B 107 33696	Disc Pad Retainer
7	—	Anchor Plate Clips	20	B 126 33980 B 126 33990	Caliper
8	—	Drive Axle	21	—	Guide Pin Bushing Dust Boot
9	—	Guide Pin Bushing Dust Boot	22	—	Copper Seals
10	—	Flex Line Retainer Clip	23	—	Guide Pin Bushing
11	—	Flex Hose	24	—	Banjo Fitting
12	—	Bleeder Screw	25	B092 33698/9	Caliper Bolt
13	2001	Disc Pad and Shim	26	—	Banjo Bolt

When servicing the brake system, clean all metal parts with isopropyl alcohol. Then, clean out and dry grooves and passageways with compressed air. Make sure caliper bore and component parts are thoroughly clean.



**DO NOT CLEAN
BRAKE ASSEMBLIES
WITH COMPRESSED
AIR**

H5331-A

Use Rotunda Brake and Clutch Service Vacuum 091-00001 or equivalent to clean brake assemblies.

CAUTION: Do not use denatured alcohol for flushing system or cleaning assemblies where alcohol could be trapped and subsequently contaminate brake fluid. Contaminated fluid may cause eventual failure of rubber components in the system.

REMOVAL AND INSTALLATION

Service Precautions

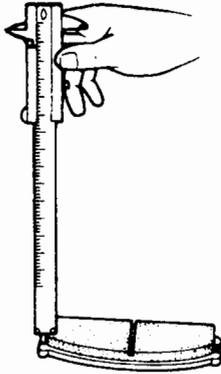
1. Grease or any other foreign material must be kept off lining surfaces and braking surfaces of rotor, and external surfaces of hub during service operation. In handling rotor and caliper assemblies, avoid deformation, nicking or scratching of brake linings and rotor.
2. If a caliper piston is removed for any reason, piston seal and dust boot must be replaced. Exercise care not to damage plastic piston by protecting it from contact with any metal or sharp-edged objects.
3. During removal and installation of a wheel assembly, exercise care not to interfere with, or damage caliper splash shield, if so equipped, or the bleeder screw fitting.
4. Vehicle must be centered on hoist before servicing any front end components to avoid bending or damaging rotor splash shield, if so equipped, on full right or left wheel turns. Refer to Section 00-02.
5. Do not attempt to clean or restore oil or grease-soaked brake linings. When contaminated linings are found, brake linings must be replaced in complete axle sets and rotor braking surfaces wiped clean.
6. Calipers must be installed with bleed screws in upward position for proper purging of air from the front brake system during bleeding.

Brake Pads

NOTE: Whenever servicing brake pads, inspect the pads for the following:

REMOVAL AND INSTALLATION (Continued)

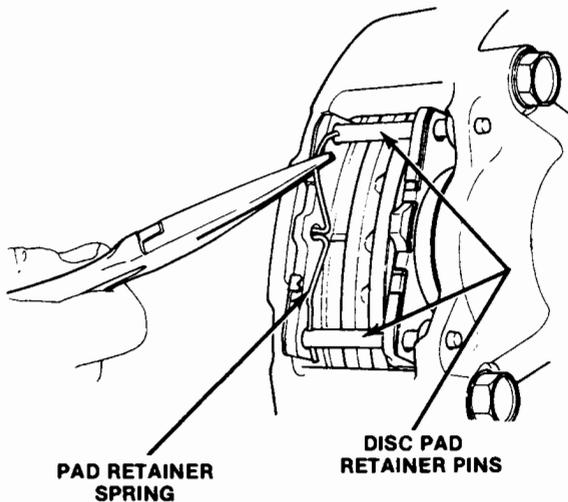
- Oil or grease on the face.
- Abnormal wear or cracking.
- Deterioration or damage due to heat.
- Minimum thickness of 3mm (0.12 inch) or greater.



H5356-A

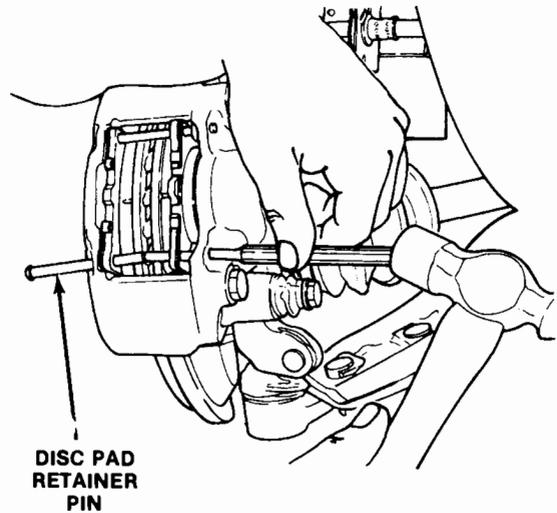
Removal

1. Remove approximately two-thirds of the brake fluid from the master cylinder.
2. Remove wheel and tire assembly.
3. Using a pair of needle-nose pliers, remove the pad retainer spring that locks in the disc pad retainer pins.



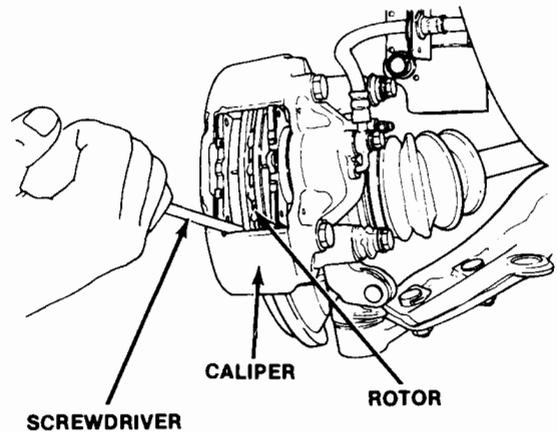
H5332-A

4. Remove the disc pad retainer pins using a hammer and pin punch.



H5333-A

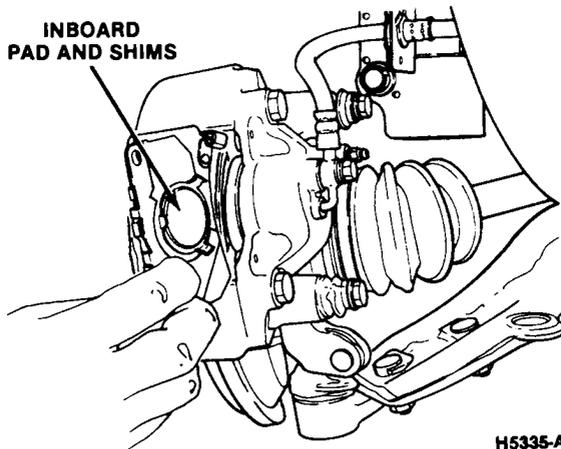
5. Using a screwdriver, pry the caliper outboard and remove the outboard brake pad and shim. Tag the shims so they can be installed in their original position.



H5334-A

REMOVAL AND INSTALLATION (Continued)

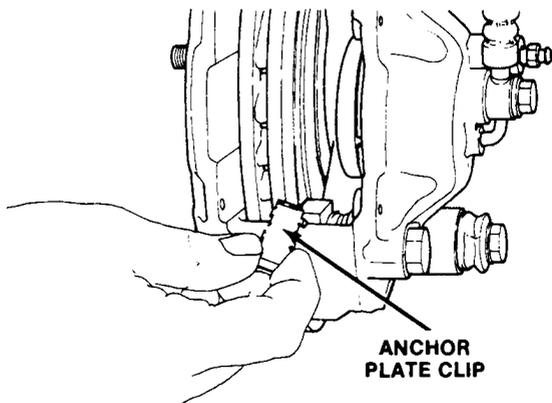
6. Push the caliper inboard with one hand and remove the inboard brake shoe and shims with the other hand.



H5335-A

CAUTION: Use care to prevent damage to the caliper piston dust boot.

7. Remove the anchor plate clips from the caliper anchor plate. Attach tape to the anchor plate clips and label "top" and "bottom".

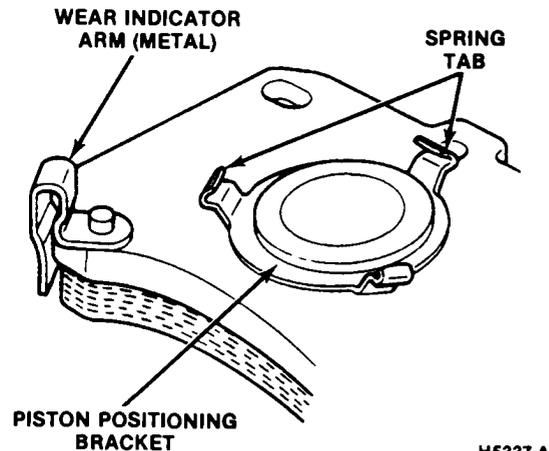


H5336-A

Installation

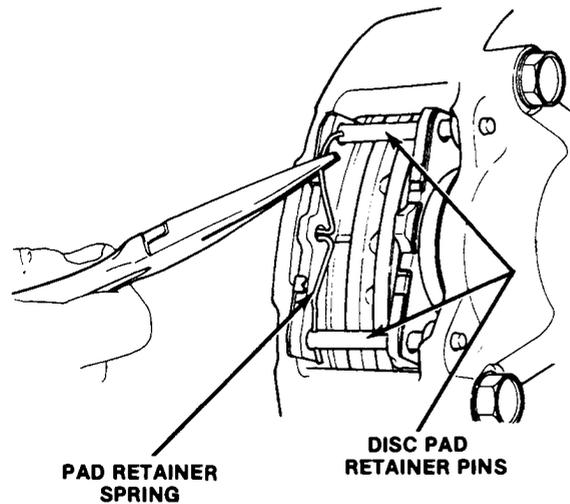
1. Install the anchor plate clips. If they are not installed in their original locations, the locating tabs may contact the rotor.
2. Push the caliper inboard and install the inboard brake pad and shims.

CAUTION: Make sure the spring tabs on the back of the brake pad are properly aligned and fully seated in the caliper piston.



H5337-A

3. Pry the caliper outboard. Install the outboard brake pad and shim.
4. Install the brake shoe retaining pins.
5. Install the retaining spring.



H5332-A

6. Install the wheel and tire assembly. Tighten wheel lug nuts to 90-120 N·m (67-88 lb-ft).
7. Pump the brake pedal several times to seat the brake pads.
8. If necessary correct the level of the brake fluid in the master cylinder.

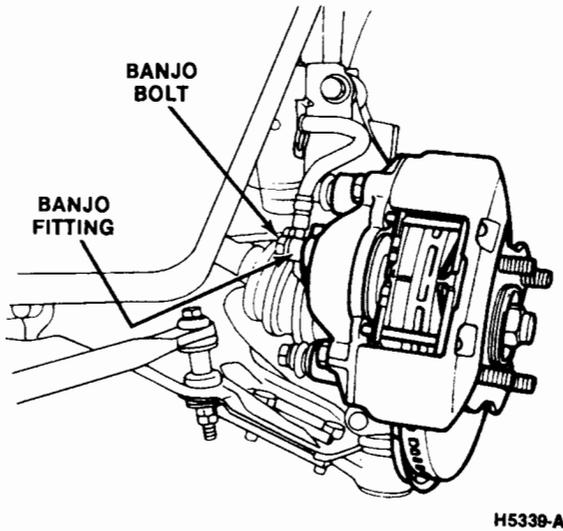
Caliper

Removal

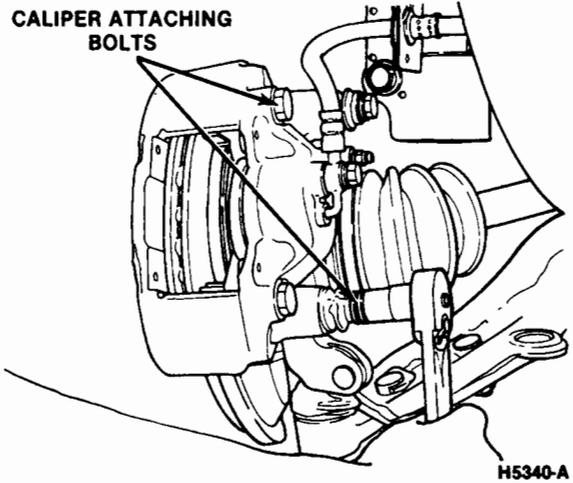
1. Remove the wheel and tire assembly.
2. Remove the brake pads as outlined.

REMOVAL AND INSTALLATION (Continued)

3. Remove the banjo bolt attaching the brake flex hose to the caliper.

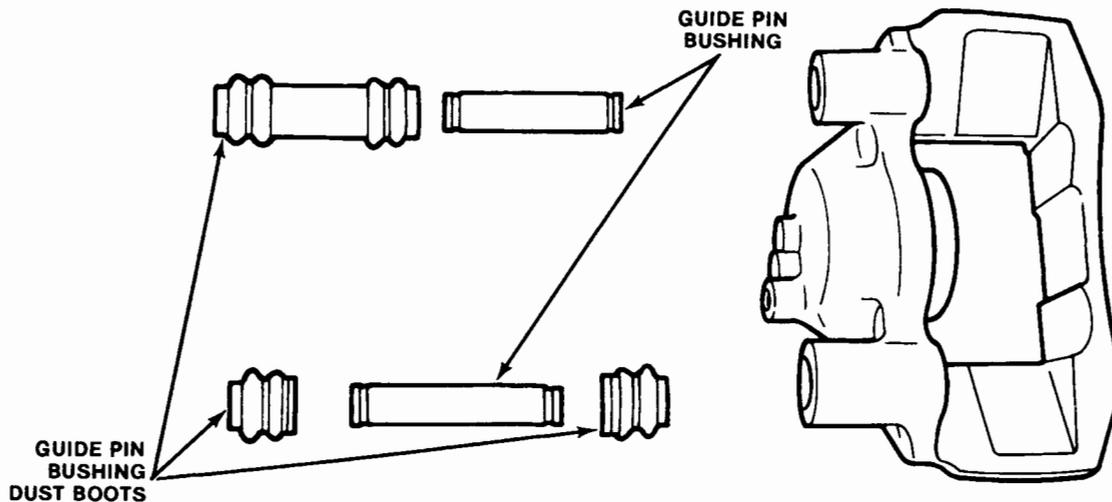


4. Remove the two copper washers that seal the flex hose banjo fitting and discard.
5. Remove the caliper retaining bolts.
6. Lift the caliper off the rotor.

**Installation**

1. Before installing the caliper, remove the guide pin bushing dust boots and push out the caliper guide pin bushings.
2. Lubricate the guide pin bushings with Disc Brake Caliper Slide Grease D7AZ-19590-A (ESA-M1C172-A) or equivalent and install them in the caliper. Install the guide pin bushing dust boots.
3. Position the caliper over the rotor.

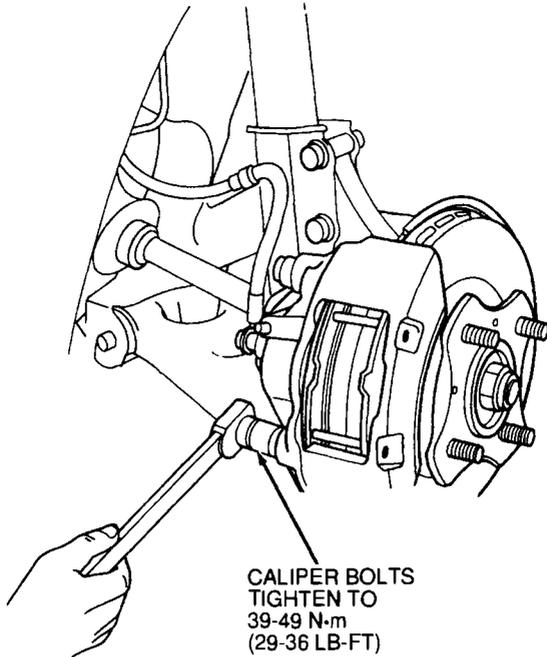
NOTE: To provide the necessary clearance it may be necessary to pull outward slightly on the caliper bushings.



H5341-A

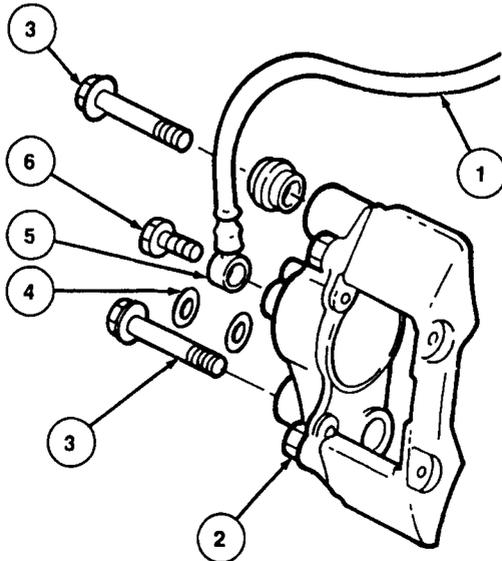
REMOVAL AND INSTALLATION (Continued)

4. Install the caliper retaining bolts. Tighten to 39-49 N·m (29-36 lb-ft).



H7239-B

5. install two new copper washers and the banjo bolt on the flex hose banjo fitting.



H7365-B

Item	Part Number	Description
1	—	Flex Hose
2	—	Caliper

(Continued)

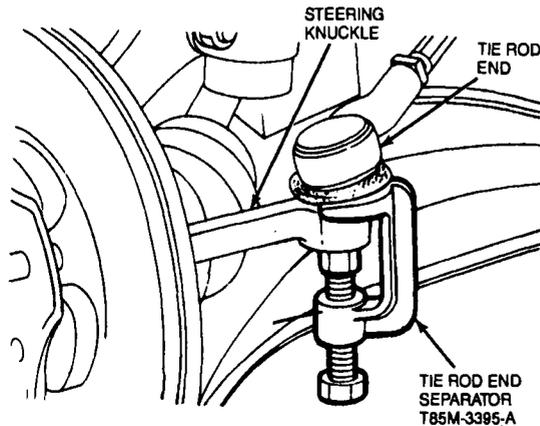
Item	Part Number	Description
3	—	Caliper Bolt
4	—	Copper Washer (2 Req'd)
5	—	Banjo Fitting
6	—	Banjo Bolt

6. Position the flex hose on the caliper and install the banjo bolt. Tighten to 22-29 N·m (17-21 lb-ft).
7. Install brake pads and shims as outlined.
8. Bleed the front brakes either manually or with a pressure bleeder such as Rotunda Brake Bleeder 104-00064 or equivalent. Refer to Section 06-00.
9. Install wheel and tire assembly. Tighten wheel lug nuts to 90-120 N·m (67-88 lb-ft).

Rotor

Removal

1. Remove wheel and tire assembly.
2. Using a cape chisel, unstack and remove halfshaft retaining nut and washer. Discard nut; do not reuse. Refer to Section 04-01.
3. Remove brake pads and caliper from the steering knuckle as outlined. Support the caliper by a wire strung from the coil spring. Do not disconnect the brake line from the caliper.
4. Using Tie Rod End Separator, T85M-3395-A or equivalent, disconnect the tie rod end from the steering knuckle.

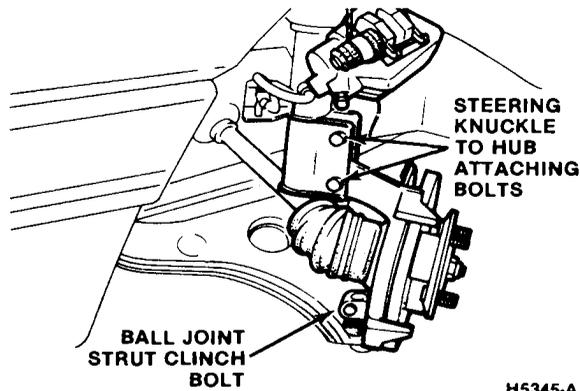


H7338-A

5. Remove ball joint pinch bolt. Separate control arm from steering knuckle. Refer to Section 04-01.

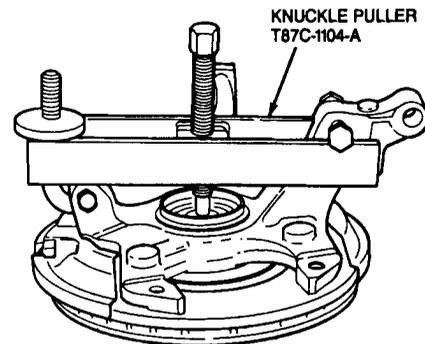
REMOVAL AND INSTALLATION (Continued)

6. Remove steering knuckle to strut assembly retaining bolts.

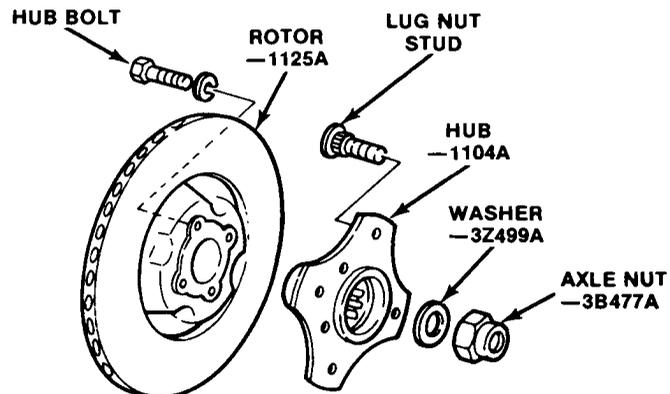
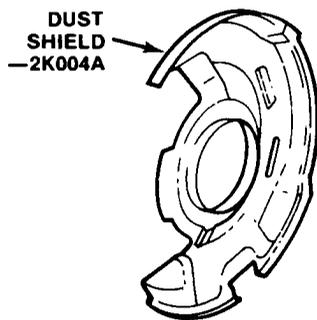


7. Remove the rotor and hub assembly from the steering knuckle using Knuckle Puller T87C-1104-A and Step Plate D80L-630-3 or equivalent.

NOTE: The dust shield is pressed onto the steering knuckle. If the bearings are not being serviced, leave the dust shield attached to the knuckle.



8. Remove rotor from hub.

**Installation**

1. Install rotor to the hub. Tighten retaining bolts to 44-54 N·m (33-39 lb-ft).
2. Press the hub and rotor assembly into the steering knuckle. Refer to Section 04-01.
3. Position the steering knuckle on the MacPherson strut and install the retaining bolts. Tighten bolts to 93-117 N·m (69-86 lb-ft).
4. Raise the lower control arm and position the lower ball joint stud in the steering knuckle. Install the ball joint pinch bolt. Tighten to 43-54 N·m (32-39 lb-ft). Refer to Section 04-01.

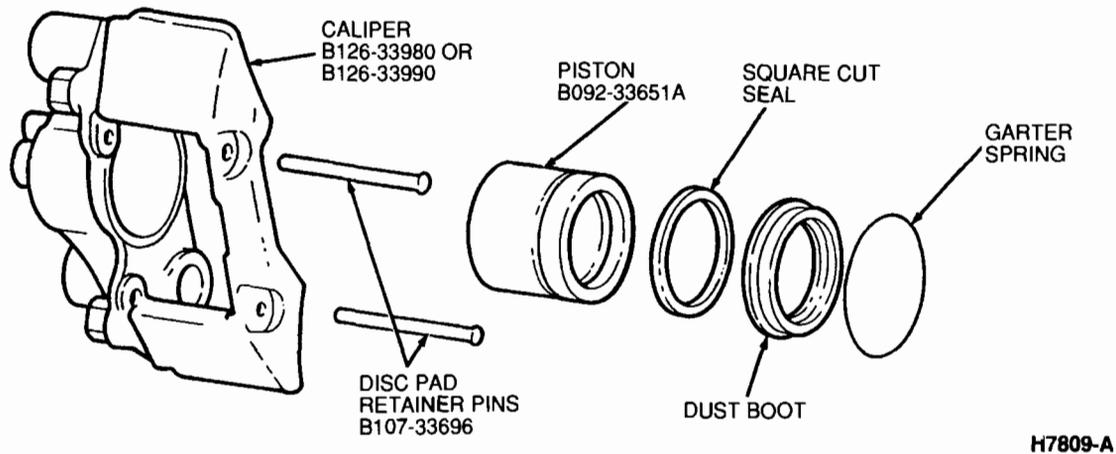
5. Install caliper and brake pads as outlined.
6. Install new halfshaft retaining nut. Tighten to 157-235 N·m (116-173 lb-ft).
7. Install wheel and tire assembly. Tighten wheel lug nuts to 90-120 N·m (67-88 lb-ft).

DISASSEMBLY AND ASSEMBLY

NOTE: The caliper bore, piston seal groove and piston must be inspected for cuts, deep scratches and pitting whenever the caliper is rebuilt. The piston and bore may be lightly polished with crocus cloth but if deep scratches remain, they must be replaced. The seal groove in the caliper must be free of deep scratches that would prevent the seal from working properly.

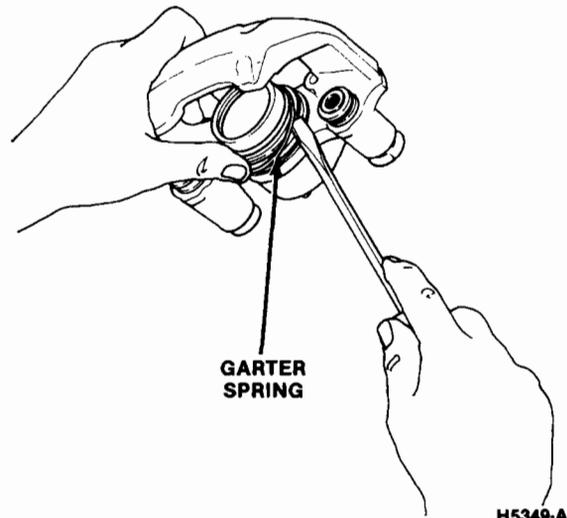
Caliper

Caliper — Disassembled View



Disassembly

1. Open the bleeder screw and drain the brake fluid from the caliper through the brake hose fitting. Close the bleeder screw.
2. Remove brake pads and shims as outlined.
3. Remove the caliper as outlined.
4. Remove the caliper guide bushing and dust boots.
5. Pry the garter spring off the dust boot with a screwdriver.

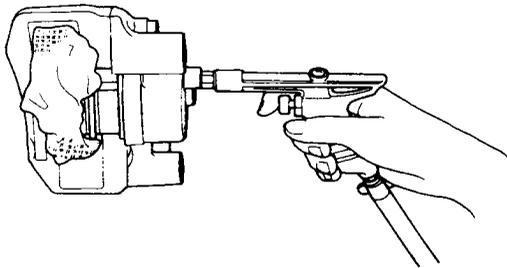


DISASSEMBLY AND ASSEMBLY (Continued)

- Position a wood block, or a roll of shop towels between the piston and caliper.

WARNING: DO NOT USE AN EXCESSIVE AMOUNT OF AIR PRESSURE TO REMOVE THE PISTON. EXCESSIVE PRESSURE CAN FORCE THE PISTON OUT OF THE CALIPER BORE WITH ENOUGH FORCE TO CAUSE PERSONAL INJURY. NEVER ATTEMPT TO CATCH THE PISTON BY HAND AS IT COMES OUT OF ITS BORE.

- To remove the piston, apply air pressure through the brake hose fitting.



H5350-A

NOTE: Apply only enough air pressure to ease the piston out of the caliper.

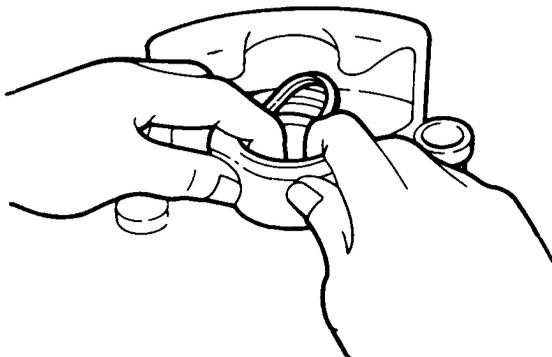
- Remove the dust boot and discard.
- Remove the piston seal from the caliper and discard.

CAUTION: Use a plastic or wooden pick to remove the seal. A metal tool can scratch or nick the seal groove resulting in a possible seal leak.

Assembly

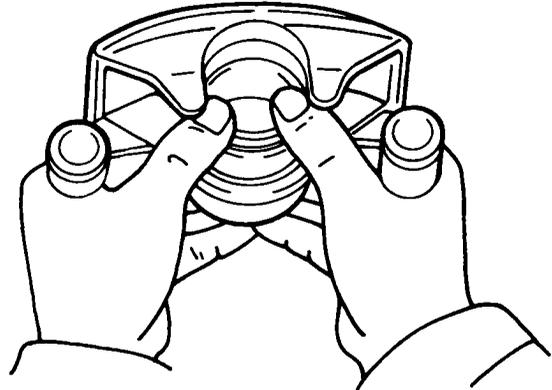
- Lubricate a new piston seal with brake fluid and install the seal in the caliper groove. Lubricate the caliper bore and the piston with brake fluid.

CAUTION: Be sure the seal does not become twisted and that it is firmly seated in the caliper bore.



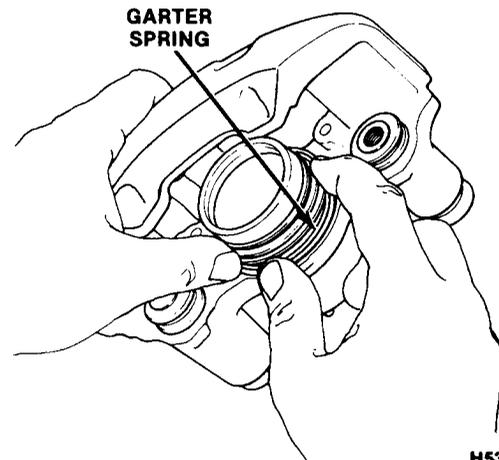
H5351-A

- Install the dust boot on the piston and slide the dust boot into its groove.
- Install the piston in the caliper bore and push it down into the bottom of the bore with a gentle rocking motion.



H5352-A

- Slide the dust boot over the boss on the caliper bore and install the wire garter spring.



H5353-A

- Install the caliper bushings and bushing boots.
- Install the caliper on the anchor plate.
- Install the caliper retaining bolts and tighten to 39-49 N·m (29-36 lb-ft).
- Install the anchor plate clips, brake pads, shims, retainer pins and spring retainer as outlined.
- Bleed the front brakes either manually or with a pressure bleeder, such as Rotunda Brake Bleeder 104-00064 or equivalent. Refer to Section 06-00.
- Pump the brake pedal several times to seat the pads.
- Check master cylinder reservoir and add fluid if needed.
- With the transmission shift lever in the NEUTRAL position, spin each rotor to make sure the brakes are not dragging.

DISASSEMBLY AND ASSEMBLY (Continued)

13. Install both front tire and wheel assemblies. Tighten wheel lug nuts to 90-120 N·m (67-88 lb-ft).

MAJOR SERVICE OPERATIONS

Any time brake service is performed, the rotor must be visually inspected to check for any abnormal wear, and checked with a micrometer to make sure the thickness is within specification. Refer to Section 06-00.

Brake Rotor Refinishing

If there are just surface irregularities, the rotor may be resurfaced by lightly sanding the face with fine emery cloth as follows:

1. Remove the wheel and tire assembly.
2. Remove the caliper and support it by wire as outlined.
3. Lightly sand both sides of the rotor. The back side of the rotor can be sanded at the anchor plate where the caliper normally rides. If scratches or scoring exceed 0.22mm (0.008 inch) the rotor must be resurfaced.

If the rotor has deep scratches or grooves, rotor runout (warped rotor) or incorrect parallelism (thickness variation), it must be resurfaced off the vehicle on a brake drum / rotor lathe as follows:

1. Remove the wheel and tire assembly.
2. Remove the caliper and support it by a wire as outlined.
3. Remove the rotor from the vehicle as outlined.
4. Resurface the rotor on a rotor lathe. Follow the manufacturer's instructions for the rotor refinishing equipment being used.

NOTE: The rotor must be machined while it is bolted to the hub. The rotor and hub are mounted as an assembly on the rotor lathe, and then the rotor is turned. Machining the rotor separately and then bolting it back on to the hub may cause rotor runout.

Minimum Thickness

Brake rotor minimum thickness is stamped on each rotor. This is the thickness at which the rotor becomes unsafe to use. The discard thickness is 16mm (0.630 inch). To find the minimum thickness to which the rotor can be machined, add 0.762mm (0.030 inch) to the minimum thickness, 16mm (0.630 inch) discard limit marked on the rotor. This 16.762mm (0.660 inch) machining limit allows for rotor wear after it has been resurfaced and returned to use.

If the thickness of the rotor is less than the minimum thickness, discard the rotor and install a new one.

Machining a rotor thinner than the machining limit could permit the rotor to wear past the safe discard point before the lining wears out. It may also result in severe overheating and fade because the thin rotor may be unable to absorb the heat generated during braking.

SPECIFICATIONS**TORQUE SPECIFICATIONS**

Description	N·m	Lb-Ft
Caliper Retaining Bolts	39-49	29-36
Banjo Bolt	22-29	17-21
Rotor-to-Hub Bolts	44-54	33-39
Knuckle-to-Strut Bolts	93-117	69-86
Knuckle-to-Lower Ball Joint Bolt	43-54	32-39
Wheel Lug Nuts	90-120	67-88
Halfshaft Retaining Nuts	157-235	116-173

SPECIAL SERVICE TOOLS

Tool Number	Description
T85M-3395-A	Tie Rod End Separator
T87C-1104-A	Knuckle Puller
D80L-630-3	Step Plate

ROTUNDA EQUIPMENT

Model	Description
091-00001	Brake and Clutch Service Vacuum
104-00064	Brake Bleeder