

# SECTION : 4E

## REAR DISC BRAKES

**CAUTION :** *Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.*

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## SPECIFICATIONS

### FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb-Ft	Lb-In
Bleeder Valve	11	–	97
Brake Hose Caliper Inlet Bolt	32	24	–
Caliper Bracket Mounting Bolts	56	41	–
Caliper Mounting Bolts	31	23	–
Parking Brake Shoe Hold-Down Spring Assembly Screw	3.5	–	31
Rotor Detent Screw	4	–	35
Splash Shield Bolts	25	18	–
Wheel Hub Assembly-to-Spindle Shaft Castle Nut	25 + 1*	18 + 0.7	–

\* Tighten the castle nut up to 1 N•m (9 lb-in) as needed to align the castle nut cotter pin notch with the spindle shaft hole.

## DIAGNOSIS

### LINING INSPECTION

1. Raise and suitably support the vehicle.
2. Remove the rear wheels. Refer to *Section 2E, Tires and Wheels*.
3. Visually check the linings for minimum thickness and wear.
4. Measure the thickness.

**Important :** The minimum thickness of the lining is 0.2 mm (0.08 inch).

5. Install the shoe and linings in axle sets only.
6. Install the rear wheels. Refer to *Section 2E, Tires and Wheels*.
7. Lower the vehicle.

### ROTOR INSPECTION

Brake rotors are manufactured with close tolerances for thickness variation, flatness, and lateral runout. However, pits and grooves are created in the rotors during usage. The lack of uniformity of the braking surfaces of the rotor can cause inadequate braking and a pulsating pedal during braking. The surface finish of the rotor is also important because an unsuitable surface finish can cause pulling and rapid wear of the brake shoe lining.

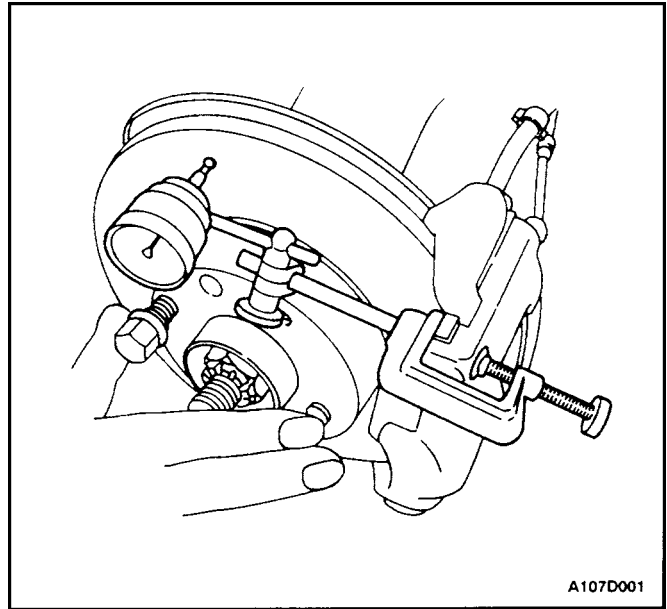
If a rotor does not meet specifications, it should be refinished to specification or replaced. Refinishing of the rotor should only be done with precision equipment.

Thickness variation can be checked by measuring the thickness of the rotor at four or more points around the circumference of the rotor. All measurements must be made at the same distance from the edge of the rotor. A rotor that varies by more than 0.10 mm (0.004 inches) can cause pedal pulsations and/or front end vibration during braking. Thickness can be measured with a commercially available micrometer.

Light scoring of the rotor surfaces is acceptable if it does not exceed 0.40 mm (0.016 inches) in depth. Scoring measurements can be made with a commercially available brake micrometer.

Lateral runout cannot exceed 0.10 mm (0.004 inches). If lateral runout exceeds the specification, make sure there is no dirt between the rotor and the hub and that hub-to-rotor contact surfaces are smooth and free from burrs. Use a commercially available dial indicator to check the lateral runout according to the following procedure:

1. Position the transaxle in NEUTRAL and raise the vehicle.
2. To preserve wheel balance, mark the relative positions of the wheel and the hub, and remove the front wheel.
3. Fasten the brake rotor to the wheel hub with two wheel bolts.
4. Fasten a dial indicator to the brake caliper.



5. Place the gauge tip approximately 234 mm (9.2 inches) from the center of the rotor hole, perpendicular to the disc and under slight preload. Observe the gauge while rotating the rotor.
6. After the measuring is completed, remove the dial indicator and wheel bolts.
7. If necessary, refinish the rotor with precision equipment. Measure the runout again after refinishing. If the runout exceeds 0.10 mm (0.004 inches) after refinishing, the rotor should be replaced.
8. Align the marks that were made before the wheel was removed and install the front wheel.
9. Lower the vehicle.

## MAINTENANCE AND REPAIR

### ON-VEHICLE SERVICE

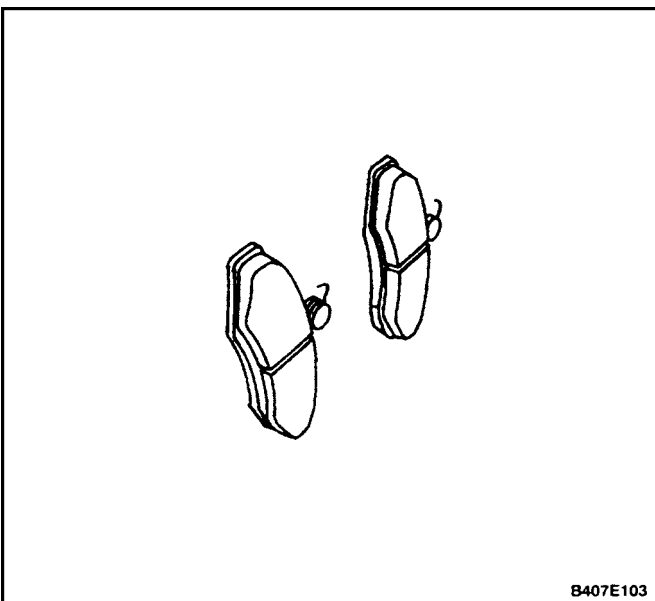
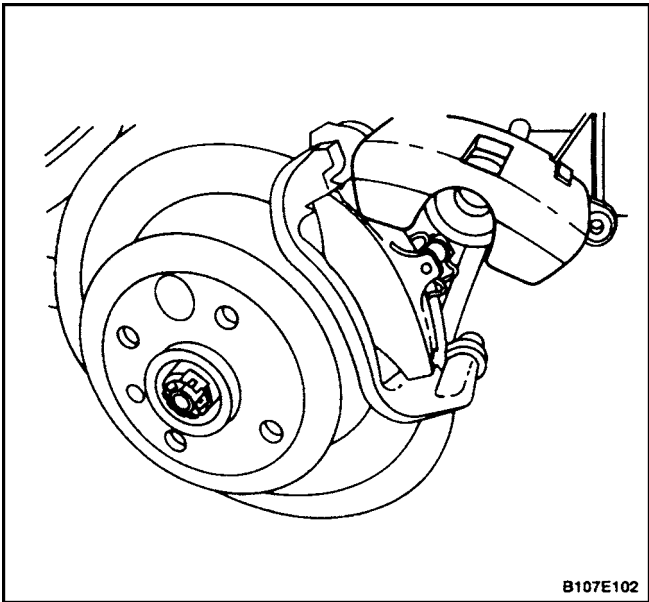
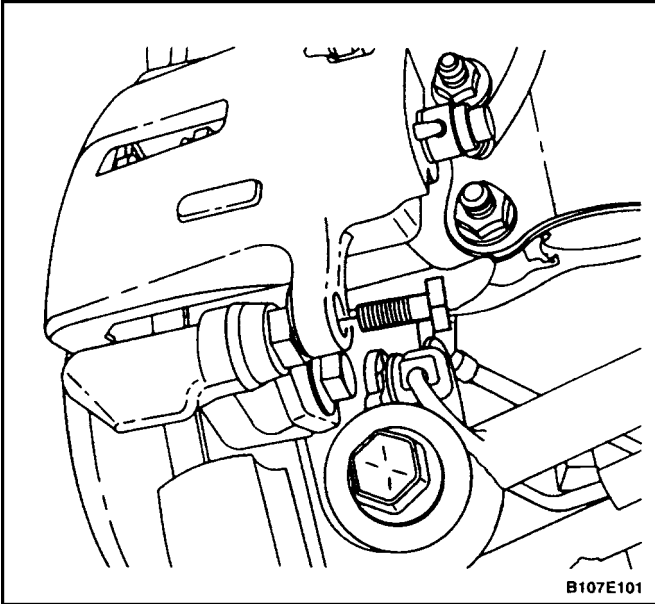
#### SHOE AND LINING

##### Removal Procedure

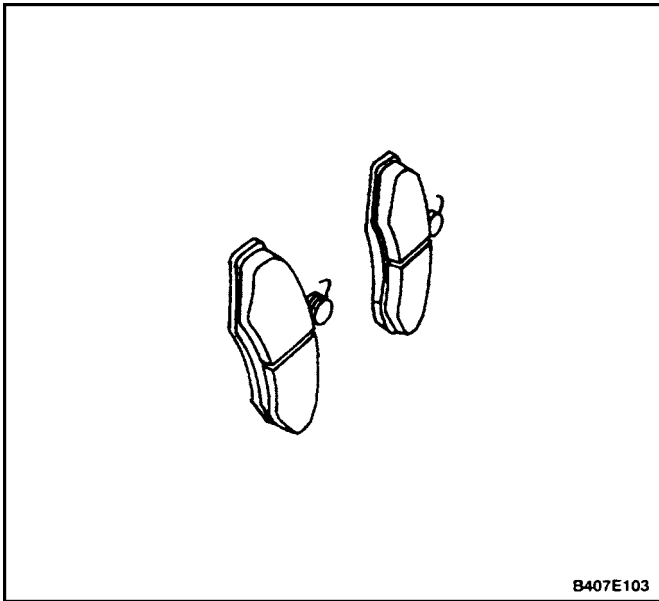
1. Raise and suitably support the vehicle.
2. To preserve wheel balance, mark the position of the rear wheels relative to the wheel hubs and remove the wheels. Refer to *Section 2E, Tires and Wheels*.
3. Remove the lower caliper mounting bolt.

**Important :** It is not necessary to remove the caliper to service the brake shoes.

4. Pivot the caliper upward.



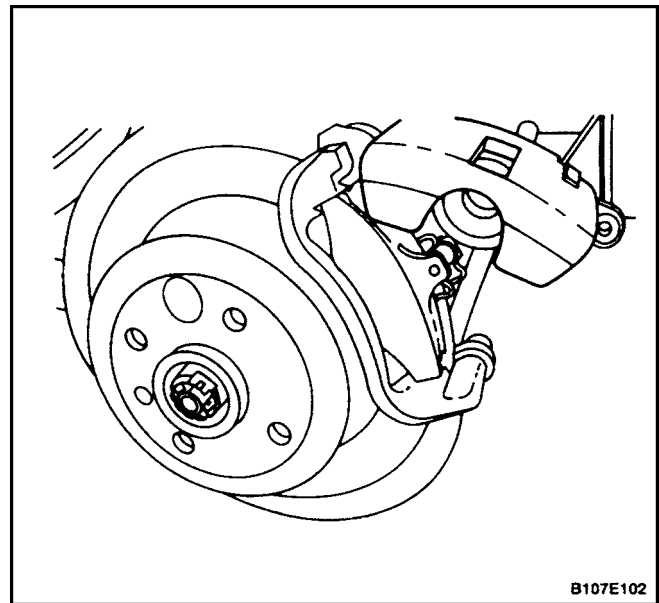
5. Remove the brake shoes.



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### Installation Procedure

1. Measure the minimum shoe lining thickness. Refer to "Lining Inspection" in this section.
2. Install the brake shoes.
3. Push the piston inward, if needed.



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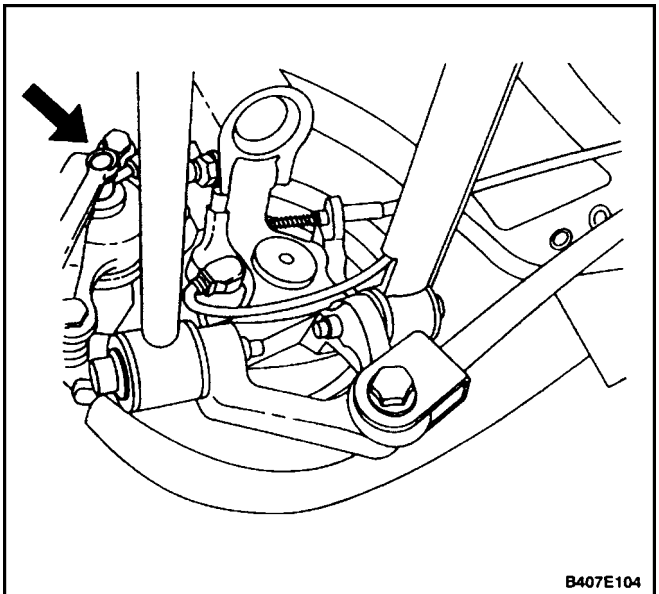
**Notice :** Do not damage the piston seal when the caliper is pivoted downward.

4. Pivot the caliper downward and install the lower bolt.

#### Tighten

Tighten the lower caliper mounting bolt to 31 N•m (23 lb–ft).

5. Align the match marks that were made before removal and install the rear wheels. Refer to *Section 2E, Tires and Wheels*.
6. Lower the vehicle.

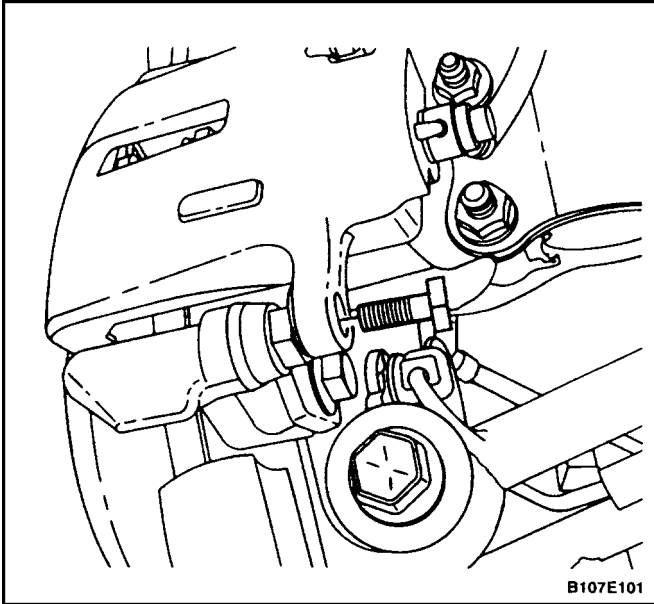


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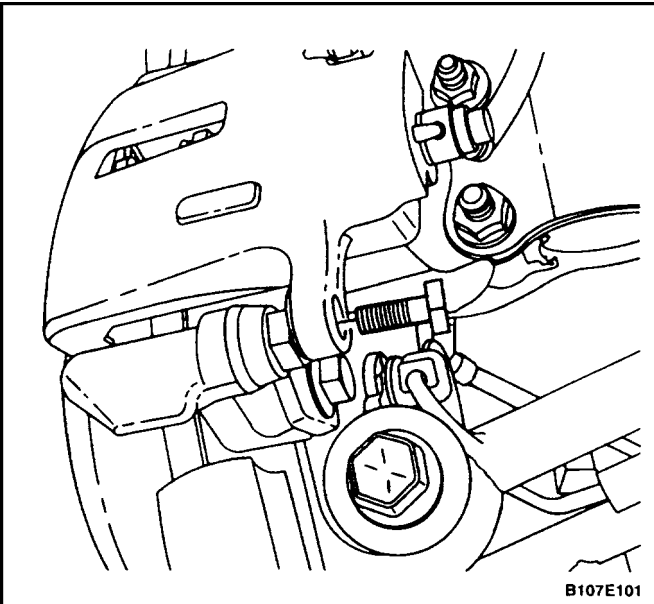
## CALIPER

### Removal Procedure

1. Raise and suitably support the vehicle.
2. To preserve wheel balance, mark the position of the rear wheels relative to the wheel hubs and remove the wheels. Refer to *Section 2E, Tires and Wheels*.
3. Remove the brake hose caliper inlet bolt and the washers.



4. Plug the openings in the caliper and the brake hose to prevent fluid loss and contamination.
5. Remove the caliper mounting bolts and the caliper.

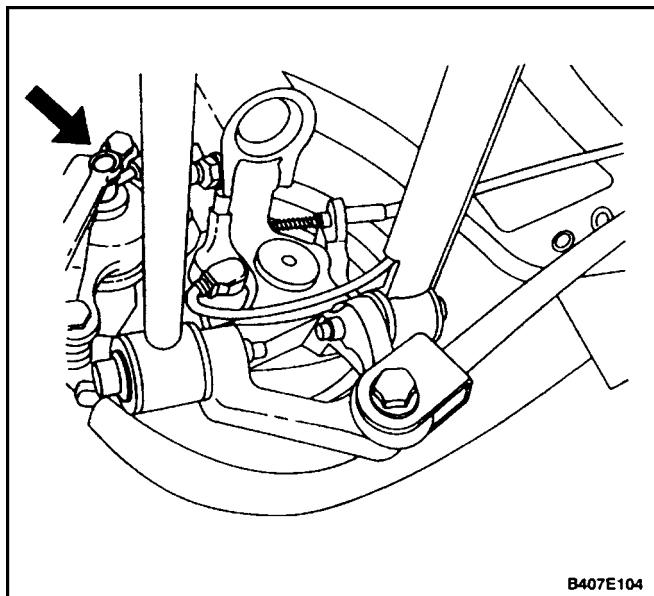


### Installation Procedure

1. Install the caliper with the mounting bolts.

#### **Tighten**

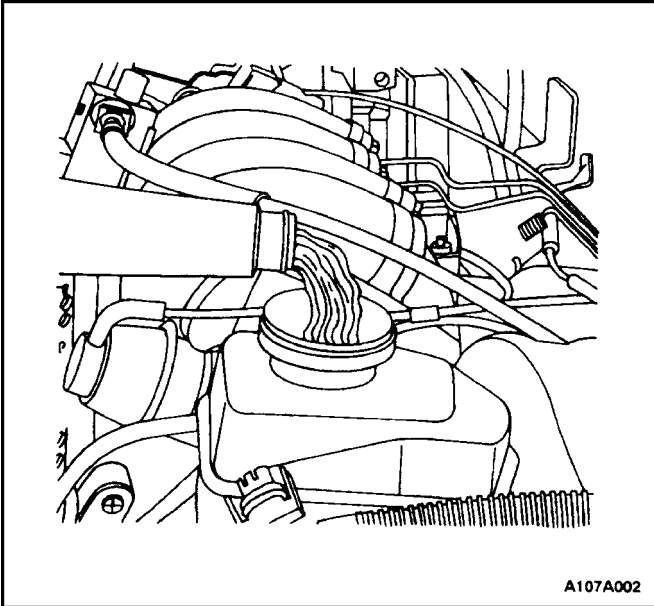
Tighten the caliper mounting bolts to 31 N•m (23 lbf).



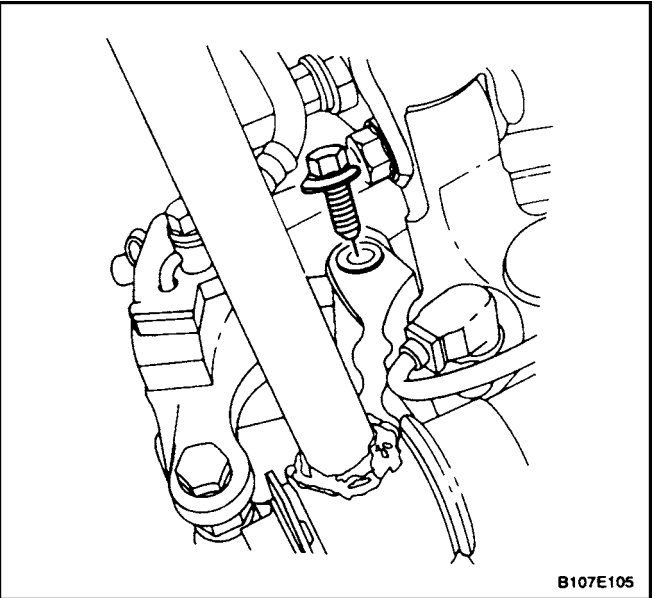
2. Connect the brake hose and the washers with the mounting bolt.

#### **Tighten**

Tighten the brake hose caliper inlet bolt to 32 N•m (24 lb–ft).



3. Align the match marks that were made before removal and install the rear wheels. Refer to *Section 2E, Tires and Wheels*.
4. Fill the master cylinder to the proper level with clean brake fluid.
5. Bleed the caliper. Refer to *Section 4A, Hydraulic Brakes*, or *Section 4F, Antilock Brakes*, if applicable.
6. Recheck the fluid level.
7. Repeatedly press the brake pedal to bring the pads into contact with the rotor. Do not move the vehicle until a firm pedal is obtained.



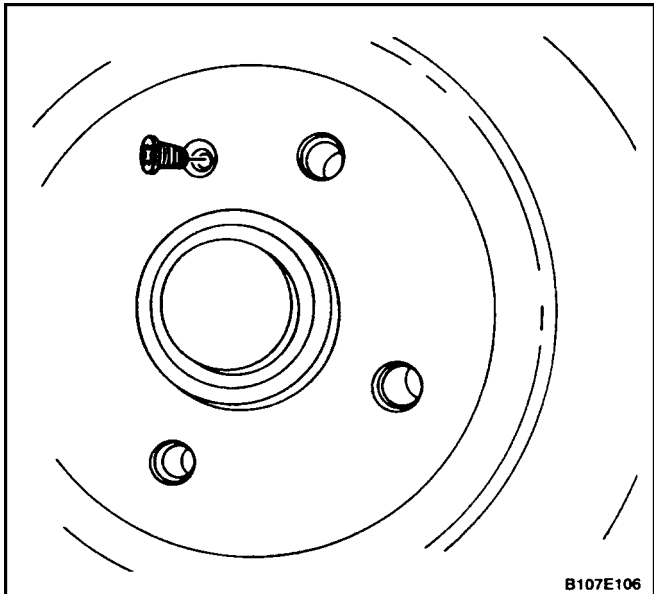
## ROTOR

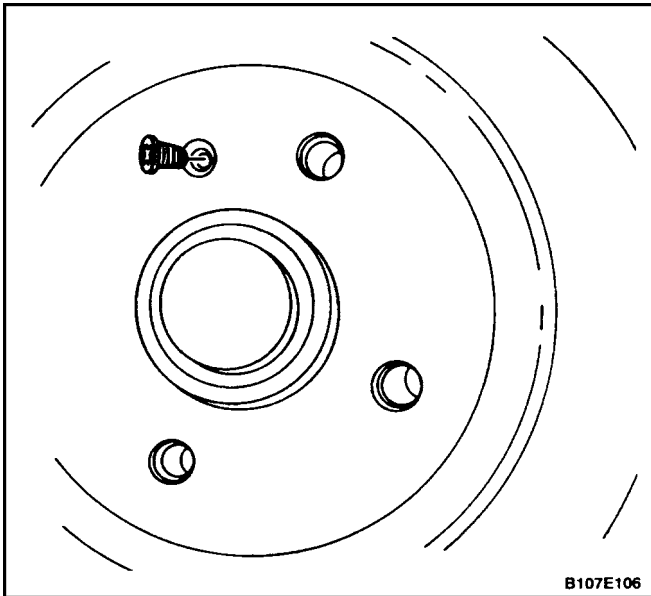
### Removal Procedure

1. Raise and suitably support the vehicle.
2. To preserve wheel balance, mark the position of the rear wheels relative to the wheel hubs and remove the wheels. Refer to *Section 2E, Tires and Wheels*.

**Notice :** To prevent damage to the brake hose, do not hang the caliper from the brake hose.

3. Remove the caliper. Refer to "Caliper" in this section.
4. Remove the caliper bracket.
5. Remove the rotor detent screw.
6. Remove the rotor.





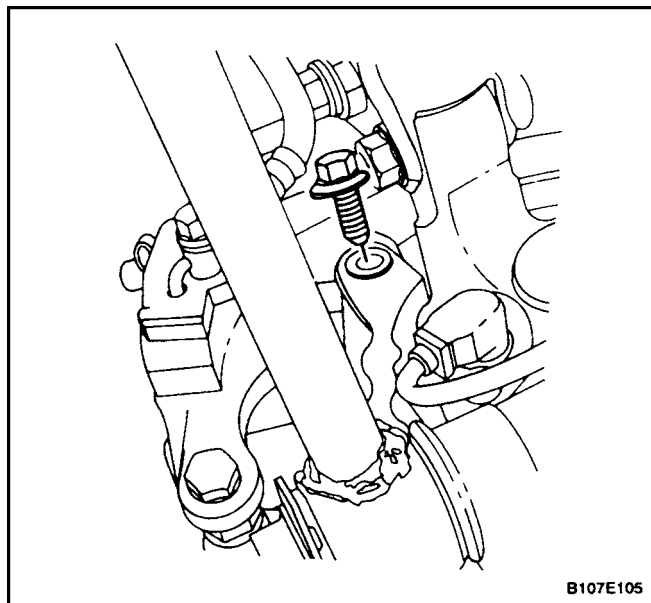
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### Installation Procedure

1. Inspect the rotor. Refer to "Rotor Inspection" in this section.
2. Install the rotor with the detent screw.

#### Tighten

Tighten the rotor detent screw to 4 N•m (35 lb-in).



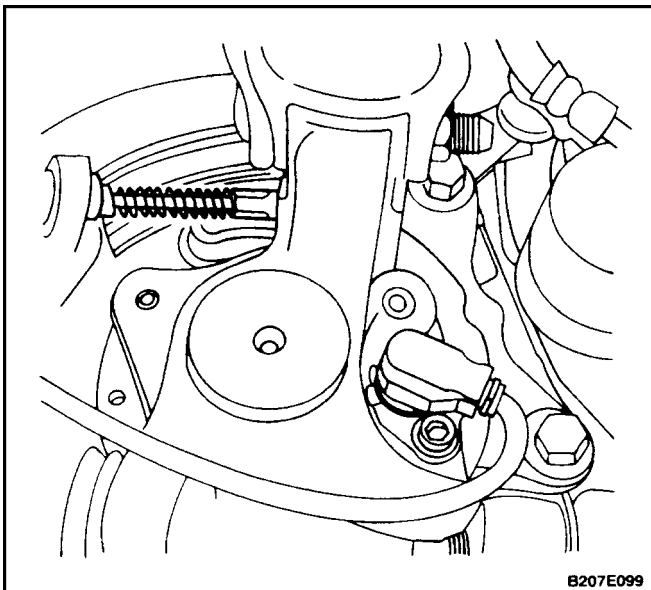
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3. Install the caliper bracket.

#### Tighten

Tighten the caliper bracket mounting bolts to 56 N•m (41 lb-ft).

4. Install the caliper. Refer to "Caliper" in this section.
5. Align the match marks that were made before removal, and install the rear wheels. Refer to *Section 2E, Tires and Wheels*.
6. Lower the vehicle.

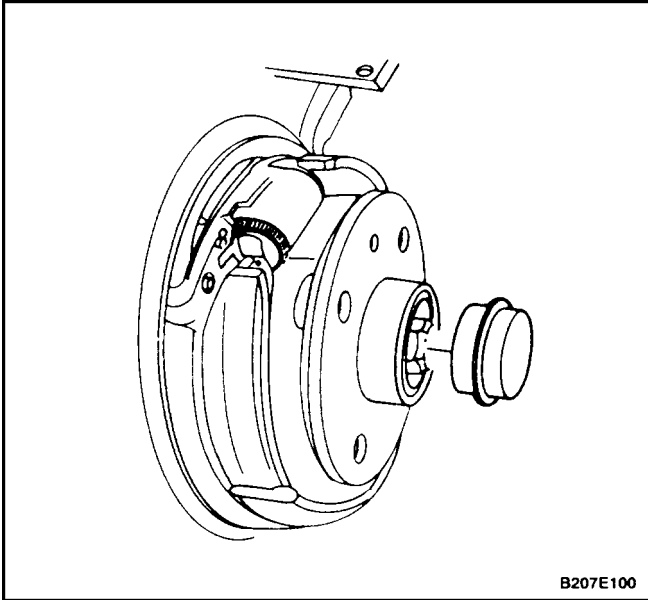


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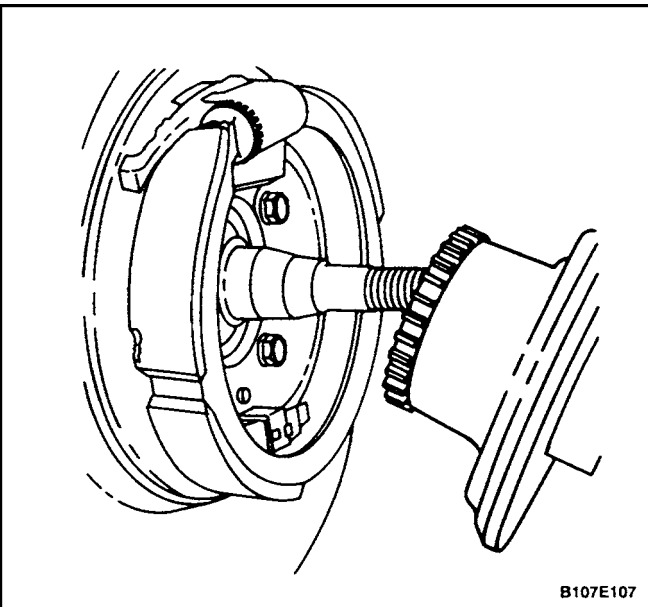
### SPLASH SHIELD/BACKPLATE AND PARKING BRAKE LEVER

#### Removal Procedure

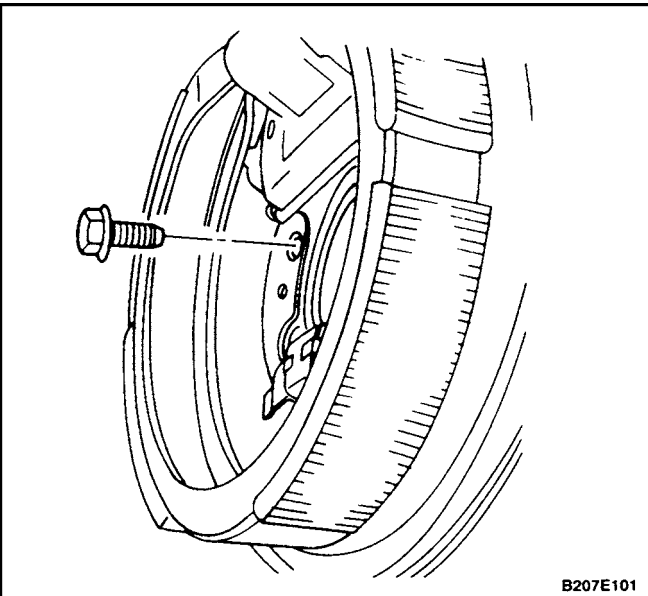
1. Remove the rotor. Refer to "Rotor" in this section.
2. Disconnect the parking brake cable from the brake backplate operating lever.



3. Pry off the shaft dust cover.
4. Remove the spindle shaft castle nut.

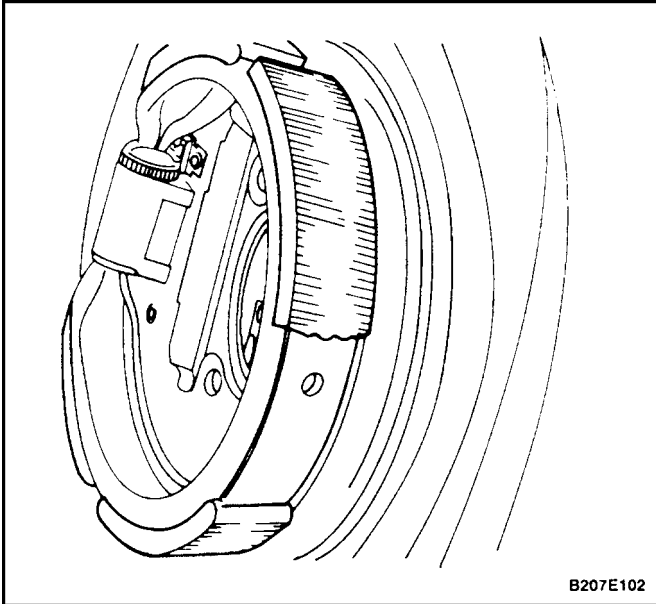


5. Remove the wheel hub assembly from the spindle shaft.



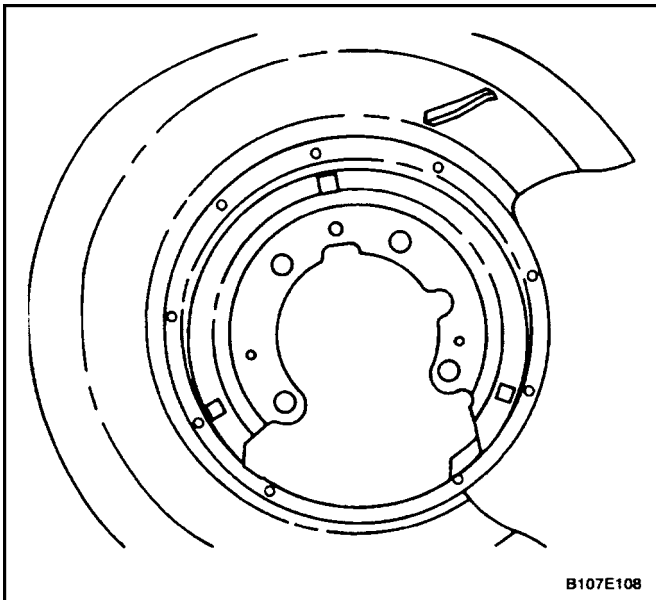
6. Remove the bolts that secure the splash shield/ backplate/ parking brake shoe assembly to the steering knuckle.
7. Remove the splash shield/backplate/parking brake shoe assembly from the steering knuckle.





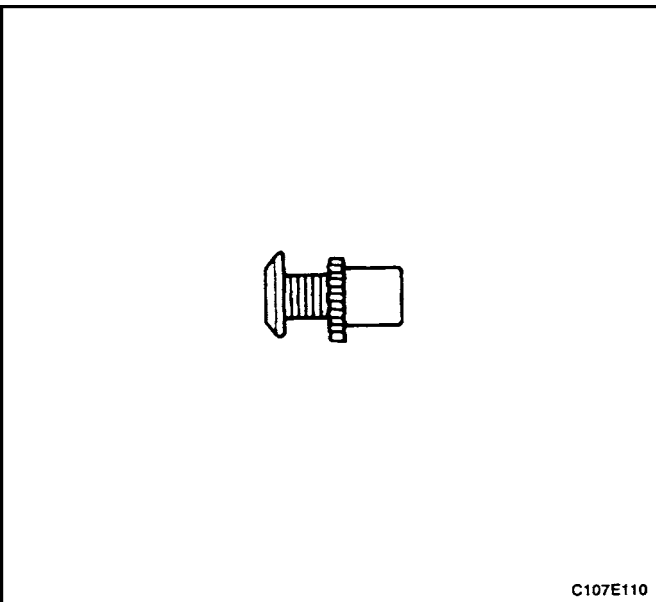
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8. Remove the screw that secures the parking brake shoe hold-down spring assembly to the backplate.
9. Remove the parking brake shoe, sliding it away from the actuation mechanism.



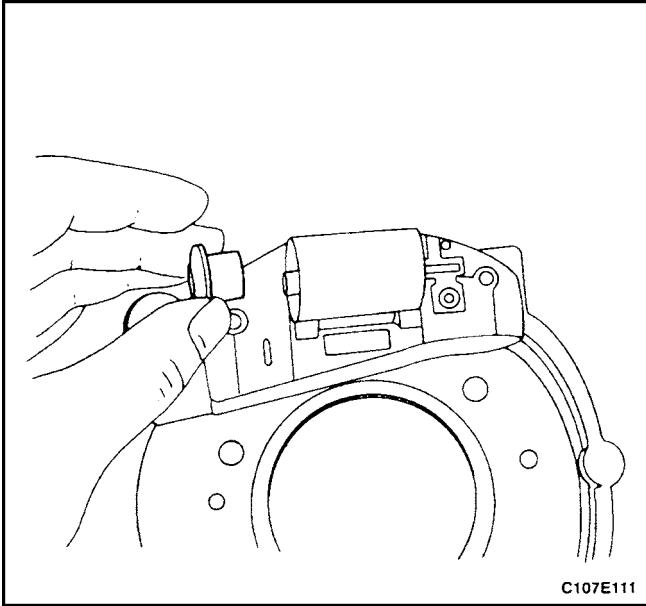
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10. Remove the splash shield.

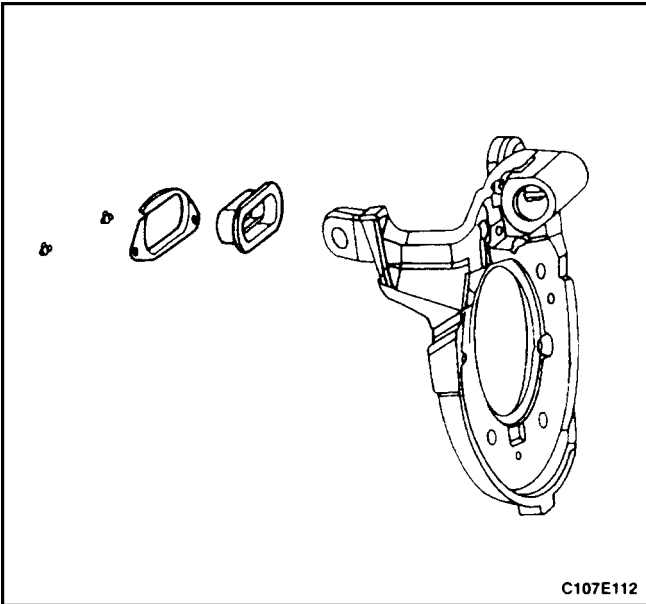


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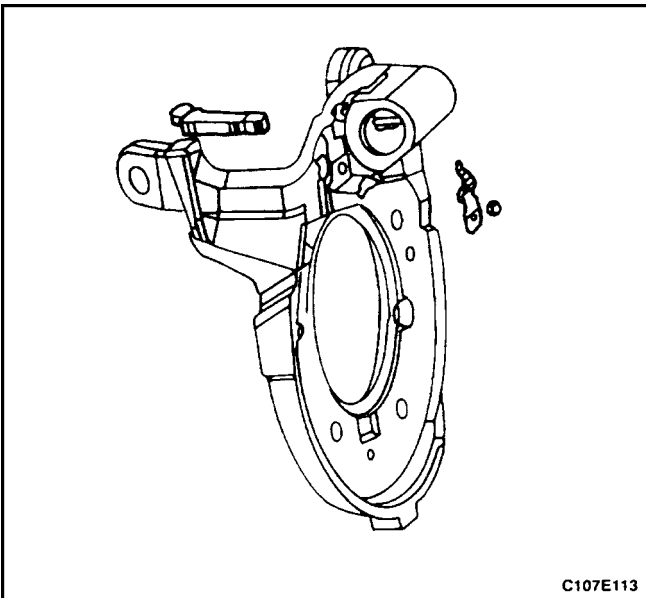
11. Remove and discard the adjuster screw and the nut.



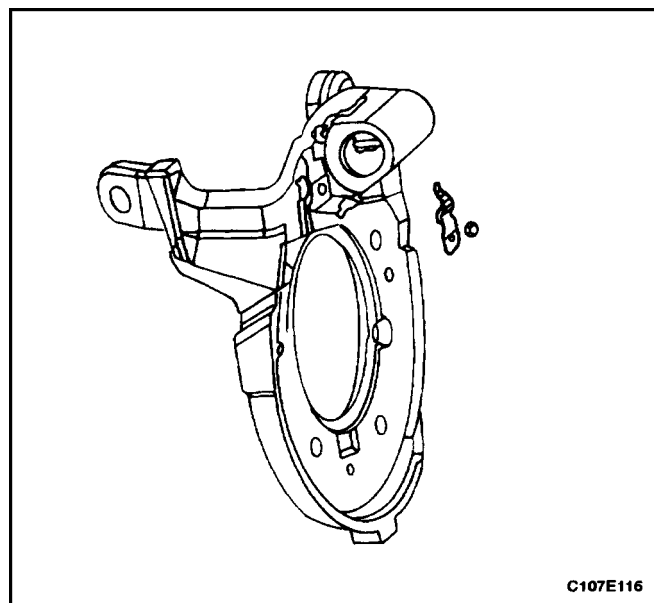
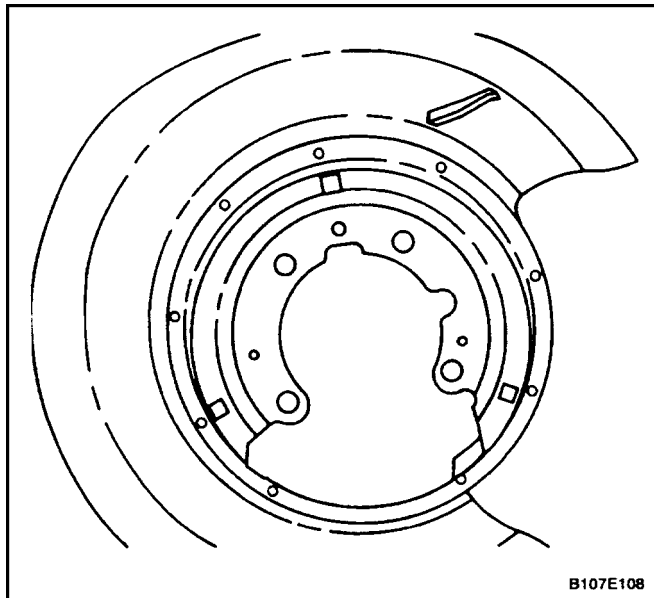
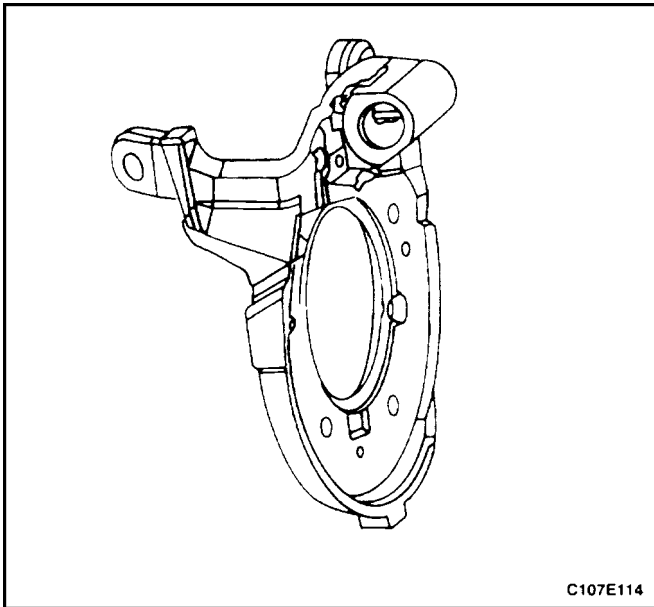
12. Remove and discard the tappet and the pushrod.



13. Using a 3.5 mm (0.14 inch) drill, remove the pop rivets holding the dust cover assembly and the adjuster pawl to the backplate.
14. Remove and discard the dust cover, and the dust cover retainer from the backplate.



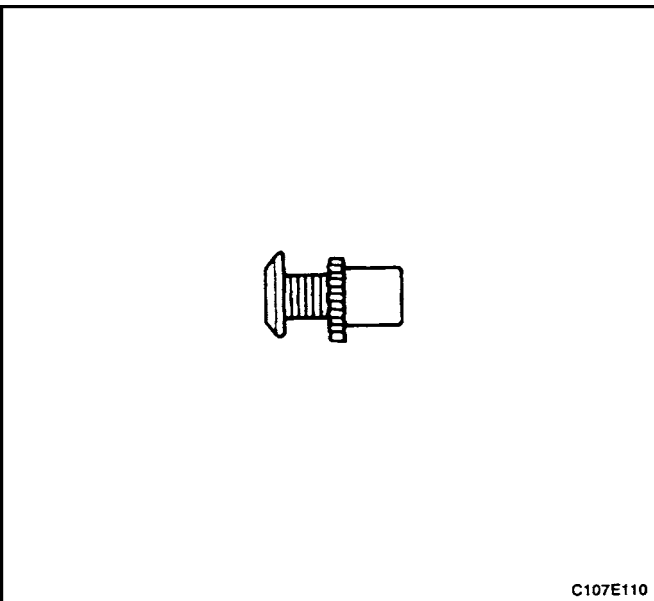
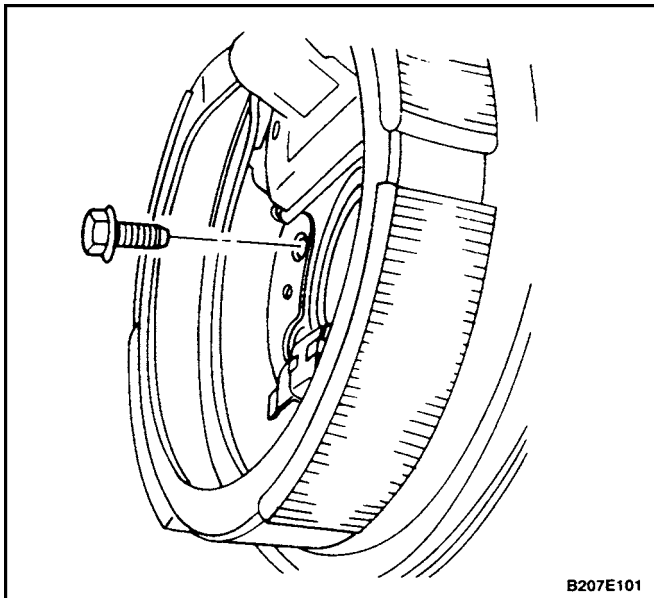
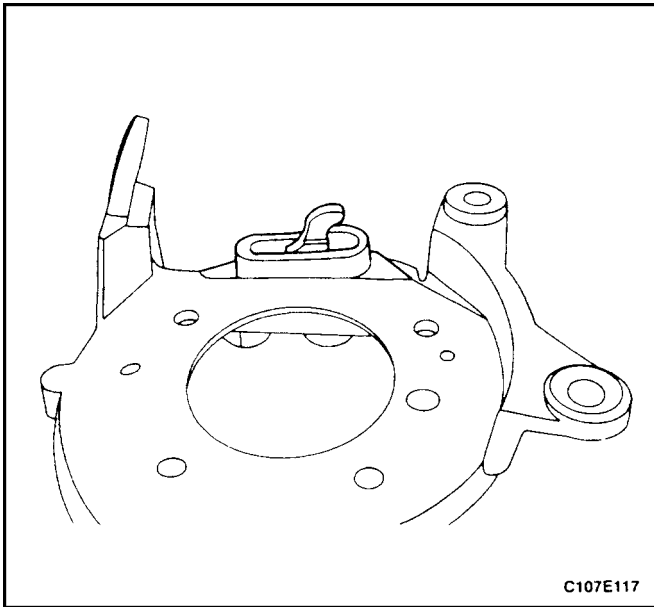
15. Remove and discard the lever and the adjuster pawl.



## Installation Procedure

**CAUTION :** A high flash point oil-free solvent such as trichloroethylene or acetane, used in cleaning brake components such as backing plates, is usually highly flammable and presents health hazards if inhaled for prolonged periods of time.

1. Clean the backing plate, ensuring the actuation cavity is free from grease and any other contamination.
2. Inspect the shoe assembly position. The shoe should fit centered on the splash shield with the shoe tips located correctly in the slots.
3. Inspect the splash shield for rust or any other damage. Replace the splash shield, if necessary.
4. Install the new adjuster pawl to the backing plate by securing it with a pop rivet.



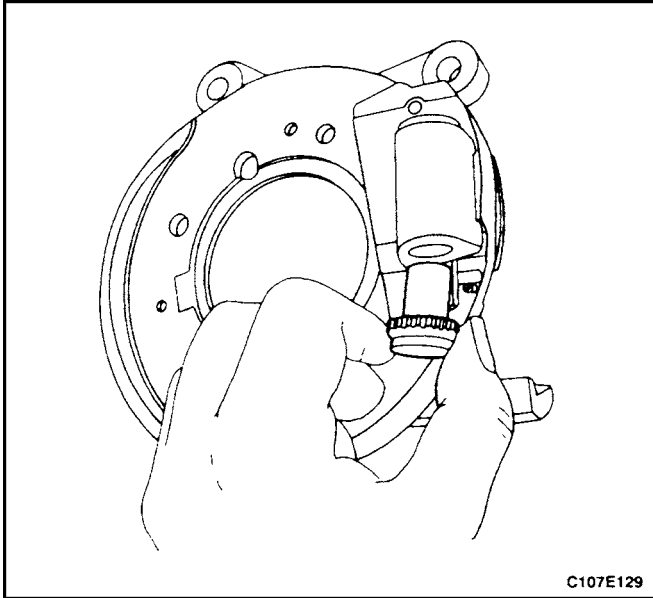
5. Slide the new dust cover onto the dust cover notches.
6. Insert the new lever and the dust cover assembly into the backing plate.
7. Secure the new dust cover retainer using pop rivets.

8. Lubricate the actuation cavity and the tappet with grease. Ensure that the internal bore of the cavity is covered with grease.
9. Secure the splash shield and the backplate to the steering knuckle with the bolts, and secure the parking brake shoe hold-down spring assembly with the screw.

**Tighten**

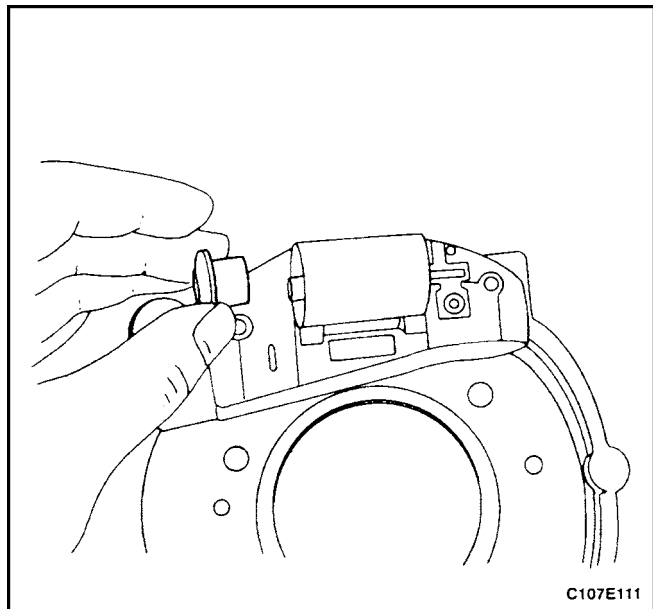
Tighten the splash shield bolts to 25 N•m (18 lb-ft).  
Tighten the parking brake shoe hold-down spring assembly screw to 3.5 N•m (31 lb-in).

10. Connect the new parking brake adjustment screw to the new adjustment nut. Tighten the nut to where it meets the screw, and then back off one-quarter of a turn.



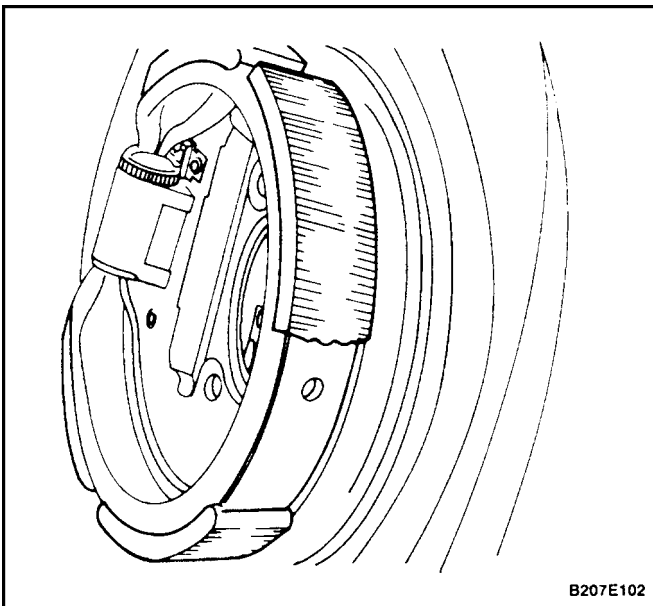
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11. Install the adjustment screw and the adjustment nut into the backing plate actuation mechanism on the adjustment pawl side. Keep the shoe slot parallel with the backing plate face.



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12. Install the new pushrod into the tappet. Ensure the pushrod is set correctly in the lever socket by holding the lever into the backing plate while inserting the pushrod and the tappet.



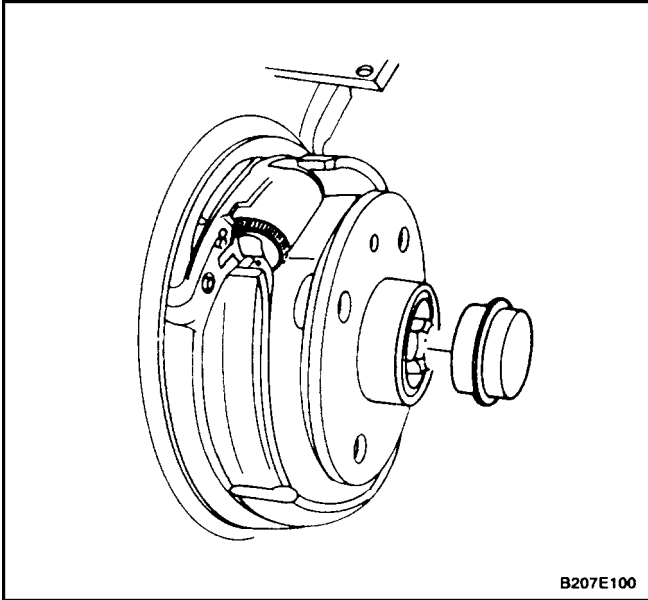
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13. Clean excess grease using a clean rag.

**Important :** The shoe assembly must be resting on the splash shield with the brand side up.

**Important :** Clean hands are required when handling the parking brake shoe.

14. Install the parking brake shoe engaging the shoe tips in both the adjusting screw and the tappet slots.

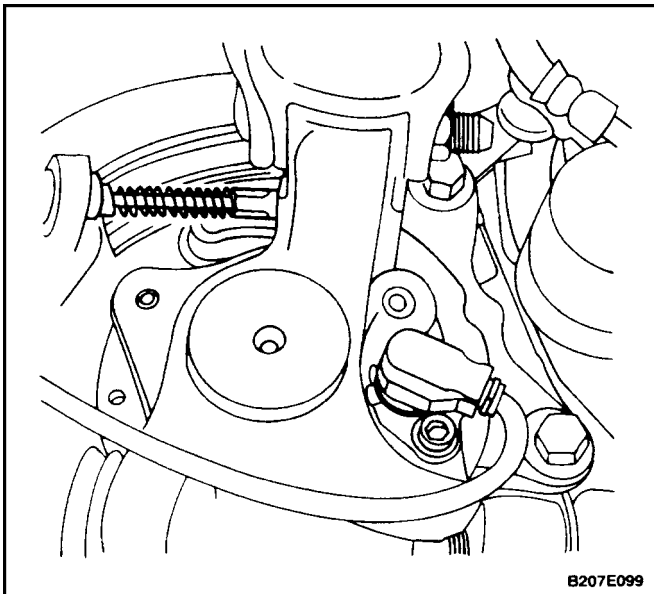


15. Install the wheel hub assembly, and secure it with the wheel hub assembly-to-spindle shaft castle nut.

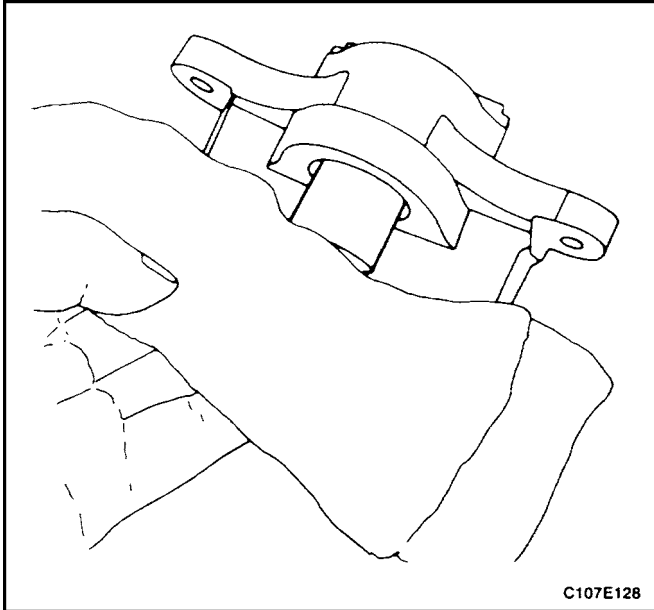
**Tighten**

Tighten the wheel hub assembly-to-spindle shaft castle nut to 25 N•m (18 lb–ft), plus 1 N•m (9 lb–in).

16. Install the shaft dust cover.



17. Install the parking brake cable to the parking brake lever on each side of the vehicle.
18. Adjust the parking brake. Refer to *Section 4G, Parking Brake*.
19. Install the rotor. Refer to "Rotor" in this section.



## UNIT REPAIR

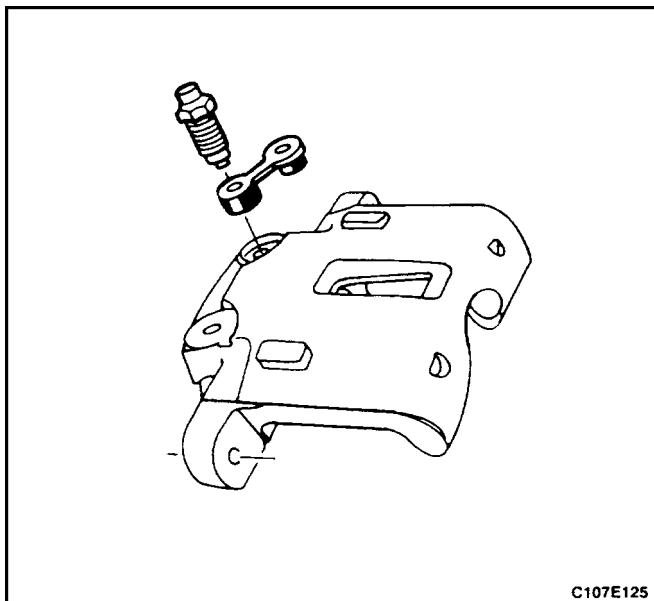
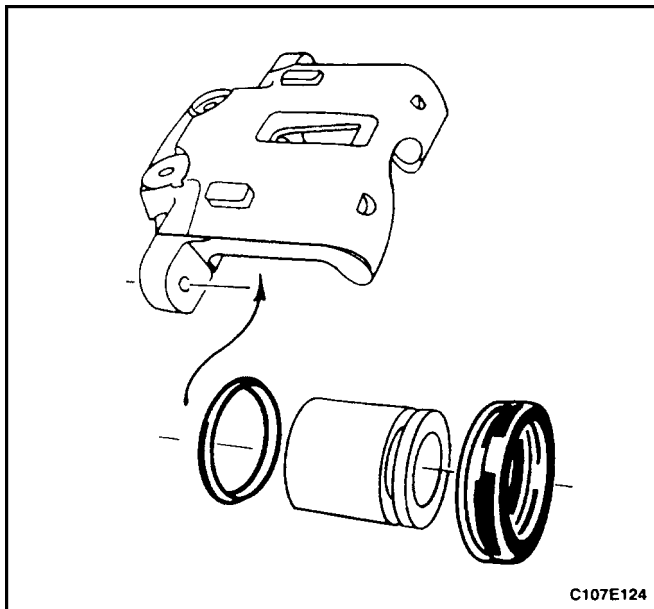
### CALIPER OVERHAUL

#### Disassembly Procedure

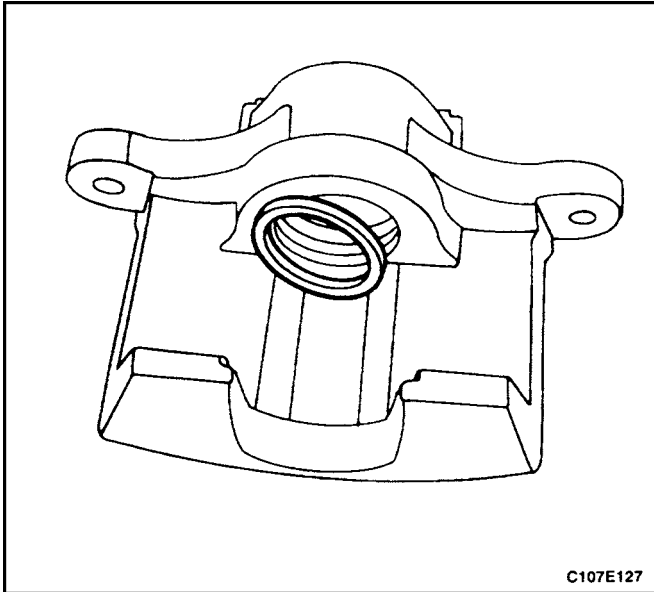
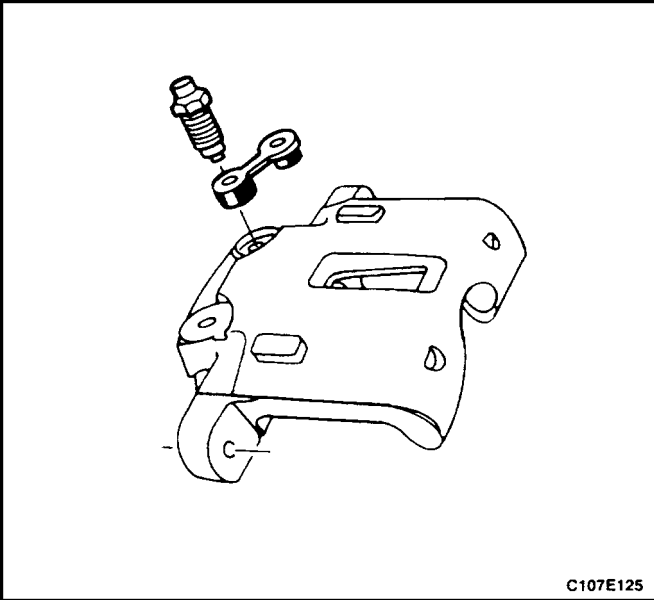
1. Remove the caliper. Refer to "Caliper" in this section.
2. To prevent damage to the piston when removing it, place a clean shop towel between the piston and the caliper.

**CAUTION :** When applying air pressure at the caliper inlet port, do not place fingers in front of the piston. The piston will pop out of its bore with enough force to cause serious injury.

3. Apply unlubricated compressed air to the caliper inlet port, and progressively increase the air pressure until the piston is forced out of the bore.
4. Remove and discard the outer dust seal.
5. Remove the inner seal and discard it. Do not scratch the piston bore or the seal groove when removing the inner seal.



6. Remove the bleeder valve and the dust cover.



## Assembly Procedure

**CAUTION :** Keep alcohol and brake fluid away from the eyes, as serious injury may result.

**CAUTION :** Keep rubber seals and brake parts away from oil. Oil can cause the seals to swell and deteriorate, and the braking system could become inoperative.

**Important :** Do not use a hone or any other procedure to remove material from the piston or caliper bore.

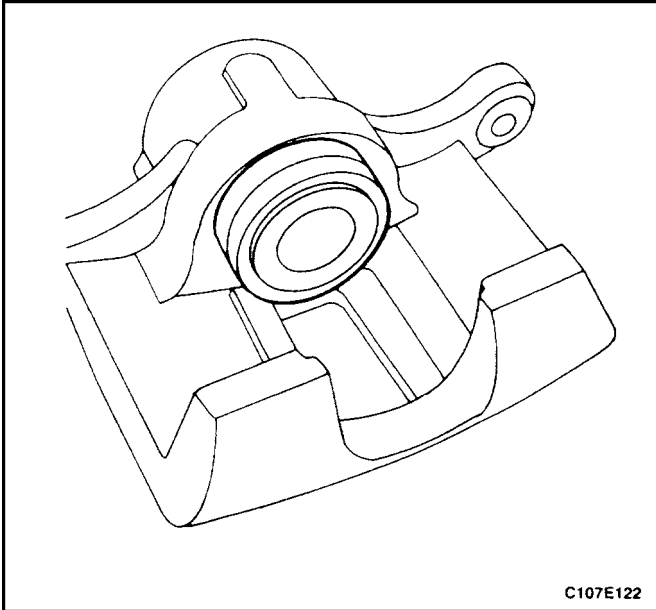
1. Clean all parts with denatured alcohol or brake fluid. Dry the parts with unlubricated compressed air, and blow out all passages in the caliper and the bleeder valve.
2. Inspect the piston and the caliper for scoring and corrosion. Replace any components that show these conditions.
3. Insert the bleeder valve and the dust cover.

### Tighten

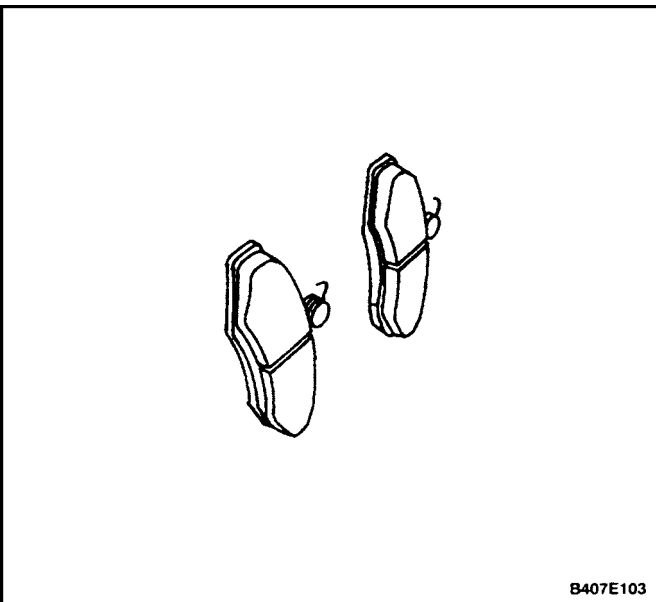
Tighten the bleeder valve to 11 N•m (97 lb-in).

4. Lubricate a new piston inner seal with brake fluid.
5. Install the piston inner seal into the groove in the caliper bore.

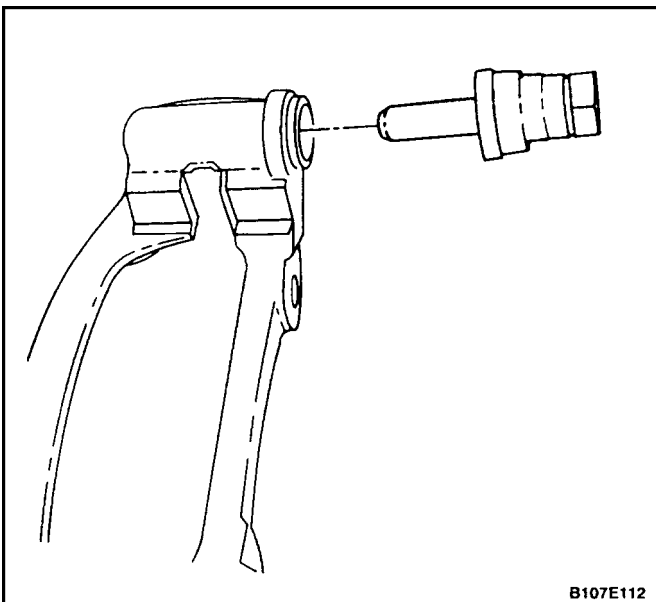




6. Install the inner seal into the groove in the caliper bore.
7. Lubricate the piston with brake fluid.
8. Install the piston into the caliper.
9. Install the outer seal into the piston groove. Apply steady hand pressure until the piston is seated in the bore.



10. Inspect the brake shoe linings for minimum thickness. Refer to "Lining Inspection" in this section. If necessary, install new shoes.



11. Inspect the guide pins and boots. If the boots are damaged, or if the guide pins do not slide easily, replace these parts. Lubricate the guide pins with a lithium soap base glycol grease or other grease which will not deteriorate or swell the rubber boots.
12. Install the caliper. Refer to "Caliper" in this section.

## **GENERAL DESCRIPTION AND SYSTEM OPERATION**

### **DISC BRAKE CALIPER**

The caliper has a single bore and it is mounted to a bracket on the wheel knuckle. Hydraulic pressure, which is transmitted to the piston and the caliper, is created by pressing the brake pedal. During braking, the piston and the caliper apply a clamping force on the brake shoes. The vehicle is stopped as a result of the friction between the rotor and the brake shoes.

- When servicing a caliper, replace all parts included in the caliper repair kit.
- During caliper overhaul, lubricate the piston and the inner seal with clean brake fluid to ease assembly.
- Do not use lubricated shop air on brake parts because oil will deteriorate rubber seals.
- If any hydraulic component is removed or disconnected, it may be necessary to bleed all or part of the brake system.
- Replace the shoes in axle sets only.
- The torque values specified are for dry, unlubricated fasteners.
- Perform the service operations on a clean bench away from oily material.