

SECTION : 4E

REAR DISC BRAKES

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SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb-Ft	Lb-In
Brake Hose Inlet Bolt and Ring Seals	32	24	–
Caliper Bracket Mounting Bolts	65	48	–
Lower Caliper Mounting Bolt	31	23	–
Parking Brake Shoe Hold-Down Spring Assembly Screw	4	–	35
Rotor Detent Screw	4	–	35
Splash Shield Bolts	65	48	–
Wheel Hub Assembly-to-Spindle Shaft Caulking Nut	285	210	–

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 brake shoe linings for minimum thickness and wear.
4. Measure the thickness.

Important : The minimum discard thickness of the brake shoe lining is 2 mm (0.08 inch).

5. Install the shoes 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, but pits and grooves are created in rotors during usage. 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 the specification, 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

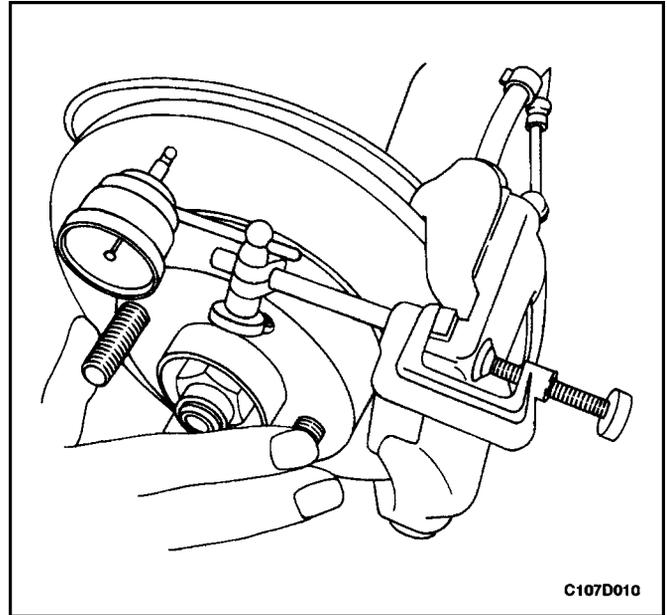
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varies by more than .10 mm (0.004 inch) can cause pedal pulsation and/or front end vibration during braking. Thickness can be measured with a commercially available micrometer.

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

Lateral runout cannot exceed 0.10 mm (0.004 inch). If lateral runout exceeds the specification, make sure that 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 hub, and remove the front wheel.
3. Fasten the brake rotor to the wheel hub with two wheel nuts.
4. Mount a dial indicator on the brake caliper.
5. Place the indicator tip approximately 10 mm (0.39 inch) from the outer edge of the brake rotor, perpendicular to the disc and under slight preload. Observe the indicator gauge while rotating the rotor.
6. After measuring is completed, remove the dial indicator and the wheel nuts.
7. If necessary, refinish the rotor with precision equipment. Measure the runout again after refinishing. If the runout exceeds 0.10 mm (0.004 inch) after refinishing, the rotor should be replaced.
8. Align the marks that were made before wheel removal, and install the front wheel.
9. Lower the vehicle.



MAINTENANCE AND REPAIR

ON-VEHICLE SERVICE

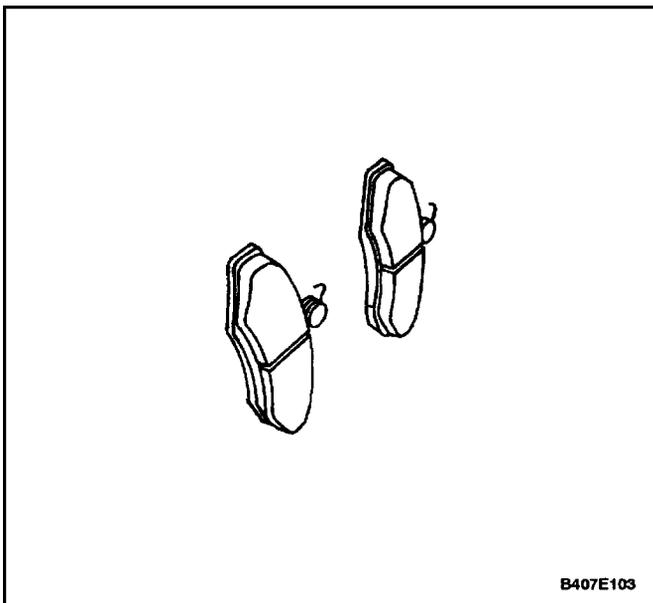
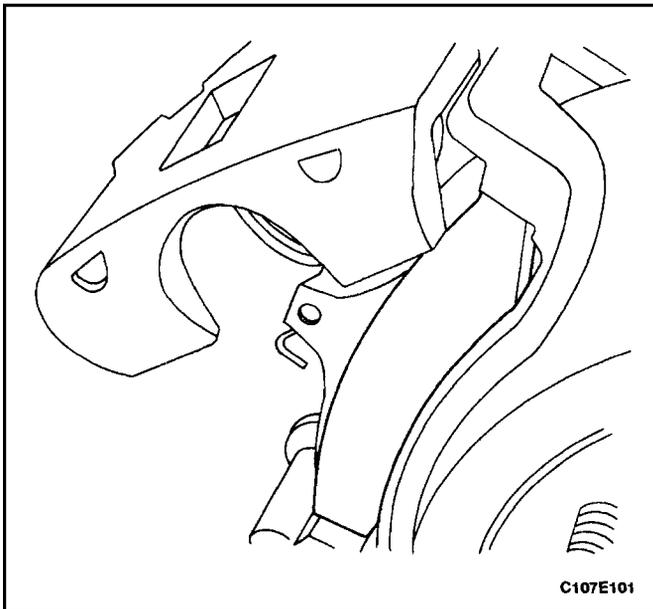
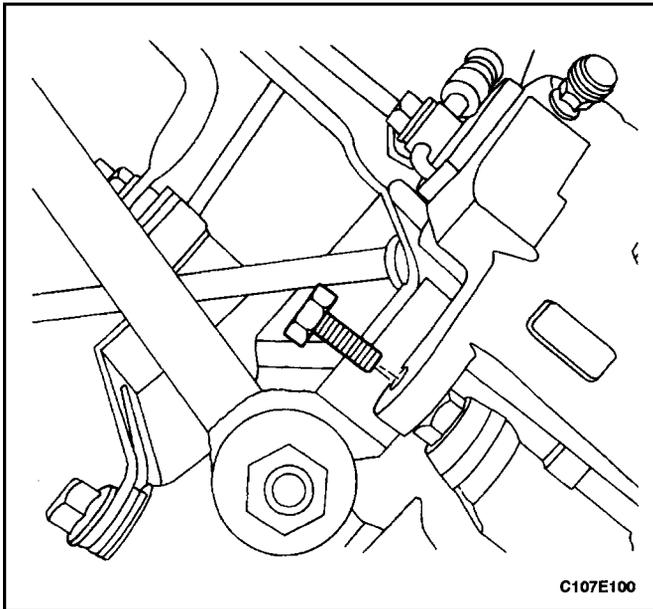
SHOE AND LINING

Removal Procedure

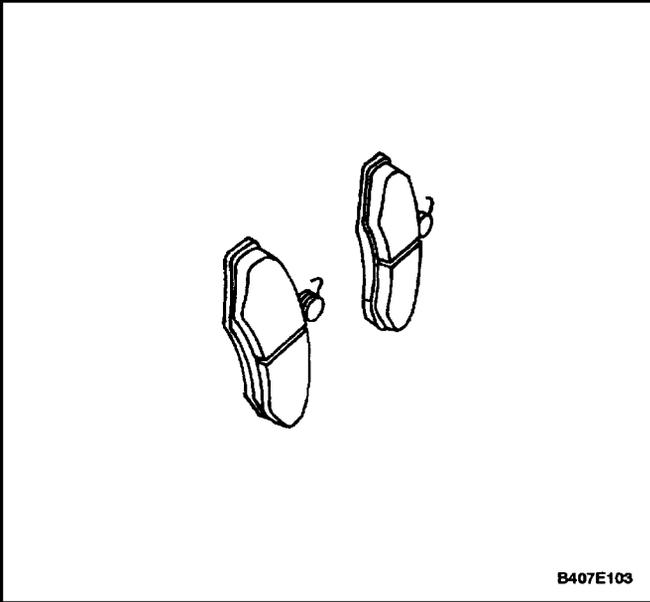
1. Raise and suitably support the vehicle.
2. Remove the rear wheels. Refer to *Section 2E, Tires and Wheels*.
3. Remove the lower caliper guide pin bolt.

Important : Caliper removal is not necessary to service the brake pads.

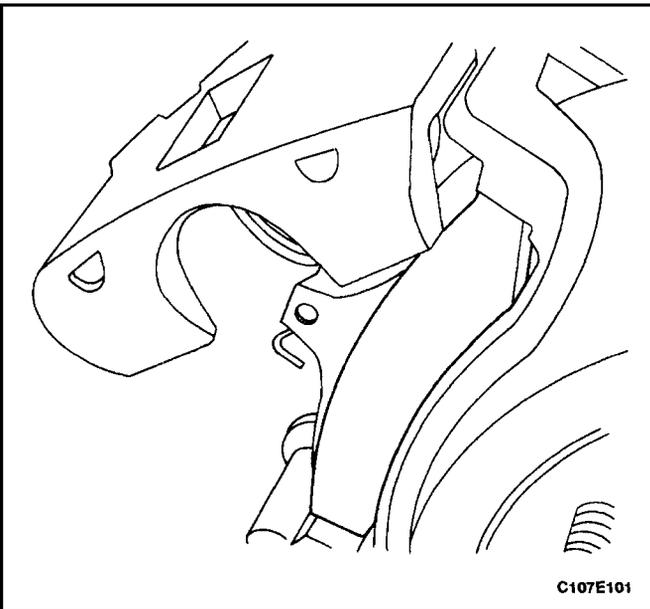
4. Pivot the caliper upward.



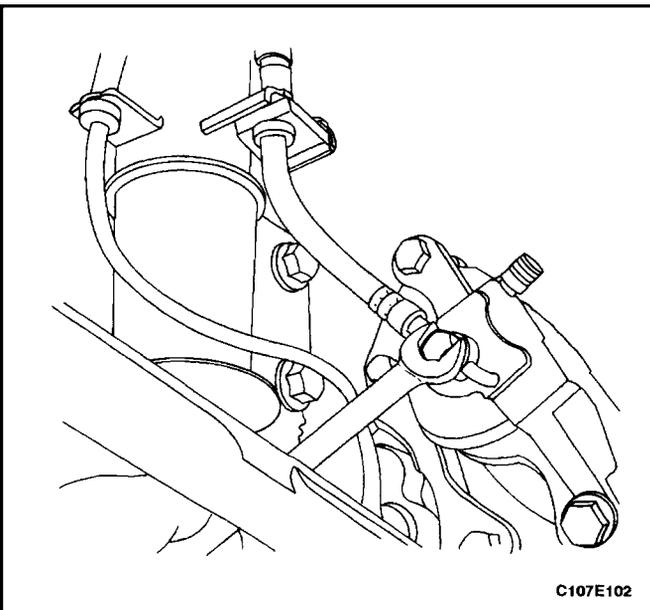
5. Remove the brake shoes.



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Installation Procedure

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

Notice : Avoid damaging the piston seal when the piston housing is pulled down.

4. Pivot the caliper downward and install the bolt.

Tighten

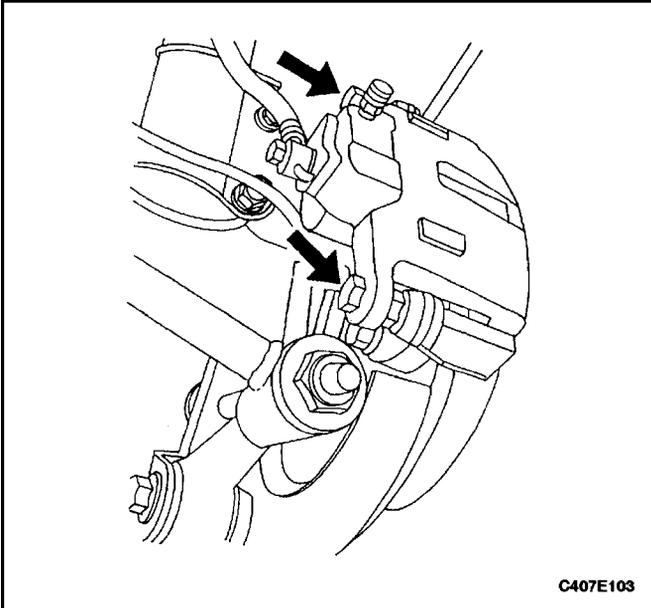
Tighten the lower caliper mounting bolt to 31 N•m (23 lb–ft).

5. Install the rear wheels. Refer to *Section 2E, Tires and Wheels*.
6. Lower the vehicle.

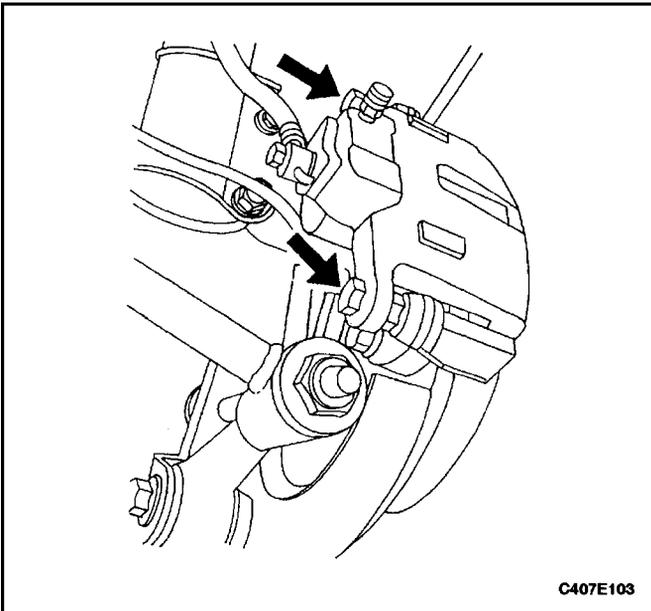
CALIPER

Removal Procedure

1. Raise and suitably support the vehicle.
2. 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 bolt and the ring seals that attach the brake hose inlet fitting to the caliper.



4. Disconnect the brake hose. Plug the openings in the caliper and the brake hose to prevent fluid loss or contamination.
5. Remove the caliper mounting bolts from the steering knuckle.
6. Remove the caliper.

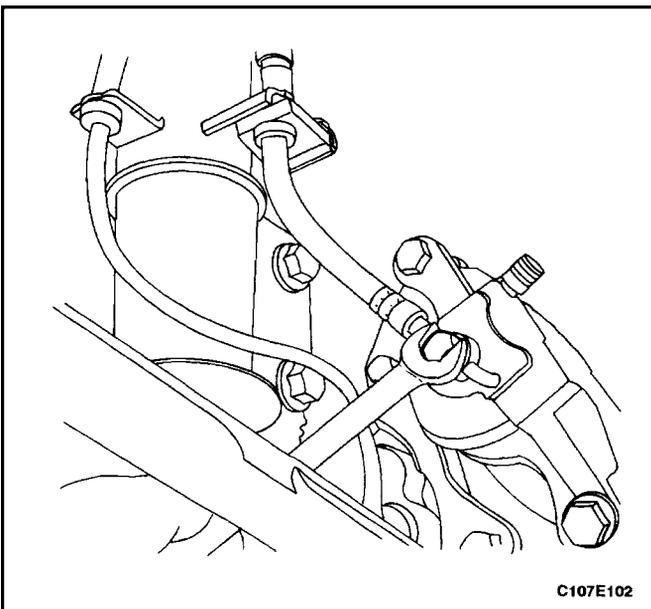


Installation Procedure

1. Install the caliper with the mounting bolts.

Tighten

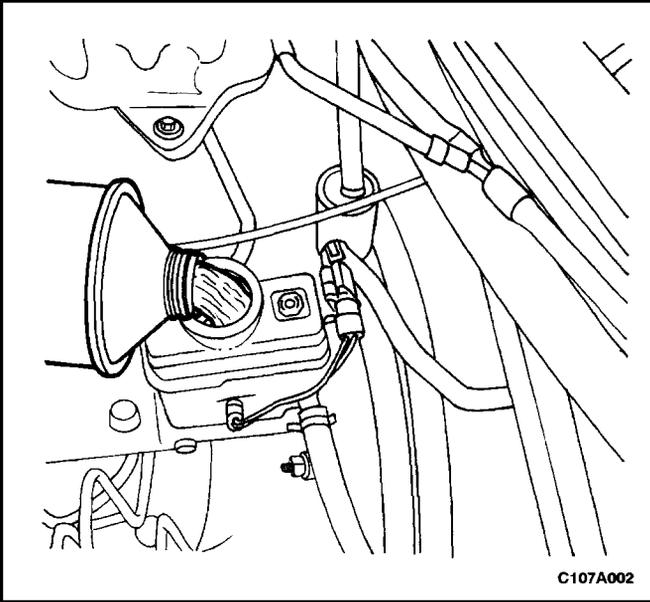
Tighten the caliper mounting bolts to 65 N•m (48 lb–ft).



2. Connect the brake hose with the bolt and ring seals.

Tighten

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

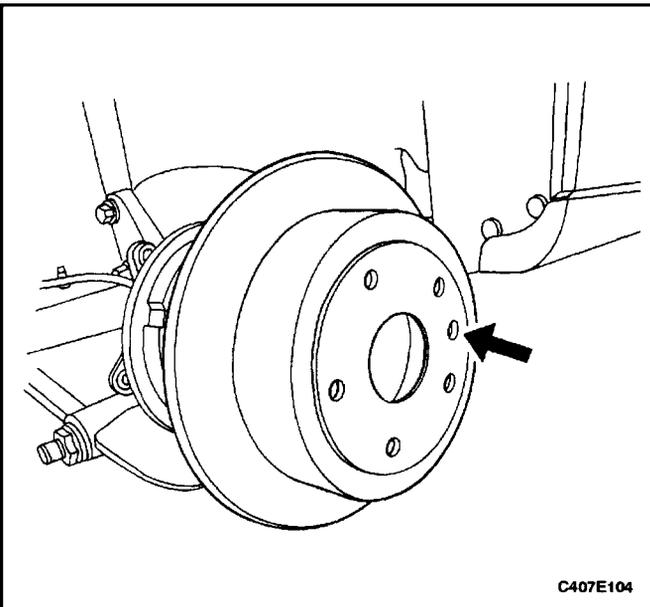
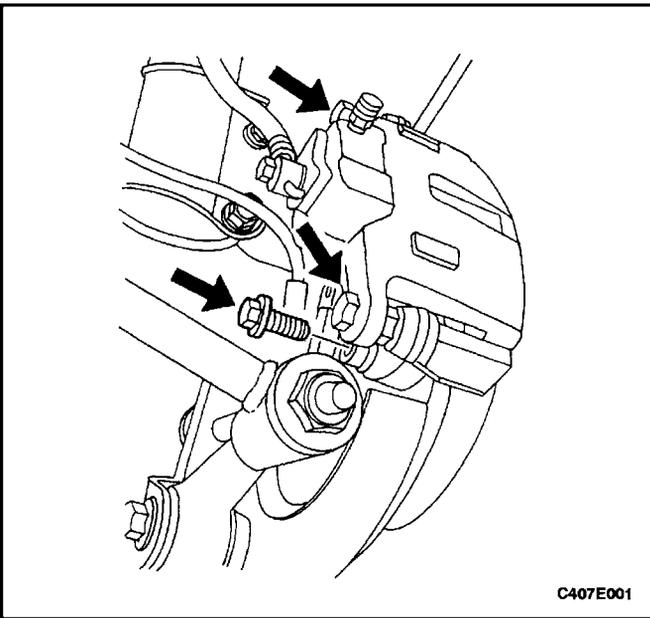


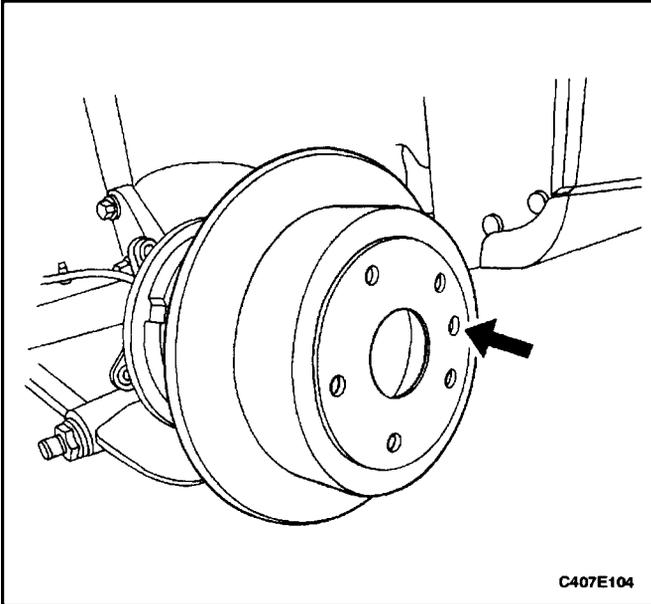
3. Install the rear wheels. Refer to *Section 2E, Tires and Wheels*.
4. Lower the vehicle.
5. Fill the master cylinder to the proper level with clean brake fluid.
6. Bleed the caliper. Refer to *Section 4F, Antilock Brake System and Traction Control System*.

ROTOR

Removal Procedure

1. Remove the caliper. Refer to "Caliper" in this section.
2. Remove the brake shoes.
3. Remove the caliper mounting bracket.
4. Remove the rotor detent screw.
5. Remove the rotor.





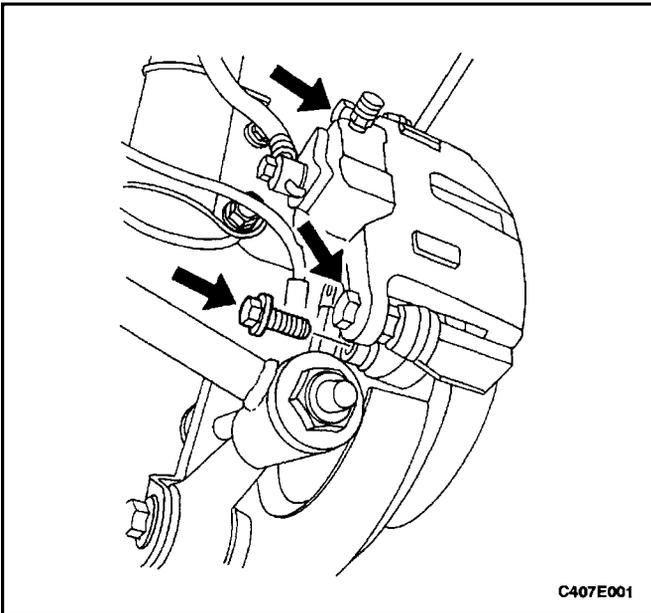
Installation Procedure

Important : To guarantee uniform braking, always refinish both rotors even if only one rotor is defective.

1. Install the rotor on the front wheel hub and install the detent screw.

Tighten

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

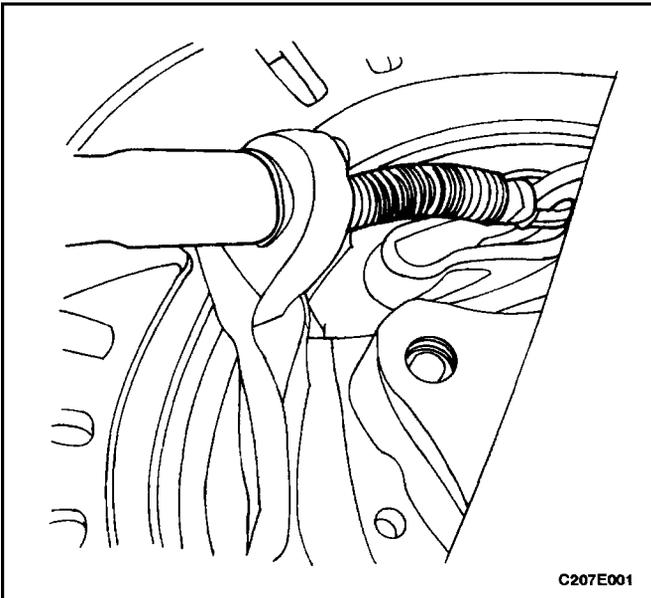


2. Apply a few drops of thread-locking compound to the caliper bracket mounting bolts and install the caliper bracket.

Tighten

Tighten the caliper bracket mounting bolts to 65 N•m (48 lb-ft).

3. Install the brake shoes and the caliper. See "Caliper" in this section.

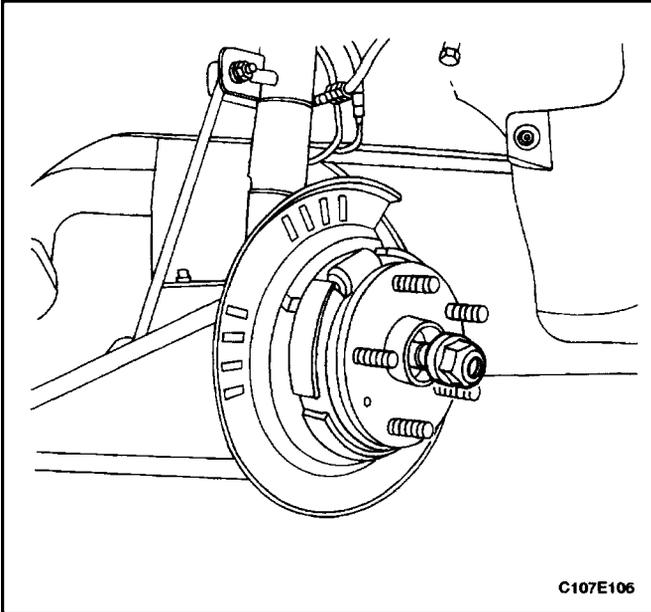


SPLASH SHIELD/BACKPLATE AND PARKING BRAKE LEVER

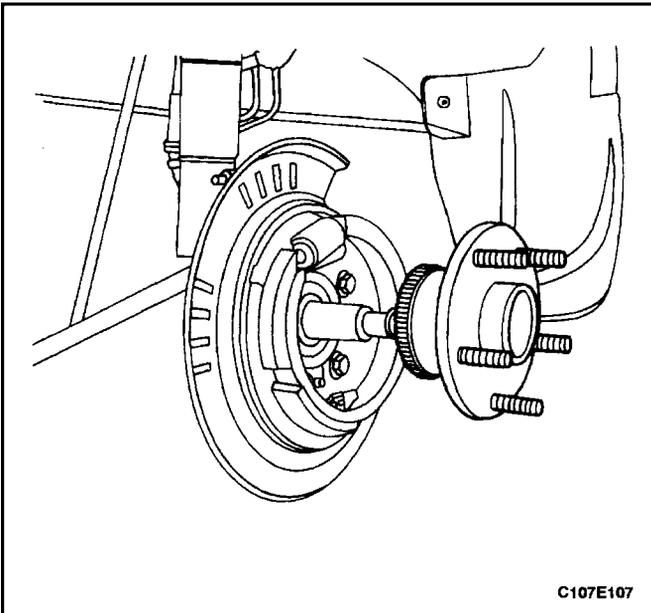
Removal Procedure

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

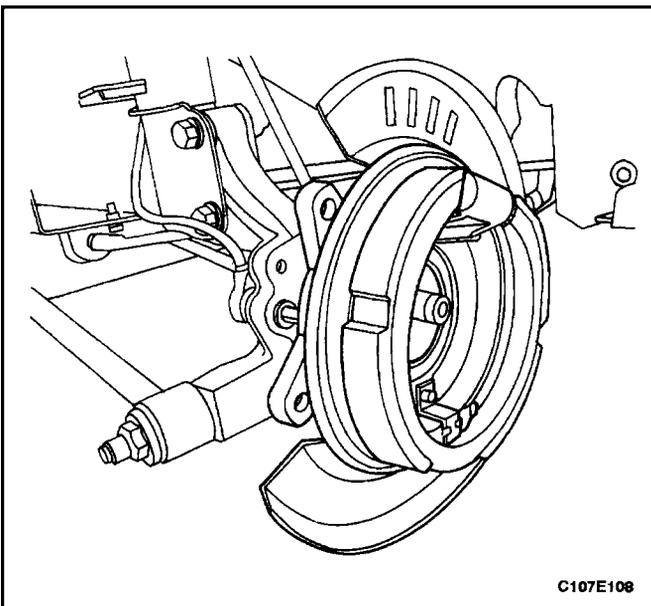
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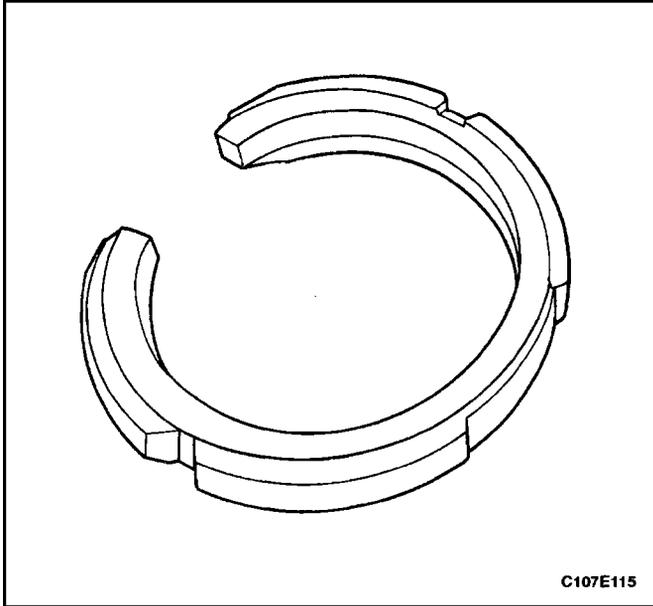
3. Pry off the shaft dust cover.
4. Remove the spindle shaft caulking nut.



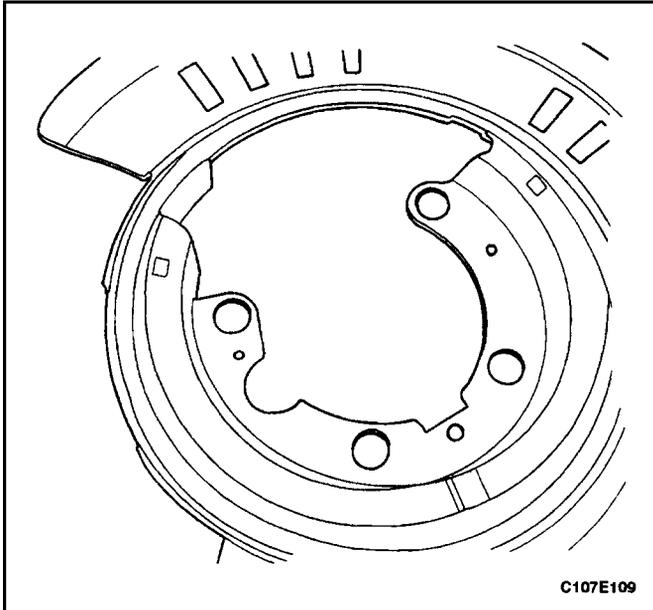
5. Remove the wheel hub assembly from the spindle shaft.



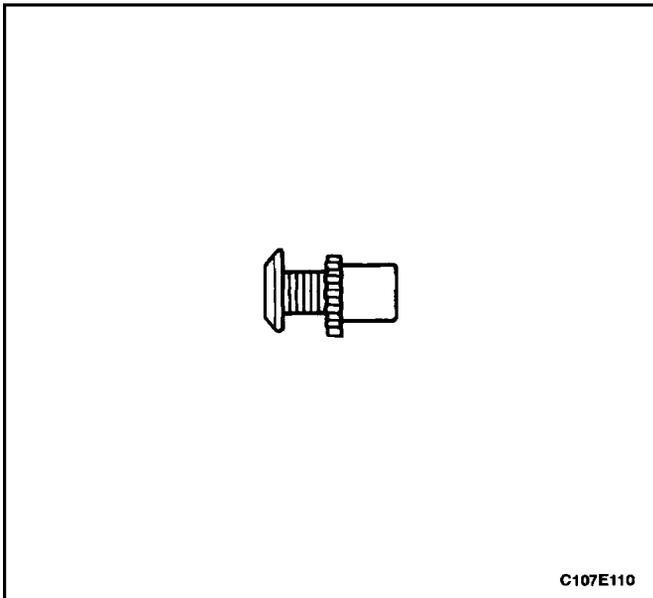
6. Remove the bolts that secure the splash shield/ backplate/parking brake shoe assembly to the steering knuckle.
7. Remove the splash shield/backplate/shoe assembly from the steering knuckle.



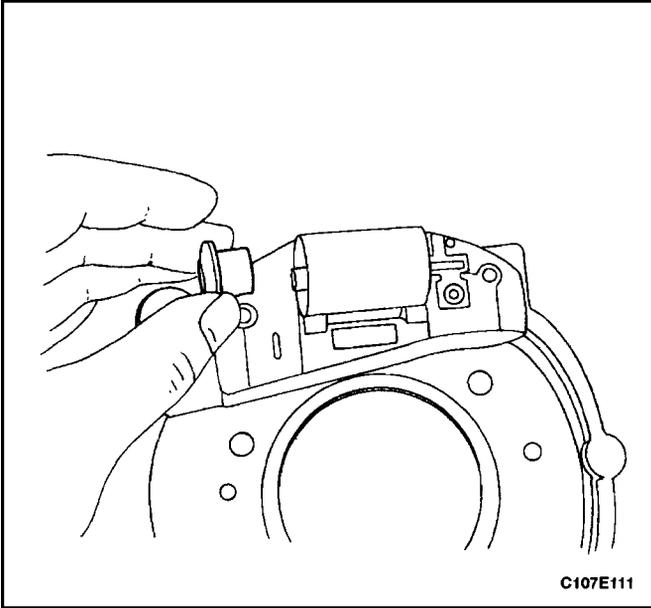
8. Measure the shoe assembly diameter. Refer to *Section 4G, Parking Brake*.
9. Remove the screw that secures the parking brake shoe hold-down spring assembly to the backplate.
10. Remove the parking brake shoe, sliding it away from the actuation mechanism.



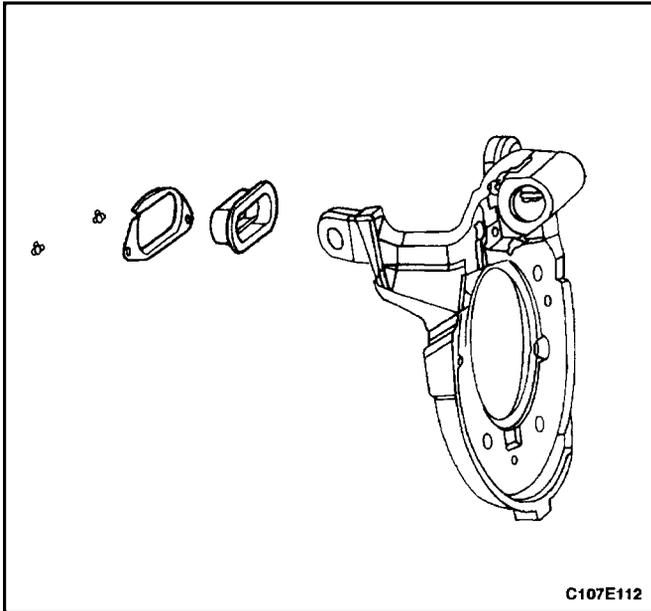
11. Remove the splash shield.



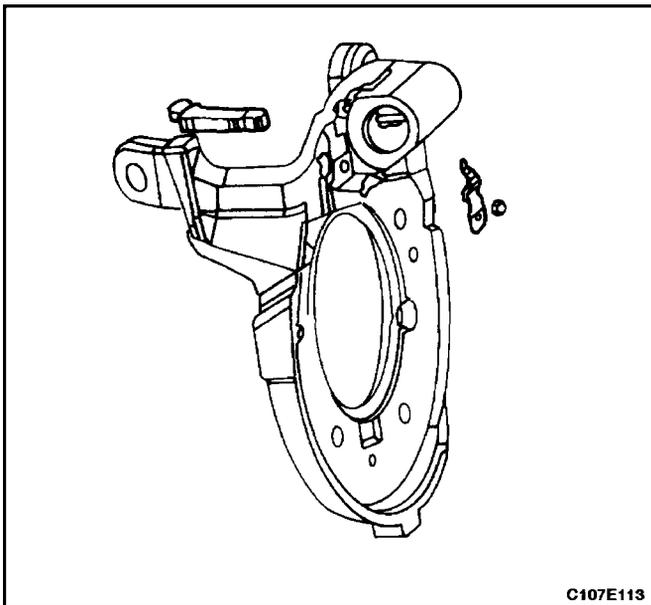
12. Remove the adjuster screw and the nut.



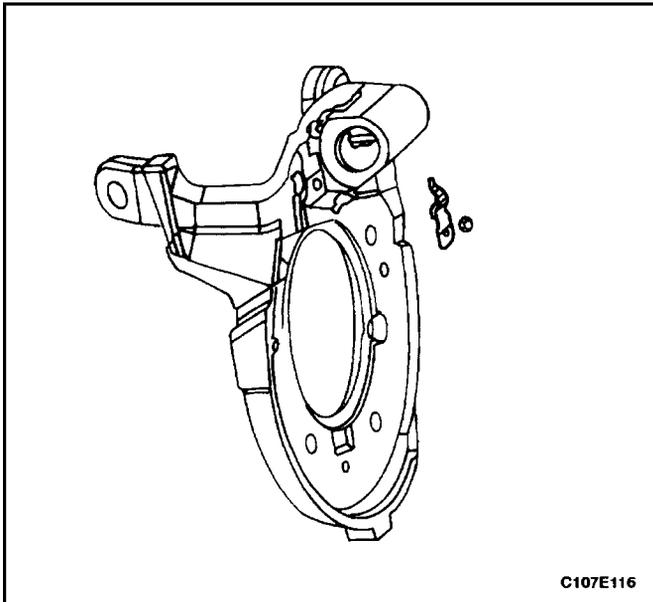
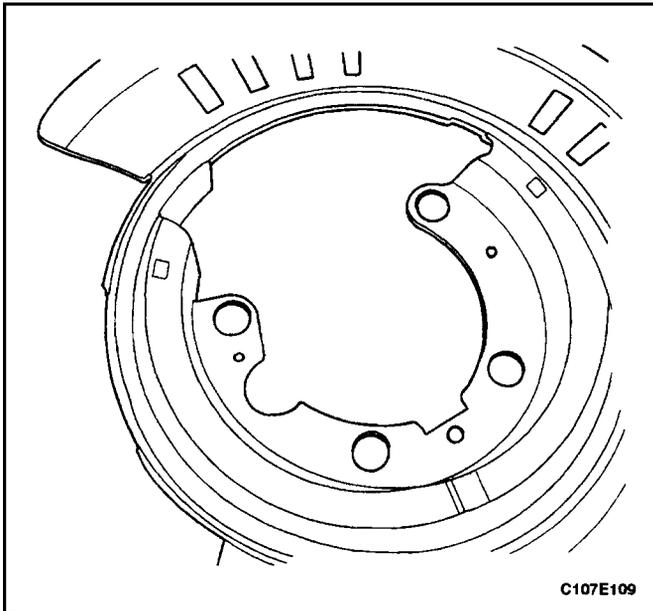
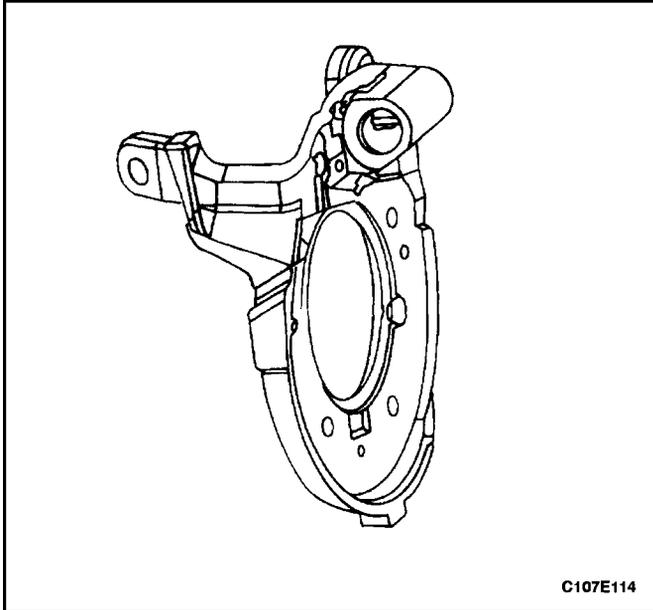
13. Remove the tappet and the pushrod.



- 14. Use a 3.5-mm (0.14-inch) drill to remove the pop rivets that hold the dust cover assembly and the adjuster pawl to the backplate.
- 15. Remove the dust cover and the dust cover retainer from the backplate.



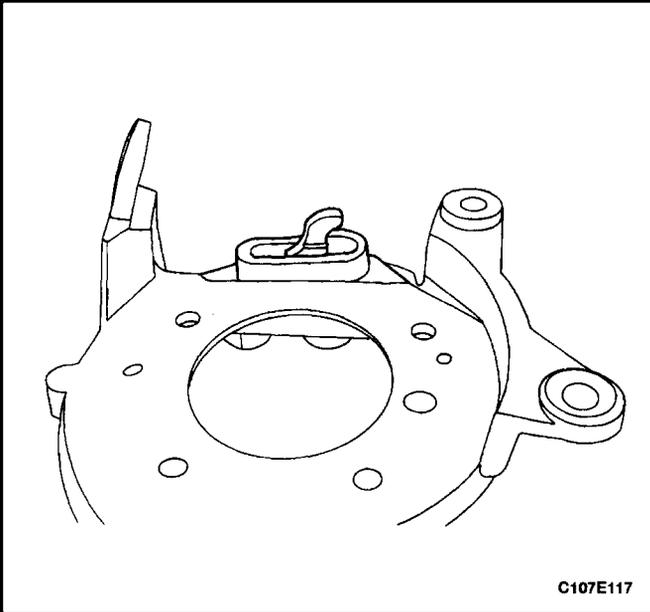
16. Remove the lever and the adjuster pawl.



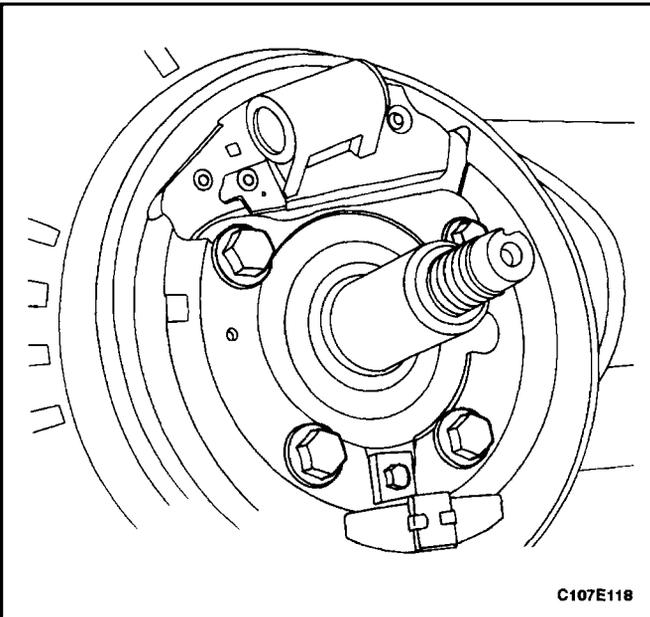
Installation Procedure

CAUTION : A high flash point oil –free solvent, such as trichloroethylene or acetone, used in cleaning brake components, such as backplates, is highly flammable and is unhealthy if inhaled for prolonged periods.

1. Clean the backplate to make sure the actuation cavity is free from grease and any other contamination.
2. Check the shoe assembly position. The shoe will fit centered on the splash shield.
3. Inspect the splash shield for rust or any other damage. Replace the splash shield, if necessary.
4. Install the adjuster pawl to the backplate and secure it with a pop rivet.



5. Slide the dust cover onto the dust cover notches.
6. Insert the lever and the dust cover assembly into the backplate.
7. Secure the dust cover retainer with pop rivets.



8. Lubricate the actuation cavity and the tappet with the grease. Make sure that the internal bore of the cavity is covered with the grease.
9. Secure the splash shield and the backplate to the steering knuckle with the bolts.

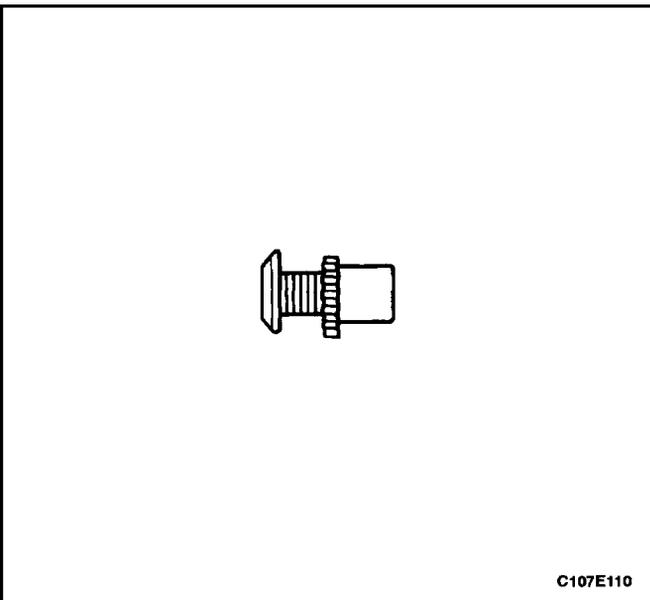
Tighten

Tighten the splash shield bolts to 65 N•m (48 lb–ft).

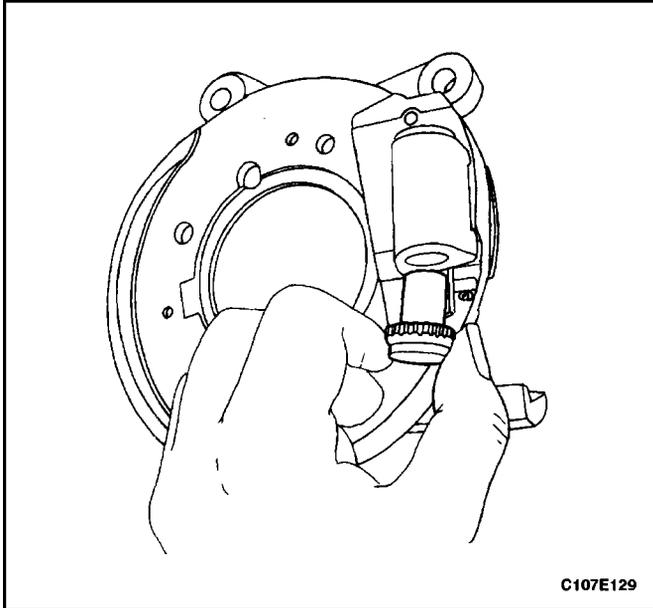
10. Secure the parking brake shoe hold–down spring assembly with the screw.

Tighten

Tighten the parking brake shoe hold–down spring assembly screw to 4 N•m (35 lb–in).

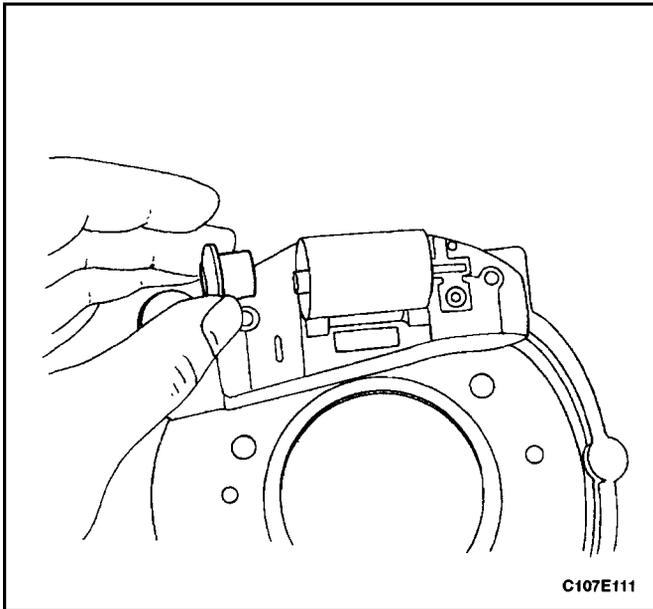


11. Connect the parking brake adjustment screw to the adjustment nut.
12. Tighten the adjustment nut to the point at which it meets the screw, and then back off one–quarter turn.



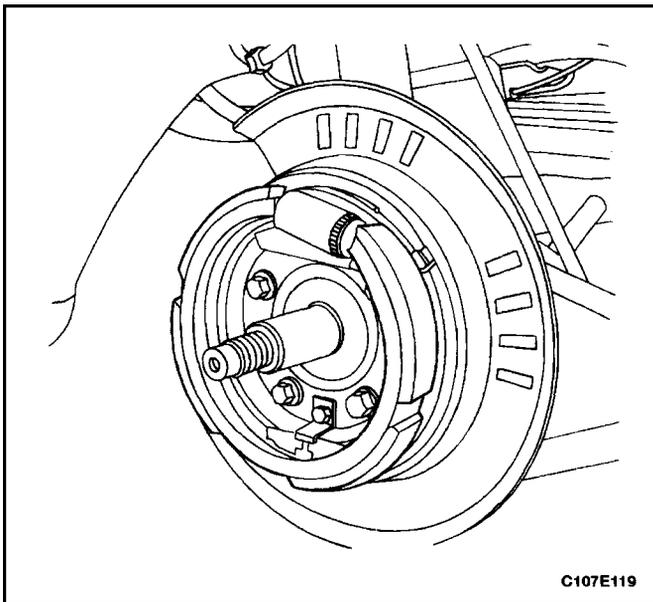
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13. Install the adjustment screw and the adjustment nut into the backplate actuation mechanism on the adjustment pawl side. Keep the shoe slot parallel with the backplate face.



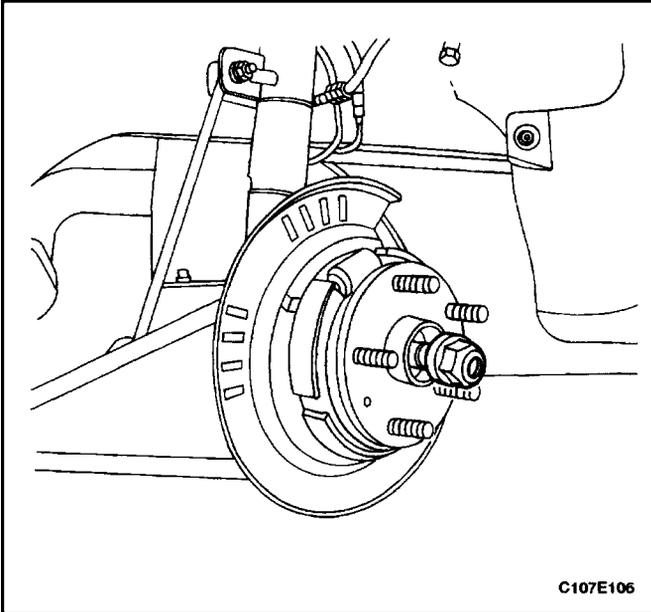
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14. Install the pushrod into the tappet. Make sure the pushrod is set correctly into the lever socket by holding the lever into the backplate while inserting the pushrod and the tappet.



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15. Clean the excess grease away using a clean rag.
Important : The shoe assembly must be resting on the shield with the brand side up.
Important : Clean hands are required when handling the parking brake shoe.
16. Install the parking brake shoe, engaging the shoe tips in both the adjusting screw and the tappet slots.

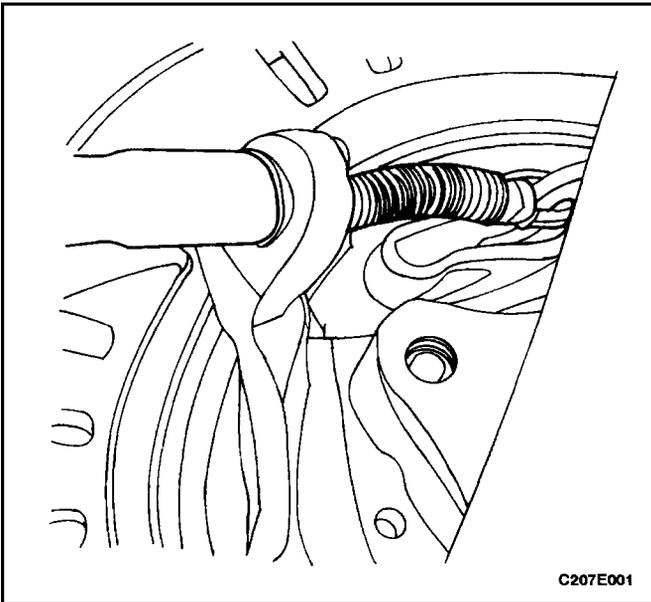


17. Install the wheel hub assembly.
18. Secure the wheel hub assembly with the wheel hub assembly-to-spindle shaft caulking nut.

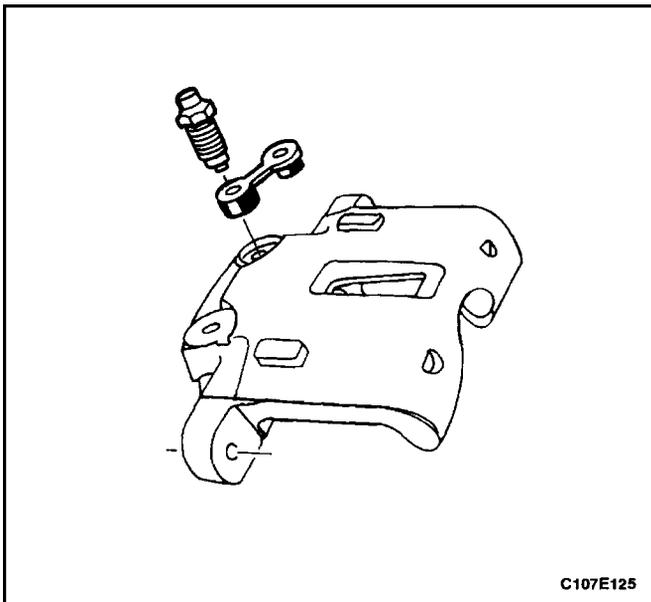
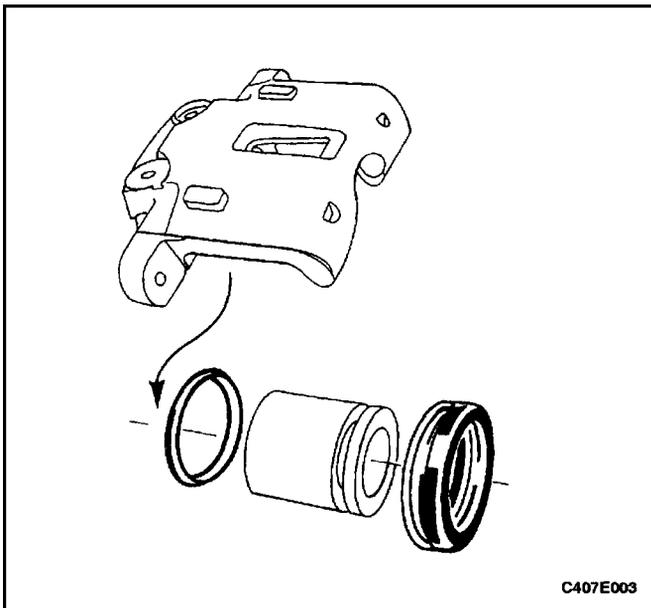
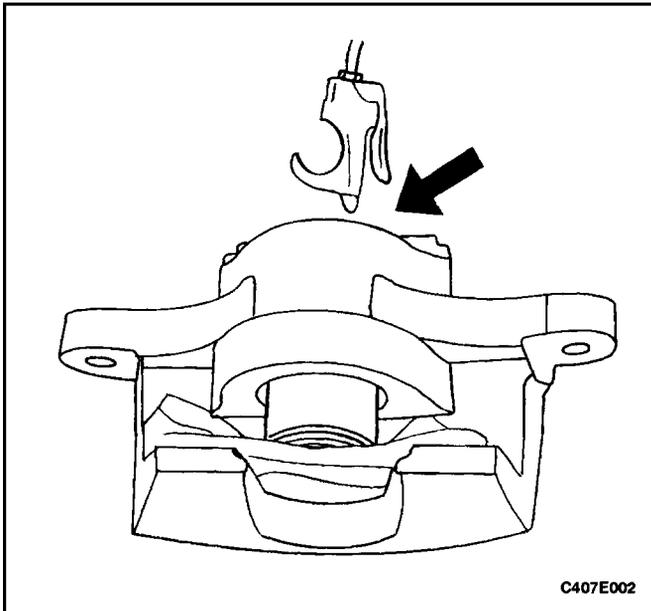
Tighten

Tighten the wheel hub assembly-to-spindle shaft caulking nut to 285 N•m (210 lb-ft).

19. Install the shaft dust cover.



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



UNIT REPAIR

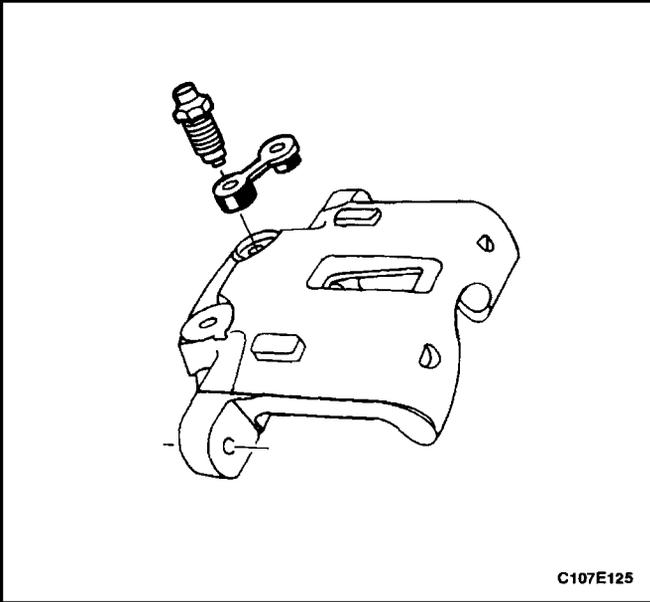
CALIPER OVERHAUL

1. Remove the caliper. Refer to "Caliper" in this section.

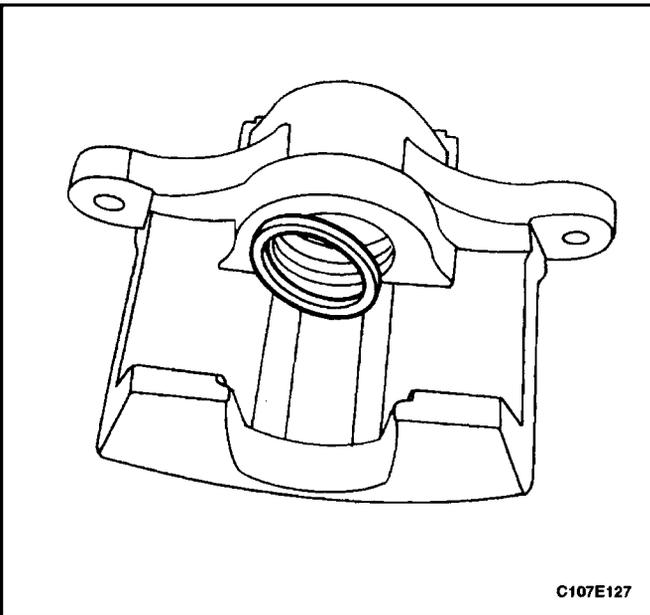
CAUTION : Do not attempt to catch the piston when attempting to remove the piston with compressed air. The piston will pop out of its bore with enough force to damage a hand or fingers.

Important : When removing the caliper piston with compressed air, place some rolled-up shop towels beneath the caliper to prevent damage to the piston.

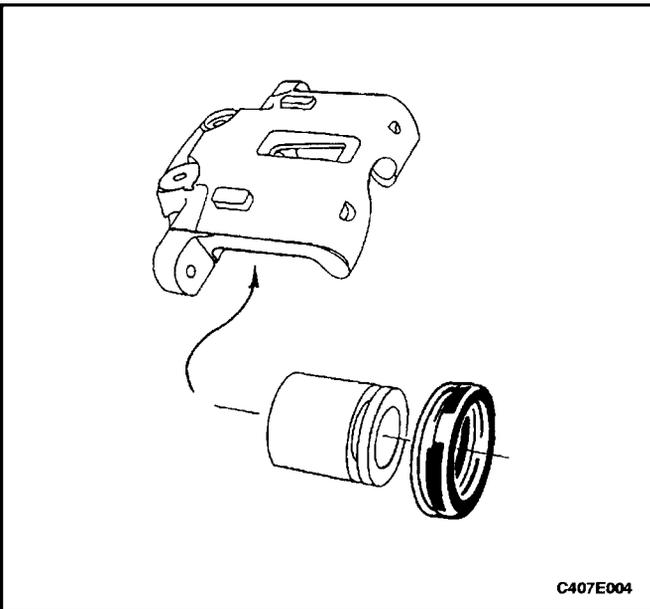
2. Apply unlubricated compressed air at the hose inlet of the caliper.
3. Remove the piston from its bore and remove the piston dust seal.
4. Remove the inner seal from the bore. Avoid scratching the bore.
5. Remove the bleeder valve dust cap and the bleeder valve.



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Assembly Procedure

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

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

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 piston dust seal in its groove.
7. Lubricate the piston with brake fluid.
8. Push the piston inward until it is properly seated. Make sure that the dust seal is in the correct groove in the piston and the caliper.
9. Reinstall the caliper. Refer to "Caliper" in this section.
10. Bleed the brake system. Refer to *Section 4F, Anti-lock Brake System*.

GENERAL DESCRIPTION AND SYSTEM OPERATION

DISC BRAKE CALIPER ASSEMBLY

The caliper has a single bore and is mounted to the steering knuckle with two mounting bolts. Hydraulic pressure, created by applying the brake pedal, is converted by the caliper to a stopping force. This force 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.

- Replace all components included in the repair kits used to service the caliper.
- Lubricate the rubber parts with clean brake fluid to ease assembly.
- Do not use lubricated shop air on brake parts, as damage to the rubber components may result.
- If any hydraulic component is removed or disconnected, it may be necessary to bleed all or part of the brake system. Refer to *Section 4F, Anti-lock 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, free from oily material.