

SECTION 4E

REAR DISC BRAKES

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SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb•Ft	Lb•In
Brake Hose Inlet Fitting to Caliper Bolt	32	24	-
Caliper Bleeder Valve	6	-	53
Caliper to Steering Knuckle Mounting Bolts	65	48	-
Caliper Guide Pin Bolts	31	23	-
Parking Brake Shoe Hold Down Spring Assembly Screw	4	-	35
Rotor to Rear Wheel Hub Detent Screw	4	-	35
Splash Shield/Backplate to Steering Knuckle 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 linings for minimum thickness and wear.
4. Measure the thickness.

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

5. Install the pads in axle sets only.

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

7. Lower the vehicle.

ROTOR INSPECTION

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 in from the edge of the rotor.

A rotor that varies by more than 0.10 mm (0.004 inch) can cause pedal pulsations and/or front end vibration during brake applications. A rotor that does not meet these specifications should be refinished to specifications or replaced.

During manufacturing, the brake rotor and the tolerances of the braking surface regarding flatness, thickness variation, and lateral runout are held very close. The maintenance of close tolerances on the

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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. The control of the braking surface finish is necessary to avoid pulls and erratic performance and to extend lining life.

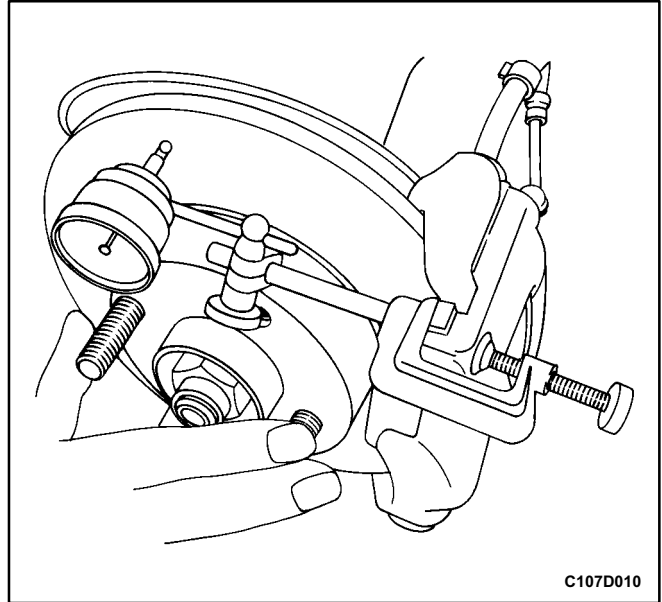
Notice: Permissible lateral runout is a maximum 0.10 mm (0.004 inch). If lateral runout exceeds the specification, make sure there is no dirt between the rotor and the hub and that contact surfaces are smooth and free from burrs in order to avoid premature wear.

Using a commercially available dial indicator, check the lateral runout as follows:

1. Position the transaxle in neutral.
2. Remove the rotor. Refer to „Rotor” in this section.
3. Fasten the brake rotor to the wheel hub with two wheel bolts.
4. Fasten a dial indicator to the brake caliper.
5. The dial indicator probe tip should measure 234 mm (9.2inches) from the center of the disc hole.
6. Remove the dial indicator and the wheel bolts.

Important: Since accurate control of the rotor tolerances is necessary for proper performance of the disc brakes, refinishing of the rotor should be done only with precision equipment.

7. Refinish the rotor, if required, with precision equipment. Discard the rotor if it fails to meet the above specifications after refinishing.
8. Install the rotor. Refer to „Rotor” in this section.



MAINTENANCE AND REPAIR

ON-VEHICLE SERVICE

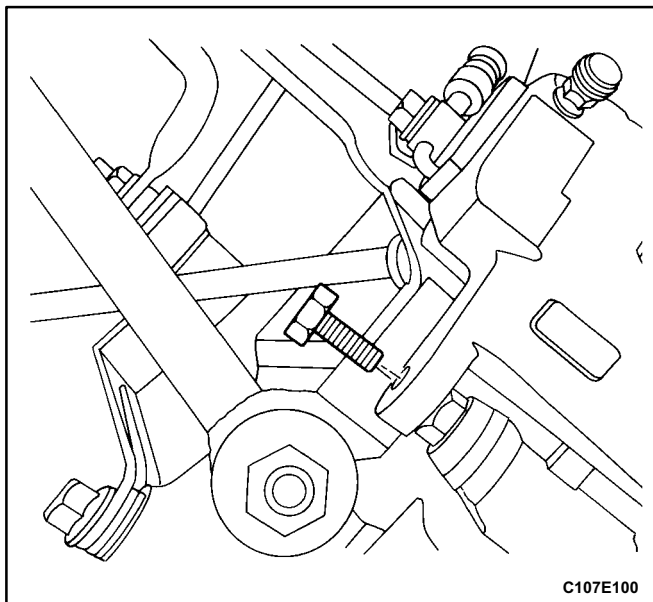
SHOE AND LINING (BRAKE PADS)

Removal Procedure

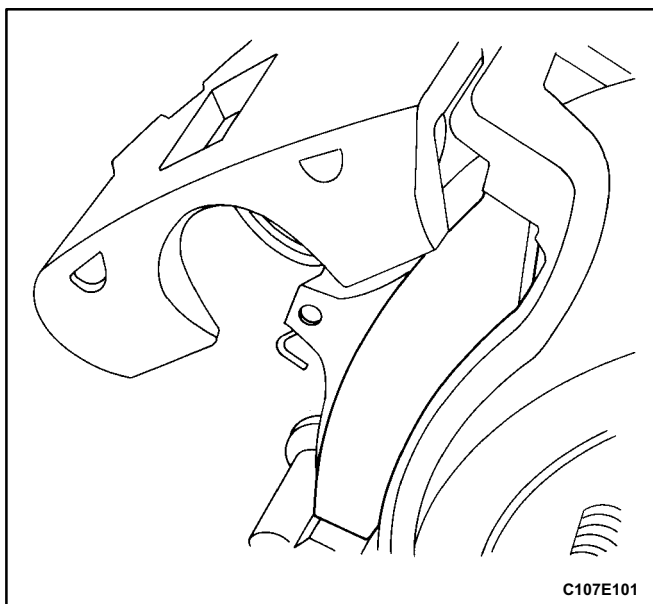
1. Raise and suitably support the vehicle.
2. Remove the rear wheels. Refer to *Section 2E, Tires and Wheels*.
3. Remove the lower guide pin bolt of the caliper assembly, and loosen the upper guide pin bolt.

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

4. Pull the caliper piston housing up.

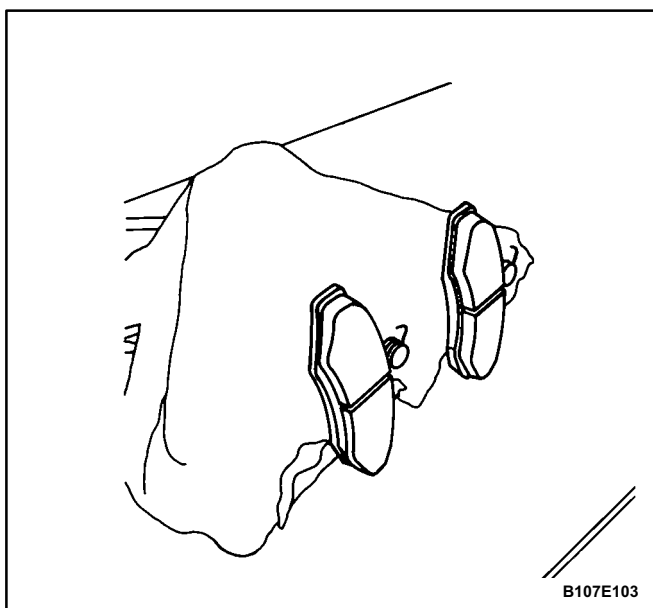


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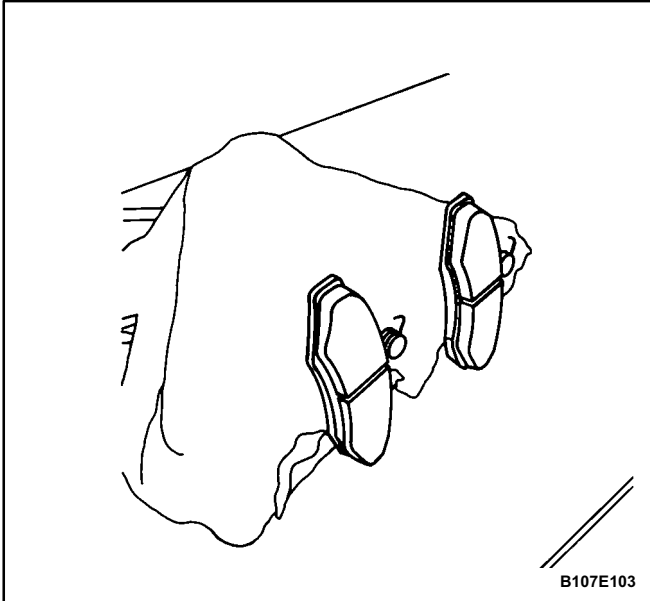


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5. Remove the brake pads.

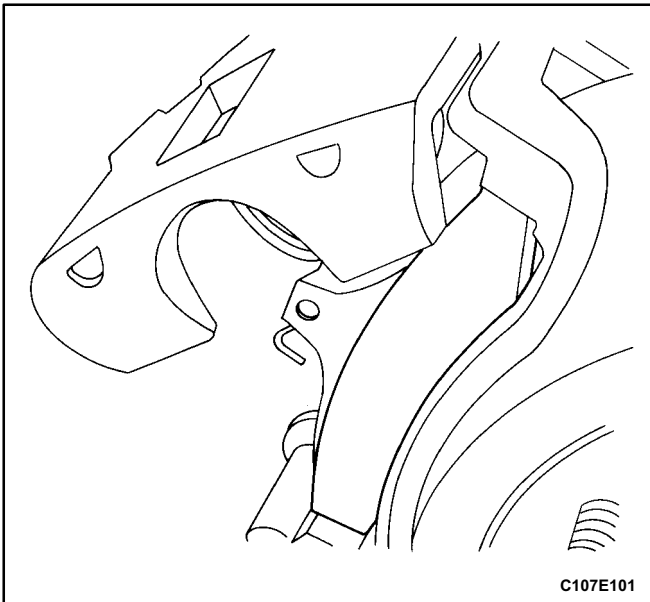


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Installation Procedure

1. Measure the minimum brake pad thickness. Refer to „Lining Inspection” in this section.
2. Install the brake pads into the caliper.
3. Push the piston inward, if needed.



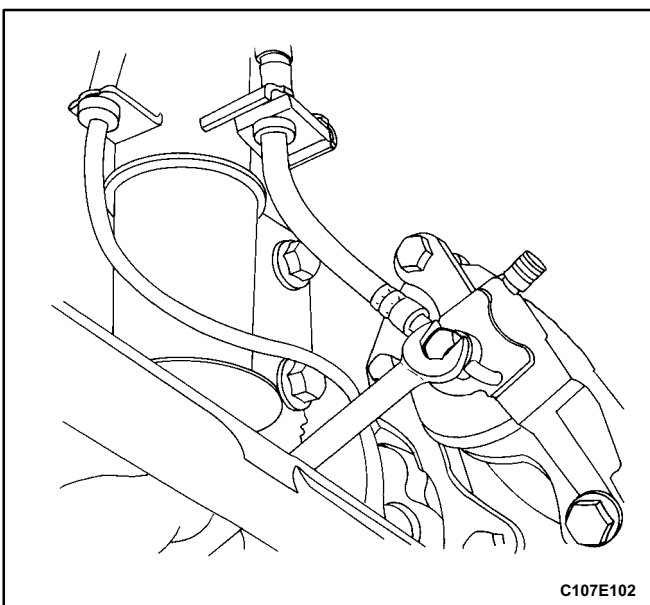
Notice: Take care not to damage the piston seal when the piston housing is pulled down.

4. Pull down the caliper piston housing and secure it with the bolts.

Tighten

Tighten the upper and the lower caliper guide pin bolts to 31 N•m (23 lb•ft).

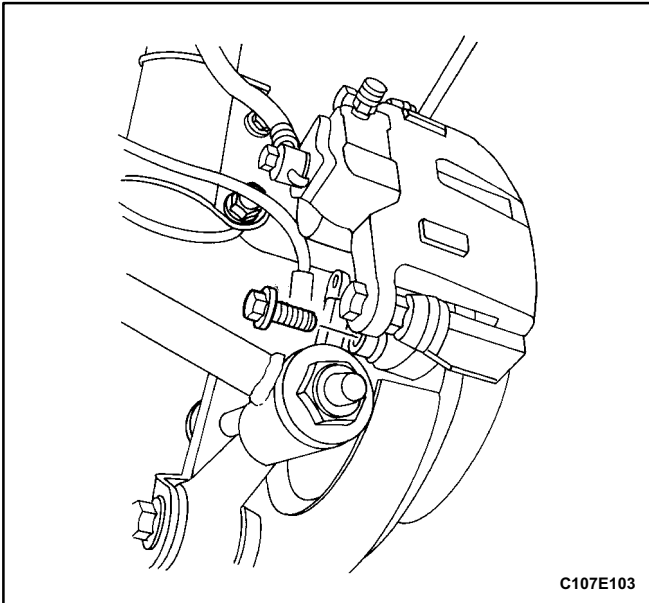
5. Install the rear wheels. Refer to *Section 2E, Tires and Wheels*.
6. Lower the vehicle.



CALIPER ASSEMBLY

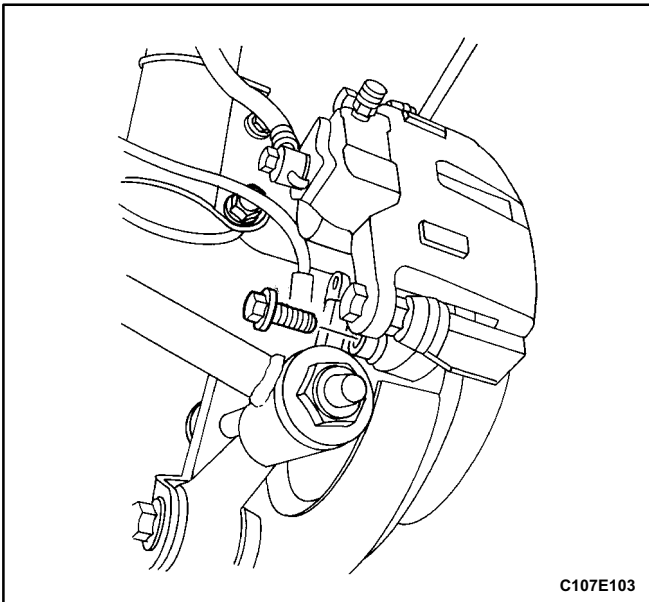
Removal Procedure

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 washers that attach the brake hose inlet fitting to the caliper.



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



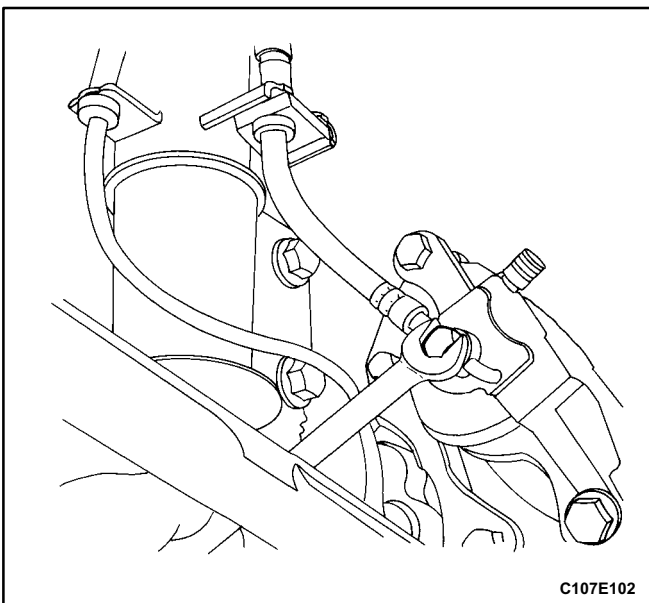
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Installation Procedure

1. Install the caliper assembly with the mounting bolts.

Tighten

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

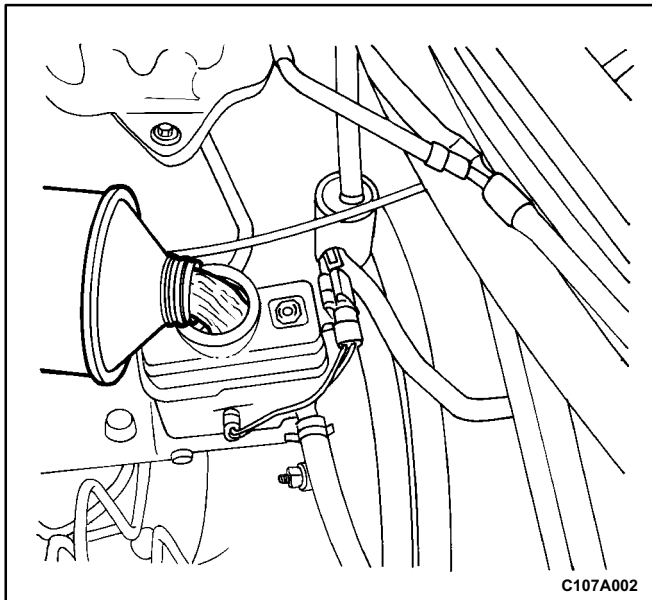


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2. Connect the brake hose with the bolt and washers.

Tighten

Tighten the brake hose inlet fitting to caliper bolt and washers 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 4A, Hydraulic Brakes*.
7. Recheck the fluid level.

Notice: Do not move the vehicle until a firm pedal is obtained, or improper braking action will result.

8. Repeatedly press the brake pedal to bring the pads in contact with the rotor.

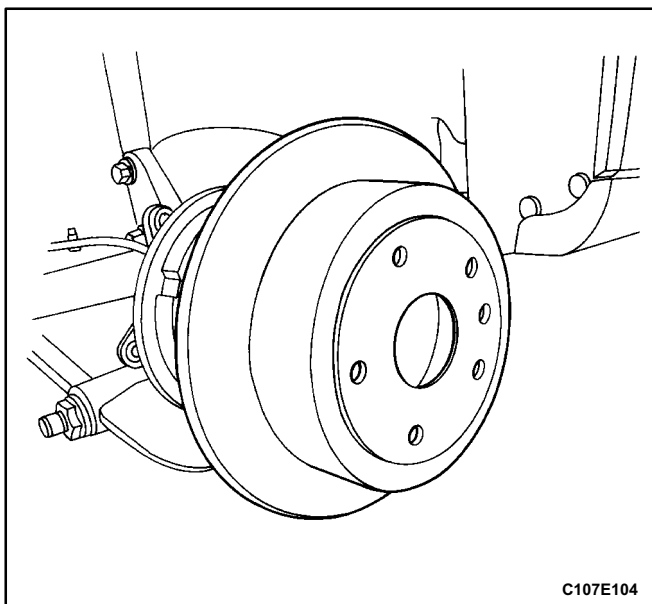
ROTOR

Removal Procedure

Notice: In order to avoid damage to the components, do not hang the caliper assembly from the brake hose.

Important: To guarantee uniform braking on both sides, both rotors must have identical surfaces regarding smoothness and scoring depth. For this reason, always replace both rotors.

1. Remove the caliper assembly without disconnecting the brake hoses. Refer to „Caliper Assembly” in this section.
2. Remove detent screw from the rotor to rear wheel hub.
3. Pull off the rotor.



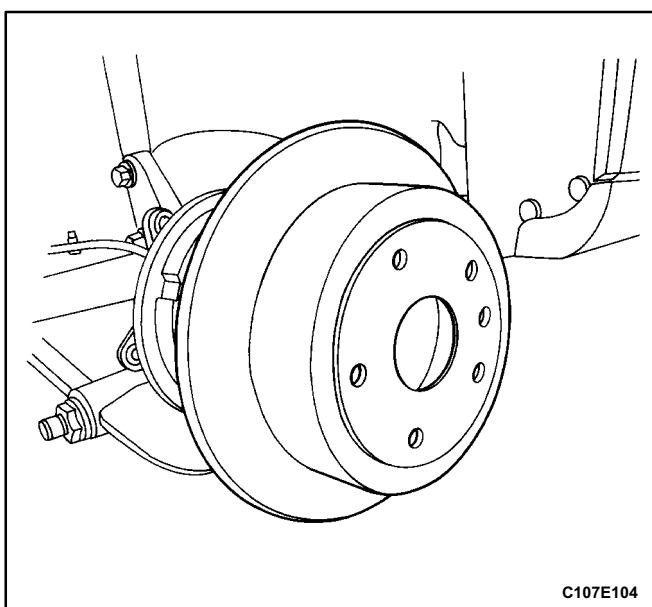
Installation Procedure

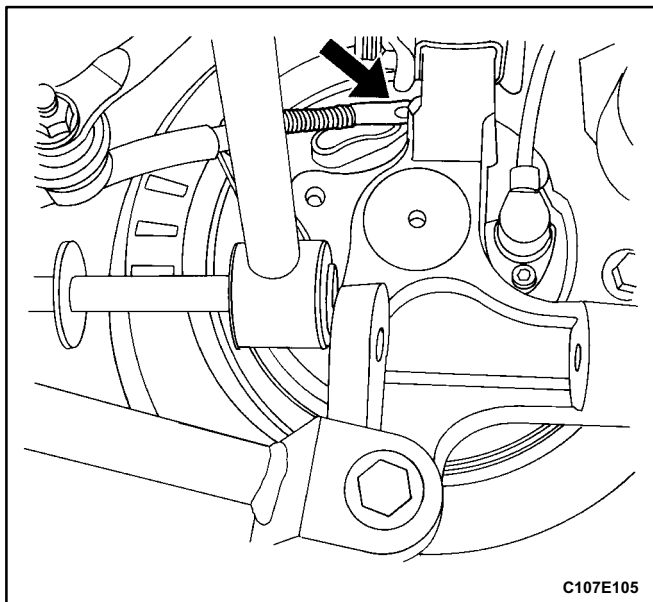
1. Inspect the rotor. Refer to „Rotor Inspection” in this section.
2. Install the rotor to rear wheel hub with the detent screw.

Tighten

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

3. Install the caliper assembly. Refer to „Caliper Assembly” in this section.

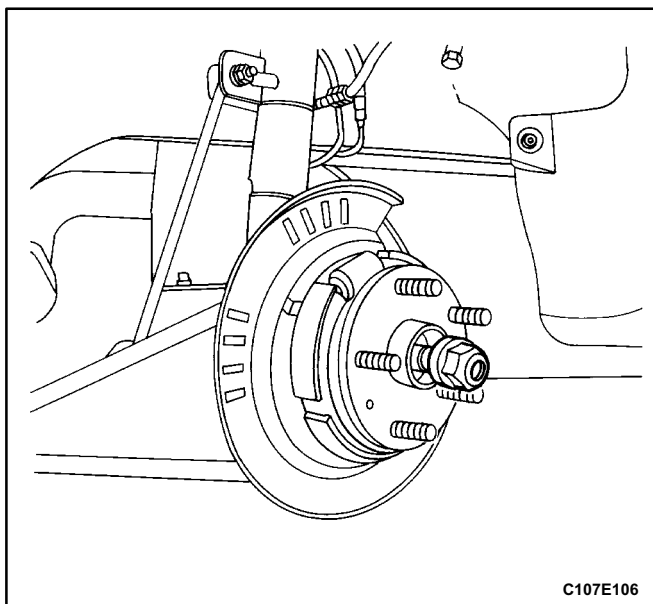




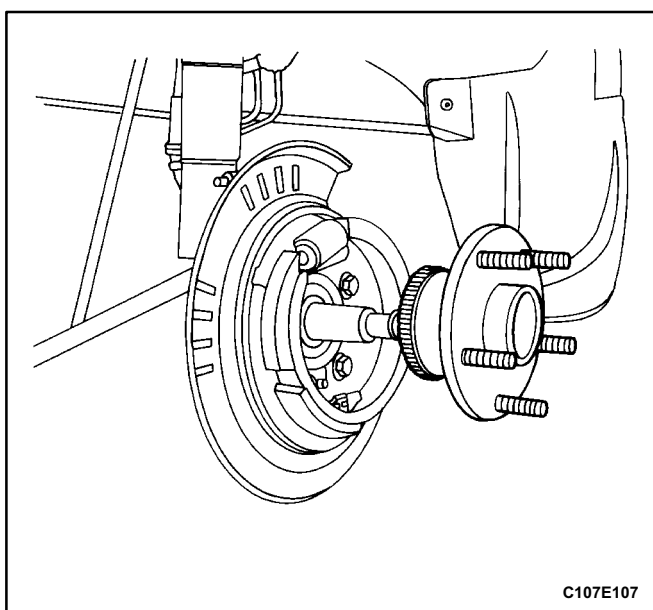
SPLASH SHIELD/BACKPLATE AND PARKING BRAKE LEVER

Removal Procedure

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

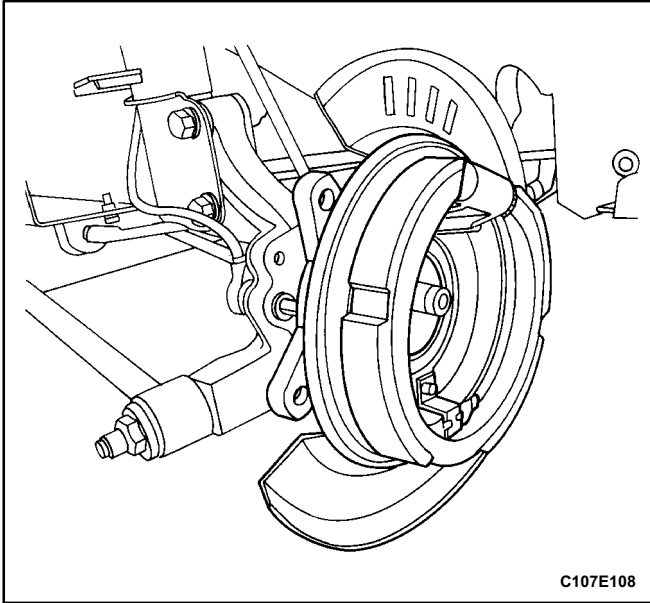


3. Pry off the shaft dust cover.
4. Remove the spindle shaft caulking nut.

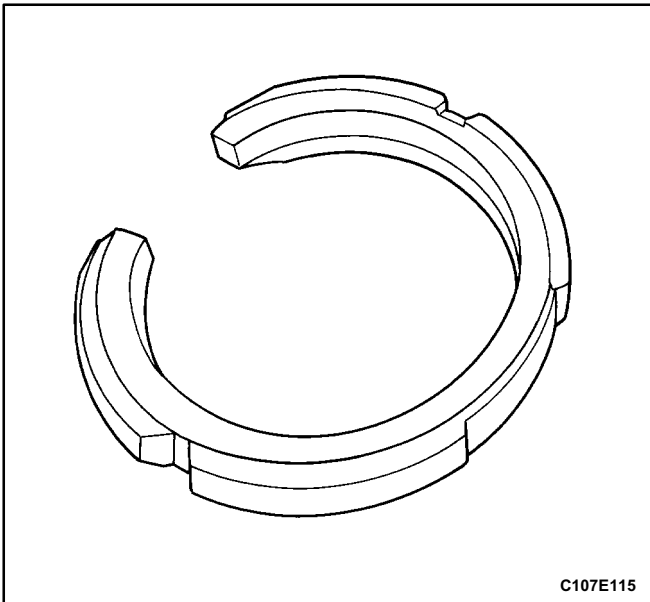


5. Remove the wheel hub assembly from the spindle shaft.

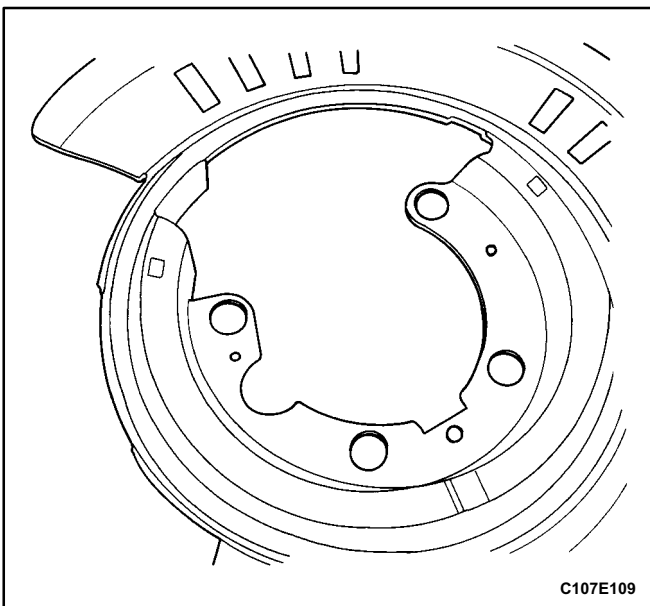
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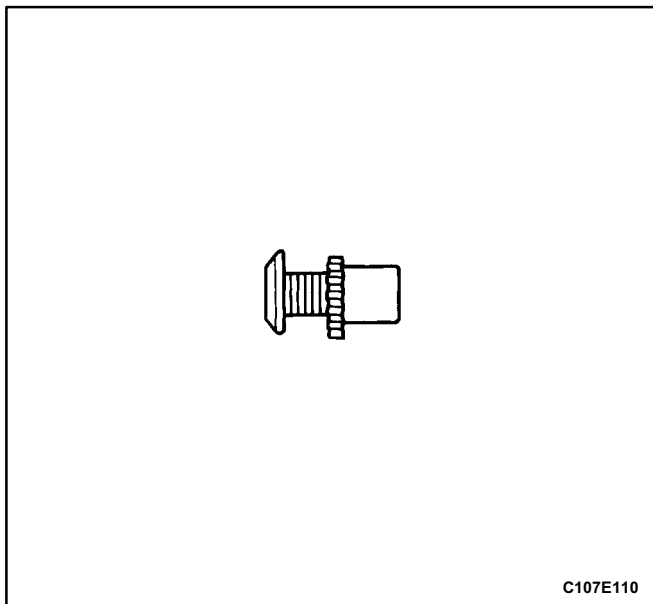
6. Remove the bolts that secure the splash shield/backplate/parking brake shoe assembly to the steering knuckle.
7. Remove the splash shield/backplate/shoe assembly from the steering knuckle.



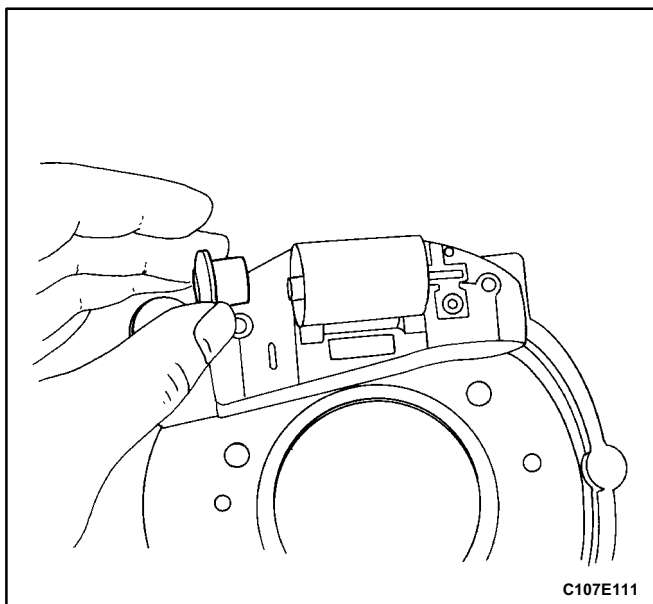
8. Remove the screw that secures the parking brake shoe hold down spring assembly to the backplate.
9. Remove the parking brake shoe, sliding it away from the actuation mechanism.



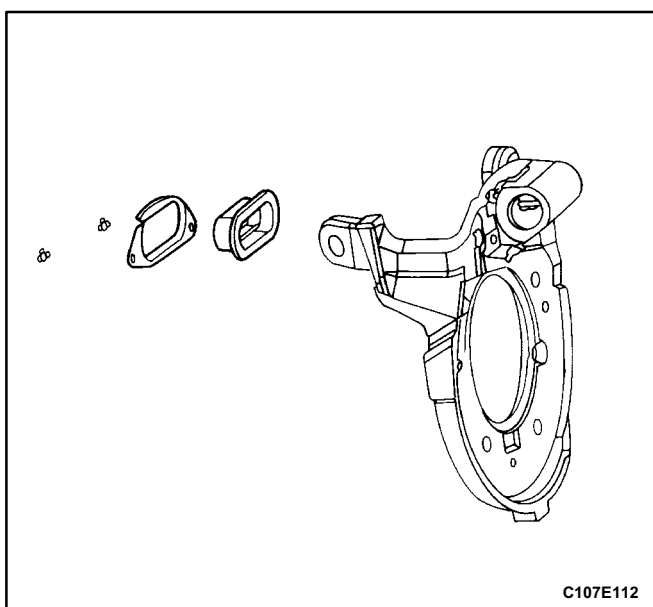
10. Measure the shoe assembly diameter. Refer to *Section 4G, Parking Brake*.
11. Remove the splash shield.



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

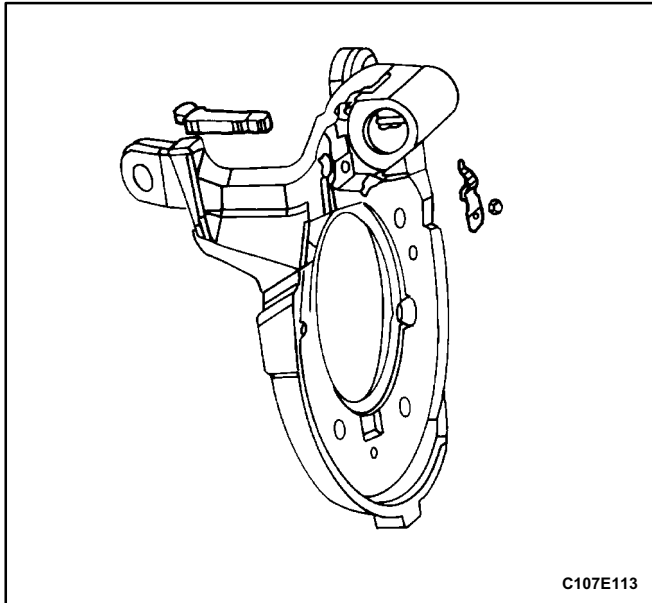


13. Remove and discard the tappet and the pushrod.

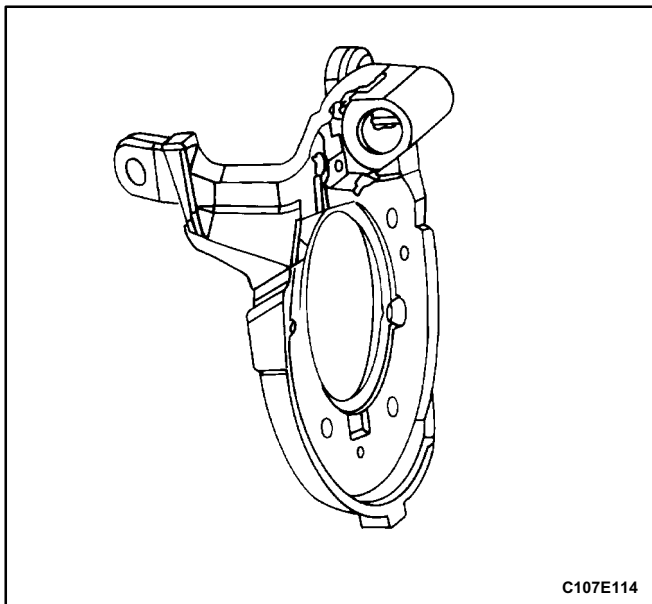


14. Use a 3.5 mm (0.14 inch) drill to remove the pop rivets that hold the dust cover assembly and the adjuster pawl to the backplate.

15. Remove and discard the dust cover and the dust cover retainer from the backplate.



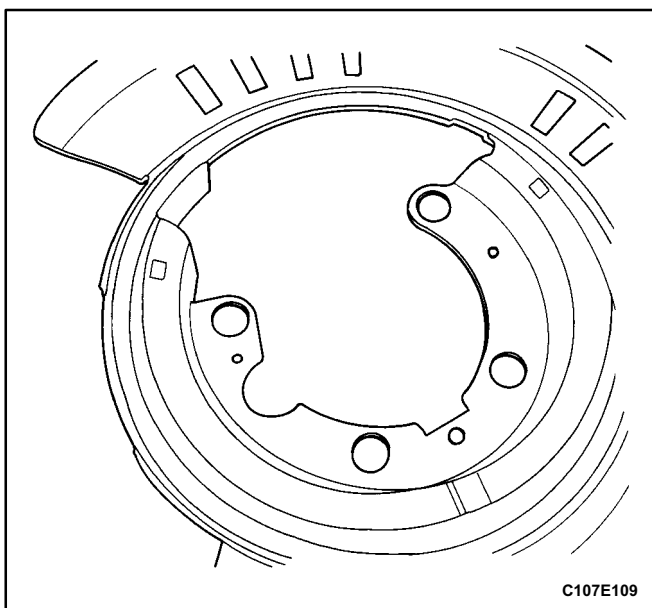
16. Remove and discard the lever and the adjuster pawl.



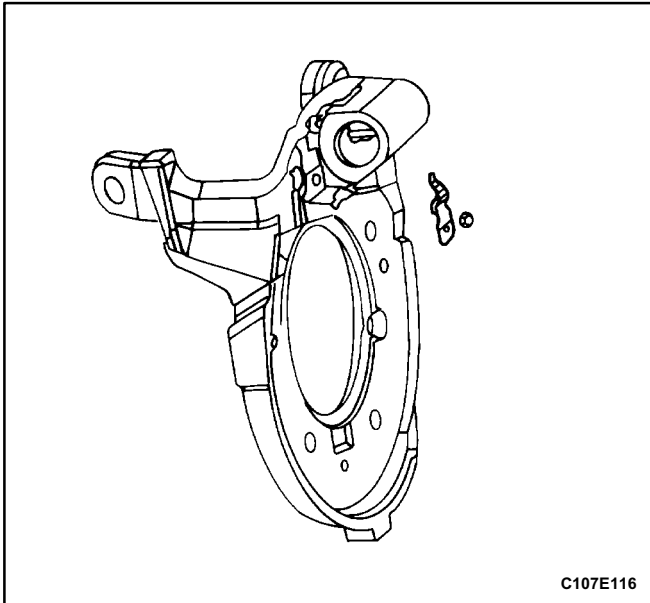
Installation Procedure

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

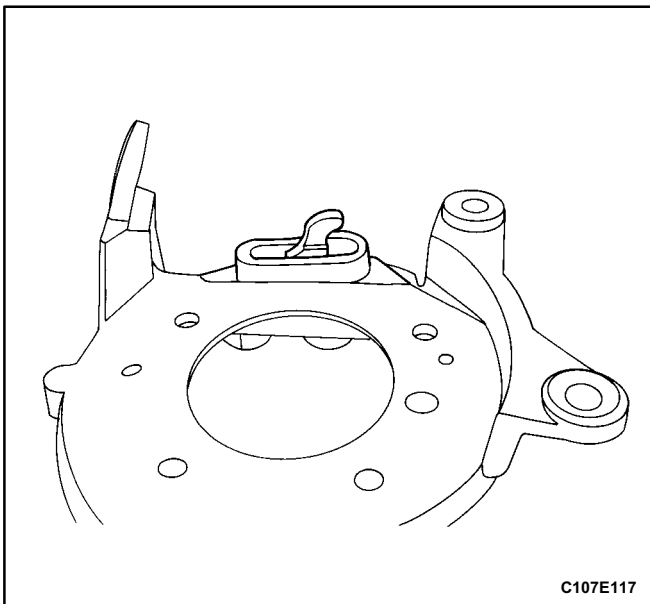
1. Clean the backplate to make sure the actuation cavity is free from grease and any other contamination.
2. Inspect the shoe assembly position. The shoe should fit centered on the splash shield with the shoe tips located correctly in the slots.



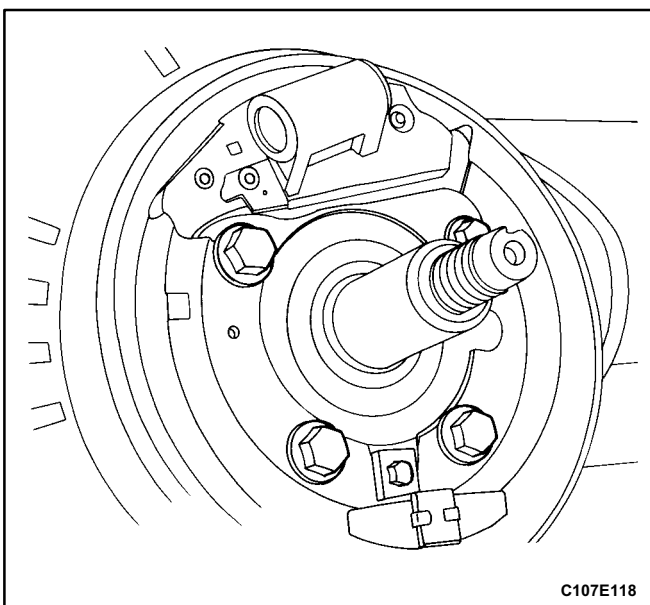
3. Inspect the splash shield for rust or any other damage. Replace the splash shield if necessary.



4. Install the new adjuster pawl to the backplate and secure 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 backplate.
7. Secure the new 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.

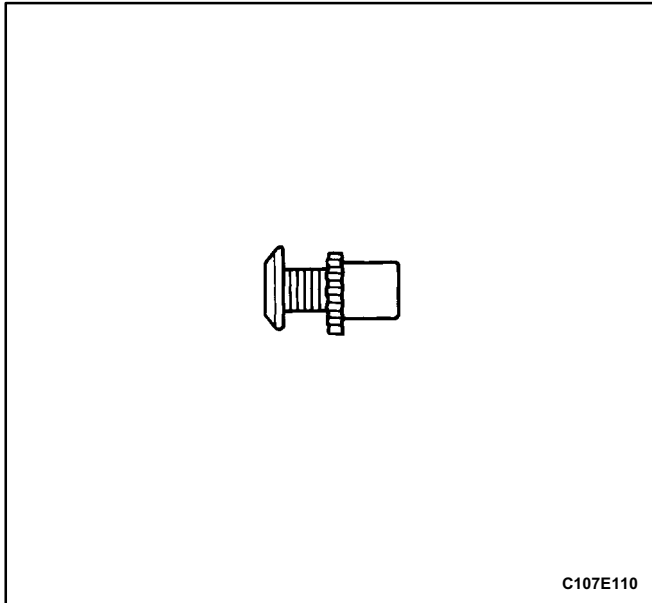
Tighten

Tighten the splash shield/backplate to steering knuckle bolts to 65 N•m (48 lb•ft).

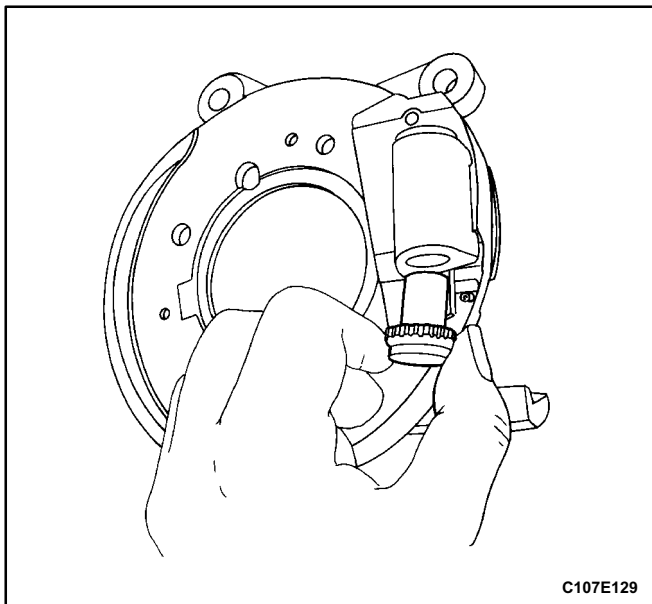
10. Secure the parking brake shoe hold down spring assembly with the screw.

Tighten

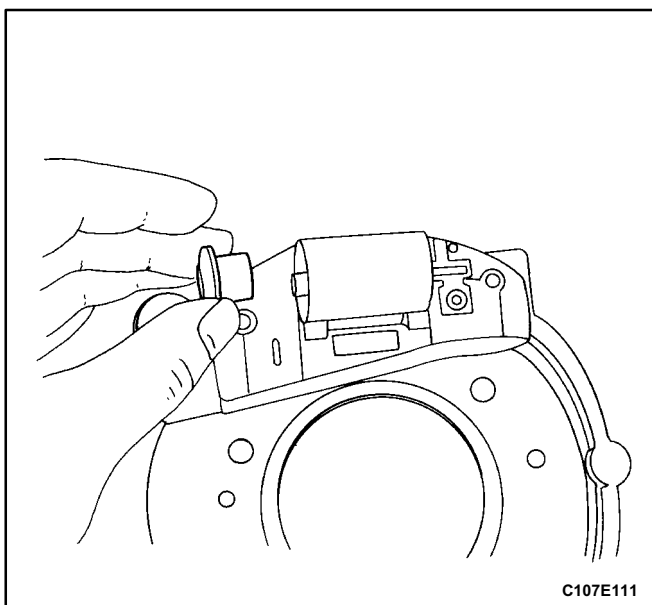
Tighten the parking brake shoe hold down spring assembly screw to 4 N•m (35 lb•in).



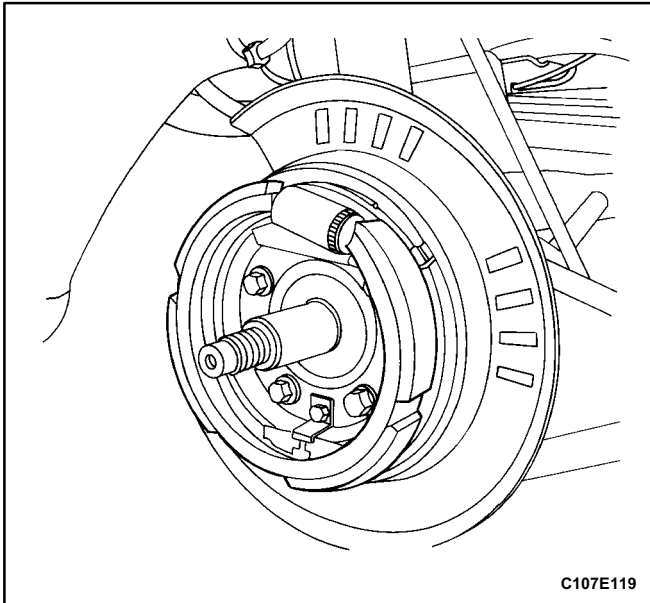
11. Connect the new parking brake adjustment screw to the new adjustment nut.
12. Tighten the adjustment nut to the point at which it meets the screw, and then back off one quarter turn.



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.



14. Install the new 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.

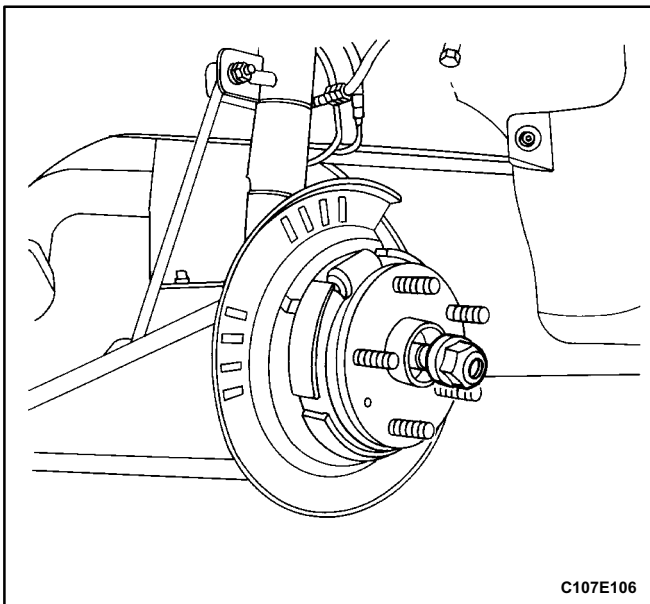


15. Clean the excess grease away using a clean rag.

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.



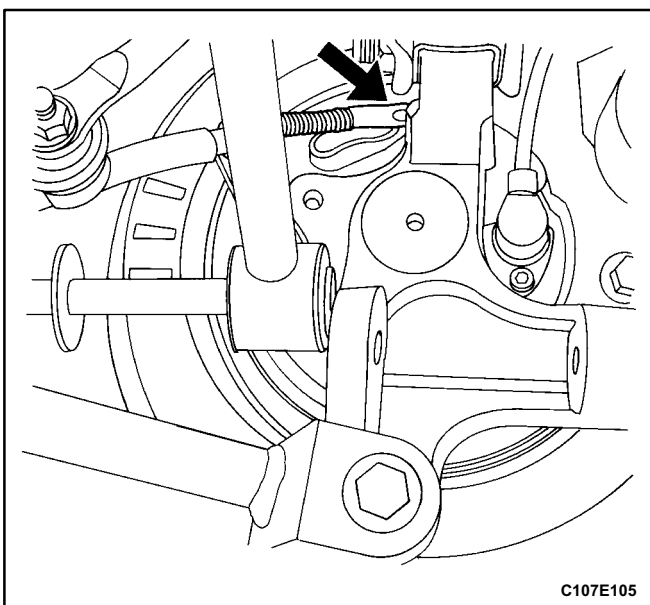
17. Install the wheel hub assembly.

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*.

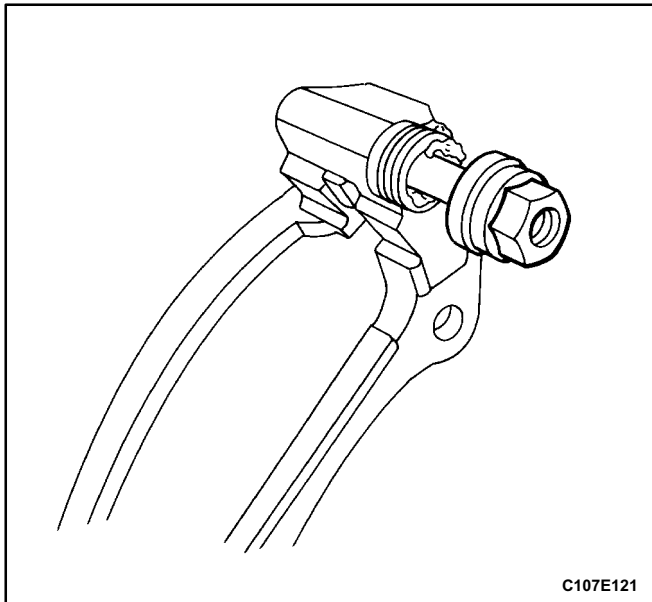
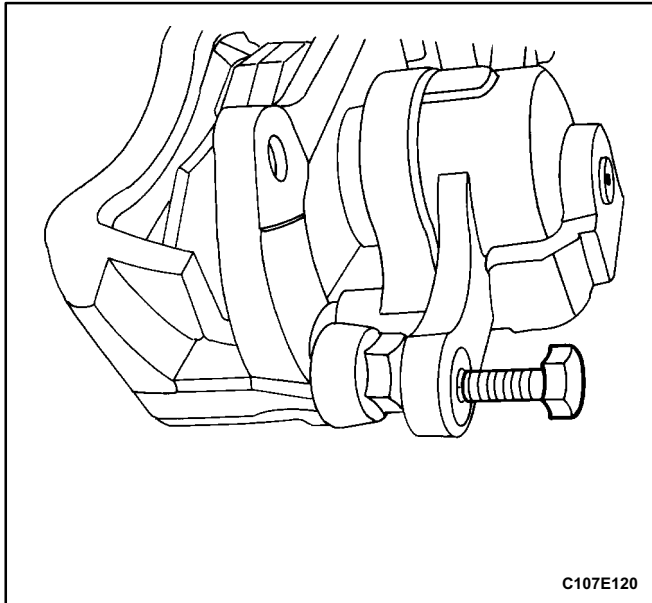
22. Install the rotor. Refer to „Rotor” in this section.

UNIT REPAIR

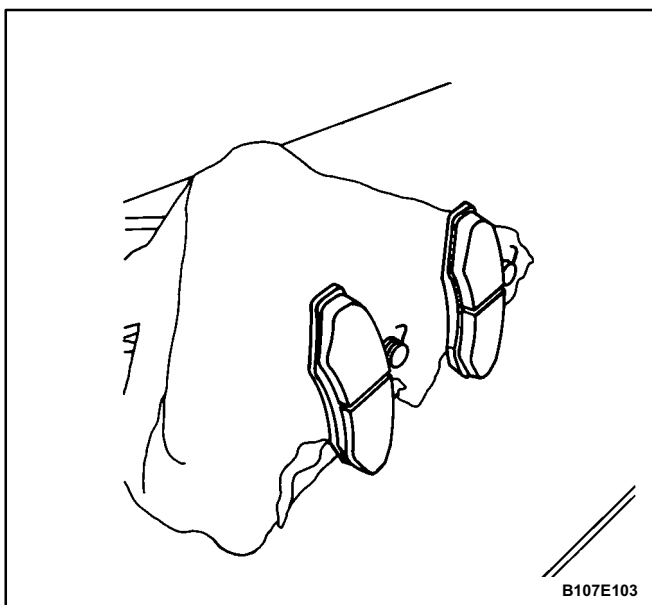
CALIPER OVERHAUL

Disassembly Procedure

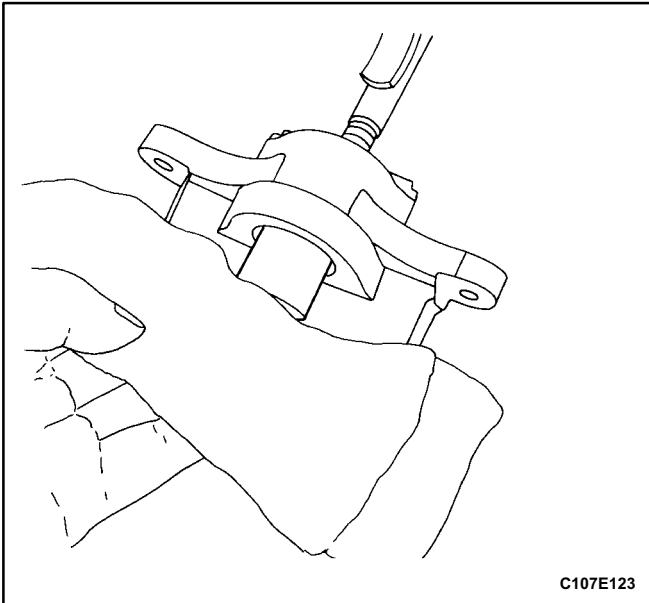
1. Remove the caliper assembly. Refer to „Caliper Assembly” in this section.
2. Plug the caliper housing inlet port and the brake hose end to prevent contamination or fluid loss.
3. Remove and discard the guide pin bolts.



4. Remove the caliper piston housing assembly.
5. Remove the guide pins and the boots, plugging the holes of the anchor bracket to prevent contamination. Discard the boots.



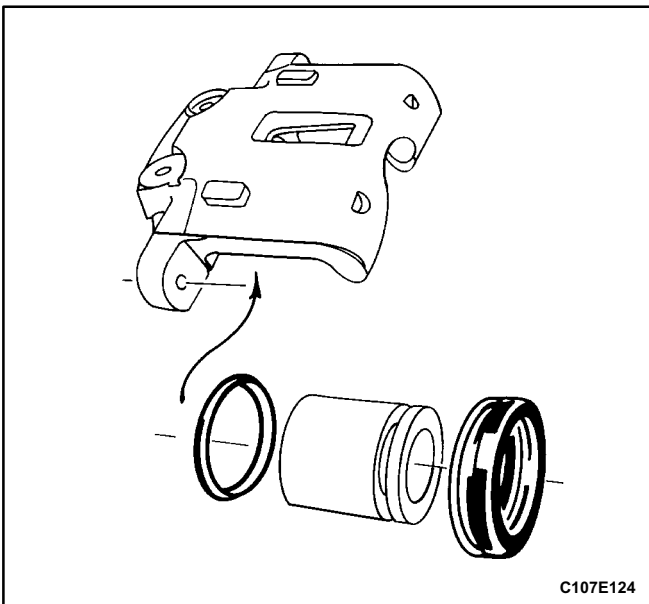
6. Remove the inner and the outer pads of each rear pad brake set from the brake anchor bracket on each side of the vehicle. For the minimum thickness measurement, refer to „Lining Inspection” in this section.



7. Clean all residue from the disc pad guide surfaces on the anchor bracket and the caliper housing.
8. Inspect the anchor bracket, and replace it if corroded, worn, or damaged.
9. Place a clean shop towel between the piston and the caliper housing.

Caution: Do not place fingers in front of the piston in an attempt to catch it or protect it when applying compressed air or light air pressure at the housing inlet port. Such action could result in serious injury.

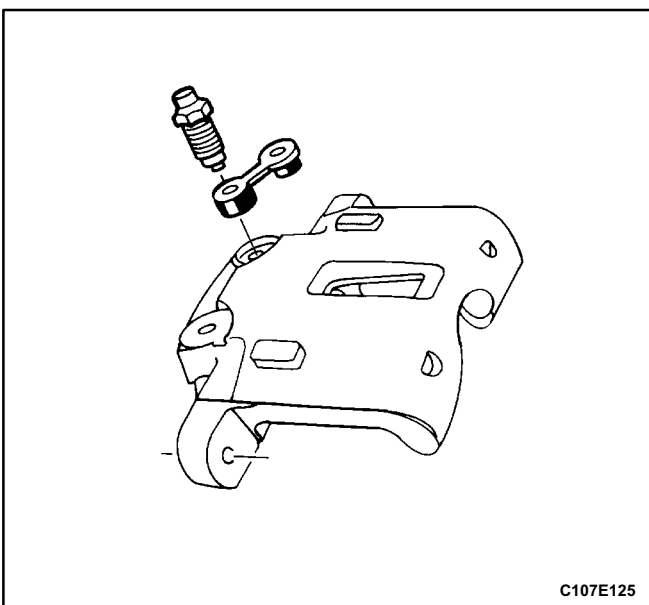
10. Progressively increase the air pressure until the piston is forced out of the bore.



11. Remove and discard the outer boot.

Important: Be careful not to damage the piston bore or the seal groove when removing the inner seal, especially when using a tool, such as a screwdriver.

12. Remove and discard the inner seal.



13. Remove and discard the caliper bleeder valve dust cover.

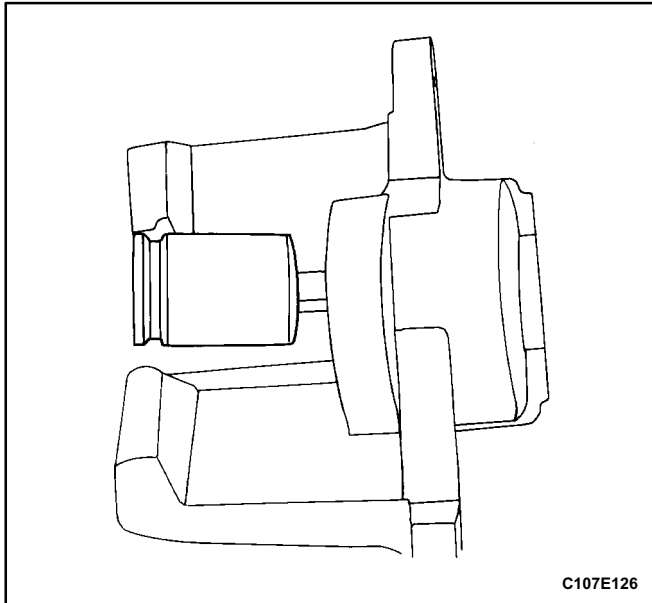
14. Remove the caliper bleeder valve.

Assembly Procedure

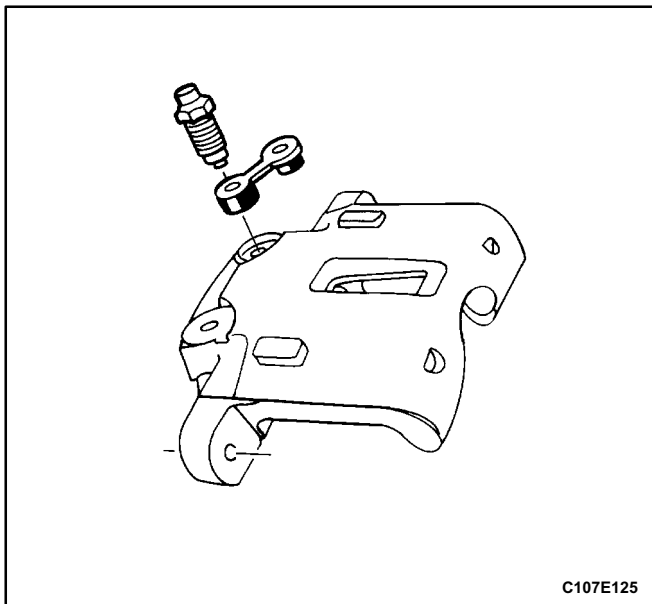
Caution: Be extremely careful to keep the alcohol and any debris away from the eyes to avoid serious injury.

Notice: Keep the rubber components away from the mineral oil to avoid damaging the components.

1. Clean all parts in denatured alcohol or the brake fluid.
2. Dry the parts with unlubricated compressed air.
3. Blow out all passages in the housing and the caliper bleeder valve.
4. Inspect the piston and the housing for scoring, nicks, and corrosion. Replace any components that are scored, nicked, or corroded.

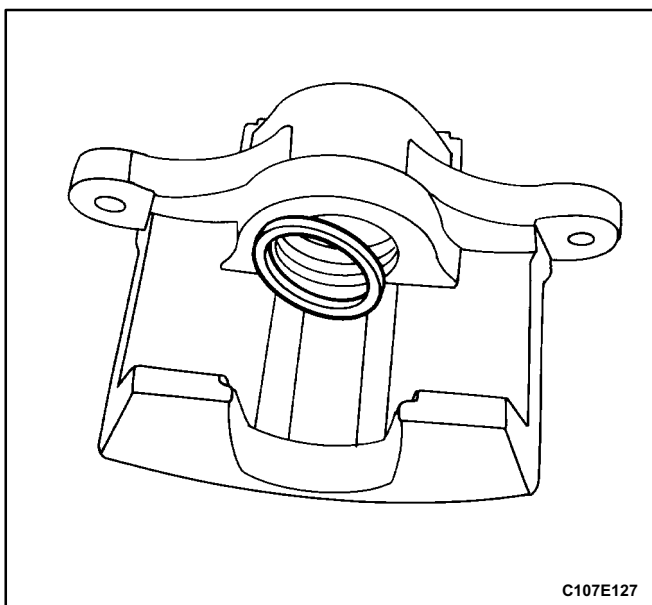


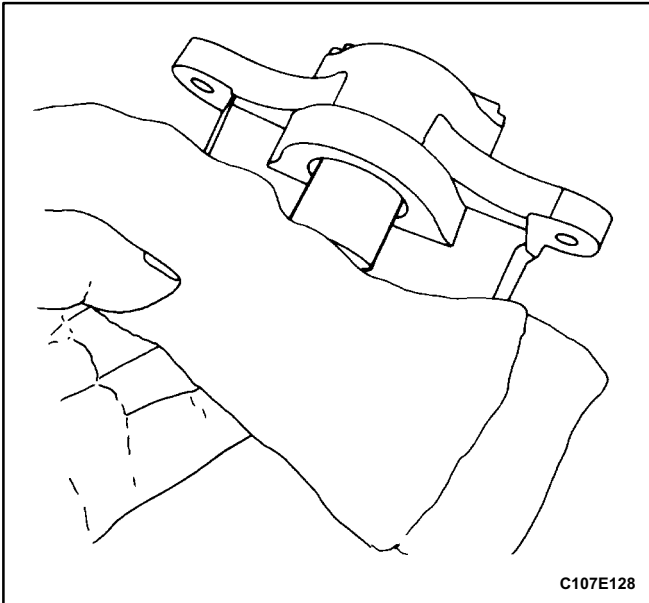
5. Inspect the caliper bleeder valve.



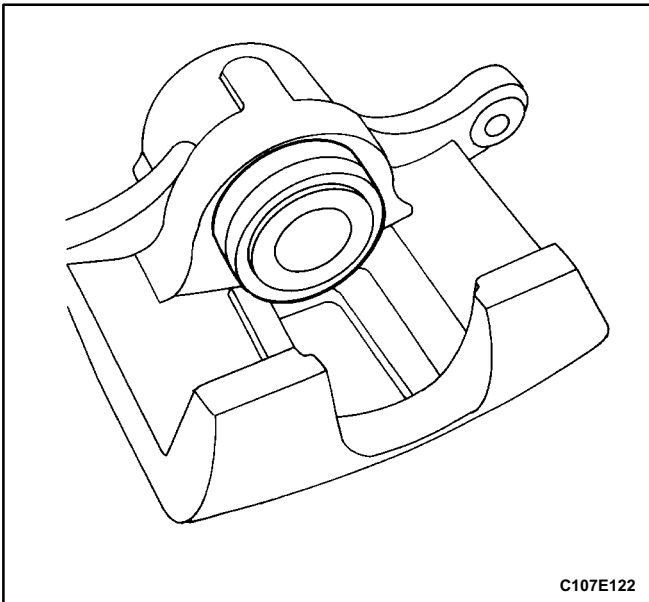
Important: Do not remove material from the piston or the caliper bore.

6. Lubricate a new piston inner seal and the housing bore with brake fluid or silicone grease.
7. Lubricate the piston with brake fluid.
8. Install the piston inner seal into the caliper housing groove. Make sure that the seal is not twisted.

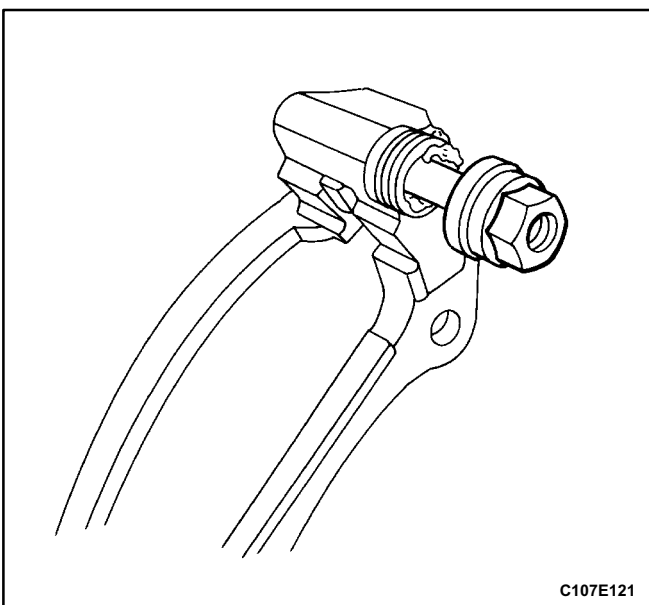




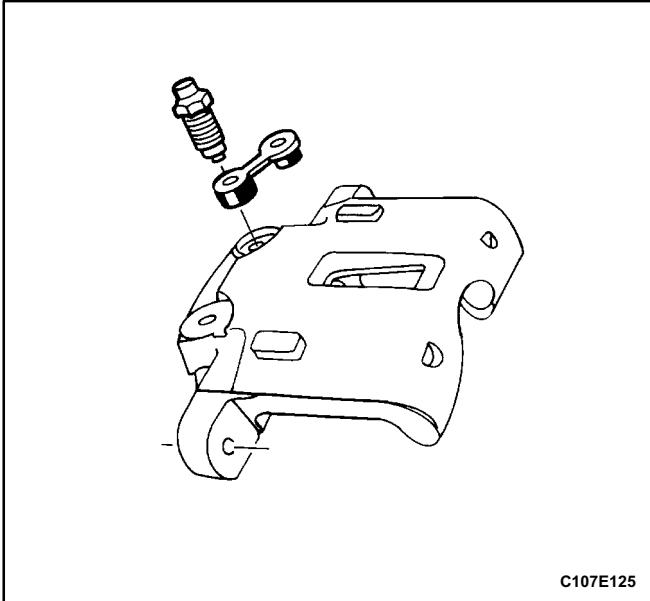
9. Install the boot over the open end of the piston and move the boot toward the closed end.
10. Push the boot away from the piston closed end and install it into the boot groove in the piston bore.
11. Slowly enter the piston into the bore by hand.
12. Apply steady hand pressure until the piston is fully seated in the bore.



13. Inspect the piston and the outer boot, checking to see if the boot is properly engaged in the piston groove.



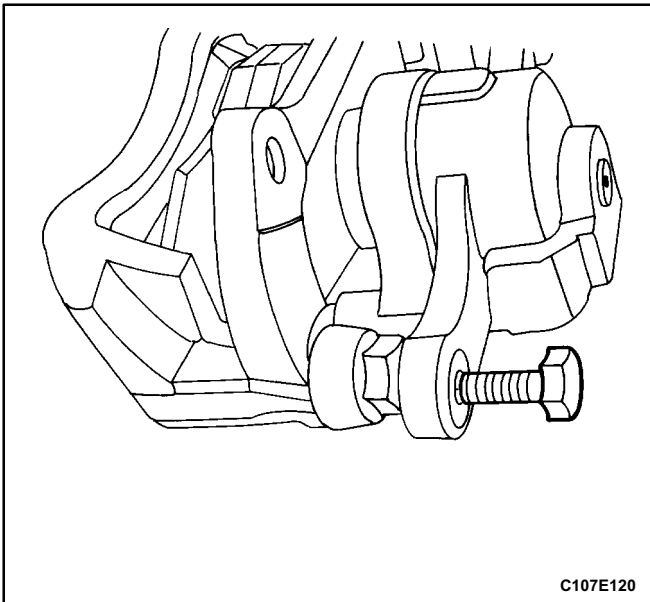
14. Coat the new guide pins with rubber grease and install the pins and the boots into the caliper housing assembly.



15. Assemble the new dust cover on the caliper bleeder valve and screw the caliper bleeder valve into the housing.

Tighten

Tighten the caliper bleeder valve to 6 N•m (53 lb•in).



16. Install the disc pads on the anchor bracket.
17. Place the caliper housing assembly into its operating position.
18. If the brake pad springs are sticking through the caliper housing inspection hole, lift the caliper housing and make the necessary corrections to ensure that the springs are fully retained by the housing.
19. Install the new guide pin bolts.

Tighten

Tighten the caliper guide pin bolts to 31 N•m (23 lb•ft).

20. Install the caliper assembly. Refer to „Caliper Assembly” in this section.

GENERAL DESCRIPTION AND SYSTEM OPERATION

DISC BRAKE CALIPER ASSEMBLY

This 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.

Important:

- Replace all components included in the repair kits used to service this 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.
- Replace the pads in axle sets only.
- The torque values specified are for dry, unlubricated fasteners.
- Perform the service operations on a clean bench, free from all mineral oil materials.

BLANK