

BRAKE SYSTEM

1995 Volvo 850

1995-96 BRAKES
Volvo Brakes - Disc

850

DESCRIPTION

All models use front and rear disc brakes with 3 makes of calipers: ATE, Bendix (DBA) and Girling. Service brakes are hydraulically-operated by a tandem master cylinder and vacuum power brake unit. Parking brake uses rear wheel disc rotor internally mounted brake shoes.

NOTE: For information on Volvo anti-lock brake system, see appropriate article:

- * ANTI-LOCK BRAKE SYSTEM & TRACTION CONTROL - 1995
- * ANTI-LOCK BRAKE SYSTEM & TRACTION CONTROL - 1996

BLEEDING BRAKE SYSTEM

NOTE: Use only DOT 4 grade brake fluid.

1) Raise and support vehicle. Fill master cylinder reservoir to maximum mark. Bleed brakes in sequence. See BRAKELINE BLEEDING SEQUENCE TABLE. After bleeding brakes, depress brake pedal with a force equal to an abrupt stop.

2) Pedal travel should not exceed 1.57" (40 mm). Brake warning light should not illuminate. If air is still present in system, repeat procedure.

BRAKELINE BLEEDING SEQUENCE TABLE

Application	Sequence
850	LR Or RR, RF, LF

ADJUSTMENTS

BRAKE PEDAL HEIGHT

Brake pedal height should be equal to clutch pedal height. To adjust, loosen lock nut, remove cotter pin and turn push rod until pedal height is equal. Replace cotter pin and tighten lock nut. Pedal travel should be 6-6.5" (150-163 mm). Pedal travel can ONLY be measured during brake bleeding operation.

PARKING/EMERGENCY BRAKE

1) Remove rear wheels. Rotate brake disc until adjustment hole is directly over adjustment screw between brake shoes. Adjust brake shoes by turning adjustment screw upward until brake disc can no longer be rotated. Adjust shoes by backing off screw 5 notches.

2) If there is play between cable and lever, fine adjustment can be made at parking lever. To access adjustment screw, remove square cover plate located under armrest on center console. Turn adjustment screw so full parking brake activation is achieved between

second and eighth notch. Install cover plate.

STOPLIGHT SWITCH

Adjust switch so brakelights come on when pedal is depressed .30-.60" (8-14 mm).

REMOVAL & INSTALLATION

DISC PADS

NOTE: Use Remover (2917) to remove disc pads.

Removal & Installation (Front)

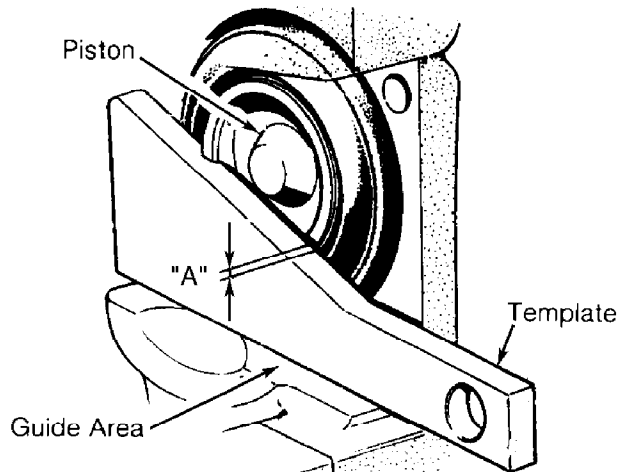
1) Raise and support vehicle. Mark position of wheel in relation to hub for reassembly reference. Remove tire and wheel. Carefully remove retaining spring to avoid bending. Remove protective caps from 2 guide pin bolts. Using a 7-mm Allen wrench, remove both guide pin bolts. Carefully remove brake caliper from carrier to avoid damage to brake hose. Remove brake pads.

2) Check guide pin rubber sleeves and replace as necessary. Grease guide pin bolts with silicone. Press piston into brake caliper cylinder, Ensure dust boot is correctly seated. Insert NEW brake pads and rein-stall brake caliper. Tighten caliper guide pin bolts to specification. See TORQUE SPECIFICATIONS.

Removal & Installation (Rear)

1) Raise and support vehicle. Mark position of wheel in relation to hub for reassembly reference. Remove tire and wheel. Using a 3-mm drift, knock out retaining pins. Pull out retaining spring. Remove brake pads and shims. Use Puller (999 2917) if brake pads are difficult to remove.

2) Grease shims on both sides with a thin coating of silicone. Install shims on brake pad plates. Install NEW brake pads. Replace one retaining pin and retaining spring, then replace other retaining pin and retaining spring.



NOTE: "A" no more than .04" (1mm).

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Fig. 1: Checking ATE Rear Caliper Piston Angle To Avoid Brake Squeal
Courtesy of Volvo Cars of North America.

CALIPER ASSEMBLY

Removal & Installation (Front)

1) Raise and support vehicle. Remove wheel. Carefully remove retaining spring. Remove protective caps from 2 guide pin bolts. Using a 7-mm Allen wrench, remove both guide pin bolts. Carefully remove caliper from carrier.

2) To install, reverse removal procedure. Grease guide pin bolts with silicone. Ensure pins slide easily in their sleeves.

Removal & Installation (Rear)

1) Raise and support vehicle. Remove wheel. Remove disc pads. See DISC PADS under REMOVAL & INSTALLATION. Remove brakeline from brake caliper. Remove brake caliper mounting bolts and take off caliper.

2) Using NEW bolts, install brake caliper. Tighten bolts to specification. See TORQUE SPECIFICATIONS. Reinstall brakeline on caliper.

DISC BRAKE ROTOR

Removal & Installation (Front)

1) Remove caliper and brake pads. See DISC PADS and CALIPER ASSEMBLY under REMOVAL & INSTALLATION. Remove 2 caliper carrier mounting bolts and remove carrier. Remove guide pin bolt and screws (if equipped). Remove disc brake rotor.

2) To install, reverse removal procedure. Tighten guide pin bolt and screws (if equipped) to 72 INCH lbs. (8 N.m).

Removal & Installation (Rear)

Remove caliper. Remove screws retaining rotor to hub. Remove rotor. To install, reverse removal procedure.

REAR AXLE SEAL & BEARING

NOTE: Models have sealed wheel bearings. See SUSPENSION - REAR article in SUSPENSION.

PARKING BRAKE SHOES

Removal

1) Remove cover plate under middle console armrest. Loosen parking brake adjustment screw at parking brake lever. Remove rear wheel. Remove brake caliper bolts and remove brakeline from mounting clip. On left side, remove 3-way brakeline connector screw. Remove brake caliper and suspend by wire.

2) Adjust brake shoes so they do not catch when brake disc is being removed. Remove guide pin bolt and brake disc. Mark hub and disc for reassembly reference. Remove lower return spring. Press apart brake shoes and remove from hub.

Installation

To install, reverse removal procedure. Ensure adjustment screw faces correct way. Adjust brake shoes by turning adjustment screw until brake disc can no longer be rotated. Back off adjustment screw 5 notches in other direction.

MASTER CYLINDER

Removal & Installation

Disconnect hydraulic lines at master cylinder. Plug openings to prevent entry of foreign matter. Remove cylinder attaching nuts. Remove cylinder assembly from vehicle. To install, reverse removal procedure. Bleed hydraulic system.

POWER BRAKE UNIT

Removal

1) Turn ignition off. Disconnect negative battery cable. Depress brake pedal several times to purge vacuum from power brake booster. Remove hydraulic modulator bracket. See appropriate article:

- * ANTI-LOCK BRAKE SYSTEM & TRACTION CONTROL - 1995.
- * ANTI-LOCK BRAKE SYSTEM & TRACTION CONTROL - 1996.

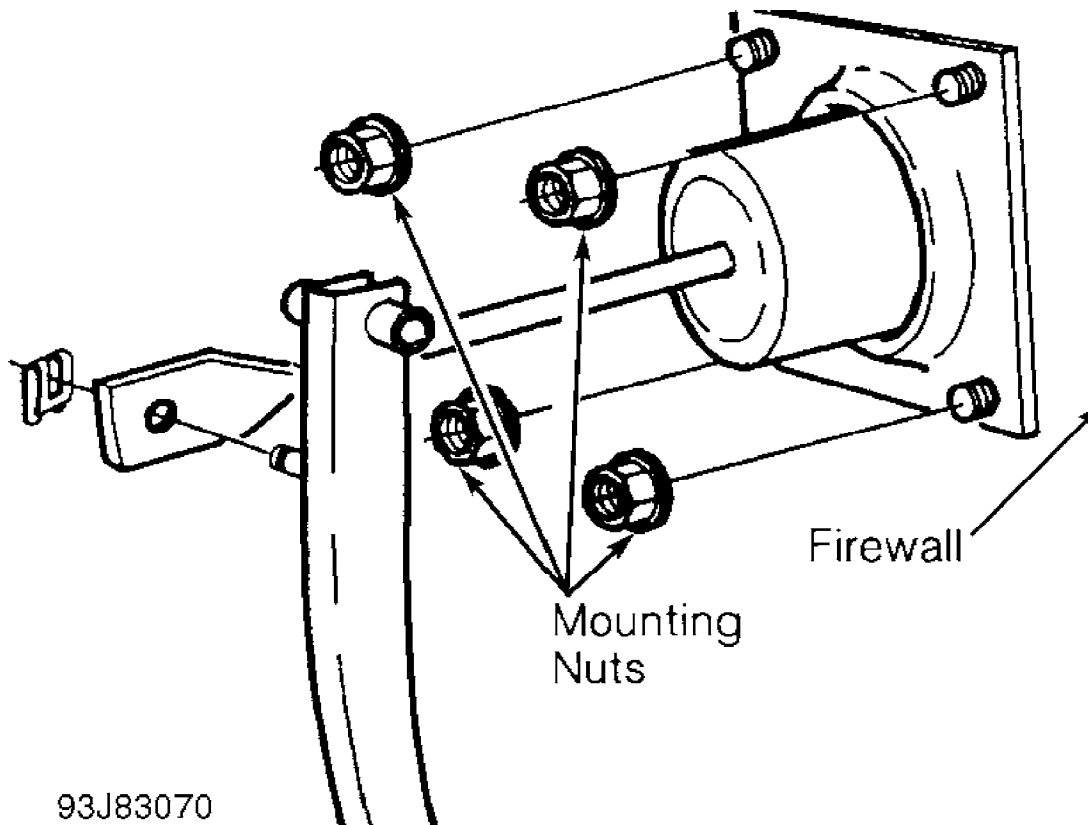
Remove clutch master cylinder. See CLUTCH article.

2) Remove non-return valve and vacuum hose. Disconnect connector from pedal sensor. Remove ventilation hose and disconnect wire above power brake booster to allow clearance.

3) Remove sound proofing under steering wheel. Remove 4 nuts holding power brake booster to inside of firewall. See Fig. 2. Remove spring clip holding push rod at brake pedal. Remove power brake booster. Carefully handle sealing ring located between power brake booster and firewall.

Installation

Install sealing ring on power brake booster. Install power brake booster. Connect push rod to brake pedal and replace spring clip. Install 4 mounting nuts and tighten to 19 ft. lbs. (25 N.m). To complete installation, reverse removal procedure.



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Fig. 2: Removing Power Brake Booster
Courtesy of Volvo Cars of North America.

Check Valve Replacement

Disconnect vacuum hose from check valve. Using 2

screwdrivers, lever out check valve. Remove seal. Install NEW seal, ensuring that flange is properly aligned in cylinder. Coat seal with grease. Press valve carefully into place. Ensure that seal does not move out of position. Reconnect vacuum hose so that highest point is attached to valve.

OVERHAUL

BRAKE CALIPER

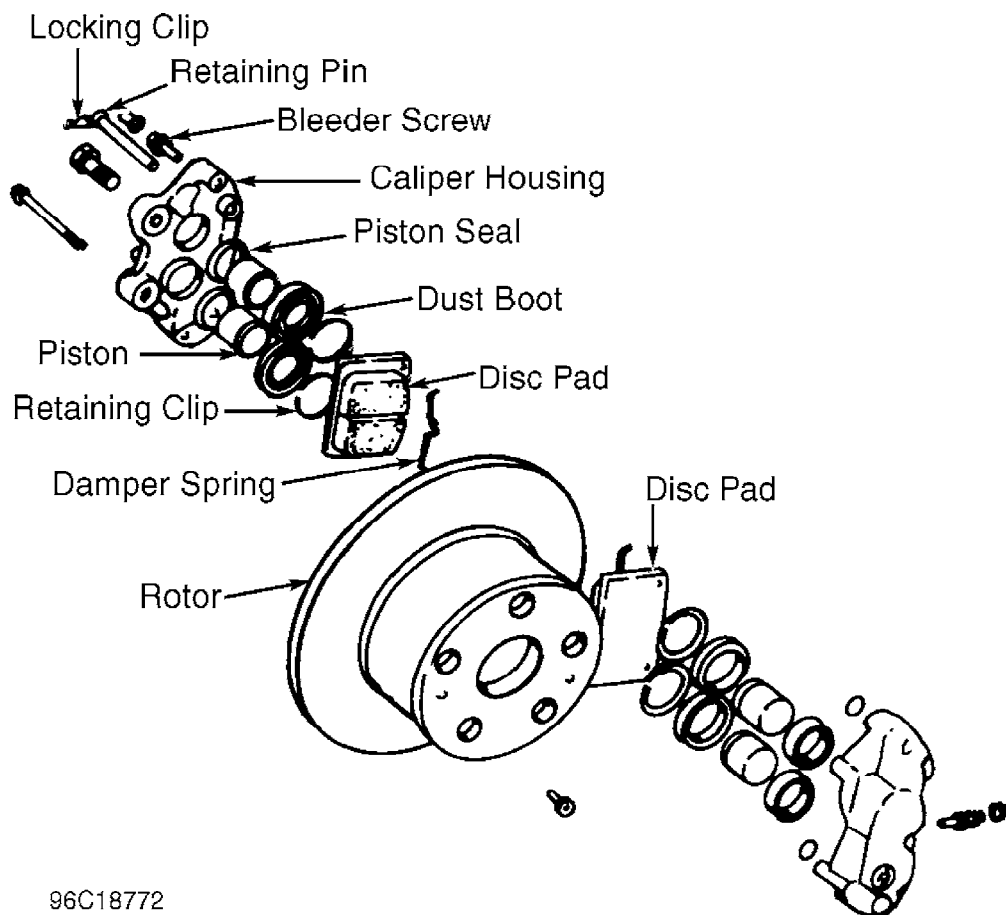
Disassembly

Remove disc pads, piston dust covers, and retaining clips. Insert wooden block into caliper housing. Apply compressed air at fluid inlet ports to force pistons out of caliper. Remove piston seals from cylinder bore.

NOTE: DO NOT separate caliper halves.

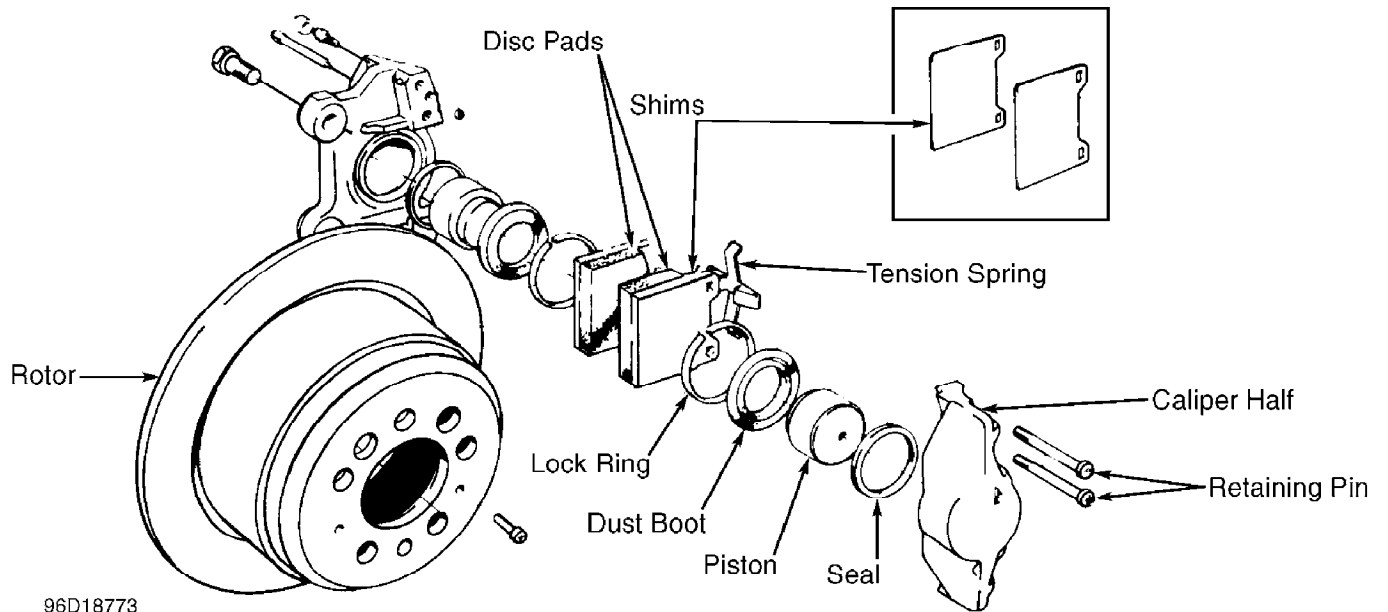
Cleaning & Inspection

Clean all parts in brake fluid or alcohol. Inspect cylinder bores for scoring, rust or corrosion. Replace if defective. Replace rubber seals and dust covers during overhaul. See Figs. 3-8.



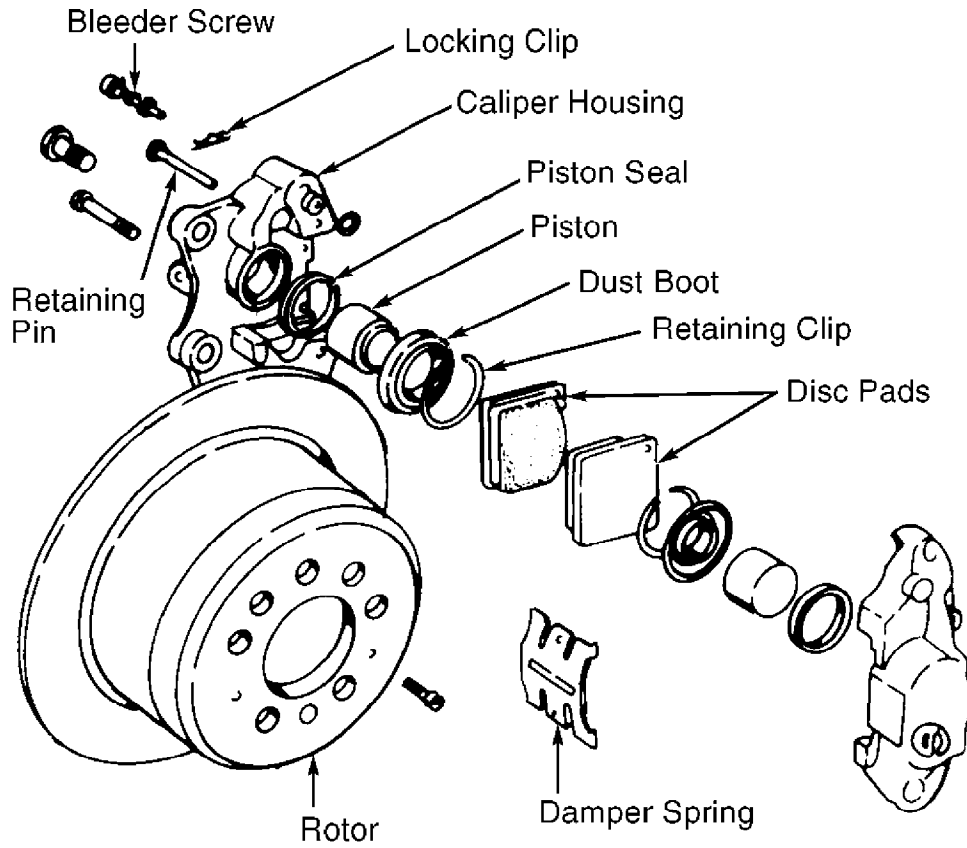
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Fig. 3: Identifying Girling Front Caliper Components
Courtesy of Volvo Cars of North America.



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Fig. 4: Identifying ATE Rear Caliper Components
 Courtesy of Volvo Cars of North America.



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Fig. 5: Identifying Girling Rear Caliper Components
 Courtesy of Volvo Cars of North America.

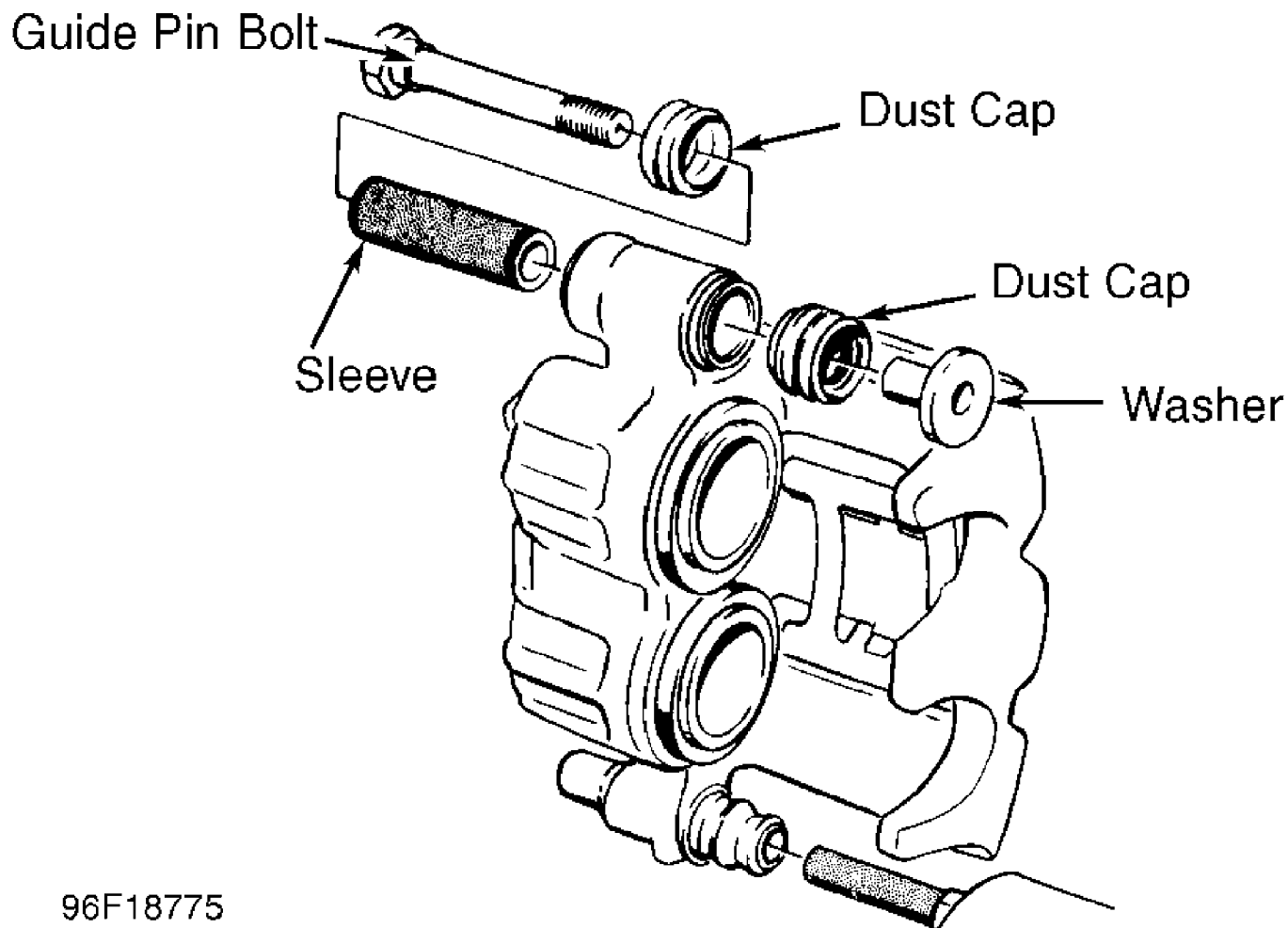


Fig. 6: Identifying Bendix (DBA) Front Caliper Components
 Courtesy of Volvo Cars of North America.

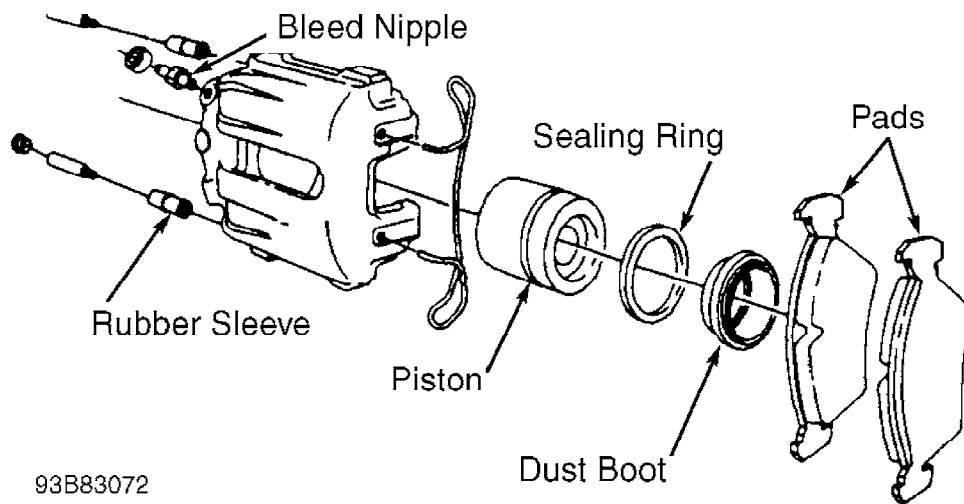


Fig. 7: Identifying Front Caliper Components
 Courtesy of Volvo Cars of North America.

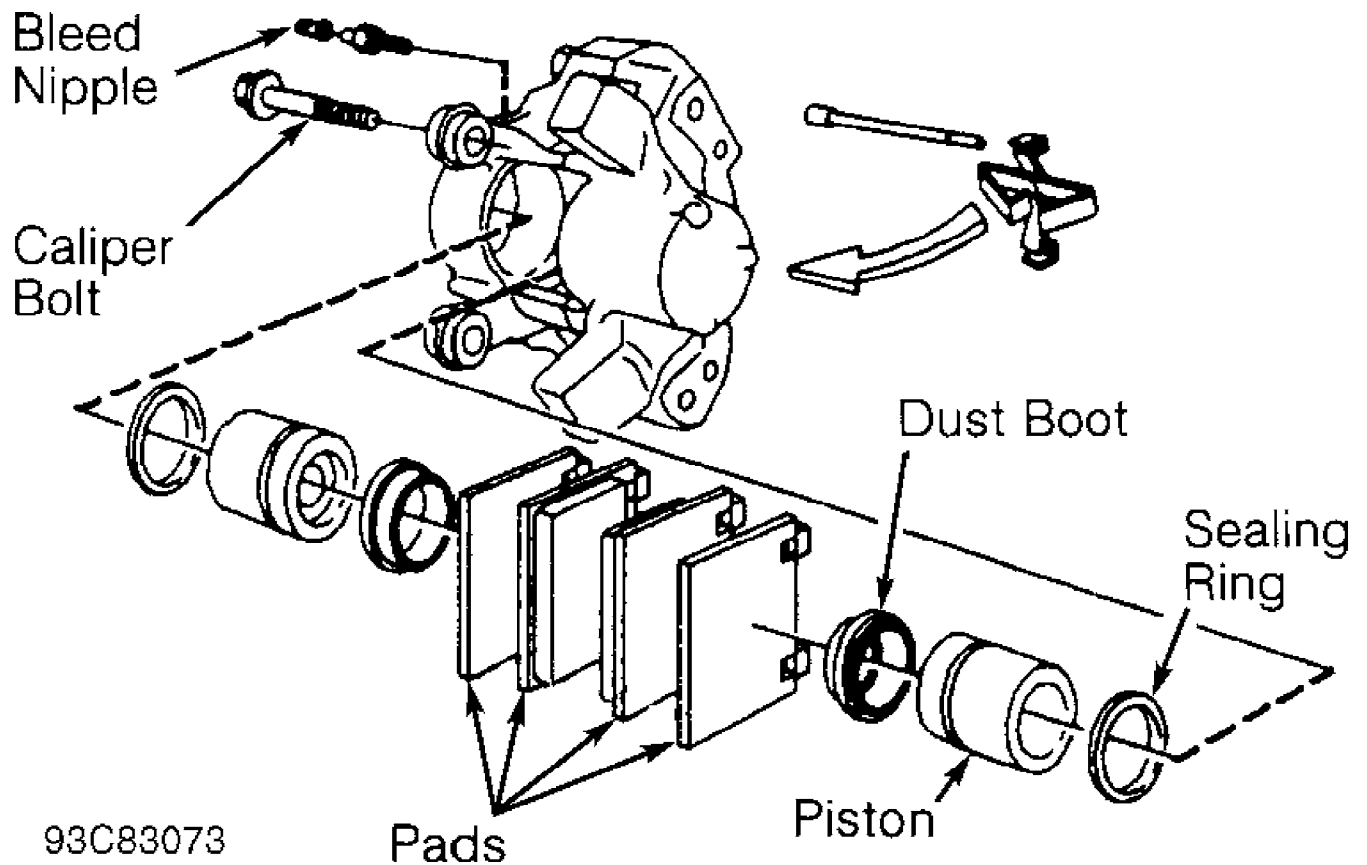


Fig. 8: Identifying Rear Caliper Components
 Courtesy of Volvo Cars of North America.

Reassembly

Coat all parts with clean brake fluid. Install NEW piston seals in cylinder bores. Carefully install pistons into cylinder bores. On ATE rear brake calipers, check piston position. See DISC PADS under REMOVAL & INSTALLATION. See Fig. 1. Install dust boots and retaining clips. Install bleeder screw and disc pads.

MASTER CYLINDER

NOTE: Master cylinder overhaul procedure is not available at time of publication.

Disassembly

Remove master cylinder from vehicle. Clamp mounting flange in a vise. Remove reservoir from cylinder. Remove rubber sealing rings. Remove retainer ring from end of cylinder bore. Remove pistons from cylinder bore. See Fig. 9.

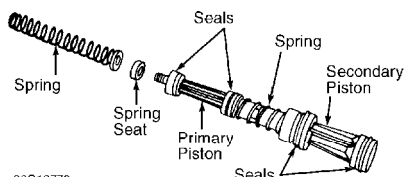


Fig. 9: Identifying Master Cylinder Piston Components
 Courtesy of Volvo Cars of North America.

Cleaning & Inspection

Wash all parts in clean brake fluid or alcohol. Blow dry with compressed air. Inspect cylinder bore for scratches, rust or corrosion. Replace if defective. Replace both pistons with connector sleeve as an assembly.

Reassembly

1) Lubricate all parts with clean brake fluid prior to reassembly. Position washer, seal, and back-up ring on secondary piston. Install spring thrust washer on piston. Install piston assembly into cylinder bore. Install washer, seal and back-up ring on primary piston.

2) Install spring with plate and sleeve on piston. Install piston assembly into cylinder bore. Push piston into cylinder bore. Install retaining ring. Install reservoir sealing rings, and install reservoir.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Caliper Guide Pin Bolts	22 (30)
Front Caliper Mounting Bolts	74 (100)
Master Cylinder Mounting Bolts	22 (30)
Power Booster Mounting Nuts	19 (25)
Rear Caliper Mounting Bolts	43 (58)
Wheel Lug Nuts	81 (110)
	INCH Lbs. (N.m)
Rotor Retaining Stud	72 (8)

DISC BRAKE SPECIFICATIONS

DISC BRAKE SPECIFICATIONS TABLE

Application	In. (mm)
Disc Diameter	
Front	11.02 (280)
Rear	11.61 (295)
Lateral Runout (Maximum)	
Front001 (.04)
Rear003 (.08)
Original Thickness	
Front	1.02 (26)
Rear38 (9.6)
Minimum Refinish Thickness	(1)
Discard Thickness	
Front90 (23)
Rear33 (8.4)
Parking Brake Drum (Inside Rotor)	
Maximum Runout006 (.15)

(1) - Always use minimum thickness specification stamped on rotors.