VOLVO

240 Series
260 Series

DESCRIPTION

Volvo models may be equipped with Girling calipers on all four wheels or Girling front calipers; ATE rear calipers. Service brakes are hydraulically operated by a tandem master cylinder and vacuum power brake unit. Master cylinder distributes hydraulic pressure to a distribution/warning valve. Distribution/warning valve equally distributes hydraulic pressure to each circuit. One circuit is lower front caliper pistons and left rear caliper; other circuit is upper front caliper pistons and right rear caliper. If hydraulic pressure differs between circuits, a dash mounted light will glow. Each rear brake line has a pressure valve to prevent rear wheel lock-up. Parking brake system is mechanically operated on rear wheel mounted brake shoes.

ADJUSTMENT

PEDAL HEIGHT

Brake pedal height should be equal to clutch pedal. To adjust, loosen lock nut, remove cotter pin and turn push rod until height is equal. Replace cotter pin and tighten lock nut. Pedal travel should then be 5.7-6.5" (145-165 mm).

NOTE – *Pedal travel can only be measured during brake bleeding operation.*

DISC BRAKES

Disc brakes are self-adjusting; therefore, no adjustment in service is required.

PARKING BRAKE

NOTE – *Adjust parking brake when full application stroke of brake lever exceeds 3 or 4 notches.*

1) Remove center console rear ash tray, then working through ash tray hole, loosen parking brake cables adjusting screw until cables are slack. Raise and support rear of vehicle, then remove wheels. Align hole in parking brake drum with starwheel adjuster.

2) Tighten starwheel until drum can just be rotated by hand, then back off adjuster until drum just rotates freely. Install rear wheels. Tighten parking brake cable adjusting screw until parking brake is fully applied when lever is pulled two or three notches. Install ash tray and lower vehicle.

HYDRAULIC SYSTEM BLEEDING

NOTE – *Rear wheels must be higher than front wheels during bleeding operation, if vehicle is supported on safety stands.*

1) Start at left front brake. Connect bleed tubes to all three bleeder screws and immerse opposite end of tubes in a container partially filled with brake fluid. Pump brake pedal ten times, then keep pedal depressed and using assistants, open all three bleeder screws simultaneously. When pedal reaches end of travel, close all bleeder screws. Continue operation until all air is bled from caliper assembly. Repeat procedure on right front brake.

2) Depress brake pedal several times to level out master cylinder. Connect a bleed tube to right rear brake bleeder screw and immerse opposite end of tube in a container partially filled with brake fluid. Open bleeder screw and gravity bleed (no pumping of pedal) caliper assembly. Close bleeder screw when brake fluid is free of air bubbles. Repeat procedure on left rear brake.

REMOVAL & INSTALLATION

DISC PADS

Removal (All Types) – 1) Raise and support vehicle on safety stands; remove wheel. On Girling calipers, remove lock clip then remove one lock pin while holding damper spring in place. Remove springs and other lock pin. On ATE calipers, drive out upper guide pin and remove tensioning spring. Drive out lower guide pin.

2) Pull disc pads from caliper with pad extractor tool (2917). Replace pads in sets if lining thickness is less than 1/8" (3 mm). If pads are to be reinstalled, mark for reference.

Installation (All Types) – 1) Siphon small amount of brake fluid from master cylinder reservoir. Seat pistons in caliper bore with suitable tool (2809). On ATE rear calipers, check piston position by installing template SVO 2919 (or equivalent). Piston recess should incline 20° in relation to lower guide area on caliper. If distance from one recess to the other *(Measurement A in Fig. 1)* exceeds .04" (1 mm), adjust position.

2) Install new pads, install intermediate plates (if equipped) or damper washers (if equipped) in original positions. On Girling calipers, install one lock pin, then install damper springs and other lock pin. Install new locking clips on pins. On ATE calipers, tap one guide pin into position, install new tensioning spring and install other guide pin while holding tensioning spring in position.

NOTE – *Install damper washers with small contact face toward pad. DO NOT install intermediate plates in calipers equipped with damper washers.*

3) After installation, depress brake pedal several times to seat pads against rotor. Ensure proper operation of brakes, install wheel and lower vehicle.

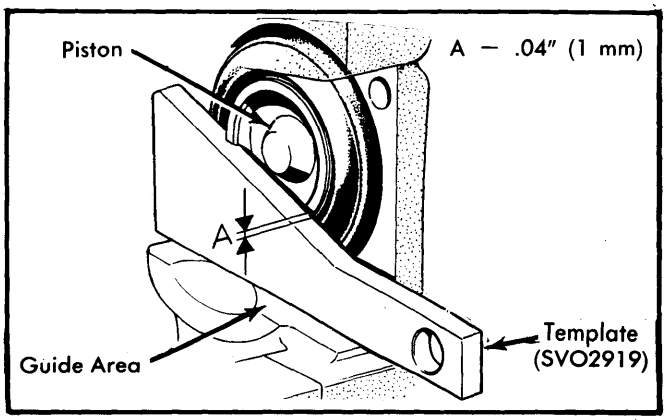

Fig. 1 Checking ATE Rear Caliper Piston Angle

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CALIPER ASSEMBLY

Removal – Raise and support vehicle, and remove wheel. Disconnect brake line connections at caliper, and cap lines to prevent entry of foreign matter. Remove caliper mounting bolts and lift caliper from vehicle.

Installation – Position caliper assembly on mounting bracket, and install attaching bolts. After installing bolts, check clearance between disc pads and rotor on both sides of rotor; maximum deviation between sides should not exceed .022" (.01 mm) for front calipers or .010" (.25 mm) for rear calipers. If clearance is not within specifications, correct by adding shims to caliper. Connect hydraulic lines and bleed brakes.

DISC BRAKE ROTOR

Removal & Installation – With caliper assembly removed, mount a dial indicator and check rotor runout. Runout must not exceed .004" (.10 mm). Measure rotor thickness through one revolution; thickness variance must not exceed .0008" (.02 mm). Unscrew rotor lock bolts and pull rotor from hub. To install, reverse removal procedure.

PARKING BRAKE SHOES

Removal – Remove center console rear ash tray and loosen parking brake cable adjusting nut until cables are slack. Raise and support rear of vehicle and remove wheels. Remove caliper (without disconnecting hydraulic line) and support out of way, then remove rotor. Remove brake shoe return springs and lift off shoes and adjuster.

Installation – Reverse removal procedure and note the following: Replace brake drum (rotor) if out-of-round more than .008" (.2 mm). Apply a thin coat of heat resistant graphite grease to brake shoe sliding surfaces and to adjusting starwheel. After installation, adjust parking brake. See *Parking Brake*.

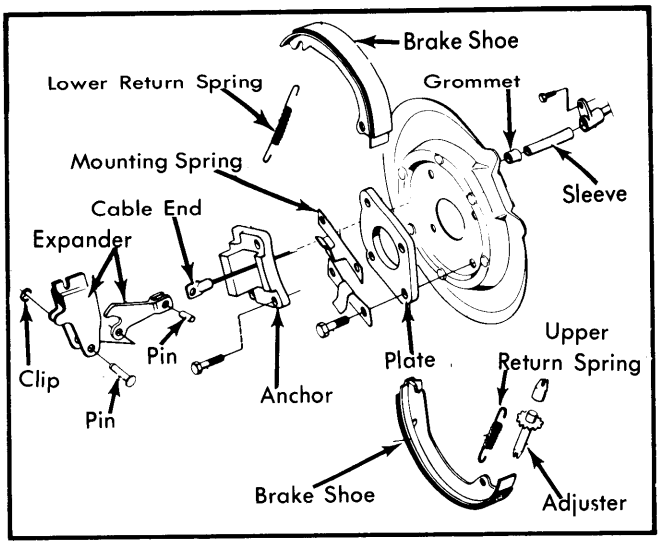

Fig. 2 Exploded View of Parking Brake Assembly

MASTER CYLINDER

Removal & Installation – Disconnect hydraulic lines at master cylinder and cap openings to prevent entry of foreign matter. Remove cylinder attaching hardware, and remove cylinder assembly from vehicle. To install, reverse removal procedure, and bleed hydraulic system.

POWER BRAKE UNIT

Removal & Installation – With master cylinder removed, disconnect vacuum hose at power unit. From inside vehicle, disconnect push rod link at brake pedal and remove clutch pedal stop bracket. Remove power unit attaching nuts at firewall. Tilt power unit slightly forward and remove lock nut and yoke. Remove power unit from engine compartment. To install, reverse removal procedure and note: Install new gasket between power unit and firewall; discarding sealing putty (if equipped). Install vacuum hose connector facing down. Bleed hydraulic system.

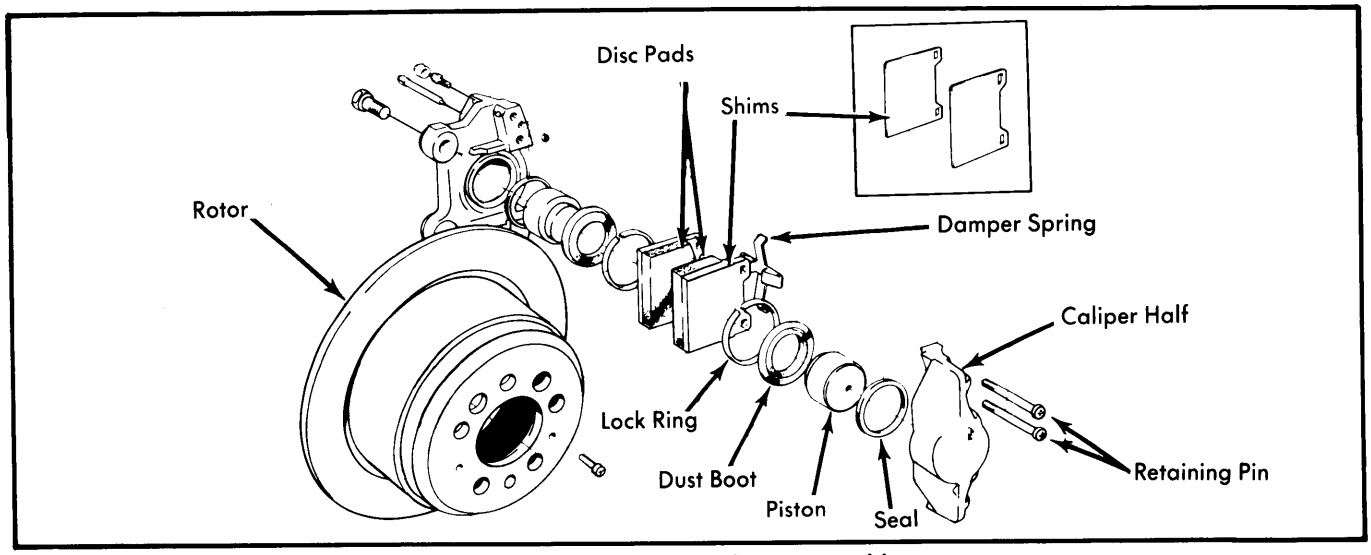

Fig. 3 ATE Rear Caliper Assembly

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Check Valve Replacement – Remove vacuum hose clamps at check valve, and remove check valve from vehicle. When installing check valve into vacuum hose, install valve with arrow on valve housing pointing toward intake manifold.

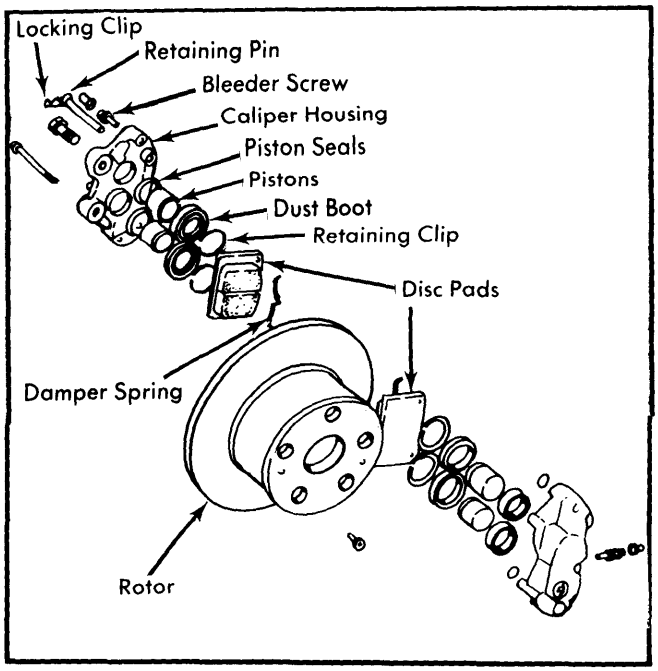

Fig. 4 Girling Front Caliper Assembly

Filter Replacement – Remove power brake unit from vehicle. Remove rubber dust boot, and filter retainer washer. Withdraw silencer and filter from end of booster. To install, reverse removal procedure, making sure slots in filter and silencer are 180° apart.

VACUUM PUMP

Removal & Installation – Disconnect hoses at vacuum pump and remove mounting bolts and pump. Clean mating surfaces to remove gasket material, install new gasket and reverse removal procedure to complete installation.

OVERHAUL

BRAKE CALIPER

Disassembly – With caliper removed from vehicle, remove disc pads, piston dust covers and retaining clips. Insert wooden block into caliper housing and apply compressed air at fluid inlet ports to force pistons out of caliper. Remove piston seals from cylinder bore with blunt tool without damaging cylinder bore. Remove bleeder screw.

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.

Reassembly – Coat all parts with clean brake fluid and install new piston seals in cylinder bores. Carefully install pistons into cylinder bores. Check piston position on ATE rear brake calipers. Install rubber dust boots and retaining clips. Install bleeder screw and disc pads.

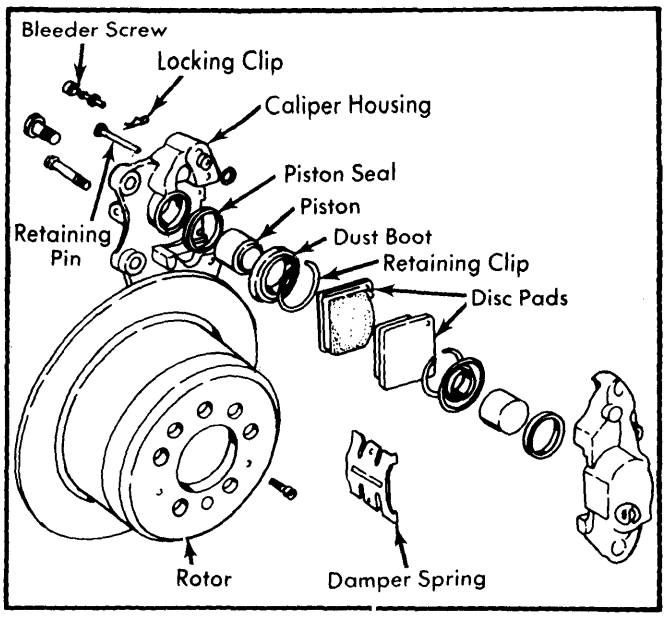

Fig. 5 Girling Rear Caliper Assembly

MASTER CYLINDER

Disassembly – Remove master cylinder from vehicle, and clamp mounting flange in a vise. Remove reservoir from cylinder, and remove rubber sealing rings. Remove piston stop screw, and remove retainer ring from end of cylinder bore. Remove pistons from cylinder bore.

Cleaning & Inspection – Wash all parts in clean brake fluid or alcohol and 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.

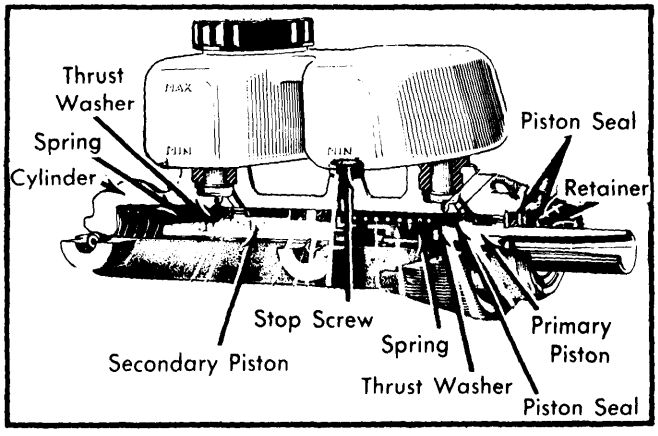

Fig. 6 Master Cylinder Assembly

Reassembly – 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, and install piston assembly into cylinder bore. Install washer, seal,

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and back-up ring on primary piston. Install spring, with plate and sleeve on piston, then install piston assembly into cylinder bore. Push piston into cylinder bore, and install piston stop screw. Install reservoir sealing rings, and install reservoir.

VACUUM PUMP

Disassembly – 1) Place pump in soft jawed vise. Index mark valve housing with cover. Remove valve housing. Remove diaphragm, washers, and spring from pump.

2) Turn pump over. Remove bottom cover. Remove actuating lever pin. Slide out pump lever, pump rod and nylon bushing.

Reassembly – 1) Place bushing on pump rod. Put rod in pump housing. Fit lever and pin. Install bottom cover and gasket.

2) Place washer and "O" ring on diaphragm screw. Remember to lightly coat end of screw with suitable thread locking compound. Install diaphragm assembly. Insert valve housing aligned with index marks. Fit valves and seals. Make sure domed side disc faces diaphragm. Install valve housing cover with spring and gasket.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Front Caliper Mounting Bolts	65-70 (9.0-9.7)
Rear Caliper Mounting Bolts	45-50 (6.2-6.9)
Wheel Nuts	70-95 (9.7-13.1)
Master Cylinder Bolts	20-35 (2.8-4.8)
Brake Fluid Lines	6-9 (.83-1.2)

DISC BRAKE ROTOR SPECIFICATIONS

Application	Disc Diameter In. (mm)	Lateral Runout In. (mm)	Parallelism In. (mm)	Original Thickness In. (mm)	Minimum Refinish Thickness In. (mm)	Discard Thickness In. (mm)
240						
Front	10.35 (263)	.004 (.10)	.0008 (.02)	.563 (14.3)	.520① (13.2)	...
Rear	11.06 (281)	.004 (.10)	0008 (.02)	.378 (9.6)	.331 (8.4)	...
260						
Front	10.35 (263)	.004 (.10)	.0008 (.02)	.95 (24)	.520① (13.2)	...
Rear	11.06 (281)	.004 (.10)	.0008 (.02)	.378 (9.6)	.331 (8.4)	...

① – Min. Refinish Thickness for non-ventilated front calipers.
Girling ventilated front caliper: .819" (20.8 mm).
ATE ventilated front caliper: .898" (22.8 mm).