VOLVO

164
240 Series

DESCRIPTION

Volvo brake system incorporates two separate circuits, hydraulic disc brakes, and mechanical internal expanding shoe parking brake. Disc brakes are actuated by a tandem master cylinder attached to a vacuum operated power assist unit. Master cylinder feeds two separate hydraulic circuits. One circuit feeds lower front caliper pistons and right rear caliper. Second circuit feeds upper front caliper pistons and left rear caliper. Brake valves are installed in both circuits to distribute braking power equally. A brake warning light, mounted on instrument panel, indicates pressure differences between primary and secondary circuits.

ADJUSTMENT

DISC BRAKES

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

PARKING BRAKE

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

HYDRAULIC SYSTEM BLEEDING

NOTE — Always bleed system in correct sequence, to ensure elimination of all air in system.

164 — Disconnect brake warning light switch wire, and remove switch from master cylinder. Attach a bleed tube to caliper bleeder screw, and immerse opposite end of tube in a container partially filled with brake fluid. Open bleeder screw ½ turn and slowly press brake pedal down. When pedal reaches end of travel, pause and then quickly release pedal. Continue operation until air bubbles are no longer seen in discharged fluid. Tighten bleeder screw on a down stroke of pedal. Repeat procedure on remaining wheels until all air is bled from system. Reinstall warning switch.

240 Series — **1)** Starting 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.

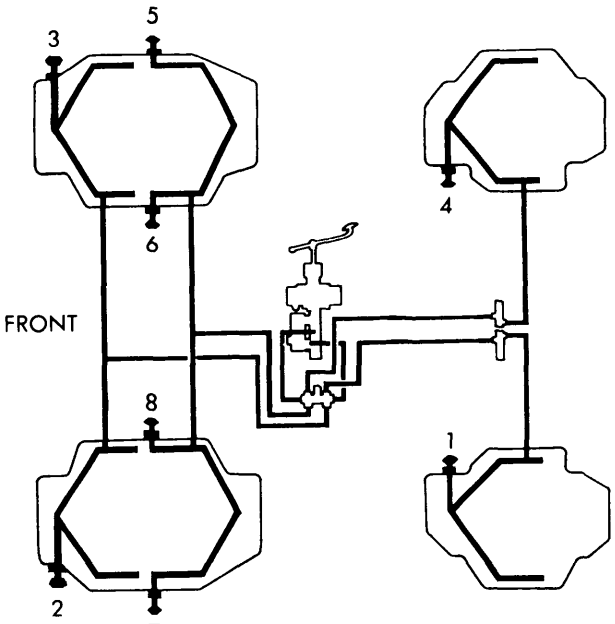

Fig. 1 Schematic of Bleeding Sequence

REMOVAL & INSTALLATION

DISC PADS

Removal — Raise and support vehicle, and remove wheel. Remove guide pin locking clips. Remove upper guide pin, then remove damper spring and lower guide pin. Lift disc pads from caliper assembly.

Installation (Front) — Press pistons into caliper until bottomed in bore. Insert disc pads into position, and install lower guide pin. Install damper spring, and upper guide pin. Install guide pin locking clips. After pads have been installed, depress brake pedal several times to position pads against rotor.

Installation (Rear) — Press pistons into caliper until bottomed in bore. Before installing disc pads, ensure pistons are in proper position to prevent brake squeal; piston recess should incline 20° in relation to lower guide area on caliper (see illustration). Check piston angle using suitable template (SVO 2919) and correct if necessary. Install disc pads and one guide pin. Install damper spring and remaining guide pin and secure with locking clips. After installation, depress brake pedal several times to position pads against rotor.

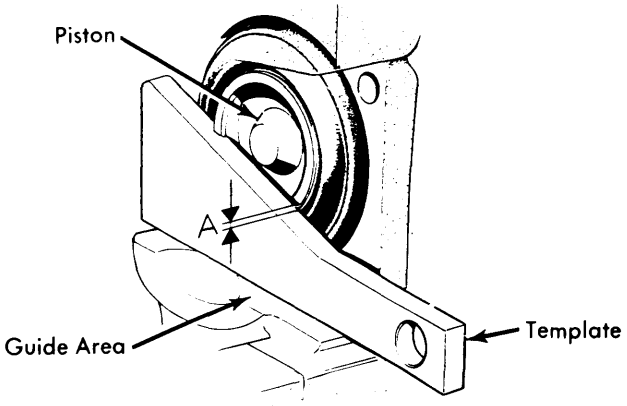

Fig. 2 Checking Piston Angle
(Rear Brakes Only)

VOLVO (Cont.)

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 attaching bolts, check clearance between disc pads and rotor on both sides of rotor; maximum deviation between sides should not exceed .010" (.25 mm), except for 240 series front brakes which is .022" (.01 mm). If clearance is not within specifications, correct by adding shims to caliper. Connect hydraulic lines to caliper and bleed hydraulic system.

BRAKE ROTOR

Removal & Installation – Raise and support vehicle, and remove wheel. Remove caliper assembly, and unscrew rotor lock bolts. Pull rotor from wheel 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: Apply a thin coat of heat-resistant graphite grease to brake shoe sliding surfaces on backing plate and to adjusting starwheel. After installation, adjust parking brake.

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 – Remove master cylinder from vehicle. Disconnect vacuum hose and support unit at power brake unit. Remove power booster attaching hardware, then remove yoke lock nut and yoke. Tilt power booster forward slightly, and remove unit from vehicle.

Installation – Position power brake unit on vehicle, and attach yoke to push rod. Install and tighten push rod lock nut. Install and tighten power booster mounting hardware, and install master cylinder to booster. Install vacuum hose, and bleed hydraulic system.

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.

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.

OVERHAUL

BRAKE CALIPER

Disassembly – Remove caliper from vehicle. Remove disc pads from caliper. Remove piston dust covers and retaining clips. Position a piece of wood between pistons, and carefully apply compressed air at fluid inlet port to force pistons out of cylinder bores. Remove piston seal from cylinder bore, then remove bleeder screw. *NOTE – DO NOT separate caliper halves.*

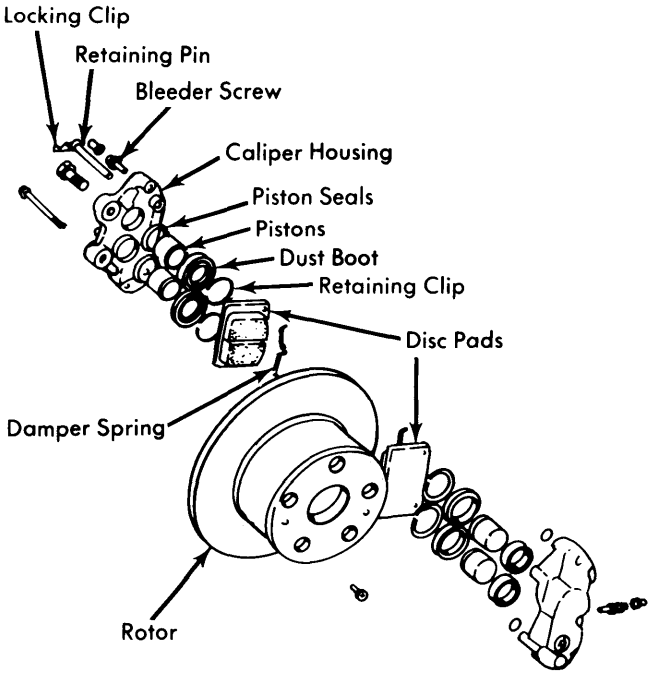

Fig.3 Components of Front Caliper Assy. (240 Series Shown)

Inspection – Clean all parts in brake fluid or denatured alcohol. Inspect cylinder bores for scoring, grooving, or corrosion. If any cylinder bore is found to be damaged, replace caliper housing.

Reassembly – Lubricate all parts with clean brake fluid prior to reassembly. Install new piston seals in cylinder bore, then install pistons. *NOTE – Large diameter end of pistons must face toward center of caliper bore.* Install rubber dust boots and retaining clips. Install bleeder screw, then install disc pads.

VOLVO (Cont.)

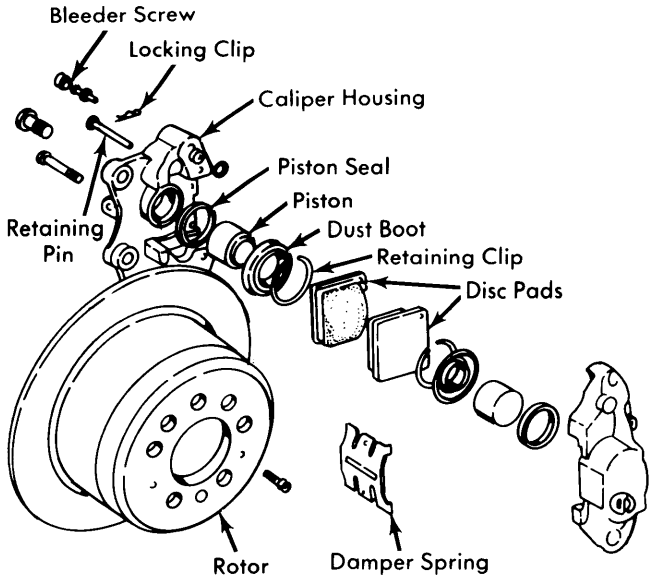

Fig. 4 Components of Rear Caliper Assy. (240 Series Shown)

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, 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.

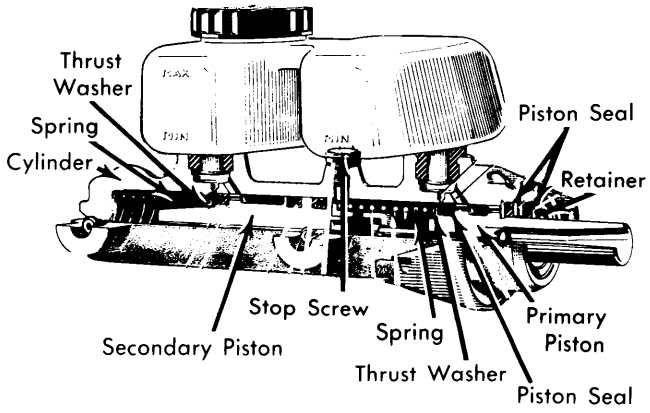

Fig. 5 Master Cylinder Assembly

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.

Inspection – Clean all parts in clean brake fluid or denatured alcohol and blow dry with compressed air. Inspect cylinder bore for scratches, scoring or corrosion. If cylinder is scored or scratched, it should be replaced.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Caliper Mounting Bolts	
Front	65-70 (9-10)
Rear	45-50 (6-7)
Wheel Stud Nuts	70-100 (10-14)
Bleeder Screw	1-3 (.1-.4)

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)
Volvo 164						
Front	10.7 (272)	.004 (.10)	.0012 (.03)	1.00 (24)	.900 (22.8)	....
Rear	11.63 (295.5)	.006 (.15)	.0012 (.03)	.378 (9.6)	.331 (8.4)	....
Volvo 240 Series						
Front	10.35 (263)	.004 (.10)	.0012 (.03)	.563 (14.3)	.557 (13.14)	....
Rear	11.06 (281)	.004 (.10)	.0012 (.03)	.378 (9.6)	.331 (8.4)	....