VOLVO

140 Series
164

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.

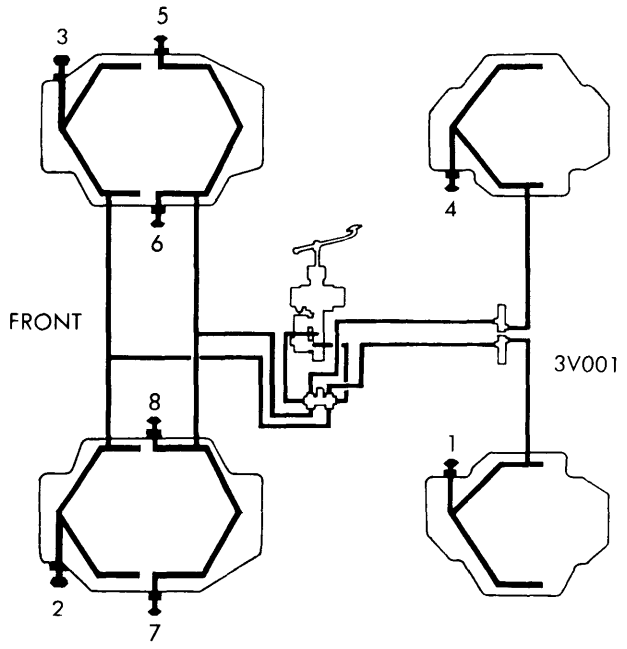
PARKING BRAKE

Disconnect brake cable at lever. Align hole in brake drum with starwheel adjuster. Using a screwdriver, tighten adjuster until shoes just contact drum. Back off adjuster until drum is just free to rotate without drag. Connect brake cable to lever and ensure parking brake is fully applied when the lever is pulled through three or four notches. If lever can be applied past the fourth notch, adjust cable by loosening lock nut and tighten adjuster nut.

HYDRAULIC SYSTEM BLEEDING

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

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 brake warning switch.



HYDRAULIC 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 — Press piston(s) 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.

CALIPER ASSEMBLY

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

Installation — Position caliper assembly on mounting bracket, and install attaching bolts. *NOTE* — There must be a clearance of at least .010" between rotor and caliper. Connect brake 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.

MASTER CYLINDER

Removal & Installation — Disconnect hydraulic lines at master cylinder, and cap openings to prevent entry of foriegn 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.

VOLVO (Cont.)

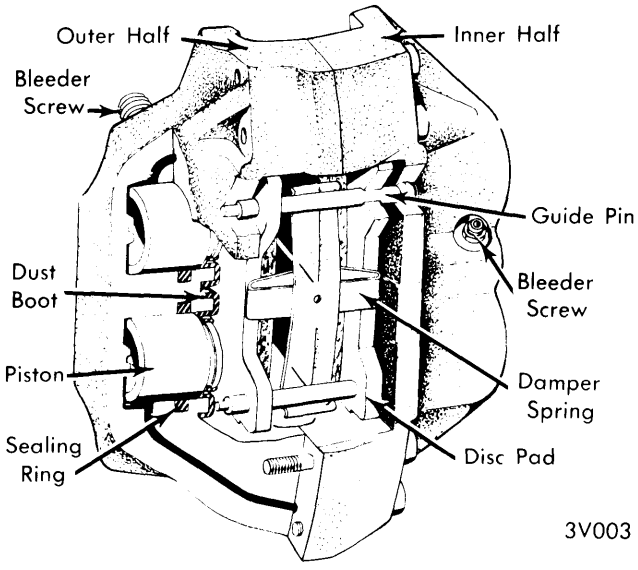
OVERHAUL

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 sealing rings from pistons, and bleeder screw from caliper.

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 sealing rings on piston assemblies, and install pistons into cylinder bores. *NOTE – Large diameter end must face toward center of caliper.* Install rubber dust boots and retaining clips. Install bleeder screw, then install disc pads.



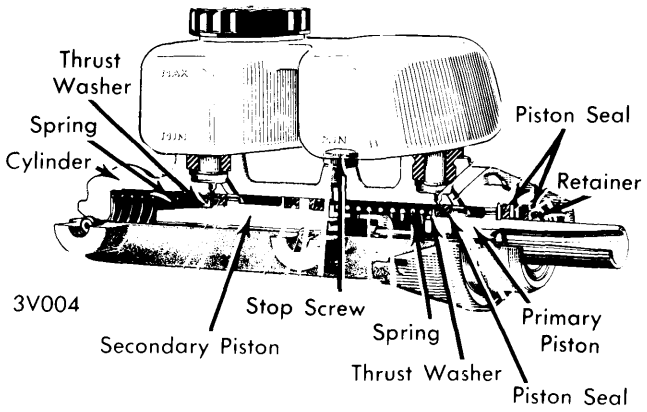
CALIPER ASSEMBLY

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.

Inspection – Clean all parts in clean brake fluid or denatured alcohol. Inspect cylinder bore for scratches, scoring, or corrosion. Cylinder may be honed, providing bore diameter does not exceed .881" (.942" on Volvo 164).

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.



MASTER CYLINDER ASSEMBLY

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 140						
Front	10.7 (272)	.004 (.10)	.0012 (.03)	.504 (12.8)	.457 (11.6)	....
Rear	11.6 (295)	.006 (.15)	.0012 (.03)	.378 (9.6)	.331 (8.4)	....
Volvo 164						
Front	10.7 (272)	.004 (.10)	.0012 (.03)	1.00 (24)	.900 (22.8)	....
Rear	11.6 (295)	.006 (.15)	.0012 (.03)	.378 (9.6)	.331 (8.4)	....