

SAAB

99
900

DESCRIPTION

Service brake system is hydraulically operated by a tandem master cylinder and vacuum power brake unit acting on four-wheel disc brakes. Front calipers are sliding yoke Girling calipers; rear brakes are fixed yoke ATE calipers. Master cylinder contains level sensor which illuminates a warning lamp on instrument panel if fluid level becomes low. Brake circuit is double diagonal system (right front, left rear/left front, right rear). Parking brake is mechanically operated on FRONT brake caliper assemblies.

ADJUSTMENT

DISC BRAKES

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

PARKING BRAKE CABLE

Before adjusting cable, apply brake lever several times to stretch cables. Rotate cable adjusting nuts located at rear of parking brake lever under plastic cover until distance between lever on front caliper and yoke is .016-.022" (.41-.56 mm). Check distance with parking brake fully released.

NOTE — *Parking brake cables are crossed, so to adjust left parking brake mechanism (cable), right adjusting nut must be rotated and vice versa.*

HYDRAULIC SYSTEM BLEEDING

Connect bleeder tube to bleeder screw, and submerge open end of tube in a jar half full of clean brake fluid. Open bleeder screw, and push brake pedal down quickly, allowing it to return slowly. Repeat procedure until fluid flows from bleeder tube with no sign of air. On last downward stroke, close bleeder screw. Bleeding sequence is left-rear, right-front, right-rear, left-front.

REMOVAL & INSTALLATION

DISC BRAKE PADS

Removal — Raise and support vehicle on safety stands; remove wheel. Rotate brake rotor until recess in edge of rotor is aligned with brake pads. On Girling calipers, remove damper spring, pin retaining clips and retaining pins. On ATE calipers, remove cover plate, mounting pins and retaining spring. Remove brake pads; use extractor tool (8995771) if required.

Installation — Open bleeder screw and seat piston into cylinder bore; close bleeder screw. On Girling calipers, rotate piston while pressing into cylinder bore. On ATE calipers, check piston position with template (8995342). Install brake pads. On Girling calipers, install retaining pins, clips and damper spring. On ATE calipers, install spring, lock pins and cover plate. Pump brake pedal several times to set pad-to-rotor clearance.

NOTE — *Girling caliper brake pads are not interchangeable. Outer pads are identified by "V" notch.*

DISC BRAKE CALIPER

Removal — Raise and support vehicle and remove wheels. On front wheel calipers, disconnect parking brake cable from lever on caliper. On all wheels, disconnect hydraulic line from hose, then plug lines to prevent entry of dirt and loss of fluid. Remove caliper attaching bolts and lift off caliper.

Installation — To install, reverse removal procedure and note the following: Tighten all attaching bolts, bleed hydraulic system and adjust parking brake cables.

DISC BRAKE ROTOR

Removal — Remove caliper assembly (hydraulic line attached) and support out of way. DO NOT allow caliper to hang by hydraulic line. On front disc, apply parking brake, remove rotor and hub attaching nut from spindle and release parking brake. Remove rotor and hub assembly from spindle with a puller, remove hub-to-rotor bolts and separate rotor. On rear disc, remove rotor attaching bolts and rotor.

Installation — To install, reverse removal procedure. Tighten all nuts and bolts and adjust parking brake if necessary.

MASTER CYLINDER

Removal — Disconnect electrical lead to warning switch on master cylinder. Disconnect clutch master cylinder hose from fluid reservoir, then plug reservoir nipple to prevent loss of fluid. Disconnect hydraulic lines from master cylinder. Remove master cylinder-to-power brake unit attaching nuts and lift off master cylinder.

Installation — To install, reverse removal procedure and bleed hydraulic system.

POWER BRAKE BOOSTER

NOTE — *Before power brake unit can be removed on 900 Series, ash tray and lower portion of instrument panel must be removed.*

Removal — From inside engine compartment, remove upper circlip from brake pedal push rod. Disconnect all electrical leads, hydraulic lines and vacuum lines from master cylinder and power brake unit. Remove the four attaching nuts and lift off master cylinder and power unit as an assembly. Separate master cylinder from power unit.

NOTE — *Three power unit attaching nuts are removed from inside vehicle while fourth is removed from engine compartment, 99 Series only. All attaching nuts are removed from inside vehicle on 900 Series.*

Installation — To install, reverse removal procedure and bleed hydraulic system.

Check Valve Replacement — Remove vacuum hose clamps at check valve and remove check valve from power unit. To install, reverse removal procedure.

Filter Replacement — Remove power brake unit from vehicle. Remove rubber dust boot and filter retainer. Withdraw silencer and filter from end of booster. To install, cut a slit in filter and

SAAB (Cont.)

slip over push rod. Reverse removal procedure and ensure slots in filter and silencer are 180° apart.

OVERHAUL

CALIPER ASSEMBLY

Disassembly (Girling Type) – 1) With caliper removed from vehicle, mount assembly in a soft jawed vise. Remove parking brake return spring. Separate yoke from caliper assembly. Remove spring and parking brake lever from yoke.

2) Remove retaining ring and dust boot, then using compressed air, force out indirect piston assembly from caliper. Press direct piston push rod and remove piston from caliper. Remove "O" rings and seal rings from caliper bore and pistons.

Cleaning & Inspection – Wash all parts, except indirect piston assembly, in clean brake fluid and dry with a lint-free cloth. Inspect all parts for corrosion, damage or wear; replace defective parts. Replace all rubber parts during overhaul.

NOTE – Indirect piston assembly must be wiped clean only. DO NOT use any type of solvent or brake fluid.

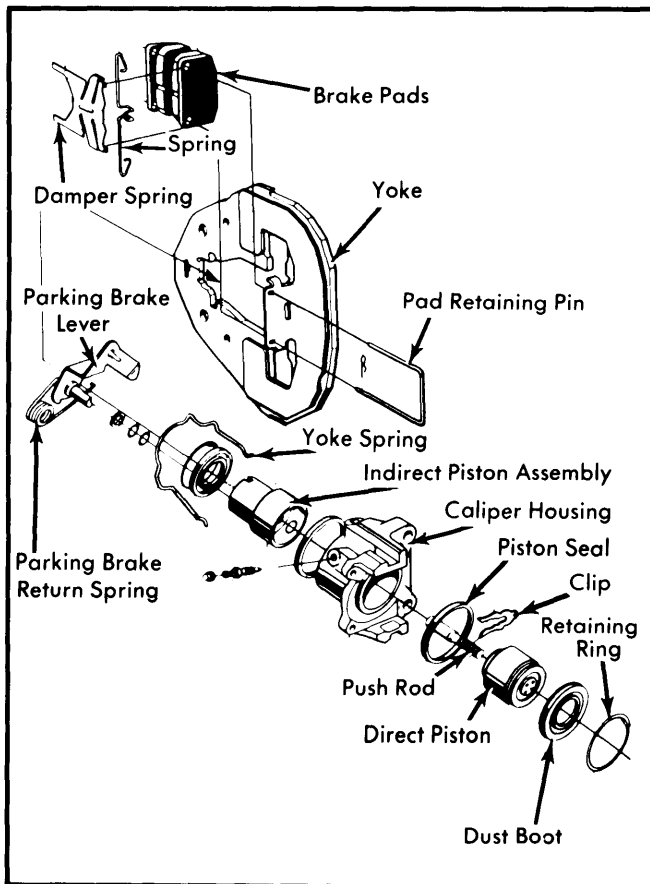


Fig. 1 Exploded View of Girling Caliper

Reassembly – 1) Lubricate pistons and caliper bore with clean brake fluid, then install new "O" rings and seal rings to

pistons and caliper bore. Install indirect piston into caliper with recess for yoke aligned with groove in caliper housing, then install direct piston in the same manner. Press in indirect piston and screw in direct piston until edges of dust boot grooves are flush with caliper housing.

2) Install dust boots and retaining rings. Fit yoke spring and parking brake lever to yoke, then align yoke guide edges with groove on caliper housing and install yoke. Lift parking brake lever and install axle pin into hole in indirect piston. Install parking brake return spring. Check yoke-to-caliper housing clearance; no clearance is permissible on bleeder screw side, opposite side clearance must be .006-.012" (.15-.30 mm). See illustration.

NOTE – Yoke must seat in indirect piston recess.

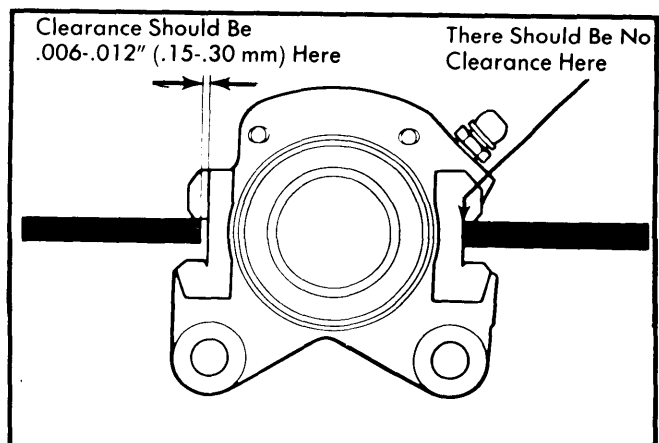


Fig. 2 Girling Caliper Clearance Measuring Points

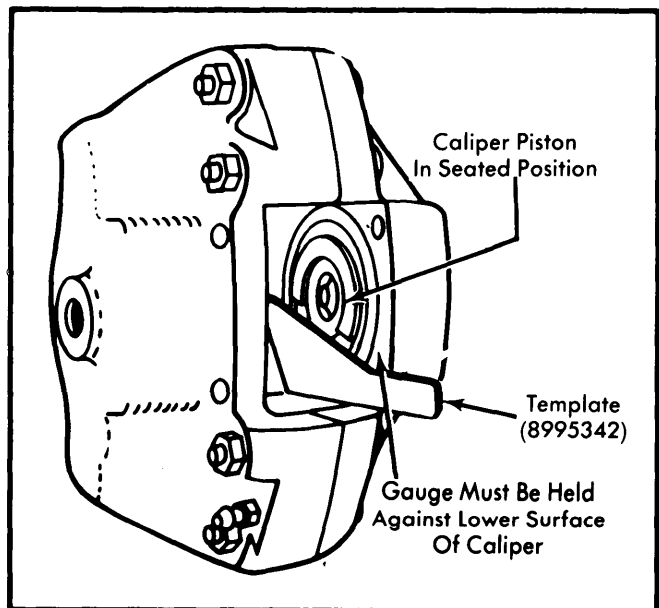


Fig. 3 Checking ATE Caliper Piston Position

Disassembly (ATE Type) – 1) With caliper removed from vehicle and disc pads removed, clean outer portion of caliper.

SAAB (Cont.)

Remove dust covers and retaining rings. Insert wooden block between pistons and carefully apply compressed air to fluid inlet port to force pistons out of cylinder bores. Remove piston seals from cylinder bores without damaging bores. Remove bleeder screw.

NOTE — DO NOT separate caliper halves.

Cleaning & Inspection — Wash all parts in clean brake fluid. Inspect cylinder bores and pistons for corrosion, damage or wear; replace defective parts. Replace all rubber parts 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 with template (8995342). Install rubber dust boots and retaining clips. Install bleeder screw and disc pads.

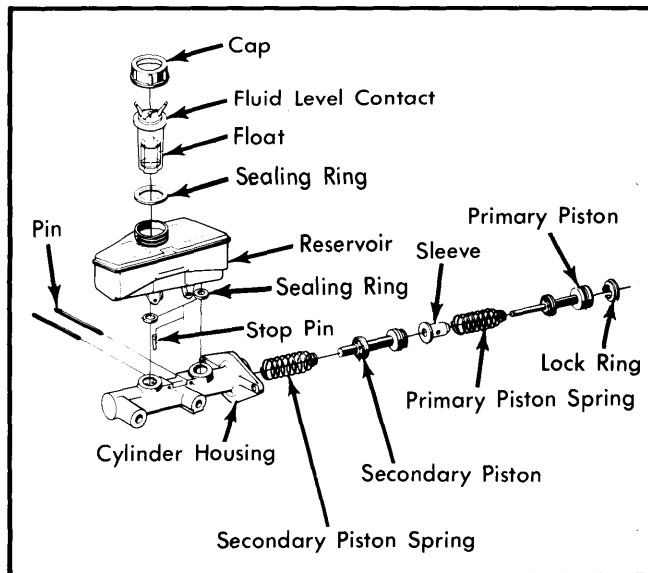


Fig. 5 Exploded View of Master Cylinder

Reassembly — Reverse disassembly procedure. Coat all parts with clean brake fluid and use care not to damage seals during installation of pistons.

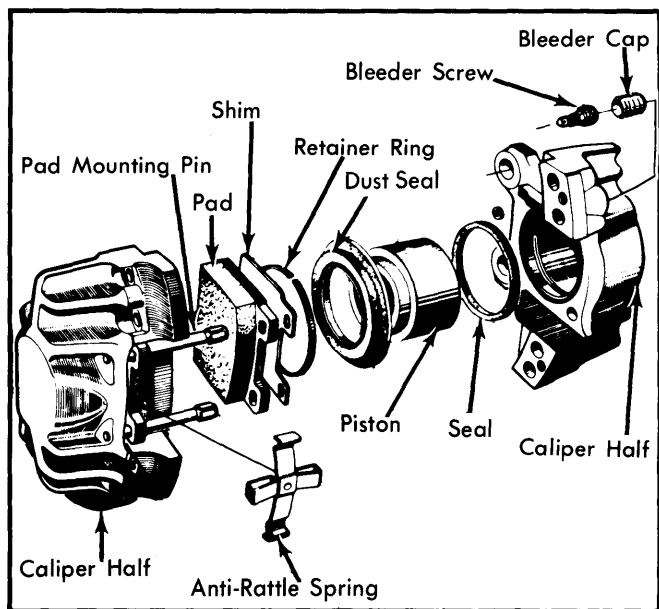


Fig. 4 Exploded View of ATE Caliper

MASTER CYLINDER

Disassembly — 1) With master cylinder removed from vehicle, drain brake fluid from reservoir. Mount cylinder in a soft jaw vise. Remove retaining pins and separate reservoir from master cylinder (pins may have to be driven out). Remove rubber seals from reservoir mounting holes in cylinder.

2) Push in on primary piston and pull secondary piston stop pin from forward reservoir mounting hole. Remove circlip and take out primary piston assembly and spring. Remove cylinder from vise and carefully knock it against a block of wood to remove secondary piston assembly and spring. Remove brake warning switch from master cylinder, then remove end plug and lift out warning valve assembly.

Cleaning & Inspection — Wash all parts in clean brake fluid and dry with a clean, lint-free cloth. Inspect all parts for corrosion, damage or wear; replace defective parts. Replace rubber parts during overhaul.

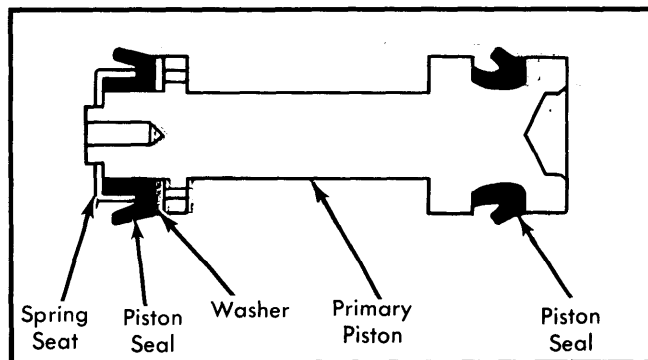


Fig. 6 Primary Piston Seal Installation

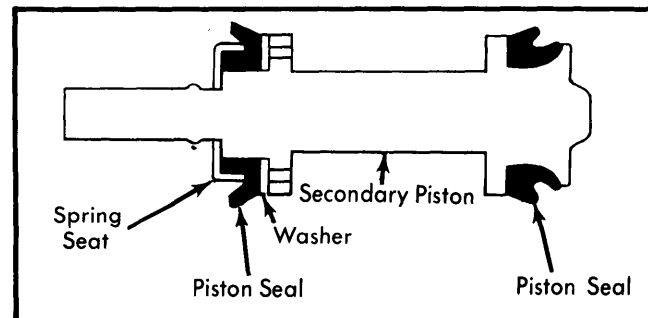


Fig. 7 Secondary Piston Seal Installation

Brakes

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DISC BRAKE ROTOR SPECIFICATIONS						
Application	Disc Diameter In. (mm)	Lateral Runout In. (mm)	Parallelism In. (mm)	Original Thickness In. (mm)	Refinish Thickness In. (mm)	Minimum Discard Thickness In. (mm)
99						
Front	11.024 (280)	.004 (.10)	.0006 (.015)	.500 (12.7)	.461 (11.7)	.460 (11.6)
Rear	10.614 (269.5)	.004 (.10)	.0006 (.015)	.413 (10.5)	.374 (9.5)	.373 (9.4)
900						
Front	10.866 (276)	.004 (.10)	.0006 (.015)	.500 (12.7)	.461 (11.7)	.460 (11.6)
Rear	10.886 (276.5)	.004 (.10)	.0006 (.015)	.413 (10.5)	.374 (9.5)	.373 (9.4)

BRAKE SYSTEM SPECIFICATIONS				
Application	Drum Diam. In. (mm)	Wheel Cylinder Diameter		Master Cylinder Diameter In. (mm)
		Front In. (mm)	Rear In. (mm)	
All Models	①	2.126 (54)	1.181 (30)	.875 (22.3)

① — Disc brakes