

TEVES

1993 Saab 900

DESCRIPTION

Saab Mark II Anti-Lock Brake (ABS) system monitors front wheels individually, and rear wheels as a pair. The ABS system consists of 4 wheel sensors, relays, fuses, hydraulic unit, warning lights, and an Electronic Control Unit (ECU). Brake servo unit is hydraulically operated. ECU provides self-diagnostic capability.

OPERATION

Each time a sensor rotor tooth passes by the wheel speed sensor, a magnetic field is distorted, causing an electric signal to be generated. These signals, which are proportional to wheel speed, are transmitted to the Electronic Control Unit (ECU). ECU processes these signals and computes a value defined as reference speed. See Fig. 1.

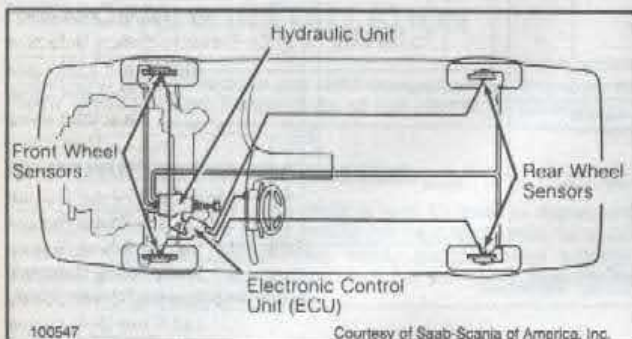


Fig. 1: Locating ABS Components

When a wheel is about to lock, the speed signal from that wheel will be different from reference speed. ECU detects this difference and modulates the solenoid valves. Solenoid valves regulate hydraulic brake pressure to the brake circuits.

ABS operation will continue until ECU detects that wheel speed is decreasing at the same rate for all wheels (all wheel speeds are the same as reference speed). Up to 12 brake pressure modulation cycles per second are possible.

CAUTION: See **ANTI-LOCK SAFETY PRECAUTIONS** at front of this manual.

NOTE: Remove ECU from vehicle before using an arc welder on vehicle or placing vehicle in an oven for painting.

SERVICING

Replace brake fluid every 24 months or 30,000 miles (48,000 km), whichever comes first.

BLEEDING BRAKE SYSTEM

NOTE: ALWAYS use DOT 4 brake fluid. DO NOT use DOT 5 brake fluid. Front wheels MUST be bled first.

1) Fill brake fluid reservoir. Bleed left front wheel, then right front wheel.

2) Press brake pedal approximately 20 times to depressurize brake system. Connect bleed hose to left rear wheel. With brake pedal pressed, turn ignition on to activate electric hydraulic pump. When brake fluid from left rear wheel contains no air, tighten bleeder valve. Turn ignition off. Depressurize brake system and bleed right rear wheel using same procedure.

BRAKE LINE BLEEDING SEQUENCE

Application	Sequence
All Models	LF, RF, LR, RR

DIAGNOSIS & TESTING

PRE-DIAGNOSIS INSPECTION

To isolate simple problems, perform a comprehensive visual inspection of system components. Ensure brake fluid reservoir is full when accumulator is fully charged. Ensure fuses in fuse box adjacent to ABS ECU are okay.

NOTE: ABS Tester (89 96 514) and Extension Cable (89 96 589) are required for ABS testing.

RETRIEVING CODES

Connect ABS Tester (89 96 514) according to manufacturer's instructions. Follow manufacturer's test procedure to retrieve codes. See ABS TROUBLE CODES.

REMOVAL & INSTALLATION

CAUTION: Before removing any ABS hydraulic brake component, press brake pedal approximately 20 times, with engine off, to depressurize brake system. Clean work area thoroughly to prevent entry of dirt.

ACCUMULATOR

Removal & Installation — 1) Remove accumulator retaining bolt. Remove accumulator.

2) To install, reverse removal procedure. Install NEW "O" ring and tighten bolt to specification. See TORQUE SPECIFICATIONS.

ELECTRONIC CONTROL UNIT

Removal & Installation — ABS ECU is located in left side of engine compartment. Remove ECU retaining screws. Unplug connector. Remove ECU. To install, reverse removal procedure.

HYDRAULIC CONTROL UNIT

Removal — 1) Remove center console, trim panel below dash, heater duct, and acoustic insulation behind brake pedal. Disconnect left heater hose from heater box. Remove retaining clip and pin from hydraulic unit push rod. Remove air intake.

2) Move coolant expansion tank aside. Unplug electrical connectors from pressure switch, main valve, fluid level indicator, and pump motor. Unbolt bracket between hydraulic unit and front assembly. Disconnect ground lead. Unplug sensor connector. Move bracket and wiring aside.

3) Siphon fluid from reservoir. On M/T vehicles, disconnect hose for clutch cylinder. Plug hose opening. To avoid entry of air into clutch system, DO NOT allow fluid to drain from hose. Disconnect fluid lines. Plug openings. Remove hydraulic unit.