

OPERATION (Continued)

The 4-wheel anti-lock brake system is self monitoring. When the ignition switch is placed in the RUN position, the ABS module will perform a preliminary self check on the anti-lock electrical system indicated by a three to four second illumination of the amber ANTI-LOCK indicator in the instrument cluster. During vehicle operation, including normal and anti-lock braking, the ABS module monitors all electrical anti-lock functions and some hydraulic operations.

In most malfunctions of the anti-lock brake system, the amber ANTI-LOCK BRAKE and/or red BRAKE indicator(s) will be illuminated. The sequence of illumination for these warning indicators combined with the symptoms, can determine the appropriate diagnostic tests to perform. However, most malfunctions are recorded as a coded number in the ABS module memory and assist in pinpointing the component needing service.

BRAKE SYSTEM BLEEDING

Tools Required:

- Anti-Lock Test Adapter T90P-50-ALA
- Rotunda EEC-IV Breakout Box 014-00322

The anti-lock brake system must be bled in two steps:

1. The master cylinder and hydraulic control unit must be bled using the Anti-Lock Test Adapter T90P-50-ALA. If this procedure is not followed, air will be trapped in the Hydraulic Control Unit which will eventually lead to a spongy brake pedal.

To bleed the master cylinder and HCU, disconnect the 55-pin plug from the ABS module and install the Anti-Lock Brake Breakout Box / Bleeding Adapter to the wire harness 55-pin plug.

 - a. Place Bleed / Harness switch in Bleed position.
 - b. Turn ignition to ON position. At this point the red OFF indicator should turn on.
 - c. Push motor button on adapter down. This starts the pump motor. The red OFF indicator will turn off and the green ON indicator will turn on. The pump motor will run for 60 seconds once the motor button is pushed. If the pump motor is to be turned off for any reason before this 60 seconds has elapsed, push the abort button and the pump motor will turn off.
 - d. After 20 seconds of pump motor operation, push and hold the valve button down. Hold valve button for 20 seconds then release.
 - e. The pump motor will continue to run for an additional 20 seconds after the valve button is released.
2. The brake lines can be bled in the conventional manner, as outlined in Section 06-06.

Bleed in the following sequence:

- RH Rear
- LH Front
- LH Rear
- RH Front

DIAGNOSIS AND TESTING

Warning Indicator Functions

The anti-lock brake system uses two warning indicators to alert the driver of malfunctions in the system.

The red BRAKE warning indicator will come on for only two reasons. If the brake fluid level in the master cylinder reservoir falls below the level which is determined by the switch point of the Fluid Level Switch (FLS), the BRAKE indicator will come on. Also, if the parking brake is applied, the BRAKE indicator will come on.

The amber CHECK ANTI-LOCK BRAKE warning indicator will come on for numerous reasons. It warns the driver that the ABS has been turned off due to a condition that exists in the system. Normal power-assisted braking remains but the wheels can lock during a panic stop while the indicator is on. Certain procedures must be followed to find the fault in this situation. They are explained in this section.

Ensure the diagnostic procedures are followed step-by-step in order as indicated.

WARNING: FOLLOWING THE WRONG SEQUENCE OR BYPASSING STEPS WILL LEAD TO UNNECESSARY REPLACEMENT OF PARTS, AND/OR INCORRECT RESOLUTION OF THE SYMPTOM.

The diagnostic procedure consists of four sections:

1. On-Board Diagnostics
2. Manual Quick Tests
3. Warning Indicator Symptom Chart
4. Diagnostic Tests (including electrical schematics.)

On-Board Diagnostics

Tools Required:

- Rotunda SUPER STAR II Tester 007-0041B

The anti-lock brake system (ABS) module is capable of performing a self-test using Rotunda SUPER STAR II Tester 007-0004 1B or equivalent. The procedures for using the SUPER STAR II Tester are covered in the Anti-Lock Diagnostic Section.

If the SUPER STAR II Tester is not available, the Anti-Lock Quick Check Sheet should be used as outlined.