ANTILOCK BRAKE SYSTEM (ABS) - OPERATION (1500/2500/3500)

1500/2500/3500

Battery voltage is supplied to the ABM. The ABM performs a system initialization procedure at start up along with an ABS motor check. Initialization consists of a static and dynamic self check of system electrical components.

The static and dynamic checks occurs at ignition start up. During the dynamic check, the ABM briefly cycles solenoids to verify operation. An audible noise may be heard during this self check. This noise should be considered normal.

If an ABS component exhibits a fault during initialization, the ABM illuminates the amber warning light and registers a fault code in the microprocessor memory.

The ABM monitors wheel speed sensor inputs continuously while the vehicle is in motion. However, the ABM will not activate any ABS components as long as sensor inputs indicate normal braking.

During normal braking, the master cylinder, power booster and wheel brake units all function as they would in a vehicle without ABS. The HCU components are not activated.

The purpose of the antilock system is to prevent wheel lockup. Preventing lockup helps maintain vehicle braking action and steering control.

The antilock ABM activates the system whenever sensor signals indicate periods of wheel slip.

The antilock system prevents lockup during a wheel slip condition by modulating fluid apply pressure to the wheel brake units.

Brake fluid apply pressure is modulated according to wheel speed, degree of slip and rate of deceleration. Sensors at each wheel convert wheel speed into electrical signals. These signals are transmitted to the ABM for processing and determination of wheel slip and deceleration rate.

The ABS system has four fluid pressure control channels. Each wheel brakes are controlled separately. A speed sensor input signal indicating a wheel slip condition activates the ABM antilock program.

There are Two solenoid valves (Isolation and Dump valve) which are used in each antilock control channel. The valves are all located within the HCU valve body and work in pairs to either increase, hold, or decrease apply pressure as needed in the individual control channels.

During an ABS stop the ISO valve is energized which acts to prevent further pressure build-up to the calipers. Then the Dump valve dumps off pressure until the wheel unlocks. This will continue until the wheels quit slipping altogether.