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BMW 3-Series 320i & 320xi (12-14), 325i, 325xi, 330i & 330xi (06) & 328i & 328xi (07-14) Haynes Online Manual

19 Anti-lock Brake System (ABS) - general information

General information

Note:

The ABS unit is a dual function unit, and controls both the Anti-lock Brake System (ABS) and traction control function of the Dynamic Stability Control (DSC) system.

1 The anti-lock brake system is designed to maintain vehicle steerability, directional stability and optimum deceleration under severe braking conditions on most road surfaces. It does so by monitoring the rotational speed of each wheel and controlling the brake line pressure to each wheel during braking. This prevents the wheels from locking up.

2 The ABS system has three main components - the wheel speed sensors, the electronic control module (ECM) and the hydraulic unit (which consists of hydraulic solenoid valves and an electrically-drive return pump). Four wheel-speed sensors - one at each wheel - send a variable voltage signal to the ECM, which monitors these signals, compares them to its program and determines whether a wheel is about to lock up. When a wheel is about to lock up, the control unit signals the hydraulic unit to reduce hydraulic pressure (or not increase it further) at that wheel's brake caliper. Pressure modulation is handled by electrically-operated solenoid valves. A brake pedal position sensor is integral with the power brake booster, and informs the ECM of brake pedal position.

3 If a problem develops within the system, an "ABS" warning light will glow on the dashboard. Sometimes, a visual inspection of the ABS system can help you locate the problem. Carefully inspect the ABS wiring harness. Pay particularly close attention to the harness and connections near each wheel. Look for signs of chafing and other damage caused by incorrectly routed wires. If a wheel sensor harness is damaged, the sensor must be replaced. **Warning:** *Do NOT try to repair an ABS wiring harness. The ABS system is sensitive to even the smallest changes in resistance. Repairing the harness could alter resistance values and cause the system to malfunction. If the ABS wiring harness is damaged in any way, it must be replaced.* **Caution:** *Make sure the ignition is turned off before unplugging or reattaching any electrical connections .*

4 An accumulator is also incorporated into the hydraulic system. As well as performing the ABS function as described above, the hydraulic unit also controls the traction/stability control side of the DSC system. If the ECM senses that the wheels are about to lose traction under acceleration, the hydraulic unit momentarily applies the rear brakes to prevent the wheel(s) spinning. If the system senses that the lateral acceleration/yaw rate of the vehicle is about to exceed a predetermined threshold - resulting in oversteer or understeer, the system can apply the brake of each individual wheel to maintain stability and prevent/control a skid.

5 The DSC system can also control the steering of the vehicle to maintain stability in an oversteer or understeer situation - known as Active steering. With conventional systems, the driver has to actively steer the vehicle in a straight line if the brakes are applied on a road surface with varying traction levels. In these situations, the DSC control unit calculates the yaw rate with the brake pressure sensors on the front axle, then the DSC control unit transmits to the Active Steering control unit the yaw-moment compensation correction angle needed for stabilization.

6 Should a fault develop with the ABS/DSC system, the vehicle must be taken to a dealer or qualified shop for diagnosis.

Diagnosis and repair

7 If a dashboard warning light comes on and stays on while the vehicle is in operation, the ABS system requires attention. Although special electronic ABS diagnostic testing tools are necessary to properly diagnose the system, you can perform a few preliminary checks before taking the vehicle to a dealer service department.

- A. Check the brake fluid level in the reservoir.
- B. Verify that the computer electrical connectors are securely connected.
- C. Check the electrical connectors at the hydraulic control unit.
- D. Check the fuses.
- E. Follow the wiring harness to each wheel and verify that all connections are secure and the wiring is undamaged.

8 If the above preliminary checks do not rectify the problem, the vehicle should be diagnosed by a dealer service department or other qualified repair shop. Due to the complex nature of this system, all actual repair work must be done by a qualified automotive technician .