

Anti-Lock Brake System (ABS) and Stability Control - Overview

Overview

The ABS and stability control systems are comprised of the following subsystems which assist the driver in maintaining control of the vehicle:

- ABS
- Brake fluid support
- Drive away release (EPB)
- EBD
- EPB control
- ESC
- Hill descent control™
- Hill start assist
- Hydraulic fade compensation
- RSC
- Side-wind stabilization
- Supplemental braking assist
- Supports adaptive cruise control
- Supports collision avoidance
- Traction control
- Trailer sway control
- Torque vectoring control
- Vacuum on-demand system

The ABS helps maintain steering control during hard braking by preventing wheel lock up. The ABS also includes a brake assist function which provides maximum brake system pressure during a severe braking situation.

Brake fluid support increases brake fluid flow to the wheel ends to help compensate for brake fade conditions.

The drive away release function automatically releases the electric parking brake once certain conditions

have been met.

The EBD system helps maintain vehicle control by keeping a balanced braking condition between the front and rear wheels.

The ABS module is the ECU for the electric parking brake system. For information on the electric parking brake system,

Refer to: Parking Brake (206-05 Parking Brake and Actuation - Vehicles With: Electronic Parking Brake (EPB)) .

The ESC system helps prevent skids or lateral slides by modulating brake fluid pressure to individual brake calipers and reducing engine torque.

The hill descent control™ feature helps to maintain a low vehicle speed while descending steep inclines on various surface conditions.

The hill start assist feature is designed to assist the driver during hill-starts. Using the ABS, the hill start assist system holds the vehicle on an incline for a short time, allowing the driver to release the brake pedal and press the accelerator pedal without needing to use the parking brake.

Hydraulic fade compensation counteracts brake fade by providing additional brake pressure at the wheel ends if the maximum achievable vehicle deceleration is not reached when the driver applies very high force to the brake pedal.

The RSC system helps prevent excessive vehicle roll by modulating brake fluid pressure to individual brake calipers and reducing engine torque.

The side-wind stabilization system helps to reduce the effect of a sudden gust of wind to the side of the vehicle.

The supplemental braking assist system uses the hydraulic pump motor and HCU to provide additional braking assist during a severe braking event or to compensate for a loss of vacuum in the brake booster.

The ABS supports the adaptive cruise control system by applying the brakes as necessary to maintain the distance gap set by the driver. For information on the adaptive cruise control system, Refer to: Cruise Control (419-03 Cruise Control - Vehicles With: Adaptive Cruise Control) .

The ABS supports the collision avoidance system by monitoring information and precharging the brake system allowing the vehicle to stop in the shortest distance possible. For information on the collision avoidance system,

Refer to: Collision Warning and Collision Avoidance System (419-03 Collision Warning and Collision Avoidance System) .

The traction control system helps prevent loss of traction by reducing drive-wheel spin during acceleration.

The trailer sway control system helps maintain vehicle stability while towing a trailer by detecting and aiding in the reduction of conditions causing trailer sway.

Torque vectoring control uses the rear brakes to adjust the speed between the driven wheels while accelerating through a corner, forcing the front end to hug the inside of the curve and improve tire grip.

Vehicles equipped with a 3.5L engine use a PCM controlled, solenoid valve to replenish brake booster vacuum from the engine during periods of high brake vacuum demand.

Some noise from the system and pulsations in the brake pedal are normal conditions during most ABS and stability control system activations. Longer than normal brake pedal travel may also be experienced immediately following an ABS or stability control system activation.

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