The possibilities of today’s electronic brake systems go far beyond the tasks for which they were originally designed. Originally the antilock braking system (ABS) was only used to prevent the wheels of a vehicle from locking up and therefore to ensure the steerability of the vehicle even during emergency braking. Today, the brake system also controls the distribution of the braking force. The electronic stability program (ESP), with its ability to build up brake pressure independently of the position of the brake pedal, offers a whole series of possibilities for active brake intervention. The ESP is intended to assist the driver by applying the brakes automatically and to therefore provide the driver with a higher level of comfort and convenience. Some functions, however, enhance the vehicle safety since automatic brake application during an emergency results in shorter braking distances.

### Automatic brake functions

The main function of the electronic brake system is the Electronic Braking-force Distribution (EBD) function which replaces the mechanical components for braking-force distribution between the front and rear axles. This function not only cuts costs, but also makes the electronic distribution of the braking force extremely flexible.

Additional functions are gradually being integrated into electronic brake systems. The following additional functions are currently available:

- **Hydraulic brake assist (HBA):**
  HBA detects emergency braking situations and shortens the braking distance by building up the brake pressure up to the wheel-lock limit.

- **Controlled deceleration for parking brake (CDP):**
  CDP brakes the vehicle until it is stationary when requested by the driver.
• **Hill hold control (HHC):**
  HHC intervenes in the brake system when pulling away on a hill and prevents the vehicle from rolling backwards.

• **Hill descent control (HDC):**
  HDC assists the driver when driving downhill on steep terrain by automatically applying the brakes.

• **Controlled deceleration for driver assistance systems (CDD):**
  CDD brakes the vehicle if required in combination with automatic vehicle-to-vehicle ranging.

• **Hydraulic fading compensation (HFC):**
  HFC intervenes if the maximum possible vehicle deceleration is not achieved even though the driver is forcefully pressing the brake pedal, e.g. due to high brake disk temperatures.

• **Hydraulic rear wheel boost (HRB):**
  HRB also increases the brake pressure in the rear wheels up to the wheel-lock limit during ABS brake application.

• **Brake disk wiping (BDW):**
  BDW removes splash water from the brake disks by briefly applying the brakes. This brake application is not noticed by the driver.

These functions work together with the Electronic Stability Program (ESP). Some of these functions may also be available with the Antilock Braking System (ABS) or the Traction Control System (TCS).

Most of the additional functions operate with the sensor technology of the existing electronic brake systems. Some functions, however, require additional sensors.