Vehicle dynamics control

The terms “vehicle dynamics control”, “electronic stability control” or “Electronic Stability Program” refer to driver-assistance systems which prevent skidding by performing targeted brake interventions in individual wheels and interventions in the engine control system.

Function

Sudden driving manoeuvres – such as quick steering and counter-steering, unexpected lane changes or swerving into the path of obstacles – and wet, contaminated or slippery roads can cause the car to become unstable and begin to skid. The ESP® program can prevent the vehicle from skidding within the limits of what is physically possible by performing targeted interventions in the brakes and in the engine control system.

Using sensors, the Electronic Stability Program permanently compares whether the driver’s steering input corresponds to the vehicle’s actual direction of travel. If the system detects a situation where the values differ, ESP® intervenes – as soon the vehicle threatens to become unstable.

UNDERSTEERING

If ESP® detects that the vehicle is understeering in a curve – i.e. where the front axle continues to move straight ahead despite the wheels being inclined – the system restricts the engine power and brakes the rear wheel at the inside edge of the curve to stabilise the vehicle.

OVERSTEERING

If there is a threat of oversteering – i.e. where the rear of the vehicle swerves outwards – ESP® reduces the engine torque and brakes the front wheel at the outside edge of the curve. This results in a counter-torque, which counteracts the oversteering tendency and stabilises the vehicle.

Electronic stability systems/ESP®

In 1995, a vehicle dynamics control system was installed as standard for the first time: it took the form of the Electronic Stability Program (ESP®) in the Mercedes S-Class coupé. The acronym ESP® is a trademark of Daimler AG, which is why numerous other names are also in use today. Terms such as DSC (Dynamic Stability Control) or ESC (Electronic Stability Control) have become established, among others.

Safety

Skidding is one of the main causes of serious road accidents. ESP® systems are already able to detect an impending risk of skidding at an early stage and stabilise the vehicle within the limits of what is physically possible. According to estimates, ESP® is already integrated into 64 per cent of all new vehicles worldwide.

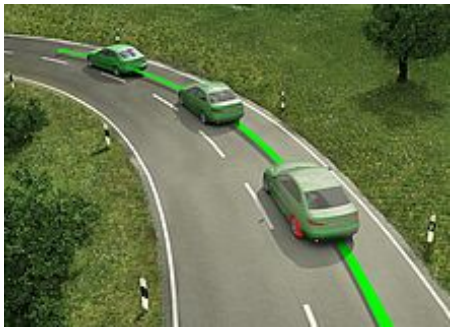
Numerous international studies conducted by renowned vehicle manufacturers and safety authorities have proven the increase in safety and effectiveness of ESP®: up to 80% of all accidents caused by skidding were prevented thanks to electronic stability control. In Europe alone, the number of fatalities and injuries resulting from road accidents each year could be reduced by 4,000 and 100,000 respectively by equipping all vehicles with ESP®.

Images

Source: Bosch

Images



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Source: https://www.my-cardictionary.com/dictionary/driver-assistance-systems/vehicle-dynamics-control