

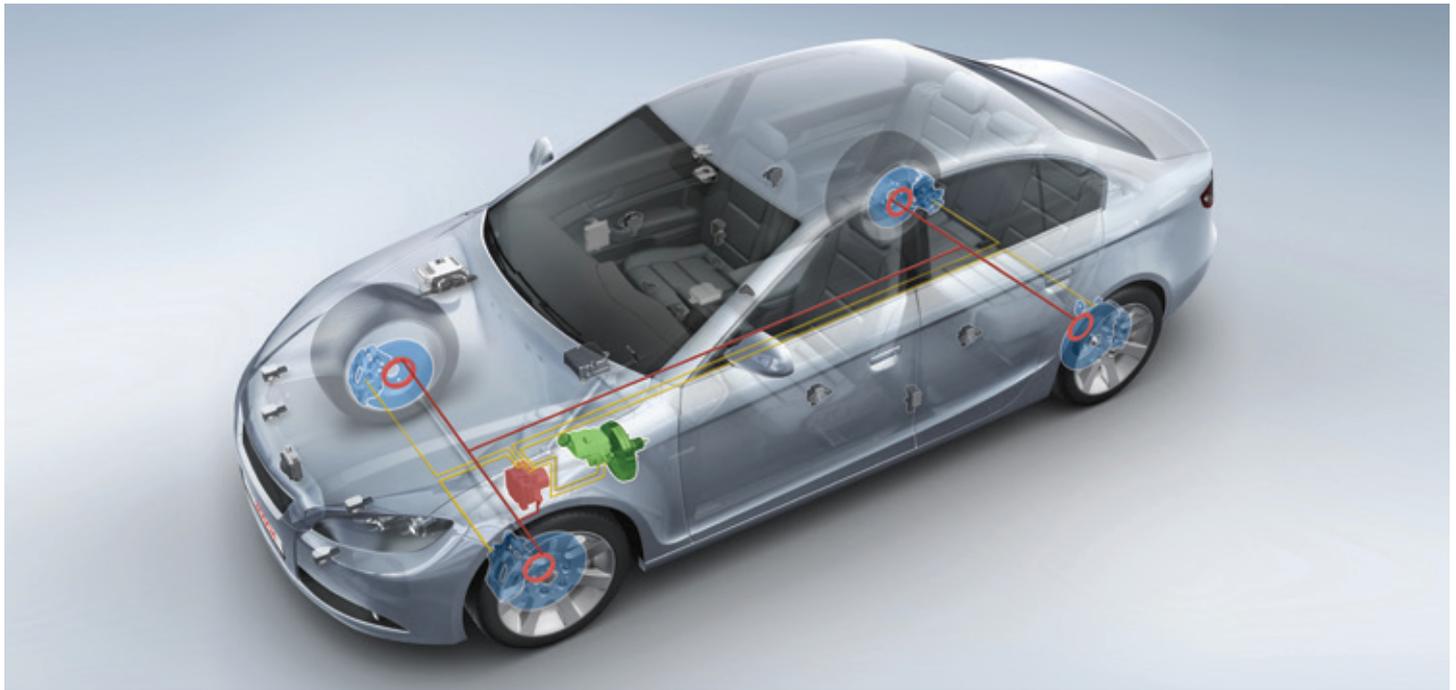
ABS/ESP Sensors

Overview, features and benefits

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BOSCH
Invented for life



- ▶ Original equipment product
- ▶ Growing market due to compulsory installation of ABS and ESP
- ▶ Comprehensive range
- ▶ Bosch is the largest manufacturer of sensors worldwide
- ▶ Easy diagnosis and safe installation with ESI[tronic] & KTS

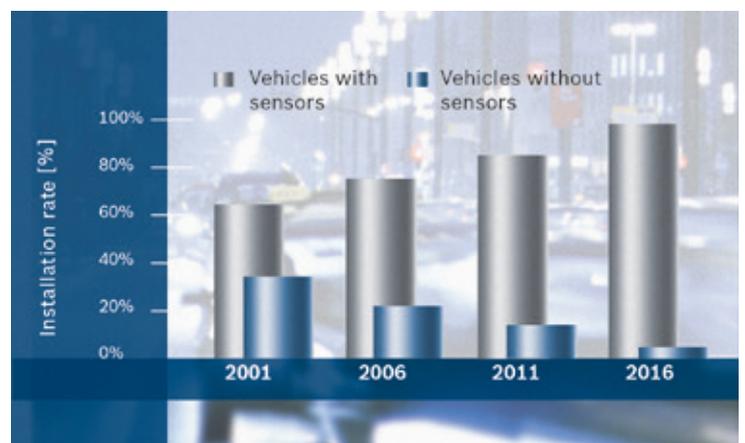
Modern vehicles are being equipped with more and more electronic components. As a consequence, there has also been an increase in the number of sensors installed in vehicles. These sensors act as the “sensory organs” of a vehicle to record a wide range of different parameters.

The introduction of the world’s first anti-lock braking system for passenger cars by Bosch in 1978 is a milestone in the area of active driving safety. Since then we have developed our ABS further to offer smaller, lighter and more powerful systems.

The antilock braking system (ABS) has the purpose of keeping vehicles steerable and improving directional stability even during emergency braking. The ABS system is also the foundation for the electronic stability program (ESP®) system.

Sensor system:

A rapidly growing market with best prospects for the future of workshops and trade.



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In 1995, active driving safety reached yet another dimension thanks to Bosch invention of ESP. ESP® incorporates the functions of ABS and TCS, with the additional benefits of stability control. It detects if skidding is imminent and intervenes by applying braking power to individual wheels and/or reducing engine power in order to restore the vehicle's stability.

ESP® is always on and enabled. A microcomputer monitors the signals from the ESP® sensors and checks 25 times a second, whether the driver's steering input corresponds to the actual

direction in which the vehicle is moving. If the vehicle moves in a different direction ESP® detects the critical situation and reacts immediately – independently of the driver. It uses the vehicle's braking system to stabilize the vehicle. With these selective braking interventions ESP® generates the desired counteracting force, so that the car reacts as the driver intends. ESP® not only initiates braking intervention, but can also reduce engine torque to slow the vehicle. So, within the limits of physics, the car is kept safely on the desired path.



Yaw Rate Sensor

Function:

- ▶ Yaw rate sensors record the rotary motion of the vehicle along the longitudinal, vertical and lateral axes
- ▶ Used in ESP®

Advantages:

- ▶ Flexible and cost-effective sensor cluster with highly integrated electronics
- ▶ Modular concept for different integration stages
- ▶ Multiple use of sensor signals for future highly dynamic safety and convenience systems
- ▶ Optimised monitoring and safety concept

Acceleration Sensor

Function:

- ▶ Acceleration sensors record the acceleration values of a frontal or side impact or vehicle movement. They support the Electronic Stability Program ESP® and the Antilock Braking System ABS or airbag systems

Advantages:

- ▶ Excellent ability to distinguish between vibration and actual vehicle movement
- ▶ Safe and reliable triggering of life-saving reactions, such as airbag deployment

Wheel Speed Sensor

Function:

- ▶ Wheel speed sensors transmit the most important data for safe ABS/ESP® control

Advantages:

- ▶ Safety: Exact speed from virtual 0 km/h, essential for traction control systems
- ▶ Active Sensors can detect forward and backward movement, and stoppage
- ▶ Best protection against external magnetic influences
- ▶ 1000+ part numbers covering Top vehicles in Top Markets

Steering Angle Sensor

Function:

- ▶ Steering angle sensors record the steering angle without contact
- ▶ Used in ESP®, steering systems, active steering

Advantages:

- ▶ Safety: The highest measurement accuracy through low tolerance values
- ▶ Comfort: Signal refresh frequency adjustable to system requirements
- ▶ Driving sensation: modular expansion of functions, e.g. for all-wheel-drive

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