



ABS (Anti-Blocking System)

By preventing wheel locking in the event of emergency braking, ABS (which stands for Anti-Blocking System) lets **the tyres retain their ability to steer the car**. The driver therefore remains in control of the vehicle's trajectory.



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BASIC FACTS

Contrary to a generally accepted idea, ABS does not reduce braking distances – it optimises them, whatever the level of adherence between the tyre and the ground. It also allows the driver to retain control of the trajectory of the car and maintain its stability. When a tyre grips the roadway under normal con-

ditions, this ensures the car can be steered correctly. Conversely, when a wheel is blocked following too-sharp braking, the tyre loses its directional ability and the trajectory of the car becomes uncontrollable. By preventing wheel blocking, ABS avoids the appearance of this phenomenon.

IN SHORT >>>

ABS detects the start of wheel blocking. It then reduces the pressure in the braking system so that the tyre can recover its grip. It restores the pressure immediately so that braking can continue.



HOW DOES IT WORK?

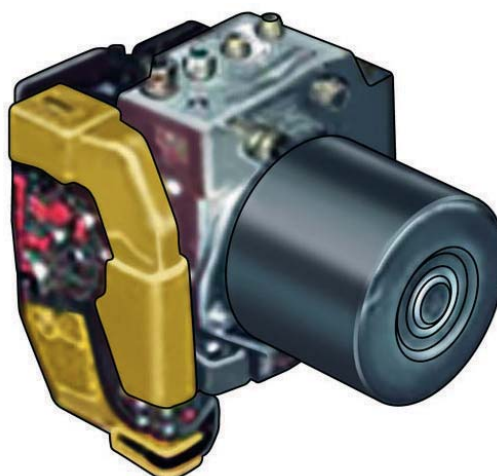
1 TRAJECTORY CONTROL

Each wheel of the car has a tachometer – a device capable of measuring rotation speed. It consists of a disk with a notched periphery that is connected directly to the wheel and an electro-magnetic sensor. When the wheel turns, the sensor delivers a pulse each time a notch of the disk passes in front of it. The frequency of the pulses is therefore proportional to the number of revolutions of the wheel. When braking occurs, as long as the wheel does not block, the frequency at which the sensor delivers the pulse gradually declines, until the car stops. On the other hand, any onset of blocking is signalled by an abrupt fall-off in the frequency of the sensor output. The ABS computer detects the break in

the regularity of the fall-off, signifying that slip between the tyre and the ground is starting to occur. Through the activation of a solenoid valve, the system starts to resist an additional increase of pressure in the braking circuit. If the onset of blocking persists, the computer acts again on the solenoid valve to bring about a drop in pressure. As soon as it detects that the tyre has found its grip, which is apparent from an increase in the speed of wheel rotation and thus of the pulse frequency delivered by the sensor, it acts again on the solenoid to restore the pressure in the braking system. This operation can be repeated numerous times, at very short intervals.

2 ARCHITECTURE ABS is the cornerstone of many other systems

The ABS computer has taken on major importance within car on-board electronics architecture. ESP, emergency brake assist, ASR, traction control (see sheet), and also cruise control, tyre pressure monitor and many other systems, either base their operation on information which it delivers, or make direct use of the ABS computer to perform their task.



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