# Understanding electric parking brakes

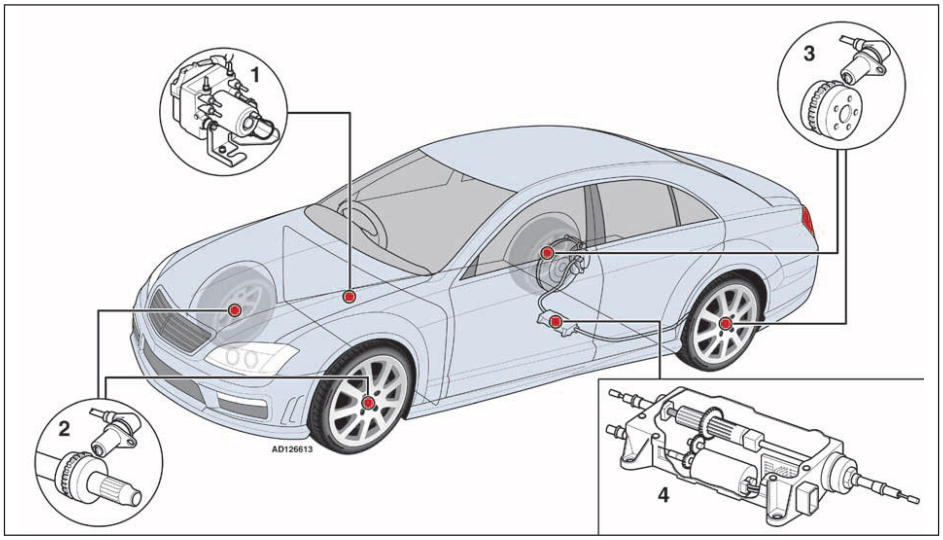
Electric parking brakes have been around for more than a few years now, and they are becoming more common. To help you better understand how they work, Autodata offers some details on the basics of the these parking brakes.

Electric parking brakes (EPB) were introduced on cars from about 2002. First on more expensive model ranges, but then becoming common on vehicles of all classes. Advantages of the system include ease of use and the incorporation of automatic functions like hill holding and automatic brake application.

There are now many variants of EPBs but they can be categorised as:

Integrated: Using a special brake calliper with integrated motor and gears and have no mechanical (cable) operation.

Electromechanical actuator: Using conventional mechanical parking brakes with their cables connected to an electromechanical actuator.




**Electric Parking Brake (EPB) components: 1. ABS modulator 2. Front wheel speed sensors 3. Rear wheel speed sensors 4. EPB actuator**

## Integrated EPB's

The integrated option, favoured by some manufacturers, has the advantage of being compact and having fewer components, but has the disadvantage of sometimes lacking a mechanical emergency release system. In cases where the system fails for reasons other than a discharged battery, some disassembly of the calliper or brake components may be required to release the brakes. Brake pad replacement usually requires the use of diagnostic equipment to retract the calliper pistons and reset the operating software after completion. However there are now many aftermarket tools available that allow the independent garage to undertake servicing and repairs.

## Electromechanically activated

The electromechanical actuator option, favoured by many manufacturers, has the advantage of allowing any model to be made with or without an EPB, without major changes to the vehicle's brake design. The actuator uses an electric motor coupled to a gear train, and is controlled by an integrated force sensor and control module. The EPB control module communicates with other control modules in the vehicle, commonly using the controller area network (CAN), and would normally require it to be programmed if replaced. Most, if not all, have an emergency release procedure that allows for both an electrical or mechanical failure. Servicing is generally simpler than the integrated type, with very few requiring the use of any special equipment.

**Calliper with integrated EPB**

**EPB actuator**

**EPB switch**

The operation of the system has been designed to be failsafe: after switching the ignition off (or stopping the engine), the brakes are automatically applied. When stopping in traffic or at junctions, the brake is automatically applied and then automatically released when the accelerator is depressed. Most models incorporate a procedure that allows the driver to leave the vehicle without the EPB being applied, which is sometimes needed when the vehicle is parked during low ambient temperatures, likely to result in the brakes being frozen on. Different lamps are used to warn the driver of the status of the EPB, the selected function(s) of the EPB or a system malfunction. Most vehicles use the ABS hydraulics in the event of an emergency. Continuous operation of the EPB switch will signal the ABS modulator to operate all of the brakes, to bring the vehicle to a safe stop.

The system, depending on model application, can also include driver convenience features such as 'hill holding'. When selected, the brakes will remain applied until the vehicle starts to move off, thus ensuring that the vehicle does not 'run back' when restarting on gradients.

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