



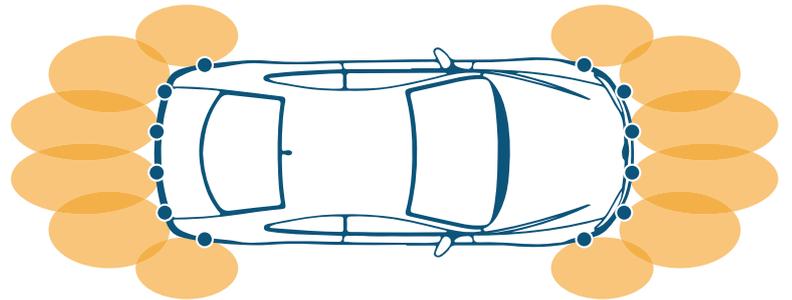
TECHNICAL INFORMATION

FAE PARKING SENSORS

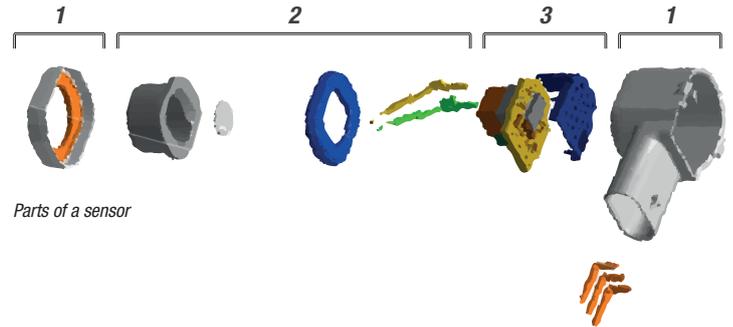
Parking sensors aid safety and comfort for drivers by helping them both manoeuvre and park their cars and warning of any obstacles near the vehicle. They work using ultrasound emitted by various sensors. If an obstacle is detected, the driver is alerted either visually or audibly. The more ultrasonic sensors installed across the vehicle, the more accurate the measurements are. Depending on the vehicle or system, LED indicators, graphic displays on the screen, or purely sound signal transmitters can be installed.

Parts of a parking sensor:

1. Housing
 - Protects the sensor from the weather
 - Holds the sensor onto the bumper
2. Mechanical transducer
 - Converts electrical energy into mechanical energy and vice versa
3. Electronics / PCB (printed circuit board)
 - Communication sensor - ECU
 - Signal processor



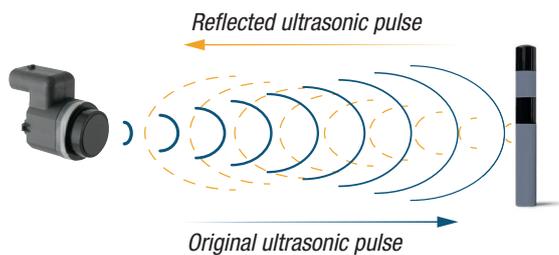
Detection fields



Parts of a sensor

How does ultrasound detect obstacles?

An ultrasonic pulse is generated in a particular direction. This echo then reflects off a surface and returns to the sensor. With exception of the disconnect switch, all system components tend to be located at the rear of the vehicle to reduce the length of wiring.



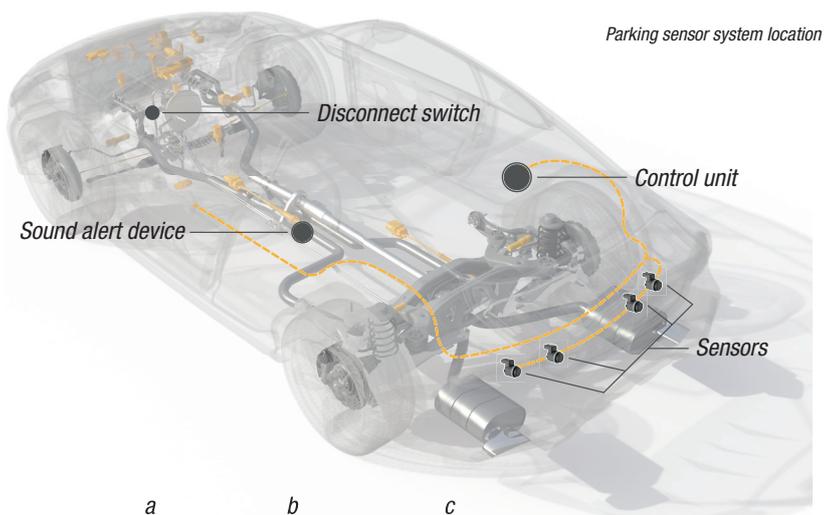
For it to work, the driver simply needs to select reverse gear. A sound alert will then notify them that the system has been activated. If the unit receives information that an obstacle is approaching, a series of audible warnings will be emitted, sometimes accompanied by light warnings.

The units used usually have two fittings, one with the sensor connections and the other with the sound output, general mass, reversing information and push-button system. Sometimes the units are connected to a network. Through this network, and together with the information necessary for correct operation, it's possible to carry out a complete diagnosis with the diagnostic tool.

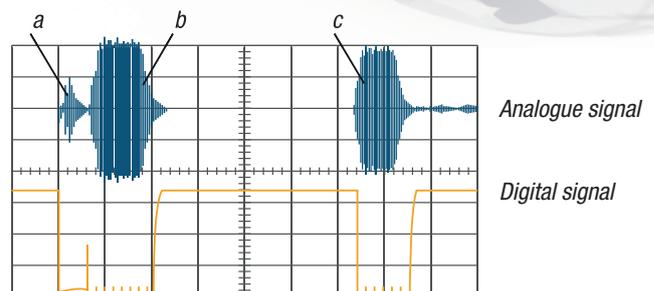
The sound alert device is a small loudspeaker that emits a "BEEP" when the system is active (when the car is in reverse gear). Depending on the distance of the vehicle from the obstacle, it repeats this "BEEP" at a lower to higher frequency the closer it gets to the obstacle.

A simple installation process makes it possible to fit these systems to any vehicle. Generally, to power the unit we only need a negative (which can be provided by a disconnect switch) and a positive connection (which could be the one that turns on the reverse lights). These universal systems make it possible to fit a warning light instead of or together with the sound alert device. Each sensor consists of an electronics system, a piezoelectric element and a membrane.

The signal emitted by the proximity sensors corresponds to the digitalisation of a first ultrasound pulse (a) that causes the sensor membrane to vibrate (zone b). When there's an obstacle, this membrane vibrates again due to the "echo" of the ultrasound (c). Depending on the time elapsed between the emission and reception, the distance to the obstacle can be calculated.



Parking sensor system location



Signal emitted by the proximity sensors