TECHNICAL BULLETIN:
Brake Pad Wear Sensors

The brake pad wear sensor is a simple component that plays a critical role in vehicle safety. There is a multitude of factors that affect how quickly brake pads wear. Varying driving conditions, speeds and pad compounds make it difficult to predict the lifespan of the brake pad. What we do know,is that below a certain level of wear, the effectiveness of the brake pad reduces significantly. The challenge faced by vehicle manufacturers is how to alert the driver once brake pads reach this point.

Early Brake Pad Wear Indicators and Sensors

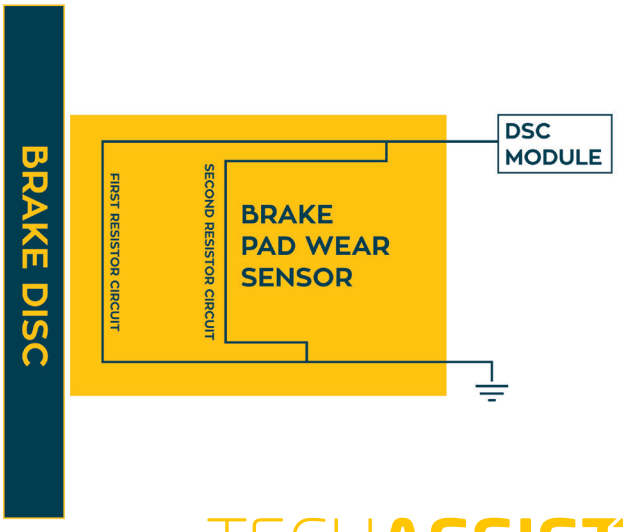
The most basic form of brake pad level indication is a groove cut into the profile of the pads. Once the groove is no longer visible, the pads are due for replacement. This of course involves a visual inspection so is not ideal. Another simple form of indication involves embedding a metal plate in the pad at the level where maximum wear is reached. At this point the metal plate is exposed and contacts the brake disc, creating a high pitch squeal. Effective, if a little crude.

The first brake pad wear 'sensors' (rather than indicators) appeared in the 1970's and consisted of a loop of wire with a low current passing through it. As the brake pad wears past an acceptable level, the sensor loop is exposed and contacts the brake disc. This creates an open circuit and a warning light is illuminated to alert the driver. These basic sensors were prone to failure caused by damage and corrosion and often replacement was avoided by simply splicing the two wires together, leaving the driver with no indication of brake wear.

Modern Brake Pad Wear Sensors

Today, the most advanced brake pad wear sensors are seen on German marques like BMW and Mercedes. These two-stage sensors have two parallel resistor circuits. One at a higher level and the second at the lowest acceptable level. Resistance in the sensor increases when the first circuit is broken and becomes an open circuit when the second circuit is broken.

By working in conjunction with the first circuit of the brake pad wear sensor and considering wheel speed, brake pressure and temperature information; the vehicle's dynamic stability control module (DSC) calculates the estimated brake pad lifespan and replacement intervals. This is often displayed to the driver via the car's information system.



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Replacing Brake Pad Wear Sensors

Brake pad wear sensors should be inspected regularly and changed if there are signs of damage to the clips or wiring. They should also be replaced every time the brake pads are changed. Unlike single stage sensors, there is no 'cheat' to avoid replacing a two-stage sensor and as they are relatively inexpensive component it makes perfect sense to replace them whilst work is carried out on the vehicles brakes.

Tech**ASSIST** TIP: Remember to reset the brake life service indicator after replacing brake pads and wear sensors.