Wheel Speed Sensor

General

Wheel speed sensor are fitted near the wheel hubs or differentials and records the wheels speed. They work with the anti-lock-brake system, traction control system and the GPS. In a combination of systems the anti-lock-brake system provides the data available, via data lines, for the other systems. There are two different types of sensors a hall sensor and an inductive pick up. Before checking it must be clear which kind of sensor is fitted.

Function

The changing magnetic fields in the sensor developed by the rotating sensor ring, fitted to the axle shaft, are send a signal to the ECU . The ECU detects wheel lock by monitoring the wheel speed and provides a breaking effect without locking the wheel.

Effects of failure

A faulty wheel speed sensor can cause the following:

- warning light illumination
- storing a fault/trouble code
- other systems not operating
- locking wheels during breaking

Causes of failure:

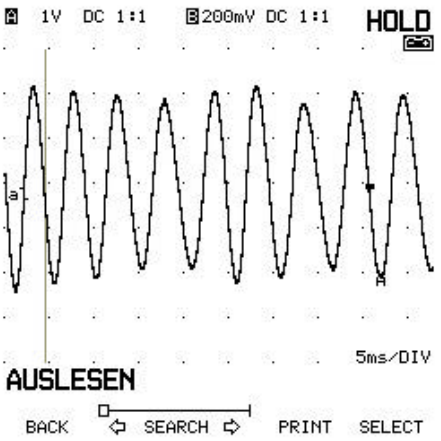
- internal short circuit/ open circuit
- soiling
- wire short circuit
- mechanical damage of the sensor ring
- faulty wheel bearing
- gap between ring and sensor incorrect

Diagnostics

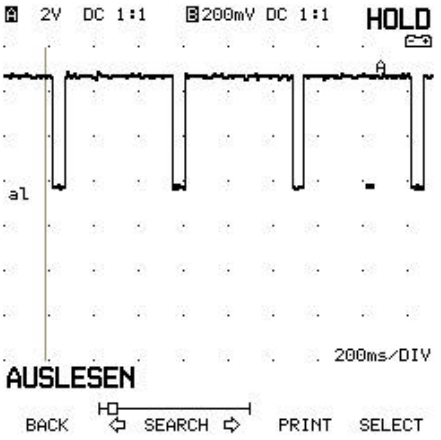
For fault recognition consider the following system tests:

- Read out fault/trouble codes
- Check electrical leads and wires of the plug and sensor for correct fitting and contact
- Check for damage and soiling
- check for correct gap

The fault recognition of the wheel speed sensor could be difficult because of the differentiation between a hall sensor and an inductive pick up, it is impossible to differentiate between them by sight every time. When they have three pins in the plug it is not sure which type it is, for that you need specific manufacturers data and details from the parts catalogue. If the type is not clearly identified don't use an ohmmeter because it can destroyed the sensor. When the sensor has a two pin plug it is usually an inductive pick up. By the inductive pick up you can check the internal resistor, a short circuit to earth and the signal. For this remove the sensor plug and check the internal resistance, if the measured value is between 800 and 1200 ohm (according the given value) the sensor is okay, if it is 0 ohm there is a short circuit and when it is Mohm there is an open circuit. For checking a short circuit to earth, measurement each pin of the sensor to vehicle ground, measured value > 30 Mohm. Measurement with an oscilloscope must have a strong enough sinus signal. AC voltage can be checked by measuring across the pins and spinning the wheel. With hall sensor you can only check the signal voltage (rectangular signal) and the operating voltage.



Signal Inductive Pick Up



Signal Hall Sensor

Directions for fitting

Watch correct distance between sensor and sensor ring.