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Technical writing sample: diagnostic procedure for wheel speed sensor

Writing prompt:

> Write a step-by-step diagnostic procedure for a two-wire wheel speed sensor with a short to ground.

My submission begins on the next page.

Diagnose a short to ground in a two-wire wheel speed sensor

A *short to ground* is a type of short circuit in which current flows unintentionally to the ground, resulting in an uncontrolled flow of electricity. A short to ground is commonly caused by a loose or damaged component making contact with a grounded surface. This electrical fault can damage components, cause systems to malfunction, and drain the vehicle's battery.

Tools and materials

- ☐ Digital multimeter
- ☐ Colored tape or a marker

Procedure

1. **Turn off power** ⚠
   To avoid hurting yourself or damaging the equipment, turn off power to the sensor before you begin.
2. **Set up the multimeter**
   a. Turn on the multimeter.
   b. Set the multimeter to the continuity test mode, usually indicated by a sound wave symbol.
   Note: On some multimeters, the continuity test mode is combined with the resistance test mode, usually indicated by the ohm symbol (Ω).
   c. Insert the plug end of the black probe into the COM jack on the multimeter.
   d. Insert the plug end of the red probe into the VΩ jack on the multimeter.
3. **Locate a ground point**
   Identify a ground point for the sensor. You will connect the black probe to the ground point in step 5.
   Note: In a typical two-wire sensor, the signal wire is also a ground wire. If the sensor is installed in a vehicle, you can use any unpainted metal on the vehicle's chassis as a ground point.
4. **Locate a test point**
   Identify a point on the sensor wiring that you suspect might be shorting to ground. You will connect the red probe to the test point in step 5.
   Note: Look for signs of excessive current flow, such as blown fuses, burn marks, or melted wire.
5. **Test the sensor**
   a. Touch the metal tip of the black probe to the ground point and hold it in place.
   b. Touch the metal tip of the red probe to the test point and hold it in place.
6. **Read the multimeter**
   a. If the multimeter beeps, there is a short to ground between the test point and the ground point. Go to step 7.
   b. If the multimeter does not beep, there is no short to ground at this test point. Identify a new test point and go to step 5.
7. **Isolate the fault**
   Disconnect components as needed to isolate the fault. Use colored tape or a marker to clearly label the location of the short.
8. **Put away the multimeter**
   Turn off the multimeter. Unplug the red probe, then unplug the black probe.