

Testing for a Speedometer Signal

One of the most common tech calls at Classic Instruments starts with, “My electric speedometer is not working!” Once power and ground to the instrument are verified, the next step is to determine if the speedometer is receiving a signal. With the flexibility of electric speedometers come many options for signal sources, each with its own method for testing. Testing can become complex with fancy electronic testing units, but a simple multimeter is all that is needed to verify that a signal is present.

Follow along with the guide below to determine what type of speedometer signal is present, and learn how it is tested.

1

Determine the signal source.

Generally most speedometer signals will be one of three types, for simplicity, we will call them one-wire, two-wire, and three-wire.

One-wire signals are typically found in late model computer controlled transmissions or fuel injected applications. This single wire is the signal wire.

Two-wire sensors are present in many manual transmissions, aftermarket cruise control, or older electronic speedometer kits. They have two wires, one is the ground wire and the other is the signal wire. The two wires can be reversed.

Three-wire signals are usually found in newer aftermarket speedometer kits and they have three wires. One wire is a reference power, one wire is the ground, and the third wire is the signal.

2

Use a multimeter to test.

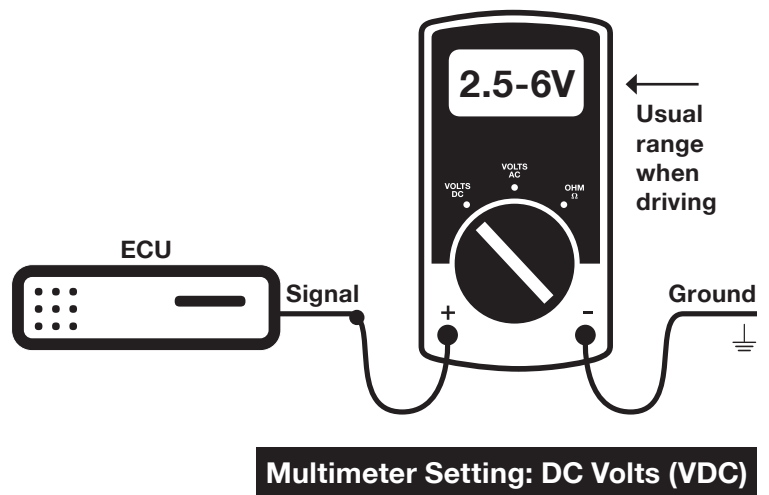
One-Wire Signals. (Figure 1.)

Most one-wire signals can be measured with a multimeter set to DC volts. Depending on the application, the reference voltage is usually 12 or 5 volts, and the signal measured will be approximately half of that when the vehicle is moving. At rest, the voltage present will be either the reference voltage or 0 volts. If there is no change in voltage or no voltage at all when the vehicle is moving, there is not a signal.

A few notes to consider when using a one-wire signal source

- Some engine computers do not require a speed sensor input to run. There must be a speed sensor (usually a two-wire) connected to the engine computer to get the speed signal from the computer.
- Often times, a re-worked factory computer has the speedometer function stripped, use the test above or consult the ECU provider/tuner to see if this function is present.
- Most standalone transmission controllers provide a clean electric speedometer signal that can be calibrated within the controller itself with the rear end ratio and tire size inputs.
- Many factory computer signals are considered “dirty” or have a lot of ignition interference present. A speedometer filter may be needed to clean the signal to a point that a speedometer can process the signal. Filter part no. SN79.
- Some factory computer signals either put out a really fast or really slow signal that is out of range for electric speedometers, an additional interface may be needed. Part no. SN74Z.

Figure 1. One-Wire Signals



Use a multimeter to test. (Cont'd)

Two-Wire Sensors. (Figure 2.)

The two-wire sensor works by generating AC voltage. The faster the sensor is spun or triggered, the more voltage is generated. Some two-wire senders have a shaft that is spun by a speedometer gear (Part no. SN96 & SN95) and some have a toothed wheel that spins next to a no-contact sensor (found in many Tremec transmissions or factory VSS).

Spin the sensor or drive the car with a multimeter set to VAC and connected to the two leads. At rest, the sender will produce 0 volts AC and this reading will increase with speed.

Three-Wire Signals. (Figure 3.)

The three-wire sensor (Part no. SN16) works by switching (pulsing) a reference voltage on and off as the sensor spins. This switching is fast, usually 8 or 16 pulses per revolution of the sender. The switching happens fast enough that it will register on a multimeter as approximately one half of the reference voltage since the "switch" is only on half of the time.

Spin the sensor with a drill and measure the voltage on the signal wire. If it is not approximately one half of the reference voltage, the sensor is defective.

Figure 2. Two-Wire Signals

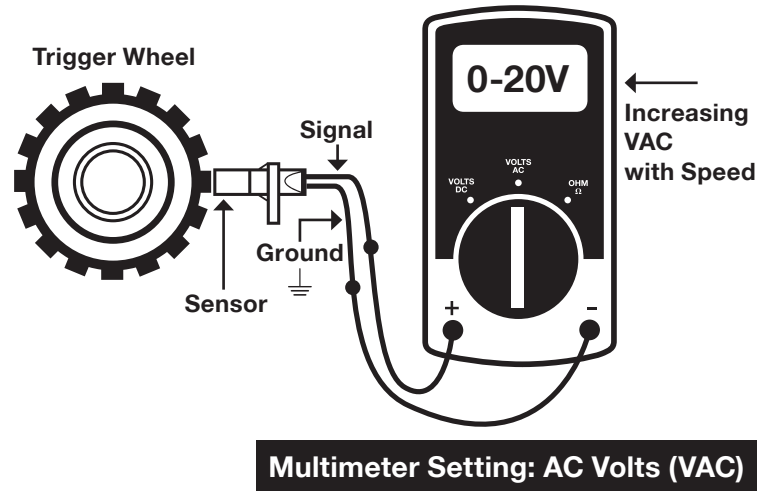
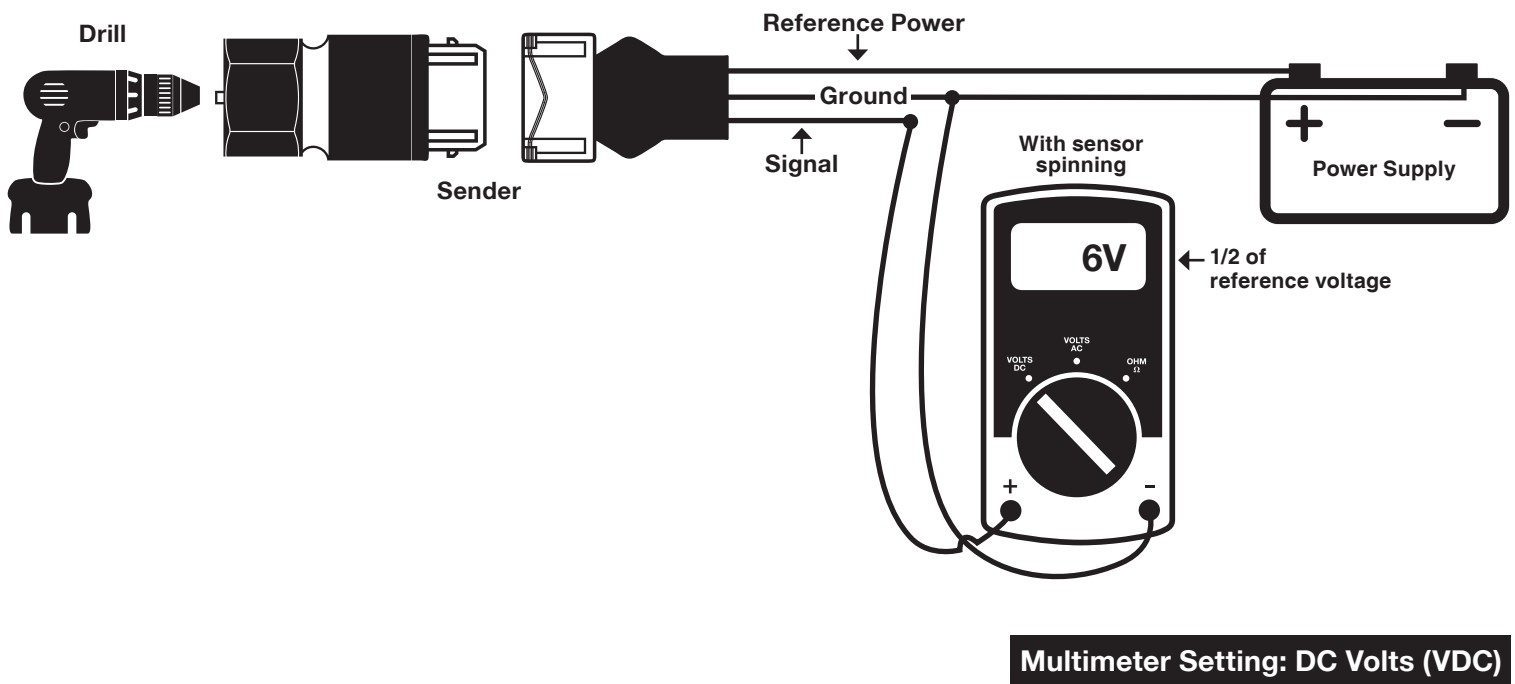


Figure 3. Three-Wire Signals



Additional Questions?

Please call tech support 844-342-8437