

Voltage Drop Testing Switch Contacts

We find switch contacts in: relays, turn signal levers, circuit breakers, head light, dimmer, and ignition switches, etc. The switch contact *surfaces* in all of these devices are made of conducting material, and, when new, should not cause voltage drops that affect the load. Do to constant use switch contact surfaces can become pitted. Pitting increases the “air gap” of the switch contacts and causes resistance. This resistance causes heat, which causes more resistance. Resistance anywhere in a current path causes a voltage drop. If the resistance of the switch contact surfaces becomes great enough, a voltage drop across the contacts that was not engineered appears. This voltage drop robs voltage, intended for the load, because it is in series with the load. The end result is that the load does not work as engineered.

If the switch is mechanical and is located on the feed side of the circuit, this quick test can tell you if the switch is bad.

1. Put the DVOM neg. (-) at battery neg. (-).
2. Put the DVOM pos. (+) on the wire connection from the switch that goes to the load.
3. The load must be operating.
4. A good switch is indicated when the meter reads within $\frac{1}{2}$ volt of what the battery voltage reads for a low amp circuit, and within; 1 $\frac{1}{2}$ volt of battery voltage for a high amp circuit.

If the switch is mechanical and is located on the ground side of the circuit, this quick test can tell you if the switch is bad.

1. Put the DVOM neg.(-) on battery neg. (-).
2. Put the DVOM pos (+) on the output of the load, (non-computer controlled).
3. The load must be operating.
4. A good switch is indicated when the meter shows no more than .100volts (100mvolts).

Note: if the “switch” on the ground side is in the computer (a transistor), the voltage drop between the exit side of the load and ground could be as much as 1.5volts. What you are reading here is the voltage required to turn on the transistor circuits.

Quick test for any mechanical switch using an ohmmeter.

1. Circuit is off.
2. Place the ohmmeter across the switch.
3. Make sure switch contacts are closed.
4. 1 ohm of resistance across any mechanical switch contacts tells you that you have a bad switch.

Be sure you know if the switch is “NO” normally opened, or “NC” normally closed.

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