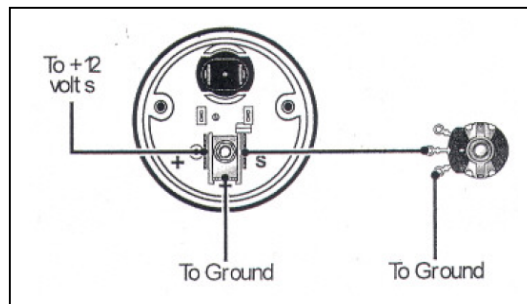


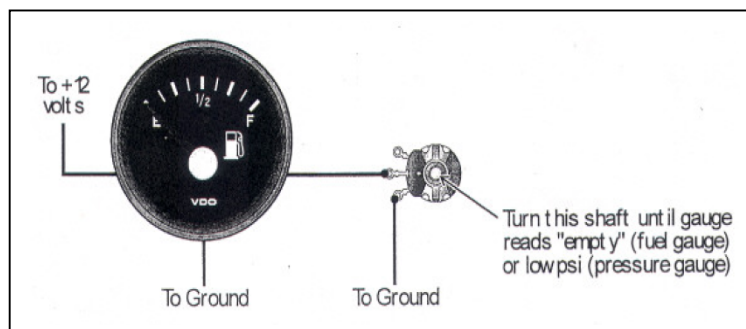
Product: General	Description Determine Sender Resistance needed for Gauge	Date 08/04/09
Type: Electrical		

To determine the resistance of a gauge, follow the steps below:

1. A potentiometer (variable resistor) is required. You purchase an inexpensive one at Radio Shack (500 ohm or 1000 ohm) [1 Kohm].
2. Remove the sender wire from the sender and attached to the middle terminal on the potentiometer. Make sure the other end of this wire is connected to the "sender" terminal on the back of gauge. Run another wire from one of the outer terminals on the potentiometer (either one) to ground.

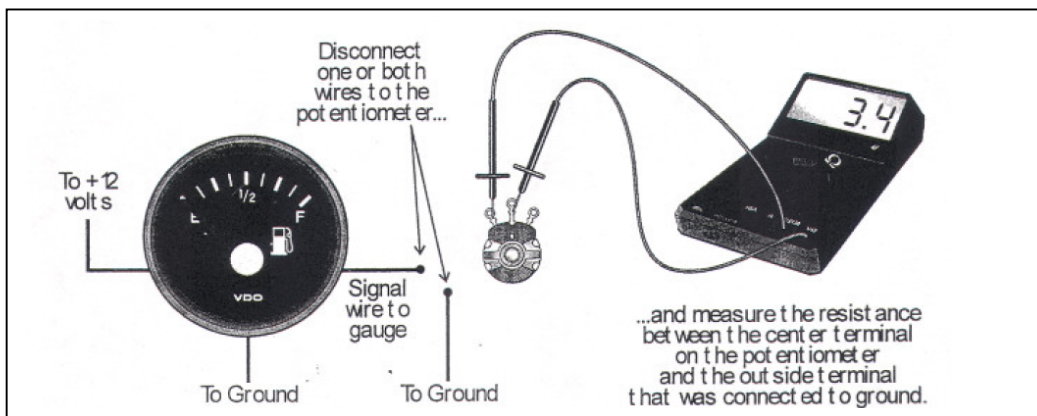


3. Make sure the +12 volts and a ground wire are also connected to the gauge on which sender Resistance (ohms) you're trying to determine.
4. With the key on (power turned on to the gauge), rotate the potentiometer until the gauge reads "empty" (for a fuel gauge) or "low" (for a pressure gauge)



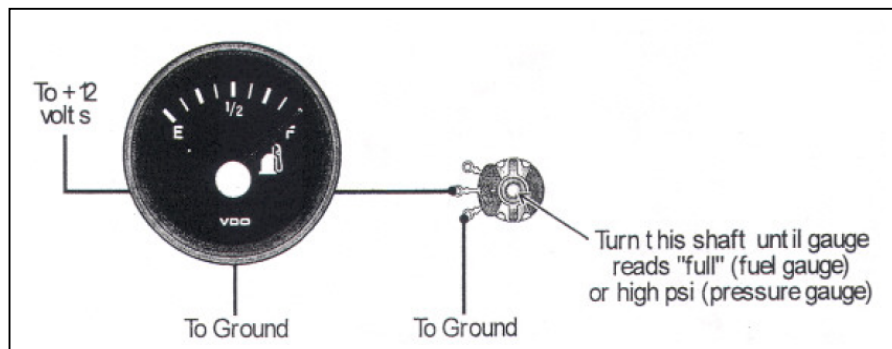
Product: General	Description Determine Sender Resistance needed for Gauge	Date 8/04/09
Type: Electrical		

5. Disconnect either one of the wires from the potentiometer. Take an ohm meter (Set to the lowest range possible) :



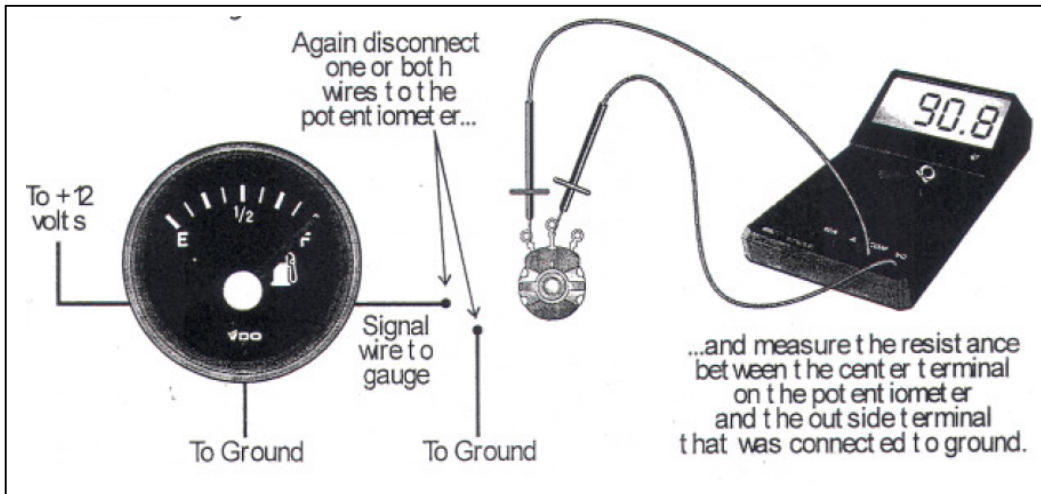
Write the value down.

6. Reconnect the wires to the potentiometer and rotate the pot until gauge reads "full" (for a fuel gauge) Or "high" (for a pressure gauge).



Product: General	Description Determine Sender Resistance needed for Gauge	Date 8/04/09
Type: Electrical		

7. Do the following:



**Again, write that value down**

You now have determined the resistance range of the sender you need for the gauge in question. For example, if the value for "Empty" read 3.4 ohms and the value for "Full" read 90.8 ohms, you would need a 0-90 ohm sender. If the value you wrote down for "Empty" was 17 ohms and the value you wrote down for "Full" was 188 ohms, you would need a 10-180 ohm sender. The values listed for each sender are nominal, and vary plus or minus 20 ohms or so at either end. If you perform this test as described, it is a fail-safe method for determine the value of the sender you need.

Here is a table of the most common sender values:

10 Ohms	to 180 Ohms	VDO Ohm Range
0 Ohms	to 30 Ohms	GM Range (before 1965)
0 Ohms	to 90 Ohms	GM Range (after 1965)
16 Ohms	to 158 Ohms	Ford Range (after 1987)
73 Ohms	to 10 Ohms	Ford Range (before 1987)
73 Ohms	to 10 Ohms	VW Beetle Range
240 Ohms	to 33 Ohms	U. S. Ohm Range
10 Ohms	to 180 Ohms	VDO Ohm Range
240 Ohms	to 33 Ohms	U.S. Ohm Range