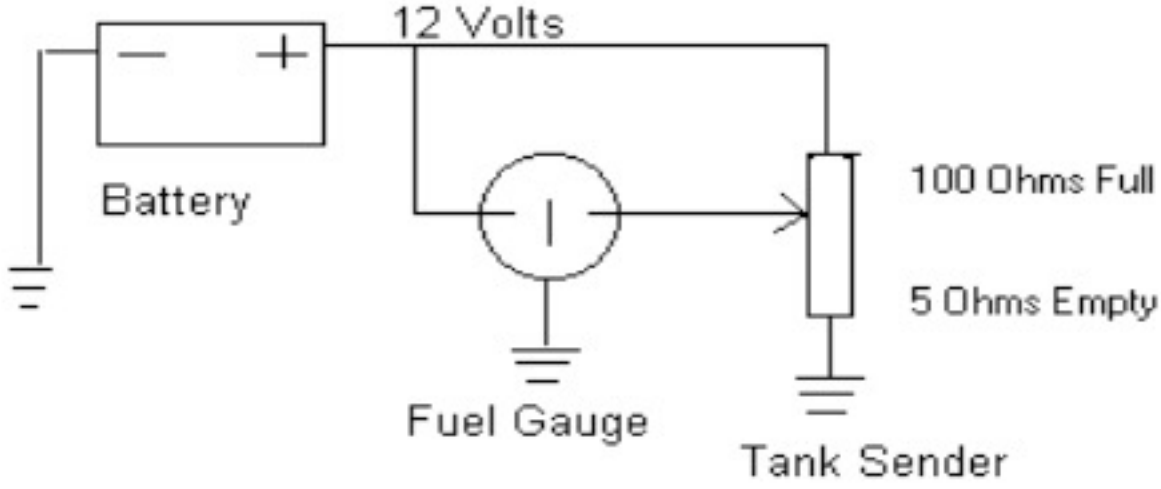

63-67 Corvettes only

For C2 Corvettes:

At the sending unit, there are three connections, a black wire to ground, a tan wire from the slider and a pink wire that supplies 12 volts to the sender. 63 cars use Green for Pink and Yellow for Tan. The power connection on the sender is smaller than the slider connector.

You will note from the diagram that the top of the sender and one side of the gauge are both hooked to the battery.

A constant current flows through the sender resistance unit. This can be calculated using Ohms Law (I=E/R) or about 0.125 amps. The power consumed by the circuit is given by P=EI giving about 1.56 watts. Kirchoff's Law states that the voltage drops around a circuit must equal the applied voltage. Since the only resistance in the sender circuit is the resistance unit of the sender, the entire 12 volts must be dropped by the sender. The slider picks off the voltage drop of the sending unit as it moves from full to empty. You can use Ohms Law (E=IR) and plug in various values of resistance between 5 and 100 ohms to determine the actual voltage drop as the slider moves.

Referring to the above figure, you have one side of the meter hooked to battery voltage and the other side hooked to the slider. The voltage at the slider terminal will be less than the battery voltage since the sender resistance is dropping some of the voltage. As the fuel level changes, the slider picks off more or less voltage depending on the tank level and the gauge sees a difference in voltage proportional to the position of the slider. The gauge is responding to the difference in voltage between the battery voltage and the voltage picked off by the slider.

To test the sender there are two measurements. Disconnect all leads to the sender. Measure the resistance between the Pink lead terminal of the sender and the ground lug of the sender. This should read about 100 ohms.

Connect the ohmmeter between the Pink terminal and the Tan terminal on the sender and have someone carefully move the float arm through its full range of motion. Do not use a metal rod as this may cause a spark or ground out the sender, use a piece of wooden dowel. The resistance should vary between 100 and about 5 ohms. If these resistance values are correct, the sender is working properly.

Measure the voltage at the pink lead of the wiring harness with a voltmeter and the ignition ON. This should be battery voltage. Turn off the ignition and measure the resistance to ground at the black lead of the wiring harness. This should read zero.

Connect the Pink and black leads to the sender. Connect a voltmeter to the sender terminal for the tan lead and to ground. Turn ON the ignition and move the float arm through its range of motion. As you move the float arm from the full to empty position the voltage should decrease from near battery voltage to near zero. The actual values you get will be dependent on battery voltage and the resistance characteristics of the sender. In general, you should get about 10 volts when full and zero volts when empty.

If all these tests are OK, then the problem is in the gauge or wiring. It is not necessary to use a potentiometer to test the gauge or wiring since you have one built in to the sender. If the sender checks out OK then you can move the float arm of the sender and check the gauge.

If you want to substitute a potentiometer in the circuit in place of the sender, obtain a 100 ohm 2-watt potentiometer. Set the pot at 100 ohms and mark the position of the pot shaft. Set the pot to 5 ohms and also mark this position. Set the pot back to 100 ohms. Solder three leads to the pot with alligator clips on each lead. Connect one of the end leads to the pink wire, one of the end leads to ground and the center lead to the tan wire. Adjust the pot to obtain the gauge readings for empty, ¼, ½, ¾ , and full marking the position of the shaft for each gauge reading. Disconnect the pot and read the resistance between the lead you connected to the pink terminal and the center lead of the pot.

The resistance of the sender is fairly linear. If you plot the values you obtained using the pot on a graph, you should get a straight line, more or less.

Unlike the temperature gauge, corroded contacts can cause the fuel gauge to read either high or low depending on which side of the gauge the bad connection is located.

If the gauge continually wants to read high, then the bad contact is on the battery side of the gauge. If the gauge continually wants the read low, then the bad contact is on the sender side of the gauge. Recall that the meter is responding to the difference in voltage across the meter.

A bad ground could also insert some resistance into the circuit. In this case all of the voltage would not be dropped across the sender since the resistance added by the bad ground will also drop some voltage. In this case the gauge will read lower than the tank level.