Diagnostic Help
The fuel gauge diagnostics on all cars 1977-1982.

Hopefully by following the suggestions on this publication, you will be able to diagnosis any dash gauge problem and/or a problem with your gas tank sending unit problem.

How it Works

The fuel gauge works off a basic system that requires three inputs: 12 volts, Ground and an ohms signal input from gas tank all of which are feed to the gauge from the center gauge cluster plug in connector. (Shown below).

The Power: The gauge is powered by voltage supplied from the ignition switch. The schematic shown in the following pages will detail the 12 volt power route from the switch to the gauge.

The Signal or Ohms Resistance: The gauge receives ohms resistance from the sender on what is referred to as the ohms or signal wire. This wire runs from the gas tank sending unit straight to the dash gauge. The only connector between the sender and the dash unit is the front to rear connector in the harness. The location of this connector is detailed below.

The Ground: The ground for the fuel gauge is supplied by the printed circuit which is pinched between the upper nut and lower nut on the gauge stud.

Now let me try to explain the Signal in more detail. Your gas gauge requires resistance to operate properly. This resistance is what makes the dash gauge move from empty to full. Resistance change is created when the float on the sending unit moves up and down. This resistance is measured in what is called Ohms. If you need a better explanation of what an ohm is, please refer to Wikipedia. The lower the float level the lower the resistance, and the higher the float level the higher the resistance or ohms reading. For any fuel gauge from 1963-1982 to function properly you must have 0 ohms when empty, 45 ohms at one half a tank and 90 ohms at full tank.
The most common problem diagnosed in a fuel gauge system is a pegged needle to the three o’clock position. When a gauge reads this there is usually an ohms signal problem either at the dash unit or the sending unit.

Always pay attention to what the dash gauge is reading with the key on. The needle position is a tale sign of what the problem may be with the dash unit. This suggestion sheet almost needs a flow chart! There is no way for us to know what your gauge needle response is so at anytime feel free to move from test to test until you isolate your problem.

**The Basic Connection’s and Components**

Below you’ll see the printed circuit both new and installed. I’ve noted in color the connections (circuits) that pertain to the fuel gauge. Both pictures are shown as if you were looking at the back of the center cluster.

- **Red** = Power
- **Blue** = Ohms Signal
- **Black** = Ground

On the gauge they will appear in this fashion.
Below are the actual connections on the dash gauge.

The Blue Signal comes from the gas tank sending unit. The wire that supplies the ohms reading runs all the way from the back of the car to the kick panel connector and from this connection straight to the dash gauge through the printed circuit.

The Red Power is supplied from the ignition switch to the fuse panel and then feeds power to the fuel gauge through the printed circuit.

The Black Ground. The printed circuit connector contains a ground for this gauge unlike the 68-76 style which grounds through the temperature gauge. Between the ground stud nut and the metal gauge housing is a flat washer shown below as B-1

All needed inputs on the small gauge cluster are supplied by the main cluster connection shown below.
Below you will see the center dash connectors for each individual car. They are shown as if you were sitting in the car and in each picture you will notice I have marked the three pins that deal with the fuel gauge.

77-82 fuel gauge itself has a metal washer (shown in picture B-1) on the grounding stud and it is located under the first retainer nut. Picture B-2 illustrates the resistor on the back of the gauge. Picture B-3 illustrates the typical gauge nut used on 1977-1982 fuel gauges.
The Picture C-1 below is the basic schematic for the fuel gauge!

![Fuel Gauge Schematic]

The picture below shows the Gas Tank Sender Schematic for the 77-82 cars. They are different only in the color of the wire at the ohms post on the sending unit.

![Gas Tank Sender Schematic]

Shown below, you can see the wire connections on the fuel tank sending units for the appropriate year. Note: ohms wire is tan on 75-77 and pink on 78-82.
Do you have the tools?

To diagnosis your gauge you are going to need what is called a Multi-Meter as shown below.
Testing the Fuse

The first place I want to start is the fuse! Always check the gauge fuse before you ever move forward. If your multi meter is equipped with an audio setting as the one above is, you won’t have to look at the meter to test for continuity. If you place the setting in the audio mode (the red area just to the right of the 200 above), it will allow you to hear a tone when you test if continuity is present.

Go to the fuse and with your meter in the audio mode and touch both sides of the fuse. If the fuse is good you will hear tone. If it is defective replace the fuse and test your gauge again.

Before moving forward, move your multi-meter to test for voltage. Test both sides of the fuse holder for current! Fuse holders can corrode and not make a good connection to the fuse even when the fuse is good. If you find the fuse holder clips are corroded on this fuse it is also a great idea to check each and every one in the fuse panel.

Testing the Sending Unit in the Tank.

Testing the sending unit in the tank is easy! Remove the gas cap and with a dowel rod, try to estimate how much fuel is in the tank. This will be difficult since later cars have the neck with the smaller hole and trap door. Take your time and try to make a close estimate.

Pull off the wire shown as number 1 in the picture below.

Now with your multi-meter in the 200 setting, test the output on the NUMBER 1 STUD you removed the ohms wire from. The sending unit should give you a reading from 0 – 90 ohms. If the sending unit is not putting out an ohms reading, pull the ground wire number 6 off the sending unit grounding tang and test it for a good ground.
If you verify the ground is good and there is not an ohms reading on the stud 1 on the sending unit the sending unit is defective. If the ground is defective or bad run a new ground wire and test again.

**Empty Tank Reading**

If you test the sending unit as shown below, this is what you would see when the gauge is in the empty (0 ohms). PLEASE NOTE: The reading .4 is less than one ohm. Do not confuse this with 40 ohms. The picture reading below 00.4 is equivalent to Zero ohms.

Test to sender ground first, test to the harness ground second. Harness ground would be the wire that is plugged into the ground terminal.
Full Tank Reading

Test to sender ground first, test to the harness ground second. Harness ground would be the wire that is plugged into the ground terminal.

Open Circuit Reading

If while testing your sender you see this reading and you have a verified ground, the sending unit is damaged.
Testing the Wire from the Tank to the Dash.

A: If you have an ohms reading at the tank turn the ignition switch to the on position in the car and remove the number 1 wire on the tank unit. If you remove this wire from the sender the dash unit should peg past full to the 3 o’clock almost 4 o’clock position. If your dash unit responds in this manner you have also verified you have power running to the dash gauge.

B: If the dash unit moved to full then ground the number 1 wire and see if the gauge moves to empty. By ground the wire I mean to touch it to something grounded! You may have to insert a small bolt in the end of the connector and touch it to the frame. If the dash gauge moved to full, on the A test, and moved to empty on the B test then you should re-test the sending unit and the connections for the wires to the sending unit. They may be corroded, the ground may not be making good contact or there may be a problem in the end of the number 1 wire not allowing it to make good contact to the stud. If the dash unit did nothing then lets move closer to the dash unit.

Testing the Wire from the Tank to the Main Harness Connection.

Assuming you did have an ohms reading on your gas tank sending unit but the dash unit did not peg when you removed the wire in the test above! Test the ohms wire at the front to rear harness connection for an ohms reading (shown below). This is done on the number 6 side of the connection and the same color wire as the number one you removed from the sending unit test above. On 1977 cars this is a tan wire; on 1978-1982 cars this wire is pink. If you do not have an ohms reading at this connection, you have a defective wire between the sending unit and this connection.

![Diagram showing wire colors at the front to rear connector broken down by year. As you can see, the colors are shown for each year, from 1977 to 1982, with labels for each year’s specific color scheme.](image-url)
see, the 1977 used a tan wire and there is only one tan wire in the connector. The 1978-1979 cars used a pink wire and there is only one pink in the connector. 1980-1982 cars used pink and there are two pink wires in this connector. On 80-82 cars make sure you have the correct pink wire, it is the outer most pink wire in the connector.

**Remove the dash cluster from the car.**

If you are to this point, you’ll need to REMOVE the dash cluster center bezel from the car. You can find a link [HERE](#) for removal. This is the dash pad removal instructions but the center cluster is covered between pages 3 and 5.

Once you have the dash bezel out of the car un-plug the connector from the back of the printed circuit. The connector should look like this. It is a pinch connector with two rows of connection pins.
Below, you will see the connector pins as seen while sitting in the front seat of the car. Notice that on all cars the only pins used in the fuel gauge are located on the passenger side of the connector starting with the second pin as the power supply, the third is the ohms signal and the third is the ground.

The wires on the connector should be as illustrated above. The pink wire in the number two connection from the top is your power wire from the ignition switch; the tan or pink wire in the number three position is the ohms wire and it is a straight wire from the gas tank sending unit. The black wire is of coarse your ground wire.

As mentioned in the last test, if you have ohms at the sending unit and at the connection of the front and rear harness’s then you should also have ohms at this location in the connector. If you do not have ohms at this connector and you have it at the front to rear connector, you have a defective wire between the dash unit and the front to rear harness connection.
Testing the Power Wire

Testing the power wire at the main gauge connection for 12 volts is a must at this point. Again, I have no idea what your gauge is doing but you should have 12 volts on this connector when you turn on the ignition. If you do not have power on this wire the gauge will not do anything! If you have tested the fuse, the fuse holder clips and both are good; you should have power on this wire with the key on.

You can run a continuity test between the fuse and the end of this wire but if you do not have power on this wire there really is no need to run a continuity test, there is a break in this wire between the fuse panel and the dash unit.

![Multimeter measuring voltage](image)

**Driver Side**  **Passenger Side**
(Looking at the connector)

**Verify your gauge is grounded!**

Simple test! The fuel gauge is grounded through the forth pin from the top on the center connector right hand side. If you have power on the connector in the above test, use this pin as the ground. If you have voltage using this as a ground, then your ground wire is good.

If you do not have a good ground then you have a break in the ground wire and will need to isolate this problem. You can run an independent ground for testing by splicing a verified ground in this position.
Testing the Resistor

If you have power at the connector and you have an ohms reading and a verified ground. Next test the resistor on the back of the gauge. Between the signal stud on the gauge (ohms wire) and the power stud you will find the resistor. If the resistor is defective, the highest the dash unit will read with a full tank (90 ohms) is just a shade above the ¼ tank mark as shown below.

This resistor should test approximately 90 ohms. On the test resistor we used, it tested right at 94 ohms. This test is done with the resistor off the gauge. Test this resistor in the 200 setting on your meter. *Resistor ohms can vary per year.

Resistor tested off the gauge aprox. 94 ohms
Resistor tested on the gauge aprox. 47.7 ohms.

Test Here on Gauge

Installed 47.7 ohms.

Test Here off Gauge

Not installed 94.0 ohms.
Sequence of Installation

This has been illustrated to show you how the parts of the dash unit should be assembled. It is only done in case you removed the dash unit from the metal housing for testing and just don’t remember how it went back together.

Install Gauge in Metal Housing.

Install Resistor on gauge as shown

Install Resistor Nuts and Ground Washer

Install Ground Nut

Install Printed Circuit as Shown.
Common signs and how to read them!
Some quick test

A fuel gauge can be tested on your bench without any high tech equipment. Use the picture below for reference points.

Run 12 volts to number 2, Run a ground to number 1. This should make your gauge read like this.

Next move the ground wire from number 1 and move it to the number 5 stud with the power still on the number 2 connector. This should make your gauge read like this. This is a gauge with power and ground but missing signal input.
A dash unit that is reading like the one shown below in picture G-1 is a gauge that usually has power and a good ground but is missing the input signal. This can be caused by:

1: Break in the wire from the sending unit to the dash unit.
2: A Ground off the sending unit or bad ground on the sending unit at the tank. (Always remember, for a potentiometer to send out ohms it must also have a ground).
3: Defective sending unit.

![Picture G-1](image)

A dash unit that is reading like the one shown below in picture G-2 is a gauge that usually has power and a good ground but has a grounded input signal. This can be caused by a wire being shorted to ground somewhere in the system. Always remember grounding the ohms wire either at the tank or somewhere else in the system with good power and ground will cause the gauge to read read empty!

![Picture G-2](image)

**Good luck and I hope this helps.**

As with all help and repair suggestion we publish, they are merely . . . Suggestions. Please read carefully and if you do not understand something feel free to contact us at the customer service email address listed at the top of the page.

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