

Quick Multimeter Instructions

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All RVers should carry a multimeter, also called a test meter, voltmeter, etc. Just about any meter will work for troubleshooting an RV. You can purchase one for less than \$10. at various locations such as Amazon or Harbor Freight. Spending big bucks is not required as you DO NOT need any of the fancy extras some meters have.

OK, you now have a meter but are unsure how to use it. This quick guide will get you going fast. These things are safe and very easy to use. Try the following to become familiar with your new meter.

Meter Setup

If not already installed, insert the meter battery into place. **NOTE:** If you ever notice your meter not working properly, such as weird measurements, try replacing the battery. When the battery gets weak the meter can produce some strange results.

You will have 2 meter leads – one black and one red. Plug the black lead into the “**Com**” connection. Plug the red lead into the connection for measuring voltage (NOT “**A**” or “**mA**”) labeled **Input**, or **V**, or **VΩmA**. As long as you don’t plug into a connection intended only for current readings, such as **A** (amps) or **mA** (milliamps), you are good to go. You will probably never use the current measuring function.

Let’s Measure Something

Find a simple battery (take it out of your TV remote if needed) – AA, AAA, C, D, or 9 volt. Turn the meter on and set to measure DC Volts. Typically this setting will show **DCV** or **V—...** and then select a voltage maximum of **20** (if required). Touch the black lead to the negative terminal of the battery and touch the red lead to the positive terminal. The meter will display your battery’s voltage.

Just for the fun of it, touch the black lead to the positive terminal and the red lead to the negative terminal. No you did not destroy your meter, it will just display a negative symbol before the voltage reading. All this means is that your leads are reversed. You will never be measuring negative voltages in an RV so if you ever see the negative symbol on the display you simply have your leads backwards.

Measuring a 12 Volt Vehicle Battery

The setting you just used for a little battery will be the same for a large 12 volt battery. Touch the red lead to the positive terminal and the black lead to the negative terminal of the battery. Battery voltage is an important test!



Voltage	State of Charge	Status
12.6+	100%	Normal
12.5	90%	
12.4	80%	
12.3	70%	Weakness
12.2	60%	
12.1	50%	Slow cranking
11.9	40%	No cranking
11.8	30%	
11.6	20%	
11.3	10%	
10.5	0%	Dead



Measuring a 120 Volt Power Outlet

Measuring an electrical outlet is completely safe as long as you do not touch the metal portion of the meter leads. It is very easy to insert the leads into the electrical outlet for measurement.



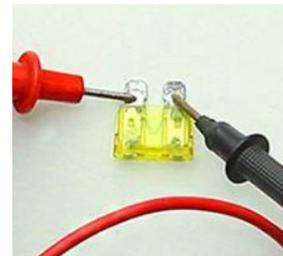
The meter setting will need to be changed to **AC volts** which may be indicated by **V~**. The range will need to be set to **200** if the meter has range selections. After setting the meter, push the lead tips into the outlet and take your measurement.

Testing A Fuse

The OHMS measuring function of your meter can be used to test a fuse. That would probably be the only reason to use this setting. **NOTE: Never** set the meter to measure resistance (OHMS) and touch the leads to a circuit that has any voltage on it. Doing so could damage the meter. If you want to test a fuse, remove it from the fuse holder.

Set the meter to measure **OHMS Ω** and select the lowest range, typically **200 ohms**. Do not select 200K or 200M as those may not yield the results you need. Touch the meter tips together to see what the display will read. This reading is what a good fuse should show which is basically a dead short. When you separate the tips the meter will display an "open" circuit which is infinity ohms. This is what a bad fuse will display.

Touch the tips of the leads to the metal fuse connections and see what the meter reads. A good fuse will display close to 0 ohms while a bad fuse will display an open circuit. **NOTE:** When making resistance measurements DO NOT touch the metal on the fuse or probes as the resistance in your body will alter the readings.



Other Meter Functions

These test meters are capable of other measurements such as current, frequency, diode tests, etc. Most of these are useless in RV troubleshooting. If you wish to measure current, I recommend buying a meter that has a current measuring clamp that can measure both ac and dc current. Not all do dc. Although the cheap meters can measure current you have to connect them in-line with the circuit which can be cumbersome. Also, they are usually limited to 10 amps maximum.



Summary

You should now be able to use your new test meter to troubleshoot an RV. Keep it with you as you will never know when you will need it. Also, have a new spare battery available for it.

This is Part 1 of a 2 part series. The second article will detail troubleshooting RV systems.