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QWIK TECH TIPS

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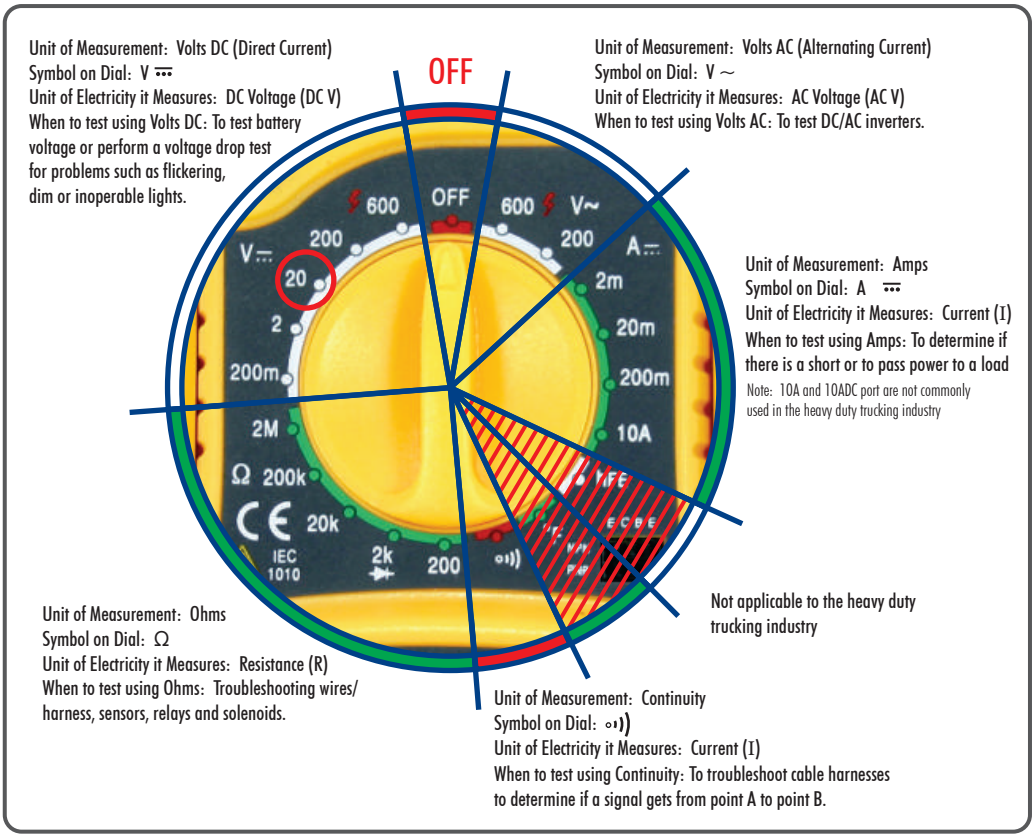
Electrical Measurements on a Multimeter

An understanding of electricity works hand in hand with the use of a multimeter. Electricity is characterized into three basic units: voltage **(V)**, current **(I)** and resistance **(R)**. Voltage is measured in **(AC or DC) volts**, current is measured in **amps** and resistance is measured in **ohms**. To help understand these terms think of electricity as water flowing through a series of pipes. Voltage is comparable to water pressure, current is comparable to the rate the water is flowing, and resistance can be compared to the size of the pipes.

Below is a graphic showing the dial measurement settings; volts, amps and ohms, and their relation to the units of electricity they measure (voltage, current and resistance). In the heavy duty trucking industry, testing for direct current voltage is probably the most commonly performed diagnostic with a multimeter because the power supplied by the tractor batteries to the rest of the vehicle is direct current **(DC)** voltage.

Determining and Setting the Range Within a Measurement

Most tests performed with a multimeter have a parameter of a minimum and maximum range in which the unit of electricity can be accurately measured. Once you know your parameters, the dial should always be turned to the first measurement that falls just above the test parameter's maximum range output. For example, when measuring a vehicle's battery, its maximum output should be no more than around 12.6 volts DC (when the vehicle is off). So referencing the graphic, the dial would be set at 20V DC (circled in red). It's important to make sure that the dial is set within the correct range, for that measurement. If you do not set the dial to the correct measurement range, the reading will display a 1 (one). Some advanced devices are "auto-range", which means you set it to the desired unit of measure and the multimeter automatically adjusts the range for the test being performed.



TIPS

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- An understanding of electricity works hand in hand with the use of a multimeter.
- Electricity is characterized into three basic units: voltage (V), current (I) and resistance (R).
- Voltage is measured in (AC or DC) volts, current is measured in amps and resistance is measured in ohms.
- Most tests performed with a multimeter have a parameter of a minimum and maximum range in which the unit of electricity can be accurately measured.
- Voltage is equal to the current times the resistance V=IR

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