

BASIC ELECTRICAL TERMINOLOGY

In any discussion of electricity, there are three basic terms you will need to understand.

CURRENT

VOLTAGE

RESISTANCE

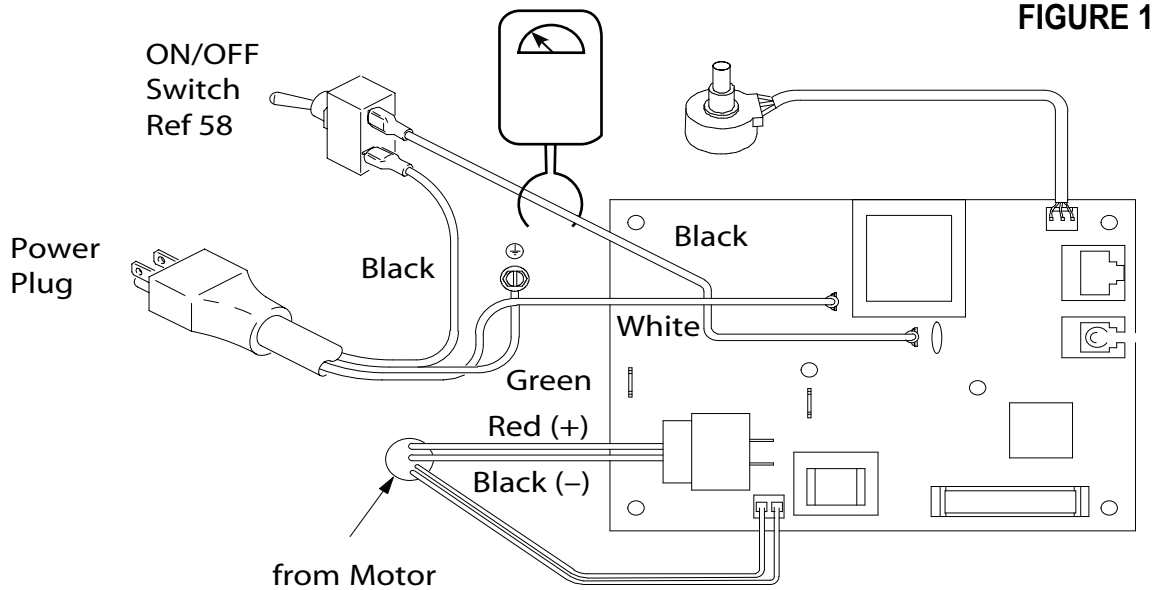
CURRENT:

Current is the movement of the electrical charge.

Current Flows through the wires from the power source to the load.

Current is measured in AMPERES (AMPS, A or I). See Figure 1.

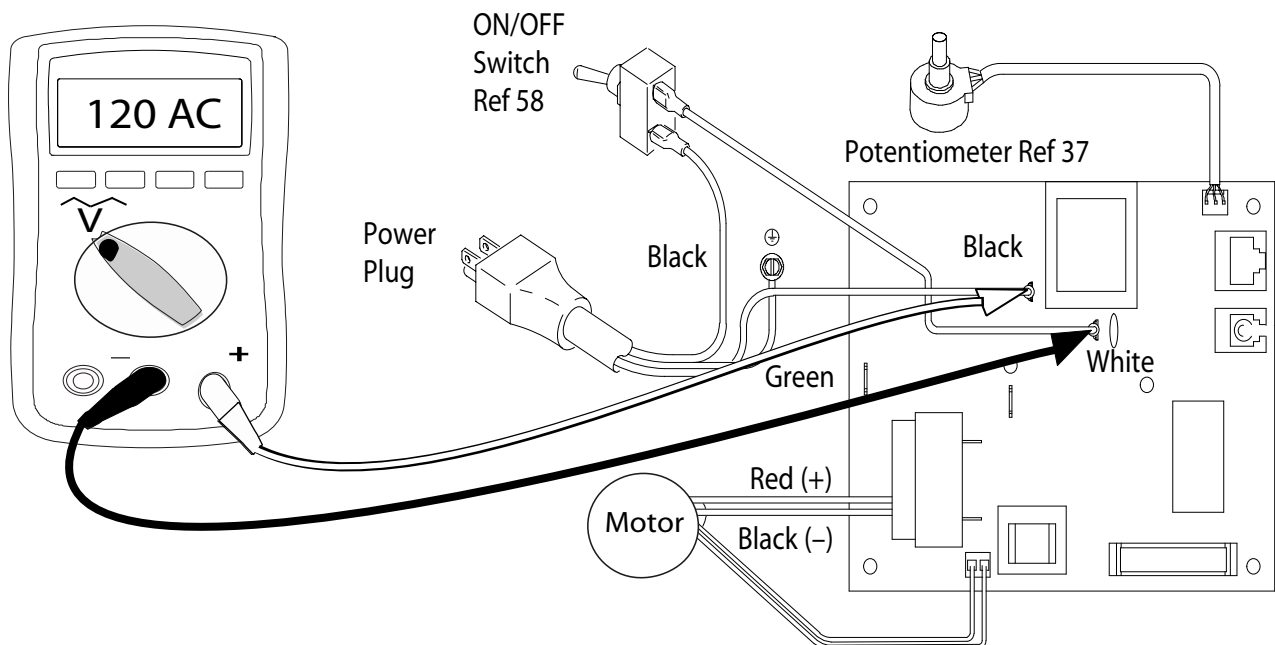
NOTE: Meter is only clamped around one wire.



VOLTAGE:

Voltage is the force that causes current to flow in a circuit.

Voltage is measured in VOLTS (V or E). See Figure 2.



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RESISTANCE:

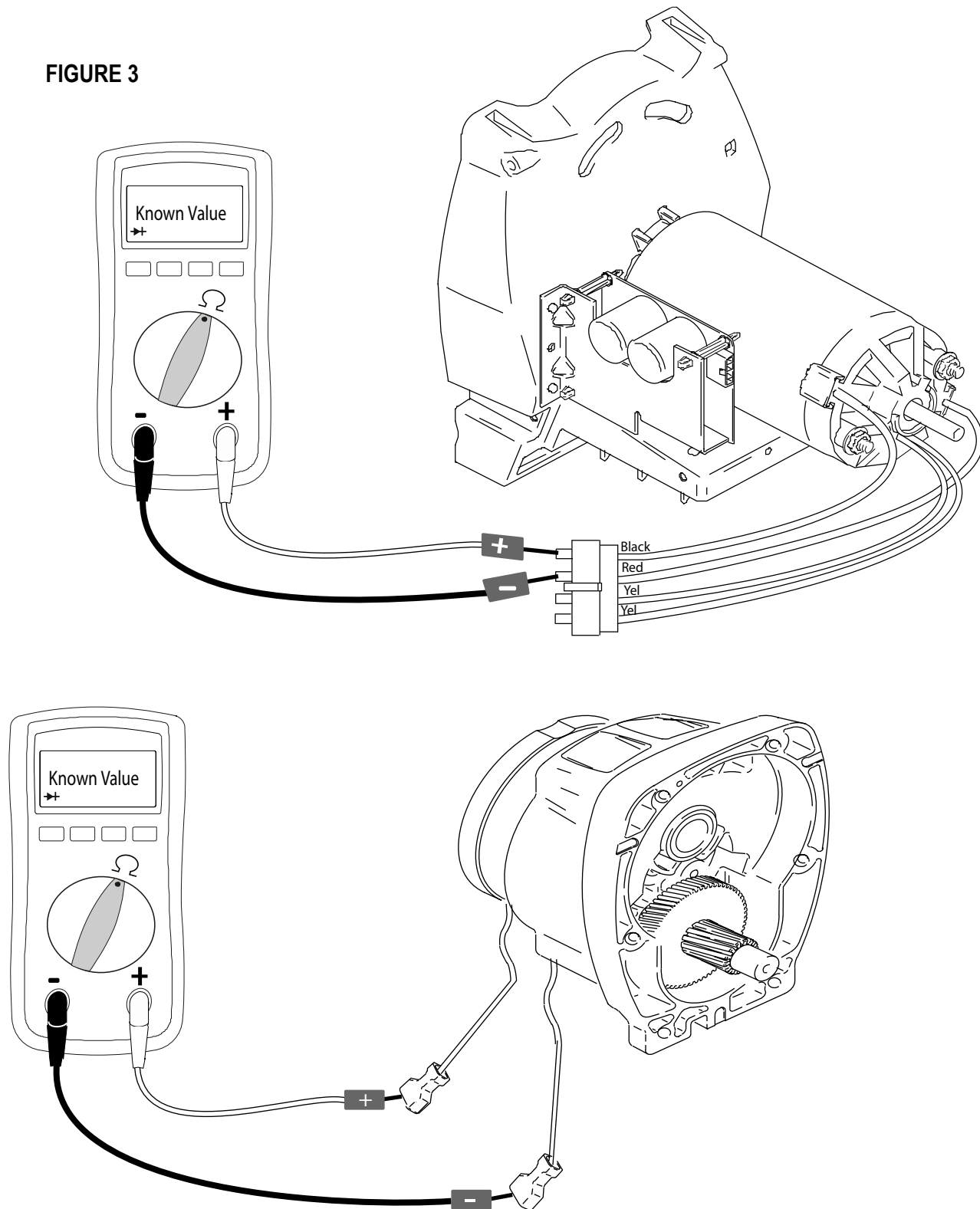
Resistance is anything that causes an opposition to the flow of current in a circuit.

Resistance is used to control the amount of voltage and/or amperage in a circuit.

Resistance is measured in OHMS - Ω . See Figure 3.

A common component check would be motor and clutch field windings.

FIGURE 3



CONTINUITY TESTING

Checking “continuity” is one of the most common tests in electrical troubleshooting. Continuity is the ability of a wire or electrical component to conduct current. When you use a continuity tester, you connect a circuit (the continuity tester) that you know works, to a wire or a component that may or may not work. The continuity tester will tell you if the wire or component is capable of conducting current. Continuity testers are available at almost any hardware store.

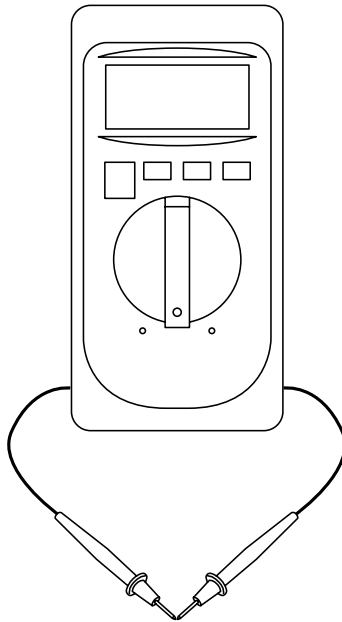
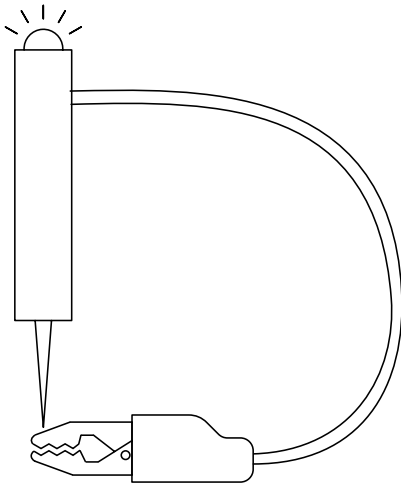
A volt-ohmmeter or VOM can also be used to check continuity. This meter can be purchased at most electrical or electronic supply stores.

To test a component for continuity:

- 1 Check the tester by connecting the leads.

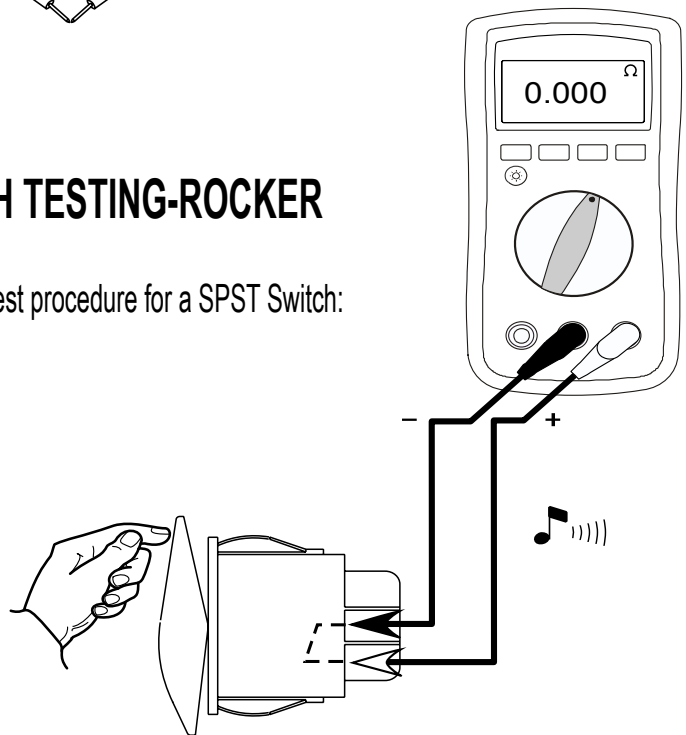
* If using a test light the light should turn on.

* If using a digital volt-ohmmeter, the screen should show 00 if OL appears the meter needs to be repaired.



SWITCH TESTING-ROCKER

Common test procedure for a SPST Switch:



WIRE CONTINUITY TESTING

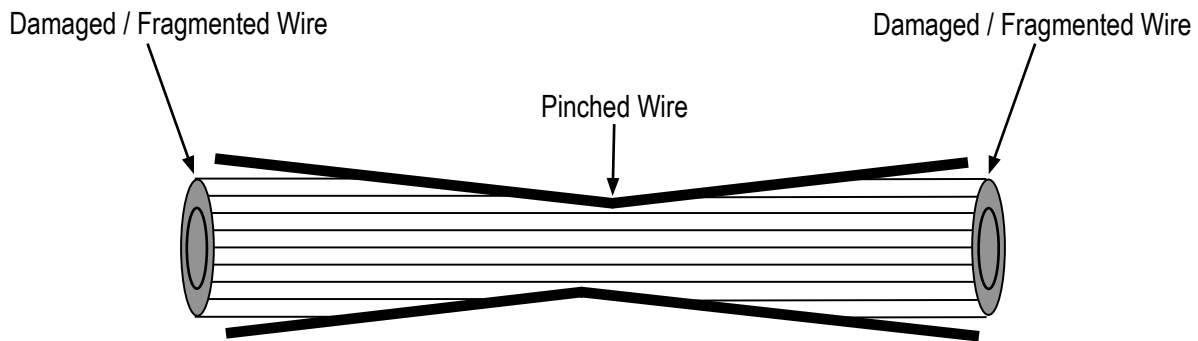
Continuity testing will “NOT” find wire fragmentation!!

Example:



120 Vac input static voltage and drops to 119Vac load voltage.

A good piece of wire will carry line and load voltage.



120 Vac input static voltage and drops to 76Vac load voltage.

Other causes:

Poor stripping of outer insulation.

Poor crimp.

A defective piece of wire may carry line voltage but will “NOT” carry load voltage

GROUND TESTING

Improper installation or alteration of grounding plug could result in risk of electric shock, fire or explosion that could cause serious injury or death. The other function of the grounding plug is to protect the control board from static build up. If the plug is missing this could cause permanent damage to the control board.

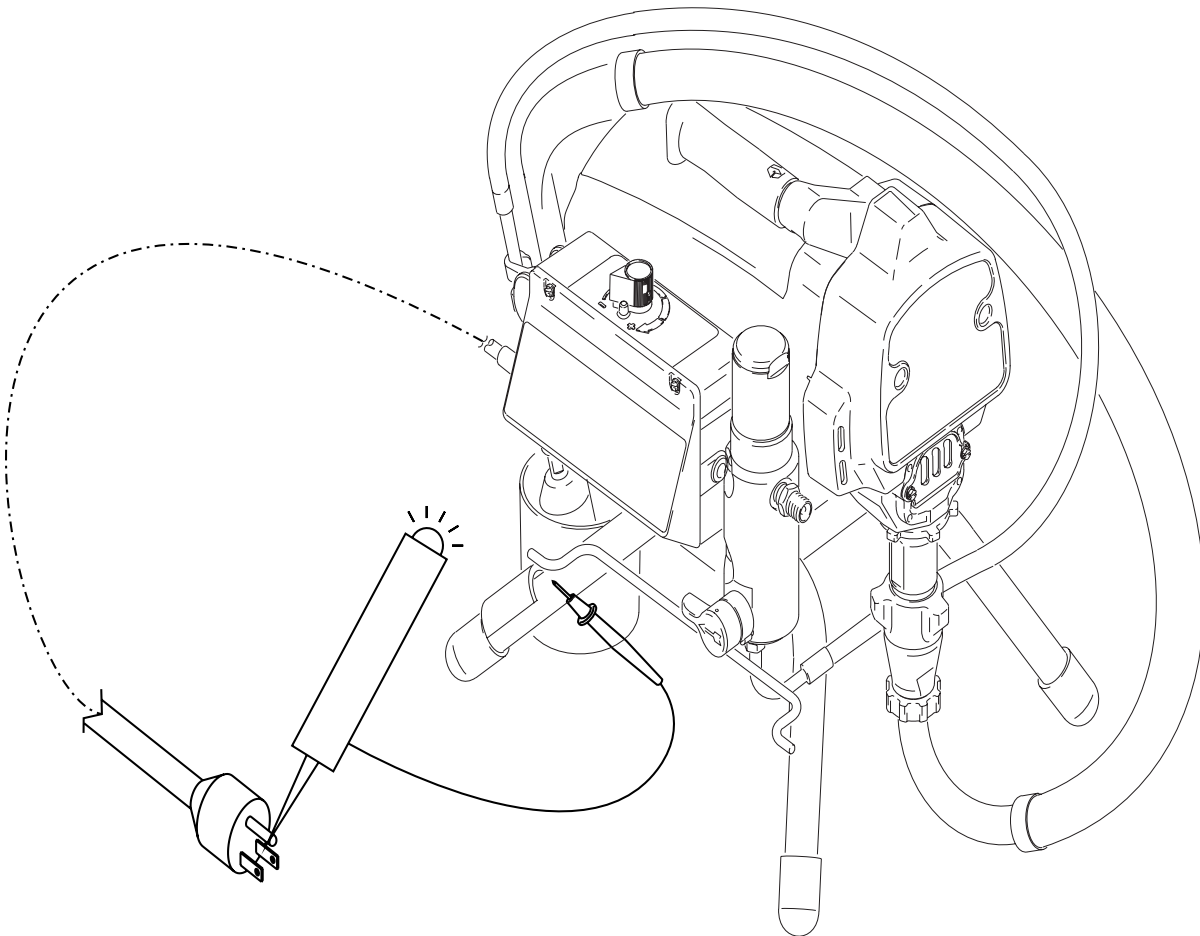
Every corded electric sprayer that comes into your shop for repair should be tested as described below, to make sure that it is properly grounded.

Pull the machine's plug out of the wall outlet and connect one lead from a DC continuity test light or a VOM to the (round) ground terminal on the plug.

NOTE:

If the ground terminal is broken off of the plug, install a new plug.

Touch the test light (or VOM) leads to several bare metal surfaces on the body of the machine. If the light (or meter) indicates continuity, the machine is properly grounded. If the light (or meter) doesn't indicate continuity trace through the ground (green) wiring on the machine to determine where the break is.



CAPACITOR TESTING:

A capacitor is an electrical component that stores electricity. Capacitors are usually used to help start a motor or make a motor run more efficiently.

The following instructions can be used to test any capacitor.

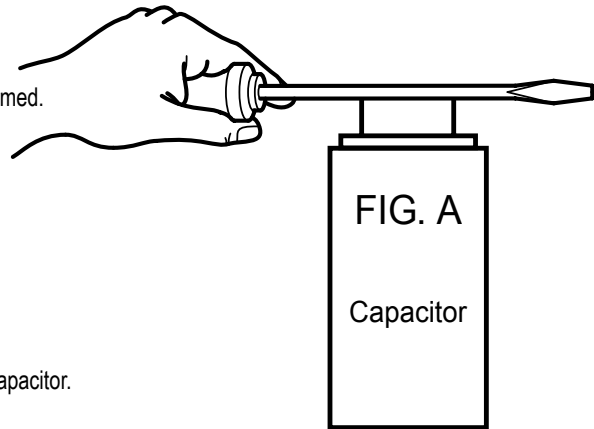
⚠ **WARNING!**

A CAPACITOR CAN SHOCK YOU EVEN WHEN A MACHINE IS UNPLUGGED. NEVER TOUCH CAPACITOR TERMINALS WITH YOUR FINGERS. ALWAYS USE TOOLS WITH INSULATED HANDLES. NEVER DISCHARGE A CAPACITOR NEAR FLAMMABLE LIQUIDS OR VAPORS.

1 Visually inspect the capacitor for leaks, mechanically damage or loose terminals. Replace it if any of these problems exist.

2 Unplug the machine and remove the capacitor(s).
If capacitor(s) are attached to the control board the test can not be performed.

3 "SEE ABOVE WARNING" Using a screwdriver with insulated handles, hold so that the blade contacts the capacitor terminals as shown in Fig. A. This will "discharge" the capacitor.



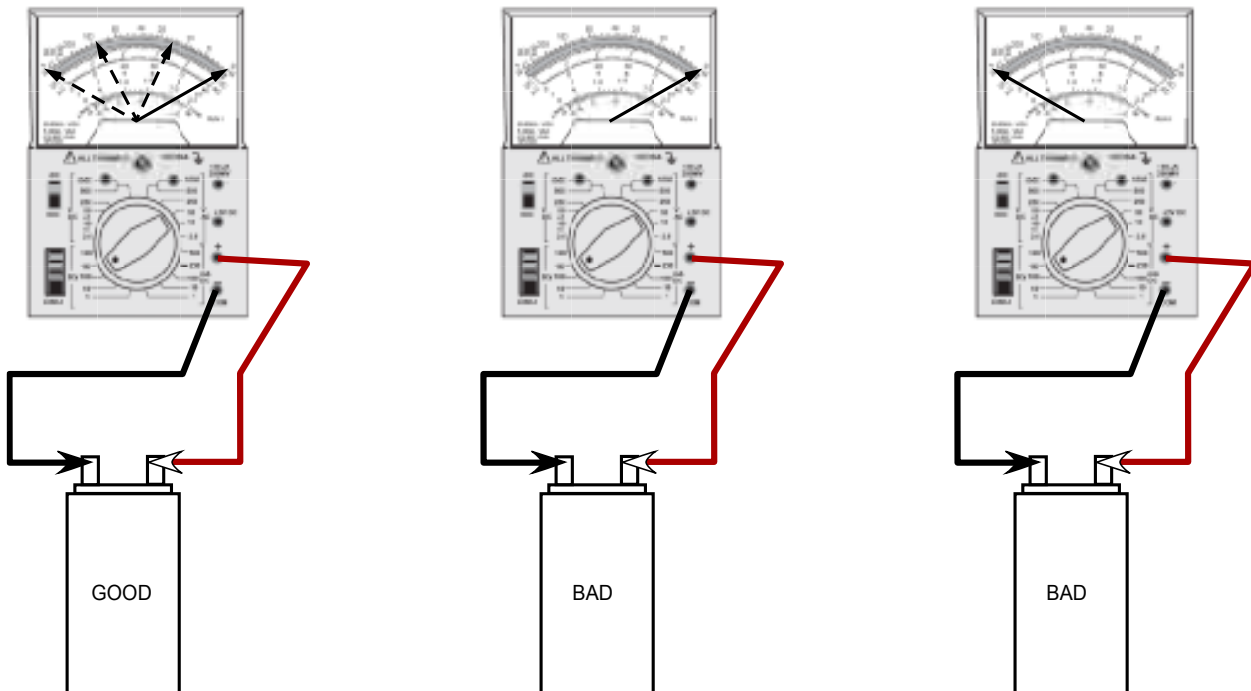
4 Put a volt-Ohm meter on the R X 100 scale.

5 While watching the meter, connect the 2 leads to the 2 terminals on the capacitor.

➤ If the capacitor is good, the meter needle will go to the right (toward 0 resistance) (Fig. 1), then to the left (toward - maximum resistance)

➤ If the meter needle goes all the way to the right and stays there, the capacitor is defective.(Fig.2)

➤ If the meter needle stays all the way to the left (doesn't move at all when connected to the capacitor), the capacitor is defective.(Fig. 3)



RECTIFIER

(See Fig. 1) Now we come to the most popular application of the diode: rectification. Simply rectification is the conversion of alternating current (AC) to direct current (DC). This almost always involves the use of some device that only allows one-way flow of electrons. As we have seen, this is exactly what a diode does.

RECTIFIER TESTING:

The following instructions can be used to test any bridge rectifier.
Use a DC continuity test light or a VOM (on the R x 100 scale) for all tests.

Disconnect all wires from the rectifier.

- 1 Connect test leads as shown in Figure A. If the meter beeps, the rectifier is defective. If the meter does not beep, go to the next step.
- 2 Connect test leads as shown in Figure B. If the meter does not beep, the rectifier is defective. If the meter beeps, go to the next step.
- 3 Connect test leads as shown in Figure C. If the meter beeps, the rectifier is defective. If the meter does not beep, go to the next step.
- 4 Connect test leads as shown in Figure D. If the meter does not beep, the rectifier is defective. If the meter beeps, go to the next step.
- 5 Connect test leads as shown in Figure E. If the meter beeps, the rectifier is defective. If the meter does not beep, go to the next step.
- 6 Connect test leads as shown in Figure F. If the meter does not beep, the rectifier is defective. If the meter beeps, go to the next step.
- 7 Connect test leads as shown in Figure G. If the meter beeps, the rectifier is defective. If the meter does not beep, go to the next step.
- 8 Connect test leads as shown in Figure H. If the meter does not beep, the rectifier is defective. If the meter beeps, the rectifier is good.

FIG. 1

