

How to Test a Brushless Generator

This bulletin covers the following Champion Power Equipment models:

All 1,200 to 1,800 Watt Generators

Note: Read instructions completely before performing service.

The regulation of the 120v voltage is maintained by the governed speed of the engine (approx. 3600 RPM) and is set with the throttle adjustment screw to give a Frequency (Hz) of about 60-63 Hz for a satisfactory output level.

Diagnostic Testing of the AC Voltage Electrical System

By using a common Multi-tester (VOM – Volt Ohms Meter) for Volts-Ohms measurement, you can do a diagnostic on the AC output of the generator.

Test #1a - Remove the yellow end cover (vented cover over generator) and unplug the 4 wire plug with a red and black wire (AC Voltage to outlets) and two orange or yellow wires coming from the Exciter winding within the Stator. Using the meter set to AC, connect each probe (no direction is required) on the two orange or yellow wires and obtain the reading. This test is performed with the engine running. A normal reading will be: Yellow Wires 6.7 AC Volts, Red/Black Wires 11.7 AC Volts (+ or -5% for each).

Test #1b - Re-connect the plug-in connection and start the generator. Setting the volt meter to AC voltage, place your test probes on each of yellow or orange wires and the reading should be about 150 volts AC. If this test is to specs, then the condenser is functioning normally. You will not have to test any further or disassemble the panel cover. Your panel voltage should be at or close to normal (115v-125v AC).

Test #2 - This test involves removal of the 4 panel bolts and relaxing the panel assembly away from the chassis. On the backside of the panel is a black dust cover that is held on by 2 Philips screws. Upon removal of screws, you will move the dust cover away from the panel and see a small black box (Condenser or Capacitor) that the Orange or Yellow wires attach too. Remove any one of the two connections and do a Microfarad test across the terminals on the Condenser. This test will set your meter to an Icon that looks like a "uF". Usually a mode position of the Ohms scale which is a "horseshoe" looking Icon. The result should be about 11-12 uF (Microfarads) + or – replaced.

Test #3 - With the generator running, you need to set your meter to AC and then place one probe on each Blade terminal at the AC outlet on the front panel. You should have a reading between 115 and 125 volts AC. Adjust this range with the governor adjustment screw about the Recoil housing of the start rope. Due to the condenser style excitement used on this model generator, you will notice a somewhat unstable view of the AC voltmeter to give a solid hold at any particular setting. Turn it until a happy medium of this voltage range is determined. Of course 120 VAC is the most desirable medium setting. Don't be disappointed if your setting is only close to this number and any slight movement changes the setting. A little trial and error will work for your setting.

Static Testing of the Stator and Rotor

Stator Testing - With the nylon plug disconnected under the yellow cover, an Ohms test can also be performed on the Stator. Using the probes of the VOM and touching them to the ends of the yellow or orange wires, you will get a result of about 5.88 Ohms + or - .2 ohms. Outside of this range will indicate a failure of the stators Exciter field winding.

Now you can test the Red and Black leads at the nylon plug on the Stator. This test should give a positive result of 1.05 Ohms + or - .2 ohms. Outside of this range will indicate a failure of the Main Winding of the Stator.

Rotor Testing - You will note that the ends of the field winding wires include a Resistor between them. If the Resistor is tested in place the reading will be about 8.7 ohms + or -5%. If the Resistor is removed then the test will show about 10 ohms when tested at the ends of the field winding wires. Any numbers outside of 5% of this test will indicate failure of the rotor and a replacement will be necessary.

If you have any questions, please contact Champion Power Equipment:

Champion Power Equipment, Inc.
12039 Smith Ave.
Santa Fe Springs, CA 90670
Phone: 1-877-338-0999

Email: tech@championpowerequipment.com