

**NOTE:** The following conditions are necessary for all tests that follow. Your life, your safety and the life of your test equipment depend on paying attention to these details.

- 1) All resistance checks are with the unit STOPPED!
- 2) All voltage checks are with the engine running.
- 3) Always start with the highest voltage scale. (600 Volt scale minimum)
- 4) Check for residual voltage before any disassembly.
- 5) Don't disassemble any more than necessary.
- 6) Mark leads for reassembly.
- 7) Disconnect loads before residual voltage checks.
- 8) Write down all your readings.
- 9) Record Model #, Serial #, and P/N before calling.

## **NO OUTPUT (ALL GENERATORS)**

### **(All AC voltage readings are with engine running)**

1. Check for Residual output at receptacles WITH THE ENGINE RUNNING. Expect Minimum of 3 - 5 VAC at the 120V receptacles, double at the 240V recept. Always start on the HIGHEST ACV Scale. Don't blow the ohms scale on the first test!
2. With the engine running, flash the field with 9 VDC dry battery if output is below 5 VAC. Refer to diagram #1
3. Re-Check for output at ALL receptacles.
4. STOP the engine. On WINCO units remove end-cover and disconnect only the generator output leads G1, G3 and N from the control box leads. Restart engine and check for output at stator power leads. The DYNA generators cannot be checked this way, for DYNA units move to step #9.
  - a. All units with 120 volt capabilities:
    - G-1 to N = 120 volts AC
    - Q-1 to Q-2 = 170-300 Volts AC (Capacitor Winding)
  - b. For units with 240 volt capabilities:
    - G-1 to N = 120 volts AC
    - G-3 to N = 120 volts AC
    - G-1 to G-3 = 240 volts AC
    - Q-1 to Q-2 = 170-300 Volts AC (Capacitor Winding)
5. If you get proper AC voltage from stator leads the generator end is good. Check receptacle panel for loose wires, shorted receptacles or defective parts.
6. If you get no output from stator leads:
  - a. For RFB - Rotating Field Brush type excitation - move to #17.
  - b. For RFL - Rotating Field BrushLess Capacitor excitation - move to #7.

### **RFL - Rotating field with brushless Capacitor type excitation.**

7. Check capacitors.
  - a. Visually check capacitors for loose or burned wires and leaking caps.

- b. Discharge capacitors by momentarily grounding capacitor terminals to the capacitor case. (Failure to ground capacitors may cause a shock)
  - c. Disconnect capacitor leads.
  - d. Using an VOM (ohm meter) set at 200K ohms. Connect meter leads to the two sets of terminals on one capacitor. Ohm meter should read "0" and slowly move to an open circuit. (5 to 10 seconds) (the battery in ohm meter is charging capacitor) Reversing the meter leads will cause the Ohm meter to count down to zero. Then charge up and move to open circuit.
  - e. Repeat step (d) for any remaining capacitors. (there may be up to three capacitors depending on the model of generator)
8. Check stator capacitor leads for continuity and grounding.
    - a. There should be continuity between leads.
    - b. The resistance values are shown in table #1.
    - c. There should not be any reading to ground.
  9. Check stator output power leads for continuity, resistance and grounding.
    - a. There should be continuity between leads.
    - b. The resistance values are shown in table #1.
    - c. There should not be any reading to ground.
  10. Check for continuity between the capacitor leads and power leads in the stator.
    - a. There should **not be** continuity between these two sets of leads.
  11. Remove stator/shell assembly.
  12. Unbolt the diode(s) from mounting bracket or the fan on rotor.
  13. Check diode(s) with an ohm meter. Most meters use a special setting for testing a diode. If your meter does not have special setting use the RX1 ohms scale.
    - a. Meter leads should be placed on either end of one diode, check meter for current flow. (**Diode must be unbolted to test**)
    - b. Reverse meter leads, check meter for current flow.
    - c. Current flow (reading) should be detected in only one direction. If diode reads current flow in both or neither direction it should be replaced.
    - d. Depending on model. Repeat step a thru c for the other diode if installed.
- NOTE: All of the two diode systems use one forward polarity and one reverse polarity diode.***
14. Check rotor leads for continuity and grounding. Place meter leads on solder end of diode(s). At least one of the diodes must be disconnected from the rotor to check continuity and resistance. There should be continuity between leads but no reading to ground See table #1 for resistance values.
  15. Replace any defective parts and reassemble generator.
  16. Flash field according to diagram #1.

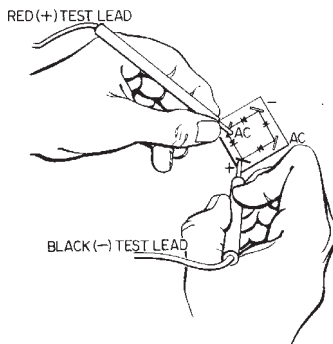
### **RFB - Rotating Field with Brush type excitation.**

17. Disconnect wires from rectifier and check rectifier.
18. Check rectifier leads from the stator for continuity and grounding.
  - a. There should be continuity between leads.

- b. The resistance values are shown in table #1.
- c. There should not be any reading to ground.
- 19. Check Stator Output power leads for continuity, resistance and grounding.
  - a. There should be continuity between leads.
  - b. The resistance values are shown in table #1.
  - c. There should not be any reading to ground.
- 20. Check for continuity between the rectifier leads and power leads from the stator.
  - a. There should **not be** continuity between these two sets of leads.
- 19. Remove brush rack and check brushes for spring tension, binding, burning, and a minimum of 3/8 in. length.
- 20. Check rotor slip rings for wear and corrosion.
- 21. Check rotor slip rings for continuity and grounding.
  - a. There should be continuity between slip rings.
  - b. The resistance values are shown in table #1.
  - c. There should not be any reading to ground.
- 22. Replace any defective parts and reassemble generator.
- 23. Flash field according to diagram #1.

## TESTING RECTIFIERS

The field excitation is supplied through a full wave bridge rectifier. This type of rectifier has four terminals - two AC, one DC positive and one DC negative. There are 4 diodes within each rectifier, one between each of the terminals as you go around the outside of the rectifier.



The rectifier is tested in the following manner:

1. Disconnect all leads from rectifier.
2. Connect the red ohmmeter lead to the positive DC (+) terminal.
3. Connect the black lead to each of the AC terminals in turn. Either a high or low resistance reading will be obtained.
4. Reverse the meter leads, black lead to the DC POS (+) and red lead to the AC terminals, each in turn. An opposite reading should be observed.
5. Connect the red ohmmeter lead to the negative DC (-) terminal.
6. Connect the black lead to each of the AC terminals in turn. Either a high or low resistance reading will be obtained.
7. Reverse the meter leads, black lead to the DC NEG (-) and red lead to the AC terminals, each in turn. An opposite reading should be observed.
8. Check each terminal to the case. An open circuit (very high resistance) reading should be observed.
9. If the rectifier fails any of the above tests, it should be considered defective and replaced.

If a battery powered test light is used. Follow the same procedures described below. A good diode element will allow current to pass to the light in the test lamp in only one direction.

# FIELD FLASHING PROCEDURES

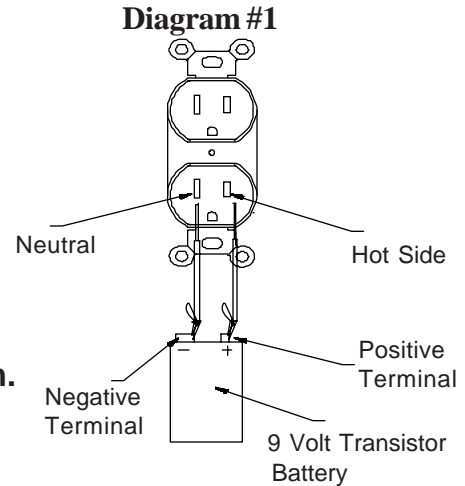
## Material Required

1. 9 Volt DC Transistor Battery
2. Jumper wires 20 to 22 gauge  
Each wire should have a clip on one end and be stripped about 3/8 of an inch on the other.

## Procedure

**Caution: Insure there is no open or spilled fuel in the area of the unit when flashing the fields. Insure the wires used to flash the field have no bare spots on them.**

1. Clip the jumper wires to the terminals on the battery.
2. Start the engine generator set.
3. Locate the 120 volt receptacle with the two flat blade slots.
4. Making sure not to touch the bare wire, momentarily insert the bare ends of the wires into the appropriate slots.
5. **BRIEFLY POKE THE WIRES INTO THE RECEPTACLE, BUT DO NOT HOLD THE WIRES IN THE RECEPTACLE. THIS RECEPTACLE WILL ENERGIZE TO 120 VOLTS IMMEDIATELY.**



<b>GENERATOR RESISTANCE TABLE #1</b>					
<b>MODELS</b>	<b>ROTOR</b>	<b>G1 TO N</b>	<b>G2 TO N</b>	<b>Q1 TO Q2</b>	<b>SS SPEC</b>
HD3200, HD3200H HP3300, HP3300H, WT3000, WC3000H	0.83-0.92	0.52-0.57		1.68-1.87	SS 1530
TF4500, DX4500, HP4500, HP4500H HP5000H, HD4500, HD4500, EC4500 WC4500, WC5000H, W4500, W5000H	0.95-1.05	0.17-0.19	0.34-0.375	0.53-0.58	SS 1531
TF6000, DX6000, HP6000, HP6000H	1.87-2.08	0.12-0.14	0.25-0.28	0.34-0.39	SS 1533
TFM6000,DXM6000, HDM6000, HDM6000H HPM6000, HPM6000H, WC6000, WC6000H W6000, W6000H	10.9-12.1	0.10-0.11	0.17-0.19	0.76-0.84	SS 1544
DX9000, HP9000, HP9500H TF9000, PSS8000, WC9000, W9500	0.69-0.77	0.12-0.13	0.12-0.13	0.22-0.24	SS 1538
LC1500, LC1750	0.73-0.82	0.72-0.86		2.40-2.67	SS 1545
LC3000, LC3000H, LC3000I, D3000	0.83-0.92	0.52-0.57		2.40-2.67	SS 1540
LC4500, LC5000H, LLC4500, LLC5000H DLC4500, D4500, D5000, DL4500, DL5000	0.79-0.87	0.61-0.67	0.61-0.67	2.10-2.33	SS 1541
LC6000, LLC6000, DLC6000, TFLC6000, DL6000, DL6000H	1.95-1.05	0.21-0.23	0.22-0.25	0.53-0.58	SS1543
LLC9000, TFLC9000, DL9000	0.69-0.77	0.12-0.13	0.12-0.13	0.22-0.24	SS1538