

## INSTRUCTION MANUAL

### INTRODUCTION

The information in this manual covers generator sets using static excitation. This type of excitation will be discussed in detail in later paragraphs of this manual. The information contained should be studied carefully and the instruction book kept at hand for ready reference. Read very carefully the paragraphs on proper installation and maintenance of the generator set.

The equipment described is the result of careful engineering design and manufacturing techniques. It has been completely inspected and tested before shipment. Carefully inspect on delivery for evidence of shipping damage. If damage has occurred it should be noted on the freight bill in order that a claim can be filed to recover the cost of the damage. If the damage appears to be of a major nature, the generator should not be operated until the fault has been corrected.

If you wish to contact your dealer or the factory make sure you mention the model and serial number of the generator set as listed on the nameplate on the side of the generator.

Promptly fill in and return the guarantee card enclosed in the front of the manual. Winpower generators are designed to deliver voltage and current identical to that of a normal power line. Equipment that can be operated on normal power can also be operated by the generator set, provided the capacity of the generator is not exceeded. It should be remembered that the power line, for all practical purposes, is backed by an unlimited generator.

### ENGINE

Information on the engine is to be found in the engine instruction manual attached. Engine problems and trouble shooting information will be found to be included in that part of the instructions. The engine is air-cooled, spark ignition, using gasoline, natural gas or liquid petroleum fuel. Discussion of the proper installation and maintenance for the various fuels will also be found in later pages of this booklet. As in the case of the generator, it is important that proper care and maintenance be given to the engine. The installation area should be kept clean and well ventilated. It is important that a standby generator set be operated at periodic intervals, preferably not to exceed seven to ten days. When the generator set is operated it should be for sufficient duration to assure that stabilized operating temperature has been reached before shutdown. An interval of too short duration will result in condensation, formation of sludge, carbon and poor ignition. Thirty minutes is recommended.

### GENERATOR

The generator is a revolving armature type, using a static system for excitation and control of the voltage regulation. Carefully read the paragraph which describes the static excitation. The generator armature is attached directly to the tapered engine crankshaft by a matching taper in the armature shaft. It is held in place by a thru-bolt and supported on the outboard end by a pre-lubricated ball bearing. The speed at which the armature turns determines the frequency of the current. A 60 cycle generator must be operated at approximately 1800 RPM and a 50 cycle generator at approximately 1500 RPM. Engine speed is

### Starting Procedure:

1. Check crankcase oil level and fuel supply.
2. The carburetor main jet has been adjusted during factory testing. A slightly richer mixture may be needed in cold weather. Turn the needle valve slightly in a counter-clockwise direction and re-adjust to the best operating position after the engine has warmed. Refer to carburetor adjustment in the engine manual for details.
3. Close choke on carburetor by pushing choke lever down.
4. Wind rope fully around sheave and pull briskly. Open choke after engine has started.
5. Allow engine to warm up for a few minutes before adding load.

### Stopping the Engine:

1. Allow engine to operate at no load for a few minutes before stopping. The possibility of warped valves will be reduced.
2. Model GS3800WA is equipped with a stop switch on the governor shield assembly. Model GS2500WB has a stop switch on the magneto. Depress the switch until the engine stops.
3. If the set is not expected to be used within 20 to 30 days, allow the engine to run out of fuel. Soured gasoline and formation of gum in the carburetor jet and float valve will be prevented. See storage precautions in the engine manual for prolonged idle periods.
4. Rotating the flywheel until the piston is on compression is good precaution after stopping. Both valves will be seated, reducing the chances of warping or carbon flakes between valve and seat.

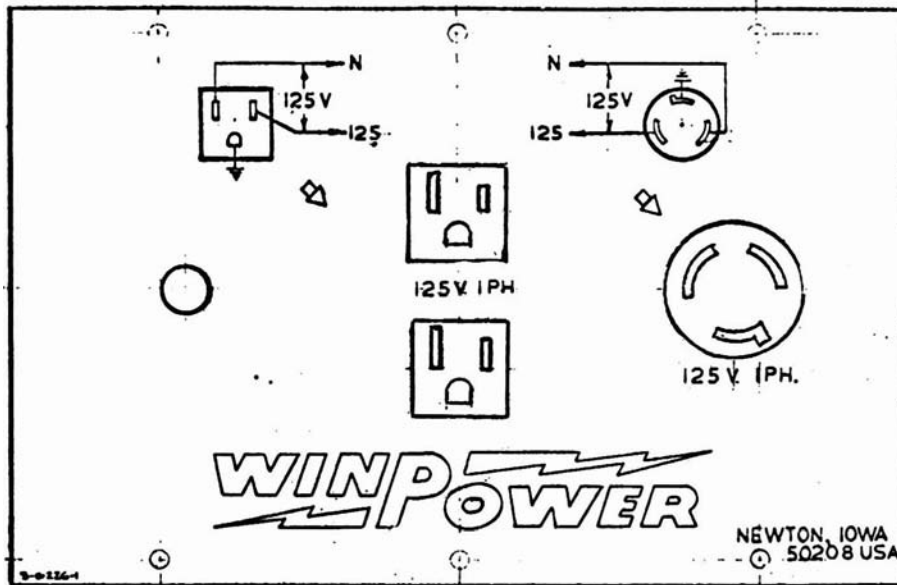
### PERMANENT INSTALLATION

There are several factors which must be considered for the proper installation of a generator set. These involve sufficient space for clearance between walls or other items which might interfere with accessibility to the engine controls, generator controls, location of the exhaust system, load connections and battery placement. Each installation must be considered on its own merits -- these instructions are intended as a general guide. In no case should a generator set be installed so near to a wall that there is insufficient space for a walk way. Local regulations for building code, fire ordinance, etc. must also be taken into account.

### EXHAUST PIPING

The weight of the exhaust pipe system must not be supported on the engine exhaust manifold. A short piece of flexible exhaust tube should be connected between the manifold and the rigid portion of the exhaust piping. The muffler should be installed as near as practical to the generator set. The complete exhaust system should be as short as possible. The pipe should be increased one size

## TYPICAL LOAD OUTLET PANEL



Model GS2500WB Panel

This panel is typical for single voltage sets at a nominal of 125 volts.

Twistlock receptacles are convenient for power cord extension as they will not be disconnected by an accidental pull.

The twistlock receptacle has the same configuration for voltage above 125. The convenience receptacle for higher voltages has an altered arrangement to prevent accidental connection of low voltage equipment.



# SERVICE DIAGNOSIS

## LOW OUTPUT VOLTAGE

POSSIBLE CAUSE	REMEDY
Low Speed	<ol style="list-style-type: none"> <li>1. Check for overload on the engine.</li> <li>2. Defective governor. Check governor spring tension, tight or defective throttle levers and joints.</li> <li>3. Defective engine. (See engine manual)</li> </ol>
High line loss. Indicated by lower voltage at load than at generator terminals.	Increase size of line wiring. Might also be the result of loose connections which will be indicated by excessive heating at the loose connections.
Shorted or grounded field coil. In some cases one coil only, that is shorted or grounded, will reduce voltage to approximately one half of rating.	See information for testing field circuits.
Defective compound field circuit. Field marked S <sub>1</sub> & S <sub>2</sub> .	See information for testing field circuits.
Defective series field bridge. Indicated by excessive loss of voltage with load.	See information for testing diodes.

## HIGH OUTPUT VOLTAGE

Excessive speed	Check governor linkage, spring tension, etc. Governor linkage must be free from dirt & gum.
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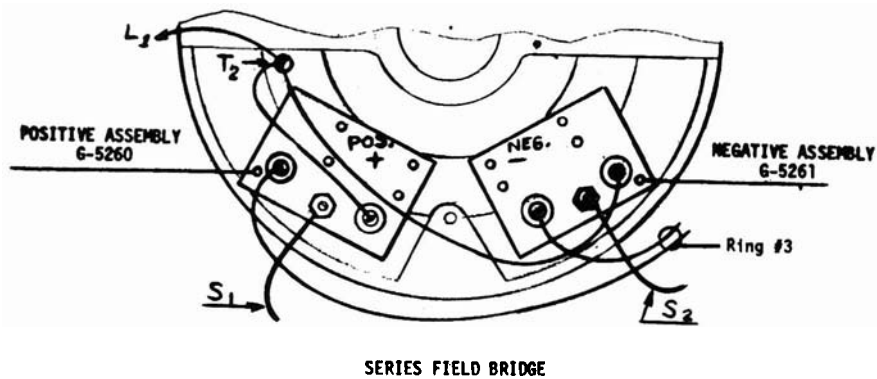
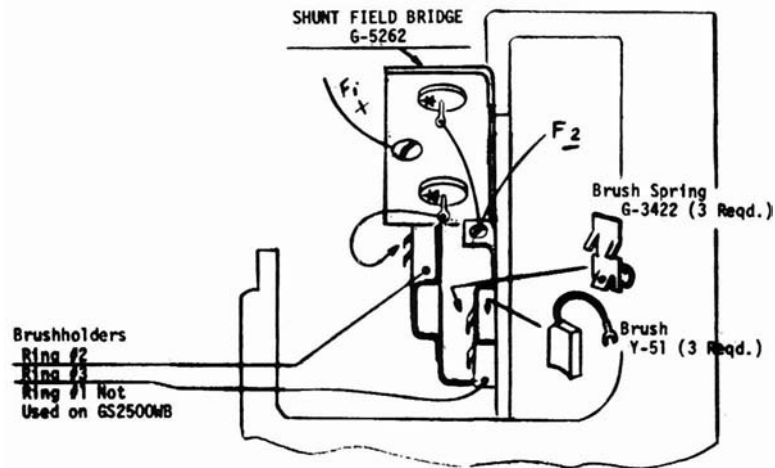
## EXCESSIVE HEATING

Clogged ventilating inlet and/or outlet.	Clean screens, make sure interior of generator is unobstructed.
Overheated engine due to blocked ventilating passages.	Clean intake and outlet passages on air cooled engines. Check oil level.
Overheated engine due to small or lengthy exhaust line, too many elbows or restricted muffler.	Increase size of exhaust pipe. Replace muffler if blocked. Use long sweep elbows. (See instruction book)
High room temperature	Improve engine room ventilation.

## NO OUTPUT VOLTAGE

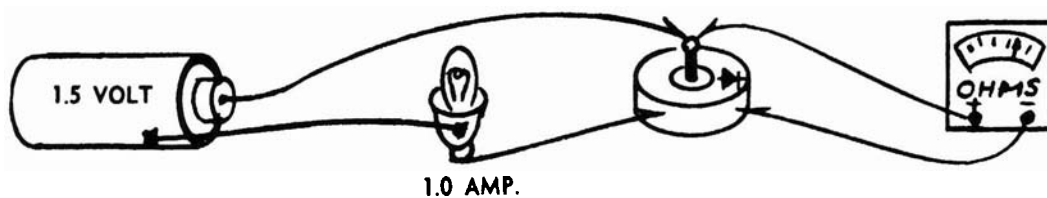
Poor Brush Contact: Brushes tight in holder.	Clean Brush Holder. Brush should move freely in holder.
Weak Brush Spring Tension	Brush spring tension should snap brush into contact with ring when lifted and released.
Film on Collector Rings caused by corrosive or dirty atmosphere.	Clean rings with fine sandpaper during rotation of armature. Caution: Tape sandpaper to stiff cardboard for safety.
Defective Rectifier Bridge (See illustration for method of checking bridge.)	Replace defective bridge assembly. Find assembly number under DIODE ASSEMBLY in parts list.
Open field circuit (see illustration for method for checking).	Replace open coil(s) or repair if open connection is in the connecting leads.
Grounded or shorted field coil(s) (See illustration for method.)	Replace grounded coil(s) and insulation or repair damage.
Loss of residual magnetism. This is a condition brought about by some unusual condition. It will always occur after disassembly of the field frame.	See note under field assembly for procedure to restore magnetism.
<b>Defective Armature:</b> Shorted winding. This can be identified by the use of a "growler" at a competent re-winding shop. Grounded armature winding-check by test lamp or high potential tester from collector rings to shaft. Open armature circuit. Measure circuit between rings with an ohmmeter.	Replace the armature. (Include generator model and serial number on the order.)

## BRUSH GEAR & BRIDGE ASSEMBLIES MODEL GS2500WB

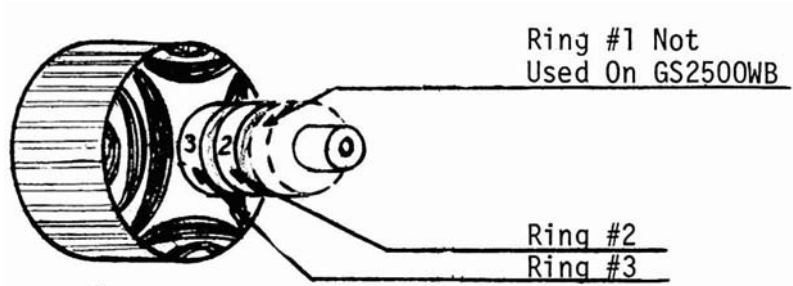


### Check for Defective Diode

1. Disconnect all external wiring to rings and field coils. (Carefully mark disconnected wiring to assure proper re-connection.)
2. A diode that is in good order will conduct in one direction and block in the opposite direction. The conducting direction is marked on the case by an arrow ( $\rightarrow$ ).
3. Use an ohmmeter (or a 1.5 volt flashlight battery and bulb as illustrated) to check current direction. Connect positive to the base of the arrow and negative at the end of the arrow points. (See illustration). A diode that conducts in both directions or neither direction is defective. "Pressed in" diodes cannot be replaced without special tooling to prevent damage during installation. Replace the complete bridge assembly.



ARMATURE ASSEMBLY  
GS2500WB  
Part No. G5137



**Note:** Before attempting to check an armature circuit lift all brushes from the slip rings.

The resistance of the armature is too low to be measured by the average ohmmeter. There should be a circuit between the rings.

A reading from either ring to the shaft would mean that the winding is grounded.

A "growler" is used to check for shorted turns in the winding. This equipment can be found at any armature rewinding shop.

Be sure to mention the model and serial number as shown on the nameplate when ordering a replacement.