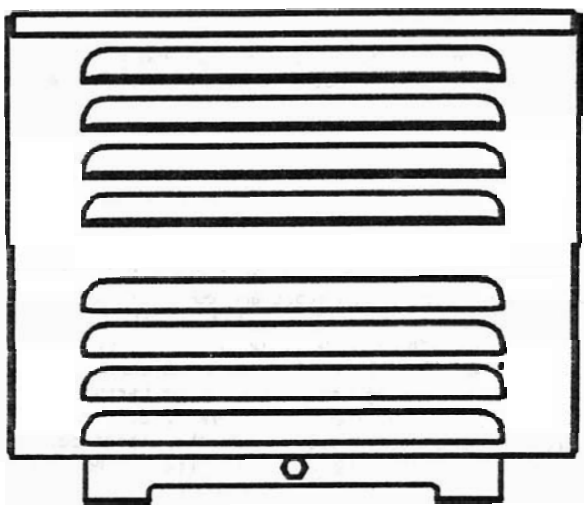
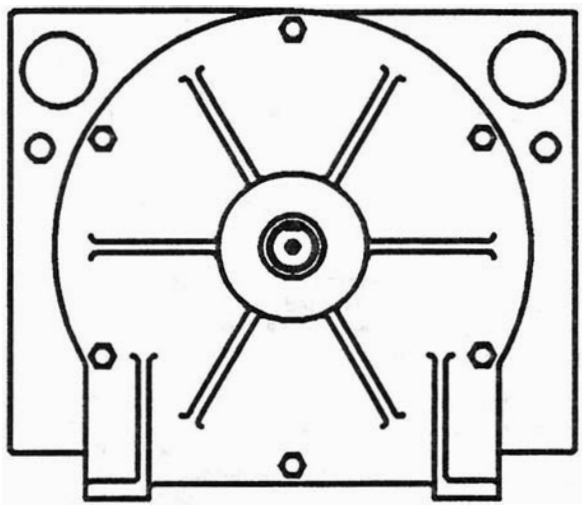
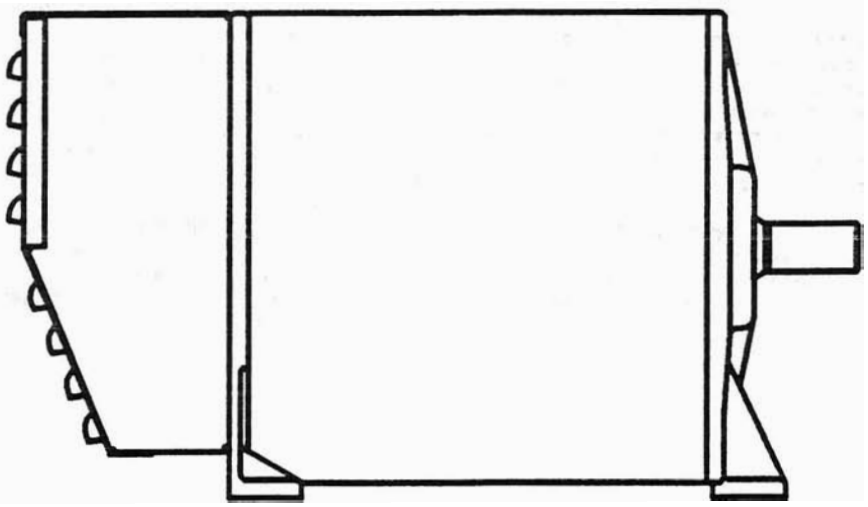
WINCO®
INCORPORATED

Owners/Operators Manual
EMERGENCY RESCUE GENERATORS







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Testing Policy

Before any generator is shipped from the factory, it is fully checked for performance. The generator is loaded to its full capacity, and the voltage, current, and frequency are carefully checked.

Rated output of generators is based on factory tests of typical units, and is subject to, and limited by, the temperature, altitude, fuel, and other conditions specified by the manufacturer of the applicable engines and governors in each installation.

INTRODUCTION AND DESCRIPTION

This two bearing rotating field generator is a direct drive, two bearing generator specifically designed for auxiliary PTO drive and vehicle mounting. It provides primary power for lighting, motors and equipment loads for the emergency rescue (ER) market. The height and length are minimized to permit fitting between the rails of rescue vehicles with a minimum of box and chassis modification and cost. The generator uses simple, proven excitation and boost circuits for exceptional motor starting ability. The unit is complete, tested and ready for installation. All items necessary for installation are included except mounting, drive and wiring hardware. The generator is equipped with a wide spaced four foot mounting, 1-5/8 keyed drive input shaft and junction box for wiring electrical output. The junction box is designed to provide complete access to all the electrical circuits from the electrical output end with the removal of a single end cover. The unit is fully tested to insure proper operation of all components, system performance and reliability.

The generator design is an 1800 rpm, 4 pole, 60 Hz series of five units ranging from a 35 kw (35,000 Watt), 120/240 v single phase through 75 kw (75,000 Watt), 120/240 volt three phase. Comparable special order 50 Hz models are available. 50 Hz models operate at 1500 rpm and must be derated approximately 20%. Base 50 Hz model is rated at 27 Kw (27,000 Watt). The generator has a current boost transformer compensated brush type exciter, revolving field design.The generator is self excited with magnetic inserts to insure reliable buildup. It is inherently regulated to +/- (plus or minus) 7% - no load to full rated load at unity power factor (1.0 pf). It can be operated continuously under any load within its rating. The frequency regulation is dependent on the drive engine and governor. Typical emergency rescue vehicles are usually equipped with large engines and precision electronic governors that are able to maintain the output frequency to within less than a 1 cycle variation. The generator is designed to maintain proper output voltage even if operated at up to a 3 cycle variation (61.5 Hz - 58.5 Hz) no load to full rated load.

The vehicles power input PTO drive shaft operates at 1800 rpm (1500 rpm for 50 Hz) and must provide approximately 2 Hp per required kw. See specifications for the drive power requirements of each model. The PTO drive power is generally taken from an auxiliary drive output on the vehicle transmission or through a special gear reduction box driven by a modified split drive line. The power is coupled to the generator through a rotating drive shaft, generally with universal or constant velocity joints.

SPECIFICATIONS

Generator

Model	Watts	Volts	Amps	HZ	PH	PF Start	Motor	Insulation
35PSB4G-3/A	35,000	120/240	145.8A	60	1	1.0	20Hp	Class F
40PSB4G-4/A	40,000	120/208	111.0A	60	3	1.0	25Hp	Class F
45PSB4G-17/A	45,000	120/240	108.2A	60	3	1.0	30Hp	Class F
55PSB4G-3/A	55,000	120/240	229.1A	60	1	1.0	30Hp	Class F
75PSB4G-4/A	75,000	120/208	208.1A	60	3	1.0	40Hp	Class F
75PSB4G-17/A	75,000	120/240	180.4A	60	3	1.0	40Hp	Class F
27PSB4G-53/A	27,000	110/220	122.7A	50	1	1.0	15Hp	Class F

Mechanical/Drive

Model	Input RPM	Input Horsepower	Shaft Diam.	Key	Net Weight	Shipping Weight
35PSB4G-3/A	1800	58.6	1-5/8"	3/8"	416 #	436 #
40PSB4G-4/A	1800	63.0	1-5/8"	3/8"	420 #	440 #
45PSB4G-17/A	1800	70.9	1-5/8"	3/8"	420 #	440 #
55PSB4G-3/A	1800	92.1	1-5/8"	3/8"	600 #	625 #
75PSB4G-4/A	1800	118.4	1-5/8"	3/8"	605 #	630 #
75PSB4G-17/A	1800	118.4	1-5/8"	3/8"	605 #	630 #
27PSB4G-53/A	1500	45.2	1-5/8"	3/8"	416 #	436 #

The rated power of each generator is subject to, and is limited by the engine input power provided. Both the generator and the engine are affected by temperature. In addition, the engine is derated by altitude and all other ambient conditions specified by the engine manufacturer. Drive engine power will typically decrease about 3-1/2% for each 1000 ft. above sea level, and will decrease an additional 1% for each 10 degrees fahrenheit above 60 degrees fahrenheit.

UNPACKING INSTRUCTIONS

**** Notice ****

When unpacking the generator, be sure to inspect it carefully for freight loss or damage. If loss or damage is noted at the time of delivery, require that the person making the delivery make note of the loss or damage on the freight bill, or affix his signature under the consignee's memo of the loss or damage. Contact the carrier for claim procedures.

When loss or damage is noted after delivery, segregate the damaged material, and contact the carrier for claim procedures.

"CONCEALED DAMAGE" is understood to mean damage to the contents of a package which is not in evidence at the time of delivery by the carrier, but which is discovered later. The carrier or carriers are responsible for merchandise lost or damaged in transit. The title to goods rests with the consignee when generators are shipped FOB factory, and only the consignee can legally file claims.

Unpacking

1. Carefully examine the carton and pallet for visible freight damage before opening. Immediately report any suspected damage to the freight carrier. Don't sign the freight bill until the external examination is complete.

2. Carefully dismantle carton and examine the generator for concealed damage.

3. After inspecting the generator for external physical damage, check for the following items packed inside the carton.
   a. Owner's manual, and
   b. Repair Parts List.
   c. Any additional accessories ordered (if any).

4. Remove hold down bolts, (4).

5. Unit can now be lifted from shipping pallet.

SAFETY INFORMATION

****** Caution ****** : Indicates any condition or practice, which if not strictly observed or remedied, could result in damage or destruction of the equipment.

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******* Warning ****** Indicates any condition or practice, which if not strictly observed, COULD RESULT IN personal injury or possible LOSS OF LIFE.

Despite the safe design of this generator, operating it imprudently, neglecting its maintenance, or being careless with it can cause serious injury or death. This generator is powerful enough to deliver a fatal electric shock. Allow only a responsible and capable person to operate this generator.

Installing and wiring a generator is not a "do it yourself" project. Consult a qualified, licensed electrician or contractor. The installation must comply with all national, state, and local codes.

2. Do not allow anyone to operate the generator without proper instruction.
3. Avoid touching live terminals or receptacles.
4. Be extremely careful if operating this generator in rain or snow.
5. This generator must be properly grounded.
6. Hot parts, moving parts, and generator output all can seriously injure the generator operator. The operator must use caution and remain alert when using this generator.
7. Provide permanent safety guards and shields for the input power drive system.
8. Keep all safety guards and power shields in position and tightly secured while equipment is operating.
9. When working around this generator and drive system, do not wear neckties, loose articles of clothing, or anything else that can be caught in the generator or drive system parts.
10. The generator manufacturer recommends that only qualified electrical technicians be allowed to service (install, maintain, repair, or replace parts) this generator, and that only factory approved repair parts be used in it.
11. Do not work on this generator (or other potentially hazardous equipment) when fatigued.
12. Use extreme caution when working on electrical components. High generator output voltage can cause serious injury or death.
13. Keep the generator and the area around it clean. Remove all material that can create dangerous conditions, such as grease, water, ice, and snow. Also remove all flammable material from the area.
14. Keep fire extinguishers on the vehicle at all times. Extinguishers rated ABC by the NFPA are appropriate for this use. Consult the local fire department if you have questions regarding fire extinguisher ratings. Keep the extinguisher properly maintained and be familiar with its proper use.

INSTALLATION

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***** Warning ****
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Before proceeding with the installation, be sure the drive line and engine are disabled and cannot accidentally operate while the generator is being installed.

Also, before beginning the installation process recheck the voltage, power rating and physical size and drive line rating and speed, horsepower etc. Be certain they can handle the intended load and are compatible with the required vehicle equipment voltage, phase and current ratings. Plans for installation should be prepared with proper attention to mechanical and electrical engineering detail to assure a satisfactory system installation. The information in this manual is offered as a guide to finalizing your installation plans. The installation sequence is summarized below:

A. Plan the installation :

1. Space required for installation and service access
2. Protected location, close to electrical connections
3. Mounting frame
4. Clear of moisture and dirt
5. Shielded from excess heat and cold

B. Mounting generator system.

C. Clear, protected source of ventilation of generator.

D. Drive line aligned within 5 degrees (10 degrees max).

E. Pre-wire system check. Engine exhaust system plumbed clear of generator and wiring.

F. Initial system start-up.

G. Generator electrical power connections.

H. Final system check.

A. Space required and location.

1. The space required should allow for ample working room around and in back of generator. A general rule to follow is 6 inches minimum clearance all around the unit. This allows service men to repair and remove engine or generator parts in the event service is needed. In general, all service can be performed from the rear of the generator junction box.

2. The generator must be mounted in direct line with the drive line. Allow space for cooling air to sweep across the shell. Locate as close to electrical service as possible. This will reduce the cost of electrical wiring and minimize the losses in the power conductors. Position the unit to keep clear of the drive line and exhaust runs. Protection from adverse weather conditions and road spray must be provided without restricting adequate ventilation for cooling. Careful planning will eliminate costly rework.

3. Mounting support - frame loading - frame type and strength should be taken into consideration when installing an emergency rescue generator.

4. Moisture and dirt - all electrical equipment should be protected from excessive moisture. Failure to do so will result in deterioration of the insulation and will result in short circuits and grounds.

Foreign materials such as dust, sand, lint and abrasive materials have a tendency to cause excessive wear, not only to the engine parts, but also to the generator parts, particularly the brushes. It is important that the unit be installed in a reasonably clean location for best service.

5. Heat and cold - all generators and engines give off considerable heat when they are running. In addition, these units are generally mounted in a somewhat restricted location which precludes natural convective cooling. It is important that the temperature of the ambient air around the unit not exceed 105 degrees fahrenheit while operating. Additional cooling louvers or fans may be necessary if adequate cooling flow is not provided by engine cooling air discharge.

B. Mounting

****** Caution ******

The generator should be bolted solid to a heavy steel cross channel or plate. It is recommended that the generator be mounted on a steel sub-frame which facilitates easy removal of the generator for better service access to the chassis or for generator repair.

Shock mounting the generator or mounting frame is generally not recommended do to possible harmonic vibration, drive misalignment and mounting stress.

C. Ventilation of generator

This is an air cooled generator. This unit is equipped with a suction fan to cool the rotor and stator. Therefore it will be necessary to insure that the hot air discharge plume gets out of the mounting area.

D. Drive line and lubrication

Install input PTO drive shaft. 60 Hz units operate at 1800 rpm. 50 Hz at 1500 rpm. See specifications for the drive power requirements of each model. The PTO drive line power should be maintained in as straight a line as possible. Install the generator so the drive line is aligned to within 5 degrees (10 degrees max). Be sure that the auxiliary drive power output on the vehicle transmission and the gear reduction box is capable of the expected mechanical load. It is generally recommended that the drive shaft be balanced to minimize drive line vibration and stress.

The generator uses permanently lubricated bearings. No further lubrication is necessary (or possible). Bearings should be checked annually to minimize potential catastrophic failures.

E. Pre-Wire system check:

Before wiring the generator to the distribution load circuits, the installation and operation of the drive system and generator should be checked to insure proper drive line, engine and generator operation.

Use the following check list to verify correct installation before starting the engine:

Item Check

1. Drive engine - Lube oil, coolant and filters.
2. Unit mounting base and hardware. Solid and bolts torqued.
3. Ventilation clear and protected.
4. Clearance on all sides and service access on end.

After completing the above checklist, the generator is ready for the initial start-up test.

F. Initial start and test procedure

1. See vehicle manufacturers instructions for operating procedures. The generator should be turning at specified rpm and producing correct voltage and frequency. If the generator fails to operate as specified, stop the engine and refer to the trouble shooting section of this manual.

2. With the engine running smoothly, check the no load voltage and frequency at terminals G1 (T1), G2 (T2) and G3 (T3). G1 (T1) and either G2 (T2) or G3 (T3) are located at the boost transformer. On single phase units (models ending in -3/ or -53/), no G2 (T2) lead is present. The following voltages are present on the generator output terminals measured from line to line and line to neutral. Note the correct voltage group by locating the voltage connection suffix in the generator model number:

i.e. - 45PSB4G-17/A - the -17 specifies the 120/240 volt, 4 wire, 3 phase delta, 60 Hz connection. Voltage connections are:

-3	120/240 volt. 60Hz, 1ph.	-53	110/220 volt. 50Hz, 1ph.
-4	120/208 volt. 60Hz, 3ph.		
-17	120/240 volt. 60Hz, 3ph.	-517	110/220 volt. 50Hz, 3ph.

CONNECTION CODE	VOLTAGE (line to line)	FREQUENCY (Hz)
-3/	G1 (T1) to G3 (T3) 240-250 vac	freq. 60 To 61 Hz
-4/	G1 (T1) to G3 (T3) 208-230 vac	freq. 60 To 61 Hz
	G2 (T2) to G1 (T1) 208-230 vac	freq. 60 To 61 Hz
	G3 (T3) to G2 (T2) 208-230 vac	freq. 60 To 61 Hz
-17/	G1 (T1) to G3 (T3) 240-250 vac	freq. 60 To 61 Hz
	G2 (T2) to G1 (T1) 240-250 vac	freq. 60 To 61 Hz
	G3 (T3) to G2 (T2) 240-250 vac	freq. 60 To 61 Hz
-53/	G1 (T1) to G3 (T3) 220-230 vac	freq. 50 To 51 Hz

CONNECTION CODE	VOLTAGE (line to neut)	FREQUENCY (Hz)
-3/	G1 (T1) to N	120-125 vac
	G3 (T3) to N	120-125 vac
-4/	G1 (T1) to N	120-125 vac
	G2 (T2) to N	120-125 vac
	G3 (T3) to N	120-125 vac
-17/	G1 (T1) to N	120-125 vac
	G2 (T2) to N	120-125 vac
	G3 (T3) to N*	208-217 vac*
-53/	G1 (T1) to N	110-115 vac
	G3 (T3) to N	110-115 vac

*G3 is the 'high' or 'Wild' leg. This voltage combination is normal for the 3 phase delta winding

**** Notice ****

If for any reason during the check-out procedure the voltage and frequency are not correct, stop the engine and refer to the trouble-shooting procedures.

After verifying the voltage and frequency are correct, prepare for final wiring of the generator by disabling the drive system and or engine. The generator can now be connected to the load circuits.

G. Generator Electrical Power Connections

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***** Warning *****
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All wiring should be done by an experienced electrician, and should conform to the national electrical code and with state and local regulations.

****
***** Warning *****
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The generator terminals are marked G or T: The "hot" leads [marked G1 (G2) and G3] are wired to the main line circuit breaker in the distribution panel. The neutral wire is run to the neutral terminal in the distribution panel. Note: Most codes require that the neutral conductor be 'bonded' (grounded directly to the frame of the generator). Check local codes to insure compliance. Refer to the national electrical code NEC for portable / mobile equipment. No further electrical connections are required.

The load current carrying wires (L) or (T) must be sized to handle the maximum load current without excessive voltage drop. By NEC code, conductors must be heavy enough to handle the full current rating of the main line circuit-breaker (or fuse) in the load distribution panel protecting the conductors.

All wires should be installed in rigid or flexible conduit. (Knockouts are provided in the control box). Because of the many different types of wiring service, feeder, and distribution panels used on rescue equipment, no specific wiring instructions can be provided.

Please note: If auxiliary (Shore/Commercial) power may also be connected to the load for demonstration, training or alternate source power, THERE MUST BE AN ISOLATION SWITCH TO PREVENT BACK-FEED OF COMMERCIAL POWER INTO THE GENERATOR OR GENERATOR POWER INTO THE COMMERCIAL LINE.

When the load is connected to the generator there must be absolutely no feedback from the generator to the power line or from the power line to the generator during any operating condition. When correctly connected, the design of the wiring control system prevents an possibility of feedback. Improper installation can create a serious hazard that could result in equipment damage, serious personal injury or death.

H. Final System Check

Recheck voltages at mainline circuit breaker. Voltages should match readings taken at the pre-wire check-out. If problems are noted, consult troubleshooting section or factory.

OPERATION

Since the generator is self excited and regulated, no operational controls for the generator are needed. The vehicle manufacturer will provide operation manual for the control(s).

MAINTENANCE

A. General information

The main components of the generator are: Stator/bar and ring, boost transformer, rotating field, rotor mounted cooling fan, brushes, brush holder assembly, end brackets, and junction box. Before performing any maintenance on the generator, isolate and/or disable the drive system so the **unit can not be accidentally** started while being repaired.

Service/maintenance items include periodic external physical inspection for missing hardware or damage to mounting or drive system. It is recommended that the generator be operated at least monthly under normal loads to familiarize operators with the procedures and controls as well as to dry out any accumulated condensation or other moisture in the generator electrical windings. The maintenance and service attention invested will insure getting the peak performance that was designed into the unit.

B. Generator maintenance

1. Brushes

Under ordinary circumstances, brushes will operate for extremely long periods without requiring replacement. They should be inspected after the first 5000 hours of operation, and after every 1000 hours of operation thereafter. Remove brushes one at a time and check for length; be sure that each moves freely in the brush holder. Brushes should be replaced when worn down to 3/8". Replace brushes in complete sets, never singly. When replacing brushes, be careful to reconnect the lead wires properly.

Poor contact (or "skipping") between brush and slip ring is caused by oil and grit, flint, or other hard substance on the brush, or by the brush not being properly shaped to fit the slip rings. Remedy these defects by fitting the brushes to the slip-ring curvature. Place # 00 sandpaper under the brushes with the abrasive side to the brushes, and work it back and forth until the brushes are the same shape as the slip-rings.

2. Slip rings

The two continuous copper rings located at the end of the rotating field are the excitation slip rings. For proper generator output, the surface of the slip rings must have a smooth, shiny, highly polished finish. Normal brush seating will transfer a shiny black finish that will seal the copper surface. This finish should not be removed unless it becomes dull or begins to build up. Under sustained use, it is advisable to check and if necessary, polish the ring surfaces with a crocus cloth to maintain the smooth finish.

C. Electrical testing:

1. Testing generator rotating field for opens and grounds

a. Disconnect field slip rings from rectifier.
b. Set multi-meter to read resistance (ohms), and connect the meter leads to the slip rings. See technical data on the repair parts list for correct resistance for the unit.
If field is defective in an open condition, the meter will read infinite resistance. Repair slip ring connection or field jumper connection if possible. If not, replace entire rotor.
c. Connect one meter lead to the stator shell and the other lead still connected to one of the field slip rings.
If meter indicates continuity (any resistance reading), the field is grounded and should be replaced.

2. Testing Stator for opens and grounds.

a. Disconnect stator leads (Hot and Neutral)
b. Ground test
Set multi-meter to read resistance, holding one meter lead against a clean spot on the stator shell, touch the other lead to any of the power conductors (G1, G2 or G3).
If meter indicates continuity (any resistance reading), the stator winding is grounded. Faults causing the grounded condition, even if visually detected, are generally not repairable. Replace the stator if it is grounded.
c. Testing for opens
(meter still set to read resistance - Rx1).
Holding one meter lead on G1 lead, touch other meter lead to G3, (and G2 if applicable). Record the readings. The meter should indicate continuity (very low resistance). If not (i.e. if meter indicates infinite resistance) part of stator winding is open and the entire stator must be replaced.
Check for open between all stator leads in same manner. Again, record your results for reference.

3. Testing rectifiers

The field excitation rectifier is a full-wave bridge rectifier. This type of rectifier has four terminals, two AC, a DC+ (positive), and a DC- (negative). The rectifier test Procedure follows:

Connect one ohmmeter lead to the positive DC+ terminal, and the other lead to each of the AC terminals in turn. A high or low resistance reading will be obtained. Reverse the meter leads, and an opposite reading should be observed. Now check from the negative terminal to each of the AC terminals, using the same procedures. Check each terminal both ways to the case. No resistance reading should be observed. Check between the two AC terminals. There should never be any reading either direction between the AC terminals. A rectifier that does not pass any of these tests is defective and must be replaced.

If a battery-powered test light is used, follow the procedures described above. If the rectifier is good, the light will come on in one direction only between a DC and AC terminal, but never between the terminals and the case or between the two AC terminals.

If the rectifier fails any of the above tests, it should be considered defective and replaced.

4. Transformer testing

The transformer is mounted on the end of the generator above the brush rack and slip rings. There are four secondary wires that provide alternative connection patterns for increased or decreased voltage boost depending upon the application and connected load. Consult factory if changes appear necessary. The boost transformer provides extra current boost for the field to start large electric motors and to compensate for normal voltage droop under load. To determine whether a transformer is defective, stop and disable the engine, disconnect all the power lead wires from the transformer and the secondary leads from the rectifier. Measure the windings for continuity and grounds as described for the stator and rotor above. Grounded transformers or transformers with internal primary to secondary shorts must be replaced.

Safety, control circuits - generator protection

In addition to a main line circuit breaker to protect the generator stator and load wiring, an over-speed relay or circuit should be supplied by the vehicle manufacturer that is factory pre-set to operate at 67 hertz, (approximately 2000 rpm on the generator shaft). DO NOT EXCEED 2000 RPM ON THE GENERATOR SHAFT FOR ANY REASON - CENTRIFUGAL FAILURE OF THE ROTOR IS PROBABLE AND NOT WARRANTABLE.

D. Operating Speed:

If operating speed is out of tolerance, consult the vehicle manufacturer for instructions. Under a full load condition of 80 to 100% capacity, the drive system should maintain a 59 to 60 hz reading.

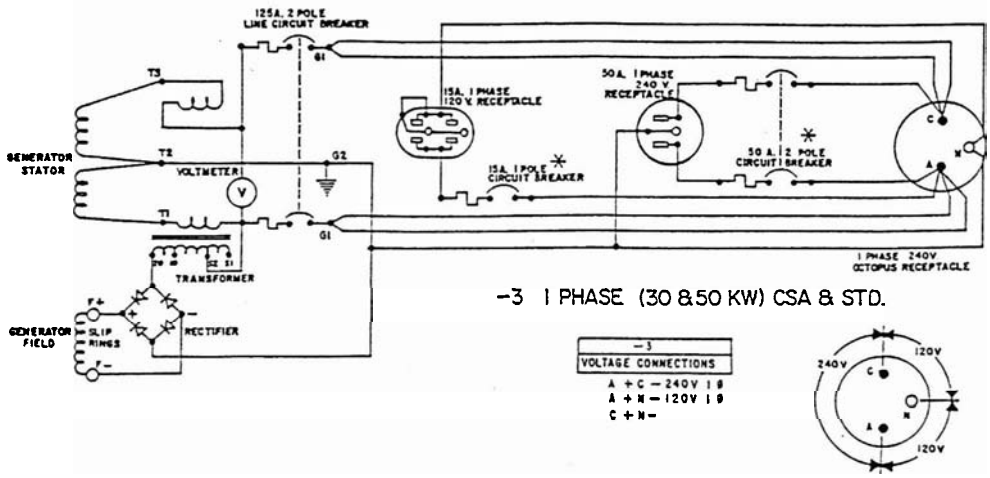
****** Caution ******

Under full load, do not adjust the Hz above 60. If a higher hz reading is used, as the load is decreased and the governor is not maintaining proper regulation, the Hz may go beyond the upper design limits (61.5 to 62 hz).

TROUBLESHOOTING TABLE

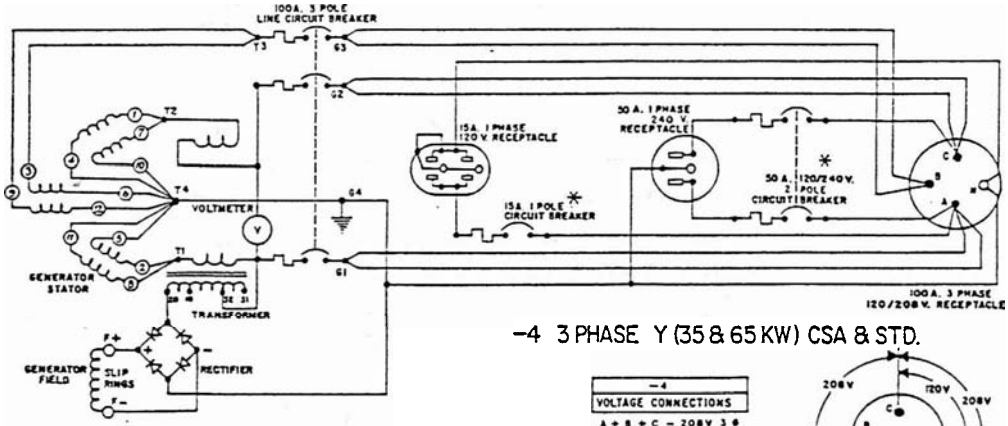
SYMPTOM	CAUSE(S)	CORRECTIVE ACTION
No output or low output voltage.	Open or shorted stator.	Replace stator.
	Open or shorted field winding.	Replace rotating field.
	Generator operating too slow.	Generator must be operated at 1800 rpm +/- 45 rpm for proper output voltage. (1500 rpm for 50 Hz)
	Generator overloaded.	Reduce load to generator nameplate.
	short circuit in the load.	Disconnect the load. Check voltage at output receptacles. Check motors, lights and load leads for short circuits. Repair short.
	Loose (or broken) wires or connections in the control box.	Remove panel cover and check all wiring and connections. Tighten and/or repair where necessary.
	Defective rectifier.	Test rectifier. Replace if defective.
	Dirty slip rings.	Clean and polish. Use 00 sandpaper and crocus cloth, never emery paper.
	Brushes binding in holders.	Check brushes for swelling: replace defective brushes: clean brush holders
	Loss of residual magnetism.	Check output voltage with sensitive meter. If very low (eg 1/2 volt), flash or separately excite field with 12 vdc battery.
Output voltage too high	Drive input speed too high.	See rescue equipment manual (governor adj.).
	Transformer incorrectly tapped.	Consult generator manufacturer.
Generator overheating	Generator overloaded.	Reduce load.
	Field rubbing on stator.	Check bearing condition. Check bearing bracket alignment.
	Poor ventilation.	Clear inlet and outlet air vents of debris. Insure at least 6 inches clearance on all sides and inlet and outlet vents are unobstructed.
	Short circuit in field.	Repair or replace - shorted or grounded field must be replaced.
	Shorted turns in stator.	Replace stator.
Sparking at the brushes	Generator overloaded.	Reduce load.
	Brushes not seated properly.	Contour brushes (see maintenance).
	Slip rings rough or eccentric.	Redress slip rings (see maintenance)
	Brushes sticking in brush rack.	Remove brushes and inspect and correct problem.
	Brushes worn down shorter than 3/8 inch.	Replace brush - Note: Always replace brushes in full sets - don't partial.

WIRING DIAGRAMS



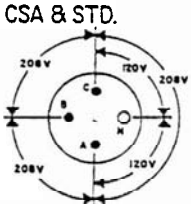
-3 1 PHASE (30 & 50 KW) CSA & STD.

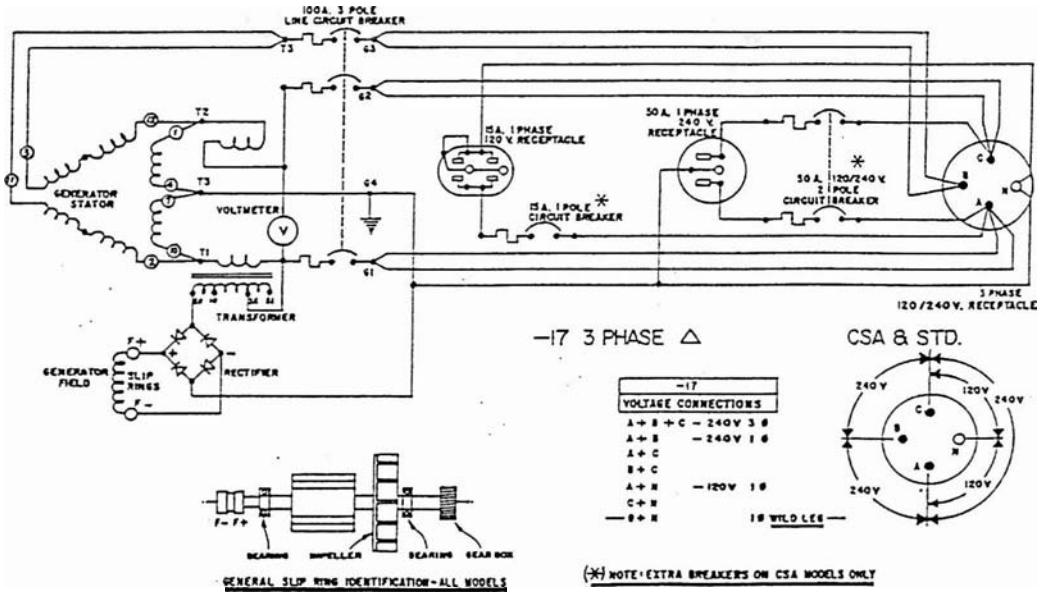
-3 VOLTAGE CONNECTIONS
A + C — 240V 1 Φ
A + N — 120V 1 Φ
C + N —



-4 3 PHASE Y (35 & 65 KW) CSA & STD.

-4 VOLTAGE CONNECTIONS	
A + B + C	— 208V 3 Φ
A + B	— 208V 1 Φ
A + C	
B + C	
A + N	— 120V 1 Φ
C + N	
B + N	





-17 3 PHASE △ CSA & STD.

-17 VOLTAGE CONNECTIONS	
A + B + C	— 240V 3 Φ
A + B	— 240V 1 Φ
A + C	
B + C	
A + N	— 120V 1 Φ
C + N	
— B + N	1 Φ WILD LEG —

GENERAL SLIP RING IDENTIFICATION - ALL MODELS

(*) NOTE: EXTRA BREAKERS ON CSA MODELS ONLY

TECHNICAL DATA

UNIT MODEL SERIES	27PSB4G-53/A	35PSB4G-3/A
COMPLETE UNIT ASSY.	64535-004	64535-001
AC RESIDUAL VOLTS	7.0 VAC L-L	7.0 VAC L-L
FIELD RESISTANCE	3.51 OHMS	3.51 OHMS
SCHEMATIC DIAGRAM	B-91322	B-64521
WINDING SPEC. (SS#)	1388	1298
ARM. CONNECTION (AC#)	315	315

UNIT MODEL SERIES	40PSB4G-4/A	45PSB4G-17/A
COMPLETE UNIT ASSY.	64535-003	64535-002
AC RESIDUAL VOLTS	7.0 VAC L-L	7.0 VAC L-L
FIELD RESISTANCE	3.51 OHMS	3.51 OHMS
SCHEMATIC DIAGRAM	B-91323	B-64521
WINDING SPEC. (SS#)	1307	1299
ARM. CONNECTION (AC#)	317	316

UNIT MODEL SERIES	75PSB4G-4/A	75PSB4G-17/A
COMPLETE UNIT ASSY.	64544-003	64544-002
AC RESIDUAL VOLTS	7.0 VAC L-L	7.0 VAC L-L
FIELD RESISTANCE	5.36 OHMS	5.36 OHMS
SCHEMATIC DIAGRAM	B-91323	B-64521
WINDING SPEC. (SS#)	1347	1314
ARM. CONNECTION (AC#)	317	316