



MODEL 5000 PG, ITEM #165965
Portable Generator

M165965A

OWNER'S MANUAL



⚠ WARNING

Read this manual.

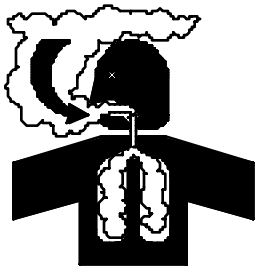
Serious injury or death can result if safety instructions are not followed.



⚠ DANGER

Fire hazard.

Do not operate in an enclosure or building. Fire or explosion will result.
Never place this product near combustible materials.



⚠ DANGER

Breathing hazard.

Poisonous fumes from engine will kill you.
Do not operate the generator in enclosed areas.
Do not operate generator near building or inside of buildings.

fig01800

**Any Questions, Comments, or Problems?
Call Customer Service at 1-800-270-0810**

THANK YOU

Thank you for purchasing a NorthStar Portable Generator. Your machine is designed for long life, dependability, and the top performance you demand. Please take time now to read through this manual so you can better understand the machine's operation, maintenance and safety precautions. Everyone who operates this generator must read and understand this manual. The time you take now will prolong your generator's life and prepare you for its safe operation. Enjoy the exceptional performance of your NorthStar Portable Generator.

IMPORTANT

Make certain the operator:

- Reads and understands the manuals pertaining to this machine.
- Is instructed in safe and proper operation of this machine.

NOTICE

K-BAR Industries Incorporated reserves the right to make improvements in design and/or changes in specifications at any time without incurring any obligation to install them on units previously sold.

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SPECIFICATIONS

| | |
|----------------------|---------------------------------------|
| Item Number | #165965 |
| Maximum Output | 5000 Watts (W) |
| Continuous Output | 4000 Watts (W) |
| Voltage | 120 / 240 Volt (V) |
| Phase | Single phase (4-wire) |
| Frequency Regulation | 56.5 - 63.3 Hertz (Hz) |
| Voltage Regulation | 112-129V |
| Power Factor | 1.0 p.f. |
| Engine | 8 HP Tecumseh (HM80) |
| Engine Speed | 3390 - 3798 RPM |
| Fuel Type | Unleaded gasoline |
| Fuel Capacity | 1 gallon (3.8 L) |
| Oil Capacity | 1.63 US quarts (1.5 L) |
| Starting Method | Recoil |
| 120 V Receptacle | 20 Amp (A) duplex (NEMA 5-20R) |
| 240 V Receptacle | 20 Amp (A) duplex (NEMA 6-20R) |
| Circuit Breaker | 17 Amp (A) thermal, push to reset |
| Grounding Post | Receives 12 Ga. wire or fork terminal |
| Dimensions | |
| Length | 26.00" (66 cm) |
| Width | 19.00" (48 cm) |
| Height | 17.50" (45 cm) |
| Dry Weight | 106 lb. (45 kg) |
| Gross Weight | 117 lb. (53 kg) |

MACHINE COMPONENT IDENTIFICATION

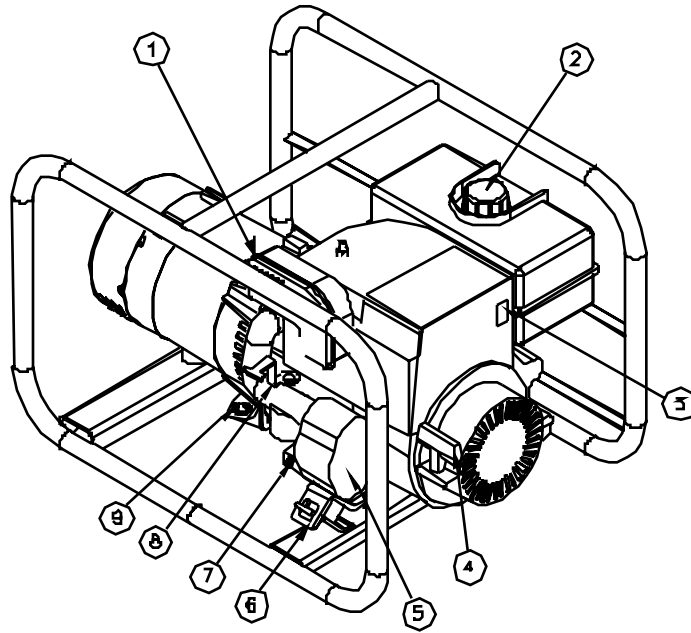


Figure 1 (Ref. 1-9) fig.01858

| Ref. | Description | Ref. | Description |
|------|---------------------------|------|----------------------|
| 1 | Muffler | 10 | Protective Frame |
| 2 | Gas Cap | 11 | Grounding Screw |
| 3 | Engine Stop Switch | 12 | 120V 20A Duplex Rec |
| 4 | Recoil | 13 | Circuit Breakers |
| 5 | Air Cleaner | 14 | 240V 20A Duplex Rec. |
| 6 | Vibration Isolation Mount | 15 | Generator Head |
| 7 | Oil Drain Plug | 16 | Warning Instructions |
| 8 | Choke Lever | 17 | Gas Tank |
| 9 | Dipstick | | |

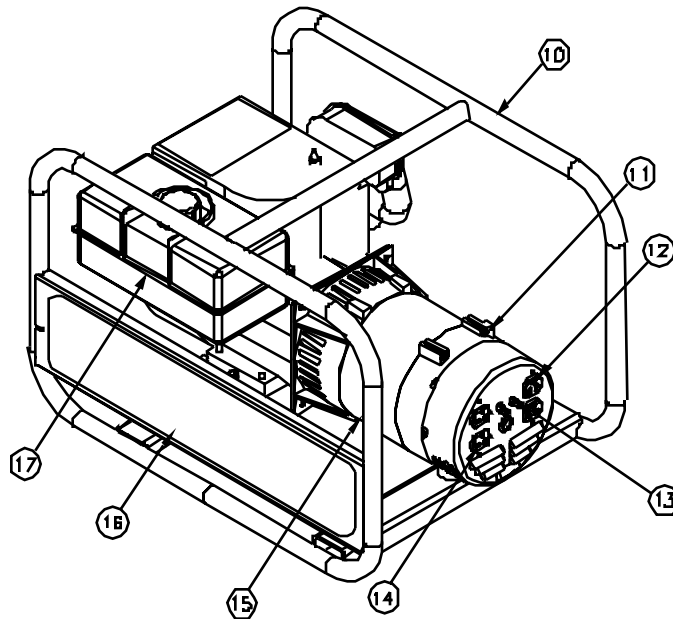


Figure 2 (10-17) Fig01857

GENERATOR FEATURES

Reference 1 - Muffler. Allow 3' clearance around the hot exhaust gas.

Reference 2 - Gas Cap.

Reference 3 - Engine Stop Switch. The rocker engine stop switch is located on the engine. I means ON. O means OFF.

Reference 4 - Recoil. Grasp firmly when starting engine.

Reference 5 - Air Cleaner. Refer to your Tecumseh engine manual for air cleaner care.

Reference 6 - Vibration Isolation Mounts. The engine and generator are mounted on rubber cylinders that absorb most of the engine vibration. This feature eliminates the tendency of the machine to "walk" which is common in engine powered equipment.

Reference 7 - Oil Drain Plug. Refer to your Tecumseh engine manual for oil change recommendations.

Reference 8 - Choke Lever. Used during cold starts. Refer to the starting/stopping instructions and the Tecumseh engine manual for usage.

Reference 9 - Dipstick

Reference 10. Protective Frame. The frame protects to engine and generator from damage.

Reference 11 - Grounding Screw. Ground the generator via the grounding screw, to a copper pipe or rod that is driven into moist soil.

Reference 12 - 120V Receptacle. The generator has a control panel with one duplex (two receptacles in a common housing) receptacle. The duplex is a 120 volt (V) 20 amp (A) straight blade receptacle, National Electrical Manufacturer's Association (NEMA) number 5-20R. This receptacle accepts NEMA plug numbers 5-15P and 5-20P. Each receptacle on the duplex is capable of drawing 17A simultaneously.

Reference 13 - Circuit Breakers. This portable single phase generator has two, 17 amp (A) push to reset circuit breakers to protect against electrical overloads.

Reference 14 - 240V Receptacle. This device is a 240V 20A NEMA 6-20R receptacle. This receptacle accepts a NEMA plug number 6-20P.

ALWAYS use grounded male plugs. The neutral line of the generator is mechanically grounded to the frame. Matching NEMA male plugs must always be used.

Reference 15 - Generator Head. The electricity producing part of the generator.

Reference 16 - Warning Instructions.

Reference 17 - Gas Tank. Always allow room for gasoline expansion by not filling the gas tank completely full.

INTRODUCTION

Before starting your generator, thoroughly study the instructions and cautions in this manual to assure you are fully acquainted with the operation of all components of this generator. Proper preparation, operation and maintenance will result in operator safety, best performance and long life of the generator. For detailed engine operation and maintenance always refer to the Tecumseh engine owner's manual furnished with the generator (Tecumseh refers to the 8 HP engine as a HM80).

NorthStar is constantly improving its products. The specifications outlined herein are subject to change without prior notice or obligation. The purchaser and/or user shall assume liability of any modification and/or alterations on this equipment from original design and manufacture.

Before using, the user shall determine the suitability of this product for its intended use and assumes liability therein.

ANSI SAFETY DEFINITIONS

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in a death or serious injury.

CAUTION indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

RULES FOR SAFE OPERATIONS

Safety precautions are essential when operating this generator. Respectful and cautious operation will considerably lessen the possibilities of a personal injury. This manual will warn of specific personal injury potential, and these will be designated by the symbol:



WARNING This generator is equipped with a grounding post, located on the control panel for your protection. Always complete the grounding path from the generator to a copper pipe/rod that is driven into moist earth, to prevent electrical shock.

ALWAYS use electrical cords that are in good condition. Worn, bare, frayed or otherwise damaged cords can cause electric shock.

NEVER operate the generator, or handle any electrical equipment while standing in water, while barefoot, while hands are wet or while in the rain or snow. Electric shock may result.

ALWAYS use a ground fault circuit interrupter (GFCI) in damp or highly electrical conductive areas and on construction job-sites to prevent electric shock.

ALWAYS remove the spark plug or spark plug wire before working on the engine or generator, to prevent accidental starting.


ALWAYS provide adequate ventilation. Do not operate generator in any enclosed or narrow space. Engines consume oxygen and give off deadly carbon monoxide poisonous gas. Improper ventilation will cause damage to generator and possible injury to people.


NEVER touch hot muffler, hot exhaust manifold or engine cooling fins.

ALWAYS remove all oil or gasoline deposits and accumulated dirt from generator and immediate area. Keep generator head and engine clean.

NEVER operate the generator under the following conditions:

- A. Excessive change in engine speed, slow or fast.
- B. Overheating in load connecting devices.
- C. Sparking or arcs from generator.
- D. Loss of electrical output.
- E. Damaged receptacles.
- F. Engine misfire.
- G. Excessive vibration.
- H. Enclosed compartments, or confined areas.
- I. Flame or smoke.
- J. Rain, snow or wet conditions.
- K. Operator non-attendance.

 **WARNING** Check fuel system on a regular basis. Look for signs of leaks, deterioration, chafed or spongy fuel hose, loose or missing fuel hose clamps, damaged fuel tank or a defective fuel shut-off valve. Correct any defects before operation.

 **WARNING** Keep fire extinguisher close by your generator and be familiar on how to use it. Consult your local fire department for correct extinguisher type.

INSTALLATION


OUTDOORS: Choose locations where the generator will not be exposed to rain, snow or direct sunlight. Position the generator on secure, level ground so it will not tip or slide down a hill. Place the

generator so that the exhaust fumes will not be directed towards people.

The installation site must be free from water, moisture, or dust. All electrical components should be protected from excessive moisture or the insulation system will deteriorate and result in grounding or shorting out the generating system.

Foreign matters, such as dust, dirt, sand, lint, or abrasive materials can cause damage to the generator head and engine if allowed into its cooling system.

NEVER install your generator inside confined areas. Inside installation can cause health hazards or death.

 **DANGER** Remember, exhaust fumes are deadly carbon monoxide gas, and must be vented to the outside where there are no people. Cooling air of sufficient amounts must be allowed to flow in and exhausted out to ensure proper cooling of the engine and generator head.

LOAD APPLICATION

It is important to determine the total electrical load before it is connected to the generator. The two major factors in determining the life of a generator head are heat build-up, caused by overloading the generator and corrosive contaminants that can attack the wiring insulation. If the generator is overloaded, the wires become excessively hot and cause the insulation to break down, reducing its ability to resist corrosive contaminants. Over time the effectiveness of the insulation is eliminated and a dead short can result.

Always compare the generator nameplate data with that of the equipment to be used to ensure that watts, volts, amperage, and frequency requirements are suitable for operating equipment. The wattage listed on the equipment nameplate is its rated output. However, some equipment may require three to ten times more wattage than its rating on the nameplate, as the wattage is influenced by the equipment efficiency, power factor and starting system. NOTE: If wattage is not given on equipment nameplate, approximate wattage may be determined by multiplying nameplate voltage by nameplate amperage.

VOLTS X AMPS = WATTS

Example: 120V X 5A = 600W

When connecting a resistive load such as incandescent lights, heaters or common electric power tools, a capacity of up to the generator full rated wattage output can be used.

When connecting a resistive-inductive load such as a fluorescent or mercury light, transformers or inductive coils, a capacity of up to 0.6 times the generator's full rated output can be used.

Always allow the generator to reach operating speed before a load is applied.

STARTING ELECTRIC MOTORS

Electric motors require much more current (amps) to start than to run. Some motors, particularly low cost split-phase motors, are very hard to start and require 5 to 7 times more current to start than to run. Capacitor motors are easier to start and usually require 2 to 4 times as much current to start than to run. Repulsion Induction motors are the easiest to start and require 1.5 to 2.5 times as much to start than to run.

Most fractional motors take about the same amount of current to run them whether they are of Repulsion-Induction (RI), Capacitor (Cap), or Split-Phase (SP) type. The following chart shows the approximate current required to start and run various types and sizes of 120 volt 60 cycle electric motors under various conditions.

| 120V, 60 Hz Motors | | Starting Amps | | |
|--------------------|---------------|---------------|----------|---------|
| Hp motor | Running Watts | RI type | Cap type | SP type |
| 1/6 | 525 | 7-11 | 9-18 | 16-22 |
| 1/4 | 700 | 9-15 | 12-23 | 22-32 |
| 1/3 | 875 | 11-18 | 14-29 | 26-35 |
| 1/2 | 1175 | 15-25 | 20-40 | NA |
| 1 | 1925 | 24-40 | 32-64 | NA |
| 1 1/2 | 2400 | 30-50 | 40-80 | NA |
| 2 | 2900 | 36-60 | 48-96 | NA |
| 3 | 4075 | 51-85 | 68-136 | NA |
| 5 | 6750 | 84-140 | 112-224 | NA |

The figures given above are for an average load such as a blower or fan. If the electric motor is connected to a hard starting load such as an air compressor, it will require more starting current. If it is connected to a light load or no load such as a power saw, it will require less starting current. The exact requirement will also vary with the brand or design of the motor.

Generators respond to severe overloading differently than the power line. When overloaded, the engine is not able to supply enough power to bring the electric motor up to operating speed. The generator responds to the high initial starting current, but the engine speed drops sharply. The overload may stall the engine. If allowed to operate at very low speeds, the electric motor starting winding will burn out in a short time. The generator winding might also be damaged.

Running the generator under these conditions may result in damage to the generator stator as well as the motor windings. Because the heavy surge of current is required for only an instant, the generator will not be damaged if it can bring the motor up to speed in a few seconds. If difficulties in starting a motor are experienced, turn off all other electrical loads and if possible reduce the load on the electric motor.

EXTENSION CORDS

When electric power is to be provided to various loads at some distance from the generator, extension cords can be used. These cords should be sized to allow for distance in length and amperage so that the voltage drop between the set and point of use is held to a minimum.

| Current/Power | | Maximum Extension Cord Length | | | |
|---------------|--------------|-------------------------------|--------------|--------------|--------------|
| Amps at 240V | Load (watts) | #10 Ga. Cord | #12 Ga. Cord | #14 Ga. Cord | #16 Ga. Cord |
| 10 | 2400 | 250' | 150' | 100' | 75' |
| 20 | 4800 | 125' | 75' | 50' | 25' |
| 30 | 7200 | 60' | 35' | 25' | 10' |
| 40 | 9600 | 30' | 15' | 10' | * |
| 50 | 12000 | 15' | * | * | * |

*Not recommended

CAUTION: Equipment damage can result from the low voltage caused by using an extension cord with a small wire size.

Use this chart to estimate the total load on your generator.

| For Determining Generator Load Requirements | |
|---|---------------|
| Device | Running Watts |
| Air Conditioner (12,000 Btu) | 1700 (a) |
| Battery Charger (20 Amp) | 500 |
| Belt Sander (3") | 1000 |
| Chain Saw | 1200 |
| Circular Saw (6-1/2") | 900 |
| Coffee Maker | 1000 |
| Compressor (1 HP) | 2000 (a) |
| Compressor (3/4 HP) | 1800 (a) |
| Compressor (1/2 HP) | 1400 (a) |
| Curling Iron | 700 |
| Dishwasher | 1200 |
| Edge Trimmer | 500 |
| Electric Nail Gun | 1200 |
| Electric Range (one element) | 1500 |
| Electric Skillet | 1250 |
| Furnace Fan (1/3 HP) | 1200 (a) |
| Freezer | 800 (b) |
| Hair Dryer | 1200 |
| Hand Drill (1") | 1100 |
| Hand Drill (1/2") | 875 |
| Hand Drill (3/8") | 500 |
| Hand Drill (1/4") | 250 |
| Hedge Trimmer | 450 |
| Home Computer | 150 |
| Impact Wrench | 500 |
| Jet Pump | 800 (a) |
| Lawn Mower | 1200 |
| Light Bulb | 100 |
| Microwave Oven | 700 |
| Milk Cooler | 1100 (a) |
| Oil Burner on Furnace | 300 |
| Oil Fired Space Htr (140,000 Btu) | 400 |
| Oil Fired Space Htr (85,000 Btu) | 225 |

| | |
|-----------------------------------|----------|
| Oil Fired Space Htr (30,000 Btu) | 150 |
| Oven | 4500 |
| Paint Sprayer, Airless (1/3 HP) | 600 (a) |
| Paint Sprayer, Airless (handheld) | 150 |
| Radio | 200 |
| Refrigerator | 600 (b) |
| Slow Cooker | 200 |
| Submersible Pump (1-1/2 HP) | 2800 (a) |
| Submersible Pump (1 HP) | 2000 (a) |
| Submersible Pump (1/2 HP) | 1500 (a) |
| Sump Pump | 600 (a) |
| Table Saw (10") | 2000 (a) |
| Television | 500 |
| Toaster | 1000 |
| Vacuum Cleaner | 250 |
| VCR | 70 |
| Water Heater | 3000 |
| Weed Trimmer | 500 |

(a) Hard-starting motors require 3 to 5 times the rated running watts.

(b) These loads may require up to 15 minutes to restart due to its normal build up of compressor head pressure.

NOTE: For extremely hard to start loads such as air conditioners and air compressors, consult the equipment dealer to determine the maximum wattage.

PRE-START PREPARATIONS

Your generator has been thoroughly tested prior to shipment from the factory. A factory test report has been included with this manual. However, damage can occur during shipping, so be sure to check for damaged parts or loose or missing nuts and bolts. If the aforementioned problems occur, call Customer Service at 1-800-270-0810.

GROUNDING - All units must be grounded. Drive a 3/4" or 1" copper pipe or rod into the ground close to the generator. The pipe/rod must penetrate moist earth. Connect an approved ground clamp to the pipe. Run a no. 12 Ga. wire from the clamp to the generator grounding post located on the control panel. Do not connect to a water pipe or a ground used by a radio system.

CAUTION: The engine has been shipped without oil. Fill the crankcase with oil before trying to start. Low oil shut down prevents your generator from starting without sufficient oil.

OPERATING SPEED

The generator must be run at the correct speed in order to produce the proper electrical voltage and frequency. The speed of the engine was carefully adjusted at the factory so that the generator produces the proper voltage and frequency.

The output voltage should be checked to ensure the generator is working properly before connecting a load to the generator. Failure to do so could result in

damage to equipment plugged into the unit and possible injury to the individual.

All engines have a tendency to slow down when a load is applied. When the electrical load is connected to the generator, the engine is more heavily loaded, and as a result the speed drops slightly. This slight decrease in speed, together with the voltage drop within the generator itself, results in a slightly lower voltage when the generator is loaded to its full capacity than when it is running with no load. The slight variation has no appreciable effect in the operation of motors, lights and most appliances. Electronic equipment and docks will be affected if correct RPM is not maintained. See Load vs. Output chart.

| Load | Output | | |
|-----------------------------|-------------|----------------|--------------------------------------|
| | Speed (RPM) | Frequency (Hz) | Generator Voltage at 120V Receptacle |
| Percent of Generator Output | | | |
| 0 % | 3780 | 63.0 | 129V |
| 50 % | 3600 | 60.0 | 120V |
| 100 % | 3510 | 58.5 | 112V |

Output voltage should be checked periodically to ensure continued proper operation of the generating plant and appliances. It can be checked with a portable meter. Frequency can be checked by using an electric clock with a sweep second hand. Timed against a wrist watch or a stop watch the dock should be correct within +/- 2 seconds per minute. All speed setting adjustments should be done by a qualified technician.

BEFORE STARTING

1. Make sure the generator is positioned on firm level surface.
2. Check the crankcase for oil and maintain at a proper level.
3. Check fuel level and fill tank with fresh unleaded gasoline if necessary. Allow for gasoline expansion by never filling fuel tank completely to the top. Always wipe up and remove any spilled gasoline.
4. Make sure that the exhaust fumes are directed away from people.

STARTING

1. Disconnect all loads to generator.
2. Move engine on-off lever located on engine to the I position.
3. For cold engine, move choke lever to full choke position. For a warm engine, move choke lever to half choke or run position.
4. Grasp recoil handle and pull.
5. When engine starts, move choke lever to run position.
6. Loads may now be connected to generator.

STOPPING

1. Disconnect all loads to generator.
2. Move engine on-off switch to the O position.

ENGINE CARE

Refer to your Tecumseh Owner's Manual for proper care and maintenance.



CAUTION NEVER change oil on a hot engine, the hot oil could cause severe burns.

GENERATOR CARE

The generator head is a two pole, 3600 RPM, 60 Hz, brushless, revolving field and synchronous type with one sealed radial roller bearing. The rotor of the generator head is directly connected to the engine crank shaft and the stator is rigidly coupled to the engine casting via the generator head casting.

Exercising The Generator - The generator should be operated every four weeks. Warm the unit up by starting the engine and letting it run for 10 to 15 minutes. This will dry out any moisture that has accumulated in the windings. If left, this moisture can cause corrosion in the winding. Frequent operation of the engine generator will also ensure that the set is operating properly should it be needed in an emergency.

Generator Maintenance - The generator head is brushless and maintenance free. Any major generator service including the installation or replacement of parts should be performed only by a qualified electrical service technician. **USE ONLY FACTORY APPROVED REPAIR PARTS.** Obtain all factory parts from Customer Service at 1-800-270-0810.

A. Bearing - The bearing used in these generators is a heavy duty sealed ball bearing. They require no maintenance or lubrication.

B. Receptacles - Quality receptacles have been utilized. If a receptacle should become cracked or otherwise damaged, replace it. Using cracked or damaged receptacles can be both dangerous to the operator and destructive to the equipment.

Stand-by Operation

If your generator is to be used as a standby electric power source in case of utility failure, it must be installed by a registered and licensed electrician and in compliance with all applicable state and local electrical codes. Also, local Fire Departments must be consulted concerning proper and safe handling procedures for gasoline. **NEVER** connect any generator to any existing electrical system without an isolating, UL approved transfer switch, installed by a licensed electrician.

TROUBLESHOOTING

| Problem | Possible Causes | Possible Remedies |
|-------------------------------------|---|--|
| Engine will not start. | <ul style="list-style-type: none"> a) Low oil level. b) Fouled spark plug. c) Out of fuel. d) Stop switch in OFF position. | <ul style="list-style-type: none"> a) Fill crankcase to proper oil level. b) Clean or replace spark plug. c) Fill fuel tank. d) Place switch in ON position. |
| Voltage too low. | <ul style="list-style-type: none"> a) Engine speed too slow. b) Generator is overloaded. | <ul style="list-style-type: none"> a) Bring generator to a qualified technician for adjustment. b) Reduce the load. (See Load Application section of this manual.) |
| Circuit breaker trips. | <ul style="list-style-type: none"> a) Defective load connected to generator. b) Defective receptade. c) Generator overloaded. | <ul style="list-style-type: none"> a) Disconnect load. b) Replace receptade. c) Reduce the load. (See Load Application section of this manual.) |
| Voltage too high. | <ul style="list-style-type: none"> a) Engine speed too high. | <ul style="list-style-type: none"> a) Bring generator to a qualified technician for adjustment. |
| Generator overheating. | <ul style="list-style-type: none"> a) Generator is overloaded. b) Insufficient ventilation. | <ul style="list-style-type: none"> a) Reduce the load. (See Load Application section of this manual.) b) Make sure there is at least 3 feet of clearance on all sides of generator. |
| No output voltage. | <ul style="list-style-type: none"> a) Defective load connected to generator. b) Broken or loose wire. c) Defective receptade. d) Defective stator. e) Defective rotor. f) Defective capactor. | <ul style="list-style-type: none"> a) Disconnect load. b) Bring generator to a qualified technician for repair. c) Replace receptade. d) Bring generator to a qualified technician for repair. e) Bring generator to a qualified technician for repair. f) Bring generator to a qualified technician for repair. |
| Engine lacks power. | <ul style="list-style-type: none"> a) Generator is overloaded. b) Dirty air filter. | <ul style="list-style-type: none"> a) Reduce the load. (See Load Application section of this manual.) b) Clean or replace air filter. |
| Engine shuts down during operation. | <ul style="list-style-type: none"> a) Out of fuel. b) Low oil level. | <ul style="list-style-type: none"> a) Fill fuel tank. b) Fill crankcase to proper oil level. |

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