

83874

OWNER'S Manual

SERIES NP-80D

LIQUID-COOLED RECREATIONAL VEHICLE GENERATOR

Model 9344-1

GENERAC
C O R P O R A T I O N

GENERAL SAFETY RULES

THE MANUFACTURER SUGGESTS THAT THESE "RULES" FOR SAFE OPERATION BE COPIED AND POSTED IN POTENTIAL HAZARD AREAS OF THE RECREATIONAL VEHICLE. SAFETY SHOULD BE STRESSED TO ALL OPERATORS AND POTENTIAL OPERATORS OF THIS EQUIPMENT.

Study these SAFETY RULES carefully before operating or servicing applicable equipment. Become familiar with this Owner's Manual and with your generator. Safe, efficient and reliable operation can only be achieved if generator is properly installed, operated and maintained. Many accidents are caused by failing to follow simple and fundamental rules or precautions. The manufacturer suggests that these GENERAL SAFETY RULES be copied and posted in potential hazard areas of the recreational vehicle. Stress safety to all operators and potential operators of this equipment.

The manufacturer cannot possibly anticipate every possible circumstance that might involve a hazard. The warnings in this manual, therefore, are not all-inclusive. If you use a procedure, work method or operating technique that Generac does not specifically recommend, you must satisfy yourself that it is safe for you and others. You must also make sure the procedure, work method or operating technique that you chose, does not render the generator to be unsafe.

- For fire safety, the recreational vehicle generator must be properly installed and maintained. Installation must comply with applicable codes and standards. Also, the generator must be installed to conform to the manufacturer's detailed installation instructions. After installation, do nothing that might render the generator in non-compliance with such codes, standards and instructions.
- The recreational vehicle generator produces extremely dangerous electrical voltages and can cause dangerous, and possibly fatal, electrical shock. Avoid contact with bare wires, terminals, etc., while the unit is running. If you must work around an operating generator, stand on an insulated, dry surface to reduce shock hazard.
- Never work on this equipment or handle any electrical device while standing in water, while barefoot, or while hands or feet are wet. Dangerous electrical shock will result.
- Have the generator properly grounded (bonded) during installation onto the vehicle, either by solid mounting to the vehicle frame or chassis or by means of an approved bonding conductor, if so equipped. DO NOT reconnect the bonding conductor to any generator part that might be removed or disassembled during routine maintenance. If the grounding conductor must be replaced, use only a flexible conductor that is of No. 8 AWG copper wire minimum.
- Inspect fuel system frequently for leaks or damage. Repair or replace any damaged or leaking component immediately. Never attempt to change, alter or modify the generator fuel system in any way that might affect safety or compliance with applicable codes and standards.
- In case of accident caused by electric shock, shut down the source of electrical power at once. If you cannot do this, free the victim from live conductor. AVOID DIRECT CONTACT WITH THE VICTIM. Use a dry board, dry rope, or other non-conducting tool to free the victim from live conductor. If victim is unconscious, apply CPR (cardio-pulmonary resuscitation) and get medical help.
- The generator engine gives off DEADLY carbon monoxide gas through its exhaust system. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. This exhaust system must have been properly installed, complying strictly with applicable codes and standards. After installing the unit, do nothing that might render the unit unsafe or in non-compliance with such codes and standards. The generator compartment must be completely vapor-sealed from vehicle interior. There must be no possibility of exhaust fumes entering the vehicle interior. Never operate this equipment with a leaking or defective exhaust system.
- Never use the generator or any of its parts as a step. Stepping on the unit can stress and break parts and may result in dangerous operating conditions from leaking exhaust gases, leaking fuel, leaking oil or leaking coolant.
- The generator compartment needs adequate ventilation to expel toxic fumes and diesel fuel vapors. Do not alter the installation in any way that might obstruct air and ventilation openings. Keep such openings clear and unobstructed.
- Keep hands, feet, clothing away from drive belts, fans and other moving parts of this equipment. Never remove a drive belt or fan guards while the unit is operating.
- Although diesel fuel is not as volatile as gasoline or LP gas (liquid propane), it is still dangerous. Comply strictly with all laws and regulations regarding the handling of diesel fuel.
- Inspect the generator periodically. Repair or replace all damaged or defective parts immediately.
- Before performing any maintenance on the generator set, disconnect its battery cables to prevent accidental starting. First disconnect the cable from the battery post indicated by a NEGATIVE, NEG or (-). Reconnect that cable last.

IDENTIFICATION RECORD

Please record the following information. Find this information on the Model/Serial Number Plate and on the Generator Data Plate, affixed to your generator.

Model Number _____

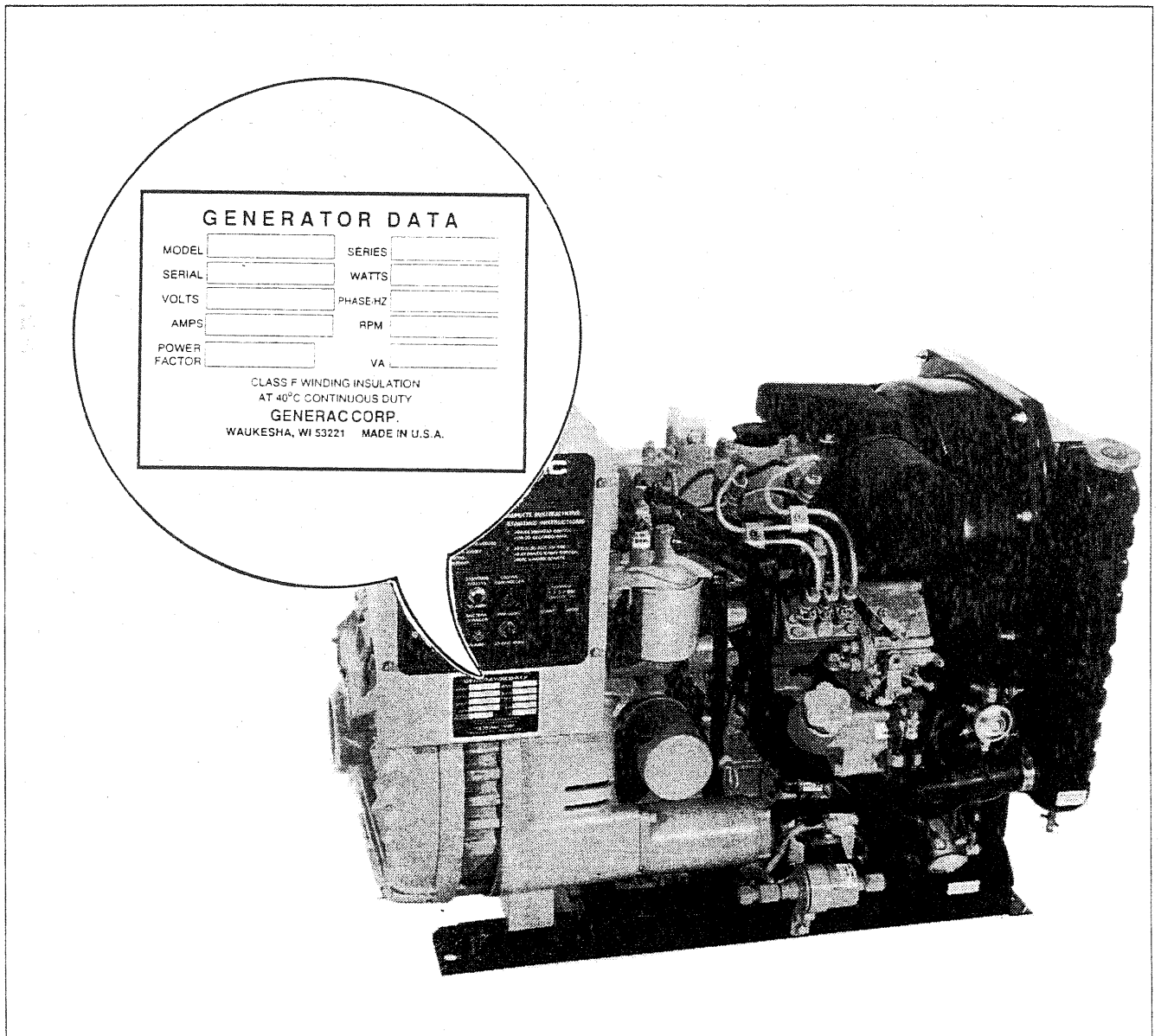
Serial Number _____

Rated kW _____

Rated Volts _____

Rated Hertz _____

Rated RPM _____



READ THIS MANUAL THOROUGHLY

If you don't understand any portion of this manual, contact Generac for a demonstration of actual starting, operating and servicing procedures.

Throughout this publication and on tags and decals affixed to the generator, DANGER and CAUTION blocks are used to alert you to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully.

These safety warnings cannot eliminate the hazards they indicate. Complying strictly with the special instructions while servicing the unit plus "common sense" are major measures for preventing accidents.

The following definitions apply to DANGER, CAUTION and NOTE blocks found throughout the manual.

DANGER! AFTER THIS HEADING YOU CAN READ INSTRUCTIONS FOR HANDLING, INSTALLING OR SERVICING THAT, IF NOT COMPLIED WITH STRICTLY, MAY RESULT IN PERSONAL INJURY.

CAUTION! After this heading you can read instructions for handling, installing or servicing that, if not complied with strictly, may result in damage to equipment and/or property.

NOTE: After this heading you can read explanatory statements that require special emphasis.

The operator (driver) is responsible for proper and safe use of the vehicle, equipment of the vehicle and the safety of all vehicle occupants. We strongly recommend that the operator read this Owner's Manual and thoroughly understand all instructions before using this equipment. We strongly recommend instructing other occupants in the vehicle to properly start and operate

the generator. This prepares them if they need to operate the equipment in an emergency.

OPERATION AND MAINTENANCE

The operator is responsible for performing all safety checks; to be sure that all maintenance for safe operations is performed promptly; and to have the equipment checked by an Authorized Dealer periodically. Normal maintenance service and replacement of parts are the responsibility of the Owner/Operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of your recreational vehicle generator keeps the number of problems to a minimum and keeps your operating expenses low. See your authorized Dealer/Distributor for service aids and accessories.

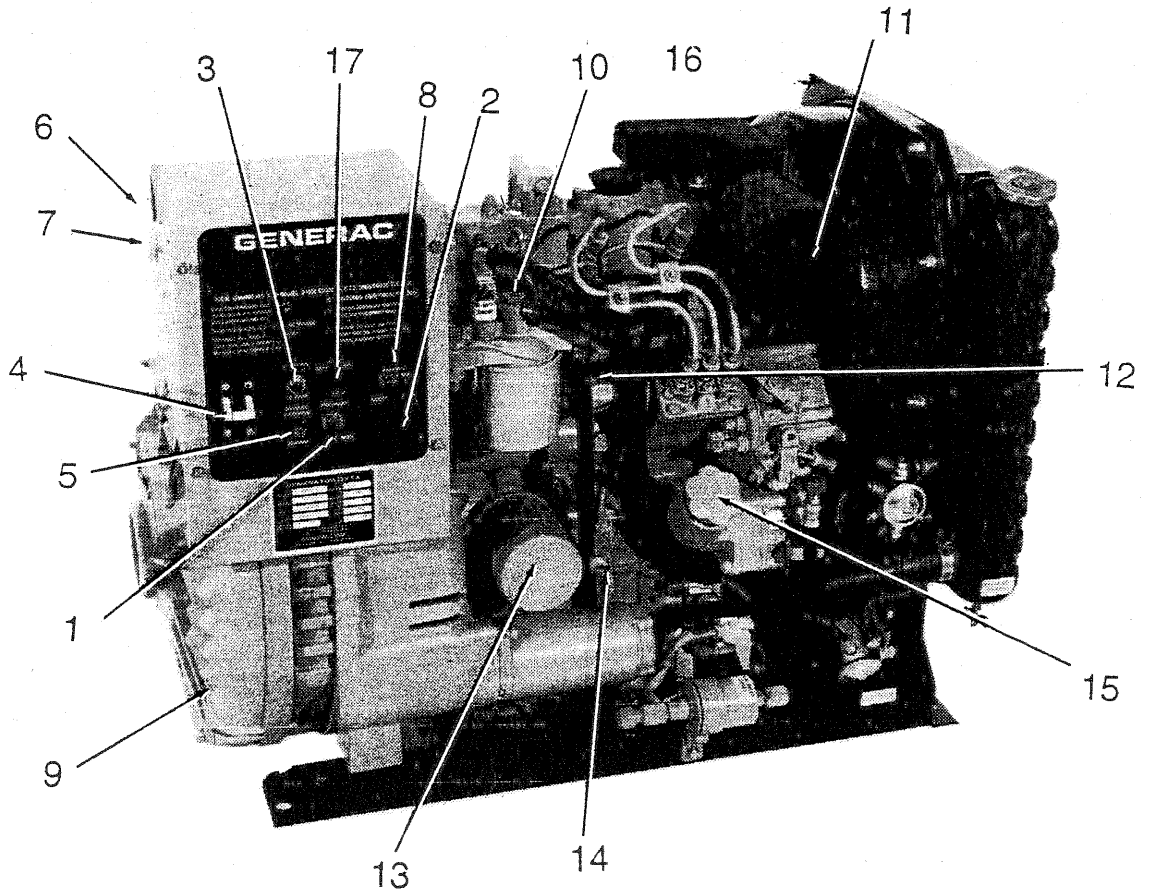
HOW TO OBTAIN SERVICE

When your recreational vehicle generator set requires servicing or repairs, simply contact an authorized Service Station for assistance. Service technicians are factory-trained and are capable of handling all of your service needs.

When contacting an Authorized Service Facility of the factory about parts and service, always supply the complete model number and serial number of your unit as given on its data plate.

The warranty of your generator is included in this Owner's Manual as are listing for repair parts.

GENERATOR FEATURES



- | | |
|---------------------------------|--------------------------------|
| 1. Engine Pre-heat Switch | 10. Fuel Return Connection |
| 2. Engine Start/Stop Switch | 11. Air Cleaner |
| 3. 10 amp DC Circuit Breaker | 12. Oil Drain Hose |
| 4. 35 amp AC Circuit Breaker | 13. Oil Filter |
| 5. 30 amp Battery Charging Fuse | 14. Oil Dipstick |
| 6. Generator AC Output Leads | 15. Oil Filler Opening and Cap |
| 7. Remote Leads | 16. Fuel Filter |
| 8. Hourmeter | 17. 14 amp Fuse |
| 9. Generator | |

GENERATOR FAMILIARIZATION

GENERATOR APPLICABILITY

These generators have been designed and manufactured for the purpose of supplying electrical power for recreational vehicles. You should not modify the generator or use it for any application other than for what it was designed. If there are any questions pertaining to its application, write or call the factory. Do not use the unit until a competent authority has advised you.

DANGER: FOR FIRE SAFETY, THE GENERATOR MUST HAVE BEEN PROPERLY INSTALLED IN COMPLIANCE WITH APPLICABLE CODES AND STANDARDS. THE GENERATOR ALSO MUST HAVE BEEN INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S DETAILED INSTALLATION INSTRUCTIONS. FOLLOWING INSTALLATION, NOTHING MUST BE DONE THAT MIGHT RENDER THE UNIT IN NON-COMPLIANCE WITH SUCH CODES, STANDARDS AND INSTRUCTIONS.

You can use this generator set to supply electrical power for operating 120/240 volts, single-phase, 60 Hz, a-c electrical loads requiring up to 7,500 watts (7.5 kW) of power. Those electrical loads cannot exceed up to 62.5 a-c amperes of current at 120 volts, or 31.2 a-c amperes at 240 volts.

CAUTION: Do not overload the generator. Some installations may require that electrical loads be alternated to prevent overloading. Applying excessively high electrical loads may damage the generator or shorten its life. Add up the rated watts of all electrical lighting, appliance, tool and motor loads the generator will power at one time. This total should not be greater than the wattage capacity of the generator. If an electrical device nameplate gives only volts and amps, multiply volts times amps to obtain watts (volts x amps = watts). Some electric motors may require more watts of power (or amps of current) for starting than for continuous operation.

INSTALLATION

This Owner's Manual has been prepared assuming that competent, qualified technicians installed the generators into recreational vehicles. We also assume installer complied with all applicable codes, standards and regulations pertaining to installation.

An INSTALLATION MANUAL was shipped with the generator. That manual contains manufacturer's instructions and recommendations for installing the unit into a recreational vehicle. Following installation, installers should forward the Installation Manual to Owner/Operators for their information. Owners/Operators have the responsibility to make sure that nothing is done that might render installation unsafe or so it will not comply with applicable codes, standards and instructions.

The owner/operator should be sure the unit has been installed to allow adequate ventilation for cooling and exhaust air.

SAFETY

Before attempting to use the generator set, carefully read GENERAL SAFETY RULES inside the cover of this Manual. Comply strictly with these RULES to prevent accidents and damage to equipment and/or property. Generac suggests that copying and posting GENERAL SAFETY RULES in potential hazard areas of the vehicle. Stress safety to all operators and potential operators of this equipment.

GENERATOR A-C CONNECTION SYSTEM

The generator is equipped with a dual stator AC power windings. These two stator windings supply electrical power to customer electrical loads by means of a dual 2-wire connection system. Note, however, the neutral is grounded.

The generator has been installed so that units power 120/240 volts AC loads (Figure 1); or you can rewire them to connect only 120 volts AC electrical loads. Be sure to add jumper wire between circuit breakers (C.B. in Figure 2) when connecting for 120 volts

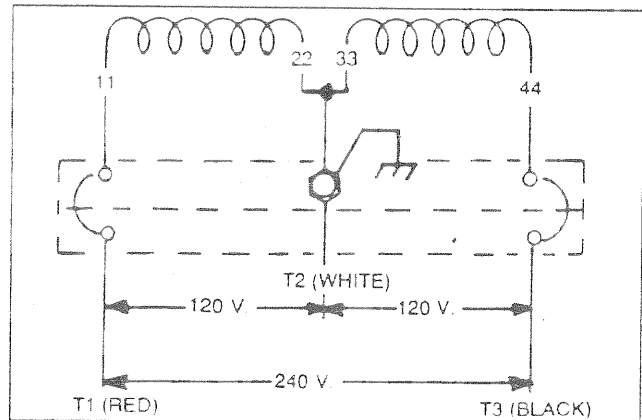


Figure 1 — Connections for 120/240 Volts

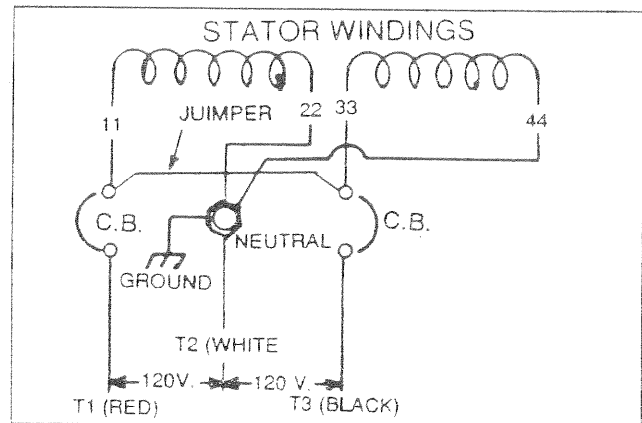


Figure 2 — Connections for 120 Volts Only

GENERATOR CONTROL PANEL

See Figure 3 to identify the following components:

Hourmeter: Provides continuous indication of engine operating time, in hours and tenths of hours. Use the hourmeter with the periodic maintenance schedule, to make sure that required periodic maintenance tasks are completed on a timely basis.

Engine-Stop/Start Switch: To crank the engine, hold switch at START position. Release the switch when the engine starts. To shut down an operating engine, set the switch to STOP.

10-Amp Circuit Breaker: Protects the DC control circuit against overload. If the circuit breaker has opened due to an overload, engine preheat and start functions cannot occur. The breaker is a "push to reset" type.

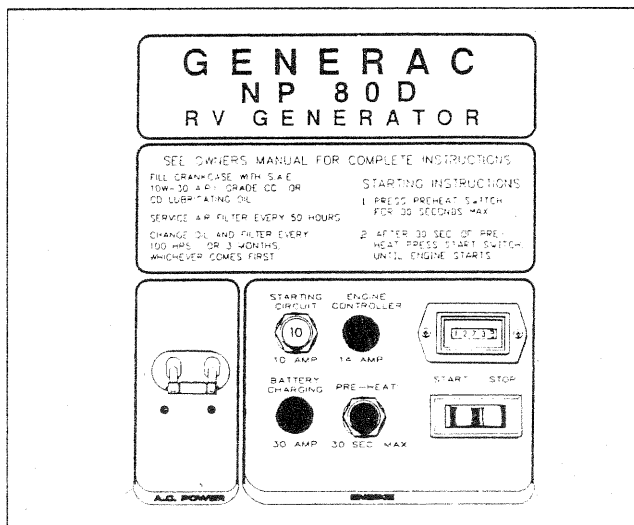


Figure 3 — Generator Control Panel

Dual AC Circuit Breaker: Rated at 35 AC amps, the circuit breaker (Figure 4) protects the generator's AC output circuit against overload and provides a method of turning OFF the generator's 120/240 volts AC output to vehicle circuits.

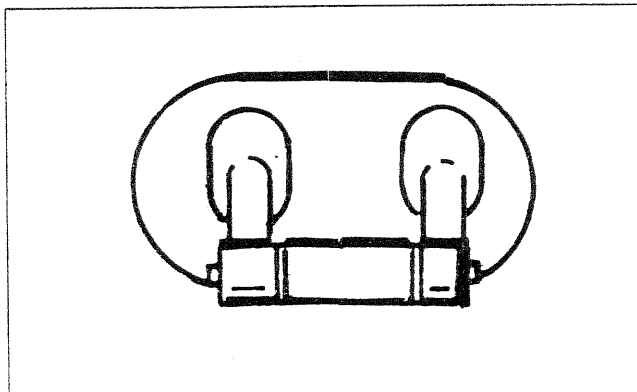


Figure 4 — Dual 35-amp Circuit Breakers

Preheat Switch: The diesel engine is equipped with glow plugs, one for each cylinder. When you press the preheat switch (Figure 3), the glow plugs heat the engine combustion chamber for quicker starts in cold weather. To preheat the combustion chamber for quicker starts in cold weather. Press the switch and between 15 and 30 seconds. Continue holding in the preheat switch while cranking the engine until it starts.

NOTE: Refer to THE GENERATOR A-C CONNECTION SYSTEM on Page 4. Individual installations will differ. If an overload occurs, the dual breakers will open the hot stator leads (11 and 44). When the generator has been connected for 120 volts only, one of the dual circuit breakers will open stator AC output lead No. 11 (hot lead).

REMOTE START/STOP PANEL

A remote mounted Start/Stop Panel is available, which allows you to start and stop the generator engine conveniently from inside the vehicle.

You can also order a remote panel that includes meters and gauges for monitoring low oil pressure, high coolant temperature and low coolant level (Figure 5), in addition to a start/stop switch. The panel also includes an ammeter, a voltmeter and an hourmeter.

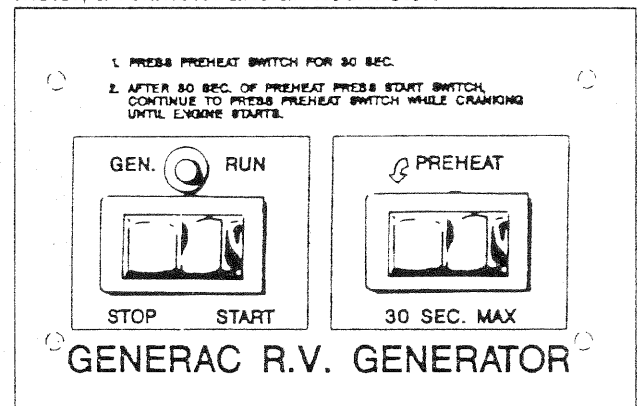


Figure 5 — Remote Start/Stop & Gauge Panel

BEFORE STARTUP

- **Check Engine Crankcase Oil Level:** Refer to SPECIFICATIONS and MAINTENANCE sections for procedures and recommendations.

CAUTION! Any attempt to crank or start the engine before properly servicing it with recommended oil will result in an engine failure.

NOTE: Engine was factory serviced with a high quality oil classified "For Service CD" or "For Service CC" and having a viscosity rating of SAE 30. The installer may have refilled the crankcase with an oil more suitable for ambient temperature ranges in your area.

- **Check Coolant Level:** Check coolant level prior to initial use and at recommended intervals. Refer to SPECIFICATIONS and MAINTENANCE sections for procedures and recommendations.
- **Check Fuel Supply:** Make sure an adequate supply of clean fuel is available to the engine. Many installations include a Fuel Shutoff Valve, which you must open before starting the engine.

NOTE: On some installations, the generator may have been provided with its own fuel tank. On other installations, the generator may "share" with the vehicle's fuel tank. When the vehicle's tank is shared, some installers may have installed a generator fuel pick up tube in the shared tank that is shorter than the vehicle's pick up tube. When a shorter generator fuel pickup tube is installed in the tank, the generator will run out of gas while sufficient fuel remains in the tank for vehicle engine operation.

START THE GENERATOR

To start the generator from either the generator control panel or from the optional Remote Panel, proceed as follows:

1. Turn OFF electrical loads, using whatever means provided.

NOTE: If starting from the generator panel, turn OFF loads by setting the generator's main circuit breaker to OFF or OPEN. If starting from a Remote Panel, turn OFF loads using whatever means is provided in the vehicle (such as a main circuit breaker.)

2. Press the preheat switch (if engine is cold) for between 15 and 30 seconds.
3. At the same time, hold the Engine-Start/Stop Switch at START and press the preheat switch to crank engine. Release the switch when the engine starts.
4. Let the engine stabilize and warm up.
5. Turn ON electrical loads, using whatever means provided.

SHUTTING DOWN THE GENERATOR

1. Turn OFF electrical loads, using whatever means provided.
2. Let the engine run at no-load for a few minutes to stabilize internal temperatures.
3. Set the Engine-Run/Stop Switch to STOP position.

ADDITIONAL INFORMATION

AUTOMATIC LOW OIL PRESSURE SHUTDOWN

The engine is equipped with a normally-closed (N.C.) oil pressure switch (Figure 6). Engine oil pressure holds the switch open during cranking and operation. Should oil pressure drop below about 15 psi, the switch contacts close and the engine automatically shuts down.

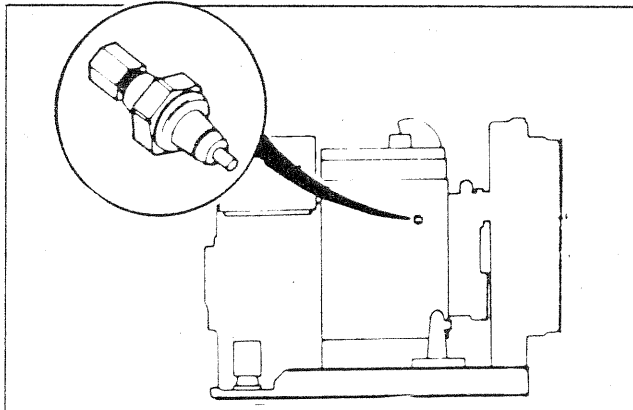


Figure 6 — Low Oil Pressure Switch

HIGH COOLANT TEMPERATURE SHUTDOWN

This switch (Figure 7) is a normally open (N.O.) thermostatic device which is immersed in engine coolant. Should engine coolant temperature exceed about 230°F (110°C), the switch contacts close and the engine shuts down.

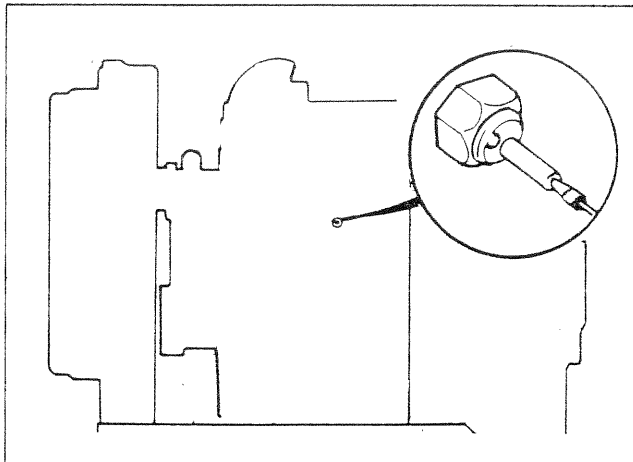


Figure 7 — High Coolant Temperature Switch

OVERSPEED SHUTDOWN

The generator control panel houses an Engine Controller circuit board (Figure 8). That circuit board receives a-c frequency signals from generator stator leads 11 and 22. Should a-c frequency exceed about 72 Hz (2160 rpm), circuit board action initiates an automatic shutdown after a few seconds.

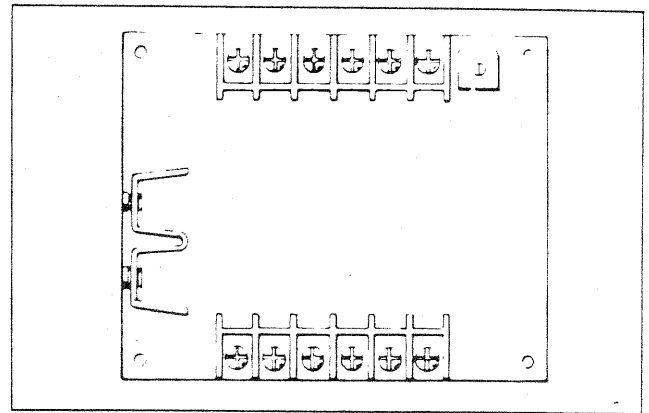


Figure 8 — Engine Controller Circuit Board

NOTE: After an overspeed shutdown, the engine may be cranked and re-started. However, if the engine overspeeds again, the engine shuts down again.

ENGINE GOVERNED SPEED

The generator is equipped with a 4-pole revolving field (rotor) which must be driven at 1500 rpm to produce the unit's rated a-c frequency of 50 Hz. The diesel engine governor was factory set to about 52 Hz. (1560) at no-load. After installing it, the installation technician should check and adjust the governed speed. Setting the no-load frequency slightly high helps prevent excessive frequency, rpm and voltage droop under heavy electrical loading.

DANGER: DO NOT TAMPER WITH THE ENGINE GOVERNOR SETTINGS. EXCESSIVELY HIGH ENGINE SPEEDS ARE DANGEROUS AND INCREASE THE RISK OF PERSONAL INJURY AND DAMAGE TO EQUIPMENT AND/OR PROPERTY. EXCESSIVELY LOW SPEEDS IMPOSE A HEAVY LOAD ON THE ENGINE WHEN ADEQUATE ENGINE POWER IS NOT AVAILABLE AND MAY SHORTEN ENGINE LIFE. THE GENERATOR SUPPLIES CORRECT RATED FREQUENCY AND VOLTAGE ONLY AT THE PROPER SPEED. SOME ELECTRICAL DEVICES MAY BE DAMAGED BY INCORRECT FREQUENCY AND/OR VOLTAGE. IF ENGINE SPEED APPEARS TO BE INCORRECT, CONTACT YOUR NEAREST AUTHORIZED SERVICE FACILITY.

25-HOUR BREAK-IN PERIOD

The first 25 hours of operation is the break-in period for the generator. Properly breaking in the generator is essential to reducing oil consumption and enhancing engine performance. During the break-in period, observe the following rules:

- For the first 25 hours, run the generator at varying electrical loads, to help set the engine piston rings properly.

- Following the initial 25-hour break-in period, avoid light electrical loads for the next 75 hours of operation. The unit should be loaded at 50% (or more) of its capacity during those 75 hours. Repeated light loads during break-in period may improperly seat the piston rings, resulting in blowby and high oil consumption.
- Check oil level frequently during the break-in period. Add oil if needed. It is natural for the generator engine to consume much oil until the piston rings have seated properly.
- When the 25-hour break-in period is done, complete the tasks recommended under 25-HOUR CHECK-UP PERIOD.

25-HOUR CHECK-UP PERIOD

After the first 25 hours of operation have been completed, contact an Authorized Service Facility for the following maintenance. The Owner/Operator is responsible for any changes.

- Change engine crankcase oil and oil filter.
- Check all fluid levels.
- Check all cooling system hoses and fittings for damage, deterioration, looseness, etc. Check all hose clamps for tightness and security.
- Check engine for proper operation.
- Inspect the diesel engine fuel system for leaks, tightness and security of fuel fittings and hoses.
- Inspect drive belts for condition and proper tension.
- Inspect the exhaust system for damage, deterioration, leaks, proper operation.
- Inspect the electrical system.
- Inspect the installation for safety violations, compliance with codes and standards.

FREEZING TEMPERATURE OPERATION

The engine cooling system should have been properly filled with a 50-50 mixture of ethylene glycol base anti-freeze and soft water. When adding coolant to the radiator or to the coolant recovery bottle, add only the recommended 50-50 mixture. Refer to SPECIFICATIONS section. If the recommended 50-50 mixture is added to the system consistently, the unit adequately protects against freezing temperatures.

ATTENTION REQUIRED AFTER SUBMERSION

If the generator has been submerged in water, it must NOT be started and operated. Following any submersion in water, have an authorized Generac Service Facility thoroughly clean and dry the generator.

OPERATING PRECAUTIONS

Never operate the generator set while the vehicle is parked over dry leaves, dry grass or any other combustible substance. The generator's exhaust system becomes extremely hot and can cause fire if it is too close to combustible materials.

The generator's exhaust system gives off DEADLY carbon monoxide gas. This dangerous gas, if breathed in sufficient concentrations can cause unconsciousness and even death. Never operate the generator set with the vehicle inside any garage or other enclosed area. Never operate the generator with a leaking exhaust system. Close windows in the vicinity of the generator exhaust outlet and take any other steps that may be necessary to prevent exhaust gases from entering rooms or areas occupied by people or animals.

EFFECTS OF MOISTURE AND DIRT

Keep the generator set as clean and dry as possible. Protect the unit against excessive dust, dirt, corrosive vapors, road splash, etc. Permitting dirt and moisture to accumulate on generator windings will have an adverse affect on the insulation resistance of those windings.

When moisture is allowed to remain in contact with windings, some of that moisture will be retained in voids and cracks in the insulation. This causes a reduced insulation resistance and will eventually cause problems. Dirt will make the problem worse, since dirt tends to hold moisture in contact with the windings. Salt (as from sea air) will also worsen the problem since it tends to absorb moisture from the air. Salt and moisture, when combined, form a good electrical conductor.

SPECIFICATIONS

FUEL REQUIREMENTS

Recommended fuel is any high quality, automotive type diesel fuel conforming to JIS No. 2D diesel fuel. Keep the fuel clean.

RECOMMENDED FLUIDS

Engine Oil: Use a high quality detergent oil classified "For Service CC or CD." Detergent oils keep the engine cleaner and reduce carbon deposits. Use oil having the following SAE viscosity rating, based on the ambient temperature range anticipated before the next oil change:

Temperature	Oil Grade (recommended)
Above 100°F	SAE 40
40°-100°F	SAE 10W-30 or SAE 30
Below 40°F	SAE 5W-20 or 5W-30

Coolant: Use a mixture of half low silicate, ethylene glycol base anti-freeze and half soft water. Coolant system capacities may vary, depending on the specific installation, length of system hoses, radiator use, etc. Use only soft water and low silicate anti-freeze. If desired, a high quality rust inhibitor may be added to the recommended coolant mixture. When adding coolant, always add the recommended 50-50 mixture.

CAUTION! Do not use any chromate base rust inhibitor with ethylene glycol base anti-freeze or chromium hydroxide ("green slime") forms and causes overheating. You must chemically clean engines the have operated with a chromate base inhibitor before adding ethylene glycol base anti-freeze. Using any high silicate anti-freeze boosters or additives will also cause overheating. In addition, using any soluble oil inhibitor is not recommended for this equipment.

GENERATOR SPECIFICATIONS

Series NP-80D
Model Number..... 9344-1
Rated Maximum Continuous
a-c Power 7500 watts (7.5 kW)
Rated Volts 120/240*
Rated Maximum Continuous Load Current
At 120 Volts 62.5 amps
At 240 Volts 31.25 amps
Rated a-c Frequency..... 60 Hz. at 1800 rpm
Phase 1-Phase
Power Factor 1.0
Number of Rotor Poles..... 4
Rotor Speed at No-Load 1860 rpm

ENGINE SPECIFICATIONS

Engine Type 4-cycle diesel
Displacement 58.2 inches (954cc)
Cooling Method Water Cooled
Combustion Chamber Swirl Type
Cylinders and Arrangement 3
Bore 2.95 inches (75mm)
Stroke 2.83 inches (72mm)
Compression Ratio 23 to 1
No. of Main Bearings 5
Break Mean
Effective Pressure 97

MAINTENANCE

PERIODIC MAINTENANCE SCHEDULE

* Performed by Authorized Service Facility

** Performed by Owner/Operator

A. After the first 25 Operating Hours*

1. Change Oil and Oil Filter.
2. Check engine coolant level.
3. Inspect cooling system.
4. Check engine operation.
5. Inspect drive belts.
6. Inspect exhaust system.
7. Inspect electrical system.
8. Inspect battery.
9. Check governed speed setting.
10. Check engine valve clearance.
11. Inspect air cleaner/flame arrestor.
12. Clean the generator.

B. Every 8 Hours of Operation**

1. Check coolant level in coolant recovery bottle.
2. Check fuel level.
3. Check engine oil level.

C. Once Each Week**

1. Inspect the generator set.
2. Inspect the generator battery.

D. Every 100 hours or Once Each Month**

(whichever comes first)

1. Inspect cooling system.
2. Inspect exhaust system.

E. Every 6 months or Every 250 Operating Hours*

(whichever comes first)

1. Change engine oil and filter.
2. Check engine operation.
3. Inspect drive belts.
4. Inspect electrical system.
5. Inspect and check battery.
6. Check engine governor setting.
7. Clean or replace fuel filters.
8. Inspect air cleaner/flame arrestor.
9. Clean the generator.
10. Check cooling system and coolant level.
11. Inspect exhaust system.
12. Inspect fuel system.

F. Once Annually or Every 500 Operating Hours*

(whichever comes first)

1. Check engine valve clearance.
2. Check engine compression and condition.
3. Check fuel injection timing.
4. Check/test fuel injection nozzles.

G. Once Every Two Years

1. Drain, flush and refill cooling system.

OVERLOAD PROTECTION FOR ENGINE D-C ELECTRICAL SYSTEM

Engine cranking, start up and running are controlled by a solid state Engine Controller circuit board. Battery voltage is delivered to that circuit board via 10 amp circuit breaker and 14 amp in-line fuse. These overcurrent protection devices will open if circuit is overloaded.

CAUTION! If a circuit breaker opens or a fuse element melts, you should find the cause of the overload before resetting the circuit breaker or replacing the fuse.

10 amp Circuit Breaker: If the circuit breaker opens due to an overload, you cannot crank or start the engine. The circuit breaker is a "push-to-reset" type. For emergency shutdown, pull the circuit breaker open. Also see "Generator Control Panel" on Page 5.

14 Amp Fuse: If the fuse element melts open, you cannot crank or start the engine. If you must replace the fuse, use only identical 14 amp fuse (Figure 9).

30 amp Fuse: The generator set battery is charged during operation by a d-c alternator, driven by the engine. This 30 amp fuse protects the charging circuit against overload. Should you need to replace the fuse, use only an identical 30 amp fuse (Figure 10).

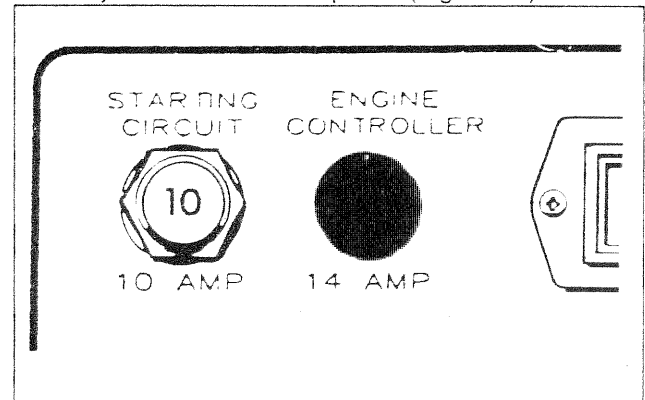


Figure 9 — 14 amp Fuse

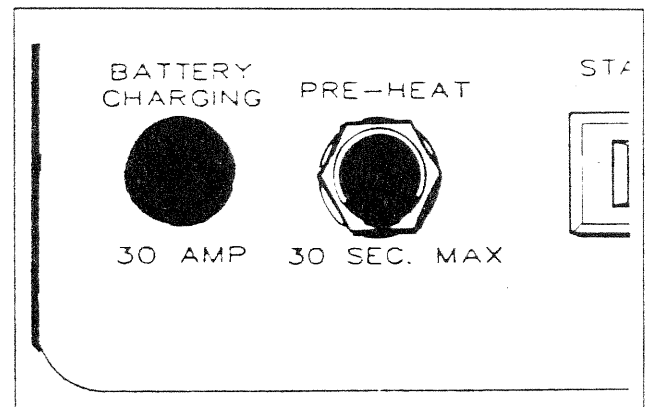


Figure 10 — 30 amp Fuse for Battery Charge Circuit

CHECKING FLUID LEVELS

Check Engine Oil: Check the engine crankcase oil level at least every 8 hours that you operate the unit, or before every time you use it (Figure 11).

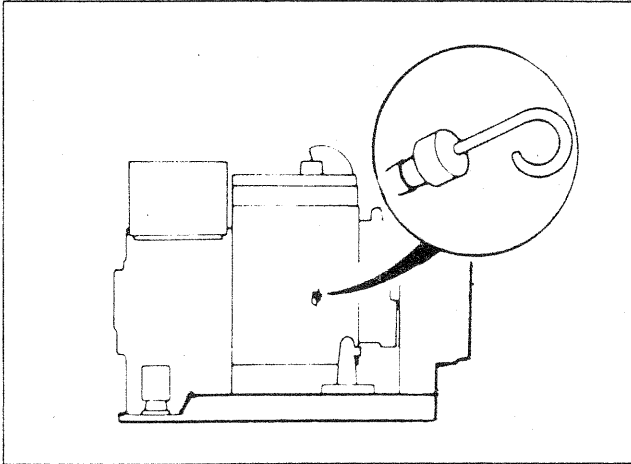


Figure 11 — Checking Oil Level

- Make sure the generator is as level as possible.
- Remove oil dipstick and wipe dry with a clean, lintfree cloth.
- Install oil dipstick, then remove again.
- Oil should be at dipstick FULL mark. Never operate the generator with oil level below dipstick ADD mark. DO NOT FILL CRANKCASE ABOVE DIPSTICK FULL MARK.

Battery Fluid: Check battery electrolyte fluid at least once weekly. Fluid should cover separators in all battery cells. If fluid level is low, add distilled water to cover tops of separators. DO NOT USE TAP WATER IN BATTERY.

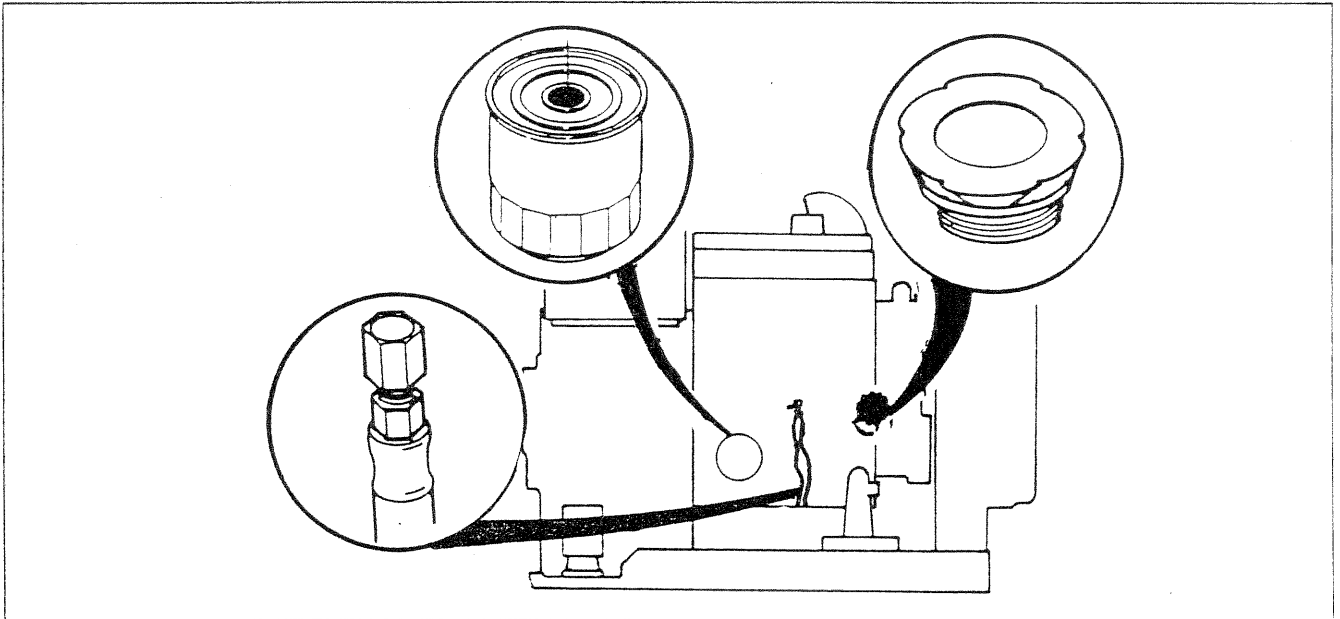


Figure 12 — Changing Engine Oil

Engine Coolant: Check coolant level in coolant recovery bottle.

- Add the recommended coolant mixture as necessary.
- Periodically remove radiator pressure cap to make sure the coolant recovery system is functioning properly. Coolant should be at bottom of radiator filler neck. If coolant level is low, inspect gasket in radiator pressure cap. Replace cap, if necessary. To have pressure cap tested, contact an authorized Generac Service Facility. Inspect cooling system and coolant recovery system for leaks.

INSPECT GENERATOR SET

Once each week inspect the generator set. Look for fuel, oil coolant leaks. Check for missing or loose nuts, bolts and other fasteners. Check for damage. If unit is dirty, it may be cleaned with a damp cloth or soft brush. Inspect the exhaust system. NEVER operate the generator with a defective exhaust.

INSPECT COOLING SYSTEM

Inspect the entire cooling system once each month or every 100 operating hours, whichever occurs first. Check for leaks, condition of hoses, tightness of clamps.

CHANGING ENGINE OIL

Refer to PERIODIC MAINTENANCE SCHEDULE for engine oil and filter change frequencies. You should also change generator engine oil before placing the vehicle into storage.

Drain the oil while engine is still warm from running, which means warm up the engine, shut it down and drain immediately as follows (Figure 12):

1. Remove OIL DRAIN HOSE from its retaining clip.
2. Loosen and remove OIL DRAIN HOSE CAP. Drain oil completely into suitable container.

3. When all oil has drained, install and tighten OIL DRAIN HOSE CAP.
4. Turn OIL FILTER counterclockwise and remove. Dispose of old filter.
5. Apply a light coating of engine oil to seal of new oil filter. Install FILTER and tighten by hand only. DO NOT OVERTIGHTEN.
6. Remove OIL FILLER CAP. Add recommended oil (see SPECIFICATIONS). DO NOT OVERFILL ABOVE THE DIPSTICK "FULL" MARK. Crankcase oil capacity is 3.7 U.S. quarts (3.5 liters).

CAUTION! After refilling the crankcase with oil, always check oil level on dipstick. NEVER OPERATE ENGINE WITH OIL BELOW THE DIPSTICK "ADD" MARK.

7. Start engine and check for oil leaks.

COOLANT CHANGE

Every two years, the cooling system should be drained, flushed and refilled by an Authorized Service Facility. See SPECIFICATIONS for cooling system recommendations.

MISCELLANEOUS MAINTENANCE

Cleaning the Generator: Keep your standby generator as clean and as dry as possible. Dirt and moisture that is allowed to accumulate on internal generator windings have an adverse effect on insulation resistance.

Periodically clean generator exterior surfaces. A soft brush may be used to loosen caked on dirt. You can use a vacuum system or dry, low pressure air to remove any accumulations of dirt. If the generator is housed inside an all-weather enclosure, clean the enclosure with a soft, damp cloth or sponge and water.

Once each year have the generator cleaned and inspected by an Authorized Service Facility. That facility will use dry, low pressure air to clean internal windings. Parts inside the control console should be cleaned and inspected at this time as well.

Finally, have the insulation resistance of stator and rotor windings checked. If insulation resistances are excessively low, the generator may require drying.

Battery: All lead-acid storage batteries discharge when not in use. Refer to specific instructions and warnings that accompany your battery. If such information is not available, observe the following precautions when handling a battery:

- DO NOT use jumper cables and a booster battery to crank or start the generator engine.
- DO NOT recharge a weak battery while it is installed in the generator. Remove battery from generator and recharge in a well-ventilated area, away from fuel vapors, sparks, heat or flames.
- Battery electrolyte fluid is an extremely caustic sulfuric solution that can cause severe burns. DO NOT permit fluid to contact eyes, skin, clothing, painted surfaces, wiring insulation, etc. If you spill any battery fluid, flush the affected area with clear water immediately.
- Always wear safety glasses, rubber apron and gloves when handling a battery.
- Batteries give off explosive hydrogen gas while charging. The gas can form an explosive mixture around the battery for several hours after charging. Any spark, heat or flames can ignite the gas and cause an explosion which can shatter the battery, causing blindness or other serious injury.

PERIODIC REPLACEMENT PARTS

Part Name	Generac Part No.
Oil Filter	127-70939
Radiator Cap	46627
Air Cleaner Element	70941
Fuel Filter	69858

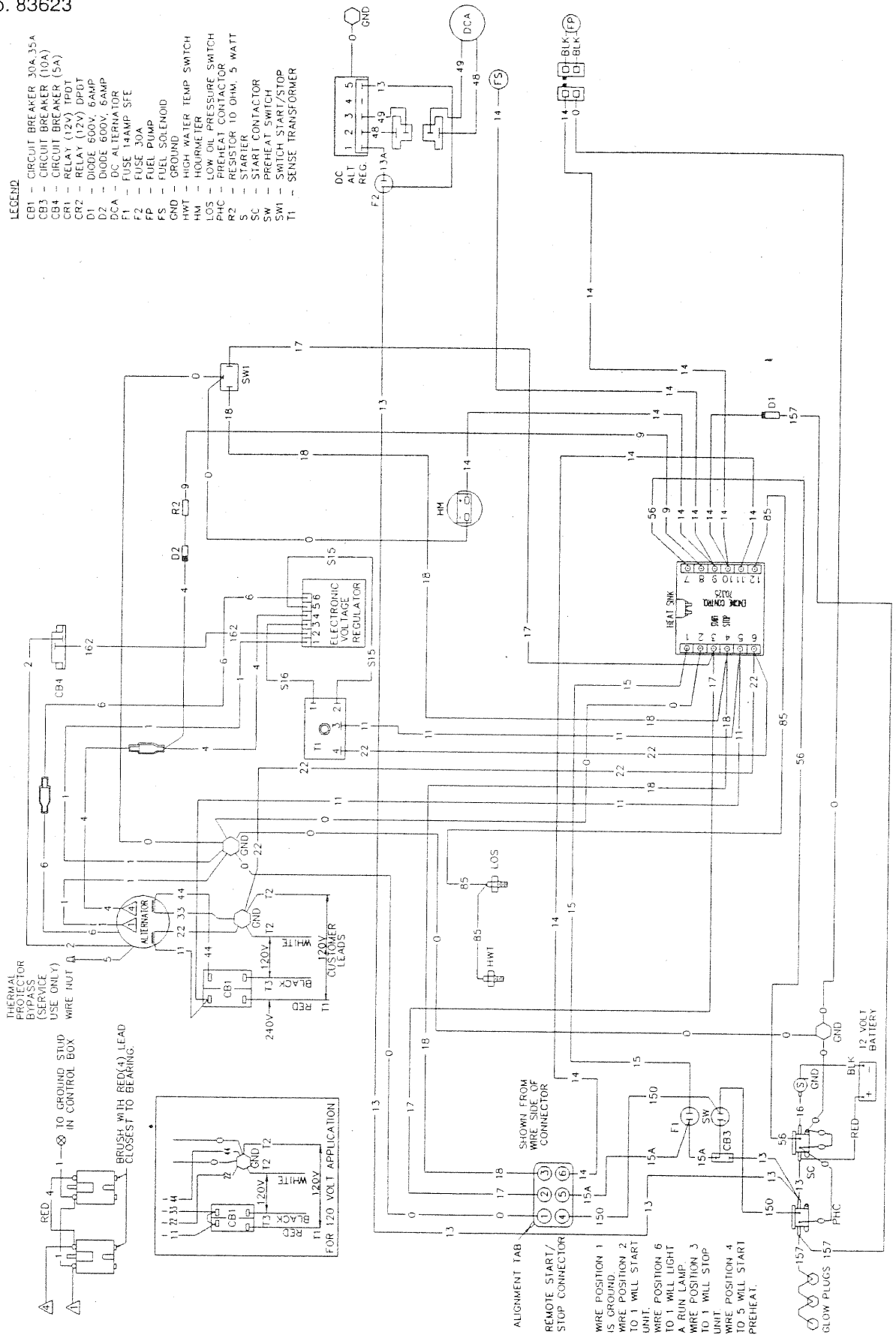
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	REMEDY
Engine won't crank.	<ol style="list-style-type: none"> 1. 10 amp circuit breaker tripped. 2. 14 amp fuse blown. 3. Loose corroded or defective battery cables. 4. Defective engine Start/Stop switch. 5. Defective starter contactor. 6. Defective starter motor. 	<ol style="list-style-type: none"> 1. Reset circuit breaker 2. Replace fuse. 3. Tighten clean or replace as necessary. 4. Replace Start/Stop switch. 5. Replace contactor. 6. Replace starter motor.
Engine cranks but won't start.	<ol style="list-style-type: none"> 1. Vehicle fuel shutoff valve is closed. 2. Out of fuel. 3. Fuel solenoid (FS) is defective 4. Fuel pump (FP) is defective. 5. Open Wire #14 from Engine Control C.B. 6. Clogged fuel filter or fuel line. 7. Engine mechanical parts failure. 8. Spark plugs defective. 	<ol style="list-style-type: none"> 1. Open valve. 2. Replenish fuel tank. 3. Replace solenoid. 4. Repair or replace fuel pump. 5. Reconnect wire. 6. Replace if clogged. 7. Repair or replace parts. 8. Clean, regap or replace plugs.
Engine starts hard, runs rough.	<ol style="list-style-type: none"> 1. Flame arrestor (air cleaner) plugged or damaged. 2. Defective fuel pump. 3. Plugged fuel filter or fuel line. 4. Water in fuel. 	<ol style="list-style-type: none"> 1. Clean or replace as needed. 2. Replace or repair fuel pump. 3. Replace filter; unclog fuel line. 4. Drain tank and refill.
Engine starts, shuts down when Start/Stop switch is released.	<ol style="list-style-type: none"> 1. Engine oil level is low. 2. Engine is overheated. 3. Defective Low Oil Pressure Switch 4. Defective Coolant Temperature Switch 5. Defective Engine Controller circuit board. 	<ol style="list-style-type: none"> 1. Check oil and add oil as needed. 2. Check cooling system for leaks. 3. Replace switch. 4. Replace switch. 5. Replace circuit board.
Start/Stop Switch at STOP, engine continues to run	<ol style="list-style-type: none"> 1. Defective Start/Stop switch. 2. Open/disconnected wire #18 between Start/Stop switch & Engine Controller C.B. 3. Open/disconnected wire #0 between Start/Stop switch & Engine Controller C.B. 4. Defective Engine Controller circuit board 	<ol style="list-style-type: none"> 1. Replace switch. 2. Reconnect/close wire. 3. Reconnect/close wire. 4. Replace board.
No a-c output from generator.	<ol style="list-style-type: none"> 1. Check 15-amp circuit breaker. 2. Check vehicle circuit breaker & fuses. 3. Transfer switch set to NORMAL position 4. Generator internal failure. 	<ol style="list-style-type: none"> 1. Reset to ON or CLOSED. 2. Reset and replace, if necessary. 3. Set to GENERATOR position. 4. Take generator to Authorized Generac service facility.

WIRING DIAGRAM — NP-80D GENERATOR

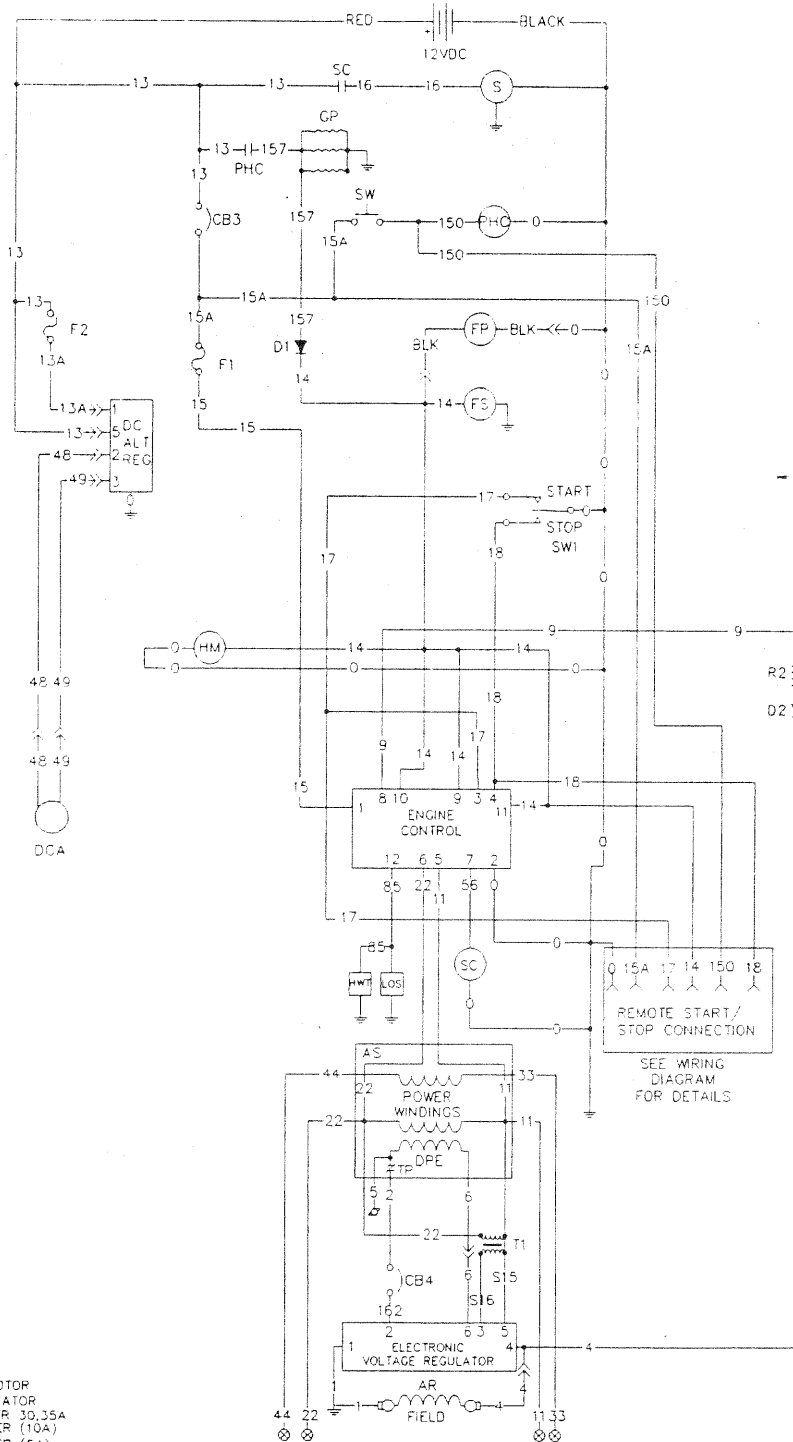
Drawing No. 83623

- LEGEND**
- CB1 - CIRCUIT BREAKER 30A, 35A
 - CB3 - CIRCUIT BREAKER (10A)
 - CB4 - CIRCUIT BREAKER (5A)
 - CR1 - RELAY (12V) TPDT
 - CR2 - RELAY (12V) DPDT
 - D1 - DIODE 600V, 6AMP
 - D2 - DIODE 600V, 6AMP
 - DCA - DC ALTERNATOR
 - F1 - FUSE 14AMP SFE
 - F2 - FUSE 30A
 - FP - FUEL PUMP
 - FS - FUEL SOLENOID
 - GND - GROUND
 - HWT - HIGH WATER TEMP SWITCH
 - HM - HOURMETER
 - LOS - LOW OIL PRESSURE SWITCH
 - PHC - PREHEAT CONTACTOR
 - R2 - RESISTOR 10 OHM, 5 WATT
 - S - STARTER
 - SC - START CONTACTOR
 - SW - SWITCH START/STOP
 - SW1 - SWITCH START/STOP
 - T1 - T1 - SENSE TRANSFORMER



ELECTRICAL SCHEMATIC — NP-80D GENERATOR

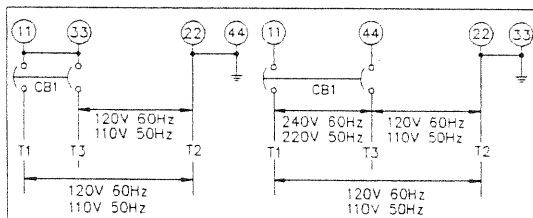
Drawing No. 83625



LEGEND

- AR - ALTERNATOR ROTOR
- AS - ALTERNATOR STATOR
- CB1 - CIRCUIT BREAKER 30,35A
- CB3 - CIRCUIT BREAKER (10A)
- CB4 - CIRCUIT BREAKER (5A)
- D1 - DIODE 600V, 6AMP
- D2 - DIODE 600V, 6AMP
- DCA - DC ALTERNATOR
- DPE - EXCITATION WINDING
- F1 - FUSE 14AMP SFE
- F2 - FUSE 30A
- FS - FUEL SOLENOID
- FP - FUEL PUMP
- HM - HOURMETER
- HWT - HIGH WATER TEMP SWITCH
- LOS - LOW OIL PRESSURE SWITCH
- PHC - PREHEAT CONTACTOR
- R2 - RESISTOR 10 OHM, SW
- S - STARTER
- SC - START CONTACTOR
- SW - PREHEAT SWITCH
- SW1 - SWITCH, START/STOP
- T1 - SENSE TRANSFORMER
- TP - THERMAL PROTECTOR

CONNECTION OPTIONS



NOTES

ELECTRICAL FORMULAS

TO FIND	KNOWN VALUES	1-PHASE	3-PHASE
KILOWATTS (kW)	Volts, Current, Power Factor	$\frac{E \times I}{1000}$	$\frac{E \times I \times 1.73 \times PF}{1000}$
KVA	Volts, Current	$\frac{E \times I}{1000}$	$\frac{E \times I \times 1.73}{1000}$
AMPERES	kW, Volts, Power Factor	$\frac{kW \times 1000}{E}$	$\frac{kW \times 1000}{E \times 1.73 \times PF}$
WATTS	Volts, Amps, Power Factor	Volts x Amps	$E \times I \times 1.73 \times PF$
NO. OF ROTOR POLES	Frequency, RPM	$\frac{2 \times 60 \times \text{Frequency}}{\text{RPM}}$	$\frac{2 \times 60 \times \text{Frequency}}{\text{RPM}}$
FREQUENCY	RPM, No. of Rotor Poles	$\frac{\text{RPM} \times \text{Poles}}{2 \times 60}$	$\frac{\text{RPM} \times \text{Poles}}{2 \times 60}$
RPM	Frequency, No. of Rotor Poles	$\frac{2 \times 60 \times \text{Frequency}}{\text{Rotor Poles}}$	$\frac{2 \times 60 \times \text{Frequency}}{\text{Rotor Poles}}$
kW (required for Motor)	Motor Horsepower, Efficiency	$\frac{HP \times 0.746}{\text{Efficiency}}$	$\frac{HP \times 0.746}{\text{Efficiency}}$
RESISTANCE	Volts, Amperes	$\frac{E}{I}$	$\frac{E}{I}$
VOLTS	Ohm, Amperes	$I \times R$	$I \times R$
AMPERES	Ohms, Volts	$\frac{E}{R}$	$\frac{E}{R}$

E = VOLTS

I = AMPERES

R = RESISTANCE (OHMS)

PF = POWER FACTOR

GENERAC'S 3-YEAR LIMITED WARRANTY

FOR NP SERIES RECREATIONAL VEHICLE GENERATORS

Generac warrants to the original purchaser that its generators will be free from defects in materials or workmanship for the period set forth below from date of original purchase. During said warranty period, Generac will, at its option, repair or replace any part which, upon examination by Generac or Generac Authorized Distributors and/or Dealers, is found to be defective under normal use and service.

3-YEAR WARRANTY SCHEDULE

1. All NP Series generators used in a recreational vehicle shall be warranted from date of purchase for a period of three (3) years or 2000 hours of operation, whichever occurs first. All parts, labor, removal and reinstallation shall be covered for the first two years. Parts and labor on selected generator and engine parts shall be covered during the third year or 2000 hours.
2. The drive train, belt and pulleys on NP series air-cooled generators shall be warranted against failure due to defective materials or normal usage for the life of the generator. For the original owner, this drive train warranty shall include parts and labor plus a \$50.00 payment upon return of the failed belt or pulley by the original owner. For succeeding owners, this power train warranty shall cover belt or pulley parts only.
3. Rental units, demonstrators or commercial applications, such as construction or utility, are warranted for one year or 2000 hours, whichever comes first.

All warranty expense allowances are subject to the conditions defined in the published "GENERAC POLICIES AND PROCEDURES" manual.

THIS WARRANTY DOES NOT COVER:

- Costs of maintenance, installation and startup.
- Failures due to normal wear, accident, misuse, abuse, negligence or improper installation.
- Products which are modified or altered in a manner not authorized by the manufacturer in writing.
- Incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of defective parts.
- Failure due to misapplication.
- Telephone, telegraph, teletype or other communications expenses.
- Living or travel expenses of persons performing service.
- All transportation/travel expenses.
- Rental equipment used while warranty repairs are being performed.
- Overtime labor.
- Starting batteries, fuses, light bulbs and engine fluids.

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PARTS AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A RESULT OF GENERAC'S NEGLIGENCE. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. Buyer agrees to make no claims against generac based on negligence.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

GENERAC CORPORATION, P.O. Box 8, Hwy 59 and Hillside Road, Waukesha, WI 53187

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