

OWNER'S MANUAL

IM-72

AIR-COOLED INDUSTRIAL MOBILE GENERATORS

Model No. 00843-0

GENERAC[®]

POWER SYSTEMS, INC.

EMISSION CONTROL SYSTEM WARRANTY

Emission Control System Warranty ("ECS Warranty") for 1995 and Later Model Year Utility and Lawn and Garden Equipment Engines:

- A. Applicability: This warranty shall apply to 1995 and later model year utility and lawn and garden equipment engines. The ECS Warranty Period ("ECS Warranty Period") shall begin on the date the new engine or equipment is delivered to its original, end-use purchaser and shall continue for 24 consecutive months thereafter.
- B. General Emissions Warranty Coverage: Generac Corporation warrants to the original, end-use purchaser of the new engine or equipment and to each subsequent purchaser that each of its utility and lawn and garden equipment engines is:
1. Designed, built and equipped so as to conform with all applicable regulations adopted by the Air Resources Board pursuant to its authority, and
 2. Free from defects in materials and workmanship which, at any time during the ECS Warranty Period, will cause a warranted emissions - related part to fail to be identical in all material respects to the part as described in the engine manufacturer's application for certification.
- C. The ECS Warranty only pertains to emissions-related parts on your engine, as follows:
1. Any warranted, emissions-related parts which are not scheduled for replacement as required maintenance in the Owner's Manual shall be warranted for the ECS Warranty Period. If any such part fails during the ECS Warranty Period, it shall be repaired or replaced by Generac Corporation according to Subsection (4) below. Any such part repaired or replaced under the ECS Warranty shall be warranted for any remainder of the ECS Warranty Period.
 2. Any warranted, emissions-related part which is scheduled only for regular inspection as specified in the Owner's Manual shall be warranted for the ECS Warranty Period. A statement in such written instructions to the effect of "repair or replace as necessary" shall not reduce the ECS Warranty Period. Any such part repaired or replaced under the ECS Warranty shall be warranted for any remainder of the ECS Warranty Period.
 3. Any warranted, emissions-related part which is scheduled for replacement as required maintenance in the Owner's Manual shall be warranted for the period of time prior to first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by Generac Corporation according to Subsection (4) below. Any such emissions-related part repaired or replaced under the ECS Warranty shall be warranted for the remainder of the ECS Warranty Period prior to the first scheduled replacement point for such emissions-related part.
 4. Repair or Replacement of any warranted, emissions-related part under this ECS Warranty shall be performed at no charge to the owner at a Generac Corporation Authorized Service Outlet.
 5. The owner shall not be charged for diagnostic labor which leads to the determination that a part covered by the ECS Warranty is in fact defective, provided that such diagnostic work is performed at a Generac Corporation Authorized Service Outlet.
 6. Generac Corporation shall be liable for damages to other original engine components or approved modifications proximately caused by a failure under warranty of any emission-related part covered by the ECS Warranty.
 7. Throughout the ECS Warranty Period, Generac shall maintain a supply of warranted emission-related parts sufficient to meet the expected demand for such emission-related parts.
 8. Any Generac Corporation authorized and approved emission-related replacement part may be used in the performance of any ECS warranty maintenance or repairs and will be provided without charge to the owner. Such use shall not reduce Generac Corporation ECS warranty obligations.
 9. Unapproved add-on modified parts may not be used to modify or repair a Generac Corporation engine. Such use voids this ECS Warranty and shall be sufficient grounds for disallowing an ECS Warranty claim. Generac Corporation shall not be liable hereunder for failures of any warranted parts of a Generac Corporation engine caused by the use of such an unapproved add-on or modified part.

EMISSION RELATED PARTS INCLUDE THE FOLLOWING:

1. Carburetor assembly and its internal components.
 - a. Fuel filter
 - b. Carburetor gaskets
 - c. Fuel pump (if so equipped)
2. Air cleaner assembly
 - a. Air filter element
 - b. Intake pipe/manifold
3. Ignition system including:
 - a. Spark plug
 - b. Ignition module
4. Catalytic muffler (if so equipped)
 - a. Muffler gasket (if so equipped)
 - b. Exhaust manifold (if so equipped)
5. Crankcase breather assembly and its components.
 - a. Breather connection tube

IDENTIFICATION RECORD

Please record the following information from the generator DATA PLATE or information decal.

- | | |
|-----------------------|------------------------|
| 1. Model Number _____ | 2. Serial Number _____ |
| 3. kW Rating _____ | 4. Rated Voltage _____ |
| 5. Phase _____ | 6. Hertz _____ |

MODEL NO.
SERIAL NO.
GENERATOR RPM

FOR SERVICE CENTER LOCATION CALL
800-333-1322 24 HOURS A DAY
GENERAC CORPORATION
WAUKESHA, WISC.

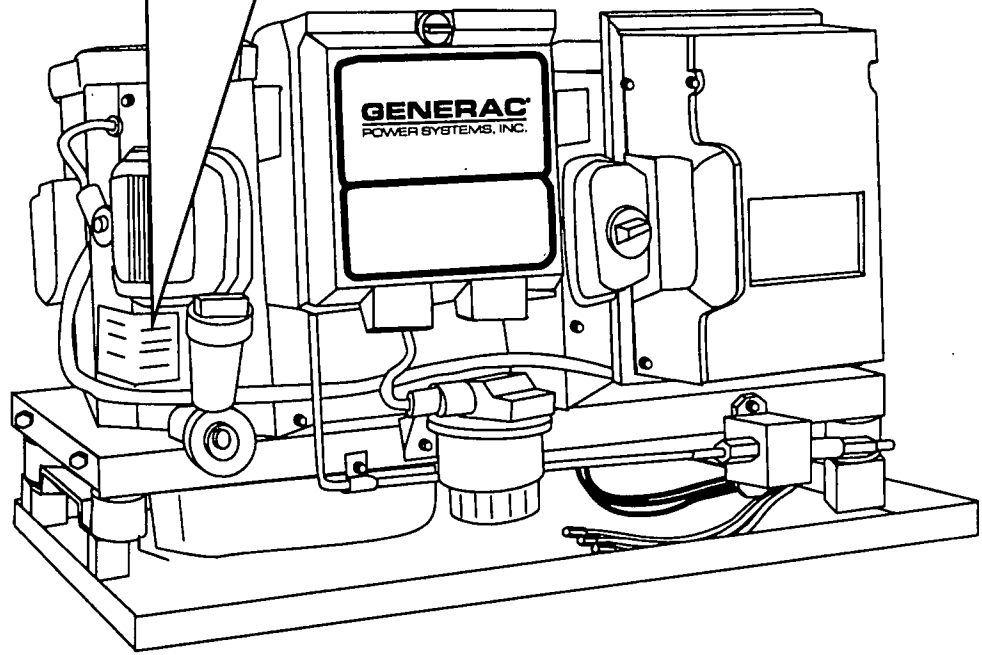


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READ THIS MANUAL THOROUGHLY

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 instruction about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully.

These safety warnings cannot eliminate the hazards that they indicate. Strict compliance with the special instructions while performing the service plus "common sense" are major measures to prevent accidents.

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



DANGER: Indicates an immediately hazardous situation which, if not avoided, will result in death or serious injury. Danger is limited to the most extreme situations.



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



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

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

These symbols indicate the following:



Points out important safety information and, if not followed, could endanger personal safety and/or property of yourself and others.



Potential explosion hazard.



Potential fire hazard.



Potential electrical shock hazard.

OPERATION AND MAINTENANCE

It is the operator's responsibility to perform all safety checks; to make sure that all maintenance for safe operation 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 industrial mobile generator assures a minimum number of problems and keeps your operating expenses at a minimum. See your authorized Dealer/Distributor for service aids and accessories.

HOW TO OBTAIN SERVICE

When your industrial mobile generator set requires servicing or repairs, simply contact an Authorized Service Facility for assistance. Service technicians are factory-trained and are capable of handling all of your service needs.

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

The warranty on your generator is included in this Owner's Manual, as well as listings for repair parts.

SERVICE DEALER LOCATION

To locate the nearest Generac Servicing Dealer, please call our 800 number.

Only dealer location information can be obtained at this number.

1-800-333-1322



WARNING:



The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

GENERATOR FAMILIARIZATION

GENERATOR APPLICABILITY

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



DANGER: For fire safety, the generator must have been properly installed in compliance with industry standards. The generator also must have been installed in strict compliance with the manufacturer's detailed installation instructions. After installation, do nothing that might render the unit in non-compliance with such codes, standards and instructions.



CAUTION: Do not overload the generator. Some installations may require that electrical loads be alternated to avoid overloading. Applying excessively high electrical loads may damage the generator and may 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 require more watts of power (or amps of current) for starting than for continuous operation.

INSTALLATION

This Owner's Manual has been prepared under the assumption that a competent, qualified technician installed the generator into an industrial vehicle. We also assume the installer complied with all applicable codes, standards and regulations pertaining to installation.

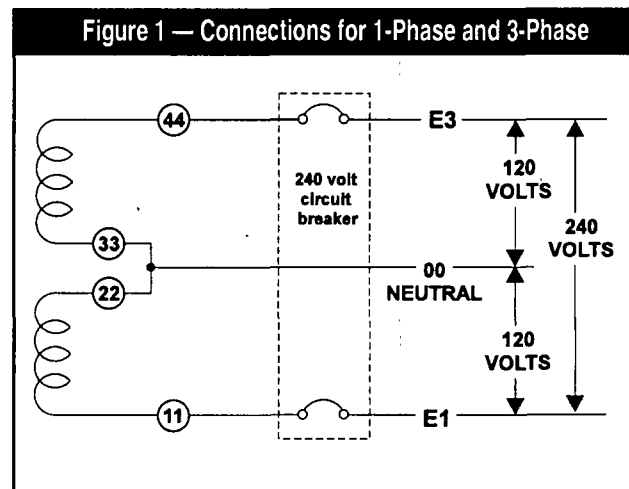
Owners/Operators should make sure nothing is done during installation that might render the unit unsafe or in noncompliance with applicable codes, standards and instructions. They should be sure the unit has been installed to allow adequate ventilation for cooling and exhaust air.

SAFETY

Before using the generator set, carefully read GENERAL SAFETY RULES inside the cover. Comply with these RULES to prevent accidents and damage to equipment and/or property. Generac suggests copying and posting the GENERAL SAFETY RULES in potential hazard areas of the generator. Safety should be stressed to all operators of this equipment.

GENERATOR AC CONNECTION SYSTEM

This generator is equipped with a 3-phase, Y connected stator. The unit is capable of delivering 3-phase and 1-phase voltage simultaneously. It is extremely important that any single phase load is applied to the correct winding, since this winding has been designed to accept 1-phase load. The maximum 1-phase load that can be applied is 3.0 kW.



OPERATING INSTRUCTIONS

OPERATING PRECAUTIONS



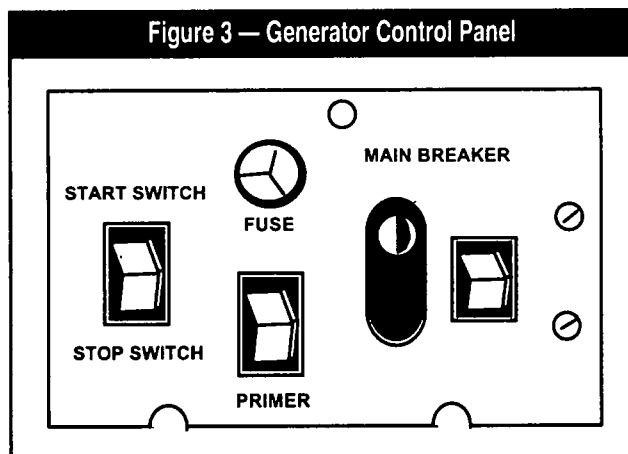
WARNING: Never operate the generator set while the vehicle is parked over dry leaves, dry grass or any other combustible substance. The generators exhaust system becomes extremely hot and can cause fire if it is too close to combustible materials.



WARNING: The generators 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 areas occupied by people.

GENERATOR CONTROL PANEL

Mounted on the generator control panel (Figure 3) are the following features:



■ FUEL PRIMER

Before starting a cold engine (it has not been started in more than two weeks), you must press this switch to bring fuel from the tank to the carburetor. This rocker type switch springs back into its original position when you release it.

■ START/STOP SWITCH

To crank and start the engine, hold this switch at its START position. Release the switch when the engine starts. To stop an operating engine, press and hold the switch in its STOP position until the engine shuts off. The switch center position is the RUN position.

■ FUSE

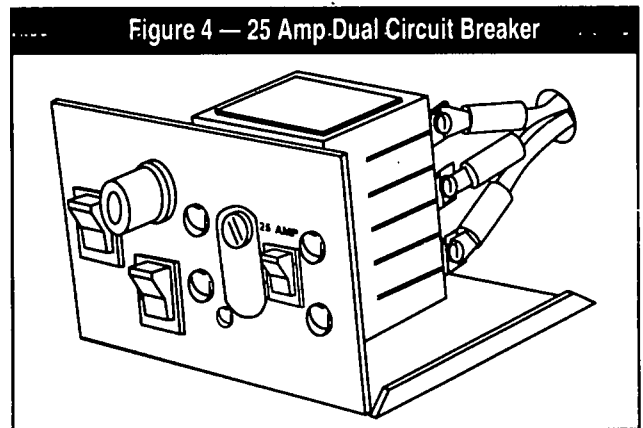
Protects the engine DC control circuit against electrical overload. If the fuse element has melted open due to overloading, the engine cannot be cranked. If you must replace it, use only an identical replacement fuse.

■ MAIN BREAKER

Protects generators AC output circuit against overload and provides a method of turning OFF the generators 120/208 volts AC output to vehicle circuits. This unit is fitted with a 25A 3-pole circuit breaker (Figure 4).

NOTE: Refer to THE GENERATOR AC CONNECTION SYSTEM on page 4. Individual installations may differ. If an overload occurs, the breaker will open the stator leads.

Figure 4 — 25 Amp Dual Circuit Breaker



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.

AUTOMATIC CHOKE

The engine is equipped with an automatic choke. During engine cranking (Start/Stop switch at START), a solid state choke module signals the choke solenoid to actuate a cyclic rate dependent on ambient temperature. The choke solenoid thus opens and closes the carburetor choke valve only when the engine is cranking. When you start it and release the start/stop switch, choke action stops. As the engine warms, the carburetor choke valve then opens gradually.

BEFORE STARTING THE ENGINE

IMPORTANT: INSTRUCTIONS AND INFORMATION IN THIS MANUAL ASSUME THE GENERATOR HAS BEEN PROPERLY INSTALLED, CONNECTED, SERVICED, TESTED AND ADJUSTED BY A QUALIFIED INSTALLATION TECHNICIAN OR INSTALLATION CONTRACTOR.

■ INSTALLATION

Generator installation must have been properly completed so it complies with all applicable codes, standards and regulations and with the manufacturer's recommendations.

■ ENGINE LUBRICATION

Have engine crankcase properly serviced with recommended oil before starting. Refer to "Maintenance" and "Specifications" sections for oil servicing procedures and recommendations.



CAUTION: Any attempt to crank or start the engine before you have properly serviced it with the recommended oil may result in engine failure.

■ FUEL SUPPLY

The engine must have adequate supply of proper fuel to operate. Before starting, check that sufficient fuel is available.

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 pick up tube is installed in the tank, the generator will run out of gas while sufficient fuel remains in the tank for vehicle engine operation.

■ COOLING AND VENTILATING AIR

Air inlet and outlet openings in the generator compartment must be open and unobstructed for continued proper operation. Without sufficient cooling and ventilating air flow, the engine-generator quickly overheats, which causes it to quickly shutdown. Overheating could also damage the unit or your vehicle.

■ ENGINE EXHAUST GAS

Before starting the generator engine, you should be sure there is no way for exhaust gases to enter the vehicle interior and endangering people. Close windows, doors and other openings in the vehicle that, if open, might permit exhaust gases to enter the vehicle.



DANGER: 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. Do not operate the generator if its exhaust system is leaking or has been damaged. Symptoms of carbon monoxide poisoning are (a) inability to think coherently, (b) vomiting, (c) twitching muscles, (d) throbbing temples, (e) dizziness, (f) headache, (g) weakness and sleepiness. If you feel any of these symptoms, move into fresh air immediately. If symptoms persist, get medical help.

STARTING 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 in your vehicle (such as a main line circuit breaker or transfer switch).

NOTE: If starting from the generator panel, turn OFF loads by setting the generators 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. If the engine is warm, skip step 2. If you have not started the engine in more that two weeks, press the Fuel Pump Primer switch and hold it for about 30 seconds.

3. To crank and start the engine, hold the start/stop switch at START. Release the switch when the engine starts.



CAUTION: If the engine does not start after it has been cranking for 15 seconds, release the start/stop switch and try again. Holding the switch for longer than 15 seconds can damage the starter motor.

4. Let the engine run at no-load for a few minutes to stabilize and warm up the engine.

5. Turn ON electrical loads, using whatever means provided (such as a main circuit breaker or transfer switch).

STOPPING THE GENERATOR

1. Turn OFF all electrical loads, using whatever means provided (such a main circuit breaker or transfer switch).

2. Place Start/Stop switch in its STOP position.

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 blow-by 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 more oil than is normal 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 cooling system ventilation openings.
- Check engine carburetor adjustments.
- Check engine ignition system.
- Inspect the entire electrical system.
- Inspect the engine exhaust system.

ATTENTION REQUIRED AFTER SUBMERSION

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

EFFECTS OF MOISTURE AND DIRT

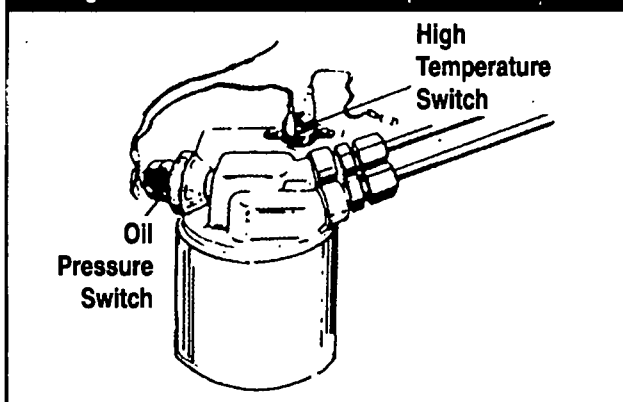
Keep the generator set as clean and dry as possible. Protect unit against excessive dust, dirt, corrosive vapors, road splash, etc. Permitting dirt and moisture to accumulate on generator windings will have an adverse effect on the insulation resistance of those windings.

When moisture is allowed to remain in contact with windings, some of the 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 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.

AUTOMATIC LOW OIL PRESSURE SHUTDOWN

The engine is equipped with a normally-closed (N.C.) oil pressure switch (Figure 5). Engine oil pressure holds the switch open during cranking and operation. Should oil pressure drop below about 8-10 psi, the switch contacts close and the engine automatically shuts down.

Figure 5 — Oil Pressure and Temperature Switches



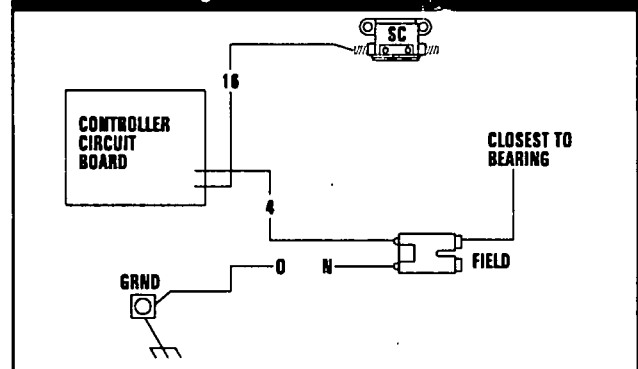
HIGH TEMPERATURE SHUTDOWN

A temperature switch (Figure 5) with normally-open (N.O.) contacts is mounted on the engine. Should engine temperature exceed about 284°F (140°C), the switch contacts close and the engine shuts down.

FIELD BOOST

The controller Circuit Board houses a field boost diode and resistor. These two components are part of a "field boost" circuit (Figure 6).

Figure 6 — Field Boost Circuit

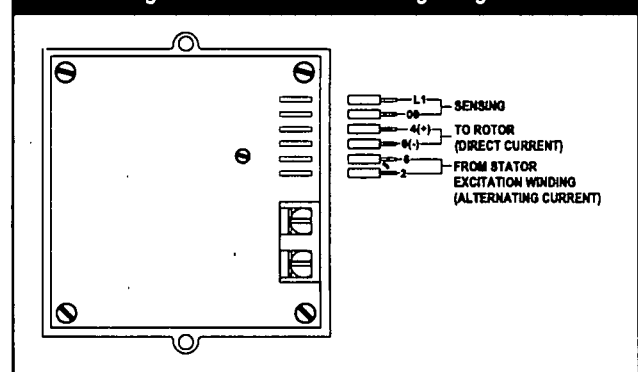


During engine cranking only, a positive DC (battery) voltage is delivered through the diode, resistor, brushes and slip rings, and to the generator rotor. Application of this voltage to the rotor "flashes the field" whenever it is started. Flashing of the field each time the generator starts makes sure that a sufficiently strong magnetic field is available to produce the required "pick up" voltage in the stator windings.

OVER VOLTAGE PROTECTION

A solid state voltage regulator (Figure 7) controls the generator's AC output voltage. This regulator supplies an excitation current to the rotor. By regulating the rotor's excitation current, the strength of its magnetic field is regulated and, in turn, the voltage delivered to connected electrical loads is controlled. When the AC frequency is 60 Hz, voltage is regulated at 208 volts, 3-phase.

Figure 7 — Solid State Voltage Regulator



The voltage regulator also incorporates a "voltage surge protection circuit." This circuit prevents troublesome surges in the generator AC output voltage. Voltage surge is a common cause of damage to electronic equipment.

ENGINE GOVERNED SPEED

The generator is equipped with a 2-pole revolving field (rotor) which must be driven at 3600 rpm to produce the unit's rated AC frequency of 60 Hz. The gas engine governor was factory set to about 62 Hz. (3000 RPM) at no-load. After installing it, the technician should check and adjust the governed speed. Setting no-load frequency slightly high helps prevent excessive frequency, rpm and voltage droop under heavy electrical loading.

DRIVE BELT

The engine drives the generator rotor by means of a pulley and drive belt arrangement. The drive belt and pulleys are warranted for the life of the generator. Drive belt tension was properly adjusted before the unit was shipped from the factory. If you suspect that drive belt tension is incorrect, contact an authorized service facility.



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.

FUEL REQUIREMENTS

These generators are equipped with gasoline fuel systems as standard equipment. Specific installations may provide either a separate fuel tank for the generator, or the generator may "share" the vehicle engine's fuel tank.

NOTE: Installations using a "shared" fuel tank may have a generator fuel pickup tube that is shorter than the vehicle engine's pickup tube. Such an arrangement causes the generator engine to "run out of gas" while adequate fuel for the vehicle remains in the tank.

To reduce lead and carbon deposits use high quality UNLEADED gasoline with the generator. Leaded REGULAR grade gasoline is an acceptable substitute.



CAUTION: Generac does not recommend using any gasoline containing alcohol (such as "gasohol"). If you use any gasoline containing alcohol, it must not contain more than 10 percent ethanol and it must be removed from the tank during storage. Do NOT use any gasoline containing methanol. If you use gasoline with alcohol, inspect more frequently for fuel leaks and other abnormalities.

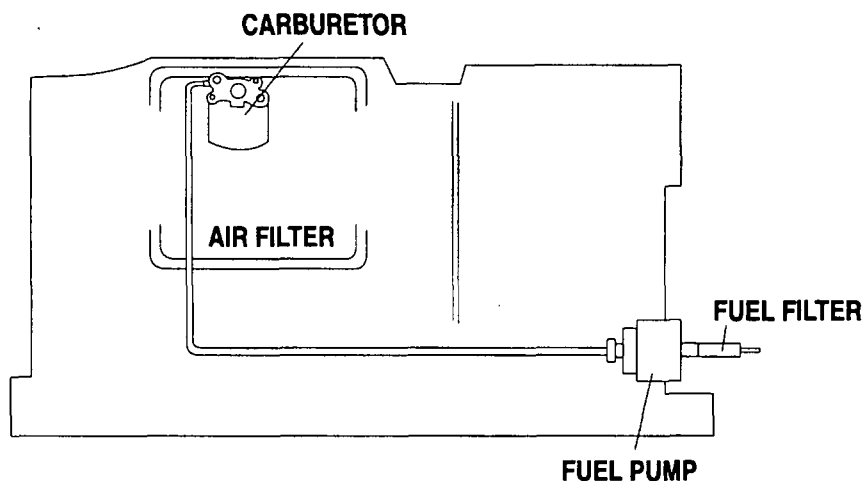
OPTIONAL LP GAS FUEL SYSTEM

This generator may be equipped with an optional liquid propane (LP) gas fuel system. LP gas is usually supplied as a liquid in pressure tanks (Figure 8).

The IM series generators require a "vapor withdrawal" type fuel system. This type of gaseous fuel system uses the vapors forming above the liquid fuel in the storage tank. Air temperatures around the storage tank must be high enough to sustain adequate fuel vaporization. In colder climates, you may need to use an independent heat source to be sure the fuel sufficiently vaporizes in the storage tank.

LP gas may consist of propane, butane, or a mixture of the two gases. Propane vaporizes at temperatures as low as -20°F (-29°C), but butane returns to its liquid state when the temperature drops below about 32°F (0°C). For that reason, a higher ratio of propane is desired in the gas mixture when temperatures drop below freezing.

Figure 8 — Typical Gas Fuel System



SPECIFICATIONS

ENGINE OIL REQUIREMENTS

Use a high quality detergent oil classified "For Service SF" and with an oil viscosity rating of SAE 10W-30 oil. Do not pour in any additives to the recommended oil. Engine crankcase capacity is 1.5 U.S. quarts. See MAINTENANCE section for oil level check and filling procedures.

TEMPERATURE	OIL GRADE (recommended)
Above 60°F (16°C)	SAE30
20° to 59°F (-7° to 15°C)	SAE 10W-30
Below 20°F (-7°C)	SAE 5W-20 or 5W-30
All Seasons	SAE 5W-30 Synthetic Oil

GENERATOR SPECIFICATIONS

Series.....	IM-72G
Rotor RPM.....	3600
Rotor Poles.....	2
Engine RPM.....	2900
Wattage*.....	7200
Voltage*.....	120/208V
Current*.....	§25/20 AC amps‡
Phase.....	1
Frequency.....	60 Hertz
Weight.....	200 pounds
Length.....	25 inches
Width.....	18.5 inches
Height.....	16 inches

‡ Rated maximum continuous current at 120 volts 1-phase between L1 and 00 ONLY (3.0kW).

§ Rated maximum continuous current at 208V 3-phase (7.2kW).

ENGINE SPECIFICATIONS

Type of Engine.....	Twin Cylinder
Cooling Method.....	Air-cooled
Rated Horsepower.....	19 at 3600 rpm
Displacement.....	.570cc
Compression Ratio.....	8.6 to 1
Cylinder Block.....	Aluminum with cast iron sleeve
Type of Governor.....	Mechanical, fixed speed
Engine Governed Speed.....	2900
Air Cleaner.....	Paper element with foam pre-cleaner
Starter.....	12 volt DC electric
Ignition System.....	Solid state with flywheel magneto
Recommended Spark Plugs.....	Champion RC12YC
Spark Plug Gap.....	0.030 inch (0.76mm)

MAINTENANCE

This section includes information about simple maintenance which includes the following tasks:

- Checking engine oil level.
- Changing engine oil.
- Changing oil filter.
- Engine air cleaner service.
- Cleaning the air intake screen.
- Cleaning spark plugs.

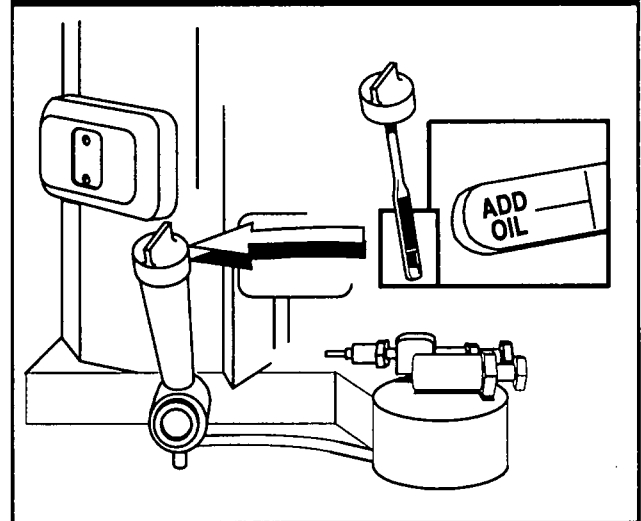
CHECKING ENGINE OIL LEVEL

Check engine crankcase oil level at least every eight hours of operation, or before each use (Figure 9).

- Be sure the generator is as level as possible.
- Remove oil dipstick and wipe dry with clean, lint-free cloth.
- Install and tighten oil dipstick, then remove again.
- Oil should be at dipstick FULL mark. If necessary, add the recommended oil to the FULL mark only. DO NOT FILL ABOVE "FULL" MARK.
- Install and tighten oil dipstick cap before operating the engine.

NOTE: See "Engine Oil Requirements" on Page 9 for recommended oils.

Figure 9 — Oil Dipstick and Fill Tube

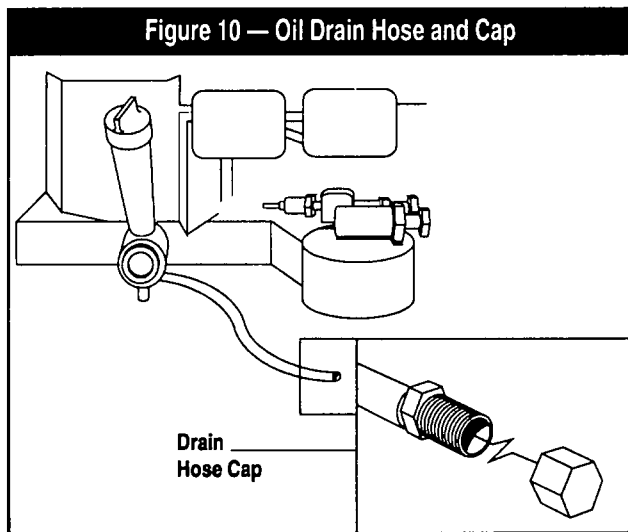


CHANGE ENGINE OIL

Change engine oil after the first 25 hours of operation (after the 25 hour break-in period, Page 6). Thereafter, change oil every 100 operating hours. Change oil more frequently if operating consistently under heavy load or at high ambient temperatures.

- Warm up engine for at least five minutes, then shut down.
- With engine still warm from running, remove cap from oil drain hose (Figure 10). Drain oil completely into a suitable container.

- When oil has drained, install and tighten drain hose cap.
- Remove oil dipstick and fill crankcase with the recommended oil (See Page 9). The engine crankcase can hold about 1.7 liters (1.5 quarts). DO NOT FILL ABOVE "FULL" MARK.
- Install and tighten dipstick cap before operating engine.

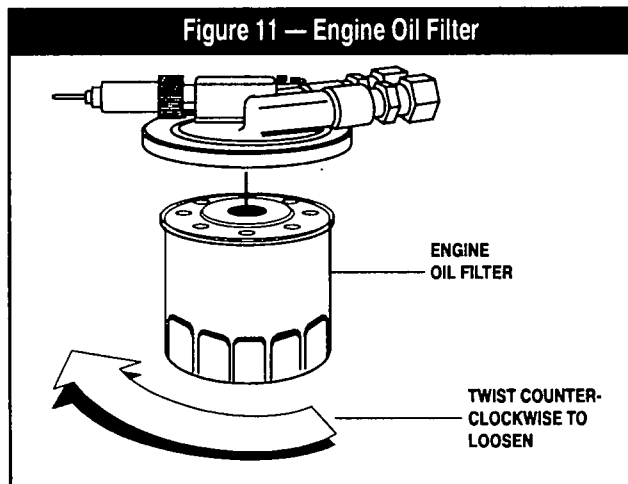


CHANGE OIL FILTER

Replace the engine oil filter after the first 25 hours of operation, every 200 operating hours thereafter.

- Turn oil filter counterclockwise to remove (Figure 11).
- Coat gasket of new filter with engine oil.
- Turn new filter clockwise until its gasket contacts tightly with the filter adapter. Then tighten with an additional 3/4 to one turn by hand.
- Run engine and check for leaks.

NOTE: Check oil level and fill to full mark after checking for leaks. Filter will retain some oil.

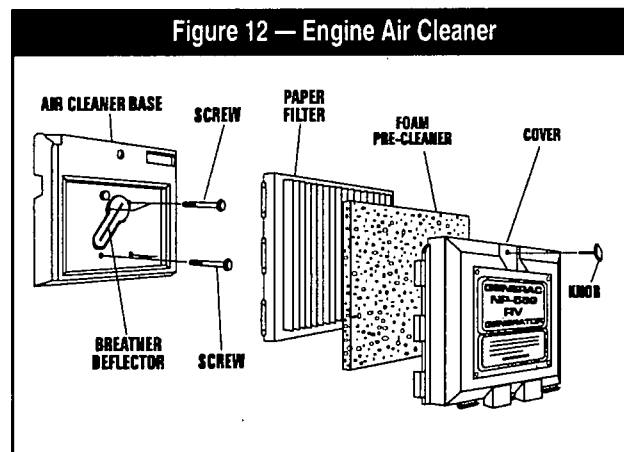


ENGINE AIR CLEANER

Clean and re-oil the foam pre-cleaner every three months or ever 25 hours of operation, whichever occurs first. Service the foam pre-cleaner more frequently if you operate the generator in extremely dusty or dirty conditions (Figure 12):

- Turn KNOB counterclockwise to loosen.
- Remove COVER, FOAM PRE-CLEANER and PAPER FILTER.
- Remove foam pre-cleaner from cover
- Wash foam pre-cleaner in liquid detergent and water.
- Wrap foam pre-cleaner in a cloth and squeeze dry.
- Saturate foam pre-cleaner in engine oil. Squeeze to remove excess oil and to distribute oil.
- Install foam pre-cleaner into cover, followed by paper filter. Tabs at edges of paper filter must lock into slots on cover.

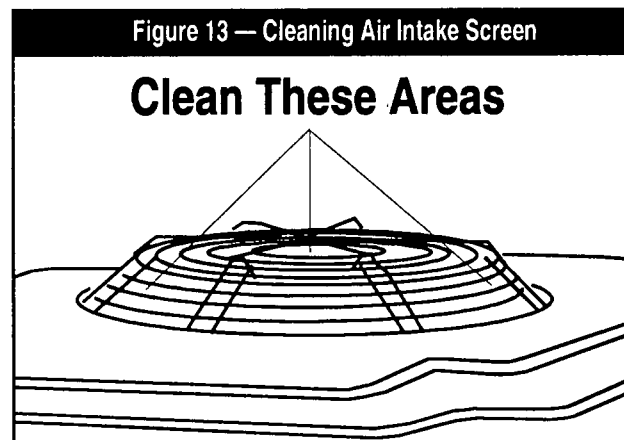
Once each year or every 100 operating hours (whichever comes first), replace the paper filter. The new replacement filter must be a flame retardent type.



CLEAN AIR INTAKE SCREEN

Clean all foreign material from the air intake screen (Figure 13) at least once every 100 hours of operation. Clean more often if necessary.

Inspect the area around the generator exhaust muffler periodically and remove all grass, leaves, dirt, etc. from this area.

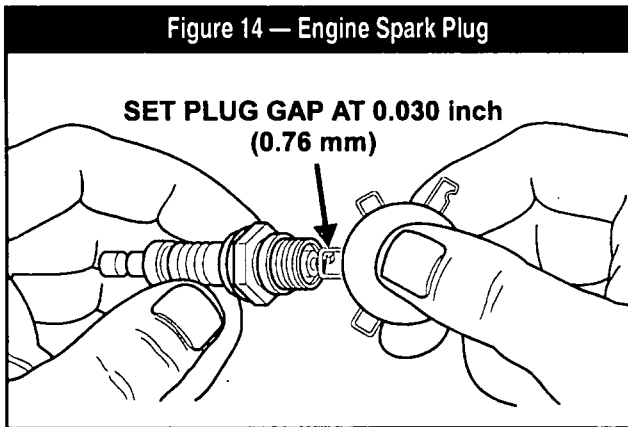


ENGINE SPARK PLUGS

Clean engine spark plugs and set gap to 0.030 inch (0.76mm) every 100 hours of operation (Figure 14). Clean by scraping or wire brushing and washing with commercial solvent. DO NOT BLAST CLEAN SPARK PLUGS.

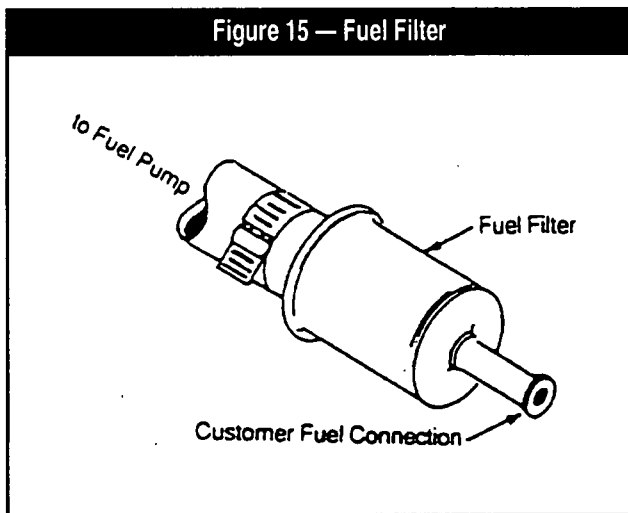


CAUTION: Sparking can occur if wire terminal does not fit firmly over spark plug terminal end. If necessary, reform wire terminal to obtain a tight fit.



FUEL FILTER

Remove and replace fuel filter (Figure 15) every 100 hours of operation or once each year, whichever occurs first.



SPARK ARRESTOR MUFFLER

If the generator is not equipped with a spark arrestor exhaust muffler and is to be used on any forest covered, brush covered or grass covered unimproved land, you may have to install a spark arrestor. The spark arrestor must be maintained in effective working order by the vehicle owner/operator.

For assistance in ordering, installing and maintaining spark arrestor exhaust mufflers, contact your nearest authorized service facility.

Exhaust mufflers supplied by Generac are spark arrestor types. Generac exhaust mufflers for IM generators do not have a spark arrestor screen, but are of the more efficient "toriod" or "swirl" type. To remove carbon and combustion deposits from such mufflers, remove the PLUG from muffler and run engine for about 15 minutes. Shut engine down, let the muffler cool and install the plug.



WARNING: Be sure to re-install the plug from the muffler tightly. Engine vibration could cause a loose plug to fall out. Without the plug in place, hot engine exhaust is directed out the opening. This hot exhaust, depending on the installation, could be directed to areas not able to withstand the extreme heat such as wooden floor boards or other flammable material. This could result in a fire.

CLEANING THE GENERATOR

Keep your generator set as clean and dry as possible. Dirt and moisture that are permitted to accumulate on electrical windings have an adverse affect on the insulation resistance of those windings.

Moisture that is allowed to remain in contact with windings will be retained in voids and cracks of the windings. Dirt makes the problem worse, since it tends to hold the moisture into contact with the windings. Salt, as from sea air, worsens the problem since it tends to absorb moisture from the air. The combination of salt and moisture makes a good electrical conductor.



CAUTION! Do NOT use a forceful spray of water to clean the generator. Water will enter the generator interior and cause problems; and may also contaminate the generator fuel system.

BATTERY

All lead-acid storage batteries will discharge when not in use. Inspect the generator battery as follows:

■ ONCE WEEKLY

Inspect battery posts and cables for tightness, corrosion. Clean and/or tighten as necessary.

Also check battery fluid level, and, if necessary, fill with **DISTILLED WATER ONLY. DO NOT USE TAP WATER IN BATTERY.**

■ EVERY SIX MONTHS

Have the battery state of charge and condition checked by an automotive service facility. This should be done with an automotive type battery hydrometer.



DANGER: Storage batteries give off explosive hydrogen gas. This gas can form an explosive mixture around the battery for several hours after charging. The slightest spark can ignite the gas and cause an explosion. Such an explosion can shatter the battery and cause blindness or other injury. Any area that houses a storage battery must be properly ventilated. Do not allow smoking, open flame, sparks or any spark producing tools or equipment near the battery.



DANGER: Battery electrolyte fluid is an extremely caustic sulfuric acid solution that can cause severe burns. Do not permit fluid to contact eyes, skin, clothing, painted surfaces, etc. Wear protective goggles, protective clothing and gloves when handling a battery. If you spill the fluid, flush the affected area immediately with clear water.



DANGER: Do not use any jumper cables or booster battery to crank and start the generator engine. If any battery has discharged, remove it from the vehicle for recharging.

MAJOR SERVICE MANUAL

To obtain a service manual for your generator, order it from your dealer/distributor or contact the factory. Be sure to identify your unit's MODEL NUMBER and SERIES.

DRIVE BELT

The engine drives the generator rotor by means of a pulley and drive belt arrangement. The drive belt and pulleys are warranted for the life of the generator. Drive belt tension was properly adjusted before the unit was shipped from the factory. If you suspect that drive belt tension is incorrect, contact an authorized service facility.

EXERCISING THE GENERATOR

Generac recommends that you start and operate the generator at least once every seven days. Let the unit run for at least 30 minutes to "exercise" the engine.

OUT OF SERVICE PROTECTION

If you cannot exercise the generator every seven days and it is to be out of service longer than 30 days, prepare the generator for storage as follows:

- Start the engine and let it warm up.
- While the engine is still warm from running, drain the oil completely. Refill crankcase with recommended oil. See "Specifications."

- Attach a tag to the engine indicating the viscosity and classification of the oil in the crankcase.
- Remove spark plugs and add about 1/2 ounce (15ml) of clean, fresh engine oil into spark plug threaded openings. Crank engine several times to distribute oil, then install and tighten spark plugs.
- Remove the battery and store in a cool, dry room on a wooden board. Never store the battery on any concrete or earthen floor.
- Clean and wipe the entire generator.

RETURN UNIT TO SERVICE AFTER STORAGE

To return the unit to service after storage, proceed as follows:

- Check tag on engine for oil viscosity and classification. Verify that the correct recommended oil is used in engine. If necessary, drain and refill with proper oil.
- Check battery. Fill all cells to the proper level with distilled water. **DO NOT USE TAP WATER IN THE BATTERY.** Recharge battery to 100% state of charge, or, if defective, replace the battery.
- Press the Fuel Pump Primer switch and hold it for about 30 seconds.
- Turn OFF all electrical loads, then start the engine.
- Let engine warm up.
- Apply electrical loads to at least 50% of the unit's rated wattage capacity.
- When engine is thoroughly warmed up, shut it down.

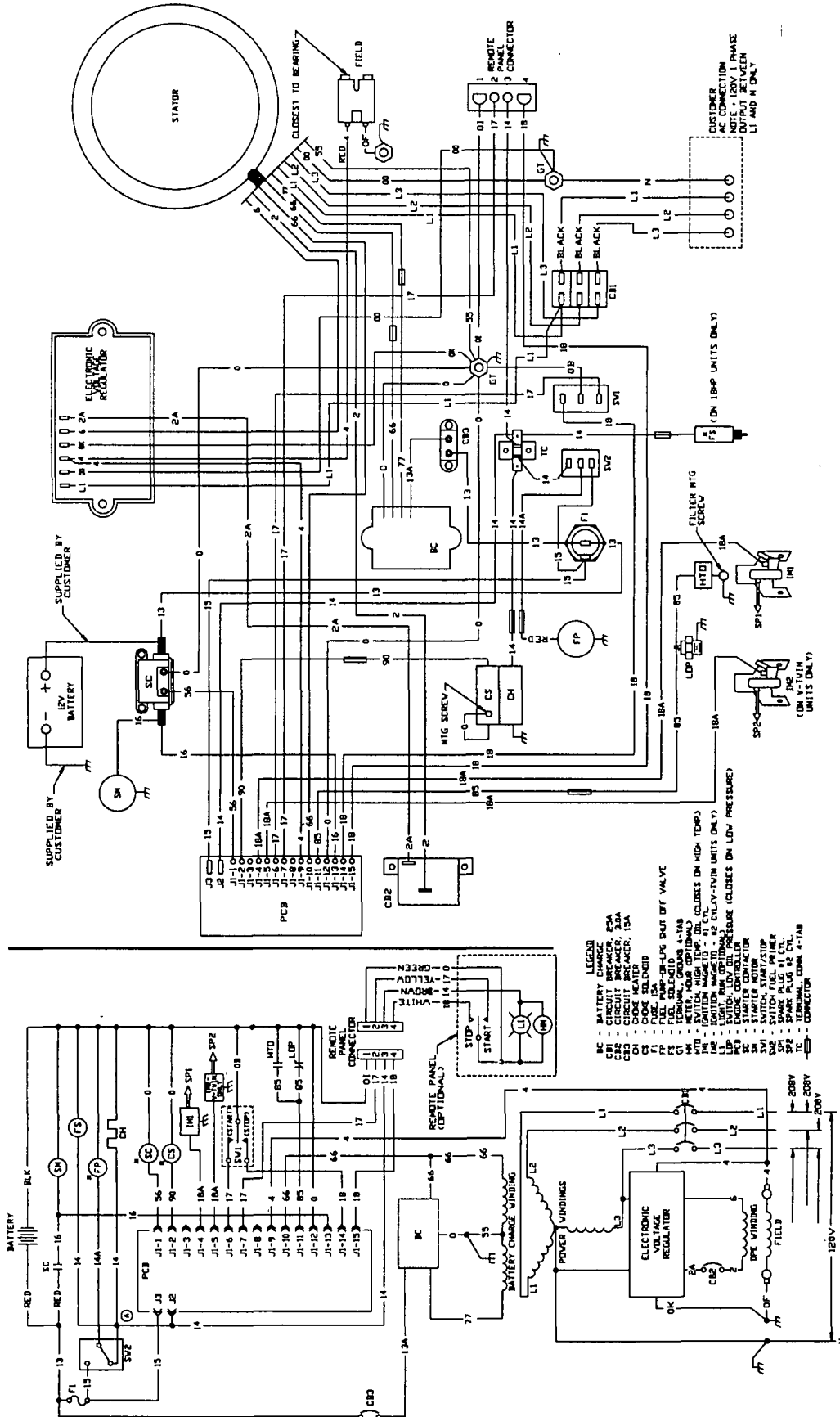
THE GENERATOR IS NOW READY FOR SERVICE.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	REMEDY
Engine won't crank.	<ol style="list-style-type: none"> 1. 15 amp fuse is blown 2. Loose corroded or defective battery cables. 3. Defective engine Start/Stop switch. 4. Defective starter contactor. 5. Defective starter motor. 6. Low Battery Voltage. 	<ol style="list-style-type: none"> 1. Replace 15 amp fuse 2. Tighten, clean or replace as necessary. 3. Replace Start/Stop switch. 4. Replace contactor. 5. Replace starter motor. 6. Charge or replace battery.
Engine cranks but won't start.	<ol style="list-style-type: none"> 1. Out of fuel. 2. Fuel pump is defective. 3. Open Wire #14 from Eng. Control Bd. 4. Engine is flooded. 5. Spark plugs defective. 	<ol style="list-style-type: none"> 1. Replenish fuel. 2. Replace fuel pump. 3. Reconnect wire. 4. Wait 5-10 min. before trying. 5. Clean, regap or replace plugs.
Engine starts hard, runs rough.	<ol style="list-style-type: none"> 1. Air cleaner plugged or damaged 2. Defective spark plugs. 	<ol style="list-style-type: none"> 1. Clean or replace as needed. 2. Clean, regap or replace plugs.
Engine starts, shuts down when Start/Stop switch is released.	<ol style="list-style-type: none"> 1. Engine oil is low. 2. Engine is overheated. 3. Defective Low Oil Pressure System 4. Defective Engine Control Board 	<ol style="list-style-type: none"> 1. Check oil; add as needed. 2. Check adequate ventilation. 3. Have serviced/replaced. 4. Have board serviced/replaced.
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 and Engine Control 3. Open/disconnected wire #0 between Start/Stop switch & Engine Control Bd. 4. Defective Engine Control Board 	<ol style="list-style-type: none"> 1. Replace switch. 2. Reconnect or close wire. 3. Reconnect or close wire. 4. Replace board.
No AC output from generator.	<ol style="list-style-type: none"> 1. Check circuit breaker. 2. Check vehicle circuit breaker & fuses. 3. Generator internal failure 	<ol style="list-style-type: none"> 1. Reset to ON or CLOSED. 2. Reset and replace if necessary. 3. Take generator to an Authorized Generac facility.

ELECTRICAL DATA

Drawing No. A2693



CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board ("CARB") and Generac Corporation are pleased to explain the Emission Control System Warranty on your new industrial mobile (IM) generator. In California, new utility and lawn and garden equipment engines must be designed, built and equipped to meet the State's stringent anti-smog standards. Generac Corporation will warrant the emission control system on your industrial mobile (IM) generator for the periods of time listed below provided there has been no abuse, neglect, unapproved modification, or improper maintenance of your industrial mobile (IM) generator.

Your emission control system may include parts such as the carburetor, ignition system and exhaust system. Also included may be the compression release system and other emission-related assemblies.

Where a warrantable condition exists, Generac Corporation will repair your industrial mobile (IM) generator at no cost to you for diagnosis, parts and labor.

MANUFACTURER'S EMISSION CONTROL SYSTEM WARRANTY COVERAGE:

Emissions control systems on 1995 and later model year utility and lawn and garden equipment engines are warranted for two years as hereinafter noted. If, during such warranty period, any emission-related part on your engine is defective in materials or workmanship, the part will be repaired or replaced by Generac Corporation.

OWNER'S WARRANTY RESPONSIBILITIES:

As the industrial mobile (IM) generator owner, you are responsible for the performance of the required maintenance listed in your owners manual. Generac Corporation recommends that you retain all receipts covering maintenance on your industrial mobile (IM) generator, but Generac Corporation will not deny warranty solely due to the lack of receipts or for your failure to provide written evidence of the performance of all scheduled maintenance.

As the industrial mobile (IM) generator owner, you should, however, be aware that Generac Corporation may deny you warranty coverage if your industrial mobile (IM) generator or a part thereof has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your industrial mobile (IM) generator to a Generac Corporation Authorized Service Outlet as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

Warranty service can be arranged by contacting either a Generac Corporation Authorized Service Outlet or by contacting Generac Corporation at:

GENERAC CORPORATION PH: (414) 544-4811
P.O. BOX 8 FX: (414) 544-0179
WAUKESHA, WI 53187

IMPORTANT NOTE: This warranty statement explains your rights and obligations under the Emission Control System Warranty ("ECS Warranty") which is provided to you by Generac Corporation pursuant to California law. See also the Generac Corporation Limited Warranties for Generac Corporation which is enclosed herewith on a separate sheet and also is provided to you by Generac Corporation. The ECS Warranty applies only to the emission control system of your new engine. To the extent that there is any conflict in terms between the ECS Warranty and the Generac Corporation Warranty, the ECS Warranty shall apply except in any circumstances in which the Generac Corporation Warranty may provide a longer warranty period. Both the ECS Warranty and the Generac Corporation Warranty describe important rights and obligations with respect to your new engine.

Warranty service can only be performed by a Generac Corporation Authorized Service Outlet. At the time of requesting warranty service, evidence must be presented of the date of the sale to the original purchaser. The purchaser shall pay any charges for making service calls and/or for transporting the products to and from the place where the inspection and/or warranty work is performed. The purchaser shall be responsible for any damage or loss incurred in connection with the transportation of any engine or any part(s) thereof submitted for inspection and/or warranty work.

GENERAL SAFETY RULES



THE MANUFACTURER SUGGESTS THAT THESE "RULES" FOR SAFE OPERATION BE COPIED AND POSTED IN POTENTIAL HAZARD AREAS OF THE GENERATOR. 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 generator. Safety should be stressed to all operators and potential operators of equipment.

The manufacturer cannot possibly anticipate every circumstance that might involve a hazard. The warnings in this Manual and on tags and decals affixed to the unit are, therefore, not all-inclusive. If you use a procedure, work method or operating technique 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 industrial mobile generator must be properly installed and maintained. Installation must always remain in compliance with applicable codes and standards. In addition, the generator must be installed in conformance to the manufacturer's detailed installation instructions. Following installation, nothing must be done that might render the generator in noncompliance with such codes, standards and instructions.



The INDUSTRIAL MOBILE generator produces extremely high and 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. DO NOT disconnect the 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.
- In case of accident caused by electric shock, shut down the source of electrical power down at once. If this cannot be done, free victim from live conductor. AVOID DIRECT CONTACT WITH THE VICTIM. Use a dry board, dry rope, or other non-conducting implement to free the victim. If the victim is unconscious apply first aid and get medical help.

- 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.
- 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, in strict compliance with applicable codes and standards. Following installation, you must do nothing that might render the system 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, fuel leakage, oil leakage, etc.
- Do not smoke around the generator. Wipe up all fuel, and oil spills immediately. Never leave oily or fuel soaked rags in the generator compartment or on the generator itself. Keep the area around the generator clean and free of debris.
- Adequate ventilation is required to expel toxic fumes and fuel vapors from the generator compartment. Do not alter the installation of this equipment in any manner that might obstruct air and ventilation openings. Such openings must be kept clear and unobstructed.
- Keep hands, feet, clothing, etc., away from drive belt, fans and other moving parts of this equipment. Never remove any drive belt or fan guards while the unit is operating.
- Inspect the generator periodically. Repair or replace all damaged or defective parts immediately.
-  These generators can be converted to use LP gas (propane) as a fuel. Liquid Propane gas is highly EXPLOSIVE. The gas is heavier than air and tends to settle in low areas where even the slightest spark can ignite the gas and cause an explosion.
- Before performing any maintenance on the generator set, disconnect its battery cables to prevent accidental start up. Disconnect the cable from the battery post indicated by a NEGATIVE, NEG or (-) first. Reconnect that cable last.

GENERAC S 1-YEAR LIMITED WARRANTY FOR IM SERIES INDUSTRIAL MOBILE 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.

1-YEAR WARRANTY SCHEDULE

1. All IM series generators used in an industrial vehicle shall be warranted from date of purchase for a period of a 1 year or 2000 hours of operation, whichever occurs first. All parts, labor, removal and reinstallation shall be covered during this period.

2. The drive train, belt and pulleys on IM 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 parts only.

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. 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. Buyer agrees to make no claims against Generac based on negligence.

GENERAC POWER SYSTEMS INC.

P.O. BOX 8

WAUKESHA, WI 53187

Telephone: (414) 544-4811

Fax: (414) 544-4851