

GENERAC[®]

POWER SYSTEMS, INC.

Owner's Manual

GUARDIAN[®]

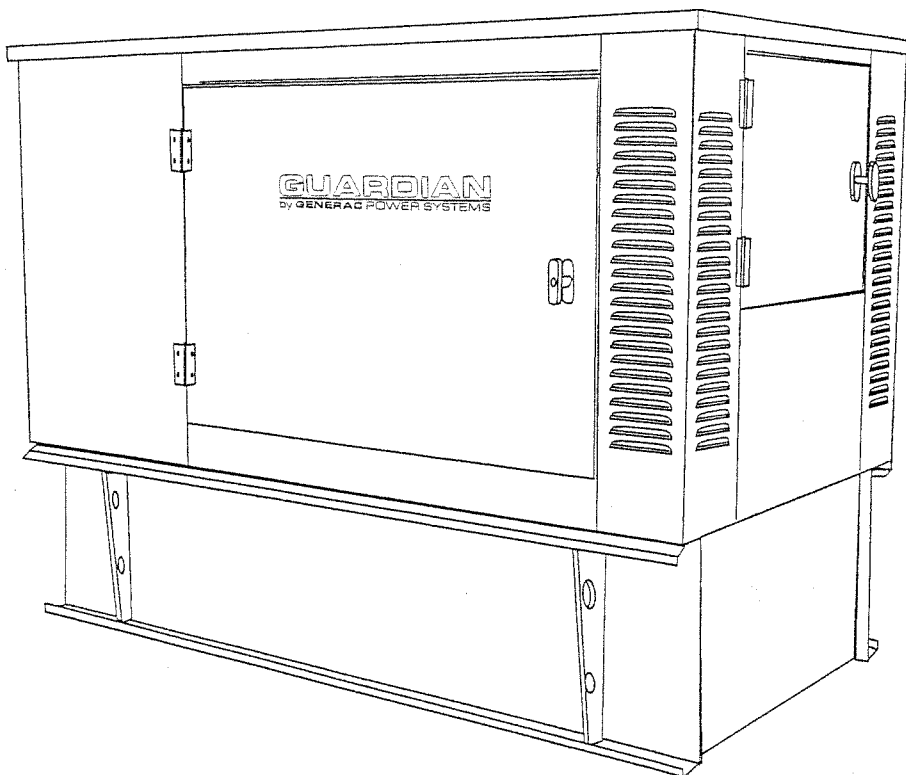
by GENERAC[®] POWER SYSTEMS

Liquid-cooled, Prepackaged
Standby Generators

Models:

04136-0 (8 kW/Single-phase)

04137-0 (8 kW/Three-phase)



—▲ **DANGER** ▲—

ONLY QUALIFIED ELECTRICIANS OR CONTRACTORS
SHOULD ATTEMPT INSTALLATION!!

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INTRODUCTION

Thank you for purchasing the Guardian product line by Generac Power Systems. This model is a compact, high performance, liquid-cooled, engine-driven generator designed to automatically supply electrical power to operate critical loads during a utility power failure.

This unit is factory installed in an all-weather, metal enclosure that is intended exclusively for outdoor installation.

◆ READ THIS MANUAL THOROUGHLY

If you do not understand any portion of this manual, contact Generac or your nearest Generac/Guardian Authorized Dealer for starting, operating and servicing procedures.

Throughout this publication, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE 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. Their definitions are as follows:



After this heading, you can read instructions that, if not strictly complied with, will result in personal injury or property damage.



After this heading, you can read instructions that, if not strictly complied with, may result in personal injury or property damage.




After this heading, you can read instructions that, if not strictly complied with, could result in damage to equipment and/or property.


NOTE:


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


These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the service are essential to preventing accidents.

Four commonly used safety symbols accompany the DANGER, WARNING and CAUTION blocks. The type of information each indicates is as follows:

 This symbol points out important safety information that, if not followed, could endanger personal safety and/or property of you and others.

 This symbol points out potential explosion hazard.

 This symbol points out potential fire hazard.

 This symbol points out potential electrical shock hazard.

The operator is responsible for proper and safe use of the equipment. We strongly recommend that the operator read this *Owner's Manual* and thoroughly understand all instructions before using this equipment. We also strongly recommend instructing other users to properly start and operate the unit. This prepares them if they need to operate the equipment in an emergency.

◆ CONTENTS

This manual contains pertinent owner's information, including warranty, electrical diagrams, exploded views and lists of repair parts, for the following Guardian models:

04136-0 and 04137-0

◆ 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 periodically by a Generac/Guardian Authorized Dealer. Normal maintenance service and replacement of maintenance 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 generator ensure a minimum number of problems and keep operating expenses at a minimum. See your Generac/Guardian Authorized Dealer for service aids and accessories.

◆ HOW TO OBTAIN SERVICE

When your generator requires servicing or repairs, simply contact a Generac/Guardian Authorized Dealer for assistance. Service technicians are factory-trained and are capable of handling all of your service needs.

When contacting a Generac/Guardian Authorized Dealer 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, which is located on your generator.

Model No. _____ Serial No. _____

AUTHORIZED DEALER LOCATION

To locate the GENERAC/GUARDIAN AUTHORIZED
DEALER nearest you, please call this number:

1-800-747-1530

DEALER LOCATION INFORMATION
CAN BE OBTAINED AT THIS NUMBER.



Important Safety Instructions

Guardian Liquid-cooled 8 kW Generators

SAVE THESE INSTRUCTIONS - The manufacturer suggests that these rules for safe operation be copied and posted in potential hazard areas. Safety should be stressed to all operators and potential operators of this equipment.



WARNING



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

Study these SAFETY RULES carefully before installing, operating or servicing this equipment. Become familiar with this *Owner's Manual* and with the unit. The generator can operate safely, efficiently and reliably only if it is properly installed, operated and maintained. Many accidents are caused by failing to follow simple and fundamental rules or precautions.

Generac cannot possibly anticipate every possible 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 also must make sure the procedure, work method or operating technique that you choose does not render the generator unsafe.

— DANGER —

Despite the safe design of this generator, operating this equipment imprudently, neglecting its maintenance or being careless can cause possible injury or death. Permit only responsible and capable persons to operate or maintain this equipment.

Potentially lethal voltages are generated by these machines. Ensure all steps are taken to render the machine safe before attempting to work on the generator.

Parts of the generator are rotating and/or hot during operation. Exercise care near running generators.

GENERAL HAZARDS

- For safety reasons, Generac recommends that the installation, initial start-up and maintenance of this equipment is carried out by a Generac/Guardian Authorized Dealer.
- The engine exhaust fumes contain carbon monoxide, which can be DEADLY. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. This exhaust system must be installed properly, in strict compliance with applicable codes and standards. Following installation, you must do nothing that might render the system unsafe or in noncompliance with such codes and standards.
- Keep hands, feet, clothing, etc., away from drive belts, fans, and other moving or hot parts. Never remove any drive belt or fan guard while the unit is operating.
- Adequate, unobstructed flow of cooling and ventilating air is critical to correct generator operation. Do not alter the installation or permit even partial blockage of ventilation provisions, as this can seriously affect safe operation of the generator.
- When working on this equipment, remain alert at all times. Never work on the equipment when you are physically or mentally fatigued.
- Inspect the generator regularly, and repair or replace all damaged or defective parts immediately. Always use factory-authorized parts.
- Turn off the AC power to the battery charger before disconnecting the battery to minimize the chance of equipment damage.
- Before performing any maintenance on the generator, 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.
- 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, fuel leakage, oil leakage, etc.

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ELECTRICAL HAZARDS

- All generators covered by this manual produce dangerous electrical voltages and can cause fatal electrical shock. Utility power delivers extremely high and dangerous voltages to the transfer switch as does the standby generator when it is in operation. Avoid contact with bare wires, terminals, connections, etc., while the unit is running. Ensure all appropriate covers, guards and barriers are in place before operating the generator. If you must work around an operating unit, stand on an insulated, dry surface to reduce shock hazard.
- Do not handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. **DANGEROUS ELECTRICAL SHOCK MAY RESULT.**
- The National Electrical Code (NEC) requires the frame and external electrically conductive parts of the generator to be connected to an approved earth ground. Local electrical codes also may require proper grounding of the generator electrical system.
- After installing this standby electrical system, the generator may crank and start at any time without warning. When this occurs, load circuits are transferred to the STANDBY (generator) power source. To prevent possible injury if such a start and transfer occur, always set the generator's Auto/Off/Manual switch to its OFF position before working on equipment.
- In case of accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. **AVOID DIRECT CONTACT WITH THE VICTIM.** Use a nonconducting implement, such as a rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.
- Never wear jewelry when working on this equipment. Jewelry can conduct electricity resulting in electric shock, or may get caught in moving components causing injury.

FIRE HAZARDS

- For fire safety, the generator must be installed and maintained properly. Installation always must comply with applicable codes, standards, laws and regulations. Adhere strictly to local, state and national electrical and building codes. Comply with regulations the Occupational Safety and Health Administration (OSHA) has established. Also, ensure that the generator is installed in accordance with the manufacturer's instructions and recommendations. Following proper installation, do nothing that might alter a safe installation and render the unit in noncompliance with the aforementioned codes, standards, laws and regulations.
- Keep a fire extinguisher near the generator at all times. Extinguishers rated "ABC" by the National Fire Protection Association are appropriate for use on the standby electric system. Keep the extinguisher properly charged and be familiar with its use. If you have any question pertaining to fire extinguishers, consult your local fire department.

EXPLOSION HAZARDS

- Do not smoke around the generator. Wipe up any fuel or oil spills immediately. Ensure that no combustible materials are left in the generator compartment, or on or near the generator, as FIRE or EXPLOSION may result. Keep the area surrounding the generator clean and free from debris.
- Although using diesel fuel is safer than using gasoline or gaseous fluids, which are extremely EXPLOSIVE, diesel still presents the danger of possible FIRE. Install the fuel supply system according to applicable fuel-gas codes. Before placing the standby electric system into service, fuel system lines must be properly purged and leak tested according to applicable code. After installation, you must inspect the fuel system periodically for leaks. No leakage is permitted.

1.1 UNPACKING/INSPECTION

After unpacking, carefully inspect the contents for damage.

- This standby generator set has been factory installed in an all-weather, metal enclosure that is intended exclusively for outdoor installation.

—▲ WARNING ▲—

- ▲ If this generator is used to power electrical load circuits normally powered by a utility power source, you are required by code to install a transfer switch. The transfer switch must effectively isolate the electrical system from the utility distribution system when the generator is operating (NEC 701). Failure to isolate an electrical system by such means will result in damage to the generator and also may result in injury or death to utility power workers due to backfeed of electrical energy.

If any loss or damage is noted at time of delivery, have the person(s) making the delivery note all damage on the freight bill or affix his or her signature under the consignor's memo of loss or damage.

If you note loss or damage after delivery, separate the damaged materials and contact the carrier for claim procedures.

"Concealed damage" is understood to mean damage to the contents of a package that is not in evidence at the time of delivery, but is discovered later.

◆ 1.1.1 LIFTING THE GENERATOR

—▲ WARNING ▲—

- ▲ When lifting or hoisting equipment is used, be careful not to touch overhead power lines.
- ▲ The generator's weight of more than 1,500 pounds requires proper tools and equipment, and qualified personnel to be used in all phases of handling and unpacking.

1.2 THE GENERATOR

This liquid-cooled, Guardian generator set is designed to supply electrical power to operate critical electrical loads during utility power failure. The unit has a four-pole revolving field (rotor) and utilizes long-life brushes and slip rings to deliver excitation current to the rotor windings. The rotor is directly connected to the engine shaft by a high-strength flexible disc. The engine governor holds the diesel engine and rotor speeds at a constant factory setting of approximately 1,860 rpm.

Use this generator as a source of electrical power for the operation of 120- and/or 240-volt, single- or three-phase loads; or 120- and/or 208-volt, three-phase loads.

These models are available, rated as follows:

04136-0: Provides 8,000 watts (8 kW) of single-phase power.

04137-0: Provides 8,000 watts (8 kW) of three-phase power.

1.3 GENERATOR AC CONNECTION SYSTEMS

The three-phase generators are shipped from the factory with their stator AC output leads connected in a 12-lead low wye configuration (Figure 1.1). This type of connection system will supply a 120- and/or 208-volt, three-phase output as shown in the illustration.

If, however, load voltage requires a 120/240-volt, single- or three-phase output, the stator's output leads will need to be reconnected (Figure 1.2). This task should be performed only by a qualified Generac/Guardian Authorized Technician. Refer to the *Guardian Installation, Start-up and Adjustment Manual* (Part No. 79699) for details.

Figure 1.1 – 12-lead Low Wye Generator AC Connection System

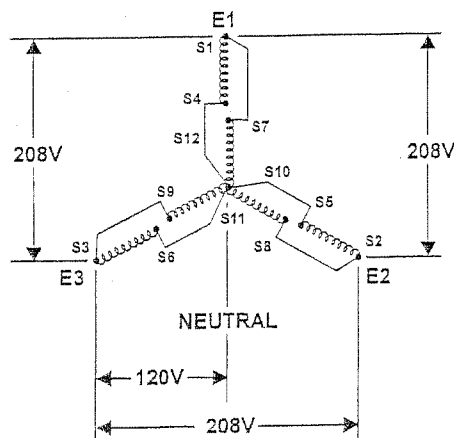


Figure 1.2 – Single- and Three-phase Delta Generator AC Connection System

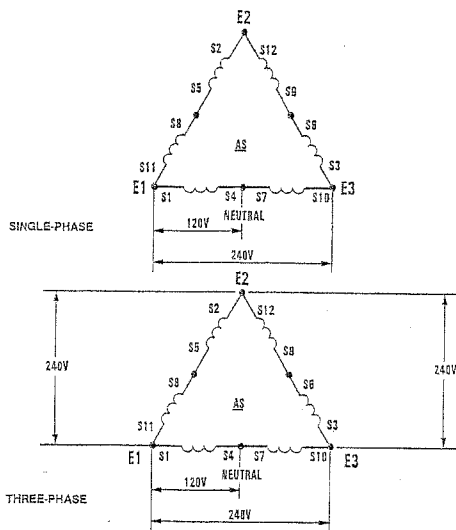
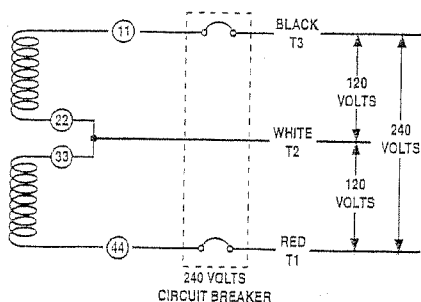


Figure 1.3 represents a single-phase, three-wire generator AC connection system. The stator assembly in this system consists of a pair of stationary windings with two leads brought out of each winding. Each single winding can supply a 120-volt, 60-Hertz AC output. When the two windings are connected in series, a 240-volt, 60-Hertz AC output results. Typically, the two "hot" leads in the circuit are Wires 11 and 44. The neutral leads are the junction of Wires 22 and 33.

Figure 1.3 – Single-phase Generator AC Connection System



1.4 AUTOMATIC SYSTEM OPERATION

When this generator, along with its transfer switch, has been installed and interconnected, a circuit board in the generator panel continuously monitors utility power source voltage. Should that voltage drop below a preset value, and remain at such a low state for a preset amount of time, the generator cranks and starts. After the generator starts, the transfer switch transfers load circuits so the generator can power them.

When utility source voltage has been restored, the switch transfers back to the utility source voltage, and the generator then shuts down.

1.5 MAIN CIRCUIT BREAKER

The generator's main circuit breaker is included with the unit as shipped from the factory. The breaker for each unit is described as follows:

Model Number	Circuit Breaker Rating
04136-0	35A-2P-BQ2
04137-0	35A-3P-BQ3

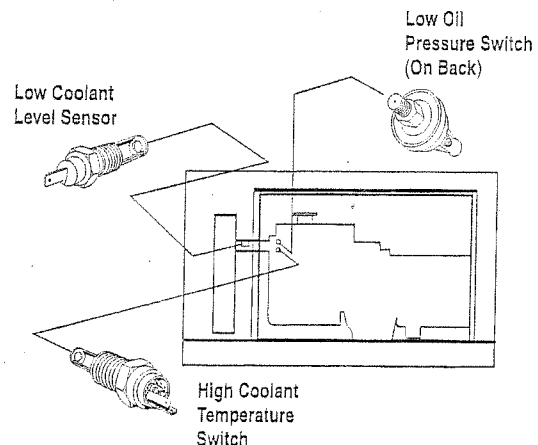
1.6 ENGINE PROTECTIVE DEVICES

The engine has several safety switches that cause it to automatically shut down under the following conditions: low oil pressure, high coolant temperature, low coolant level, and engine overspeed or overcrank. See Figure 1.4 for the location of these devices.

◆ 1.6.1 LOW OIL PRESSURE SWITCH

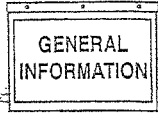
This switch is normally closed (N.C.) but is held open by engine oil pressure during engine running. Should operating oil pressure drop below approximately 15 psi, the switch contacts close, and the engine shuts down automatically.

Figure 1.4 – Engine Protective Devices



◆ 1.6.2 HIGH COOLANT TEMPERATURE SWITCH

This normally open (N.O.) thermostatic switch has a sensing tip that is immersed in captive coolant. Should the coolant temperature exceed approximately 124° C (256° F), the switch contacts close, which causes the engine to shut down automatically.



Section 1 – General Information
Guardian Liquid-cooled 8 kW Generators

◆ **1.6.3 LOW COOLANT LEVEL SWITCH**

Should the engine coolant level drop below the level of the high coolant temperature switch, it is possible for the engine to overheat without automatic shut down. To prevent such overheating without automatic shut down, the engine has a low coolant level sensor. If the engine coolant drops too low, the engine automatically shuts down.

◆ **1.6.4 OVERSPEED SHUTDOWN**

The DC control circuit board (inside control panel) senses engine speed from the frequency of the alternator AC output. Should the alternator output frequency exceed approximately 72 Hertz (2,160 alternator rpm), circuit board action initiates an automatic engine shutdown.

◆ **1.6.5 OVERCRANK SHUTDOWN**

After 90 seconds of crank-rest cycles (while in Auto mode), this function ends cranking if the engine fails to start in that 90-second span.

1.7 SPECIFICATIONS

◆ **1.7.1 GENERATOR**

	SINGLE-PHASE	THREE-PHASE
Model	04136-0	04137-0
Rated Maximum Continuous AC Power Output (kW)*	8	
Rated Voltage (volts)	120/240	120/208
Rated Maximum Continuous Current at ...		
•240 Volts, Single-phase (amps)	33.3	NA
•240 Volts, Three-phase (amps)	NA	24.1
•208 Volts, Three-phase (amps)	NA	27.8
Power Factor	1.0	0.8
Rated AC Frequency	60 Hertz at 1,800 rpm	
Number of Rotor Poles	4	
Rotor Speed at No Load	1,860 rpm	
Type of Stator	Four-wire	12-wire Reconnectable
Rotor Excitation System	Direct Excited Brush-type System	
Rotor and Stator Insulation	Class "F"	

*Rated power of generator is subject to and limited by such factors as ambient temperature, altitude, engine condition and other factors. Engine power will decrease about 3.5 percent for each 1,000 feet above sea level; and also will decrease an additional 1 percent for each 12° C (10° F) above 15.5° C (60° F). Maximum output power of the generator is limited by maximum engine power.

◆ **1.7.2 ENGINE**

MakeISM Diesel
 Cylinder Arrangement3, in-line
 Displacement58.2 inches (954 cc)
 Bore2.95 inches (75 mm)
 Stroke2.85 inches (72 mm)
 Compression Ratio.....23-to-1
 Compression Pressure at 200 rpm
 Standard426.7 psi
 Minimum Limit284.5 psi
 Combustion Chamber TypePre-Combustion
 Firing Order1-2-3
 Direction of RotationCounterclockwise
 Number of Main Bearings4
 No. of Teeth on Flywheel104
 Ground PolarityNegative
 Oil FilterFull flow, with bypass valve
 Oil Pressure29-71 psi
 Crankcase Oil Capacity
 With Filter Change4.0 U.S. quarts (3.8 L)
 Without Filter Change3.7 U.S. quarts (3.5 L)
 Recommended Engine Oil.....See Section 1.9 (Page 7)
 Type of Cooling SystemPressurized

Type of Cooling FanPusher
 Cooling System Capacity2.5 U.S. gallons (9.5 L)
 Recommended CoolantUse a 50-50 mixture of low silicate, ethylene glycol base antifreeze and soft water. See Section 3.10 (Page 14).
 Type of Fuel SystemDiesel
 Recommended FuelSee Section 1.8 (Page 7)
 Fuel Filter.....10 micron
 Fuel Injection PumpBosch "M" Type
 Injection Spray Angle20°-21° BTDC
 Injection Pressure1,707 psi
 Fuel Consumption - 60 Hz (gal/h)
 25% Load 50% Load 75% Load 100% Load
 0.35 0.52 0.63 0.84

NOTE:

Actual fuel consumption obtained may vary depending on such variables as applied load, ambient temperature, engine conditions and other environmental factors.

1.8 FUEL REQUIREMENTS AND RECOMMENDATIONS

Use clean, fresh No. 2D diesel fuel with minimum cetane number of 40. It also must conform to American Society of Testing and Materials (ASTM) specifications. The fuel should be stored in sealed containers that have low point drains which permit water to be drained from the fuel periodically. Never use any dirty or contaminated fuel.

This unit has a 46-gallon fuel tank. When adding fuel, DO NOT overfill the tank. Allow room at the top of the tank for fuel expansion.

NOTE:

Appropriate care should be taken in applications where extremely low ambient temperatures are possible to ensure the temperature of the diesel fuel is not allowed to fall below levels where "gelling" could occur.

—▲ WARNING ▲—

Although using diesel fuel is safer than using gasoline or gaseous fluids, which are extremely EXPLOSIVE, diesel still presents the danger of possible FIRE. The fuel supply system must be installed according to applicable fuel-gas codes. After installation, you must inspect the fuel system periodically for leaks. No leakage is permitted.

1.9 ENGINE OIL RECOMMENDATIONS

Use a high-quality detergent oil with American Petroleum Institute (API) classification "For Service C." Detergent oils keep the engine cleaner and reduce carbon deposits. Use oil having the following Society of Automotive Engineers (SAE) viscosity rating, based on the ambient temperature range anticipated before the next oil change:

Temperature	Oil Grade (Recommended)
Above 70° F (21° C)	SAE 30W
30° to 70° F (-7° to 21° C)	SAE 20W
Below 20° F (-7° C)	SAE 10W or 10W-30

—▲ CAUTION ▲—

Any attempt to crank or start the engine before it has been properly serviced with the recommended oil may result in an engine failure.

1.10 THE BATTERY

Use a 12-volt, automotive-type storage battery (Group 26F) rated 75 amp hours or more and capable of a minimum of 530 cold-cranking amps at -17.8° C (0° F). When using a maintenance-free battery, it is not necessary to check the specific gravity or electrolyte level. Have these procedures performed at the intervals specified in the service schedule. A negative ground system is used. Battery connections are shown on the wiring diagrams. Make sure the battery is correctly connected and terminals are tight. Observe battery polarity when connecting the battery to the generator set.

NOTE:

Damage will result if the battery connections are made in reverse.

Your generator is equipped with a battery trickle charger that is active when your unit is set up for automatic operation. The trickle charge is designed to help extend the life of your battery by maintaining the battery when the unit is not running.

—▲ 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.

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.

—▲ WARNING ▲—

Do not dispose of the battery in a fire. The battery is capable of exploding.

Do not open or mutilate the battery. Released electrolyte can be toxic and harmful to the skin and eyes.

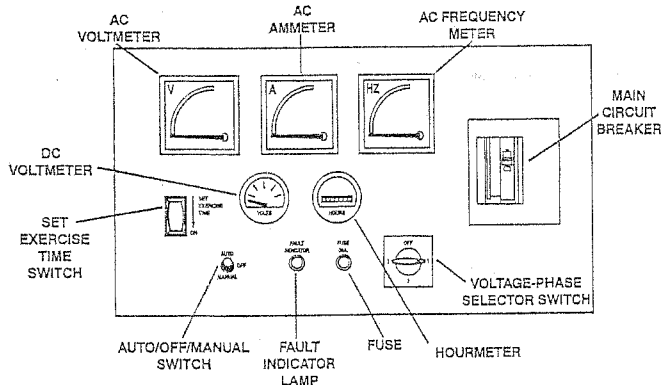
The battery represents a risk of high short circuit current. When working on the battery, always remove watches, rings or other metal objects, and only use tools that have insulated handles.



2.1 CONTROL CONSOLE COMPONENTS

The components of a liquid-cooled generator control console (Figure 2.1) are as follows:

Figure 2.1 – Control Console



◆ 2.1.1 AC VOLTMETER

The voltmeter displays generator AC output voltage during operation. Voltage is regulated by a solid-state voltage regulator and is proportional to AC frequency. Refer to your unit's DATA PLATE for rated AC voltage.

◆ 2.1.2 AC AMMETER

This indicates current draw of connected electrical loads during operation. **DO NOT EXCEED YOUR UNIT'S RATED MAXIMUM CONTINUOUS CURRENT.** Refer to the unit DATA PLATE.

◆ 2.1.3 AC FREQUENCY METER

This indicates generator AC output frequency in Hertz (cycles per second). Frequency is proportional to engine speed. Units with a four-pole rotor supply 60 Hertz at 1,800 rpm. The frequency reading with no electrical loads connected (no-load condition) should be between 61-63 Hertz. With full rated wattage/ampereage load applied to the generator, frequency should not droop below approximately 58 Hertz.

◆ 2.1.4 DC VOLTMETER

The generator is equipped with a belt-driven DC alternator, which maintains battery state of charge when the engine operates. The control module assembly also incorporates a trickle charge circuit that maintains battery state of charge during non-operating periods. Battery voltage should read approximately 12.5 to 14.5 volts DC. A low battery voltage indicates the battery is discharging.

◆ 2.1.5 HOURMETER

This indicates the time the engine-generator has operated, in hours and tenths of hours. Use the hourmeter along with the periodic maintenance schedule for your generator set.

◆ 2.1.6 AUTO/OFF/MANUAL SWITCH

See Section 2.3.

◆ 2.1.7 FAULT INDICATOR LAMP

This lamp goes ON when one or more of the following engine faults occurs and when engine shuts down.

- Low oil pressure
- High coolant temperature
- Low coolant level
- Overcrank
- Overspeed

◆ 2.1.8 30-AMP FUSE

This fuse protects the control console's DC control circuit against electrical overload. If the fuse has melted open because of an overload, engine cranking and start-up cannot occur. Should you need to replace the fuse, use only an identical 30-amp replacement fuse.

◆ 2.1.9 VOLTAGE-PHASE SELECTOR SWITCH

This switch permits you to select either line-to-line or line-to-neutral voltage and amperage readings on the console AC voltmeter and ammeter.

◆ 2.1.10 SET EXERCISE TIME SWITCH

This switch allows you to program the generator to start and exercise automatically.

◆ 2.1.11 MAIN CIRCUIT BREAKER

The generator's main circuit breaker is included with the unit as shipped from the factory. See "Main Circuit Breaker," Section 1.5 (Page 5), for the appropriate breaker.

2.2 PREPARATION BEFORE START-UP

Before starting the generator, check that oil, coolant and fuel levels are correct (see "Specifications," Section 1.7, Page 6).

2.3 USING THE AUTO/OFF/MANUAL SWITCH

◆ 2.3.1 "AUTO" POSITION

Selecting this switch position activates fully automatic system operation. It also allows the unit to start and exercise the engine every seven days with the setting of the exercise timer (see Section 2.7, Page 10).



◆ 2.3.2 "OFF" POSITION

This switch position shuts down the engine. This position also prevents operation.

◆ 2.3.3 "MANUAL" POSITION

Set the switch to Manual to crank and start the engine. Transfer to standby power will not automatically occur unless there is a utility failure.

▲ WARNING ▲

▲ With the switch set to AUTO, the engine may crank and start at any time without warning. Such automatic starting normally occurs when utility power source voltage drops below a preset level or during the normal exercise cycle. To prevent possible injury that might be caused by such sudden starts, always set the switch to OFF and remove the fuse before working on or around the generator or transfer switch. Then, place a "Do Not Operate" tag on the generator panel and on the transfer switch.

2.4 AUTOMATIC TRANSFER OPERATION

To select automatic operation, do the following:

1. Make sure the transfer switch main contacts are set to their "Utility" position, i.e., loads connected to the utility power source.
2. Be sure that normal utility power source voltage is available to transfer switch terminal lugs N1 and N2. (See the electrical data in the applicable transfer switch manual.)
3. Set the generator's Auto/Off/Manual switch to AUTO.
4. Set the generator's main circuit breaker to its ON (or closed) position.

With the preceding steps complete, the generator will start automatically when utility source voltage drops below a preset level. After the unit starts, loads are transferred to the standby power source. Refer to "Sequence of Automatic Operation."

2.5 SEQUENCE OF AUTOMATIC OPERATION

The generator's control panel houses a control logic circuit board. This board constantly monitors utility power source voltage. Should that voltage drop below a preset level, circuit board action will signal the engine to crank and start. After the engine starts, the circuit board signals the transfer switch to activate and connect load circuits to the standby power supply (load terminal lugs T1/T2 connect to terminal lugs E1/E2). (See the electrical data in the applicable transfer switch manual.)

Upon restoration of utility source voltage above a preset level, generator circuit board action signals the transfer switch to transfer loads back to that power supply. After retransfer, the engine is signalled to shut down.

The actual sequence of operation is controlled by sensors and timers on a control logic circuit board, as follows:

A. Utility Voltage Dropout Sensor

- This sensor monitors utility source voltage.
- If utility source voltage drops below about 60 percent of the nominal supply voltage, the sensor energizes a 15-second timer.
- Once the timer has expired, the engine will crank and start.

B. Engine Warm-up Time Delay

- This mechanism lets the engine warm up for about 10 seconds before the load is transferred to a standby source.

C. Standby Voltage Sensor

- This sensor monitors generator AC output voltage. When the voltage has reached 50 percent of the nominal rated voltage, transfer to standby can occur.

D. Utility Voltage Pickup Sensor

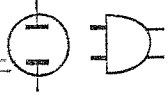
- This sensor monitors utility power supply voltage. When that voltage is restored above 80 percent of the nominal source voltage, a retransfer time delay starts timing.

E. Retransfer Time Delay

- This timer runs for about 15 seconds.
- At end of a 15-second delay, circuit board action de-energizes transfer relay in the transfer switch.
- Retransfer to utility power source then occurs.

F. Engine Cool-down Timer

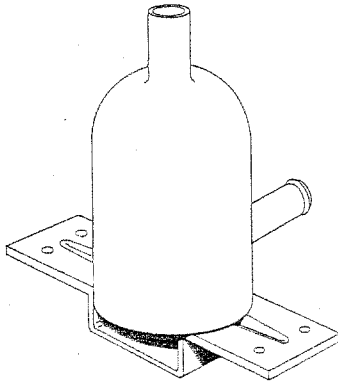
- When the load is transferred back to utility power source, the engine cool-down timer starts timing.
- The timer will run for about one minute, and the generator will then shut down.



2.6 ENGINE HEATER

Your Generac standby generator comes equipped with a block heater (Figure 2.2) that is similar to the block heaters used in automotive applications.

Figure 2.2 – Engine Block Heater



Refer to applicable wiring diagram(s) and electrical schematic(s) at the back of this manual for wiring connections.

2.7 WEEKLY EXERCISE CYCLE

The generator will start and exercise once every seven days. During this weekly exercise, the unit runs for approximately 20 minutes and shuts down. Transfer of loads to generator output does not occur during the exercise unless power is lost during the exercise period.

To select the day of the week and time of day for exercising, proceed as follows:

- Set the Auto/Off/Manual switch to OFF.
- Set generator's main circuit breaker to its OFF (or open) position.
- Locate the rocker switch on the control panel identified with the words "Set Exercise Time" (Figure 2.3).
- Push "Set Exercise Time" switch to the ON position for 20 to 30 seconds and then release. The switch will spring back into its original position when released.

- Wait 30 seconds before setting the Auto/Off/Manual switch to the AUTO position.

NOTE:

The unit will exercise 20 minutes after it is set.
Example: Set – Noon; Exercise – 12:20 p.m.



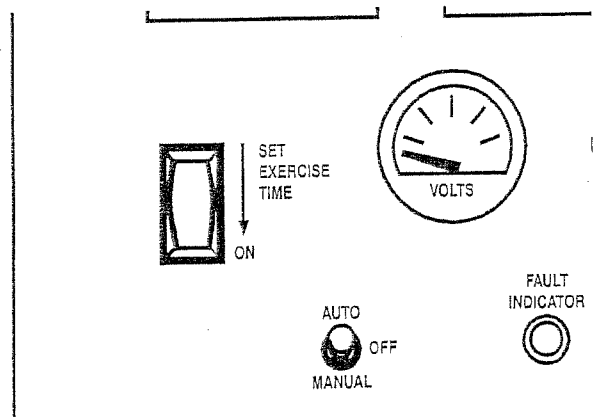
- ▲ If you switch the Auto/Off/Manual switch too soon, the engine may start. If engine does start, it will shut down automatically in about two (2) minutes.

- Set the generator's main circuit breaker to its ON (or closed) position.
- The generator is now programmed to start and exercise every seven days thereafter, on the day and at the time of day the switch was activated.
- Place a sign on the generator's control panel and on the transfer switch that indicates the day and time the generator will be exercising.

NOTE:

If the battery terminals are disconnected or the control panel fuse is removed, the exercise timer needs to be reset for automatic exercise operation.

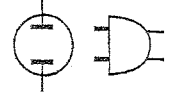
Figure 2.3 – "Set Exercise" Switch on Control Panel



2.8 OPTIONAL GTS TRANSFER SWITCH

This generator can be installed in conjunction with a Generac GTS-type automatic transfer switch, if desired.

The standard ATS-type transfer switch has no sensing or controlling circuit boards. Instead, the generator control console houses a control module assembly (CMA), which controls all phases of operation, including engine start-up and load transfer.



◆ 2.8.1 USING AN OPTIONAL GTS TRANSFER SWITCH

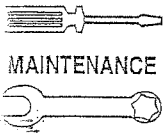
When you use a GTS-type transfer switch, it controls automatic operation and automatic transfer as follows:

- Solid-state circuits in the transfer switch monitor utility power source voltage.
- When utility source voltage drops below a preset level, transfer switch action closes the engine circuit. The engine then cranks and starts as controlled by the generator's control module circuit board.
- After the engine starts and when the generator AC output voltage and frequency have reached a preset value, transfer switch circuits signal the transfer switch main contacts to move to the standby power source side. Generator AC output then powers load circuits.

- When the utility power source voltage is restored above a preset level and the return to utility timer has timed out, the transfer switch solid-state circuits signal the switch main contacts to move back to their utility power source side.
- The engine cooldown timer starts and times out. Then, the transfer switch circuit board action opens the engine run circuit. The engine then shuts down.

NOTE:

If your generator is installed in conjunction with an optional GTS-type transfer switch, refer to the applicable transfer switch manual for exact operating parameters and timing sequences.



3.1 25-HOUR BREAK-IN PERIOD

The first 25 hours of operation constitute the break-in period for the standby generator. Correctly breaking in the generator is essential to minimize oil consumption and maximize engine performance. During the break-in period, observe the following rules:

1. Run the generator at various electrical loads for the first 25 hours of operation, to help seat engine piston rings properly.
2. For the next 75 operating hours, avoid light electrical loads.
3. During this period, load the unit at 50 percent or more of its rated capacity (4,000 watts or more). Repeated light electrical loads during the break-in period can cause improper seating of engine piston rings, resulting in blowby and high oil consumption.
4. Check the engine crankcase oil level frequently during the break-in period. It is normal for oil consumption to be high during this period.
5. After the 25 hour break-in period is completed, perform the tasks recommended under "25 Hour Checkup."

3.2 25-HOUR CHECKUP

Following the first 25 hours of operation, contact an authorized service facility for the following maintenance. The generator owner is responsible for all charges.

- Change the engine crankcase oil and filter.
- Check all fluid levels (engine coolant, fuel, battery electrolyte fluid).
- Inspect cooling system hoses for deterioration and leaks, all hose clamps for tightness and security.
- Check fuel system lines for leaks, tightness and condition.
- Check fuel injection timing.
- Check/Adjust engine governed speed (frequency).
- Inspect engine belts for condition, proper tension.
- Check for correct AC voltage output.
- Check all generator receptacles and circuit breakers for condition and proper operation.

3.3 CHECKING THE ENGINE OIL LEVEL

After the 25-hour break-in period, check the engine oil level every eight hours of operation or at least once daily before using the generator. For oil capacities, see "Specifications," Section 1.7 (Page 6). For engine oil recommendations, see Section 1.9 (Page 7). To check the engine oil level, proceed as follows (Figure 3.1):

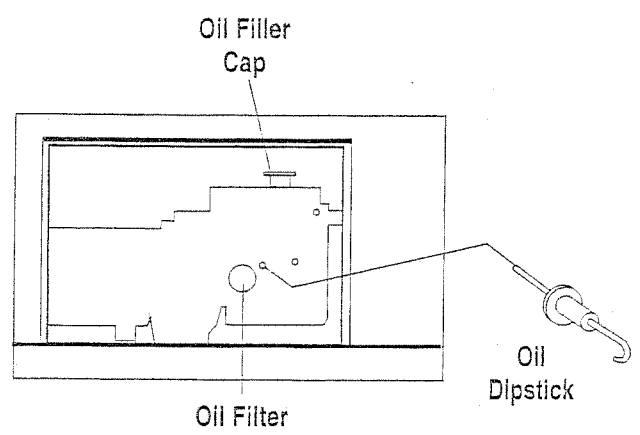
1. Remove the dipstick and wipe it dry with a clean cloth.

2. Install the dipstick cap; then, remove it again. The oil level should be at the dipstick "Full" mark. If necessary, add oil to the "Full" mark only. **DO NOT FILL ABOVE THE "FULL" MARK.**
3. Install the dipstick.

—▲ CAUTION ▲—

▲ Never operate the engine with the oil level below the "Add" mark on the dipstick. Doing this could damage the engine.

Figure 3.1 – Engine Oil Servicing Points



3.4 CHANGING THE ENGINE OIL AND FILTER

See Section 1.9, "Engine Oil Recommendations" (Page 7), for the proper oil grade for your application.

NOTE:

The engine oil and filter should be changed after the 25-hour break-in period. See the "Service Schedule," Section 3.13 (Page 16), for subsequent oil and filter changes.

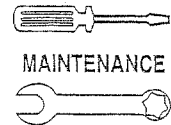
—▲ CAUTION ▲—

▲ Any attempt to crank or start the engine before it has been properly serviced with the recommended oil may result in an engine failure.

To change the oil and filter, proceed as follows:
Refer to the "Service Schedule," Section 3.13 (Page 16), for engine oil and filter change frequencies.

Drain the oil while the engine is still warm from running. This means you should warm up the engine, shut it down and drain it immediately as follows:

1. Remove the oil drain hose from its retaining clip, located on the generator base frame.
2. Loosen and remove the oil drain hose cap, located on the base frame end of the hose. Drain the oil completely into a suitable container.



MAINTENANCE

3. When all of the oil has drained, install and tighten the oil drain hose cap.
4. Turn the oil filter (Figure 3.1) counterclockwise and remove it. Dispose of the old filter.
5. Apply a light coating of engine oil to the seal of new oil filter. Install the filter and tighten by hand only. DO NOT OVERTIGHTEN.
6. Remove the oil filler cap (Figure 3.1). Add the recommended oil (see Section 1.9, Page 7). DO NOT FILL ABOVE THE DIPSTICK "FULL" MARK.

—▲ CAUTION ▲—

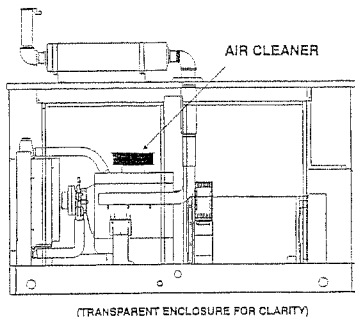
▲ After refilling the crankcase with oil, always check the oil level on the dipstick. Never operate the engine with the oil level below the "Add" mark on the dipstick. Doing this could damage the engine.

7. Start the engine and check for oil leaks.
8. Check the oil level after checking for leaks to ensure that the oil is filled to the proper level.

3.5 CHANGING THE ENGINE AIR CLEANER

To replace the engine air cleaner, (Generac part number 70941), simply remove the air cleaner cover and replace the air filter making sure it is positioned properly before reattaching the cover.

Figure 3.2 – Engine Air Cleaner



See the "Service Schedule," Section 3.13 (Page 16), for recommended air cleaner maintenance.

3.6 BATTERY MAINTENANCE

The battery should be inspected per the "Service Schedule," Section 3.13 (Page 16). The following procedure should be followed for inspection:

1. Inspect the battery posts and cables for tightness and corrosion. Tighten and clean as necessary.
2. Check the battery fluid level of unsealed batteries and, if necessary, fill with DISTILLED WATER ONLY. DO NOT USE TAP WATER IN BATTERIES.
3. Have the state of charge and condition checked. This should be done with an automotive-type battery hydrometer or load test.

—▲ 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.

▲ 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.

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

—▲ WARNING ▲—

▲ Be sure the utility power supply is turned off, or sparking may occur at the battery posts as you attach the cables and cause an explosion.

▲ Be sure the Auto/Off/Manual switch is set to the OFF position before connecting the battery cables. If the switch is set to AUTO or MANUAL, the generator can crank and start as soon as the battery cables are connected.

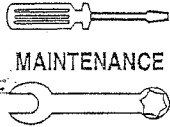
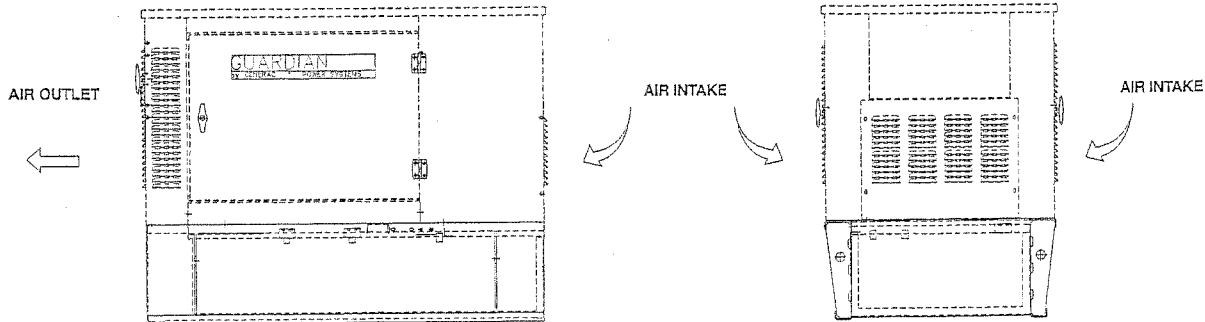


Figure 3.3 – Cooling Vent Locations



3.7 COOLING SYSTEM

Air intake and outlet openings in the generator compartment must be open and unobstructed for continued proper operation. This includes such obstructions as high grass, weeds, brush, leaves and snow.

Without sufficient cooling and ventilating air flow, the engine/generator quickly overheats, which causes it to shut down. (See Figure 3.3 for vent locations.)

⚠ WARNING ⚠

⚠ The exhaust system of this product gets extremely hot and remains hot after shutdown. High grass, weeds, brush, leaves, etc. must remain clear of the exhaust. Such materials may ignite and burn from the heat of the exhaust system.

3.8 OVERLOAD PROTECTION FOR ENGINE DC 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 a 30-amp fuse. These overcurrent protection devices will open if the 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.

3.9 FUSE

The generator panel's 30-amp fuse (Figure 2.1, Page 8) protects the DC control circuit against overload. The fuse is wired in series with the battery output lead to the panel. If the fuse element has melted open, you cannot crank or start the engine. You should replace the fuse using only an identical 30-amp replacement.

3.10 ENGINE COOLANT

Check the coolant level in the coolant recovery bottle at least once daily or prior to use. Add the recommended coolant mixture (see Section 1.7.2, Page 6) as necessary; the bottle should be kept half full. If desired, you may add a high quality rust inhibitor to the recommended 50-50 coolant mixture. If added consistently, the recommended mixture will protect the unit against freezing temperatures.

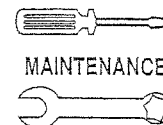
Periodically remove the radiator pressure cap to make sure the coolant recovery system is functioning properly. Coolant should be at the bottom of the radiator filler neck. If the coolant level is low, inspect the gasket in the radiator pressure cap. Replace the cap, if necessary. To have the pressure cap tested, contact a Generac/Guardian Authorized Dealer. Inspect the cooling system and coolant recovery system for leaks.

⚠ DANGER ⚠

- ⚠ Do not remove the radiator pressure cap while the engine is hot or serious burns from boiling liquid or steam could result.
- ⚠ Ethylene glycol base antifreeze is poisonous. Do not use your mouth to siphon coolant from the radiator, recovery bottle or any container. Wash your hands thoroughly after handling. Never store used antifreeze in an open container because animals are attracted to the smell and taste of antifreeze even though it is poisonous to them.

⚠ CAUTION ⚠

- ⚠ Do not use any chromate base rust inhibitor with ethylene glycol base antifreeze, or chromium hydroxide ("green slime") will form and cause overheating. Engines that have been operated with a chromate base rust inhibitor must be chemically cleaned before adding ethylene glycol base antifreeze. Using any high silicate antifreeze boosters or additives also will cause overheating. We also recommend that you DO NOT use any rust inhibitor for this equipment.



3.11 MISCELLANEOUS MAINTENANCE

◆ 3.11.1 CLEANING THE GENERATOR

Keep your generator as clean and as dry as possible. Dirt and moisture that accumulate on internal generator windings have an adverse effect on insulation resistance.

Periodically, clean the generator's 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. 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 a Generac/Guardian Authorized Dealer. Service technicians 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.

◆ 3.11.2 RODENT PROTECTION

The intrusion of rodents into the generator set can cause a wide range of problems, from failure of the unit to start, to personal injury and, in extreme circumstances, short circuit or fire. Although the unit was designed to limit this problem, you can take further precautions to help minimize both the chance of rodent entry and the extent of any damage. You should inspect the unit at regular intervals for signs of rodent intrusion. In addition, ensure that all access doors are tightly closed and secured at all times. If you detect intrusion and/or damage, contact your nearest Generac Authorized Service Dealer immediately.

3.12 OUT OF SERVICE PROCEDURE

◆ 3.12.1 REMOVAL FROM SERVICE

If you cannot exercise the generator every seven days, and it is to be out of service longer than 90 days, prepare the generator for storage as follows:

1. Start the engine and let it warm up.
2. Close the fuel shutoff valve in the fuel supply line and allow the unit to shut down.

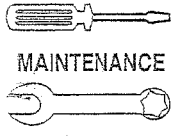
3. Once the unit has shut down, it will signal a fault on the control panel.
4. Set the Auto/Off/Manual switch to OFF and turn off the utility power to the transfer switch.
5. While the engine is still warm from running, drain the oil completely. Refill the crankcase with the recommended oil (see Section 1.9, Page 7).
6. Attach a tag to the engine indicating the viscosity and classification of the oil in the crankcase.
7. Remove the battery and store it in a cool, dry room on a wooden board. Never store the battery on any concrete or earthen floor.
8. Clean and wipe the entire generator.

◆ 3.12.2 RETURN TO SERVICE

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

1. Verify that utility power is turned off to the transfer switch and that the Auto/Off/Manual switch is set to OFF.
2. Check the tag on the engine for oil viscosity and classification. Verify that the correct recommended oil is used in engine (see Section 1.9, Page 7). If necessary, drain and refill with the proper oil.
3. Check the battery. Fill all cells to the proper level with distilled water. DO NOT USE TAP WATER IN THE BATTERY. Remove the battery before charging. Recharge the battery to 100 percent state of charge, or, if defective, replace the battery with a 12-volt DC Group 26F battery rated for 75 amp hours (part # 77483).
4. Clean and wipe the entire generator.
5. Reconnect the battery. Observe battery polarity. Damage will occur if the battery is connected incorrectly.
6. Open the fuel shutoff valve.
7. Start the unit by moving the Auto/Off/Manual switch to MANUAL. Allow the unit to warm up thoroughly.
8. Stop the unit and set the Auto/Off/Manual switch to OFF.
9. Turn on the utility power to the transfer switch.
10. Set the Auto/Off/Manual switch to AUTO.
11. Your generator is now ready for service.

Section 3 – Maintenance
Guardian Liquid-cooled 8 kW Generators



3.13 SERVICE SCHEDULE

ATTENTION: It is recommended that all service work be performed by your nearest Generac/Guardian Authorized Dealer.

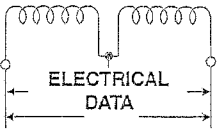
SYSTEM/COMPONENT	PROCEDURE			FREQUENCY
	Inspect	Change	Clean	
X = Action R = Replace/Adjust as Needed * = Notify Dealer if Repair is Needed.				
FUEL				
Fuel level	X			AFTER 25-H BREAK-IN, D / BEFORE USE
Fuel lines, connections and filters*	X			AFTER 25-H BREAK-IN, EVERY 250 H / 6 M
LUBRICATION				
Oil level	X			EVERY 8 H / D
Oil		X		AFTER 25-H BREAK-IN, EVERY 250 H / 6 M
Oil filter		X		AFTER 25-H BREAK-IN, EVERY 250 H / 6 M
Oil line leakage*	X			EVERY 100 H
COOLING				
Engine cooling system*	X	R		AFTER 25-H BREAK-IN, EVERY 100 H / M
Coolant level	X			AFTER 25-H BREAK-IN, D / BEFORE USE
Coolant*		X		EVERY 500 H / Y
Enclosure louvers	X		X	EVERY 250 H / 6 M
EXHAUST				
Exhaust system	X			EVERY 100 H / M
Retorque Exhaust Manifold*	X			FIRST 100 H AND EVERY 800 H
BATTERY				
Electrolyte fluid level	X			AFTER 25-H BREAK-IN, W
Charge and condition	X	R	X	W, EVERY 250 H / 6 M
FAN BELT				
Tension and condition*	X	R		AFTER 25-H BREAK-IN, EVERY 250 H / 6 M
ENGINE				
Retorque cylinder head*	X			FIRST 100 H AND EVERY 800 H
Retorque intake manifold*	X			FIRST 100 H AND EVERY 800 H
Starter motor*	X	R		EVERY 500 H
DC alternator*	X	R		EVERY 500 H AND Y
Air cleaner	X	R		EVERY 500 H
Compression*	X			EVERY 800 H
Valve clearance*	X	R		EVERY 800 H
Governor*	X	R		AFTER 25-H BREAK-IN, EVERY 250 H / 6 M
Safety devices*	X	R		EVERY 6 M
Injection system*	X	R		EVERY 3 M
GENERAL				
Overall condition	X		X	AFTER 25-H BREAK-IN, W
Exercise system				W
COMPLETE TUNE-UP*				Y



4.1 TROUBLESHOOTING GUIDE

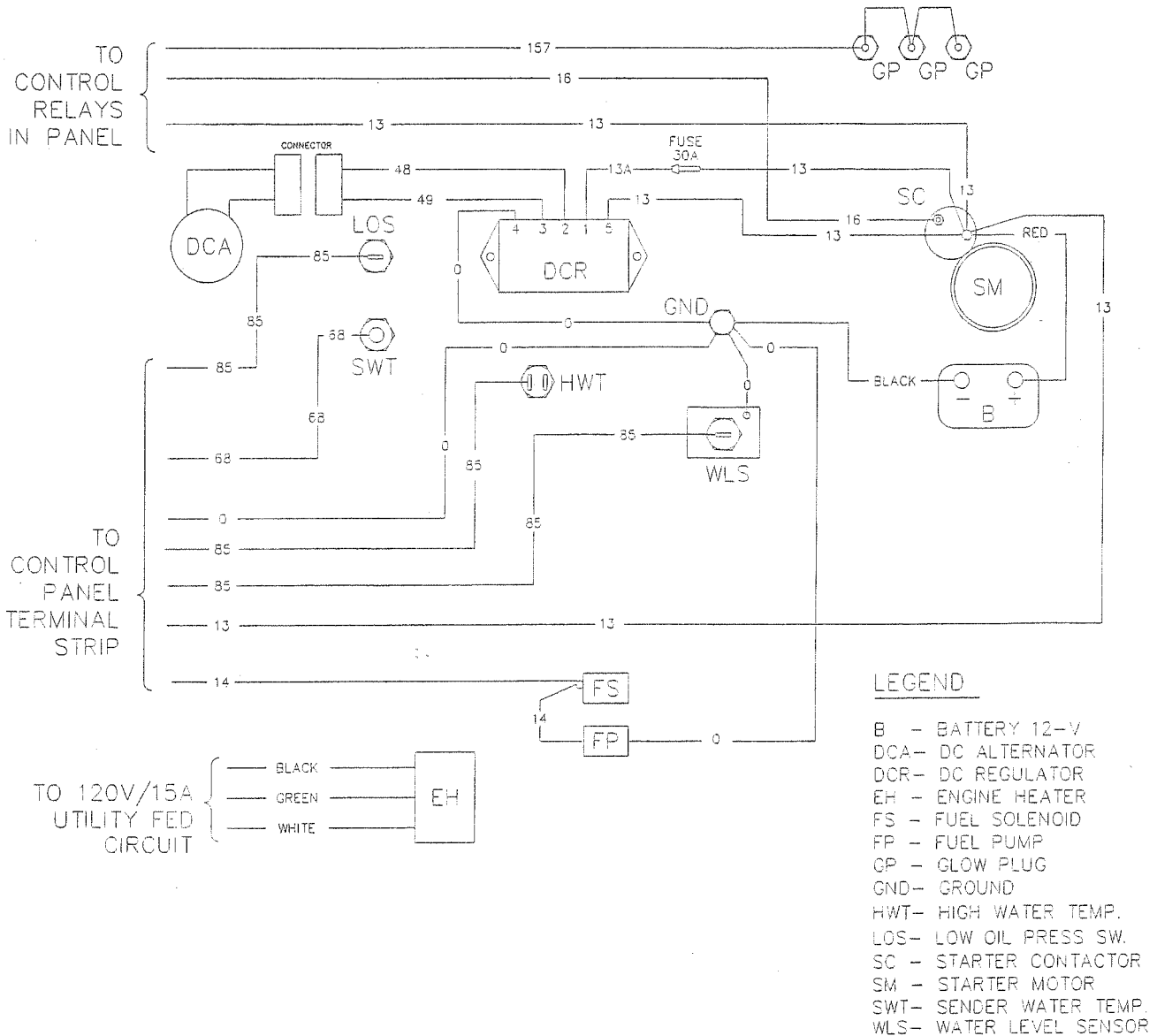
PROBLEM	CAUSE	CORRECTION
The engine will not crank.	<ol style="list-style-type: none"> 1. Fuse blown 2. Loose, corroded or defective battery cables 3. Defective starter contactor 4. Defective starter motor 5. Dead Battery 	<ol style="list-style-type: none"> 1. Replace fuse. 2. Tighten, clean or replace as necessary. 3. * 4. * 5. Charge or replace battery.
The engine cranks but will not start.	<ol style="list-style-type: none"> 1. Out of fuel 2. Defective fuel solenoid (FS) 3. Open #14 wire from engine control board 4. Dirty/Blocked air filter 5. Auto/Off/Manual Switch in OFF position 	<ol style="list-style-type: none"> 1. Replenish fuel. 2. * 3. * 4. Clean or replace as required. 5. Reset to AUTO or MANUAL.
The engine starts hard and runs rough.	<ol style="list-style-type: none"> 1. Air cleaner plugged or damaged 2. Dirty/Blocked air filter 	<ol style="list-style-type: none"> 1. Check, clean or replace air cleaner. 2. Clean or replace as required.
The engine starts, but then shuts down.	<ol style="list-style-type: none"> 1. Engine oil level low 2. Defective low oil pressure switch 3. Defective high temperature switch 4. Defective control board 5. Low coolant level 6. Defective low coolant switch 7. Engine temperature high 8. Loss of AC sensing to control board 	<ol style="list-style-type: none"> 1. Check oil and add oil as needed. 2. * 3. * 4. * 5. Check coolant level, repair leaks and refill. 6. * 7. Check engine cooling airflow. 8. *
The Auto/Off/Manual switch is set to OFF, but the engine continues to run.	<ol style="list-style-type: none"> 1. Defective switch 2. Defective control board 	<ol style="list-style-type: none"> 1. * 2. *
There is no AC output from the generator.	<ol style="list-style-type: none"> 1. Generator main line circuit breaker open 2. Generator internal failure 	<ol style="list-style-type: none"> 1. Reset circuit breaker to ON (or closed). 2. *
There is no transfer to standby after utility source failure.	<ol style="list-style-type: none"> 1. Generator main line circuit breaker open 2. Defective transfer switch coil 3. Defective transfer relay 4. Transfer relay circuit open 5. Defective control logic board 	<ol style="list-style-type: none"> 1. Reset circuit breaker to ON (or closed). 2. * 3. * 4. * 5. *

*Contact your nearest Generac/Guardian Authorized Dealer for assistance.

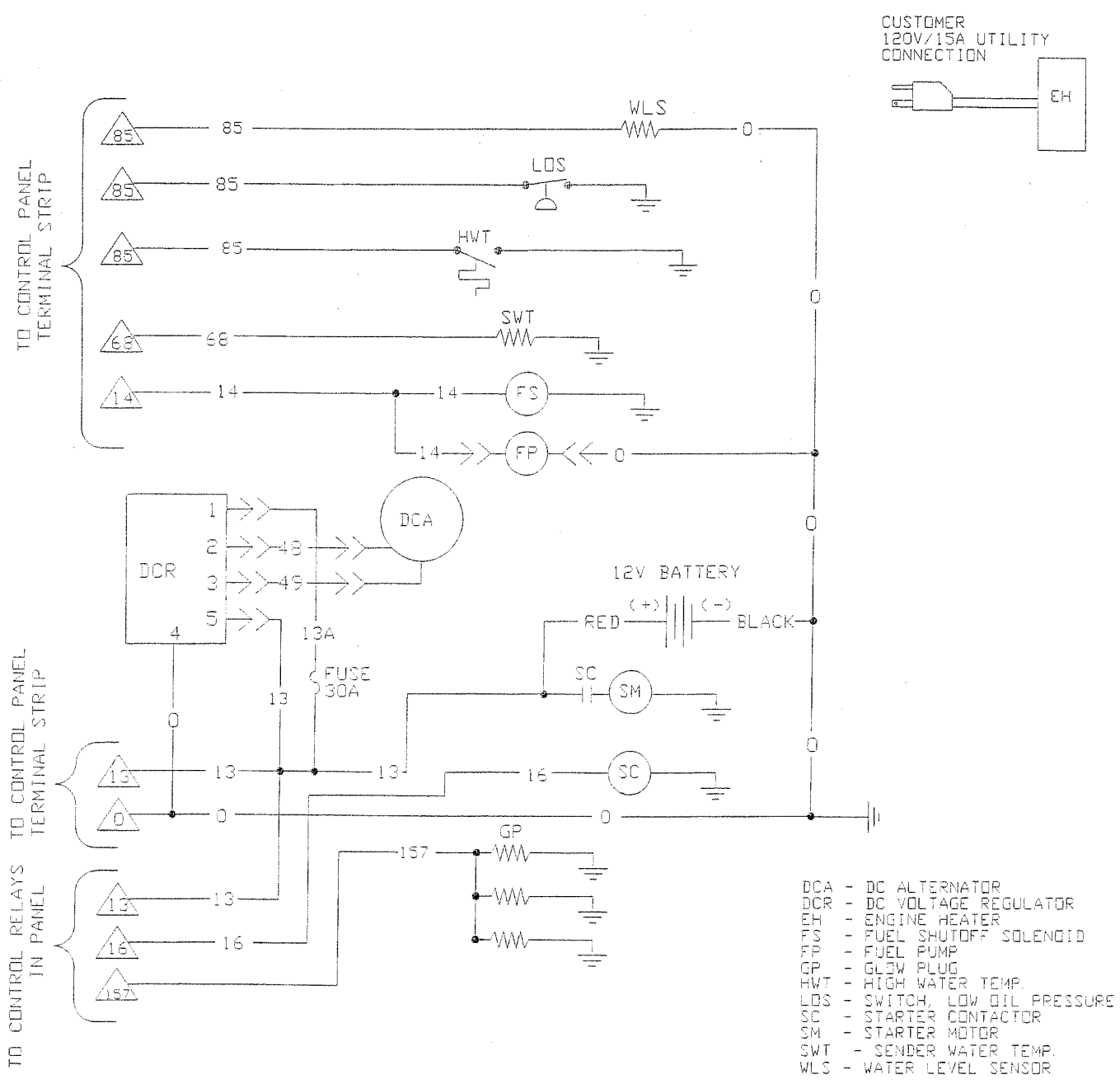
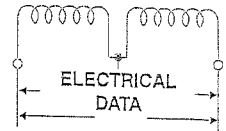


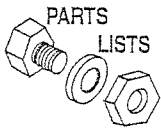
Section 5 – Electrical Data

Guardian Liquid-cooled 8 kW Generators
Wiring Diagram (1.0 Liter Engine) – Drawing No. C4954-



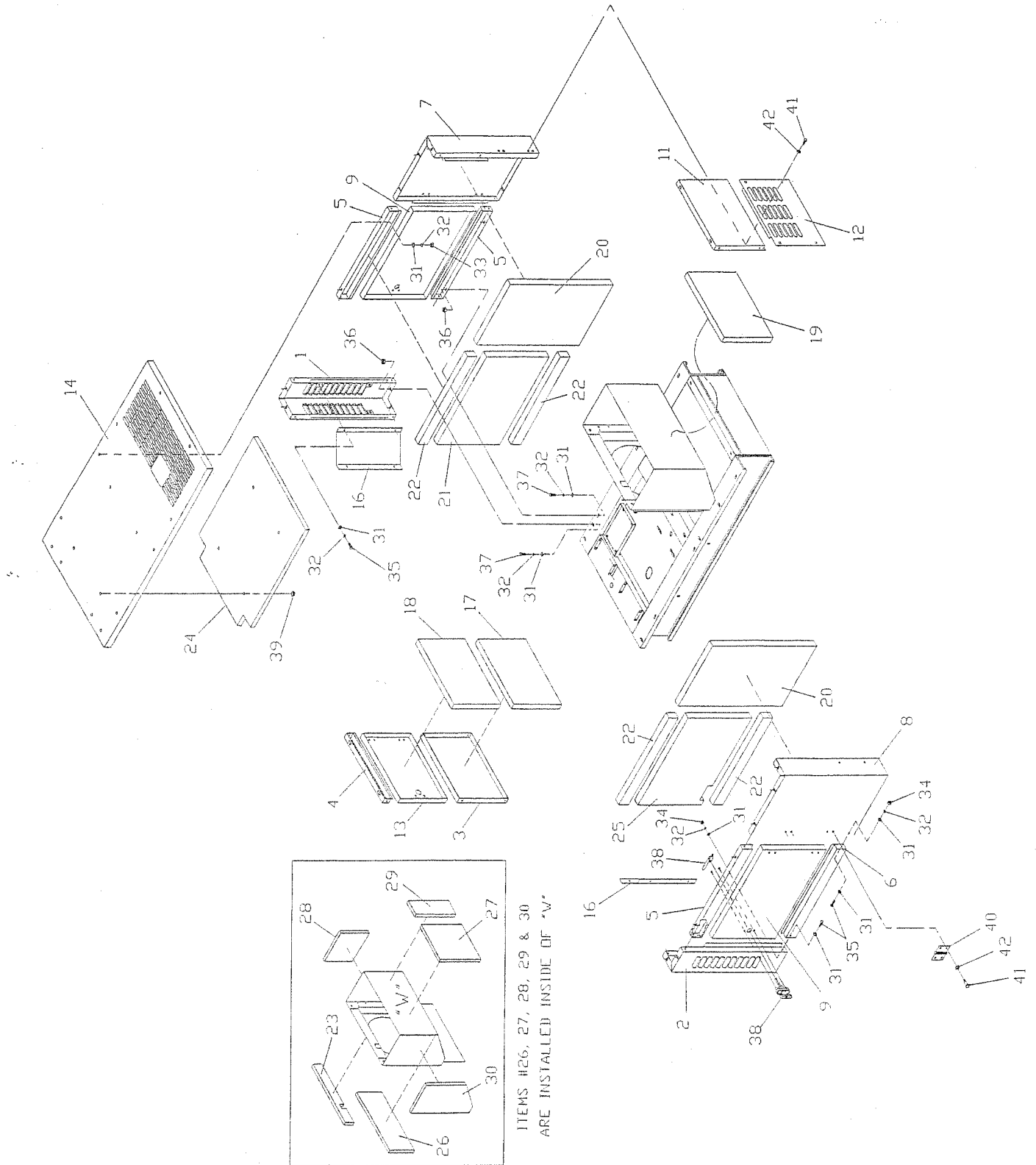
Section 5 – Electrical Data
Guardian Liquid-cooled 8 kW Generators
Electrical Schematic (1.0 Liter Engine) – Drawing No. C4955-





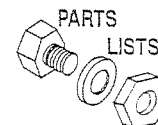
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Compartment – Drawing No. C2436-B



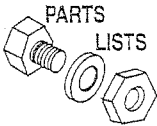
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Compartment – Drawing No. C2436-B



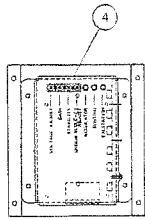
ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	*C2433	1	CORNER POST, LH. REAR	24	C2755P	1	ROOF, TOP (INSUL.)
2	*C2434	1	CORNER POST, RH. REAR	25	C2755M	1	DOOR, RIGHT SIDE (INSUL.)
3	A3443	1	PANEL, REAR BOTTOM	26	C2755G	1	AIR DUCT, BOTTOM (INSUL.)
4	A3444	1	PANEL, REAR TOP	27	C2755H	1	AIR DUCT, FRONT RH. (INSUL.)
5	A3445	3	PANEL, SIDE				
6	A3446	1	PANEL, RH. SIDE BOTTOM	28	C2755J	1	AIR DUCT, LH. SIDE (INSUL.)
7	A3447	1	CORNER POST, LH. FRONT	29	C2755K	1	AIR DUCT, FRONT LH. (INSUL.)
8	A7198	1	CORNER POST, RH. FRONT				
9	A3449	2	DOOR, SIDE	30	C2755L	1	AIR DUCT, RH. SIDE (INSUL.)
11	A3451	1	PANEL, FRONT TOP	31	22473	50	FLAT WASHER-M6-1/4"
12	A7197	1	PANEL, FRONT	32	22097	32	LOCK WASHER-M6-1/4"
13	A3453	1	DOOR, REAR	33	22127	6	NUT, HEX-1/4"-20
14	A3454	1	TOP, ROOF	34	49813	18	NUT, HEX-M6-1.0
16	*C2435	1	DUCT, RH. REAR CORNER POST	35	42568	18	CAPSCR.,HEX HD.-M6-1.0 x 20 LONG
	*C2435A	1	DUCT, LH. REAR CORNER POST	36	67577	16	SPEED NUT-1/4"-20
				37	22413	16	CAPSCR., HEX HD.-1/4"-20 x 1
17	C2755A	1	PANEL, REAR BOTTOM (INSUL.)	38	67042	4	LATCH & CAM
				39	78115	4	WASHER, SELF LOCK/DOME
18	C2755B	1	DOOR, REAR (INSUL.)	40	A3133A	2	HINGE, SLIP-MALE L.H.
19	C2755C	1	DOOR, FRONT (INSUL.)		A3133B	2	HINGE, SLIP-FEMALE L.H.
20	C2755D	2	CORNER POST, FRONT (INSUL.)		A3133C	4	HINGE, SLIP-MALE R.H.
					A3133D	4	HINGE, SLIP-FEMALE R.H.
21	C2755E	1	DOOR, LEFT SIDE (INSUL.)	41	A3359	40	BHSCS-M6 x 16 S.S.
22	C2755F	4	PANEL, SIDE (INSUL.)	42	A3360	40	SHAKEPROOF, INT.-M6 S.S.
23	C2755N	1	VENTURI, TOP (INSUL.)				

* FOR REF. ONLY (SEE C2438 CONTROL PANEL FOR
DETAILS)

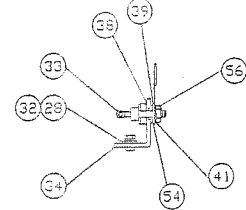
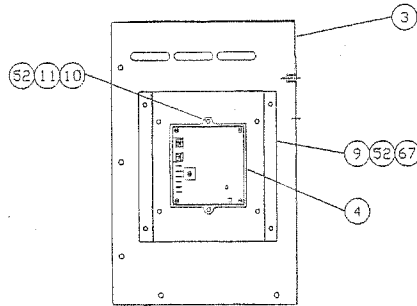


Section 6 – Exploded Views and Parts Lists

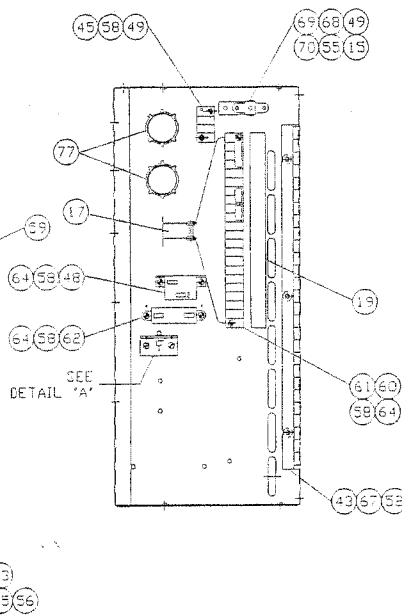
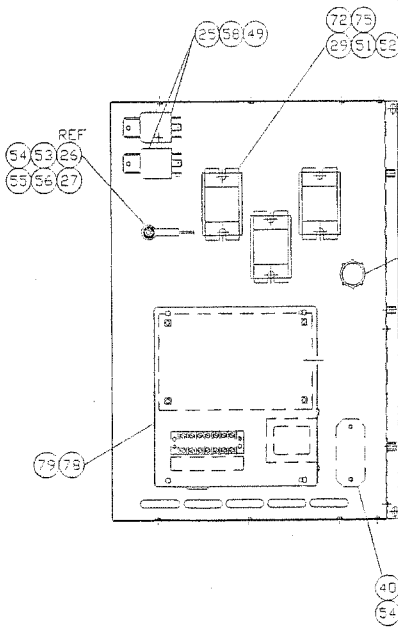
Guardian Liquid-cooled 8 kW Generators
Control Panel – Drawing No. C2438-B



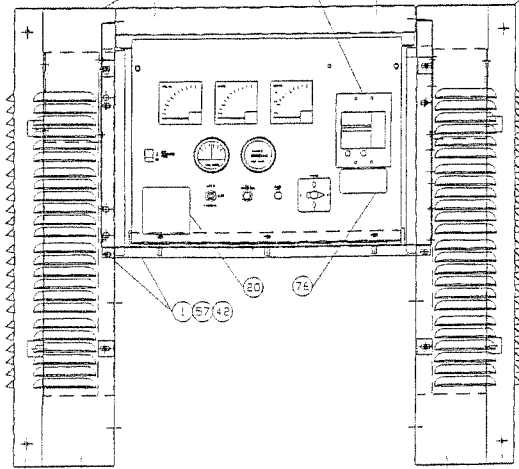
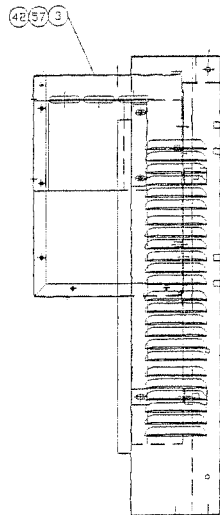
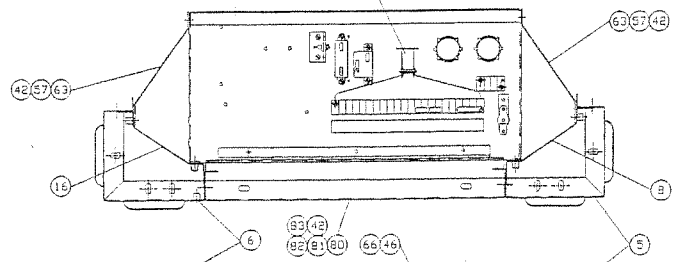
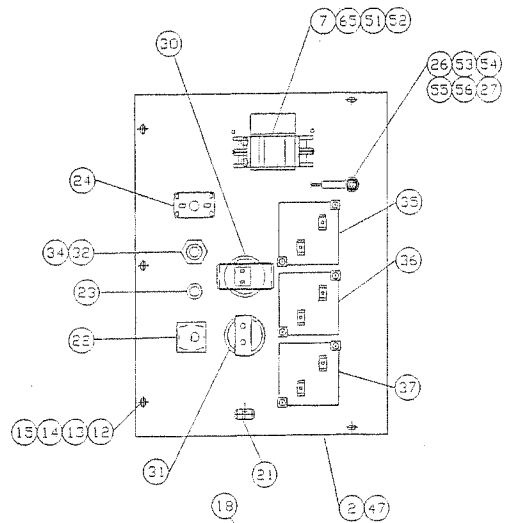
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IS USED ON 3Ø UNIT ONLY



DETAIL A

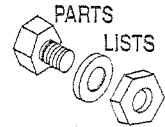


SEE
DETAIL 'A'



Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Control Panel – Drawing No. C2438-B

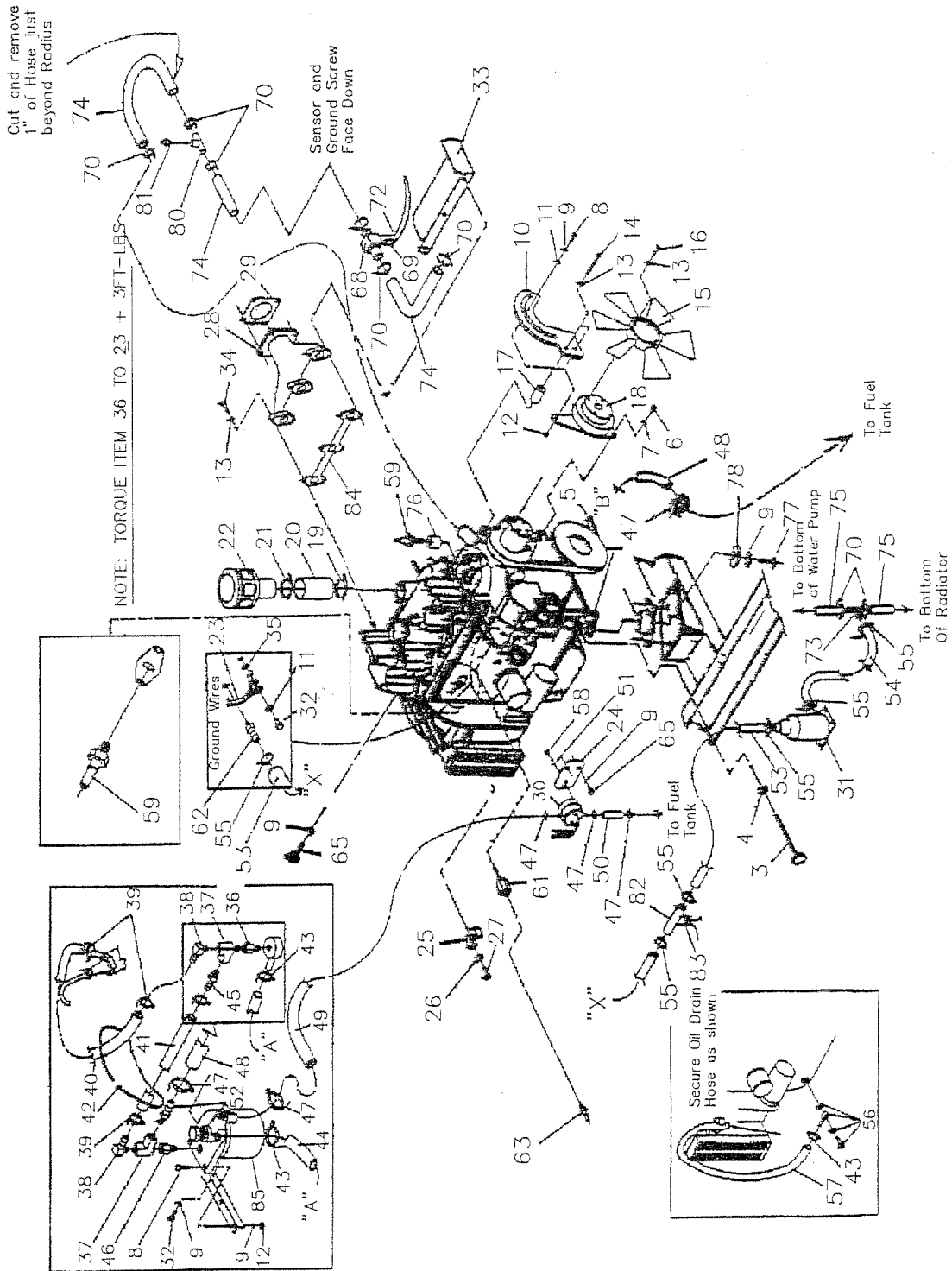


PARTS
LISTS

EM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	C2430	1	CONTROL PANEL BACK/ BOTTOM	35	70042	1	HERTZ METER 60HZ
2	C2719	1	SILKSCREEN-CONTROL PANEL	36	70045	1	AC AMMETER 0-200
3	C2431	1	CONTROL PANEL L.H. SIDE	37	71668	1	AC VOLTMETER 0-500
	C2431A	1	CONTROL PANEL R.H. SIDE	38	70370	1	WASHER, MICA
4	83048	1	VOLTAGE REGULATOR 1-PHASE 60HZ	39	30468	1	STEP, WASHER NYLON
	67680	1	VOLTAGE REGULATOR 3-PHASE 60HZ	40	71938A	1	VOLTAGE REGULATOR, D.C.
5	C2434	1	CORNER POST, RH REAR (PANEL SUPPORT)	41	23762	1	WASHER, EXTERNAL SHAKE- PROOF
6	C2433	1	CORNER POST, LH REAR (PANEL SUPPORT)	42	22097	22	WASHER, LOCK 1/4"
7	77906	1	CIRCUIT BREAKER-MAIN (35A-2P-BQ2)	43	C1914A	1	HINGE CONTROL PANEL
	57906	1	CIRCUIT BREAKER-MAIN (35A-3P-BQ3)	45	48766	1	BLOCK TERMINAL (2)
8	C2435	1	DUCT, R.H. R.R. CORNER	46	56967	2	PLUG, PLASTIC .37
9	75589	1	BRACKET, VOLTAGE REGULATOR	47	79246	4	HHCS M6-1.0 x 16 LG. W/LOCK WASHER
10	76039	2	SCREW, PPHM M5-.8 x 40MM	48	48468	1	CIRCUIT BREAKER 8A
11	51716	2	HEX NUT M5-0.8	49	22155	14	#6 LOCK WASHER
12	90426	3	PPHMS #10-32 x 3/8" S.S.	51	22142	4	HHCS 5/16"-18 x 3/4"
13	90427	3	FLAT WASHER #10	52	22145	4	WASHER FLAT 5/16"-M8
14	40295	3	LOCK WASHER #10	53	33121	2	#10-32 x 1/2" LG. HEX HD MACH. SCREW
15	40292	5	HEX NUT #10-32	54	22152	5	#10 LOCK WASHER
16	C2435A	1	DUCT, LH REAR (CORNER POST)	55	23897	6	#10 FLAT WASHER
17	C2515	1	HARNES, CONTROL PANEL "P"	56	22158	5	#10-32 HEX NUT
18	29333	4	TIE WRAP 7" LG.	57	A2419	24	SWG FASTENER 1/4"-20 x 1/2" LG.
19	76061	1	DECAL, TERMINAL STRIP	58	C2428	12	SWG FASTENER #6-32 x 1/2" LG.
20	81988	1	DECAL SET EXERCISE TIME	59	34616	1	STRAIGHT CONNECTOR
21	82573	1	SWITCH ROCKER(SET EXERCISE TIME)	60	57335	1	TERMINAL BLOCK
22	76020	1	SWITCH-AUTO/MANUAL/OFF	61	46669	7	JUMPER, TERMINAL BLOCK
23	64009	1	LIGHT FAULT INDICATOR	62	57907	1	RESISTOR, 10 OHM
24	61945	1	SWITCH, VOLTAGE SELECTOR	63	C2484	2	BRACKET, PANEL SUPPORT
25	A2560	1	RELAY 1P 50A/12V	64	22264	7	WASHER, LOCK M4
26	C5454	1	CABLE, NYLON CONTROL PANEL	65	39782	1	BRACKET, CIRCUIT BREAKER
27	22473	2	WASHER, FLAT 1/4"	66	75545	1	COVER, CIRCUIT BREAKER
28	55349	1	INSULATOR	67	C2265	9	SWG FASTENER M4-0.7 x 12 LG.
29	58568	2	CURRENT TRANSFORMER 50/5 (1 PHASE)	68	61979	1	BAR, BUS NEUTRAL STAP
	58568	3	CURRENT TRANSFORMER 50/5 (3 PHASE)	69	57073	1	STUD, JUNCTION BOX
30	70081	1	HOUR METER	70	33530	2	PHMS #10-32 x 5/8"
31	70043	1	VOLTMETER DC (BATTERY)	72	22129	4	WASHER, LOCK 5/16"-M8
32	32300	1	HOLDER, FUSE	73	36935	2	PPHMS #10-32 x 3/4"
33	49939	1	RECTIFIER	75	22259	4	HEX NUT 5/16"-18
34	22668	1	FUSE, 30A.	76	54199	1	DECAL, HIGH VOLTAGE
				77	C2512	2	WIRE CONNECTOR 1"
				78	75595	1	CMA, BOX
				79	A7215	4	SW FASTENER 1/4"-20 x 5/8" W/WASHER
				80	C2473	1	BRACE, TOP REAR
				81	22287	2	HHCS, 1/4"-20 x 3/4"
				82	22473	2	FLAT WASHER, 1/4"
				83	22127	2	HEX NUT 1/4"-20

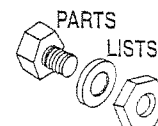
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Engine Common Parts – Drawing No. C5009-B



Section 6 – Exploded Views and Parts Lists

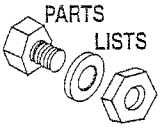
Guardian Liquid-cooled 8 kW Generators
 Engine Common Parts – Drawing No. C5009-B



ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	72501	2	MOUNT, ENGINE	44	52221	1	HOSE 5/16" I.D. x 170MM LONG
2	70936	2	DAMPENER, VIBRATION	45	30096	1	FITTING, BARBED STRAIGHT
3	75672	4	HHCS M12-1.25 x 40MM	46	74819	1	CONNECTOR FITTING
4	51769	4	WASHER, LOCK M12	47	40173	6	CLAMP, HOSE
5	46233	1	V-BELT30-1/8" LONG	48	52221	1	HOSE 5/16" x 570MM LONG
6	57642	1	HHCS M10-1.5 x 40MM	49	52221	1	HOSE 5/16" x 205MM LONG
7	46526	1	WASHER, LOCK M10	50	52221	1	HOSE 5/16" x 120MM LONG
8	42909	3	HHCS M8-1.25 X 30MM	51	22097	2	WASHER, LOCK 1/4"
9	22129	16	WASHER, LOCK M8	52	52219	1	FITTING, BARBED STRAIGHT
10	77909	1	BRACKET, ALTERNATOR	53	50967	1	HOSE 5/8" I.D. x 18"
11	22145	1	WASHER, FLAT M8	54	50967	1	HOSE 5/8" I.D. x 14"
12	45771	3	NUT, HEX M8-1.25	55	57823	6	CLAMP, HOSE #10
13	22097	14	WASHER, LOCK M6	56	72573	1	FITTING, OIL
14	57058	2	HHCS M6-1.0 x 55MM	57	69860E	1	HOSE, DRAIN
15	77910	1	FAN, ENGINE	58	22507	2	HHCS 1/4"-20 x 1/2"
16X	47411	5	HHCS M6-1.0 x 16MM	59	53667	2	SENDER, WATER TEMP.
17	50311	1	SPACER	61	42574	1	ADAPTOR
18	A1354	1	DC ALTERNATOR	62	84033	1	FITTING, BARBED STRAIGHT 3/4" NPT x 5/8"
19	39294	2	CLAMP, HOSE #44	63	99236	1	SWITCH, OIL PRESSURE
20	59399A	1	INTAKE HOSE	64*	68-44114	1	ASSEMBLY, GROUND STRAP
21	35685	1	CLAMP, HOSE #28	65	42907	5	HHCS M8-1.25 x 16MM
22	70941	1	FILTER, AIR	67	69811	1	CAP, HEX 1/4" DIA.
23	C4206	1	ENGINE HARNESS	68	84432	1	ADAPTOR, SENSOR
24	C4695	1	BRACKET, FUEL PUMP	69	57522	1	WATER LEVEL SENSOR
25	65852	1	CLAMP, SPRING	70	57824	6	CLAMP, HOSE 316
26	71952	1	WASHER, LOCK	72	46852	1	TAPTITE #10-32 x 1/4"
27	71912	1	PPHMS M5-0.8 X 8MM	73	79929	1	TEE 1 x 1 x 5/8"
28	75673	1	MANIFOLD EXHAUST	74	77444	1	UPPER RADIATOR HOSE
29	75674	1	GASKET, EXHAUST ADAPTOR	75	77913	1	LOWER RADIATOR HOSE
30	A4119	1	FUEL PUMP ASSEMBLY	76	35468	1	3/8" x 1/4" REDUCER BUSHING
31	84918	1	BLOCK HEATER	77	51730	4	HHCS M8-1.25 x 60
32	42907	3	HHCS M8-1.25 x 16MM	78	71956	4	WASHER, FLAT M8
33	75692	1	SHIELD, HEAT	80	A7803	1	1" PRE-ALARM TEE
34	45757	6	HHCS M6-1.0 x 16MM	81	66246	1	WTS PREHEAT & SHUT DOWN 230 DEG.
35	22261	1	STAR WASHER M8	82	87468	1	5/8" O.D. TUBE
36	74808	1	CONNECTOR, ADAPTOR	83	87469	1	THERMOSTAT 5/8" TUBE MOUNT
37	52233	2	CONNECTOR, ADAPTOR TEE	84	357-70939	1	GASKET, EXHAUST ISM
38	39450	2	90 DEG. ELBOW BARB	85	661-70939	1	FUEL FILTER ASSEMBLY ISM
39	74823	4	CLAMP, HOSE				
40	68736-B	1	HOSE 3/16" I.D.				
41	68736-A	1	HOSE 3/16" I.D.				
42	28739	1	TIE WRAP				
43	70928	3	CLAMP, HOSE				

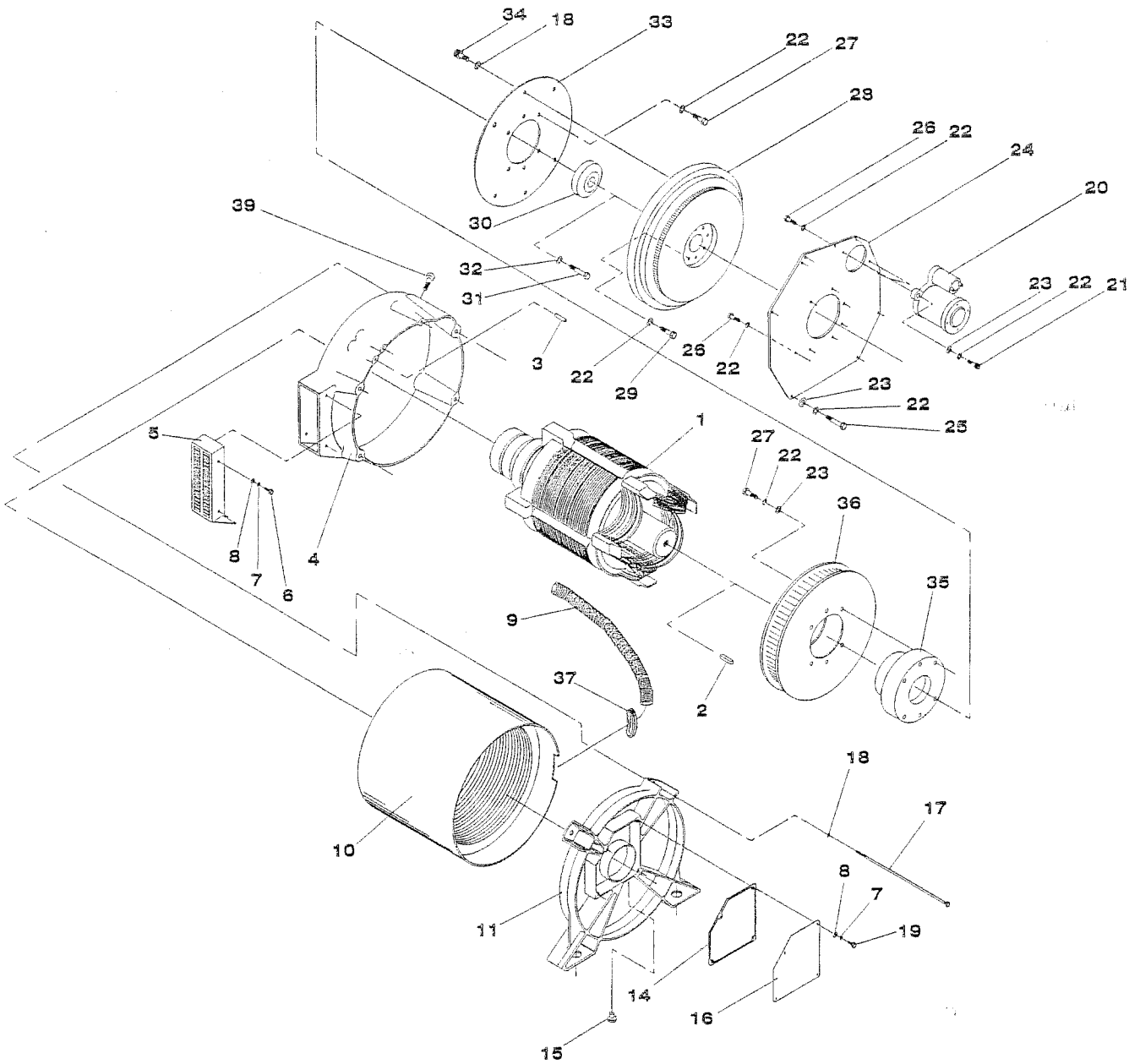
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TORQUE FT. LBS.	
X	5



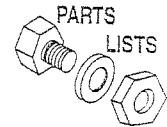
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Generator – Drawing No. A4671-B



Section 6 – Exploded Views and Parts Lists

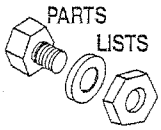
Guardian Liquid-cooled 8 kW Generators
Generator – Drawing No. A4671-B



ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	77900	1	ROTOR ASSEMBLY-8KW	22	46526	33	WASHER, LOCK
2	42558	1	KEY	23	22131	7	WASHER
3	48189	2	PIN, DOWEL	24	73450B	1	PLATE, ENGINE
4	87714A	1	HOUSING, BLOWER	25	49814	3	CAPSCREW, HEX HEAD-M10-1.5 x 25MM LONG
5	74243	1	SCREEN, AIR OUTLET	26**	51756	10	CAPSCREW, HEX HEAD-M10-1.5 x 20MM LONG
6	72512	4	CAPSCREW, HEX HEAD-M6-1.00 x 8MM LONG	27*	42907	12	CAPSCREW, HEX HEAD-M8-1.25 x 16MM LONG
7	22097	8	WASHER, LOCK-M6	28	73451	1	ASSEMBLY, FLYWHEEL & RING GEAR
8	22473	8	WASHER, FLAT-M6	29**	62963	6	CAPSCREW, HEX HEAD-M10-1.25 x 30MM LONG
9	77043C	1	FLEX CONDUIT-3/4" I.D. x 10" LONG	30	72578	1	SPACER, ATR SHAFT
10	76019A	1	STATOR ASSEMBLY-8KW	31***	53557	1	BOLT, HEX HEAD-M12-1.75 x 40MM LONG
11	69804A	1	CARRIER, REAR BEARING	32	51769	1	WASHER, LOCK-M12
14	69892	1	GASKET, REAR BEARING CARRIER	33	73454A	1	PLATE, COUPLING
15	70992	1	ARRESTER, FLAME	34*	75789	12	SOCKET HEAD CAPSCREW, 5/16-18 x 3/4"
16	98323	1	PLATE, COVER	35	73452	1	HUB, DRIVE
17	75554	4	BOLT, STATOR	36	73455	1	FAN
18	22129	24	WASHER, LOCK-M8	37	63212	1	GROMMET, RUBBER
19	47411	4	CAPSCREW, HEX HEAD-M6-1.00 x 16MM	(39)	82130B	1	SENSOR, RPM
20	134-70939	1	MOTOR, STARTER				
21	20747	2	SCREW, SOCKET-HEAD M10-1.5 x 35MM LONG				

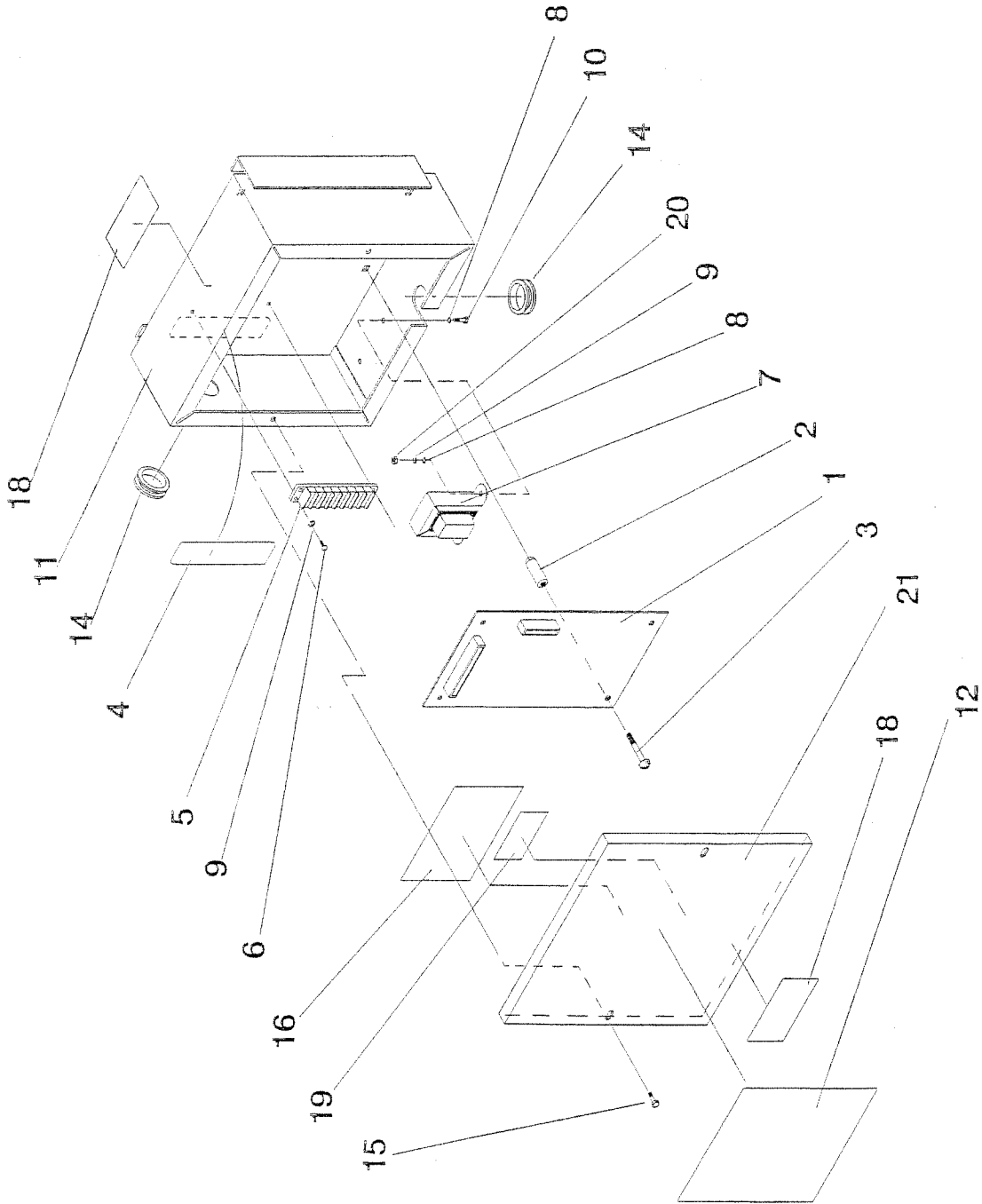
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	TORQUE FT. LBS.
*	12
**	25
***	42



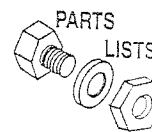
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
CMA Assembly – Drawing No. 81086-C



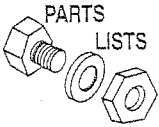
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
CMA Assembly – Drawing No. 81086-C



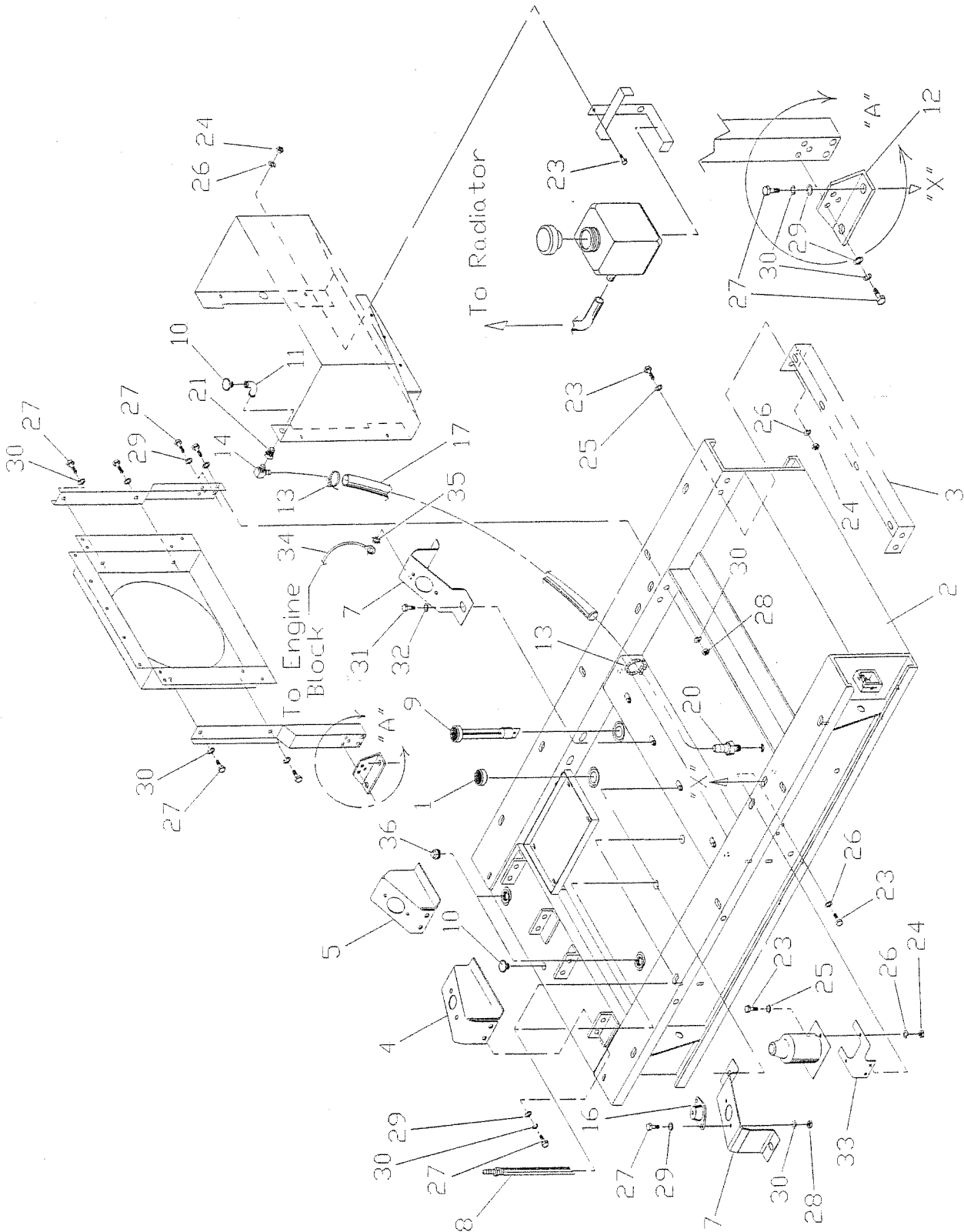
ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	76009A	1	BOARD, CIRCUIT-DC CONTROL/CRANK LATCH	12	A8504	1	DECAL, COVER-CMA (MODEL 921, 863, 865)
2	72566	4	STANDOFF, CIRCUIT BOARD SUPPORT		A8504A	1	DECAL, COVER-CMA (MODEL 9428)
3	80882	4	SCREW, PPH TAPPING #6 x 5/8"	13*	22661V	.083'	HEAT SHRINK RED .19
4	74978	1	DECAL, TERMINAL STRIP	14	38057	2	GROMMET
5	47822	1	BLOCK, TERMINAL STRIP	15	58443	2	CRIMPTITE
6	75476	2	SCREW, PPHM M4-0.7 x 16MM	16	81224	1	DECAL, MFG NAMEPLATE
7	83264	1	TRANSFORMER 24VA, 12 SEC	17*	79682	1	WIRE HARNESS
8	22985	4	WASHER, FLAT M4	18	86093	2	DECAL, CMA WARNING
9	22264	4	WASHER, LOCK M4	19	83736	1	DECAL, CSA
10	51787	2	HHCS M4-0.7 x 16	20	51715	2	NUT, HEX M4-0.7
11	79847	1	BOX, CMA	21	74495	1	COVER, CMA BOX (921, 863, 865, 9428)
					77401	1	COVER, SILKSCREENED

*NOT SHOWN



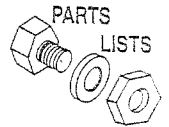
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
 Mounting Base – Drawing No. C2665-B

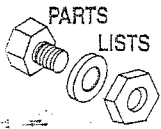


Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Mounting Base – Drawing No. C2665-B

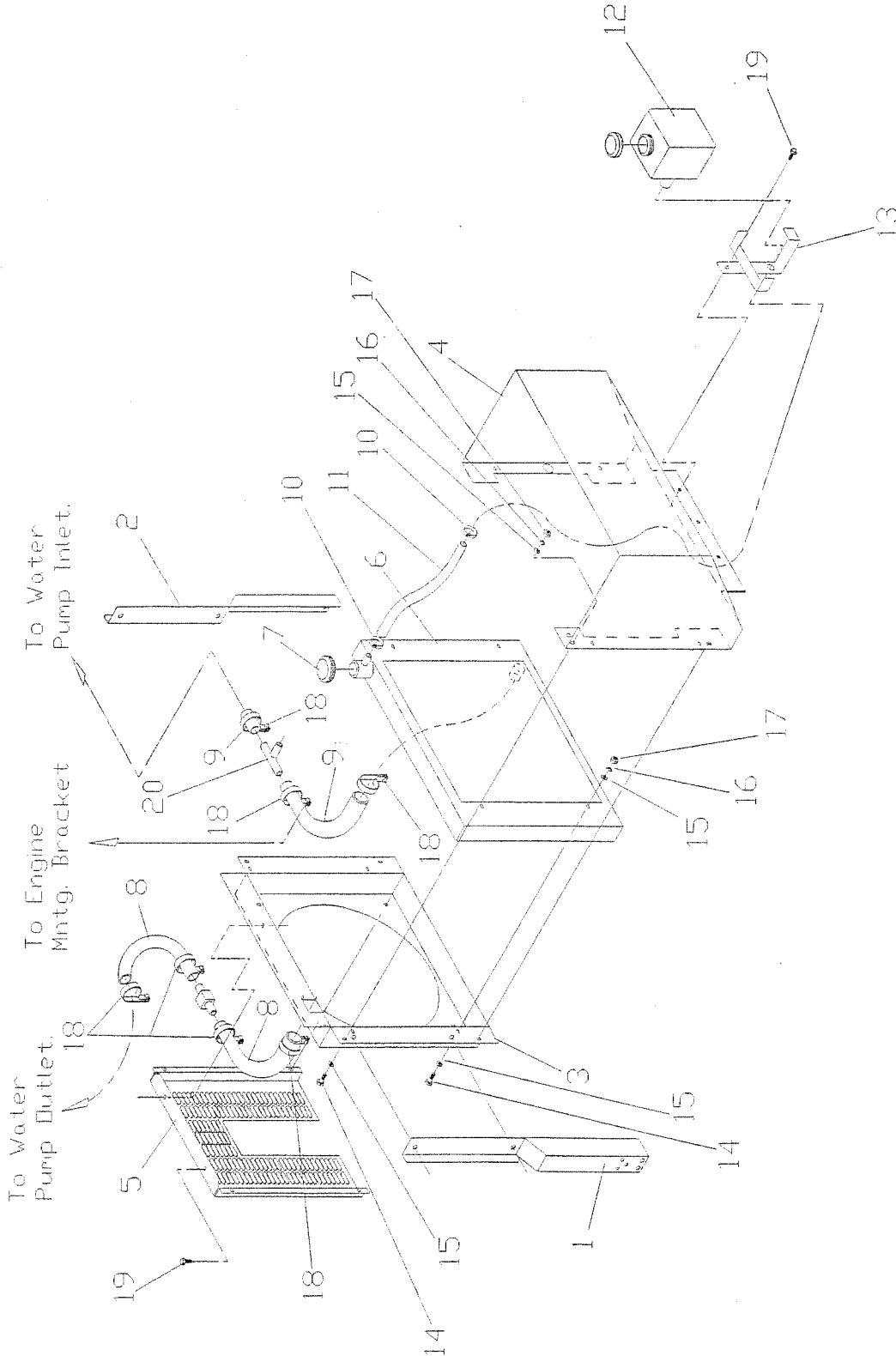


ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	A1492	1	FUEL CAP KELCH200751	20	67982	1	BARBED STRAIGHT, 5/16 x 3/8
2	A7200	1	BASE FRAME ASSEMBLY	21	35468	1	REDUCER BUSHING 3/8 x 1/4
3	A7307	1	BRACKET, FRONT FRAME	23	42568	9	M6-1.0 x 20 HHCS
4	A7726	1	ALT. MNT. ASSEMBLY, R-SIDE	24	49813	9	M6-1.0 HEX FIN. NUT
5	A7727	1	ALT. MNT. ASSEMBLY, L-SIDE	25	22473	24	1/4 SAE FLAT WASHER
7	A4285	2	BRACKET, ENGINE MOUNT	26	22097	25	1/4 SPLIT LOCK WASHER
8	21538G	2	FUEL DIP PIPE, 250MM	27	39253	38	M8-1.25 x 20 HHCS
9	21973A	1	GAUGE, FUEL LEVEL 281	28	45771	16	M8-1.25 HEX FIN, FULL NUT
10	26847	2	BREATHER	29	22145	50	5/16 SAE FLAT WASHER
11	26924	1	90 DEG. ST. ELBOW 3/8 NPT	30	22129	38	5/16 SPLIT LOCK WASHER
12	A5746	2	BRACKET, RADIATOR SUPPORT	31	49814	4	M10-1.5 x 25 HHCS
13	35472	2	HOSE CLAMP, SIZE #6	32	46526	4	M10 SPLIT LOCK WASHER
14	59502	1	BARBED 90 DEG. 1/4 x 9/16	33	A4160	1	BRACKET, ENGINE HEATER
16	70936	4	VIBRATION ISOLATOR	34	68-44114	1	ASSEMBLY, GROUND STRAP
17	52221	1	5/16 I.D. HOSE x 800MM	35	22261	1	STAR WASHER, M8
				36	63831	2	PIPE PLUG 1-1/4" SQ. HD.



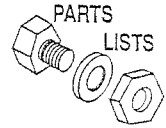
Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Radiator – Drawing No. A7886-

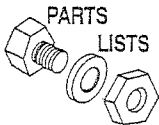


Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Radiator – Drawing No. A7886-



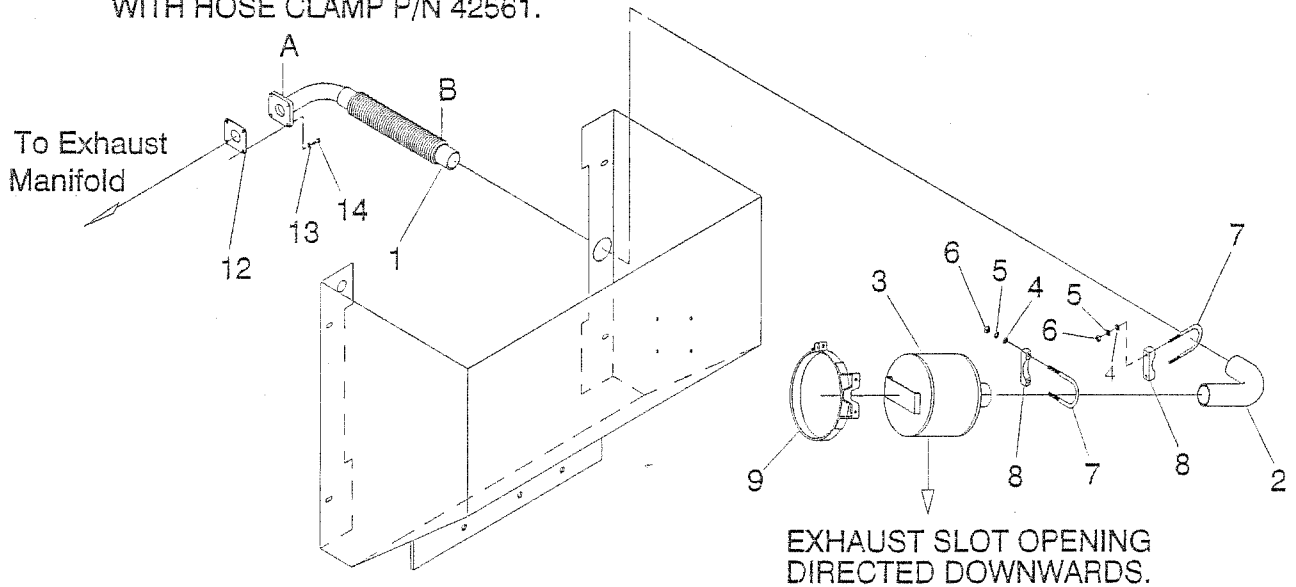
ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	A3483	1	BRACKET, RADIATOR RH SIDE	11	29032	1	5/16" I.D. X 36" HOSE
2	A3484	1	BRACKET, RADIATOR LH SIDE	12	76749	1	COOLANT RECOVERY BOTTLE
3	A3487	1	VENTURI	13	80712	1	BRACKET, COOLANT BOTTLE
4	A3488	1	AIR DUCT	14	42907	8	M8-1.25 X 16
5	A3826	1	GUARD FAN	15	22145	16	FLAT WASHER - M8
6	A4353	1	RADIATOR REWORK DRAWING	16	22129	8	LOCK WASHER - M8
7	46627	1	RADIATOR CAP	17	45771	8	HEX NUT - M8-1.25
8	77444	1	UPPER RADIATOR HOSE	18	57824	8	HOSE CLAMP NO. 16
9	77913	1	LOWER RADIATOR HOSE	19	75443	8	CRIMPTITE 1/4-20 X 5/8
10	83709	2	SPRING CLAMP, #9	20	79929	1	TEE 1 X 1 X 5/8



Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
 Exhaust – Drawing No. A4674-A

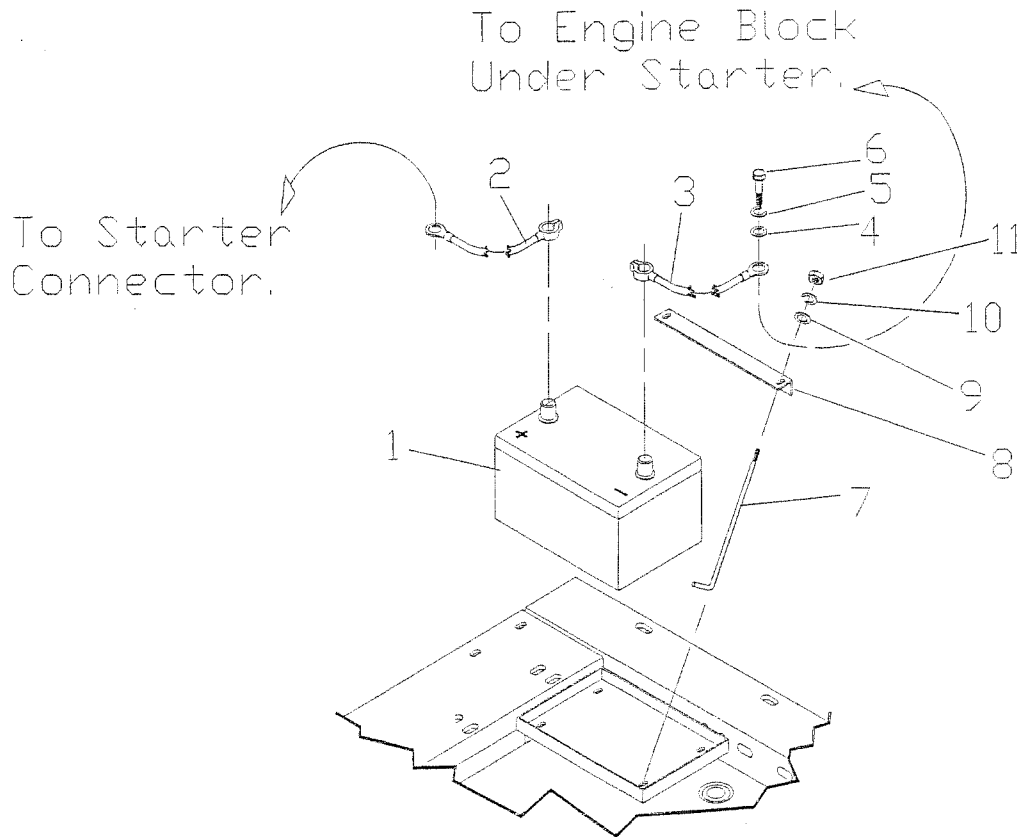
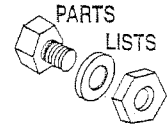
WRAP FLEX EXHAUST FROM A TO B
 WITH EXHAUST INSULATION P/N 82361.
 SECURE EACH END OF INSULATION
 WITH HOSE CLAMP P/N 42561.



ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	A3591	1	FLEX EXHAUST - 8KW TRAILER	9	77767A	2	MUFFLER MOUNTING BAND - 7" O.D.
2	A3904	1	EXHAUST ELBOW, 1.5"	10*	82361	8.5 FT.	EXHAUST INSULATION
3	A3905	1	SILENCER, 1.0L-8KW TRAILER	11*	42561	2	HOSE CLAMP, #36
4	22129	4	LOCK WASHER - 5/16"-M8	12	75674	1	GASKET, EXHAUST ADAPTOR
5	22145	4	FLAT WASHER - 5/16"-M8	13	22129	4	5/16 SPLIT LOCK WASHER
6	22259	4	HEX NUT - 5/16"-18	14	43107	4	M8-1.25 X 25MM HHCS
7	24005	2	U-BOLT - 1-3/4" X 5/16-18				
8	53413	2	SADDLE - 1-5/8-1.80				* NOT SHOWN

Section 6 – Exploded Views and Parts Lists

Guardian Liquid-cooled 8 kW Generators
Battery – Drawing No. A4675-A



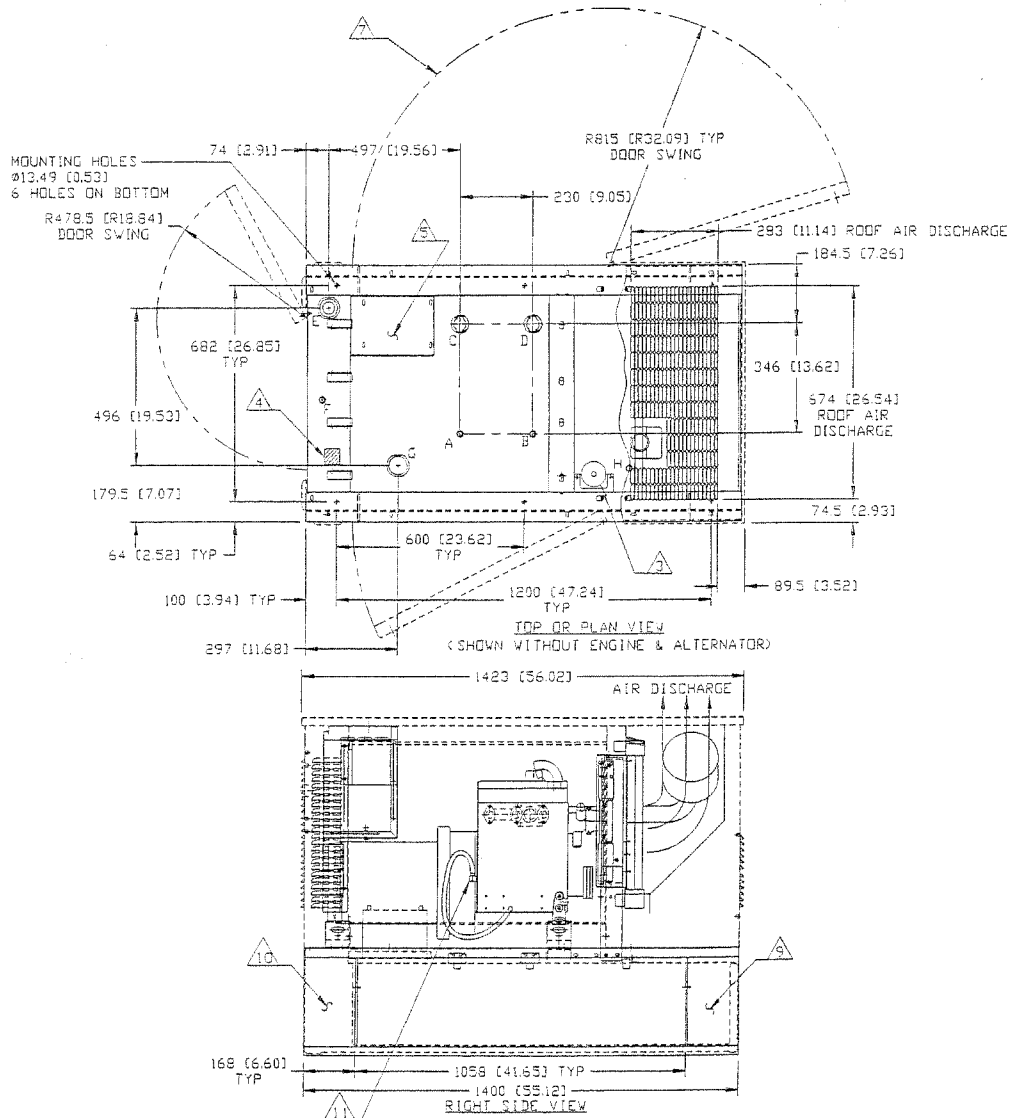
ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	77483	-	BATTERY, GROUP 26	7	59567	2	J-BOLTS, BATTERY HOLD-DOWN
2	38804Y	1	CABLE, BATTERY - RED-35"	8	78121	1	BAR, HOLD-DOWN
3	38805H	1	CABLE, BATTERY - BLACK-23"	9	22145	2	WASHER, FLAT - 5/16
4	22250	1	WASHER, FLAT - 7/16	10	22129	2	WASHER, LOCK - 5/16
5	51769	1	WASHER, LOCK - 7/16	11	22259	2	NUT, HEX - 5/16-18
6	68485	1	CAPSCREW, HEX HEAD, M12-1.25 X 20MM				

INSTALLATION



Section 7 – Installation Drawings
 Guardian Liquid-cooled 8 kW Generators
 Installation Drawing – Drawing No. C2518-A

FUEL TANK FITTING	
FITTING	DESCRIPTION
A	FUEL SUPPLY
B	FUEL RETURN
C	FUEL FILL
D	FUEL LEVEL GAUGE
E	PLUG (RUPTURED BASIN SWITCH)
F	OUTER TANK VENT
G	PLUG (LOW FUEL LEVEL SWITCH)
H	INNER TANK VENT



Section 7 – Installation Drawings
Guardian Liquid-cooled 8 kW Generators
Installation Drawing – Drawing No. C2518-A

INSTALLATION



ENGINE SERVICE CONNECTIONS

FUEL SUPPLY = 3/8" NPT COUPLING
 FUEL RETURN = 3/8" NPT COUPLING
 OIL DRAIN = SEE NOTE 11

NOTES:

1. INSTALLATION DRAWING FOR MODEL NO. 04155-0
 DESCRIPTION = SDO08 DIRECT EXCITATION ALTERNATOR WITH
 1.0L DIESEL-SOUND / PRE-PACKAGE

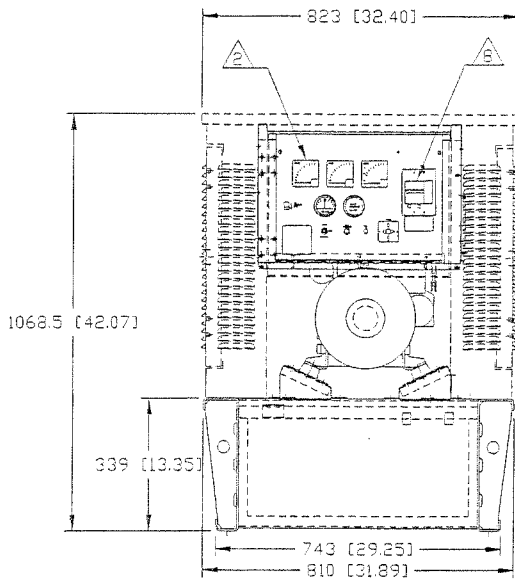
- 2 METER & CONTROL PANEL.
- 3 STANDARD BLOCK HEATER REQUIRES 120V AC CONNECTION
 (OPTIONAL BATTERY HEATER AVAILABLE).
- 4 AC LOAD LEAD CONDUIT
- 5 12 VOLT NEGATIVE GROUND SYSTEM
 BATTERY TRAY INSIDE DIMENSIONS: 207 X 183 (8.1" X 7.2")
- 6 38 (1.5") I.D. FLEX EXHAUST PIPES.
- 7 DOORS MUST BE OPENED 90 DEG. TO BE REMOVED.
- 8 MAIN LINE CIRCUIT BREAKER.
- 9 46 GALLON CAPACITY DIESEL FUEL TANK.
- 10 OUTER RUPTURE BASIN.
- 11 FLEXIBLE OIL DRAIN HOSE SERVICEABLE FROM RIGHT SIDE
 DOOR.

ALL DIMENSIONS IN: MILLIMETERS (INCH)

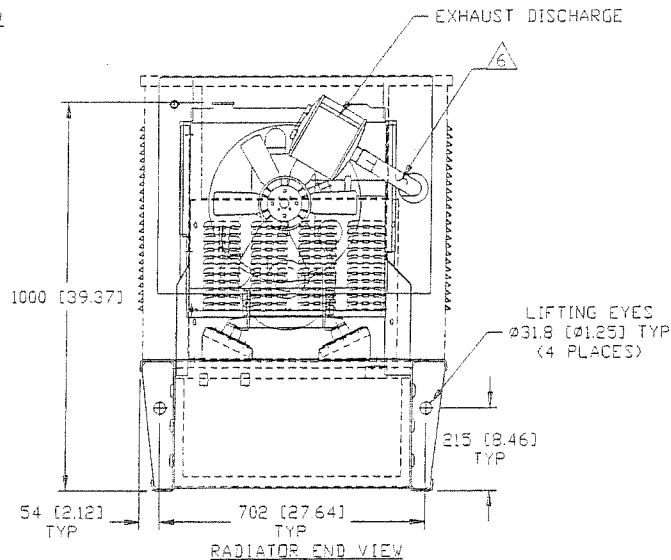
NOTE: ALL CONNECTION MUST BE FLEXIBLE.

WEIGHT DATA

UNIT: APPROXIMATELY 540 kg (1190 lb.)
 UNIT W/ DIESEL: 685 kg (1510 lb.)



PANEL END VIEW



RADIATOR END VIEW



Section 8 - Warranty

Guardian Liquid-cooled 8 kW Generators

FEDERAL AND CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT

(for non-road Diesel engines rated under 19 kW)

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), Generac Power Systems, Inc. (GENERAC) and the engine manufacturer for this equipment, Ishikawajima Shibaura Machinery Co., Ltd. (ISM), are pleased to explain the federal and California emission control system warranty on your engine.

In California, new 2000 and later small non-road engines must be designed, built and equipped to meet the state's stringent anti-smog standards. In other states, new 2000 and later non-road diesel engines rated under 19 kW must be designed, built and equipped to conform to applicable EPA regulations.

ISM must warrant the emission control system on your engine for that period of time listed below provided there has been no abuse, neglect or improper maintenance of your small non-road diesel engine.

Your California and EPA emission control system may include parts such as the fuel injection system and other emission-related assemblies.

Where a warrantable condition exists, GENERAC will repair your engine at no cost to you, including diagnosis, parts and labor, on behalf of ISM. Although ISM is ultimately responsible for this warranty, GENERAC has agreed to carry out ISM's warranty repair responsibilities, and GENERAC should be your primary contact for emission-related warranty service.

MANUFACTURER'S WARRANTY COVERAGE

For 2000 and later small non-road diesel engines first sold in California, and 2000 and later non-road diesel engines rated under 19 kW first sold in all other states, the applicable warranty period is two (2) years or 1,500 hours, whichever comes first.

If any emission-related part on your engine is defective, the part will be repaired or replaced by a Generac Authorized Warranty Service Facility on behalf of ISM.

PARTS COVERED

This emission control system warranty applies to the following engine emission control parts.

- Fuel Injection Pump
- Fuel Injectors
- Intake Manifold
- Exhaust Manifold
- Air Cleaner Element
- Miscellaneous Hoses, Bolts and Connectors

OWNER'S WARRANTY RESPONSIBILITIES

As the engine owner, you are responsible for the performance of the required maintenance listed in your *Owner's Manual*. GENERAC and ISM recommend that you retain the original purchase documentation and all receipts covering maintenance on your engine, but GENERAC and ISM cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the engine owner, you should be aware, however, that GENERAC and ISM may deny you warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for contacting a Generac Authorized Warranty Service Facility as soon as a problem occurs. 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 your selling dealer or a Generac Authorized Warranty Service Facility. To locate the Generac Authorized Warranty Service Facility nearest you, call our toll-free number:

1-800-333-1322

If you have any questions regarding your warranty rights and responsibilities, you should contact GENERAC at the following address:

**ATTENTION WARRANTY DEPARTMENT
GENERAC POWER SYSTEMS, INC.
211 MURPHY DRIVE
EAGLE, WI 53119**



OBLIGATIONS AND RIGHTS OF THE MANUFACTURER AND OWNER

The new model year, class of diesel engine, and emission application determination for your engine are identified on the emission control information label affixed to the right-hand side of your engine's timing gear case. The warranty period begins on the date the new equipment is sold to the first retail purchaser.

Any emission control system parts scheduled for regular inspection that are proven defective during normal use will be repaired or replaced during the warranty period. Any warranted part that is scheduled for replacement and that fails prior to replacement will be repaired or replaced under warranty, and the repaired or replaced part will be covered under warranty for the remainder of the period prior to the first scheduled replacement. The warranty repairs and service will be performed by any Generac Authorized Warranty Service Facility, with no charge for parts or labor (including diagnosis).

As the engine owner, you are responsible to perform all the required maintenance listed in your *Owner's Manual*. GENERAC will not deny an emission warranty claim solely because you have no record of maintenance; however, a claim may be denied if your failure to perform maintenance resulted in the failure of a warranted part. Receipts covering regular maintenance should be retained in the event of questions, and these receipts should be passed on to each subsequent owner of the engine.

It is recommended that replacement parts used for maintenance or repairs be GENERAC authorized and approved parts to maintain the quality originally designed into your emission certified engine. However, any replacement part may be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of GENERAC. Add-on or modified parts may not be used for maintenance or warranty repairs. Such use will be grounds for disallowing a warranty claim, and GENERAC will not be liable to warrant failures of warranted parts caused by the use of an add-on or modified part.

LIMITATIONS

This warranty shall not cover any of the following:

- (a) Systems and parts that were not first installed on the new equipment or engine as original equipment by GENERAC.
- (b) Conditions resulting from tampering, misuse, abuse, improper adjustment, engine alteration, use of add-on or modified parts, use of replacement parts that are not the same in performance and durability as GENERAC-approved replacement parts, accident, failure to use the recommended fuel or oil, use of unapproved fuel or oil additives, or failure to perform required maintenance.
- (c) Replacement parts used for required or scheduled maintenance.
- (d) Consequential damages such as loss of time, inconvenience, or loss of use of this engine or equipment.
- (e) Damages or repair costs caused by the owner's unreasonable delay in making the engine available for inspection and repair.
- (f) Diagnosis or inspection fees that do not result in eligible warranty service being performed.
- (g) Equipment with an altered or disconnected hourmeter where the hours cannot be determined.
- (h) Equipment normally operated outside the United States.
- (i) Accident-caused damage, acts of nature, or other events beyond GENERAC'S control.
- (j) Warranty repairs undertaken or attempted by the owner or any other person who is not affiliated with a Generac Authorized Warranty Service Facility.

OBTAINING WARRANTY SERVICE

To obtain service under this warranty, promptly contact your nearest Generac Authorized Service Dealer or a Generac Authorized Warranty Service Facility. If available, provide the GENERAC representative with the original purchase receipt (showing the initial date of purchase) and all available maintenance records.



Section 8 – Warranty

Guardian Liquid-cooled 8 kW Generators

GENERAC POWER SYSTEMS' STANDARD ONE-YEAR LIMITED WARRANTY FOR STANDBY POWER SYSTEMS

NOTE: ALL UNITS MUST BE INSTALLED BY GENERAC POWER SYSTEMS AUTHORIZED SERVICE FACILITIES. For a period of 1 (one) year or 1,500 (one thousand five hundred) hours of operation from the date of original sale, whichever occurs first, Generac Power Systems, Inc. (Generac) will, at its option, repair or replace any part which, upon examination, inspection and testing by Generac or a Generac Authorized Warranty Service Facility, is found to be defective under normal use and service, in accordance with the warranty schedule set forth below. Any equipment that the purchaser/owner claims to be defective must be examined by the nearest Generac Authorized Warranty Service Facility. All transportation costs under the warranty, including return to the factory, are to be borne and prepaid by the purchaser/owner. This warranty applies only to Generac generators used in "Standby" applications, as Generac has defined Standby, provided said generators have been initially installed and inspected on-site by a Generac Authorized Service Dealer or branch thereof.

WARRANTY SCHEDULE

YEAR ONE – 100% (one hundred percent) coverage on mileage*, labor and parts listed:

- **Engine** – All components
- **Alternator** – All components
- **Transfer System** – All components

*Travel allowance is limited to 300 miles or 7.5 hours maximum, round trip, and applies only to permanently wired and mounted units.

All warranty expense allowances are subject to the conditions defined in Generac's *Warranty Policies, Procedures and Flat Rate Manual*.

Units that have been resold are not covered under the Generac warranty, as this warranty is not transferable.

THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

- Costs of normal maintenance, adjustments, installation and start-up.
- Units sold, rated or used for "Prime Power" applications as Generac has defined Prime Power. Contact a Generac Authorized Service Dealer for Prime Power definition and warranty.
- Failures due, but not limited, to normal wear and tear, accident, misuse, abuse, negligence or improper installation.
- Failures caused by any external cause or act of God, such as collision, theft, vandalism, riot or wars, nuclear holocaust, fire, freezing, lightning, earthquake, windstorm, hail, volcanic eruption, water or flood, tornado or hurricane.
- Products that are modified or altered in a manner not authorized by Generac in writing.
- Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
- Failure due to misapplication.
- Telephone, telegraph, teletype or other communication expenses.
- Living or travel expenses of person(s) performing service, except as specifically included within the terms of a specific unit warranty period.
- Rental equipment used while warranty repairs are being performed.
- Overnight freight costs for replacement part(s).
- Overtime labor.
- Starting batteries, fuses, light bulbs and engine fluids.

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO THE 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 PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT 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. Purchaser/owner agrees to make no claims against Generac based on negligence.

This warranty gives you specific legal rights. You also may have other rights that vary from state to state.

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