

Owner's Manual



**7kW Air-cooled,
Automatic Standby Generators**



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INTRODUCTION

Thank you for purchasing this compact, high performance, air-cooled, engine-driven generator. It is designed to automatically supply electrical power to operate critical loads during a utility power failure.

This unit is factory installed in an all-weather, composite enclosure and is **intended exclusively for outdoor installation**. This generator will operate using either vapor withdrawn liquid propane (LP) or natural gas (NG).

NOTE:

This generator is suitable for supplying typical residential loads such as Induction Motors (sump pumps, refrigerators, air conditioners, furnaces, etc.), Electronic Components (computer, monitor, TV, etc.), Lighting Loads and Microwave ovens.

READ THIS MANUAL THOROUGHLY

If any portion of this manual is not understood, contact the nearest Dealer for starting, operating and servicing procedures.

The information contained herein was based on machines in production at the time of publication. The manufacturer reserves the right to modify this manual at any time.

SAFETY RULES

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

DANGER!

INDICATES A HAZARDOUS SITUATION OR ACTION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

WARNING!

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

CAUTION!

Indicates a hazardous situation or action which, if not avoided, could result in minor or moderate injury.

NOTE:

Notes contain additional information important to a procedure and will be found within the regular text body of this manual.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or 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 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. The manufacturer strongly recommends that the operator read this *Owner's Manual* and thoroughly understand all instructions before using this equipment. The manufacturer also strongly recommends 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 important instructions that should be followed during installation and maintenance of the generator and batteries for the model: 6 kW NG, 7 kW LP, single-cylinder OHV 432 Engine.

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 Dealer. Normal maintenance service and replacement of parts are the responsibility of the owner/operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of the generator ensures a minimum number of problems and keep operating expenses at a minimum. See a Dealer for service aids and accessories.

HOW TO OBTAIN SERVICE

When the generator requires servicing or repairs, contact a Dealer for assistance. Service technicians are factory-trained and are capable of handling all service needs.

AUTHORIZED SERVICE DEALER LOCATION

To locate the nearest AUTHORIZED SERVICE DEALER, please call this number:

1-800-333-1322

or locate us on the web at:

www.generac.com

When contacting a Dealer about parts and service, always supply the complete model number and serial number of the unit as given on its data decal, which is located on the generator. See section "The Generator" for decal sample and location.

Model No. _____ Serial No. _____

Safety Rules

! **IMPORTANT SAFETY INSTRUCTIONS: SAVE THESE INSTRUCTIONS** – *The manufacturer suggests that these rules for safe operation be copied and posted near the unit's installation site. Safety should be stressed to all operators and potential operators of this equipment.*

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.

The manufacturer cannot 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 using a procedure, work method or operating technique the manufacturer does not specifically recommend, ensure that it is safe for others. Also make sure the procedure, work method or operating technique utilized 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 install, operate and 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 and immediately after operation. Exercise care near running generators.**

! **Installation must always comply with applicable codes, standards, laws and regulations.**

! **A running generator gives off carbon monoxide, and odorless, colorless poison gas. Breathing in carbon monoxide can cause headaches, fatigue, dizziness, nausea, vomiting, confusion, fainting, seizures or death.**

GENERAL HAZARDS

- For safety reasons, the manufacturer recommends that this equipment be installed, serviced and repaired by a Service Dealer or other competent, qualified electrician or installation technician who is familiar with applicable codes, standards and regulations. The operator also must comply with all such codes, standards and regulations.
- 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. Do NOT alter or add to the exhaust system or do anything that might render the system unsafe or in noncompliance with applicable codes and standards.

- Install a battery operated carbon monoxide alarm indoors, according to manufacturer's instructions/recommendations.
- 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. **The generator MUST be installed and operated outdoors only.**
- 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.
- When working on this equipment, remain alert at all times. Never work on the equipment when physically or mentally fatigued.
- Inspect the generator regularly, and contact the nearest Dealer for parts needing repair or replacement.
- 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, then remove the POSITIVE, POS or (+) cable. When reconnecting the cables, connect the POSITIVE cable first, the NEGATIVE 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.

EXHAUST HAZARDS

- Generator engine exhaust contains DEADLY carbon monoxide, an odorless, colorless poisonous gas. Breathing carbon monoxide can cause: dizziness, throbbing temples, nausea, muscular twitching, headache, vomiting, weakness and sleepiness, inability to think clearly, fainting, unconsciousness or even death. If you experience any carbon monoxide poisoning symptoms, move into fresh air and immediately seek medical attention.
- Never operate the generator set inside any garage or other enclosed area.

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, secured and/or locked before operating the generator. If work must be done 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 home 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 and remove the 7.5A fuse from the generator control panel.
- 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 dry 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 must always 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. Consult the local fire department with any questions pertaining to fire extinguishers.

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.
- Gaseous fluids such as natural gas and liquid propane (LP) gas are extremely EXPLOSIVE. Install the fuel supply system according to applicable fuel-gas codes. Before placing the home standby electric system into service, fuel system lines must be properly purged and leak tested according to applicable code. After installation, inspect the fuel system periodically for leaks. No leakage is permitted.

STANDARDS INDEX

In the absence of pertinent standards, codes, regulations and laws, the published information listed below may be used for installation guidance for this equipment.

1. NFPA No. 37, STATIONARY COMBUSTION ENGINES AND GAS TURBINES, available from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
2. NFPA No. 76A, ESSENTIAL ELECTRICAL SYSTEMS FOR HEALTH CARE FACILITIES, available same as Item 1.
3. NFPA No. 54, NATIONAL FUEL GAS CODE, available same as Item 1.
4. NFPA No. 58, AMERICAN NATIONAL STANDARD FOR STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GAS, available same as Item 1.
5. NFPA No. 70, NFPA HANDBOOK OF NATIONAL ELECTRIC CODE, available same as Item 1.
6. Article X, NATIONAL BUILDING CODE, available from the American Insurance Association, 85 John Street, New York, N.Y. 10038.
7. AGRICULTURAL WIRING HANDBOOK, available from the Food and Energy Council, 909 University Avenue, Columbia, MO 65201.
8. ASAE EP-3634, INSTALLATION AND MAINTENANCE OF FARM STANDBY ELECTRICAL SYSTEMS, available from the American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085.
9. NFPA No. 30, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE, available same as Item 1.

CALIFORNIA PROPOSITION 65 WARNING

Engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

CALIFORNIA PROPOSITION 65 WARNING

This product contains or emits chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

General Information

⚠ DANGER!

- ⚠ Only qualified electricians or contractors should attempt such installations, which must comply strictly with applicable codes, standards and regulations.**

1.1 UNPACKING/INSPECTION

After unpacking, carefully inspect the contents for damage.

- This standby generator set is ready for installation with a factory supplied and pre-mounted base pad and has a weather protective enclosure that is intended for **outdoor installation only**.
- This UL listed standby generator set may be packaged with an automatic transfer switch with built in load center. Circuit breakers for emergency circuit connections are included (if equipped).
- This UL listed, 2-pole switch is rated at 50 AC amperes at 250 volts maximum. **The 50 Amp transfer switch is for indoor use only.**

⚠ WARNING!

- ⚠ If this generator is used to power electrical load circuits normally powered by a utility power source, it is 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 700, 701 & 702). 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 their signature under the consignor's memo of loss or damage.

If a loss or damage is noted 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.

To properly open the roof, press down on the center top lip and release the latch. If pressure is not applied from the top, the roof may appear stuck. Always verify that the side lock is unlocked before attempting to lift the roof.

1.2 PROTECTION SYSTEMS

Unlike an automobile engine, the generator may have to run for long periods of time with no operator present to monitor engine conditions. For that reason, the engine is equipped with the following systems that protect it against potentially damaging conditions:

1. Low Oil Pressure Sensor
2. High Temperature Sensor
3. Overcrank
4. Overspeed
5. RPM Sensor
6. Low Battery

There are LED's on the control panel to notify personnel that one of these failures has occurred. There is a Status LED that illuminates when all of the conditions described in the "Ready to Run" section are true.

1.3 NEC REQUIREMENTS

Local code enforcement may require that AFCI's be incorporated into the transfer switch distribution panel. The Transfer Switch provided with this generator has a distribution panel that will accept AFCI's.

Siemens Part No. Q115AF - 15A or Q120AF - 20A can be obtained from a local electrical wholesaler and will simply replace any of the single pole circuit breakers supplied in the Transfer Switch distribution panel.

1.4 EMISSION INFORMATION

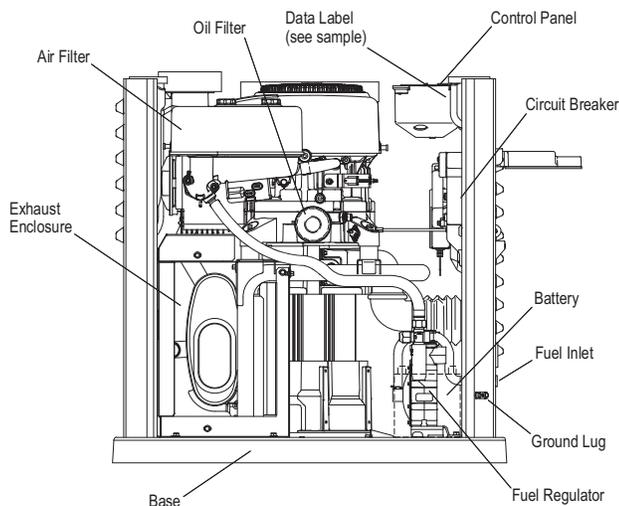
The Environmental Protection Agency requires that this generator complies with exhaust emission standards. This generator is certified to meet the applicable EPA emission levels. Additional information regarding the requirements set by the EPA is as follows:

The generator is certified for use as a stationary engine for standby power generation. Any other use may be a violation of federal and/or local laws. It is important to follow the maintenance specifications in the "Maintenance" section to ensure that the engine complies with the applicable emission standards for the duration of the engine's life. This engine is certified to operate on Liquid Propane fuel and pipeline Natural Gas. The emission control system on the generator consists of the following:

- Fuel Metering System
 - Carburetor/mixer assembly
 - Fuel regulator
- Air Induction System
 - Intake pipe/manifold
 - Air cleaner
- Ignition System
 - Spark plug
 - Ignition module

1.5 THE GENERATOR

Figure 1.1 – 7kW, Single Cylinder, LV-432 Engine (door removed)



Data label Sample

MODEL	<input type="text"/>
SERIAL	<input type="text"/>
VOLTS	<input type="text"/>
AMPS	<input type="text"/>
CONTROLLER P/N	<input type="text"/>
1 PH, 60 Hz, RPM 3600	
RAINPROOF ENCLOSURE FITTED	
CLASS F INSULATION	
RATED AMBIENT TEMP – 25°C	
FOR STANDBY SERVICE	
NEUTRAL FLOATING	
MAX LOAD UNBALANCE – 50%	
GENERAC POWER SYSTEMS WHITEWATER, WI 53190 U.S.A.	

1.6 SPECIFICATIONS

1.6.1 GENERATOR

Rated Voltage.....	240
Rated Maximum Load Current (Amps) at 240 Volts (LP)*	29.2
Main Circuit Breaker	30 Amp
Transfer Switch Load Center Circuits	
30A, 240V	1
20A, 120V	1
15A, 120V	5
Phase	1
Number of Rotor Poles.....	2
Rated AC Frequency.....	60 Hz
Battery Requirement.....	Group 26R, 12 Volts and 525 CCA Minimum

Weight (unit only in lbs.)225
 Enclosure..... Composite
 Normal Operating Range: This unit is tested in accordance to UL 2200 standards with an operating temperature of -20 °F (-29 °C) to 122 °F (50 °C). For areas where temperatures fall below 32 °F (0 °C), a cold weather kit is highly recommended. When operated above 77° F (25° C) there may be a decrease in engine power. (Please reference the engine specifications section).

These generators are rated in accordance with UL2200, Safety Standard for Stationary Engine Generator Assemblies; and CSA-C22.2 No. 100-04 Standard for Motors and Generators.

* Natural Gas ratings will depend on specific fuel Btu content. Typical derates are between 10-20% off the LP gas rating.

** Circuits to be moved must be protected by same size breaker. For example, a 15 amp circuit in the main panel must be a 15 amp circuit in the transfer switch.

1.6.2 ENGINE

Type of Engine	OHV-432
Number of Cylinders	1
Rated Horsepower @ 3,600 rpm*	14.8
Displacement.....	432cc
Cylinder Block.....	Aluminum w/Cast Iron Sleeve
Valve Arrangement.....	Overhead Valves
Ignition System	Solid-state w/Magneto
Recommended Spark Plug	RC12YC
Spark Plug Gap	0.76 mm (0.030 inch)
Compression Ratio.....	8.2:1
Starter	12 VDC
Oil Capacity Including Filter.....	Approx. 1.1 Qts (1.0L)
Recommended Oil Filter	Part # 0H9039
Recommended Air Filter	Part # 0H6104
Operating RPM.....	3,600

* Engine power is subject to and limited by such factors as fuel Btu content, ambient temperature and altitude. Engine power decreases about 3.5 percent for each 1,000 feet above sea level; and also will decrease about 1 percent for each 6 C (10 F) above 16 C (60 F) ambient temperature.

General Information

1.7 SYSTEM READY LED

The "System Ready LED" is illuminated when all of the following conditions are true:

1. The AUTO/OFF/MANUAL switch is set to the AUTO position.
2. The utility voltage supplied to the unit is sensed by the controller.
3. No alarms are present, for example, low oil pressure, high temperature, etc.

1.8 FUEL REQUIREMENTS AND RECOMMENDATIONS

With LP gas, use only the vapor withdrawal system. This type of system uses the vapors formed above the liquid fuel in the storage tank.

The engine has been fitted with a field convertible fuel system. The unit will run on natural gas or LP gas, but it has been factory set to run on natural gas. Should the primary fuel need to be changed to LP gas, the fuel system needs to be reconfigured. See the reconfiguring the Fuel System section for instructions on reconfiguration of the fuel system.

Recommended fuels should have a Btu content of at least 1,000 Btus per cubic foot for natural gas; or at least 2,520 Btus per cubic foot for LP gas. Ask the fuel supplier for the Btu content of the fuel.

Required fuel pressure for **natural gas is five (5) inches to seven (7) inches water column (0.18 to 0.25 psi); and for liquid propane, 10 inches to 12 inches of water column (0.36 to 0.43 psi).** The primary regulator for the propane supply is **NOT INCLUDED** with the generator.

NOTE:

All pipe sizing, construction and layout must comply with NFPA 54 for natural gas applications and NFPA 58 for liquid propane applications. Once the generator is installed, verify that the fuel pressure NEVER drops below five (5) inches water column for natural gas or 10 inches water column for liquid propane.

Prior to installation of the generator, the installer should consult local fuel suppliers or the fire marshal to check codes and regulations for proper installation. Local codes will mandate correct routing of gaseous fuel line piping around gardens, shrubs and other landscaping to prevent any damage.

Special considerations should be given when installing the unit where local conditions include flooding, tornados, hurricanes, earthquakes and unstable ground for the flexibility and strength of piping and their connections.

Use an approved pipe sealant or joint compound on all threaded fittings.

All installed gaseous fuel piping must be purged and leak tested prior to initial start-up in accordance with local codes, standards and regulations.

1.9 FUEL CONSUMPTION

Unit	Nat. Gas*		LP Vapor**	
	1/2 Load	Full Load	1/2 Load	Full Load
6/7 kW	85/2.41	148/4.19	0.99/3.75	1.26/4.79

Values given are approximate.

* Natural gas is in cubic feet per hour / cubic meters per hour.

** LP is in gallons per hour / liters per hour.

Verify that gas meter is capable of providing enough fuel flow to include household appliances.

1.9.1 BTU FLOW REQUIREMENTS - NATURAL GAS

BTU flow required for each unit based on 1000 BTU per cubic foot.

- 6kW — 148,000 BTU/Hour

⚠ DANGER!

 **Gaseous fuels such as natural gas and liquid propane (LP) gas are highly explosive. Even the slightest spark can ignite such fuels and cause an explosion. No leakage of fuel is permitted. Natural gas, which is lighter than air, tends to collect in high areas. LP gas is heavier than air and tends to settle in low areas.**

NOTE:

A minimum of one approved manual shut-off valve must be installed in the gaseous fuel supply line. The valve must be easily accessible. Local codes determine the proper location.

1.10 RECONFIGURING THE FUEL SYSTEM

1.10.1 7 KW, 432CC ENGINE

1. Remove the generator enclosure roof by turning the four quarter turn latches on the roof top. Push down slightly on the latch then turn 90 degrees to release. The latch should pop up as shown in Figure 1.2.

Figure 1.2 — Turn Latch



- Remove the two side panels of the enclosure by lifting the panels straight up until they are clear (Figure 1.3).

Figure 1.3 — Remove Side Panels



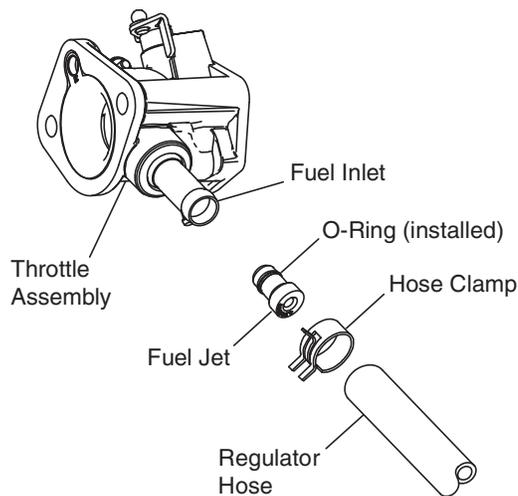
- Carefully place the roof and side panels to one side.
- Locate the fuel throttle assembly mounted to the engine intake.
- To change the fuel selection, remove the hose clamp and hose from the throttle assembly (Figure 1.4).

Figure 1.4 — Remove Hose Clamp & Hose



- Remove the Natural Gas (Larger ID) fuel jet from the fuel inlet (Figure 1.5).
- Obtain the fuel jet for Propane (Smaller ID that has been supplied loose with the owners manual).
- Verify that the O-ring, supplied loose with the owners manual is installed, into the groove of the fuel jet.
- Insert the Propane fuel jet into the end of the fuel inlet.
- Reinstall the hose and clamp onto the fuel inlet and secure.
- Verify the hose has not been kinked in any way.
- The generator is now ready to run on LP Vapor fuel.

Figure 1.5 — Remove Fuel Jet



1.11 HIGH ALTITUDE OPERATION

The fuel system on this generator may be influenced by operation at higher altitudes. Proper operation can be ensured by installing an altitude kit when required. See the table below to determine when an altitude kit is required. Operating this generator without the proper altitude kit installed may increase the engine's emissions and decrease fuel economy and performance. Kits may be obtained from any Dealer, and should be installed by a qualified individual.

Unit	Fuel	Altitude Range*	Kit Part Number
6/7 kW	LP Vapor	0- 6500 ft**	Not Required
	Nat. Gas	0- 2000 ft	Not Required
		2000 - 6500 ft**	OJ7057

* Elevation above sea level

** At elevations above 6500 ft. the engine may experience decreased performance.

General Information

1.12 LOCATION

⚠ DANGER!

⚠ 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 generator must be installed properly, in strict compliance with applicable codes and standards. Following installation, do nothing that might render the system unsafe or in noncompliance with such codes and standards. Operate the generator outdoors ONLY.

- Keep exhaust gases from entering a confined area through windows, doors, ventilation, crawl spaces or other openings (Figure 1.9).
- It is highly recommended that carbon monoxide detector(s) be installed indoors according to the manufacturer's instructions/recommendations.
- The generator must be mounted safely per applicable codes and the manufacturer's specifications. Do NOT alter or add to the exhaust system, or do anything that might render the exhaust system unsafe or in noncompliance with applicable codes and standards.

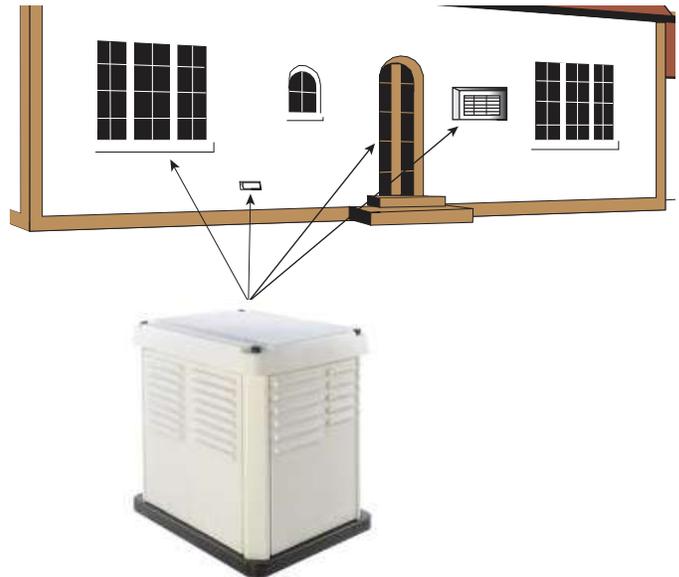
1.12.1 GENERATOR

Install the generator set, in its protective enclosure, **outdoors**, where adequate cooling and ventilating air is always available (Figure 1.6). Consider these factors:

- The installation of the generator **must comply strictly with NFPA 37, NFPA 54, NFPA 58, and NFPA 70 standards.**
- Install the unit where air inlet and outlet openings will not become obstructed by leaves, grass, snow, etc. If prevailing winds will cause blowing or drifting, consider using a wind-break to protect the unit.
- Install the generator on high ground where water levels will not rise and endanger it.
- Allow sufficient room on all sides of the generator for maintenance and servicing. This unit must be installed in accordance with current applicable NFPA 37 and NFPA 70 standards; as well as any other federal, state and local codes for minimum distances from other structures. DO NOT install under wooden decks or structures.
- Install the unit where rain gutter down spouts, roof run-off, landscape irrigation, water sprinklers or sump pump discharge does not flood the unit or spray the enclosure, including any air inlet or outlet openings.
- Install the unit where services will not be affected or obstructed, including concealed, underground or covered services such as electrical, fuel, phone, air conditioning or irrigation.
- Where strong prevailing winds blow from one direction, face the generator air inlet openings to the prevailing winds.
- Install the generator as close as possible to the fuel supply, to reduce the length of piping.

- Install the generator as close as possible to the transfer switch. REMEMBER THAT LAWS OR CODES MAY REGULATE THE DISTANCE AND LOCATION.
- The genset must be installed on a level surface. The base frame must be level within two (2) inches all around.

Figure 1.6 – Generator Clearances



- The generator is typically placed on pea gravel or crushed stone. Check local codes if a concrete slab is required. If a concrete base slab is required, all federal, state and local codes should be followed. Special attention should be given to the concrete base slab which should exceed the length and width of the generator by a minimum of six (6) inches (0.152 meters) on all sides.

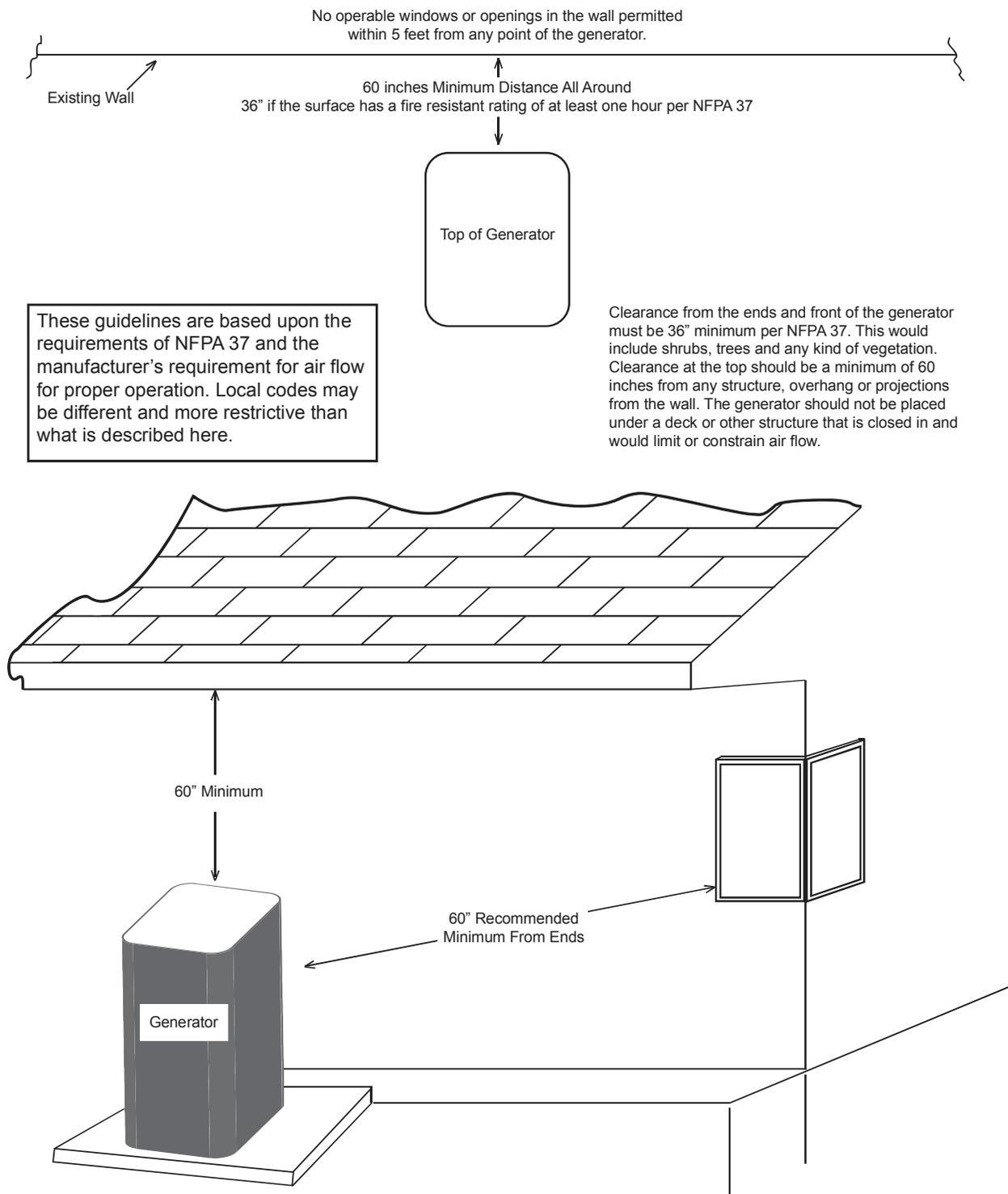
1.12.2 NEW INSTALLATION GUIDELINES FOR STATIONARY AIR-COOLED 7KW GENERATORS.

The National Fire Protection Association has a standard for the installation and use of stationary combustion engines. That standard is NFPA 37 and its requirements limit the spacing of an enclosed generator set from a structure or wall (Figure 1.7).

NFPA 37, Section 4.1.4, Engines Located Outdoors. Engines, and their weatherproof housings if provided, that are installed outdoors shall be located at least 5 ft. from openings in walls and at least 5 ft. from structures having combustible walls.

Generator exhaust contains DEADLY carbon monoxide gas. This dangerous gas can cause unconsciousness or death. Do not place the unit near windows, doors, fresh air intakes (furnaces, etc.) or any openings in the building or structure, including windows and doors of an attached garage.

Figure 1.7 – Installation Guidelines



NOTE:

Failure to follow these minimum clearance guidelines may result in the generator failing inspection by the local building, electrical or fire inspector requiring the generator be reinstalled in the correct location.

General Information

1.12.3 TRANSFER SWITCH

The transfer switch that shipped inside the carton with the generator is enclosed in a **NEMA 1 (indoor rated only)** enclosure.

- Install the transfer switch indoors on a firm, sturdy supporting structure.
- To prevent switch distortion, level the switch if necessary. This can be done by placing washers between the switch enclosure and mounting surface.
- Never install the switch where water or any corrosive substance might drip onto the enclosure.
- Protect the switch at all times against excessive moisture, dust, dirt, lint, construction grit and corrosive vapors.

⚠ WARNING!

⚠ If the AUTO/OFF/MANUAL switch is not set to its OFF position, the generator can crank and start as soon as the battery cables are connected. Sparking can occur at the battery posts and cause an explosion.

1.13 BATTERY REQUIREMENTS

See the Specifications section for correct battery size and rating.

1.14 BATTERY INSTALLATION

Fill the battery with the proper electrolyte fluid if necessary and have the battery fully charged before installing it.

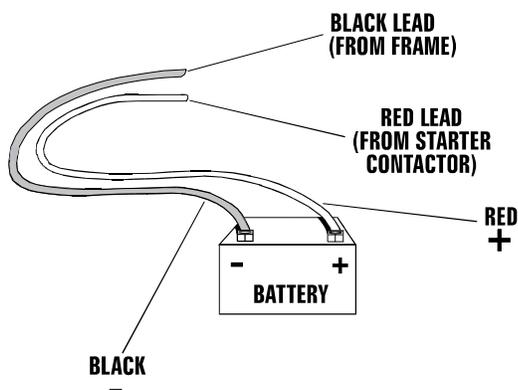
Before installing and connecting the battery, complete the following steps:

1. Set the generator's AUTO/OFF/MANUAL switch to OFF.
2. Turn off utility power supply to the transfer switch.
3. Remove the 7.5A fuse from the generator control panel.

Battery cables were factory connected at the generator (Figure 1.8). Connect cables to battery posts as follows:

4. Connect the red battery cable (from starter contactor) to the battery post indicated by a positive, POS or (+).
5. Connect the black battery cable (from frame ground) to the battery post indicated by a negative, NEG or (—).
6. Install the battery post covers (included).
7. Install fuse.

Figure 1.8 – Battery Cable Connections



NOTE:

Dielectric grease should be used on battery posts to aid in the prevention of corrosion.

NOTE:

Damage will result if battery connections are made in reverse.

NOTE:

In areas where temperatures regularly fall below 32° F (0° C) it is recommended that a pad type battery heater be installed to aid in cold weather starting.

1.15 THE BATTERY

⚠ DANGER!

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

⚠ A battery presents a risk of electrical shock and high short circuit current. The following precautions are to be observed when working on batteries:

- Remove the 7.5A fuse from the generator control panel.
- Remove watches, rings or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of the battery.
- Disconnect charging source prior to connecting or disconnecting battery terminals.

⚠ WARNING!

⚠ Do not open or mutilate the battery. Released electrolyte has been known to be harmful to the skin and eyes, and to be toxic.

⚠ The electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive.

The following procedures are to be observed:

- Wear full eye protection and protective clothing.
- If electrolyte contacts the skin, wash it off immediately with water.
- If electrolyte contacts the eyes, flush thoroughly and immediately with water and seek medical attention.
- Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of 1 pound (500 grams) bicarbonate of soda to 1 gallon (4 liters) of water. The bicarbonate of soda (baking soda) solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water and the area dried.

⚠ Lead-acid batteries present a risk of fire because they generate hydrogen gas. The following procedures are to be followed:

Post Installation Start-up and Adjustments

- **DO NOT SMOKE** when near the battery.
- **DO NOT cause flame or spark in battery area.**
- **Discharge static electricity from body before touching the battery by first touching a grounded metal surface.**

 **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.**

 **Be sure the utility power supply is turned off and the 7.5A fuse is removed from the generator control panel, or sparking may occur at the battery posts as the cables are attached and cause an explosion.**

Servicing of the battery is to be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

See the Specifications section for the correct size and rating when replacing the battery. 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.

1.16 BATTERY CHARGER

It operates as a trickle charger which ensures output is continually optimized to promote maximum battery life and charging levels are at safe conditions.

2.1 BEFORE INITIAL START-UP

NOTE:

These units have been run and tested at the factory prior to being shipped and do not require any type of break-in.

NOTE:

This unit comes filled with oil from the factory. Check the oil level and add the appropriate amount if necessary.

Before starting, complete the following:

1. Set the generator's main circuit breaker to its OFF (or OPEN) position.
2. Set the generator's AUTO/OFF/MANUAL switch to the OFF position.
3. Turn OFF all breakers on the load center of the transfer box (T1 and T2).
4. Turn OFF all loads connected to the transfer switch terminals T1 and T2.
5. Check the engine crankcase oil level and, if necessary, fill to the dipstick FULL mark with the recommended oil. Do not fill above the FULL mark.
6. Check the fuel supply. Gaseous fuel lines must have been properly purged and leak tested in accordance with applicable fuel-gas codes. All fuel shutoff valves in the fuel supply lines must be open.

During initial start up only, the generator may exceed the normal number of start attempts and experience an "over crank" fault (See the "Overcrank" section). This is due to accumulated air in the fuel system during installation. Reset the control board and retry up to two more times, if necessary. If unit fails to start, contact the local dealer for assistance.

▲ CAUTION!

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

2.2 CHECK TRANSFER SWITCH OPERATION

Refer to the "Manual Transfer Operation" section, of the owner's manual for procedures.

▲ DANGER!

 **Do not attempt manual transfer switch operation until all power voltage supplies to the transfer switch have been positively turned off. Failure to turn off all power voltage supplies will result in extremely hazardous and possibly fatal electrical shock.**

2.3 ELECTRICAL CHECKS

Complete electrical checks as follows:

1. Set the generator's main circuit breaker to its OFF (or OPEN) position.
2. Set the generator's AUTO/OFF/MANUAL switch to the OFF position.
3. Turn OFF all breakers on the load center of the transfer box (T1 and T2).
4. Turn ON the utility power supply to the transfer switch using the means provided (such as a utility main line circuit breaker).

▲ DANGER!

 **The transfer switch is now electrically energized or "live." Contact with electrically "hot" parts will result in extremely hazardous and possibly fatal electrical shock. Proceed with caution.**

5. Use an accurate AC voltmeter to check utility power source voltage across transfer switch terminals N1 and N2. Nominal line-to-line voltage should be 240 volts AC.
6. Check utility power source voltage across terminals N1 and the transfer switch neutral lug; then across terminal N2 and neutral. Nominal line-to-neutral voltage should be 120 volts AC.
7. When certain that utility supply voltage is compatible with transfer switch and load circuit ratings, turn OFF the utility power supply to the transfer switch.
8. On the generator panel, set the Auto/Off/ Manual switch to MANUAL. The engine should crank and start.

Post Installation Start-up and Adjustments

- Let the engine warm up for about five minutes to allow internal temperatures to stabilize. Then, set the generator's main circuit breaker to its ON (or closed) position.

⚠ DANGER!

⚠ Proceed with caution! Generator power voltage is now supplied to the transfer switch. Contact with live transfer switch parts will result in dangerous and possibly fatal electrical shock.

- Connect an accurate AC voltmeter and a frequency meter across transfer switch terminal lugs E1 and E2. Voltage should be 240-245 at a frequency of 62-63 Hertz.
- Connect the AC voltmeter test leads across terminal lugs E1 and neutral; then across E2 and neutral. In both cases, voltage reading should be 120-125 volts AC.
- Set the generator's main circuit breaker to its OFF (or OPEN) position. Let the engine run at no-load for a few minutes to stabilize internal engine generator temperatures.
- Set the generator's AUTO/OFF/MANUAL switch to OFF. The engine should shut down.

NOTE:

It is important not to proceed until certain that generator AC voltage and frequency are correct and within the stated limits.

2.4 GENERATOR TESTS UNDER LOAD

To test the generator set with electrical loads applied, proceed as follows:

- Set generator's main circuit breaker to its OFF (or OPEN) position.
- Turn OFF all breakers on the load center of the transfer box (T1 and T2).
- Set the generator's AUTO/OFF/MANUAL switch to OFF.
- Turn OFF the utility power supply to the transfer switch, using the means provided (such as a utility main line circuit breaker).

⚠ WARNING!

⚠ Do not attempt manual transfer switch operation until all power voltage supplies to the transfer switch have been positively turned off. Failure to turn off all power voltage supplies will result in extremely hazardous and possibly fatal electrical shock.

- Manually set the transfer switch to the STANDBY position, i.e., load terminals connected to the generator's E1/E2 terminals. The transfer switch operating lever should be down.
- Set the generator's AUTO/OFF/MANUAL switch to MANUAL. The engine should crank and start immediately.
- Let the engine stabilize and warm up for a few minutes.
- Set the generator's main circuit breaker to its ON (or CLOSED) position. Loads are now powered by the standby generator.
- Turn ON the load center of the transfer switch (T1 and T2).

- Connect an accurate AC voltmeter and a frequency meter across terminal lugs E1 and E2. Voltage should be greater than 230 volts, and frequency should be greater than 58 Hz.
- Let the generator run at full rated load for 20-30 minutes. Listen for unusual noises, vibration or other indications of abnormal operation. Check for oil leaks, evidence of overheating, etc.
- When testing under load is complete, turn OFF electrical loads.
- Set the generator's main circuit breaker to its OFF (or OPEN) position.
- Let the engine run at no-load for a few minutes.
- Set the AUTO/OFF/MANUAL switch to OFF. The engine should shut down.

2.5 CHECKING AUTOMATIC OPERATION

To check the system for proper automatic operation, proceed as follows:

- Set generator's main circuit breaker to its OFF (or OPEN) position.
- Check that the AUTO/OFF/MANUAL switch is set to OFF.
- Turn OFF the utility power supply to the transfer switch, using means provided (such as a utility main line circuit breaker).
- Manually set the transfer switch to the UTILITY position, i.e., load terminals connected to the utility power source side.
- Turn ON the utility power supply to the transfer switch, using the means provided (such as a utility main line circuit breaker).
- Set the generator's main circuit breaker to its ON (or CLOSED) position.
- Set the AUTO/OFF/MANUAL switch to AUTO. The system is now ready for automatic operation.
- Turn OFF the utility power supply to the transfer switch.

With the AUTO/OFF/MANUAL switch at AUTO, the engine should crank and start when the utility source power is turned OFF after a 10 second delay. After starting, the transfer switch should connect load circuits to the standby side after a five (5) second delay. Let the system go through its entire automatic sequence of operation.

With the generator running and loads powered by generator AC output, turn ON the utility power supply to the transfer switch. The following should occur:

- After about 15 seconds, the switch should transfer loads back to the utility power source.
- About one minute after re-transfer, the engine should shut down.

2.6 ENGINE GOVERNOR ADJUSTMENT

If both AC frequency and voltage are correspondingly high or low, adjust the engine governor as follows:

⚠ WARNING!

⚠ The engine must be OFF to perform steps 1 and 2.

1. Loosen the governor clamp bolt (Figure 2.1).
2. Hold the governor lever at its wide open throttle position (clockwise), and rotate the governor shaft clockwise as far as it will go. Then, tighten the governor lever clamp bolt to 70 inch-pounds (8 N-m).
3. Start the generator; let it stabilize and warm up at no-load.
4. Connect a frequency meter across the generators AC output leads.
5. Turn the adjust screw to obtain a frequency reading of 62.5 Hz.

Figure 2.1 — Engine Governor Adjustment Single Cylinder Engines



3.1 CONTROL PANEL INTERFACE

3.1.1 USING THE AUTO/OFF/MANUAL SWITCH (FIGURE 3.1)

⚠ WARNING!

⚠ With the switch set to AUTO, the engine may crank and start at any time without warning. Such automatic starting occurs when utility power source voltage droops 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 fuses 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.

1. “AUTO” Position – Selecting this switch activates fully automatic system operation. It also allows the unit to automatically start and exercise the engine every seven days with the setting of the exercise timer (see the Setting the Exercise Timer section).
2. “OFF” Position – This switch position shuts down the engine. This position also prevents automatic operation.
3. “MANUAL” Position – Set the switch to MANUAL to crank and start the engine. Transfer to standby power will not occur unless there is a utility failure.

3.1.2 SETTING THE EXERCISE TIMER

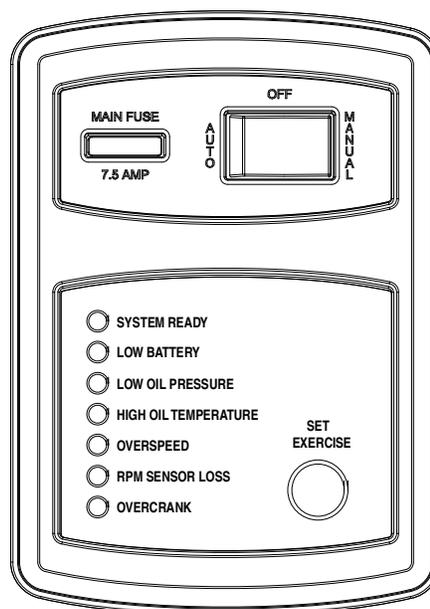
This generator is equipped with an exercise timer. Once it is set, the generator will start and exercise every seven days, on the day of the week and at the time of day specified. During this exercise period, the unit runs for approximately 12 minutes and then shuts down. Transfer of loads to the generator output does not occur during the exercise cycle unless utility power is lost.

A switch on the control panel (see Figure 3.1) permits selection of the day and time for the system to exercise. At the chosen time, perform the following sequence to select the desired day and time of day the system will exercise. Remember seasonal time changes affect the exercise settings.

1. Verify that the AUTO/OFF/MANUAL switch is set to AUTO.
2. Press and hold the “Set Exercise” switch for several seconds. All the red LED’s will stop flashing immediately and the generator will start.
3. The generator will start and run for approximately 12 minutes and then shut down. The exerciser is now set to run at this time of day each week.

Example: If the “Set Exercise” pressed on Saturday afternoon at 2:00 p.m., the generator will start and exercise for approximately 12 minutes every Saturday at 2:00 p.m.

Figure 3.1 – Generator Control Panel



Set-up Procedure

1. Ensure Utility power is supplied to the Transfer Switch.
2. Remove the 7.5A Fuse from the Control Panel.
3. Wait ten (10) seconds.
4. Install the 7.5A Fuse.
5. Set the AUTO/OFF/MANUAL switch to AUTO.
6. All the LEDs on the Control Panel will begin to flash.
7. Press and hold the SET EXERCISE button for five (5) seconds.
8. Only the System Ready LED will remain on, the rest will stop flashing.
9. The Generator will crank, start and run for twelve (12) minutes. It will NOT transfer during this time unless Utility is lost.
10. At the end of the Exercise period the Generator will shut down.

NOTE:

The exerciser will only work in the AUTO mode and will not work unless this procedure is performed. The exercise time will need to be reset every time the 12 volt battery is disconnected and then reconnected, and/or when the fuse is removed.

3.2 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 (Figure 3.1).
2. Be sure that normal UTILITY power source voltage is available to transfer switch terminal lugs N1 and N2 (Refer to the Electrical Data section).
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 the Sequence of Automatic Operation section.

3.3 SEQUENCE OF AUTOMATIC OPERATION

3.3.1 UTILITY FAILURE

Initial Conditions: Generator in Auto, ready to run, load being supplied by utility source. When utility fails (below 65% of nominal), a 10 second line interrupt delay time is started. If the utility is still not present when the timer expires, the engine will crank and start. Once started, a five (5) second engine warm-up timer will be initiated. When the warm-up timer expires, the control will transfer the load to the generator. If the utility power is restored (above 75% of nominal) at any time from the initiation of the engine start until the generator is ready to accept load (5 second warm-up time has not elapsed), the controller will complete the start cycle and run the generator through its normal cool down cycle; however, the load will remain on the utility source.

3.3.2 CRANKING

The system will control the cyclic cranking as follows: 16 second crank, seven (7) second rest, 16 second crank, seven (7) second rest followed by three (3) additional cycles of seven (7) second cranks followed by three (3) second rests.

Choke Operation

The 432cc engines have a choke behind the air box that is automatically controlled by the electronic control board.

Failure to Start

This is defined as any of the following occurrences during cranking:

1. Not reaching starter dropout within the specified crank cycle. Starter dropout is defined as four (4) cycles at 1,000 RPM.
2. Reaching starter dropout, but then not reaching 2200 RPM within 15 seconds. In this case the control board will go into a rest cycle for seven (7) seconds, then continue the rest of the crank cycle.

During a rest cycle the start and fuel outputs are de-energized and the magneto output is shorted to ground.

Cranking Conditions

The following notes apply during cranking cycle.

1. Starter motor will not engage within five (5) seconds of the engine shutting down.
2. The fuel output will not be energized with the starter.
3. The starter and magneto outputs will be energized together.
4. Once the starter is energized the control board will begin looking for engine rotation. If it does not see an RPM signal within three (3) seconds it will shut down and latch out on RPM sensor loss.
5. Once the control board sees an RPM signal, it will energize the fuel solenoid and continue the crank sequence.
6. Starter motor will disengage when speed reaches starter dropout.
7. If the generator does not reach 2200 RPM within 15 seconds, re-crank cycle will occur.
8. If engine stops turning between starter dropout and 2200 RPM, the board will go into a rest cycle for seven (7) seconds then re-crank (if additional crank cycles exist).
9. Once started, the generator will wait for a hold-off period before starting to monitor oil pressure and oil temperature (refer to the Alarm Messages section for hold-off times).
10. During Manual start cranking, if the Mode switch is moved from the Manual position, the cranking stops immediately.
11. During Auto mode cranking, if the Utility returns, the cranking cycle does NOT abort but continues until complete. Once the engine starts, it will run for one (1) minute, then shut down.

3.3.3 LOAD TRANSFER

The transfer of load when the generator is running is dependent upon the operating mode as follows:

1. Manual
 - Will not transfer to generator if utility is present.
 - Will transfer to generator if utility fails (below 65% of nominal for 10 consecutive seconds.
 - Will transfer back when utility returns for 15 consecutive seconds. The engine will continue to run until removed from the Manual mode.
2. Auto
 - Will start and run if Utility fails for 10 consecutive seconds.
 - Will start a five (5) second engine warm-up timer.
 - Will not transfer if utility subsequently returns.
 - Will transfer to generator if utility is still not present.
 - Will transfer back to utility once utility returns (above 75% of nominal) for 15 seconds.
 - Will transfer back to utility if the generator is shut down for any reason (such as the switch is in the OFF position or a shutdown alarm.
 - After transfer, will shut down engine after one (1) minute cool-down time.
3. Exercise
 - Will not exercise if generator is already running in either Auto or Manual mode.
 - During exercise, the controller will only transfer if utility fails during exercise for 10 seconds, and will switch to Auto mode.

3.3.4 UTILITY RESTORED

Initial Condition: Generator supplying power to customer load. When the utility returns (above 75% of nominal), a 15 second return to utility timer will start. At the completion of this timer, if the utility supply is still present and acceptable, the control will transfer the load back to the utility and run the engine through a one (1) minute cool down period and then shut down. If utility fails for three (3) seconds during this cool down period, the control will transfer load back to the generator and continue to run while monitoring for utility to return.

3.4 MANUAL OPERATION

This transfer switch is suitable for manual transfer under load providing the dead front cover is in place.

Manual operation must be checked BEFORE the transfer switch is operated electrically. To check manual operation, proceed as follows:

1. Turn the generator's AUTO/OFF/MANUAL switch to OFF.
2. Turn OFF both UTILITY (service disconnect breaker) and the main line circuit breaker on the generator.
3. Note position of the 2 switches below the transfer switch operator.
 - Utility supply switch (left side) ON and Generator supply switch (right side) OFF – LOAD terminals are connected to the Utility.
 - Utility supply switch (left side) OFF and Generator supply switch (right side) ON – LOAD terminals are connected to the Generator.

3.4.1 CLOSE TO UTILITY SOURCE SIDE

Before proceeding, verify the position of the transfer mechanism by observing the position of 50A, 2-pole switches.

If the Utility Supply switch (left side) is ON, no further action is required.

If not, move the Utility Supply switch handle to the ON position. Note: the Generator Supply switch handle should move to the OFF position.

The customer load is now connected to the Utility supply.

3.4.2 CLOSE TO GENERATOR SOURCE SIDE

Before proceeding, verify the position of the transfer mechanism by observing the position of 50A, 2-pole switches.

If the Generator Supply switch (right side) is ON, no further action is required.

If not, move the Generator Supply switch handle to the ON position. Note: the Utility Supply switch handle should move to the OFF position.

The customer load is now connected to the Generator supply.

3.4.3 RETURN TO UTILITY SOURCE SIDE

Move the Utility Supply switch handle to the ON position. Note: the Generator Supply switch handle should move to the OFF position.

The customer load is now connected to the Utility supply.

3.5 SIDE COMPARTMENT

(FIGURES 3.2 & 3.3)

Local codes may require this compartment to be locked. A hasp is provided so the owner can secure the compartment with their own padlock. Check local codes in the area.

3.5.1 MAIN CIRCUIT BREAKER

This is a 2-pole breaker rated according to the Specifications section.

Figure 3.2 – Side Compartment



Figure 3.3 – Open Side Compartment



3.6 PROTECTION SYSTEMS

3.6.1 ALARMS

Low Oil Pressure (Shutdown Alarm)

A five (5) second delay on start-up and eight (8) second delay once the engine is running.

This switch (Figure 3.4) has normally closed contacts that are held open by engine oil pressure during operation. Should the oil pressure drop below the five (5) PSI range, switch contacts close and the engine shuts down. The unit should not be restarted until oil level is verified.

High Oil Temperature (Shutdown Alarm – Auto Reset)

A 10 second delay on start-up and one (1) second delay before shutdown. Auto reset when the condition clears and restart the engine if a valid start signal is still present.

This switch's contacts (Figure 3.4) close if the temperature should exceed approximately 124° C (255° F), initiating an engine shutdown. Once the oil temperature drops to a safe level the switch's contacts open again.

Over Crank (Shutdown Alarm)

This occurs if the engine has not started within the specified crank cycle. (See "Cranking" section.)

Over Speed (Shutdown Alarm)

4320 RPM for three (3) seconds or 4500 RPM immediately. This feature protects the generator from damage by shutting it down if it happens to run faster than the preset limit. This protection also prevents the generator from supplying an output that could potentially damage appliances connected to the generator circuit. Contact the nearest Dealer if this failure occurs.

Figure 3.4 – Low Oil Pressure and High Temperature Switches



RPM Sensor Loss (Shutdown Alarm)

During cranking, if the Control Board does not see a valid RPM signal within three (3) seconds, it will shut down and lock out on RPM sensor loss. While engine is running, if RPM signal is lost for two (2) seconds the Control Board will shut the engine down, wait 15 seconds, then re- crank the engine. If no RPM signal is detected within the first three (3) seconds of cranking, the Control Board will shut the engine down and latch out on RPM sensor loss. If the RPM signal is detected, the engine will start and run normally. If the RPM signal is subsequently lost again, the Control Board will try one more re- crank attempt before latching out and displaying the RPM sensor failure message.

Clear Alarms

Clear alarms by setting the AUTO/OFF/MANUAL switch to the OFF position.

3.6.2 WARNINGS

Second Priority (Non-latching) Displayed on the control panel. Warnings automatically clear when the monitored condition goes away. Warnings cannot cause shutdowns.

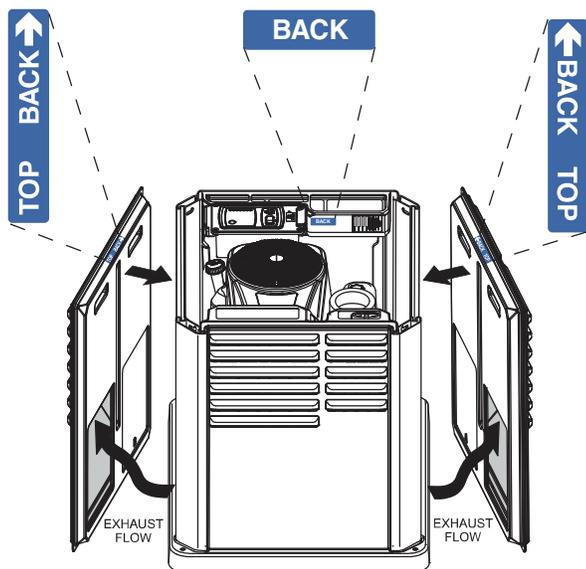
Low Battery

The Control Board monitors battery voltage and illuminates an LED warning if the battery voltage falls below 11.9 volts for one (1) minute. Warning is automatically cleared if the battery voltage rises above 12.4 volts. Battery voltage is not monitored during the crank cycle.

3.6.3 PANEL ORIENTATION

When replacing the panels after installation or maintenance, the orientation of each panel is critical to proper cooling and operation of the generator. Slide each panel into the corner post as identified in Figure 3.5. Note the decals on each panel for the correct placement, including the roof.

Figure 3.5 — Panel Location

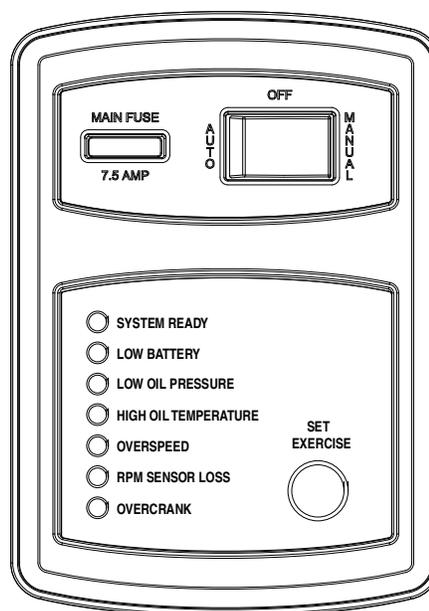


4. If the generator will be left off for longer than 1 hour without utility present remove the 7.5 Amp Main Fuse from the control panel (Figure 3.7). This will prevent the control panel from running down the battery.

STARTING THE GENERATOR

1. If the Main Fuse was removed, replace the fuse.
2. Turn the Auto/Off/Manual switch to the Auto position. After a short delay the generator will start.
3. Allow the generator to run for 15 seconds to allow the engine to warm up.
4. Turn on the Main Circuit Breaker.

Figure 3.7 – Generator Control Panel



3.7 SHUTTING THE GENERATOR DOWN WHILE UNDER LOAD

To safely stop and start a loaded generator follow these steps.

ISOLATE THE MAIN SERVICE DISTRIBUTION PANEL

1. At the main service distribution panel, open (turn off) the main service entrance breaker.

STOPPING THE GENERATOR

1. Turn the Main Circuit Breaker off (Figure 3.6).
2. Allow the generator to run for 1 minute without load to cool down.

Figure 3.6 – Open Side Compartment



3. Turn the Auto/Off/Manual switch to the Off position (Figure 3.7).

REPOWER THE MAIN SERVICE DISTRIBUTION PANEL

1. At the main service distribution panel, close (turn on) the main service entrance breaker.

This method will ensure proper transfer between generator and utility in the event that utility returns while the generator is shut off.

4.1 PERFORMING SCHEDULED MAINTENANCE

It is important to perform service as specified in the Maintenance Schedule for proper generator operation, and to ensure that the generator complies with the applicable emission standards for the duration of its useful life. Service and repairs may be performed by any capable person or repair shop. Additionally, emissions critical maintenance must be performed as scheduled in order for the Emissions Warranty to be valid. Emissions critical maintenance consists of servicing the air filter and spark plugs in accordance with the Maintenance Schedule.

4.2 FUSE

The 7.5 amp fuse on the control panel protects the DC control circuit against overload (Figures 3.1 and 3.2). This fuse is wired in series with the battery output lead to the panel. If this fuse element has melted open, the engine will not be able to crank or start. Replace this fuse using only an identical 7.5 amp replacement fuse. Whenever the fuse is removed or replaced, the exercise timer needs to be reset.

4.3 CHECKING THE ENGINE OIL LEVEL

For oil capacities, see the Specifications section. For engine oil recommendations, see the Engine Oil Recommendations section.

When power outages necessitate running the generator for extended periods of time, the oil level should be checked daily.

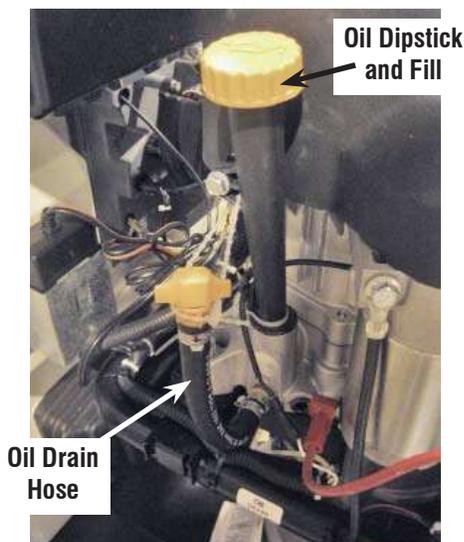
To check the engine oil level, proceed as follows (Figures 4.1):

1. If the generator is running during a utility outage, first turn OFF all associated loads running in the residence. Second, turn the generator's main circuit breaker to the OFF position.
2. Move the AUTO/OFF/MANUAL switch to the OFF position.
3. Remove the dipstick and wipe it dry with a clean cloth.
4. Completely insert the dipstick; 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.
5. Install the dipstick.
6. Reset the AUTO/OFF/MANUAL switch to its original position.
7. If the generator was running during a utility outage, first turn the generator's main circuit breaker back to the ON position. Second, turn ON needed loads in the residence.

⚠ CAUTION!

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

Figure 4.1 — Oil Dipstick and Fill



4.4 CHANGING THE ENGINE OIL

⚠ CAUTION!

⚠ **Hot oil may cause burns. Allow engine to cool before draining oil. Avoid prolonged or repeated skin exposure with used oil. Thoroughly wash exposed areas with soap.**

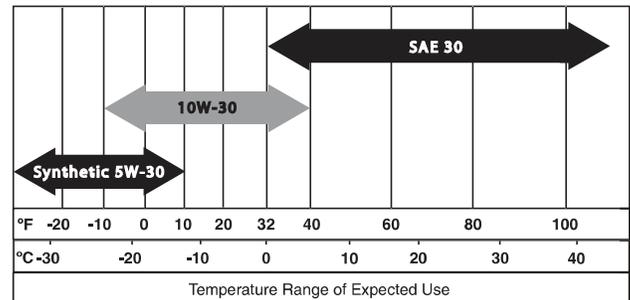
4.4.1 OIL CHANGE INTERVALS

See the "Service Schedule" section.

4.4.2 ENGINE OIL RECOMMENDATIONS

All oil should meet minimum American Petroleum Institute (API) Service Class SJ, SL or better. Use no special additives. Select the oil's viscosity grade according to the expected operating temperature.

- SAE 30 → Above 32° F
- 10W-30 → Between 40° F and -10° F
- Synthetic 5W-30 → 10° F and below



⚠ 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.**

4.4.3 OIL & OIL FILTER CHANGE PROCEDURE

To change the oil, proceed as follows:

1. Start the engine by moving the AUTO/OFF/MANUAL switch to MANUAL and run until it is thoroughly warmed up. Then shut OFF the engine by moving the switch to the OFF position.
2. Immediately after the engine shuts OFF, pull the oil drain hose (Figure 4.1) free of its zip-tie. Remove the cap from the hose and drain the oil into a suitable container.
3. After the oil has drained, replace the cap onto the end of the oil drain hose. Retain the hose in the zip-tie when finished.

Change the engine oil filter as follows:

1. With the oil drained, remove the old oil filter by turning it counterclockwise.
2. Apply a light coating of clean engine oil to the gasket of the new filter. See the Specifications section for recommended filter.

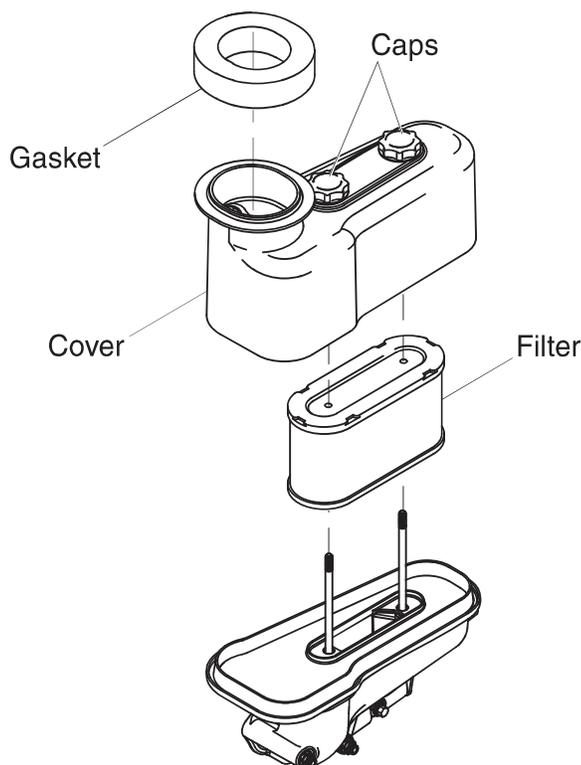
3. Screw the new filter on by hand until its gasket lightly contacts the oil filter adapter. Then, tighten the filter an additional 3/4 to one turn (Figure 3.5).
4. Refill with the proper recommended oil (see the Engine Oil Recommendations section). See the Specifications section for oil capacities.
5. Start the engine, run for one (1) minute, and check for leaks.
6. Shutdown and recheck oil level, add as needed. **DO NOT OVER FILL.**
7. Reset the AUTO/OFF/MANUAL switch to the AUTO position.
8. Dispose of used oil at a proper collection center.

4.5 CHANGING THE ENGINE AIR CLEANER

See "The Generator" section for the location of the air cleaner. Use the following procedures (Figure 4.2):

1. Lift the roof.
 2. Turn the two caps counterclockwise to loosen.
 3. Remove the cover and air filter.
 4. Wipe away dust or debris from inside of the air box and around edges.
 5. Install the new air cleaner into the air box.
 6. Install the cover. Turn the two cover caps clockwise to tighten.
- See the Service Schedule section for air cleaner maintenance. See the Specifications section for air filter replacement part number.

Figure 4.2 — Engine Air Cleaner

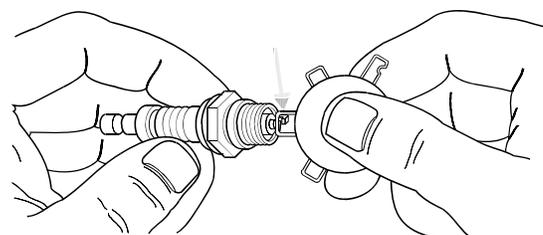


4.6 SPARK PLUG

Reset the spark plug gap or replace the spark plug as necessary. See the Service Schedule section for maintenance requirements.

1. Clean the area around the base of the spark plug to keep dirt and debris out of the engine.
2. Remove the spark plug and check the condition. Replace the spark plug if worn or if reuse is questionable. See the Service Schedule section for recommended inspection. Clean by scraping or washing using a wire brush and commercial solvent. Do not blast the spark plug to clean.
3. Check the spark plug gap using a wire feeler gauge. Adjust the gap to 0.76 mm (0.030 inch) (Figure 4.3).

Figure 4.3 – Setting the Spark Plug Gap



4.7 BATTERY MAINTENANCE

The battery should be inspected per the "Service Schedule" section. The following procedure should be followed for inspection:

1. Inspect the battery posts and cables for corrosion and tightness. Clean and tighten 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.

⚠ DANGER!

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

⚠ A battery presents a risk of electrical shock and high short circuit current. The following precautions are to be observed when working on batteries:

- Remove the 7.5A fuse from the generator control panel.
- Remove watches, rings or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of the battery.
- Disconnect charging source prior to connecting or disconnecting battery terminals.

⚠ WARNING!

⚠ Do not open or mutilate the battery. Released electrolyte has been known to be harmful to the skin and eyes, and to be toxic.

Maintenance

! The electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. The following procedures are to be observed:

- Wear full eye protection and protective clothing.
- If electrolyte contacts the skin, wash it off immediately with water.
- If electrolyte contacts the eyes, flush thoroughly and immediately with water and seek medical attention.
- Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of 1 pound (500 grams) bicarbonate of soda to 1 gallon (4 liters) of water. The bicarbonate of soda (baking soda) solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water and the area dried.

⚠ Lead-acid batteries present a risk of fire because they generate hydrogen gas. The following procedures are to be followed:

- DO NOT SMOKE when near the battery.
- DO NOT cause flame or spark in battery area.
- Discharge static electricity from body before touching the battery by first touching a grounded metal surface.

! 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.

⚠ Be sure the utility power supply is turned off and the 7.5A fuse is removed from the generator control panel, or sparking may occur at the battery posts as the cables are attached and cause an explosion.

4.8 ADJUSTING OHV-432 VALVE CLEARANCE

After the first six (6) months of operation, check the valve clearance in the engine, adjust if necessary.

Important: If feeling uncomfortable about doing this procedure or the proper tools are not available, please contact the Dealer for service assistance. This is a very important step to ensure longest life for the engine.

To check valve clearance:

- The engine should be cool before checking. If valve clearance is 0.006" - 0.008" (0.15 - 0.20mm), adjustment is not needed.
- Remove spark plug wire and position wire away from plug.
- Remove spark plug.

- Make sure the piston is at Top Dead Center (TDC) of its compression stroke (both valves closed). To get the piston at TDC, remove the intake screen at the top of the engine to gain access to the flywheel nut. Use a large socket and socket wrench to rotate the nut and hence the engine in a clockwise direction. While watching the piston through the spark plug hole. The piston should move up and down. The piston is at TDC when it is at its highest point of travel.

To adjust valve clearance (if necessary):

- Make sure the engine is at 60° to 80° F.
- Make sure that the spark plug wire is removed from the spark plug and is out of the way.
- Remove the four screws attaching the valve cover.
- Loosen the rocker jam nut. Use a wrench to turn the pivot ball stud while checking clearance between the rocker arm and the valve stem with a feeler gauge. Correct clearance is:
 - Intake — 0.005-0.007 inch (0.13-0.17 mm)
 - Exhaust — 0.007-0.009 inch (0.18-0.22 mm)

NOTE:

Hold the rocker arm jam nut in place as the pivot ball stud is turned.

When valve clearance is correct, tighten the rocker arm jam nut. Tighten the jam nut to 70 to 106 in/lbs. torque. After tightening the jam nut, recheck valve clearance to make sure it did not change.

- Install new valve cover gasket.
- Re-attach the valve cover.

NOTE:

Start all four screws before tightening or it will not be possible to get all the screws in place. Make sure the valve cover gasket is in place.

- Install spark plug.
- Re-attach the spark plug wire to the spark plug.

4.9 COOLING SYSTEM

Air inlet 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.

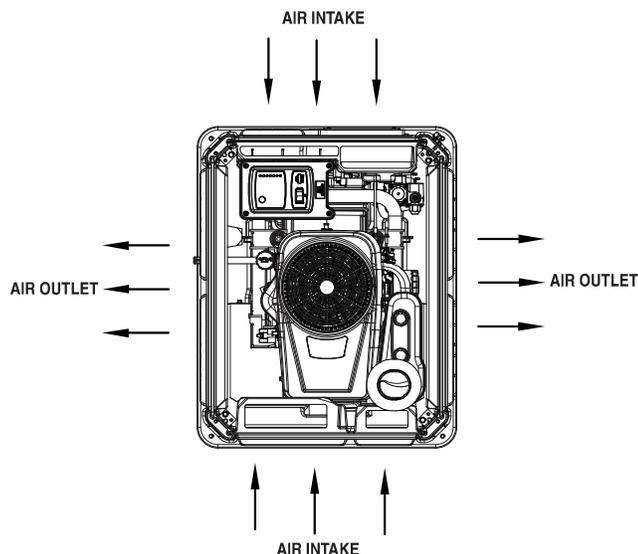
Without sufficient cooling and ventilating air flow, the engine/generator quickly overheats, which causes it to quickly shut down. (See Figure 4.4 for vent locations.)

Make sure the door and roof are in place during operation as running the generator with them removed can affect cooling air movement.

⚠ WARNING!

⚠ The exhaust from 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.

Figure 4.4 – Cooling Vent Locations



4.10 ATTENTION AFTER SUBMERSION

If the generator has been submerged in water, it **MUST NOT** be started and operated. Following any submersion in water, have a Dealer thoroughly clean, dry and inspect the generator. If the structure (ex. home) has been flooded, it should be inspected by a certified electrician to ensure there won't be any electrical problems during generator operation or when utility is returned.

4.11 CORROSION PROTECTION

Spray engine linkages with a light oil such as WD-40.

4.12 OUT OF SERVICE PROCEDURE

4.12.1 REMOVAL FROM SERVICE

If the generator cannot be exercised every seven days, and will 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, switch to the OFF position.
4. Set the generator's main circuit breaker to its OFF (or OPEN) position.
5. Set the AUTO/OFF/MANUAL switch to OFF and turn off the utility power to the transfer switch. Remove the 7.5A fuse from the generator control panel. Disconnect the battery cables as outlined in "General Hazards".
6. While the engine is still warm from running, drain the oil completely. Refill the crankcase with oil. See "Engine Oil Recommendations".

7. Attach a tag to the engine indicating the viscosity and classification of the oil in the crankcase.
8. Remove the spark plug and spray fogging agent into the spark plug threaded openings. Reinstall and tighten the spark plug.
9. 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.
10. Clean and wipe the entire generator. Use only mild soap and water to clean the composite enclosure.

4.12.2 RETURN TO SERVICE

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

1. Verify that utility power is turned off 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 the engine (see the Engine Oil Recommendations section). If necessary, drain and refill with the proper oil.
3. Check the state of the battery. Fill all cells of unsealed batteries to the proper level with distilled water. **DO NOT USE TAP WATER IN THE BATTERY.** Recharge the battery to 100 percent state of charge, or, if defective, replace the battery. See "Specifications," for type and size.
4. Clean and wipe the entire generator. Use only mild soap and water to clean the composite enclosure.
5. Make sure the 7.5A fuse is removed from the generator control panel. Reconnect the battery. Observe battery polarity. Damage may occur if the battery is connected incorrectly.
6. Open the fuel shutoff valve.
7. Insert the 7.5A fuse into the generator control panel. Start the unit by moving the AUTO/OFF/MANUAL switch to MANUAL. Allow the unit to warm up thoroughly.
8. Stop the unit by setting 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. The generator is now ready for service.

NOTE:

If the battery was dead or disconnected, the exercise timer, current date and time must be reset.

4.12.3 ACCESSORIES

There are performance enhancing accessories available for the air-cooled generators.

- **Cold Weather Kits** are recommended in areas where temperatures regularly fall below 32° F (0° C).
- **Scheduled Maintenance Kits** include all pieces necessary to perform maintenance on the generator along with oil recommendations.

For more details on accessories, please contact a Dealer.

Maintenance

4.13 SERVICE SCHEDULE

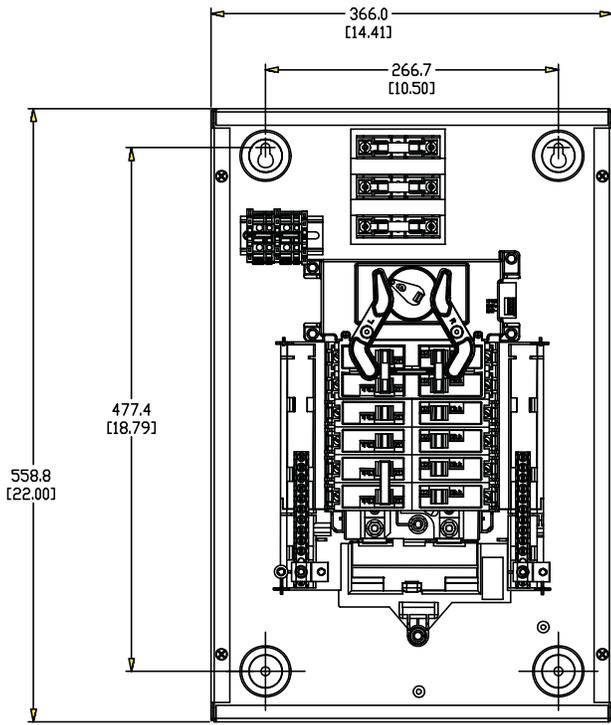
ATTENTION: It is recommended that all service work be performed by the nearest Dealer.

SYSTEM/COMPONENT	PROCEDURE			FREQUENCY
	Inspect	Change	Clean	
X = Action R = Replace as Necessary * = Notify Dealer if Repair is Needed.				W = Weekly M = Monthly Y = Yearly
FUEL				
Fuel lines and connections*	X			M
LUBRICATION				
Oil level	X			M or 24 hours of continuous operation.
Oil		X		1Y or 100 hours of operation.**
Oil filter		X		1Y or 100 hours of operation.**
COOLING				
Enclosure louvers	X		X	W
BATTERY				
Remove corrosion, ensure dryness	X		X	M
Clean and tighten battery terminals	X		X	M
Check charge state	X	R		EVERY 6 M
Electrolyte level	X	R		EVERY 6 M
ENGINE AND MOUNTING				
Air cleaner	X	R		1Y or 200 hours
Spark plug	X	R		1Y or 200 hours
GENERAL CONDITION				
Vibration, Noise, Leakage, Temperature*	X			M
COMPLETE TUNE-UP*	TO BE COMPLETED BY A DEALER			1Y or 200 hours
* Contact the nearest dealer for assistance if necessary.				
** Change oil and filter after first eight (8) hours of operation and then every 100 hours thereafter, or 1 year, whichever occurs first. Change sooner when operating under a heavy load or in a dusty or dirty environment or in high ambient temperatures.				

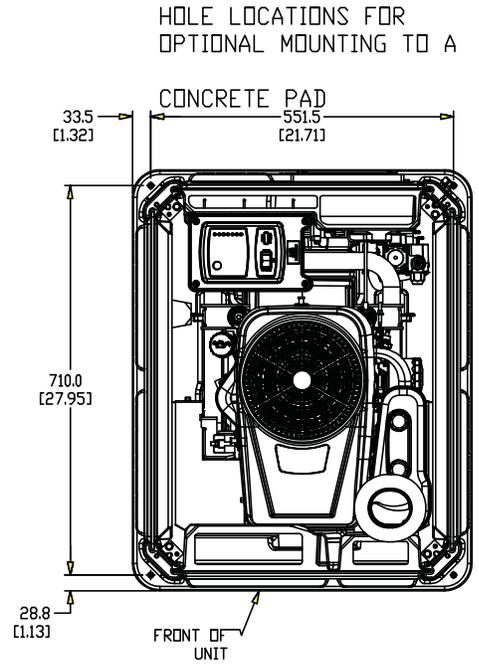
5.1 TROUBLESHOOTING GUIDE

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. Correct short circuit condition, replace 7.5A fuse in generator control panel. 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. Fouled spark plug. 5. Valve lash out of adjustment. 6. Choke not operating. 	<ol style="list-style-type: none"> 1. Replenish fuel/Turn on fuel valve. 2. * 3. * 4. Clean, re-gap or replace plug. 5. Reset valve lash. 6. Verify choke plate moves freely.
The engine starts hard and runs rough.	<ol style="list-style-type: none"> 1. Air cleaner plugged or damaged. 2. Fouled spark plug. 3. Fuel pressure incorrect. 4. Fuel selector in wrong position. 5. Choke remains closed. 	<ol style="list-style-type: none"> 1. Check, replace air cleaner. 2. Clean, re-gap or replace plug. 3. Confirm fuel pressure to regulator is 10-12" water column (0.36-0.43 psi) for LP, and 5-7" water column (0.18-0.25 psi) for natural gas. 4. Move selector to correct position. 5. Verify choke plate moves freely.
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. Main line circuit breaker is in the OFF (or OPEN) position. 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. Defective transfer switch coil. 2. Transfer switch control circuit open. 3. Defective control logic board. 	<ol style="list-style-type: none"> 1. * 2. * 3. *
Unit consumes large amounts of oil.	<ol style="list-style-type: none"> 1. Engine over filled with oil. 2. Improper type or viscosity of oil. 3. Damaged gasket, seal or hose. 4. Engine breather defective. 	<ol style="list-style-type: none"> 1. Adjust oil to proper level. 2. See "Engine Oil Recommendations". 3. Check for oil leaks. 4. *

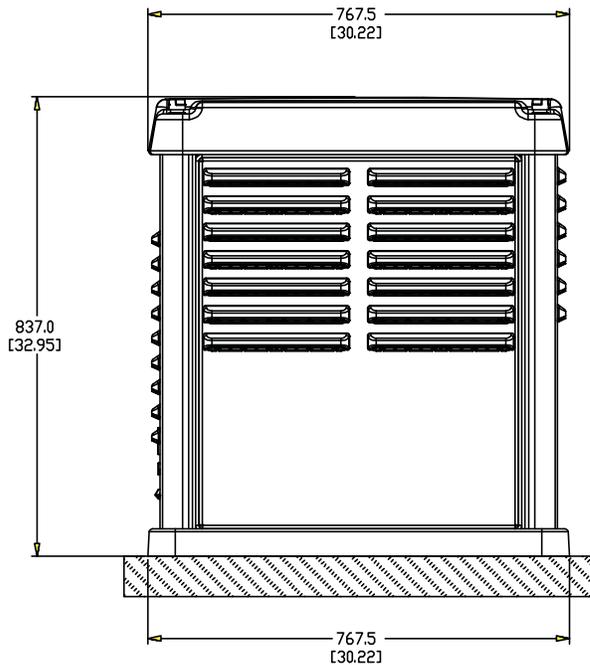
***Contact the nearest Dealer for assistance.**



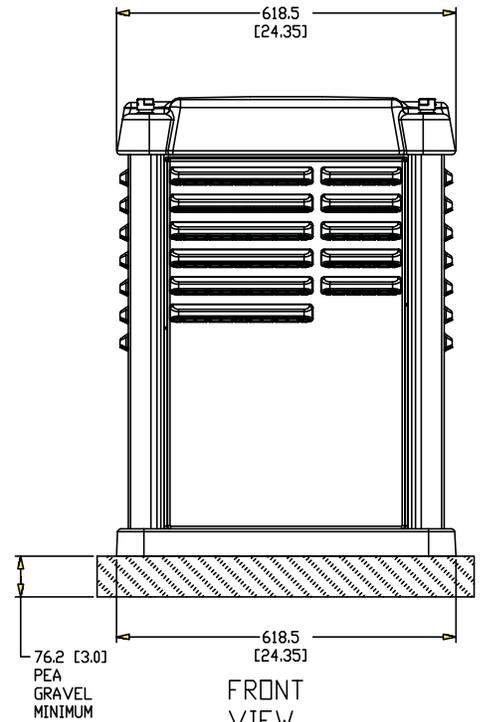
TRANSFER SWITCH DETAIL
COVER REMOVED FOR
CLARITY



GENERATOR DETAIL
ROOF REMOVED FOR
CLARITY
"DO NOT LIFT BY
ROOF"

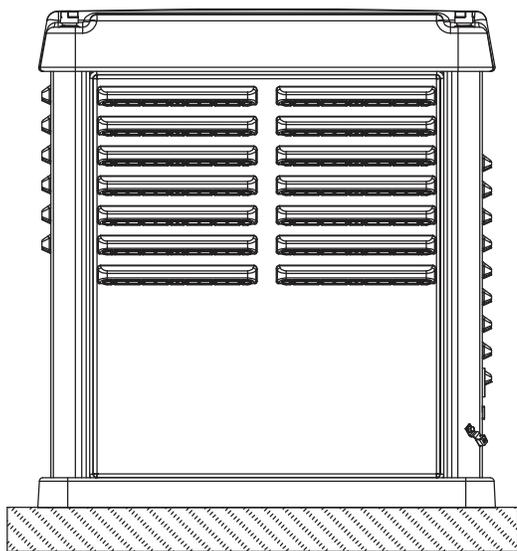
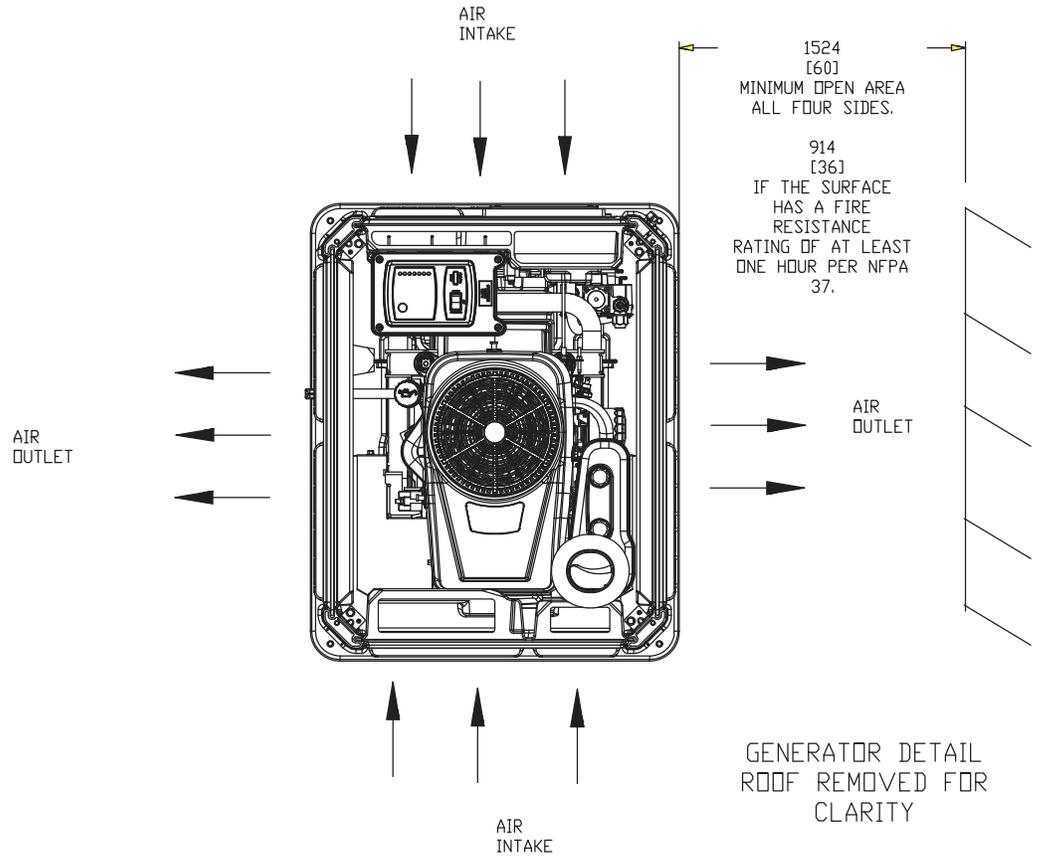


LEFT EXHAUST SIDE
VIEW

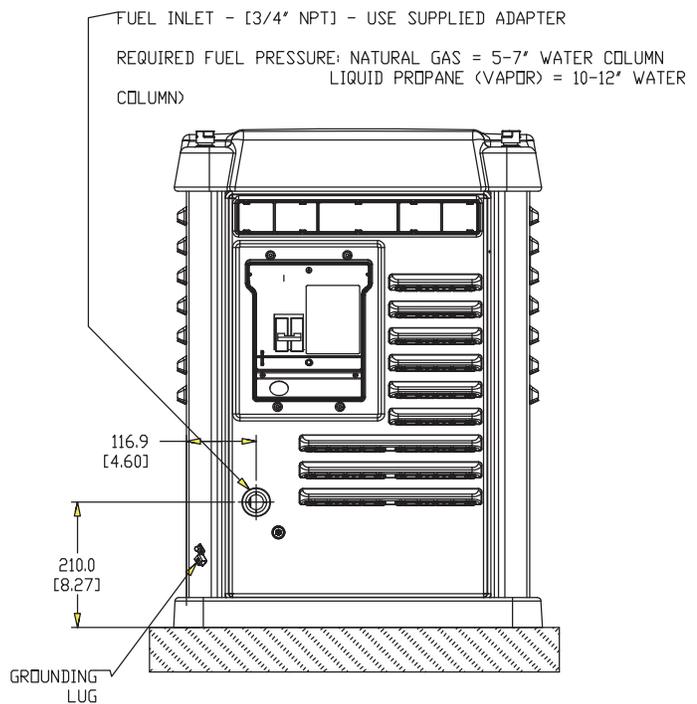


FRONT
VIEW

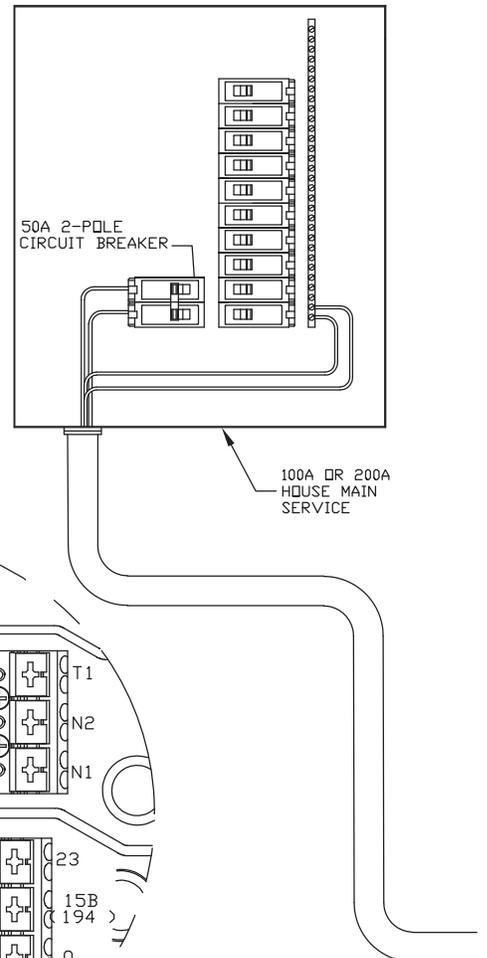
UNIT MAY BE MOVED USING HAND TRUCK FROM EITHER EXHAUST SIDE OR FRONT



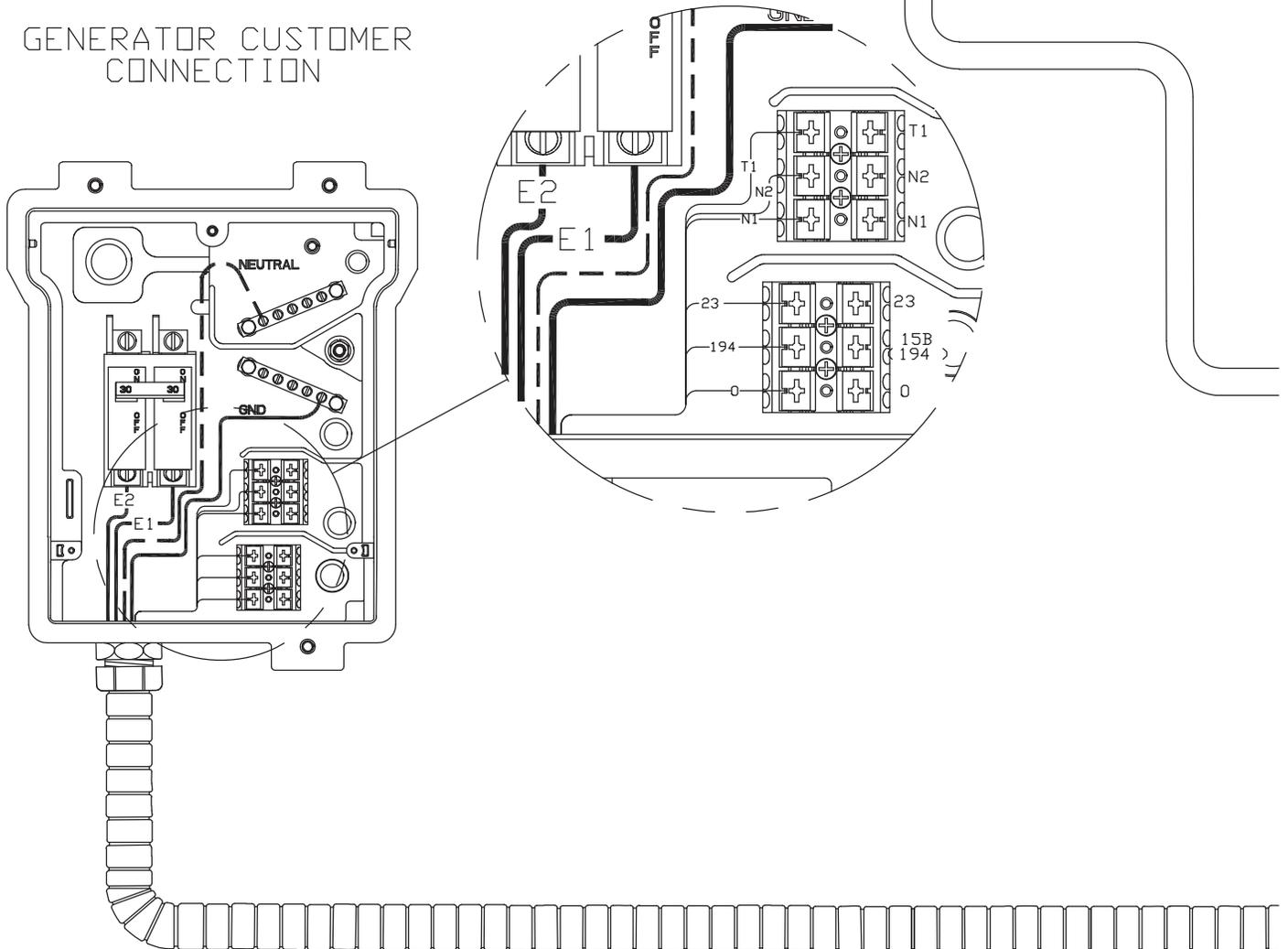
RIGHT EXHAUST SIDE
VIEW



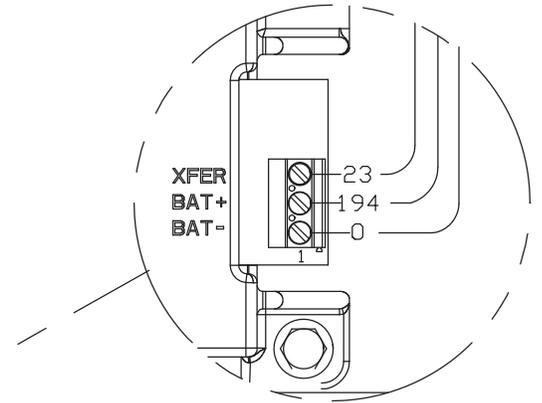
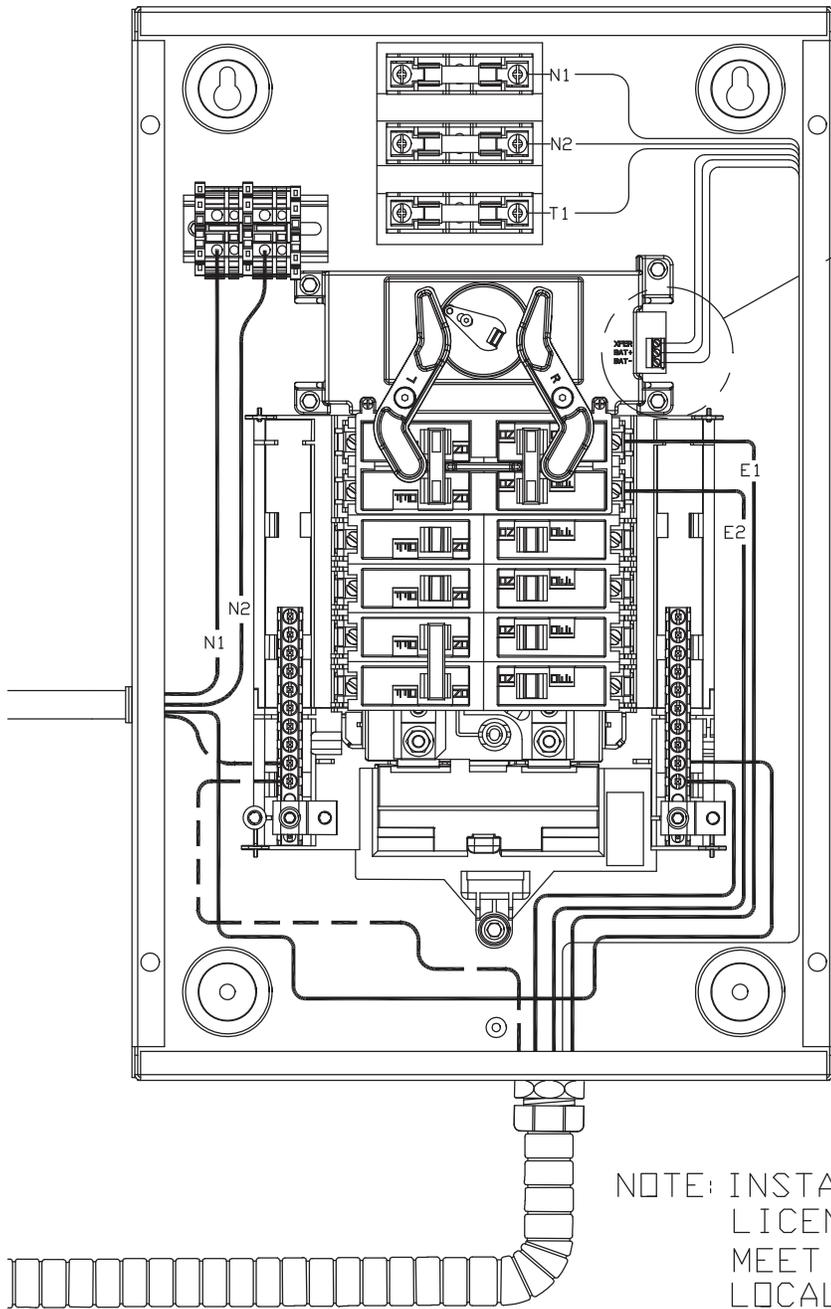
REAR
VIEW



GENERATOR CUSTOMER
CONNECTION



8 CIRCUIT TRANSFER SWITCH



NOTE: INSTALLATION TO BE DONE BY A LICENSED ELECTRICIAN AND MUST MEET ALL NATIONAL, STATE AND LOCAL ELECTRICAL CODES.

Warranty

U.S. EPA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS

The United States Environmental Protection Agency (EPA) and Generac Power Systems, Inc. (Generac) are pleased to explain the Emission Control System Warranty (ECS Warranty) on your new 2011 and later equipment. New equipment that use small spark-ignited engines must be designed, built, and equipped to meet stringent anti-smog standards for the federal government. Generac will warrant the emission control system on your equipment for the period of time listed below provided there has been no abuse, neglect, unapproved modification or improper maintenance of your equipment. The emission control system on this equipment includes all components whose failure would increase the emissions of any regulated pollutant. These components are listed in the Emissions Information section of this manual.

MANUFACTURER'S WARRANTY COVERAGE:

This ECS Warranty is valid for two years, or for the same period as specified in the Generac Limited Warranty, whichever is longer. For equipment with hour meters, the warranty period is a number of hours equal to half the Useful Life to which the equipment is certified, or the warranty period specified above in years, whichever is less. The Useful Life can be found on the Emission Control Label on the engine. If, during such warranty period, any emission-related part on your equipment is found to be defective in materials or workmanship, repairs or replacement will be performed by a Generac Authorized Warranty Service Dealer.

OWNER'S WARRANTY RESPONSIBILITIES:

As the equipment owner, you are responsible for the completion of all required maintenance as listed in your factory supplied Owner's Manual. For warranty purposes, Generac recommends that you retain all receipts covering maintenance on your generator, but Generac cannot deny warranty solely due to the lack of receipts.

You should be aware that Generac may deny any and/or all warranty coverage or responsibility if your equipment, or a part/component thereof, has failed due to abuse, neglect, improper maintenance, or unapproved modifications.

You are responsible for contacting a Generac Authorized Warranty Dealer 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 Dealer. To locate the Generac Authorized Warranty Service Dealer nearest you, call our toll free number below, or email emissions@generac.com.

1-800-333-1322

IMPORTANT NOTE: This warranty statement explains your rights and obligations under the Emission Control System Warranty, which is provided to you by Generac pursuant to federal law. See also the "Generac Limited Warranties for Generac Power Systems, Inc.," which is enclosed herewith on a separate sheet, also provided to you by Generac. Note that this warranty shall not apply to 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). 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. Any implied warranties which are allowed by law, shall be limited in duration to the terms of the express warranty provided herein. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

The ECS Warranty applies only to the emission control system of your new equipment. Both the ECS Warranty and the Generac Warranty describe important rights and obligations with respect to your new engine.

Warranty service can be performed only by a Generac Authorized Warranty Service Facility. When requesting warranty service, evidence must be presented showing the date of the sale to the original purchaser/owner.

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.
P.O. BOX 297 • WHITEWATER, WI 53190**

Warranty

EMISSION CONTROL SYSTEM WARRANTY

Emission Control System Warranty (ECS Warranty) for equipment using small spark-ignited engines:

- (a) Applicability: This warranty shall apply to equipment that uses small off-road engines. The ECS Warranty period shall begin on the date the new equipment is purchased by/delivered to its original, end-use purchaser/owner and shall continue for the lesser of:
- (1) The period of time specified in the Generac Limited Warranty enclosed herewith, but not less than 24 months, or
 - (2) For engines equipped with hour meters, a number of operating hours equal to half of the engine's useful life. The useful life is specified on the Emissions Control Label on the engine.
- (b) General Emissions Warranty Coverage: Generac warrants to the original, end-use purchaser/owner of the new engine or equipment and to each subsequent purchaser/owner that the ECS when installed was:
- (1) Designed, built and equipped so as to conform with all applicable regulations; and
 - (2) Free from defects in materials and workmanship which cause the failure of a warranted part at any time during the ECS Warranty Period.
- (c) The warranty on emissions-related parts will be interpreted as follows:
- (1) Any warranted part that is not scheduled for replacement as required maintenance in the Owner's Manual shall be warranted for the ECS Warranty Period. If any such part fails during the ECS Warranty Period, it shall be repaired or replaced by Generac according to Subsection (4) below. Any such part repaired or replaced under the ECS Warranty shall be warranted for the remainder of the ECS Warranty Period.
 - (2) Any warranted part that is scheduled only for regular inspection as specified in the Owner's Manual shall be warranted for the ECS Warranty Period. A statement in the Owner's Manual to the effect of "repair or replace as necessary" shall not reduce the ECS Warranty Period. Any such part repaired or replaced under the ECS Warranty shall be warranted for the remainder of the ECS Warranty Period.
 - (3) Any warranted part that is scheduled for replacement as required maintenance in the Owner's Manual shall be warranted for the period of time prior to first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by Generac according to Subsection (4) below. Any such emissions-related part repaired or replaced under the ECS warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for that part.
 - (4) Repair or replacement of any warranted, emissions-related part under this ECS Warranty shall be performed at no charge to the owner at a Generac Authorized Warranty Service Facility.
 - (5) Notwithstanding the provisions of subsection (4) above, warranty services or repairs must be provided at Generac Authorized Service Facilities.
 - (6) When the engine is inspected by a Generac Authorized Warranty Service Facility, the purchaser/owner shall not be held responsible for diagnostic costs if the repair is deemed warrantable.
 - (7) Throughout the ECS Warranty Period, Generac shall maintain a supply of warranted emission-related parts sufficient to meet the expected demand for such parts.
 - (8) Any Generac authorized and approved emission-related replacement parts may be used in the performance of any ECS Warranty maintenance or repairs and will be provided without charge to the purchaser/owner. Such use shall not reduce Generac's ECS Warranty obligations.
 - (9) No modifications, other than those explicitly approved by Generac, may be made to the generator. Unapproved modifications void this ECS Warranty and shall be sufficient ground for disallowing an ECS Warranty claim.
 - (10) Generac shall not be held liable hereunder for failures of any non-authorized replacement parts, or failures of any authorized parts caused by the use of non-authorized replacement parts.

EMISSION RELATED PARTS MAY INCLUDE THE FOLLOWING (IF EQUIPPED):

- | | |
|----------------------------------|--------------------------|
| 1) FUEL METERING SYSTEM | 3) IGNITION SYSTEM |
| A. CARBURETOR AND INTERNAL PARTS | A. SPARK PLUGS |
| B. FUEL TANK/CAP | B. IGNITION COILS/MODULE |
| C. FUEL LINES | 4) AIR INJECTION SYSTEM |
| D. EVAPORATIVE VENT LINES | A. PULSE AIR VALVE |
| E. REGULATOR (GASEOUS FUELS) | 5) EXHAUST SYSTEM |
| 2) AIR INDUCTION SYSTEM | A. CATALYST |
| A. INTAKE MANIFOLD | B. EXHAUST MANIFOLD |
| B. AIR FILTER | |

Part 2 of 2

Warranty

GENERAC POWER SYSTEMS LIMITED WARRANTY FOR “COREPOWER” EMERGENCY AUTOMATIC STANDBY GENERATORS

For a period of two years from the date of original sale Generac Power Systems, Inc. (Generac) warrants that its standby generator will be free from defects in material and workmanship for the items and period set forth below. Generac Power Systems, Inc will, at its option, repair or replace any part(s) which, upon examination, inspection and testing by Generac Power Systems, Inc. or an Authorized/Certified Generac Dealer, is found to be defective. Any equipment that the purchaser/owner claims to be defective must be examined by the nearest Authorized/Certified Generac Dealer. This warranty applies only to Generac emergency automatic standby generators used in "Standby" applications as Generac Power Systems, Inc has defined Standby. Scheduled Maintenance, as outlined by the generator owner's manual, is highly recommended. This Scheduled Maintenance should be performed by an Authorized/Certified Generac Dealer. This will verify service has been performed on this unit throughout the warranty period.

This warranty applies to units installed in the US and Canada. Contact the Warranty Department for specific information on installations in International Markets.

WARRANTY SCHEDULE

UNITED STATES AND CANADA

YEARS ONE AND TWO – Limited comprehensive coverage on mileage, labor and parts listed.

GUIDELINES:

1. Travel allowances are limited to 100 miles maximum and three (3) hours maximum (per occurrence) round trip to the nearest Authorized/Certified Generac Service Dealer.
2. Warranty begins upon the successful registration of the unit.
3. Proof of Purchase and Maintenance must be available.
4. Warranty only applies to permanently wired and mounted units.
5. Warranty is transferable between ownership of original installation site.
6. Any and all warranty repairs and/or concerns, must be performed and/or addressed by an Authorized/Certified Generac Power Systems Service Dealer, or branch thereof. Repairs or diagnostics performed by individuals other than Generac authorized dealer not authorized in writing by Generac Power Systems will not be covered.
7. A Generac Power Systems, Inc. Transfer Switch is to be used in conjunction with the generator set. If a Non-Generac Transfer Switch is substituted for use and directly causes damage to the generator set, no warranty coverage shall apply.
8. All warranty expense allowances are subject to the conditions defined in Generac's General Service Policy Manual.
9. Covered warranty labor rates are based on normal operating hours. Overtime, holiday, or emergency labor costs for repairs outside of normal business hours will be the responsibility of the customer.

THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

1. Any unit built/manufactured prior to July 1, 2010.
2. Damage to any covered components or consequential damages caused by the use of a non-OEM part will not be covered by the warranty.
3. Costs of normal maintenance (i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up).
4. Units sold, rated or used for "Prime Power", "Trailer Mounted" or "Rental Unit" applications as Generac Power Systems has defined Prime Power, Trailer Mounted or Rental Unit. Contact a Generac Power Systems Distributor for Prime Power, Trailer Mounted or Rental Unit definitions.
5. Units used for prime power in place of existing utility power (where utility power is present) or in place of utility power where utility power service does not normally exist.
6. Damage to generator system (including transfer switch) caused by improper installation or costs necessary to correct installation.
7. Fuel connections other than conventional utility company supplied natural gas systems or conventional LP vapor withdrawal systems.
8. Any failure caused by contaminated fuels, oils, coolants/antifreeze or lack of proper fuels, oils or coolants/antifreeze.
9. Failures due, but not limited, to normal wear and tear, accident, misuse, abuse, negligence, misapplication or improper installation.
10. As with all mechanical devices, the Generac engines need periodic part(s) service and replacement to perform as designed. This warranty will not cover repair when normal use has exhausted the life of a part(s) or engine.
11. Products that are modified or altered in a manner not authorized by Generac in writing.
12. Damage related to rodent and/or insect infestation.
13. Failures caused by any external cause or act of God including, without limitation, collision, theft, vandalism, riot or wars, nuclear event, fire, lightning, earthquake, windstorm, hail, volcanic eruption, water or flood, tornado or hurricane.
14. 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).
15. Overnight freight or special shipping costs for replacement part(s).
16. Telephone, cellular phone, facsimile, internet access or other communication expenses.
17. Living or travel expenses of person(s) performing service, except as specifically included within the terms of a specific unit warranty period.
18. Rental equipment used while warranty repairs are being performed and/or overnight freight costs for replacement part(s).
19. Expenses related to "customer instruction" or troubleshooting where no manufacturing defect is found.

Warranty

20. Costs incurred for equipment used for removal and/or reinstallation of generator, (i.e.; cranes, hoists, lifts, etc.)
21. Planes, ferries, railroad, buses, helicopters, snowmobiles, snow-cats, off-road vehicles or any other mode of transport deemed abnormal.
22. 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. Any implied warranties which are allowed by law, shall be limited in duration to the terms of the express warranty provided herein. 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. This warranty gives you specific legal rights. You also have other rights from state to state.

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To locate the nearest Authorized Dealer and to download schematics, exploded parts views and parts lists visit our website: www.generac.com

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