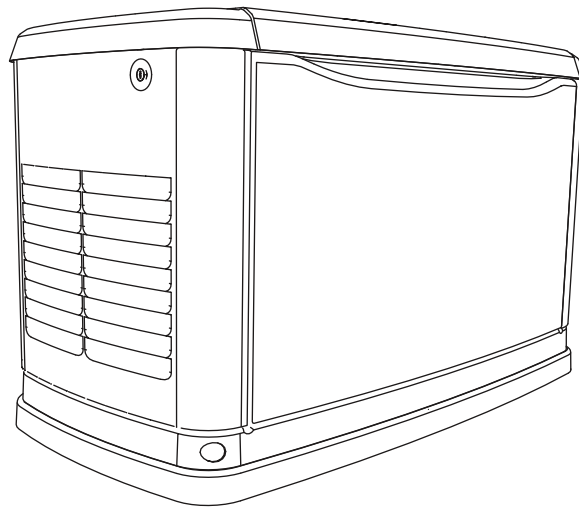




# *Installation Guidelines*

## *60 Hz Air-Cooled Generators*

15 kW EcoGen™



### **⚠ WARNING**

This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury.

(000209a)

Register your Generac product at:  
[WWW.GENERAC.COM](http://WWW.GENERAC.COM)  
1-888-GENERAC  
(888-436-3722)

Para español , visita: <http://www.generac.com/service-support/product-support-lookup>

Pour le français, visiter : <http://www.generac.com/service-support/product-support-lookup>

# **SAVE THIS MANUAL FOR FUTURE REFERENCE**

---

**Use this page to record important information about your generator set.**

Model:	
Serial:	
Prod Date Week:	
Volts:	
LPV Amps:	
NG Amps:	
Hz:	
Phase:	
Controller P/N:	

Record the information found on your unit data label on this page. For the location of the unit data label, see your Owner's Manual. The unit has a label plate affixed to the inside partition, to the left of the control panel console.

When contacting an Independent Authorized Service Dealer about parts and service, always supply the complete model number and serial number of the unit.

**Operation and Maintenance:** Proper maintenance and care of the generator ensures a minimum number of problems and keeps operating expenses at a minimum. 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 an Independent Authorized Service 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 may contribute to the need for additional maintenance or service.

When the generator requires servicing or repairs, Generac recommends contacting an Independent Authorized Service Dealer for assistance. Authorized service technicians are factory-trained and are capable of handling all service needs. To locate the nearest Independent Authorized Service Dealer, please visit the dealer locator at:

[www.generac.com/Service/DealerLocator/](http://www.generac.com/Service/DealerLocator/).

---

**! WARNING**

California Proposition 65. Engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm. (000004)

---

**! WARNING**

California Proposition 65. This product contains or emits chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm. (000005)

---

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# Section 1: Safety Rules & General Information

## Introduction

Thank you for purchasing this compact, high-performance, variable speed, air-cooled, engine-driven stationary automatic standby generator set. Every effort has been made to ensure that the information and instructions in this manual are both accurate and complete at the time of release. However, the manufacturer reserves the right to change, alter, or otherwise improve this product at any time without prior notice.

In off-grid applications as a part of an alternative energy system, the generator starts when the inverter/battery charger detects the normal power source voltage has dropped below a preset level. The generator powers the inverter and, once the voltage level of the battery rises to an acceptable level, the generator is shut down. Another off-grid application would be for use in remote locations such as for pumping water for a village or campground, or for livestock.

The unit is factory installed in an all-weather metal enclosure and **is intended for outdoor installation only**. The generator can be operated using either natural gas (NG) or vapor withdrawn liquid propane (LP).

**NOTE:** When properly sized, 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 microwaves, or loads less than 10 kW or 2 hp.

## Read This Manual Thoroughly



Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury.

(000100a)

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

This manual must be used in conjunction with the appropriate Owner's Manual.

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

Throughout this publication and on tags and decals affixed to the generator, DANGER, WARNING, and CAUTION 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 which, if not avoided, will result in death or serious injury.

(000001)

### WARNING

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

(000002)

### CAUTION

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

(000003)

**NOTE:** Notes provide additional information important to a procedure or component.

These safety warnings cannot eliminate the hazards they indicate. Observing safety precautions and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

The operator is responsible for proper and safe use of the equipment. The manufacturer strongly recommends that if the operator is also the owner, to read the 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.

## How to Obtain Service

When the generator requires servicing or repairs, contact an Independent Authorized Service Dealer for assistance. Service technicians are factory-trained and are capable of handling all service needs. For assistance locating a dealer, go to [www.generac.com/Service/DealerLocator/](http://www.generac.com/Service/DealerLocator/).

When contacting an Independent Authorized Service 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. Refer to Owner's Manual for decal location. Record the model number and serial numbers in the spaces provided on the inside front cover of this manual.

## Safety Rules

Study these SAFETY RULES carefully before installing, operating or servicing this equipment. Become familiar with this Installation Manual, the 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, verify that it is safe for others. Also, make sure the procedure, work method or operating technique utilized does not render the generator unsafe.

### General Hazards

#### **DANGER**

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury. (000190)

#### **DANGER**

Automatic start-up. Disconnect normal power source and render unit inoperable before working on unit. Failure to do so will result in death or serious injury. (000236)



#### **WARNING**

This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury. (000209a)

#### **WARNING**

This unit is not intended for use as a prime power source. It is intended for use as an intermediate power supply in the event of temporary power outage only. See individual unit specifications for required maintenance and run times pertaining to use. (000247)



#### **WARNING**

Electrocution. Potentially lethal voltages are generated by this equipment. Render the equipment safe before attempting repairs or maintenance. Failure to do so could result in death or serious injury. (000187)

#### **WARNING**

Accidental Start-up. Disconnect the negative battery cable, then the positive battery cable when working on unit. Failure to do so could result in death or serious injury. (000130)

#### **WARNING**

Only qualified service personnel may install, operate and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and damage to equipment or property. (000182)

#### **WARNING**

Only a trained and licensed electrician should perform wiring and connections to unit. Failure to follow proper installation requirements could result in death, serious injury, and damage to equipment or property. (000155)



#### **WARNING**

Moving Parts. Do not wear jewelry when starting or operating this product. Wearing jewelry while starting or operating this product could result in death or serious injury. (000115)



#### **WARNING**

Moving Parts. Keep clothing, hair, and appendages away from moving parts. Failure to do so could result in death or serious injury. (000111)



#### **WARNING**

Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire. (000108)

#### **WARNING**

Equipment and property damage. Do not alter construction of, installation, or block ventilation for generator. Failure to do so could result in unsafe operation or damage to the generator. (000146)

#### **WARNING**

Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to service this equipment and could result in death or serious injury. (000215)

**⚠ WARNING**

Injury and equipment damage. Do not use generator as a step. Doing so could result in falling, damaged parts, unsafe equipment operation, and could result in death or serious injury. (000216)

Inspect the generator regularly, and contact the nearest Independent Authorized Service Dealer for parts needing repair or replacement.

**Exhaust Hazards****⚠ DANGER**

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury. (000103)

**⚠ WARNING**

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury. (000178a)

**⚠ WARNING**

Fire hazard. Do not obstruct cooling and ventilating airflow around the generator. Inadequate ventilation could result in fire hazard, possible equipment damage, death or serious injury. (000217)

**Electrical Hazards****⚠ DANGER**

Electrocution. Contact with bare wires, terminals, and connections while generator is running will result in death or serious injury. (000144)

**⚠ DANGER**

Electrocution. Never connect this unit to the electrical system of any building unless a licensed electrician has installed an approved transfer switch. Failure to do so will result in death or serious injury. (000150)

**⚠ DANGER**

Electrical backfeed. Use only approved switchgear to isolate generator from the normal power source. Failure to do so will result in death, serious injury, and equipment damage. (000237)

**⚠ DANGER**

Electrocution. Verify electrical system is properly grounded before applying power. Failure to do so will result in death or serious injury. (000152)

**⚠ DANGER**

Electrocution. Do not wear jewelry while working on this equipment. Doing so will result in death or serious injury. (000188)

**⚠ DANGER**

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury. (000104)

**⚠ DANGER**

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury. (000145)

**Fire Hazards****⚠ WARNING**

Fire hazard. Do not obstruct cooling and ventilating airflow around the generator. Inadequate ventilation could result in fire hazard, possible equipment damage, death or serious injury. (000217)

**⚠ WARNING**

Fire and explosion. Installation must comply with all local, state, and national electrical building codes. Noncompliance could result in unsafe operation, equipment damage, death or serious injury. (000218)

**⚠ WARNING**

Fire hazard. Use only fully-charged fire extinguishers rated "ABC" by the NFPA. Discharged or improperly rated fire extinguishers will not extinguish electrical fires in automatic standby generators. (000219)

**⚠ WARNING**

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)





**⚠ WARNING**

Risk of electrocution. Refer to NFPA 70E for safety equipment required when working with a live electrical system. Failure to use required safety equipment could result in death or serious injury. (000221)



**⚠ WARNING**

Risk of Fire. Unit must be positioned in a manner that prevents combustible material accumulation underneath. Failure to do so could result in death or serious injury. (000147)

Comply with regulations the Occupational Safety and Health Administration (OSHA) has established. Also, verify 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.

### Explosion Hazards



**⚠ DANGER**

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. No leakage of fuel is permitted. Keep fire and spark away. Failure to do so will result in death or serious injury. (000192)

**⚠ DANGER**

Connection of fuel source must be done by a qualified professional technician or contractor. Incorrect installation of this unit will result in death, serious injury, and damage to equipment and property damage. (000151)



**⚠ DANGER**

Risk of fire. Allow fuel spills to completely dry before starting engine. Failure to do so will result in death or serious injury. (000174)



**⚠ WARNING**

Risk of Fire. Hot surfaces could ignite combustibles, resulting in fire. Fire could result in death or serious injury. (000110)

## General Rules

**⚠ DANGER**

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury. (000190)

**⚠ DANGER**

Electrical backfeed. Use only approved switchgear to isolate generator when electrical utility is the primary power source. Failure to do so will result in death, serious injury, and equipment damage. (000131a)

**⚠ WARNING**

Only qualified service personnel may install, operate and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and damage to equipment or property. (000182)



**⚠ WARNING**

Risk of electrocution. Refer to NFPA 70E for safety equipment required when working with a live electrical system. Failure to use required safety equipment could result in death or serious injury. (000221)

**⚠ WARNING**

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death or serious injury. (000228)

- Follow all safety precautions in the Owner's Manual, Installation Guidelines manual and other documents included with your equipment.
- Never energize a new system without opening all disconnects and breakers.
- Always consult your local code for additional requirements for the area in which the unit is being installed.

Improper installation can result in personal injury and damage to the generator. It may also result in the warranty being suspended or voided. All the instructions listed below must be followed including location clearances and pipe sizes.



## Before You Begin

- Contact the local inspector or City Hall to be aware of all federal, state and local codes that could impact the installation. Secure all required permits before starting the job.
- Carefully read and follow all of the procedures and safety precautions detailed in the installation guide. If any portion of the installation manual, technical manual or other factory-supplied documents is not completely understood, contact an Independent Authorized Service Dealer for assistance.
- Fully comply with all relevant NEC, NFPA and OSHA standards as well as all federal, state and local building and electric codes. As with any generator, this unit must be installed in accordance with current NFPA 37 and NFPA 70 standards as well as any other federal, state, and local codes for minimum distances from other structures.
- Verify the capacity of the natural gas meter or the LP tank in regards to providing sufficient fuel for both the generator and other household and operating appliances.

## NEC Requirements

Local code enforcement may require that Arc Fault Circuit Interrupters (AFCIs) be incorporated into the transfer switch distribution panel. The Transfer Switch provided with this generator has a distribution panel that will accept AFCIs (pre-wired transfer switches only).

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 pre-wired transfer switch distribution panel.

## Standards Index



### ⚠ WARNING

This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury. (000209a)

Strictly comply with all applicable national, state and local laws, as well as codes or regulations pertaining to the installation of this engine-generator power system. Use the most current version of applicable codes or standards relevant to the local jurisdiction, generator used, and installation site.

**NOTE:** Not all codes apply to all products and this list is not all-inclusive. In the absence of pertinent local laws and standards, the following publications may be used as a guide (these apply to localities which recognize NFPA and IBC).

1. National Fire Protection Association (NFPA) 70: The NATIONAL ELECTRIC CODE (NEC) \*
2. NFPA 10: Standard for Portable Fire Extinguishers \*
3. NFPA 30: Flammable and Combustible Liquids Code \*
4. NFPA 37: Standard for Stationary Combustion Engines and Gas Turbines \*
5. NFPA 54: National Fuel Gas Code \*
6. NFPA 58: Standard for Storage and Handling Of Liquefied Petroleum Gases \*
7. NFPA 68: Standard On Explosion Protection By Deflagration Venting \*
8. NFPA 70E: Standard For Electrical Safety In The Workplace \*
9. NFPA 110: Standard for Emergency and Standby Power Systems \*
10. NFPA 211: Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances \*
11. NFPA 220: Standard on Types of Building Construction \*
12. NFPA 5000: Building Code \*
13. International Building Code \*\*
14. Agricultural Wiring Handbook \*\*\*
15. Article X, NATIONAL BUILDING CODE
16. ASAE EP-364.2 Installation and Maintenance of Farm Standby Electric Power \*\*\*\*

This list is not all-inclusive. Check with the Authority Having Local Jurisdiction (AHJ) for any local codes or standards which may be applicable to your jurisdiction. The above listed standards are available from the following internet sources:

\* [www.nfpa.org](http://www.nfpa.org)

\*\* [www.iccsafe.org](http://www.iccsafe.org)

\*\*\* [www.nerc.org](http://www.nerc.org) Rural Electricity Resource Council P.O. Box 309 Wilmington, OH 45177-0309

\*\*\*\* [www.asabe.org](http://www.asabe.org) American Society of Agricultural & Biological Engineers 2950 Niles Road, St. Joseph, MI 49085

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## Section 2: Unpacking and Inspection

### General

**NOTE:** After unpacking, carefully inspect the contents for damage. It is advised to unpack and inspect the unit immediately upon delivery to detect any damage that may have occurred in transit. Any claims for shipping damage need to be filed as soon as possible with the freight carrier. This is especially important if the generator will not be installed for a period of time.

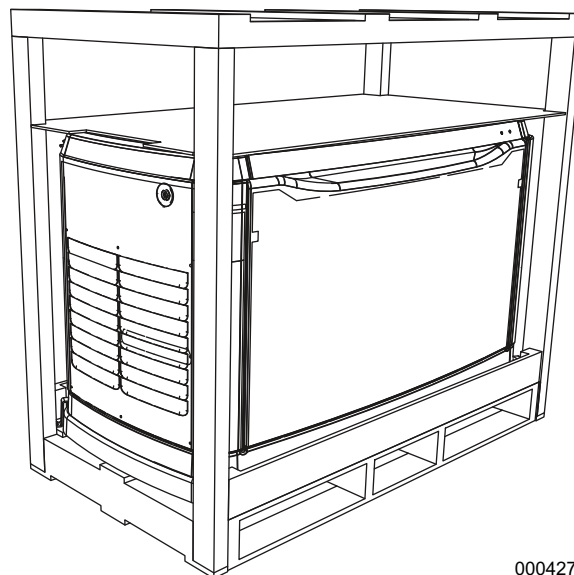
- This standby generator set is ready for installation with a factory supplied and pre-mounted base pad and has a weather protective enclosure that is **intended for outdoor installation only**.
- If any loss or damage is noted at time of delivery, have the person(s) making the delivery note all damage 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 evident at the time of delivery, but is discovered later.

### Required Tools

- General SAE and Metric hand tools
  - Wrenches
  - Sockets
  - Screwdrivers
- Standard electrician's hand tools
  - Drill and bits for mounting and routing conduits
- 4mm Allen wrench (for access to customer connections)
- 3/16 Allen wrench (test port on fuel regulator)
- Manometer (for fuel pressure checks)
- Meter capable of measuring AC/DC Voltage and Frequency
- Meter capable of measuring AC Current

### Unpacking

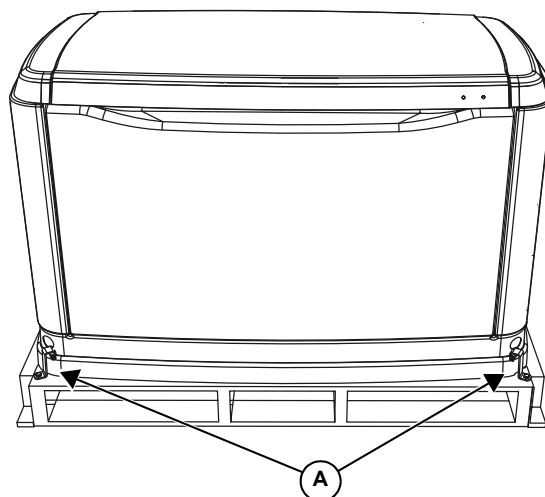
1. Remove cardboard carton.
2. See [Figure 2-1](#). Remove the wood frame.



000427

**Figure 2-1. Crated Generator**

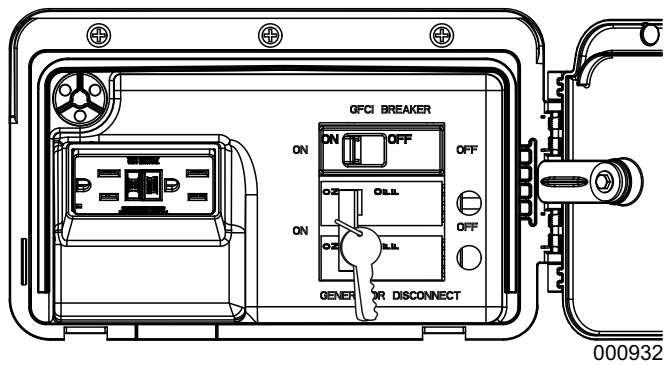
3. See [Figure 2-2](#). Remove bolts and pallet brackets (A). Exercise caution when removing the generator. Dragging it off the pallet will damage the base. The generator must be lifted from the wooden pallet to remove.



000426

**Figure 2-2. Generator on Pallet**

4. See [Figure 2-3](#). The lid will be locked. A set of keys is attached to the circuit breaker box door with a cable tie. Cut the cable tie to remove the keys. Use the keys to open the lid of the generator.



**Figure 2-3. Circuit Breaker Box and Keys**

5. Cut the cable tie to remove the keys.
6. Use the keys to open the lid of the generator.

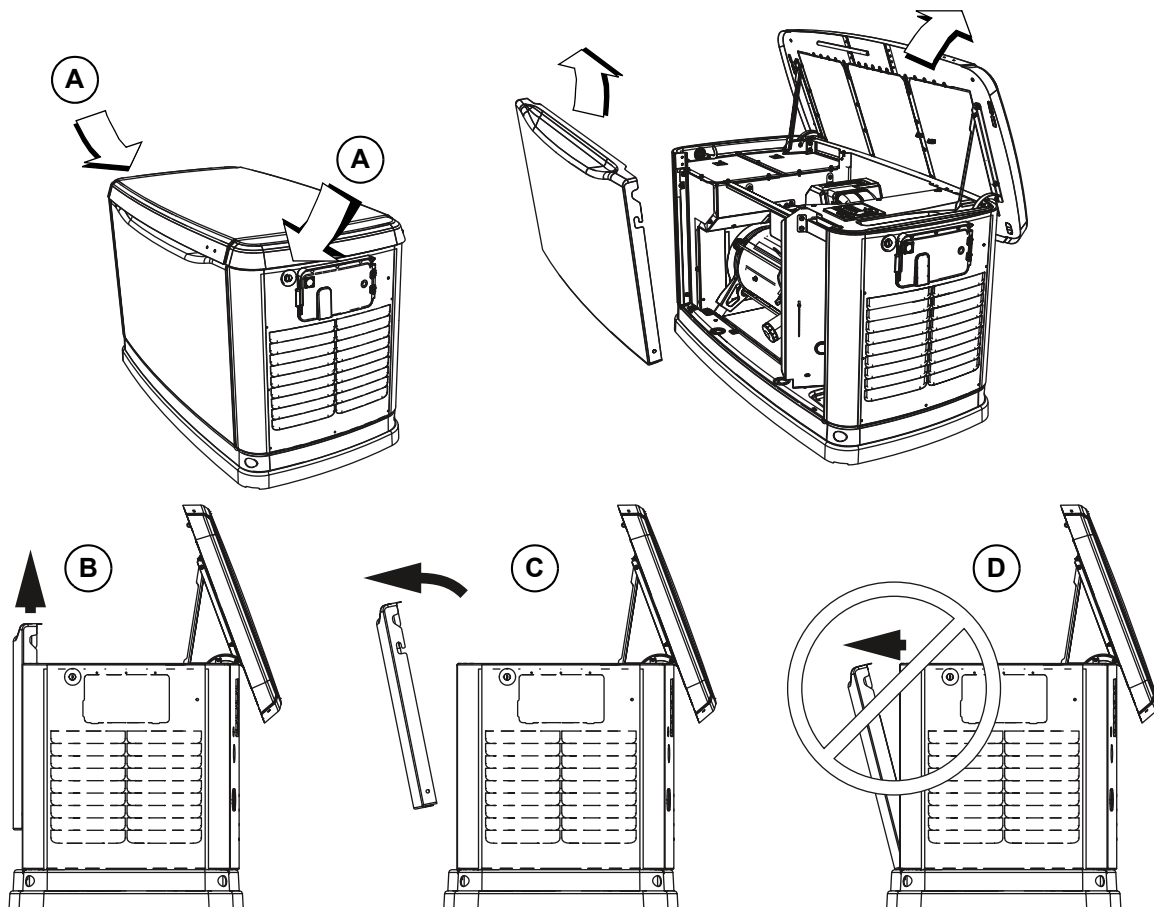
**NOTE:** The enclosed keys provided with this unit are intended for service personnel use only.

7. There are two locks securing the lid, one on each side (A in [Figure 2-4](#)). To properly open the lid, press down, on the lid, above the side lock and unlock the latch.
8. Repeat for the other side. If pressure is not applied from the top, the lid may appear stuck.

**NOTE:** Always verify that the side locks are unlocked before attempting to lift the lid.

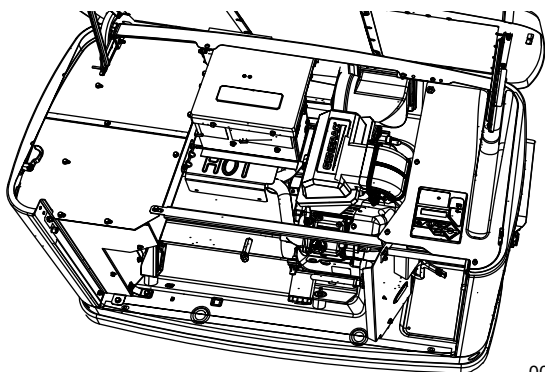
9. Once the lid is open, remove the front access panel by lifting it up and out.

**NOTE:** Always the lift the front access panel up before pulling away from enclosure (B and C in [Figure 2-4](#)). Do not pull the panel away from the enclosure before lifting up (D in [Figure 2-4](#))



**Figure 2-4. Side Lock Location and Front Panel Removal**

10. Perform a visual inspection for any hidden freight damage. If damage is present, contact the freight carrier.

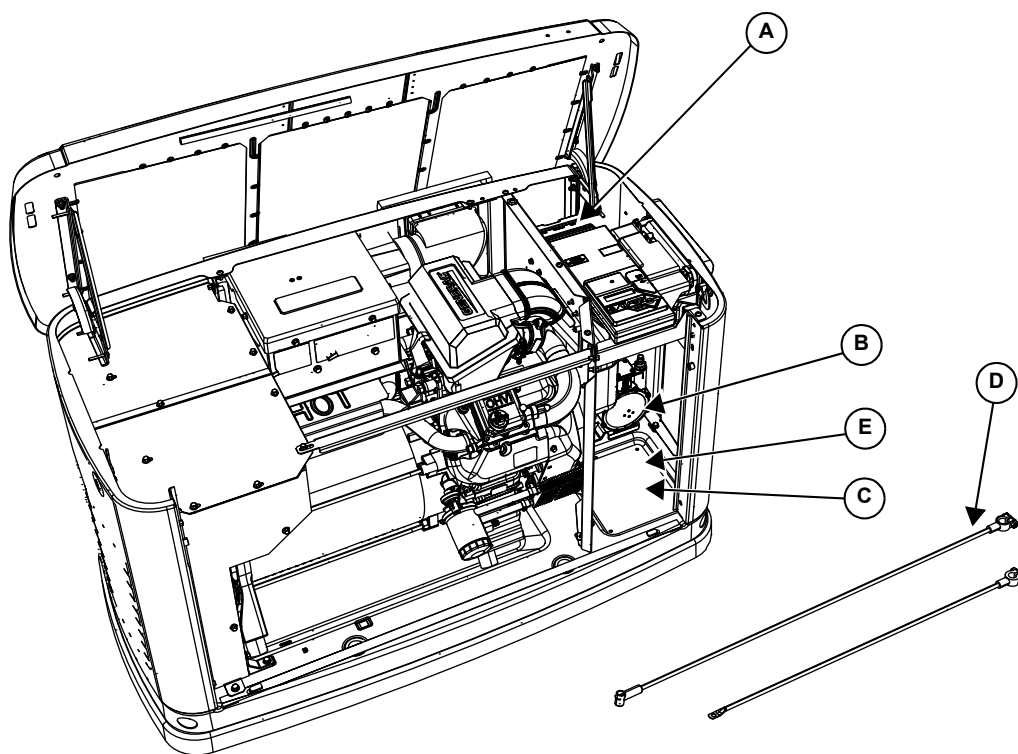


001374

**Figure 2-5. Inspect for Damage**

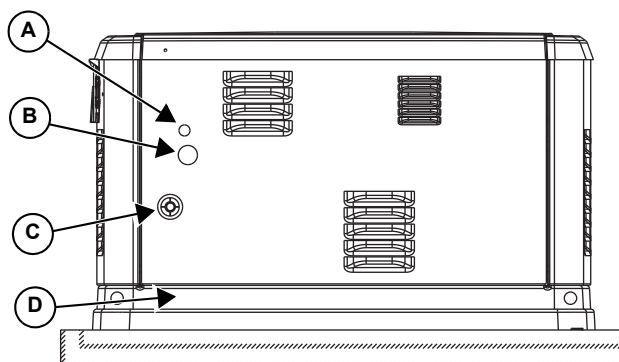
11. **Figure 2-6** illustrates the following:

A.	Customer connection area (underneath and behind the control panel)
B.	Fuel regulator
C.	Battery compartment
D.	Positive (+) and Negative (–) Battery Cables
E.	Location of “Parts Shipped Loose”



001375

**Figure 2-6. Customer Connection Area and Loose Parts Location**



001376

**Figure 2-7. Rear of Generator**

- Figure 2-7** illustrates the following:

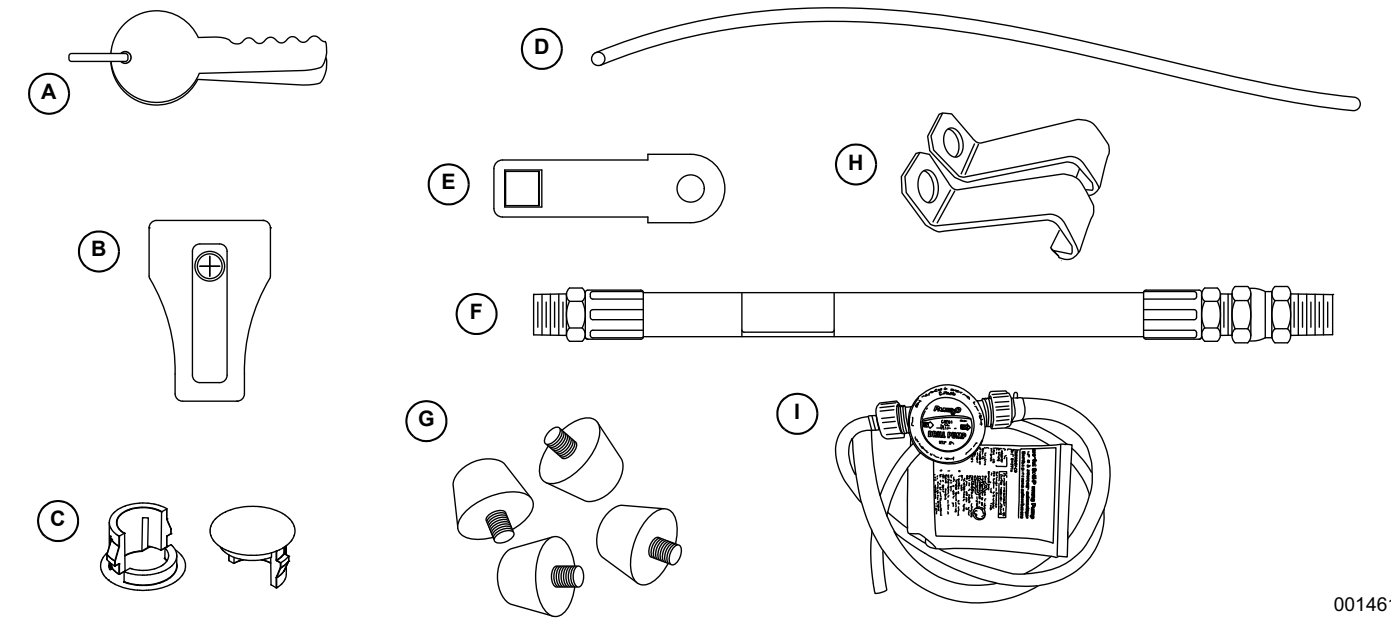
A.	Main AC/Control Wiring hole for 3/4 inch conduit
B.	Main AC/Control Wiring hole for 1–1/4 inch conduit
C.	Fuel Inlet Connection
D.	Base Fascia (if equipped)

# Parts Shipped Loose

See **Figure 2-8**. Parts shipped loose are located in a clear plastic bag inside the battery compartment. The flexible fuel line (6) is tied to either the battery wires or the alternator can.

A.	Keys
B.	Battery Terminal Cap
C.	Main Line Circuit Breaker (MLCB) Terminal Caps
D.	Wire Shielding to separate AC from DC control wires

E.	Main Line Circuit Breaker (MLCB) Locking Mechanism
F.	Flexible Fuel Line
G.	Rubber Mounts (only for units that include fascia)
H.	Rear Mounting Brackets (2)
I.	Oil Drain Pump Kit
J.	Installation and Owner's Manuals (not shown)

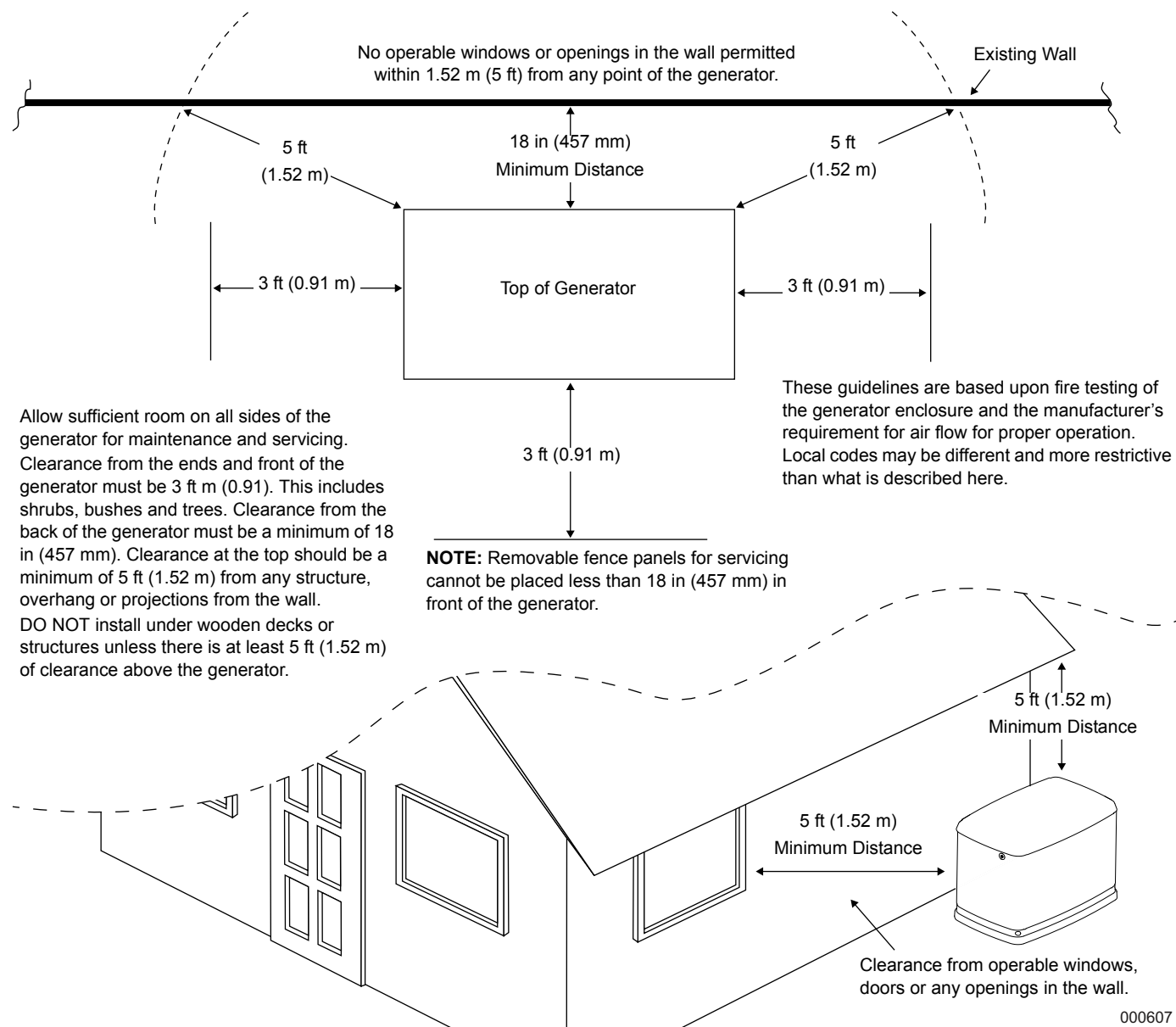


**Figure 2-8. Parts Shipped Loose**

00146

## Section 3: Site Selection and Preparation

### Site Selection



**Figure 3-1. Installation Guidelines**

See **Figure 3-1**. Install the generator set, in its protective enclosure, outdoors, where adequate cooling and ventilating air is always available. 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 windbreak to protect the unit.
- Install the generator on high ground where water levels will not rise and endanger it. It should not operate in or be subjected to standing water.
- Allow sufficient room on all sides of the generator for maintenance and servicing. This unit must be installed in accordance with any codes that are in place in your country or local jurisdiction for minimum distances from other structures.
- Clearance from the ends and front of the generator must be 3 ft (0.91 m). This includes shrubs, bushes and trees. Clearance from the back of the generator must be a minimum of 18 in (457 mm). Clearance at



the top should be a minimum of 5 ft (1.52 m) from any structure, overhang or projections from the wall.

- DO NOT install under wooden decks or structures unless there is at least 5 ft (1.52 m) of clearance above the generator.
- Install the unit where rain gutter downspouts, 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. This could affect Warranty Coverage.
- 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. REMEMBER THAT LAWS OR CODES MAY REGULATE THE DISTANCE AND LOCATION. In the absence of local codes regarding placement or clearance, we recommend following these guidelines.
- Install the generator as close as possible to the transfer switch. REMEMBER THAT LAWS OR CODES MAY REGULATE THE DISTANCE AND LOCATION.
- The generator must be installed on a level surface. The generator must be level within a 0.5 in (13 mm) all around.
- The generator is typically placed on pea gravel, crushed stone or a concrete pad. Check local codes to see what type is required. If a concrete pad is required, all applicable codes should be followed.

### Installation Guidelines for Stationary Air-Cooled Generators

See [Figure 3-1](#). The National Fire Protection Association has a standard for the installation and use of stationary combustion engines. That standard is NFPA 37; its requirements limit the spacing of an enclosed generator set from a structure or wall.

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 (1.52 m) from openings in walls and at least 5 ft (1.52 m) from structures having combustible walls. A minimum separation shall not be required where the following conditions exist:

1. The adjacent wall of the structure has a fire resistance rating of at least one hour.
2. The weatherproof enclosure is constructed of noncombustible materials and it has been

demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure.

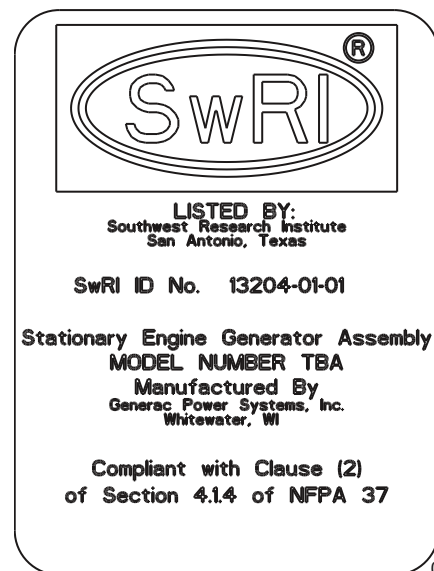
### Annex A — Explanatory Material

A4.1.4 (2) Means of demonstrating compliance are by means of full scale fire test or by calculation procedures.

Because of the limited spaces that are frequently available for installation, it has become apparent that exception (2) would be beneficial for many residential and commercial installations. With that in mind, the manufacturer contracted with an independent testing laboratory to run full scale fire tests to assure that the enclosure will not ignite combustible materials outside the enclosure.

**NOTE: Southwest Research Institute testing approves 18 in (457 mm) installation minimum from structure. Southwest Research is a nationally recognized third party testing and listing agency.**

The criteria was to determine the worst case fire scenario within the generator and to determine the ignitability of items outside the engine enclosure at various distances. The enclosure is constructed of non-combustible materials, and the results and conclusions from the independent testing lab indicated that any fire within the generator enclosure would not pose any ignition risk to nearby combustibles or structures, with or without fire service personnel response.



**Figure 3-2. Southwest Research Institute Decal**

The Southwest Research Institute Decal is located inside the generator, next to the generator's data decal.

<http://www.swri.org/4org/d01/fire/listlab/listprod/director.htm>

Based on this testing and the requirements of NFPA 37, Sec 4.1.4, the guidelines for installation of the generators listed above are changed to 18 in (457 mm) from the back side of the generator to a stationary wall or building.

For adequate maintenance and airflow clearance, the area above the generator should be at least 5 ft (1.52 m) with a minimum of 3 ft (0.91 m) at the front and ends of the enclosure. This would include trees, shrubs and bushes. Vegetation not in compliance with these clearance parameters could obstruct air flow. In addition, exhaust fumes from the generator could inhibit plant growth. See [Figure 3-1](#) and the installation drawing within the Owner's Manual for details.

### **⚠ DANGER**

Automatic start-up. Disconnect normal power source and render unit inoperable before working on unit. Failure to do so will result in death or serious injury.

(000236)



### **⚠ DANGER**

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.

(000103)

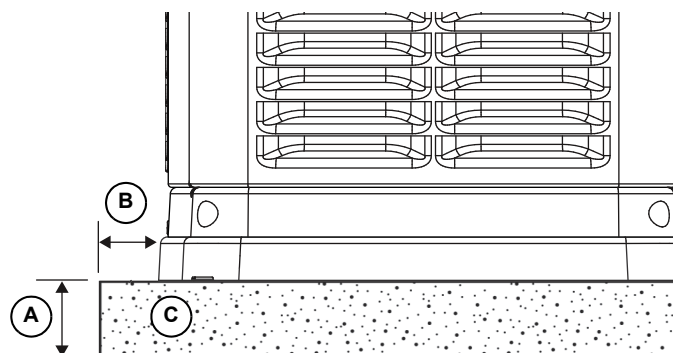
If the generator is not set to the OFF mode, it can crank and start as soon as the battery cables are connected. If the utility power supply is not turned off, sparking can occur at the battery posts and cause an explosion.

## Site Preparation

- Locate the mounting area as close as possible to the transfer switch and fuel supply.
- Leave adequate room around the area for service access (check local code), and place high enough to keep rising water from reaching the generator.
- Choose an open space that will provide adequate and unobstructed airflow.
- Place the unit so air vents won't become clogged with leaves, grass, snow or debris. Make sure exhaust fumes will not enter the building through eaves, windows, ventilation fans or other air intakes (see [Site Selection](#)).
- Select the type of base, such as but not limited to gravel or concrete, as desired or as required by local laws or codes. Verify your local requirements before selecting.

## Material Sufficient for Level Installation

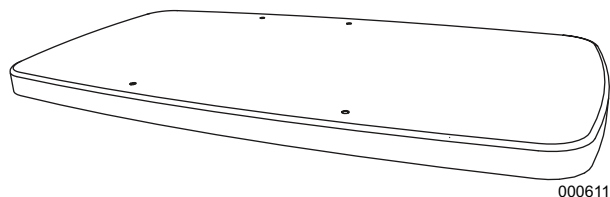
- See [Figure 3-3](#). Dig a rectangular area approximately 5 in (127 mm) deep [A] and about 6 in (152 mm) longer and wider [B] than the footprint of the generator. Fill with 4 in (102 mm) of pea gravel [C], crushed stone or any other non-combustible material sufficient for level installation. Compact and level the material. A concrete pad can be poured if desired or required. The pad should be 4–5 in (102–127 mm) thick and extend 6 in (152 mm) beyond the outside of the generator in all directions.



000856

**Figure 3-3. Compacted Gravel Pad**

**NOTE:** If a concrete pad is required, follow all applicable federal, state or local codes.



000611a

**Figure 3-4. Poured or Pre-formed Concrete Pad**

## Transportation Recommendations

Use a two wheeled hand cart or metal rails to carry the generator (including the wooden pallet) to the installation site. Place cardboard between the hand cart and the generator to prevent any damage or scratches to the generator.

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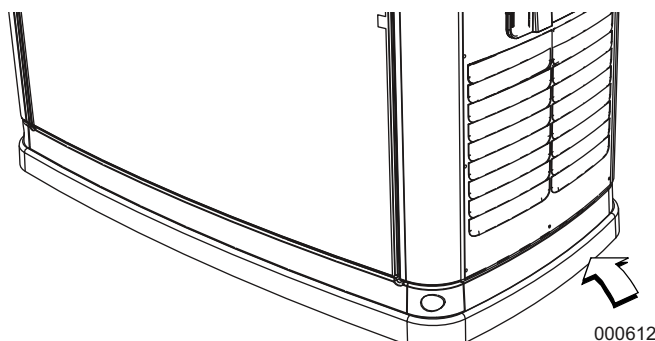
## Section 4: Generator Placement

### Generator Placement

See [Figure 4-1](#). All air-cooled generators come with a composite pad. The composite pad elevates the generator and helps prevent water from pooling around the bottom of the generator. The generator and composite pad can be placed on 4 in (102 mm) of pea gravel that is compacted, or on a concrete pad. Check local codes to see what type of site base is required. If a concrete pad is required, all federal, state and local codes should be followed. Place the generator on its mounting pad and position correctly as per the dimensional information given in [Site Selection and Preparation](#).

**NOTE:** Generator must be level within 0.5 in (13 mm).

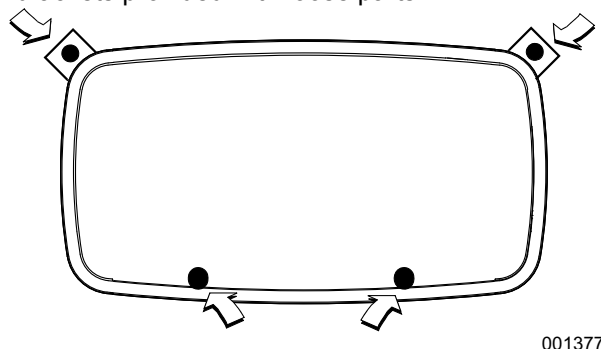
**NOTE:** If the composite pad is removed for concrete mounting, the fascia kit will not fit.



**Figure 4-1. Composite Pad**

See [Figure 4-2](#). Four mounting points are provided for securing the generator to concrete—two holes at the inside front of the enclosure and two outside rear mounting brackets.

**NOTE:** Use the template at the top of the generator carton to mark the concrete pad for drilling of the two front mounting holes. For dimensions of the two rear mounting holes, see [Installation Drawing \(2 of 2\)](#). DO NOT USE brackets from shipping pallet. Use stainless steel brackets provided with loose parts.



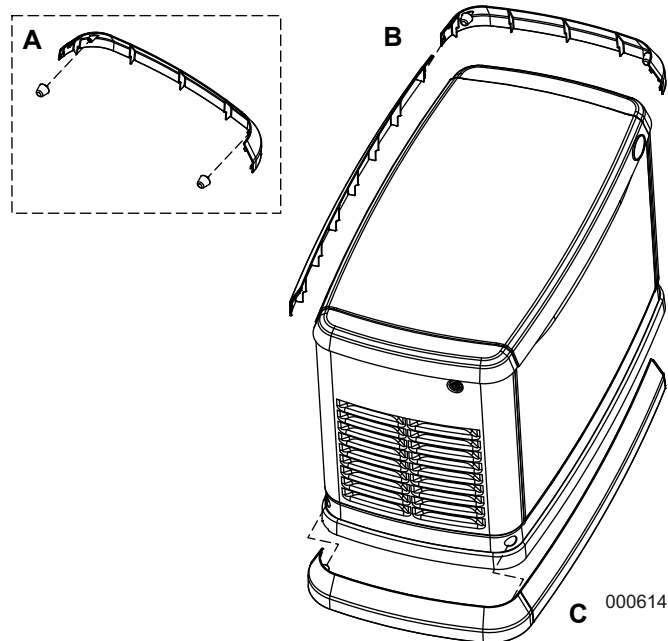
**Figure 4-2. Mounting Hole Location**

### Fascia Installation (If Applicable)

- Locate the four (4) threaded black rubber bumpers located in the Owner's Manual bag.
- See [Figure 4-3](#). Remove the four (4) bumpers from the bag and screw them into threaded holes located inside the end pieces of the fascia (two each) opposite one another (A).
- Once the bumpers are installed, snap one of the end pieces into one of the front / rear pieces of fascia. Repeat this action with the other two remaining pieces of fascia.

**NOTE:** Do not assemble all four pieces together at this point (B).

- Place both assemblies at the base of the generator and fit the rubber bumpers into the lifting holes in the generator base (C).
- Once aligned, snap together the two remaining connection points.



**Figure 4-3. Fascia Installation**

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## Section 5: Fuel Conversion/Gas Connections

### Fuel Requirements and Recommendations



**⚠ DANGER**

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. No leakage of fuel is permitted. Keep fire and spark away. Failure to do so will result in death or serious injury. (000192)

**NOTE:** Natural gas is lighter than air and will collect in high areas. LP gas is heavier than air and will settle in low areas.

Only LP gas should use a vapor withdrawal system. This type of system uses the vapors formed above the liquid fuel in the storage tank.

The unit will run on natural gas or LP gas, but has been configured at the factory to run on natural gas.

**NOTE:** Should the primary fuel need to be changed to LP gas, the fuel system needs to be reconfigured. See the [Fuel Conversion](#) section for instructions on converting the fuel system.

Recommended fuels should have a BTU content of at least 1,000 BTU/ft<sup>3</sup> (37.26 MJ/m<sup>3</sup>) for natural gas; or at least 2,500 BTU/ft<sup>3</sup> (93.15 MJ/m<sup>3</sup>) for LP gas.

**NOTE:** BTU fuel content information is available from the fuel supplier.

Required fuel pressure for natural gas is 3.5–7 inches water column (7–13 mm mercury). Required fuel pressure for liquid propane vapor is 10–12 inches H<sub>2</sub>O (19–22 mm mercury).

**NOTE:** 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 fuel pressure NEVER drops below the required specification. For further information regarding NFPA requirements refer to the NFPA website at [www.nfpa.org](http://www.nfpa.org).

Always 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.

Piping strength and connections should be given special consideration when installation takes place in areas at risk for; flooding, tornadoes, hurricanes, earthquakes, and unstable ground.

**IMPORTANT NOTE:** Use an approved pipe sealant or joint compound on all threaded fittings.

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

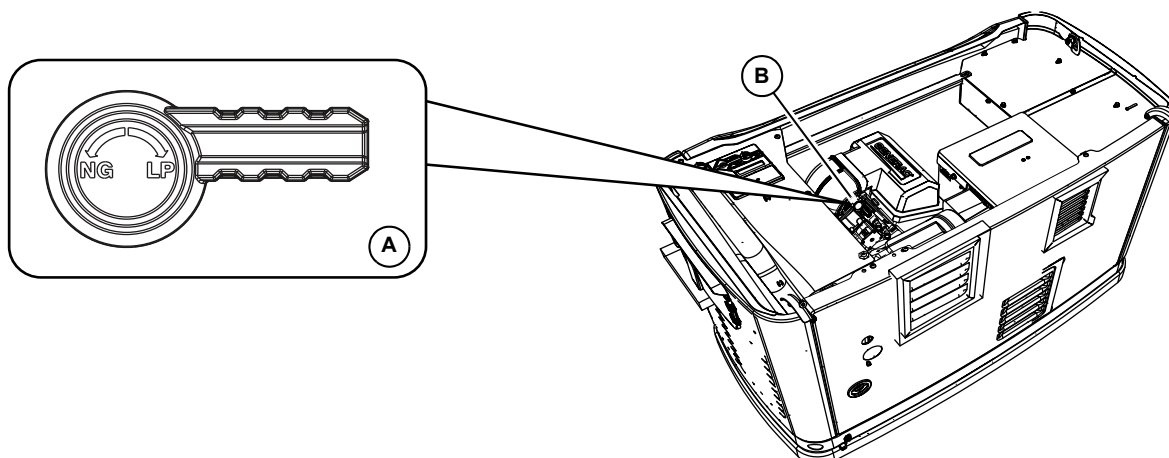
### Fuel Conversion

Converting from natural gas configuration to LP vapor can be accomplished with the following procedure. See [Figure 5-1](#) for fuel conversion knob location.

**NOTE:** The fuel selection (LP/NG) must be updated on the controller during initial power up using the Installation Wizard in the navigation menu. See [Figure 7-5](#).

**NOTE:** The orange fuel conversion knob (A) is located on the top of the fuel mixer on V-twin engines (B).

To select the fuel type, turn the valve towards the marked fuel source arrow until it stops. Fuel knob will rotate 180° and slide into the mixer body when converting to LP.



**Figure 5-1. Fuel Conversion Knob Location**

001237

## Fuel Consumption

Generator	Natural Gas		LP Vapor	
	1/2 Load	Full Load	1/2 Load	Full Load
15 kW EcoGen	128 / 3.63	302 / 8.55	1.28 / 4.85 / 47.61	2.62 / 9.92 / 104.4

\* Natural gas is in ft<sup>3</sup>/h [m<sup>3</sup>/h]

\*\* LP is in gal/h [l/h] [ft<sup>3</sup>/h]

\*\*\* Values given are approximate

These are approximate values. Use the appropriate spec sheet or Owner's Manual for specific values.

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

**NOTE:** The gas supply and pipe **MUST** be sized at 100% load BTU / Megajoule rating.

Always refer to the Owner's Manual for the proper BTU, Megajoule and required gas pressures:

<b>Natural Gas:</b>	<b>Liquid Propane Vapor:</b>
BTU = ft <sup>3</sup> /h x 1000	BTU = ft <sup>3</sup> /h x 2500
Megajoules = m <sup>3</sup> /h x 37.26	Megajoules = m <sup>3</sup> /h / hour x 93.15

## Fuel Line Sizing

Selecting the correct size fuel line is crucial to the proper operation of the unit. The generator inlet size has no bearing on the size gas pipe to be used.

For further information refer to NFPA 54 for NG or NFPA 58 for LP.

Measure the distance from the generator to the gas source.

**IMPORTANT NOTE:** The generator should be plumbed directly from the source, not off the end of an existing system.

**NOTE:** When measuring the pipe length, add 2.5 ft (0.76 m) for every angle or bend in the pipe to the overall required length of pipe needed

### Natural Gas Pipe Sizing

**Tables based on schedule 40 black pipe.**

To determine correct gas pipe size, find the kW rating of the generator in the left column, and trace to the right. The number to the right is the maximum length (measured in feet [meters]) allowed for the pipe sizes on top. Pipe sizes are measured by inside diameter (ID) to include any fittings, valves (must be full flow), elbows, tees or angles.

**Table 5.1: Natural Gas Pipe Sizing**

	For 5–7 inches of water column (9–13 mm mercury)					For 3.5–5 inches of water column (7–9 mm mercury)		
	Allowable Pipe Distances (feet / meters)							
Pipe Size (in / mm)	0.75 / 19	1 / 25	1.25 / 32	1.5 / 38	2 / 51	1 / 25	1.25 / 32	1.5 / 38
15 kW EcoGen	—	20 / 6	100 / 30	200 / 60		10 / 3	60 / 18	125 / 38



## LP Vapor Pipe Sizing

To determine correct LP Vapor pipe size, find the kW rating of the generator in the left column, and trace to the right. The number to the right is the maximum length (measured in meters/feet) allowed for the pipe sizes on top. The pipe sizes are measured by inside diameter (ID) to include any fittings, valves (must be full flow), elbows, tees or angles. Add 2.5 feet (0.76 m) per any bend, tee or angle in the pipe to the overall distance.

**Table 5.2: LP Vapor Pipe Sizing**

	For 10–12 inches of water column (19–22 mm mercury)		
	Allowable Pipe Distances (feet / meters)		
Pipe Size (in / mm)	0.75 / 19	1 / 25	1.25 / 32
15kW EcoGen	20 / 6	70 / 21	350 / 106

**NOTE:** Pipe sizes are using a second stage regulator.

**NOTE:** The minimum LP tank size is 250 gallons (946 L), unless unit calculations dictate use of a larger tank. Vertical tanks, which are measured in pounds (or kilograms), will not usually meet the minimum tank size requirement. A 1050 lb (476 kg) vertical tank size minimum is required.

## Pipe Sizing Summary

Mistakes frequently occur when sizing gas pipe. A properly sized gas pipe is critical to the proper operation of the generator. The generator inlet size has no bearing on the proper gas pipe size. If using a piping method other than black pipe, refer to local codes and the pipe manufacturer's specifications for sizing and installation information.

## Installing and Connecting Gas Lines

Both natural gas and LP Vapor are highly volatile substances, so strict adherence to all safety procedures, codes, standards and regulations is essential.

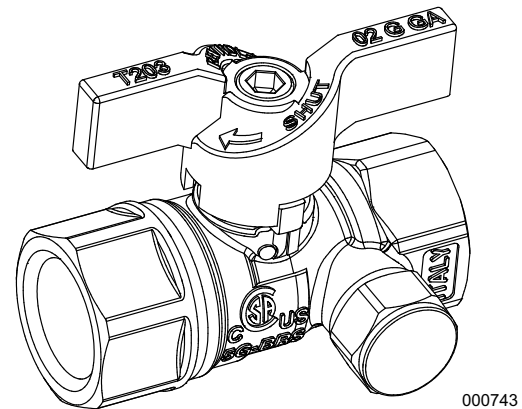
Gas line connections should be made by a certified plumber familiar with local codes. Always use AGA–approved gas pipe and a quality pipe sealant or joint compound.

Verify the capacity of the natural gas meter or the LP tank in regards to providing sufficient fuel for both the generator and other operating appliances.

### Shutoff Valve

See **A** in [Figure 5-4](#). Most applications will require an external manual full flow shut–off valve on the fuel line. The valve must be easily accessible.

**NOTE:** Local codes determine the proper location.



**Figure 5-2. Accessory Valve with Manometer Port**

**NOTE:** [Figure 5-2](#) illustrates a fuel shut–off valve with a manometer port for making fuel pressure checks. This accessory valve permits making pressure checks without going into the generator enclosure.

Valves available through Generac and Independent Authorized Service Dealers:

- 1/2 in. ball valve, part number 0K8752
- 3/4 in. ball valve, part number 0K8754

## Flexible Fuel Line

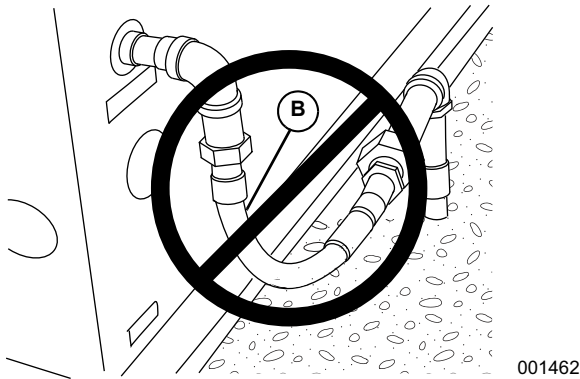
See **B** in [Figure 5-3](#) and [Figure 5-4](#). When connecting the gas line to the generator, use a hose assembly that meets the requirements of ANSI Z21.75/ CSA 6.27 – Connectors for outdoor Gas Appliances and Manufactured Homes or AGA-approved flexible fuel line in accordance with local regulations.

The purpose of flexible fuel line is to isolate vibration from the generator to reduce possibility of a gas leak at one of the connection points. It is important the line be installed with as few bends as possible. The flex fuel line should be horizontal and plumbed parallel to the back of the generator.

### **CAUTION**

Equipment damage. Do not bend flexible fuel line. Bends in fuel line restrict fuel flow and reduce ability to absorb vibration.

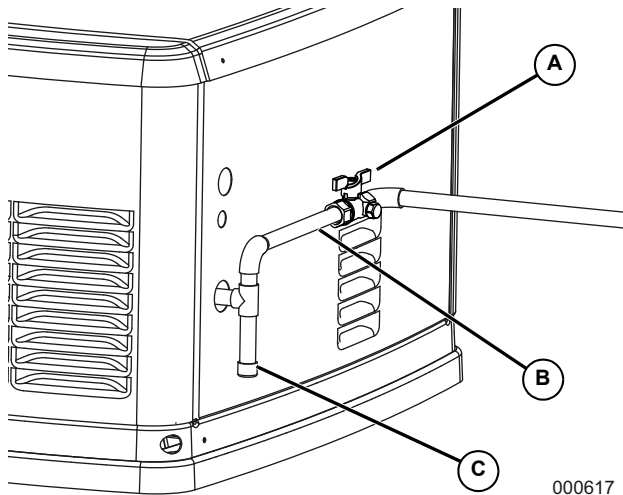
(000205)



**Figure 5-3. Do Not Bend Flexible Fuel Line**

## Sediment Trap

See **C** in [Figure 5-4](#). Some local codes require a sediment trap. Install the recommended sediment trap as illustrated.



**Figure 5-4. Sediment Trap**

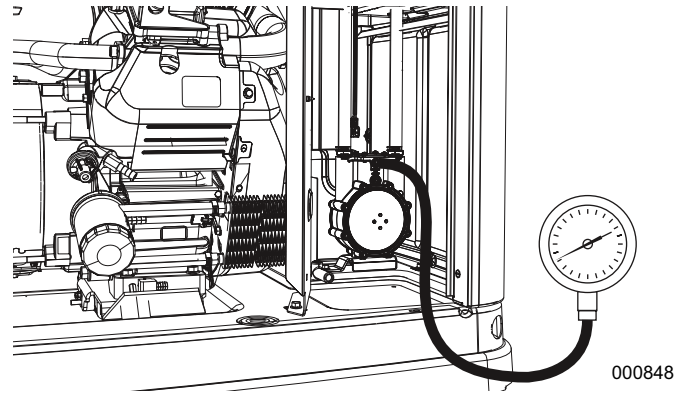
## Checking Gas Line Connections

1. Check for leaks by spraying all connection points with a non-corrosive gas leak detection fluid. You should not see the solution be blown away or form bubbles.
2. Check gas pressure at the regulator in the generator by following these steps.
  - Close gas supply valve.
  - See [Figure 5-5](#). Remove the top gas pressure test port from the regulator and install the gas pressure tester (manometer).
  - Open the gas supply valve and verify the pressure is within the specified values.

**NOTE:** Gas pressure can also be tested at the manometer port on the fuel shut-off valve shown in [Figure 5-2](#).

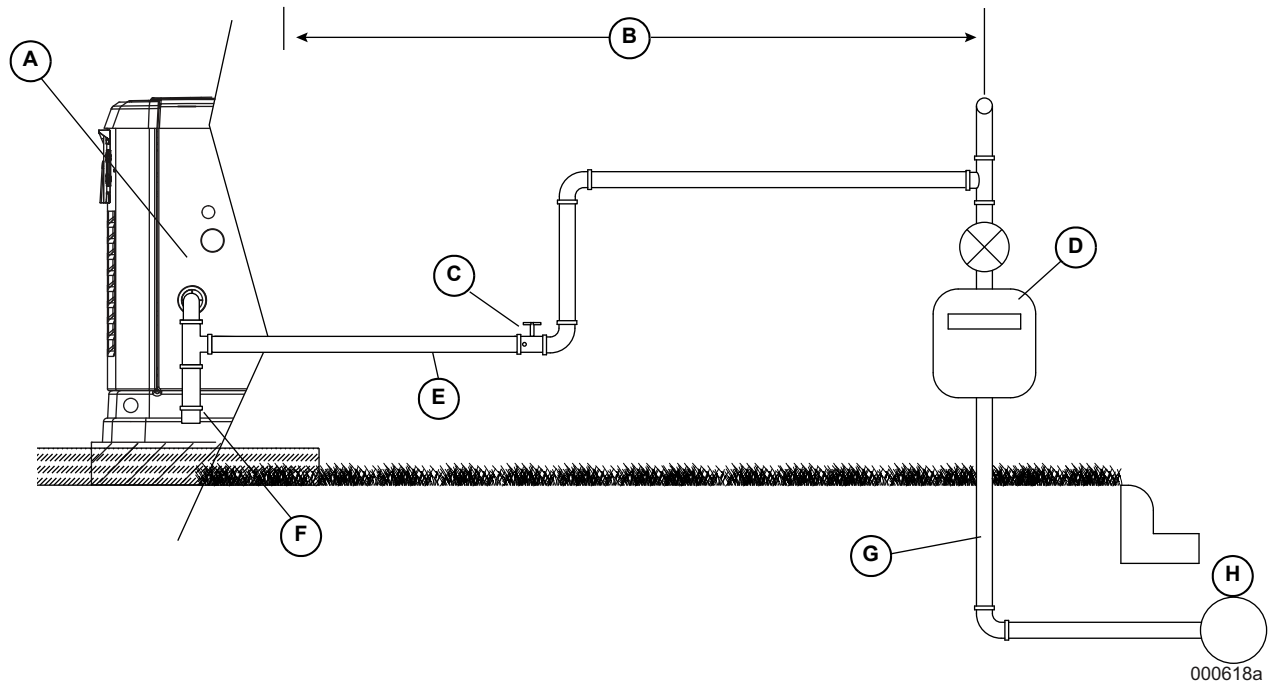
**NOTE:** See Owner's Manual or spec sheet for proper fuel pressure specifications. If the gas pressure is not within specifications, contact the local gas supplier.

3. Close gas valve when completed.



**Figure 5-5. Checking Pressure with Manometer**

# Natural Gas Vapor Installation (typical)



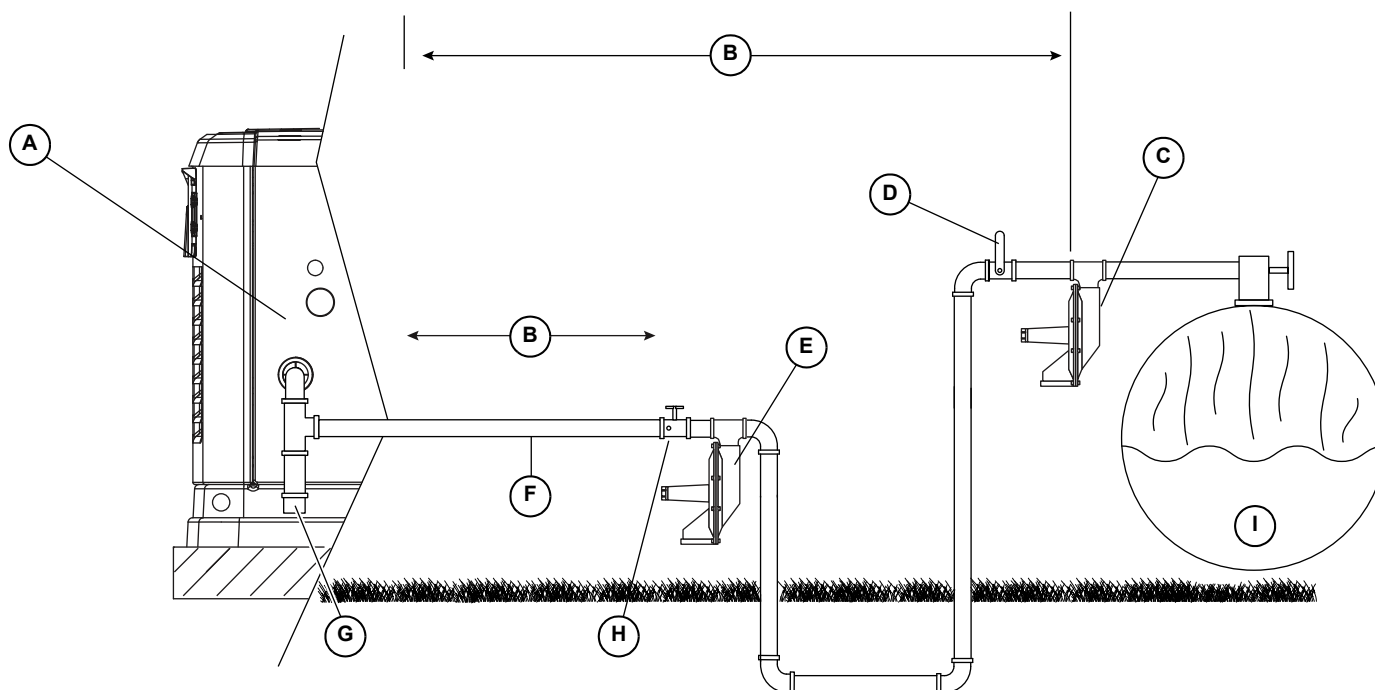
NG BTU =  $\text{ft}^3/\text{h} \times 1000$

Megajoules =  $\text{m}^3/\text{h} \times 37.26$

A.	BTU and Pressure Decal
B.	Check Distance with Gas Provider
C.	Accessory Valve with Manometer Port
D.	Size Gas Meter for Generator Load Plus All Appliance Loads
E.	Flexible Fuel Line
F.	Sediment Trap
G.	For Underground Installations, Verify Piping System for Code Compliance
H.	Gas Main

**Figure 5-6. Natural Gas Vapor Installation (typical)**

## LP Vapor Installation (typical)



000619b

NG BTU =  $\text{ft}^3/\text{h} \times 2500$

Megajoules =  $\text{m}^3/\text{h} \times 93.15$

A.	BTU and Pressure Decal
B.	Check Distance with Gas Provider
C.	Primary Fuel Pressure Regulator Per LP Provider
D.	Manual Shutoff Valve
E.	Secondary Fuel Pressure Regulator
F.	Flexible Fuel Line
G.	Sediment Trap
H.	Accessory Valve with Manometer Port
I.	Size fuel tank large enough to provide required BTUs for generator and ALL connected appliance loads. Be sure to correct for weather evaporation.

**Figure 5-7. LP Vapor Installation (typical)**

## Section 6: Electrical Connections

### Generator Connections

**NOTE:** Wiring must be performed in accordance with local jurisdiction and codes.

1. Remove the appropriate Main AC/Control Wiring knock-out plug at back of generator.
2. Install the generator feeder and control wiring between the generator and inverter or electrical loads to be powered by the generator per the applicable NEC codes for the wiring method selected. For knock-out plug locations (verify specific transfer wiring and connections per model), see [Figure 2-7](#).

**NOTE:** This wiring can be run in the same conduit if the appropriate insulation rated wire is used.

3. Seal the conduit at the generator in compliance with any codes.
4. Strip insulation from wire ends. Do not remove excessive insulation.
5. To connect the control wires, push down on the spring loaded connection point with a flat head screwdriver, insert wire and release.

**NOTE:** No wire insulation should be in the connection point; only bare wire.

**NOTE:** The system is equipped with a 2-wire start to facilitate connection to the inverter system.

### Control Wiring

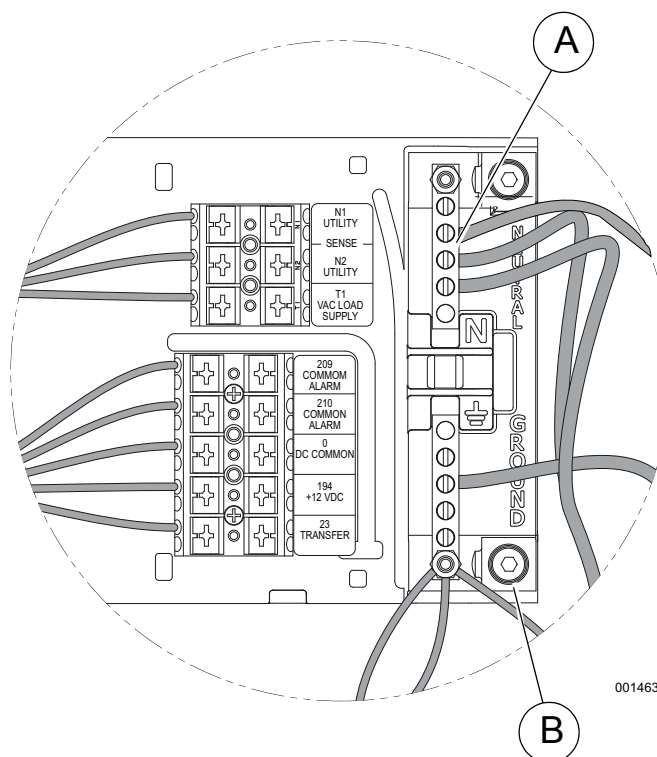


Table 6.1: Control Pad Connections		
Wire Color	Terminal / Wire	Wire Description
Blue	T1	120 VAC for Battery Charger Single Pole 15 Amp Breaker (see <a href="#">Control Wiring Notes</a> )
Black	0	DC (–) Common Ground Wire
Yellow	N1	240 VAC for Cold Weather Kit (Utility Sense)
Yellow	N2	2 Pole 15 Amp Breaker
Blue	209	Common Alarm: Optional Alarm Relay
Blue	210	Contacts (Normally Open)

Table 6.2: 2-Wire Start Wire Connections		
Wire	Connection	Location
178	Female Faston	Hanging from controller above battery compartment
183	Female Faston	

Table 6.3: Control Wiring Torque Specifications		
Location	Wire Size	Torque Specification
A	4–6 AWG	35 in-lbs (4 Nm)
	8 AWG	25 in-lbs (2.8 Nm)
	10–14 AWG	20 in-lbs (2.3 Nm)
B (Large Ground)	2/0 to 14 AWG	120 in-lbs (14 Nm)

**Figure 6-1. Control Wiring Connections**

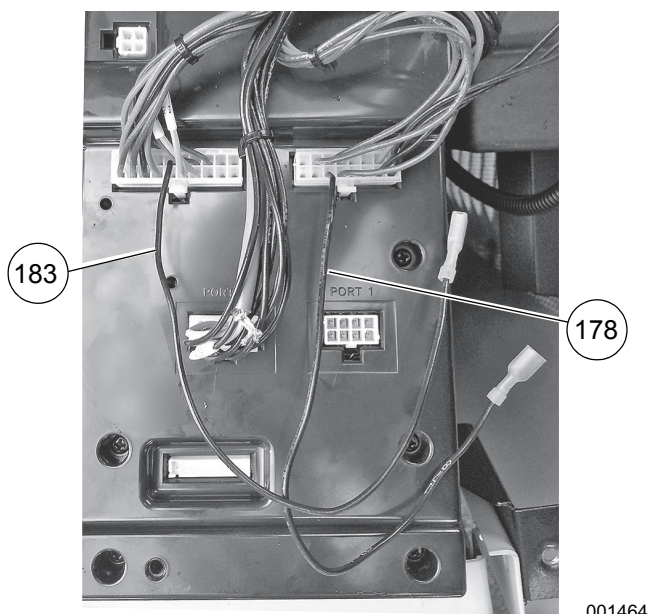
Table 6.4: Control Wire and Two-Wire Start Length and Size	
Maximum Wire Length	Recommended Wire Size
1–115 ft (1–35 m)	No. 18 AWG
116–185 ft (36–56 m)	No. 16 AWG
186–295 ft (57–89 m)	No. 14 AWG
296–460 ft (90–140 m)	No. 12 AWG

## Control Wiring Notes

- To separate low voltage from high voltage wires, unless NEC Section 300.3(c)(1) requirements are met, run 2-wire start, N1, N2, and T1 wires through wire shielding provided (see [Parts Shipped Loose](#)).
- Regardless of whether unit is running or not, keep T1 connected and energized with 120 VAC to keep battery charged.
- Supplying 240 volts to N1 and N2 on EcoGen is only for the Generac Cold Weather Kit.
- The single pole breaker used for T1 may be removed if a #14 jumper wire is installed from N2 to T1 (factory side).

## 2-Wire Start Wire Connections

See [Figure 6-2](#). Connect wires 183 and 178 as shown.



**Figure 6-2. 2-Wire Start Wire Connections**

## Main AC Wiring

**NOTE:** Main AC wiring must be in accordance with local jurisdiction and codes.

1. Strip the insulation off the wire ends. Do not remove excessive insulation.
2. Remove the two cap plugs located behind the breaker door and to the right of the Main Breaker.
3. Loosen the lugs of the Main Breaker through the access holes.
4. See [Figure 6-3](#). Insert a power wire (E1 or E2) through the opening in the back cover and into the bottom lug. Torque to the proper specification.



001467

**Figure 6-3. Inserting Power Wire (E1 or E2)**

5. There are three screws inside the top of the breaker panel (behind the breaker door). Removing these screws will allow the entire breaker box to be carefully pulled out. When reinstalling, be certain that the tabs on the bottom lock into place.
6. Connect the Neutral wire to the Neutral Lug if applicable. Torque to the required specification. See [Table 6.3](#).
7. Connect the Ground wire to the Ground Lug and torque to the required specification. See [Table 6.3](#).

**NOTE:** Neutral Bonding—For installations that require the neutral to be bonded to the ground, this is done at the customer connections terminals inside the generator. Connect a suitably sized wire from the neutral bar to the ground bar. This is normally required when the generator is the source in a separately derived system. It is not required when the generator is a backup source in a normal power source-supplied electrical system with a 2-pole transfer switch.

**NOTE:** Torque all wiring lugs, bus bars and connection points to the proper torque specifications. Torque specifications for the Main Line Circuit Breaker (MLCB) can be found on a decal located on the inside of the Main Line Circuit Breaker Door.



## Automatic Voltage Regulator (AVR) Cooling Fans

The system is equipped with two fans to cool the AVR electronics. The primary fan is powered by AC during operation. The secondary fan is powered by 12 VDC through the controller. The fans are monitored during operation and if a failure occurs, an alarm is displayed.

The secondary fan continues to operate for up to one hour after the generator is shut down. Proper cooling must occur before removing either battery connections or 7.5 amp fuse for maintenance or other service activity.



### ⚠ WARNING

Moving Parts. Avoid AVR fan housing for one hour after generator shutdown. Fan operates even if fuse is removed. Rotating fan blades could result in death or serious injury. (000222)

**NOTE:** The AVR cooling air inlet includes a filter. Verify the filter is installed and properly seated at time the unit is installed. Check the filter at regular maintenance intervals to verify proper airflow. See the Maintenance section of the Owner's Manual for details.

## Battery Requirements

Group 26R, 12V, 525 CCA (Minimum CCA)

## Battery Installation



### ⚠ WARNING

Explosion. Batteries emit explosive gases while charging. Keep fire and spark away. Wear protective gear when working with batteries. Failure to do so could result in death or serious injury. (000137a)



### ⚠ WARNING

Risk of burns. Batteries contain sulfuric acid and can cause severe chemical burns. Wear protective gear when working with batteries. Failure to do so could result in death or serious injury. (000138a)

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. Verify that the generator has been turned OFF.
2. Turn off normal source power supply to the transfer switch.
3. Remove the 7.5A fuse from the generator control panel.

See [Figure 6-4](#). Battery cables were factory connected at the generator. Connect cables to battery posts as follows:



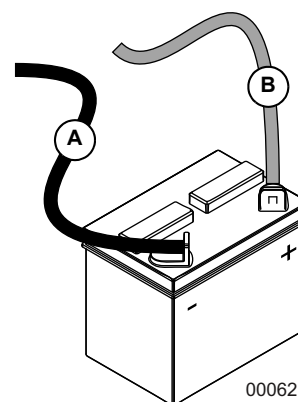
### ⚠ WARNING

Explosion. Batteries emit explosive gases. Always connect positive battery cable first to avoid spark. Failure to do so could result in death or serious injury. (000133)

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 red battery post cover (included).

**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.



- A. Negative (-) Black lead from frame  
B. Positive (+) Red lead from starter contactor

**Figure 6-4. Battery Cable Connections**

**NOTE:** In areas where temperatures fall below 32 °F (0 °C), it is recommended that a pad type battery heater be installed to aid in cold climate starting. This is available as a cold weather kit through an authorized service dealer.



### ⚠ WARNING

Explosion. Do not dispose of batteries in a fire. Batteries are explosive. Electrolyte solution can cause burns and blindness. If electrolyte contacts skin or eyes, flush with water and seek immediate medical attention. (000162)

### ⚠ WARNING

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death or serious injury. (000228)



Always recycle batteries in accordance with local laws and regulations. Contact your local solid waste collection site or recycling facility to obtain information on local recycling processes. For more information on battery recycling, visit the Battery Council International website at: <http://batteryCouncil.org>.

# Section 7: Control Panel/Start-Up/Testing

## Preparing for Start-Up



Automatic start-up. Disconnect normal power source and render unit inoperable before working on unit. Failure to do so will result in death or serious injury. (000236)

Before performing any maintenance on the generator, set to OFF, remove fuses, and disconnect 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.

## Control Panel Interface

The Control Panel Interface is located under the lid of the enclosure. Before attempting to lift the lid of the enclosure, verify that both left and right side locks are unlocked.

When closing the unit, verify that both left and right side locks are securely locked.

**NOTE:** All appropriate panels must be in place during any operation of the generator. This includes operation by a servicing technician while conducting troubleshooting procedures.

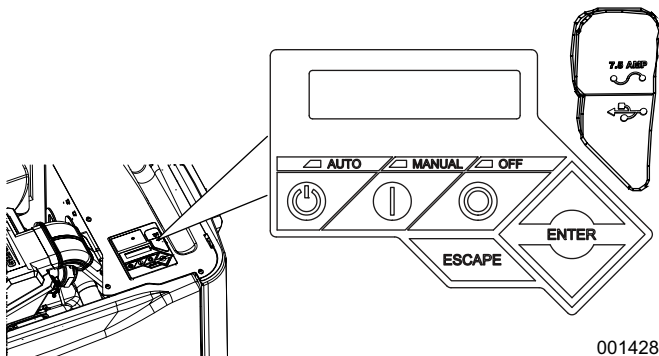


Figure 7-1. Generator Control Panel Location

With the control pad set to AUTO, the engine may crank and start at any time without warning. To prevent possible injury that might occur during sudden starts, always set the control pad to OFF and remove the 7.5 amp fuse before working on or around the generator or the electrical loads that are to be powered by the generator. For added security, place a DO NOT OPERATE tag or placard at the control pad and the electrical loads that are to be powered by the generator.

Never run the generator with any access panel removed.

## Using the AUTO/MANUAL/OFF Buttons

Button	Description of Operation
Auto	Press to activate fully automatic operation. Green LED illuminates to confirm that system is in AUTO mode. Transfer to standby power occurs if 2–wire start signal is enabled.
Off	Press to shut down engine, if running. Red LED illuminates to confirm that system is in OFF mode.
Manual	Press to crank and start engine. Blue LED illuminates to confirm that system is in MANUAL mode.

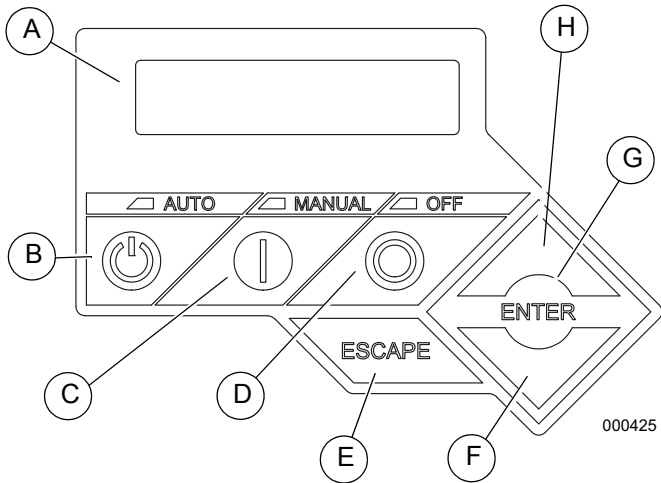


Figure 7-2. Generator Control Panel

A.	LCD Screen
B.	Auto
C.	Manual
D.	Off
E.	Escape
F.	Down Arrow
G.	Enter
H.	Up Arrow

## Generator Set-Up

When battery power is applied to the generator during the installation process, the controller will light up. However, the generator still needs to be activated before it will automatically run in the event of a power outage.

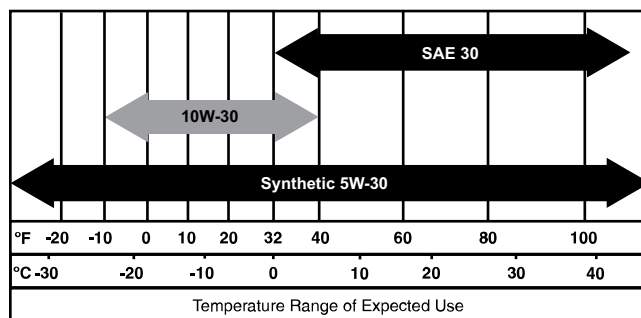
## Before Initial Start-Up

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

### CAUTION

Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

(000135)



000399

**Figure 7-3. Recommended Oil Based on Temperature**

- SAE 30 above 32 °F (0 °C)
- SAE 10W-30 between 40 ° and -10 °F (4 ° and -23 °C)
- Synthetic SAE 5W-30 for all temperature ranges

### CAUTION

Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

(000135)

## Engine Oil Recommendations

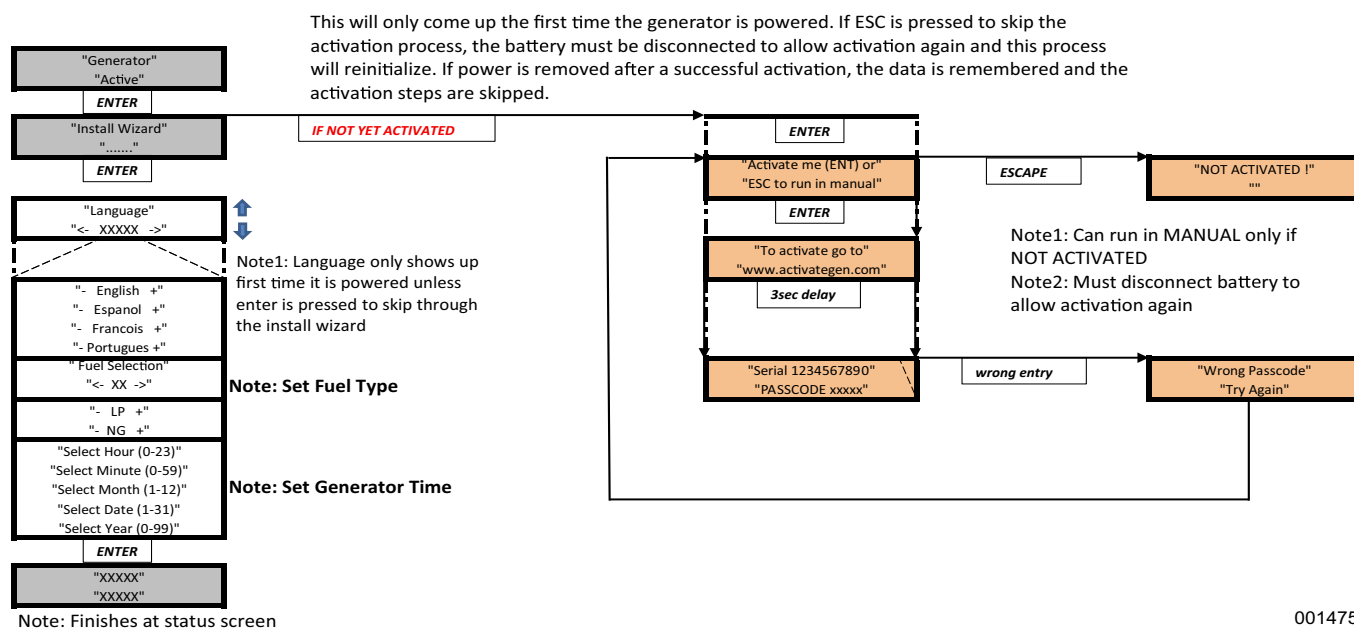
To maintain the product warranty, the engine oil should be serviced in accordance with the recommendations of this manual. For your convenience, Generac Maintenance Kits are available that include engine oil, oil filter, air filter, spark plug(s), a shop towel and funnel. These kits can be obtained from an Independent Authorized Service Dealer (IASD).

All Generac oil kits meet minimum American Petroleum Institute (API) Service Class SJ, SL, or better. Use no special additives. Select the appropriate viscosity oil grade according to the expected operating temperature. Synthetic oil also can be used in the appropriate weight as standard.

## Installation Wizard

See [Figure 7-4](#). Upon power-up, the Installation Wizard immediately appears. It allows the user to input generator settings.

The Installation Wizard will start every time AC and DC power is removed and re-applied to the generator.



001475

**Figure 7-4. Installation Wizard Menu**

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## Menu Navigation

Feature	Description
System Menus	
HOME Screen	The system returns to the Home screen if the control pad is not used for five minutes. The screen normally displays a Status message, such as Ready to Run (Auto mode) or Switched to OFF (Off mode), and the total Hours of Protection. If an active alarm/warning condition occurs, the associated Alarm/Warning message is displayed. To clear the Alarm/Warning message, press OFF on the control pad followed by ENTER. In the event of multiple Alarms/Warnings, the next message is then displayed. The highest priority alarm is always displayed first.
MAIN MENU	Enables the operator to navigate the software using UP ARROW, DOWN ARROW, ENTER and ESCAPE. The Main Menu can be accessed from any sub menu by consecutively pressing ESCAPE. Each time ESCAPE is pressed, the preceding menu is displayed. The Main Menu is reached when the System, Date/Time, Battery, and Sub Menus are displayed.
Navigation	
ESCAPE	Used to abort a routine or back up to the preceding menu.
ENTER	Used to make a selection or save an entry.
UP ARROW DOWN ARROW	Used to move forward or backward from menu to menu or to scroll forward or backward (increment or decrement) through available selections.
<b>NOTE:</b> Pressing any button on the control pad illuminates the backlight for 30 seconds. The backlight also illuminates for 30 seconds whenever an active Alarm/Warning message is displayed.	

## Change Time and Date

To change the time and date, see the Navigation Menu in [Figure 7-5](#). If power is lost (battery is disconnected/reconnected, 7.5 amp fuse is removed/installed, etc.), the display automatically prompts the user for the Time and Date. All other information is retained in memory.

## Programmable Timers

### Dealer Programmable

**NOTE:** A dealer password is required.

#### High Run Speed Timer

A programmable high run speed timer is provided. The timer controls the length of time the generator runs at maximum speed after application of a large load (such as an air conditioner). The time can be increased to prevent the potential cycling of engine RPM as loads turn on and off. For example, if the timer is currently set to **ten** minutes, and the normal AC cycling time is 15 minutes, increasing the timer to 20 minutes would prevent the engine speed from increasing and decreasing every ten minutes between AC cycles (even though fuel consumption would increase).

## USB Port for Firmware Updates

A USB port is located beneath the rubber flap adjacent to the control pad, and is provided for firmware updates. Firmware updates must be performed by an Independent Authorized Service Dealer.

**NOTE:** The USB port is intended for use with a USB thumb drive only. The USB port is not intended for charging devices such as phones or laptops. Do not connect any consumer electronics to the USB port.

## Activation

To receive the activation code, you must have the unit serial number and go to: [www.generac.com](http://www.generac.com), “Service & Support” Tab and then “Activate Your Home Standby” under the “Generac Owners” list. You can also receive an activation code by calling 1-888-9ACTIVATE (1-888-922-8482).

Activating the generator is a simple, one-time process that is guided by the controller screen prompts. Once the product is activated, the controller screen will not prompt you to activate again, even if you disconnect the generator battery, fuse and battery charge circuit (T1 60 Hz / T1 & T2 50 Hz).

After obtaining your activation code, please complete the following steps at the generator’s control panel:

1. Upon first power up of the generator, the display interface will begin an installation wizard.

**NOTE:** If the unit has already been powered up, it will be necessary to disconnect the generator battery, fuse and battery charge circuit (T1 60 Hz / T1 & T2 50Hz).

2. The installation wizard will prompt the user to set the fuel type and after choosing fuel type and “Enter”, the display will then annunciate “Activate me (ENT) or ESC” to run in MANUAL.
3. Press Enter and use the up/down arrows and the enter keys to put the activation code in.

**NOTE:** If you push ESC to run in MANUAL, the unit will not function in AUTO. To enter the activation code at a later time, it will be necessary to disconnect the generator battery, fuse and battery charge circuit (T1).

If the unit is not activated, the install wizard will only allow the programming to operate the generator. These settings are: Current Date/Time and Exercise Day/Time and annunciate “NOT ACTIVATED”.

If the unit is activated, the install wizard will allow further programming parameters and Auto operation. The maintenance intervals will be initialized when the exercise time is entered. The exercise settings can be changed at any time via the EDIT menu. If the 12 volt battery is disconnected or the fuse removed, the installation wizard will operate upon power restoration. The only difference is the display will only prompt the customer for the current Time and Date.

## Cold Smart Start

The Cold Smart Start feature can be enabled in the EDIT menu. When enabled, the generator will monitor ambient temperature and adjust its warm-up delay based on temperature. If the ambient temperature conditions are below 50 °F (10 °C) upon startup in AUTO mode, the generator will warm up for 30 seconds allowing the engine to warm before the load is applied. If the temperature is at or above 50 °F (10 °C), the generator will startup with the normal warm-up delay of six seconds.

## Interconnect System Self Test Feature

Upon power-up, this controller will go through a system self test which will check for the presence of normal power source voltage on the DC circuits. This is done to prevent damage if the installer mistakenly connects AC normal power source sensing wires into the DC terminal block. If normal power source voltage is detected, the controller will display a warning message and lock out the generator, preventing damage to the controller. Power to the controller must be removed to clear this warning.

Normal power source voltage must be turned on and present at the N1 and N2 terminals inside the generator control panel for this test to be performed and pass.

**NOTE:** All appropriate panels must be in place during any operation of the generator. This includes operation by a servicing technician while conducting troubleshooting procedures.

### Before starting, complete the following:

1. Verify that the generator is OFF.
2. Set the generator main circuit breaker to OFF or OPEN.
3. Turn off all breakers that will be powered by the generator.
4. 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.
5. 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 “OVERCRANK” fault. This is due to accumulated air in the fuel system during installation. Reset the control board by pushing the OFF button and ENTER key, and restart up to two more times if necessary. If unit fails to start, contact an Independent Authorized Service Dealer for assistance.

## Check Manual Transfer Switch Operation

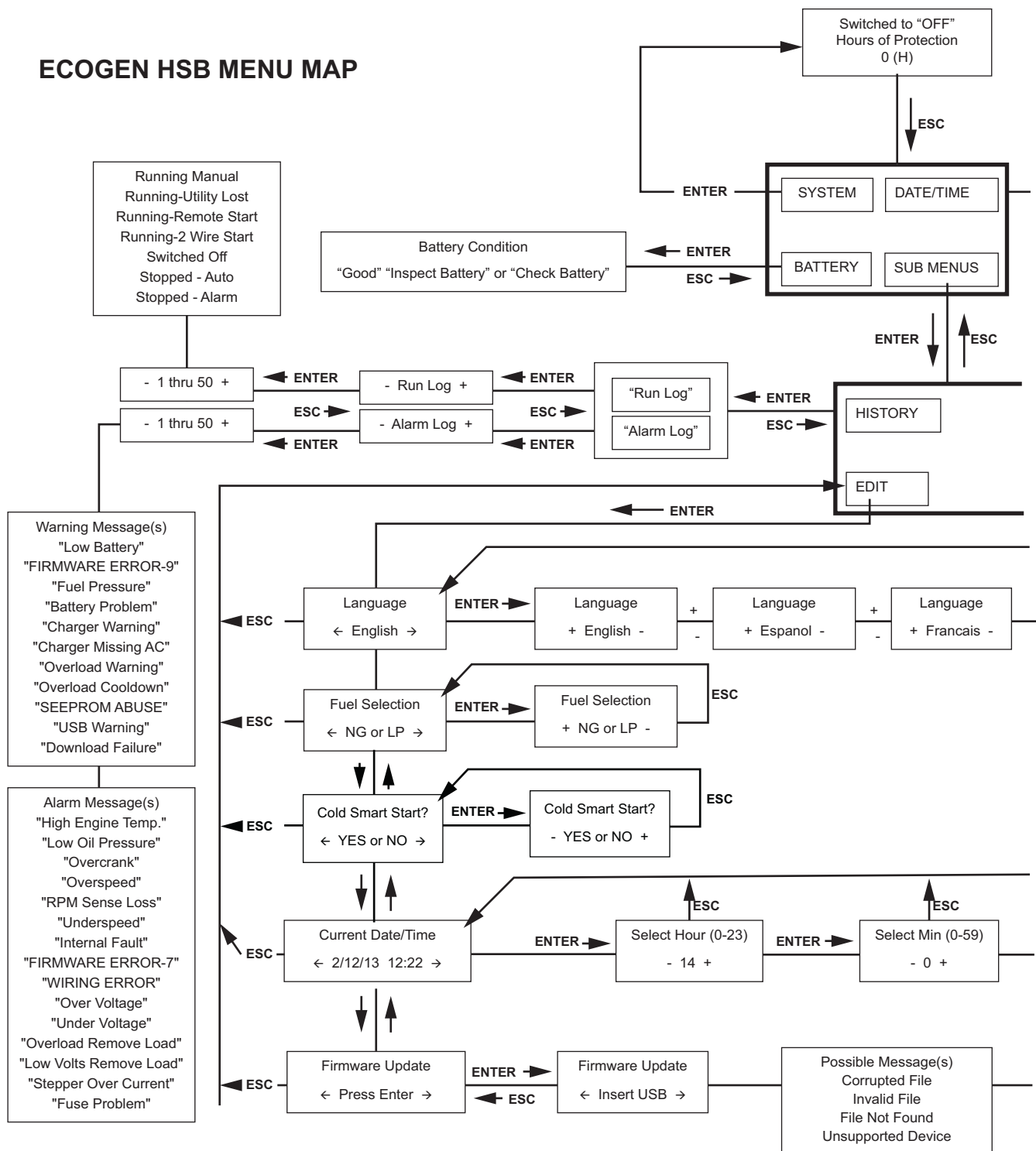
Refer to the “Manual Transfer Operation” section of the Owner’s Manual for procedures.



**⚠ DANGER**

Electrocution. Do not manually transfer under load. Disconnect transfer switch from all power sources prior to manual transfer. Failure to do so will result in death or serious injury, and equipment damage. (000132)

## ECOGEN HSB MENU MAP



001382a

**Figure 7-5. Navigation Menu**





## Electrical Checks



### **⚠ DANGER**

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)

Complete electrical checks as follows:

1. Verify that the generator is OFF. A red LED illuminates to confirm that system is in OFF mode.
2. Switch the recommended disconnect switch (installed at the generator input to the Alternative Power Management System) to the OFF (Open) position.
3. Press MANUAL on the control pad. The engine cranks and starts.
4. Once the generator is running, IMMEDIATELY move the GENERATOR DISCONNECT Circuit Breaker switch to the ON (Closed) position. This prevents the speed from ramping down before the load is applied, a condition which could cause the engine to stall.
5. Connect an accurate AC voltmeter and a frequency meter across the output terminals of the generator. Voltage should be 220–242 VAC (depending on load) at a frequency of 59.5–60.5 Hertz. If it's not, verify that the MLCB is closed and verify AC output and frequency (Hertz or Hz) at the MLCB.
6. Connect the AC voltmeter test leads across neutral and each output leg of the generator in turn. In both cases, voltage reading should be 110–121 VAC. If it's not, verify that the MLCB is closed and verify AC output between the E1 and E2 of the MLCB and Neutral at the generator. Also, verify wiring from generator to the electrical loads that are to be powered by the generator.
7. Move the Generator Disconnect Circuit Breaker switch to the OFF (Open) position.
8. Press OFF on the control pad to shut down the engine.

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



### **⚠ WARNING**

Moving Parts. Avoid AVR fan housing for one hour after generator shutdown. Fan operates even if fuse is removed. Rotating fan blades could result in death or serious injury. (000222)

The secondary 12 VDC fan continues to operate for up to one hour after the generator is shut down (even if the 7.5 amp ATO fuse is removed). To avoid hand injury, always exercise caution when working near the AVR fan housing.

## Generator Tests Under Load

1. Test the generator with electrical loads applied. Start by placing all of the breakers on the Alternative Power Management System into the OFF (Open) position.
2. Switch the recommended disconnect switch installed at the generator input to the Alternative Power Management System to OFF (Open) position.
3. Place the main Circuit Breaker on the generator in the ON (Closed) position.
4. Press MANUAL on the control pad. The generator should crank and start immediately. Allow the engine to stabilize and warm up for a few minutes.
5. Check voltage and frequency at the disconnect switch installed between the generator and the Alternative Power Management System.
6. Close the disconnect switch if the appropriate voltage and frequency are present.
7. Check voltage and frequency at the Alternative Power Management System by closing the breakers one at a time (if applicable).
8. Allow the generator to run under load for 20–30 minutes while checking for unusual noises, vibration or other indications of abnormal operation, such as oil leaks or overheating.
9. With the generator carrying the entire priority load, check gas pressure to verify that it is at the same level it was before the generator was started.
10. When completed, open the disconnect switch and allow the generator to run at no load.
11. Press OFF on the control pad. The generator will shut down.
12. Place the disconnect switch to the ON (Closed) position.

## Checking Automatic Operation

1. Press AUTO on the control pad. The system is now ready for automatic operation.
2. Verify that the remote two-wire start test switch installed near the Alternative Power Management System is set to the ON (Closed) position. This will cause the generator to start automatically.
3. With the generator running and powering loads, set the remote two-wire start test switch to the OFF (Open) position. In approximately one minute the generator will automatically shut down.

## Installation Summary

1. Verify the installation has been properly performed as outlined by the manufacturer and that it meets all applicable laws and codes.
2. Test and confirm proper operation of the system as outlined in the appropriate installation and owner's manuals.
3. Educate the end-user on the proper operation, maintenance and service call procedures.

## Shutting Generator Down While Under Load

**IMPORTANT NOTE:** To turn the generator off during main power source outages to perform maintenance, or conserve fuel, follow these steps:

To turn the generator OFF (while running in AUTO and online):

1. Turn the main power source disconnect OFF.
2. Turn the main line circuit breaker (MLCB) on the generator to OFF (OPEN).
3. Turn the generator OFF.

To turn the generator back ON:

1. Put the generator back into AUTO and allow to start and warm-up for a few minutes.
2. Set the MLCB on the generator to ON.

The system will now be operating in automatic mode. The main power source disconnect can be turned ON (CLOSED). To shut the unit off, this complete process must be repeated.

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## Section 8: Troubleshooting

### Engine Troubleshooting

Table 8-1. Engine Troubleshooting

Problem	Cause	Correction
Engine will not crank.	1) Fuse blown. 2) Loose, corroded or defective battery cables. 3) Defective starter contact. 4) Defective starter motor. 5) Dead battery.	1) Correct short circuit condition by replacing 7.5 Amp fuse. 2) Tighten, clean or replace as necessary.* 3) Tighten, clean or replace as necessary.* 4) Tighten, clean or replace as necessary.* 5) Charge or replace battery.
Engine cranks but will not start.	1) Out of fuel. 2) Defective fuel solenoid (FS). 3) Defective spark plug(s). 4) Valve clearance needs adjustment.	1) Replenish fuel / Turn on fuel valve. 2) * 3) Clean, check gap, or replace plug(s). 4) Adjust valve clearance.
Engine starts hard and runs rough.	1) Air cleaner plugged or damaged. 2) Defective spark plug(s). 3) Fuel regulator not set. 4) Fuel pressure incorrect.  5) Fuel selector in wrong position.	1) Check / replace air cleaner. 2) Clean, check gap, or replace plug(s). 3) Set fuel regulator. 4) Confirm fuel pressure to regulator is 10–12 in. water column (19–22 mm mercury) for LP, and 3.5–7 in. water column (7–13 mm mercury) for natural gas. 5) Move selector to correct position.
Generator is set to OFF, but the engine continues to run.	1) Control board wired incorrectly. 2) Defective control board.	1) Repair wiring or replace control board.* 2) Replace control board.
No AC output from generator.	1) Main line circuit breaker is in the OFF (or OPEN) position. 2) Generator internal failure.	1) Reset circuit breaker to ON (or CLOSED). 2) *
Unit consumes large amounts of oil.	1) Oil tank is over filled with oil. 2) Engine breather defective. 3) Improper type or viscosity of oil. 4) Damaged gasket, seal or hose.	1) Adjust oil to proper level. 2) * 3) See <a href="#">Engine Oil Recommendations</a> . 4) Check for oil leaks.
* Contact an Independent Authorized Service Dealer for assistance.		

# Generator Troubleshooting

**Table 8-2. Generator Troubleshooting**

Active Alarm	LED	Problem	Things to Check	Solution
NONE	GREEN	Unit running in AUTO but no power in house.	Check Generator Disconnect circuit breaker.	Contact Independent Authorized Servicing Dealer if Generator Disconnect circuit breaker is in the ON position.
HIGH TEMPERATURE	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	Check ventilation around the intake, exhaust and rear of generator. Contact s Independent Authorized Servicing Dealer if no obstruction is found.
OVERLOAD REMOVE LOAD	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	Clear alarm and remove household loads from the generator. Put back in AUTO and restart.
RPM SENSE LOSS	RED	Unit was running and shuts down, attempts to restart.	Check the LEDs/Screen for alarms.	Clear alarm and remove household loads from the generator. Put back in AUTO and restart. If problem returns, contact Independent Authorized Servicing Dealer to investigate possible fuel issue.
NOT ACTIVATED	NONE	Unit will not start in AUTO with 2-wire start signal.	See if screen says unit not activated.	Refer to <a href="#">Activation</a> .
None	GREEN	Unit will not start in AUTO with 2-wire start signal.	Check screen for start delay countdown.	If the start up delay is greater than expected, contact Independent Authorized Servicing Dealer to adjust from 2 to 1500 seconds.
LOW OIL PRESSURE	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Check oil level. Add oil per Owner's Manual. Contact Independent Authorized Servicing Dealer if oil level is correct.
RPM SENSE LOSS	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Clear alarm. Navigate to the BATTERY MENU on the control pad LCD. Contact Independent Authorized Servicing Dealer if battery is GOOD. Replace battery If CHECK BATTERY is displayed.
OVERCRANK	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Check fuel line shutoff valve is in the ON position. Clear alarm. Attempt to start the unit in MANUAL. If it does not start or starts and runs rough, contact Independent Authorized Servicing Dealer.
LOW VOLTS REMOVE LOAD	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Clear alarm and remove household loads from the generator. Set back to AUTO and restart.
FUSE PROBLEM	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Check ATO 7.5 Amp fuse. Replace with same type fuse if bad. Contact Independent Authorized Servicing Dealer if fuse is good.
OVERSPEED	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Contact Independent Authorized Servicing Dealer.
UNDER VOLTAGE	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Contact Independent Authorized Servicing Dealer.
UNDERSPEED	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Contact Independent Authorized Servicing Dealer.

**Table 8-2. Generator Troubleshooting (Continued)**

Active Alarm	LED	Problem	Things to Check	Solution
STEPPER OVERCURRENT	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Contact Independent Authorized Servicing Dealer.
MISWIRE	RED	Unit will not start in AUTO with 2-wire start signal.	Check the LEDs/Screen for alarms.	Contact Independent Authorized Servicing Dealer.

## G-Flex™ Troubleshooting

**Table 8-3. G-Flex™ Troubleshooting**

Ecode/Active Alarm	LED	Problem	Things to Check	Possible Causes/Solution
1048 VSCF Overload	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	Alternator, AVR or wiring is damaged. Contact Independent Authorized Servicing Dealer.
1049 VSCF Overload	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	Generator output is shorted or severely overloaded. Identify and clear the overload, and then restart.
1051 VSCF High Battery	YELLOW	Yellow LED illuminated in any state.	Check the LEDs/Screen for alarms.	Voltage supply to the AVR is high. If an external battery charger is in use, contact installing dealer to correct installation. If an external battery charger is NOT in use, contact Independent Authorized Servicing Dealer.
1052 VSCF DC Overvoltage	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	Probable causes are: 1) The generator was temporarily overloaded. 2) The output was temporarily shorted. Try to restart the unit.
1053 VSCF Gate Fault	RED	Unit shuts down during operation or starting.	Check the LEDs/Screen for alarms.	AVR is damaged. Contact Independent Authorized Servicing Dealer.
1054 VSCF IGBT Overtemp.	RED	Unit shuts down during operation or starting.	Check the LEDs/Screen for alarms.	Probable causes are: 1) Replace AVR filter. Inspect fan. 2) Intake or exhaust air path is blocked. Check intake and exhaust. 3) The BIG fan is not running (only runs when the engine is running). KEEP FINGERS AWAY FROM FAN HOUSING-PERSONAL INJURY CAN OCCUR IF FAN IS RUNNING. Contact Independent Authorized Servicing Dealer. 4) Air leak in AVR enclosure. Contact Independent Authorized Servicing Dealer. 5) Engine running too hot. Inspect air intake and exhaust. 6) Ambient temperature has risen above 60° F (15.5 °C). Derate the generator output per specifications.



**Table 8-3. G-Flex™ Troubleshooting (Continued)**

Ecode/Active Alarm	LED	Problem	Things to Check	Possible Causes/Solution
1055 VSCF Phase Error	RED	Unit shuts down during starting.	Check the LEDs/Screen for alarms.	An incorrect voltage and frequency has been detected during starting. Probable causes are: 1) Alternator damage. Contact Independent Authorized Servicing Dealer. 2) Generator has started into a severe load. Manually operate generator breaker and try to restart unit. If problem persists, remove load and attempt to restart unit again. 3) The engine may not be reaching its prescribed speed. Proceed as follows: <ul style="list-style-type: none"> <li>• Verify stepper motor is moving and linkage is free.</li> <li>• Verify stepper motor is plugged in.</li> <li>• Verify gas pressure is within specified limits.</li> </ul>
1056 VSCF Undervoltage	RED	Unit shuts down during operation or starting.	Check the LEDs/Screen for alarms.	The generator output voltage is too low. Probable causes are: 1) The load is too large. Remove load and attempt to restart unit. 2) Alternator or AVR damage. Contact Independent Authorized Servicing Dealer.
1057 VSCF Overvoltage	RED	Unit shuts down during operation or starting.	Check the LEDs/Screen for alarms.	Probable causes are: 1) The generator has been overloaded. Remove load and attempt to restart unit. 2) Generator has started into a severe load. Manually operate generator breaker and try to restart unit. If problem persists, remove load and attempt to restart unit again.
1058 VSCF DC Undervoltage	RED	Unit shuts down during operation or starting.	Check the LEDs/Screen for alarms.	The DPE winding supplies this voltage. 1) Alternator damage. Contact Independent Authorized Servicing Dealer.
1059 VSCF Field Loss	RED	Unit shuts down during starting.	Check the LEDs/Screen for alarms.	Unit detects no output voltage while starting. 1) Alternator damage. Contact Independent Authorized Servicing Dealer.
1061 VSCF Field Loss	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	Unit detects loss of output voltage while running. 1) Alternator damage. Contact Independent Authorized Servicing Dealer.
1060 Big Fan Failure	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	This alarm occurs when the AVR electronics temperature exceeds 70 C. Possible causes are: 1) AVR filter faulty. Replace AVR filter. 2) Intake or exhaust air path is blocked. Check intake and exhaust. 3) The BIG fan is not running (only runs when the engine is running). <b>KEEP FINGERS AWAY FROM FAN HOUSING- PERSONAL INJURY CAN OCCUR IF FAN IS RUNNING.</b> Contact Independent Authorized Servicing Dealer. 4) Air leak in AVR enclosure. Contact Independent Authorized Servicing Dealer. 5) Engine running too hot. Inspect air intake and exhaust. 6) Ambient temperature has risen above 60° F (15.5 °C). Derate the generator output per specifications. If message is displayed when generator is stopped, also check SMALL fan. Small fan RUNS for 60 minutes after generator is stopped and keeps electronics cool during heat soak.

**Table 8-3. G-Flex™ Troubleshooting (Continued)**

<b>Ecode/Active Alarm</b>	<b>LED</b>	<b>Problem</b>	<b>Things to Check</b>	<b>Possible Causes/Solution</b>
1065 Overfrequency	RED	Unit shuts down during operation.	Check the LEDs/Screen for alarms.	Probable causes are: 1) Overload. Remove load and attempt to restart unit. 2) RPM sensor has failed. Contact Independent Authorized Servicing Dealer. 3) Stepper motor problem. Contact Independent Authorized Servicing Dealer.
1066 VSCF Speed mismatch	RED	Unit shuts down during Operation or starting.	Check the LEDs/Screen for alarms.	1) Fuel problem (pressure loss). Check fuel supply and attempt to restart unit. 2) Large overload. Remove load and attempt to restart unit. 3) Throttle or engine problem. Contact Independent Authorized Servicing Dealer.
1070 Small fan failure	YELLOW	"Small fan failure" is displayed. If unit was running in AUTO, it will continue to run for one hour to cool electronics without fan.	Check the LEDs/Screen for alarms.	Small fan current incorrect. Probable causes are: 1) Fan wiring or mechanical problem. Contact Independent Authorized Servicing Dealer. 2) Air path is blocked. Check AVR filter. <b>KEEP FINGERS AWAY FROM FAN HOUSING- PERSONAL INJURY CAN OCCUR IF FAN IS RUNNING.</b>

**Table 8-4. G-Flex™ Troubleshooting (Continued)**

<b>Symptom</b>	<b>Possible Causes</b>
Generator stalls when large load is supplied.	Total load is too big for the generator. Loads must be less than 10 kW or 2 hp when operating under 3600 rpm. Contact installing dealer to correct installation.
Output voltage is low/high.	Voltage calibration incorrect. Contact Independent Authorized Servicing Dealer.
Generator does not pull full power.	Current calibration incorrect. Contact Independent Authorized Servicing Dealer.

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## Section 9: Accessories

Performance enhancing accessories are available for air-cooled generators.

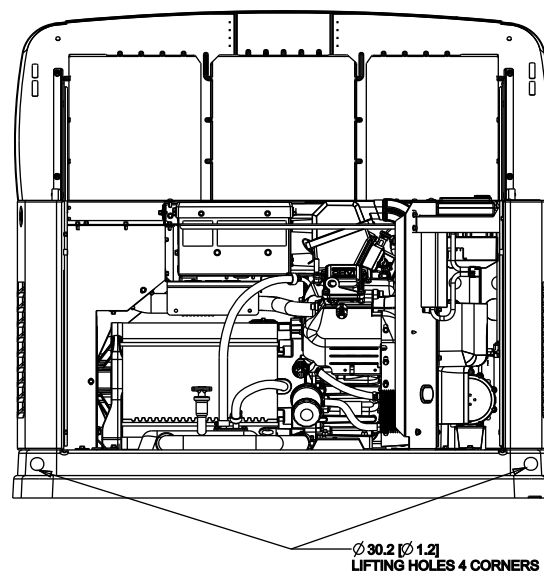
Accessory	Description
Cold Weather Kit	Recommended in areas where temperatures fall below 32 °F (0 °C).
Scheduled Maintenance Kit	Includes all pieces necessary to perform maintenance on the generator along with oil recommendations.
Mobile Link™ (USA only)	Provides a personalized web portal that displays the generator status, maintenance schedule, event history and much more. This portal is accessible via computer, tablet or smart phone. Sends emails and/or text notifications the moment there is any change in the generator's status. Notification settings can be customized to what type of alert is sent and how often. For more information, visit <a href="http://www.MobileLinkGen.com">www.MobileLinkGen.com</a> .
Touch-Up Paint Kit	Very important to maintain the look and integrity of the generator enclosure. This kit includes touch-up paint and instructions.
Wireless Local Monitor	Completely wireless and battery powered, the Wireless Local Monitor provides you with instant status without ever leaving the house. Status lights (red, yellow and green) alert owners when the generator needs attention. Magnetic backing permits refrigerator mounting and gives a 600 foot (183 m) line of sight communication.

**NOTE:** Contact an Independent Authorized Servicing Dealer or visit [www.generac.com](http://www.generac.com) for additional information on accessories and extended warranties.

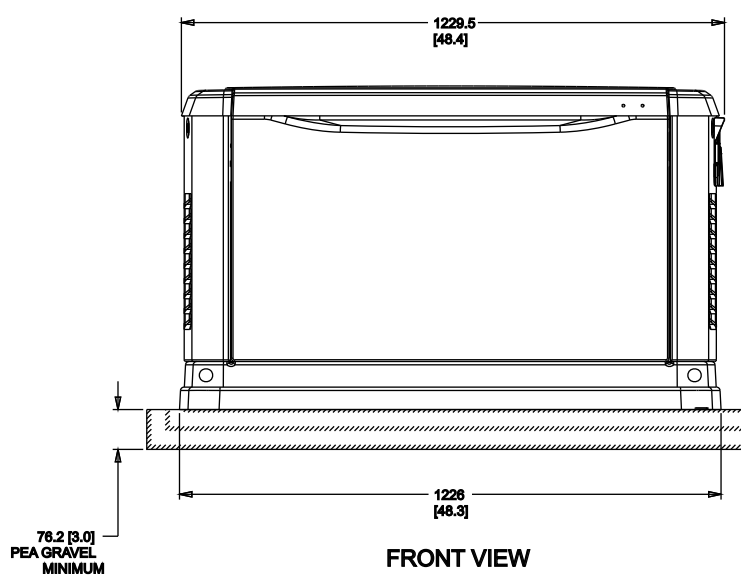
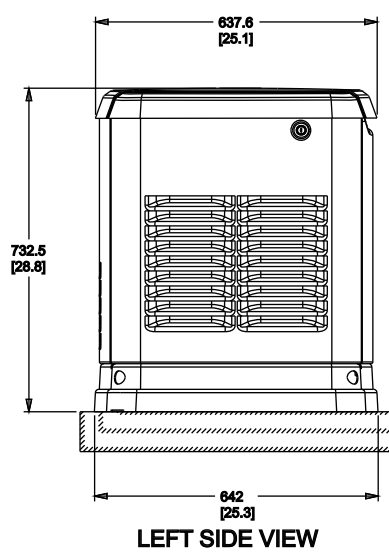
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## Section 10: Diagrams

### Installation Drawing (1 of 2)

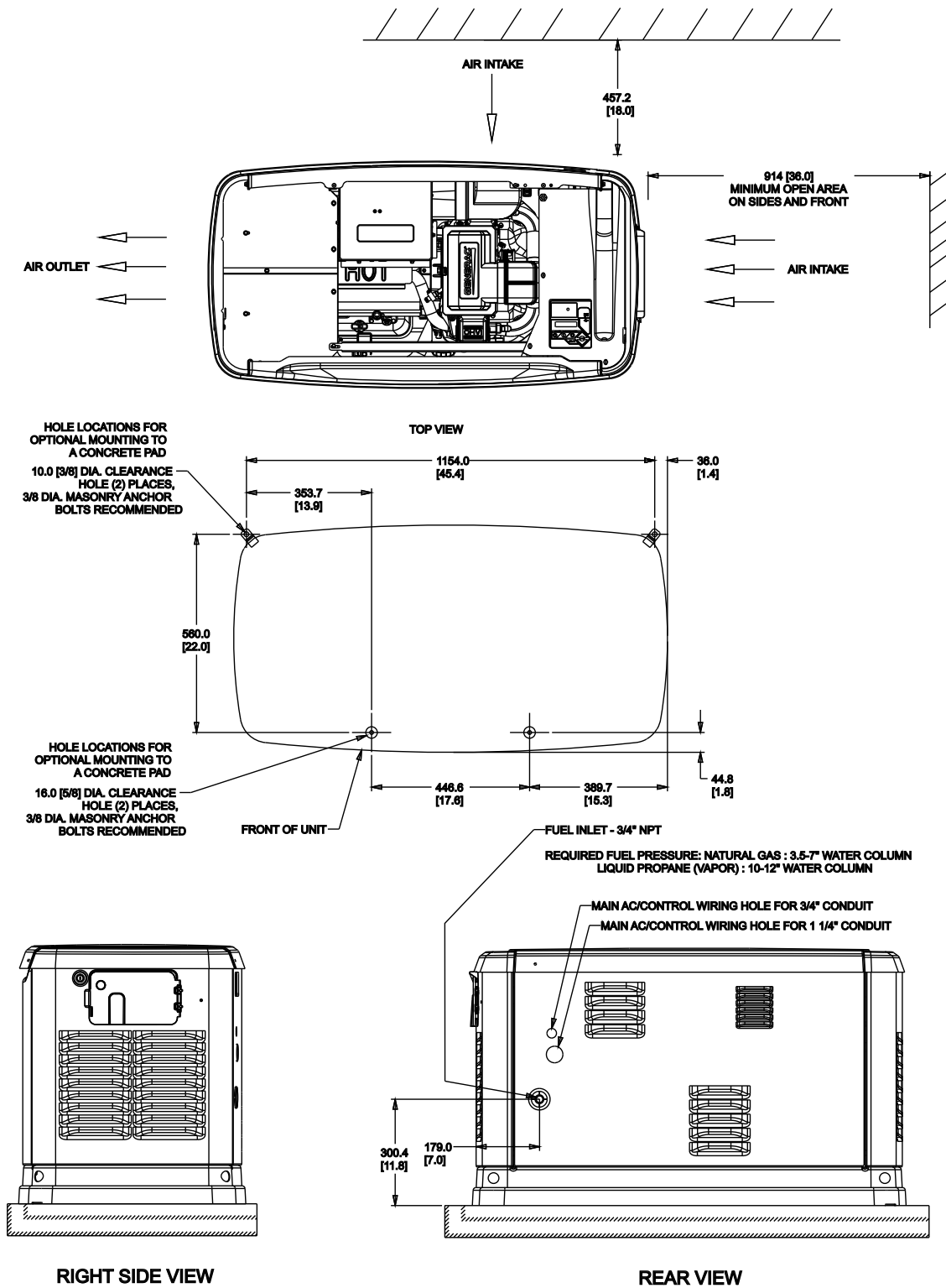


**"DO NOT LIFT BY ROOF"**



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# Installation Drawing (2 of 2)

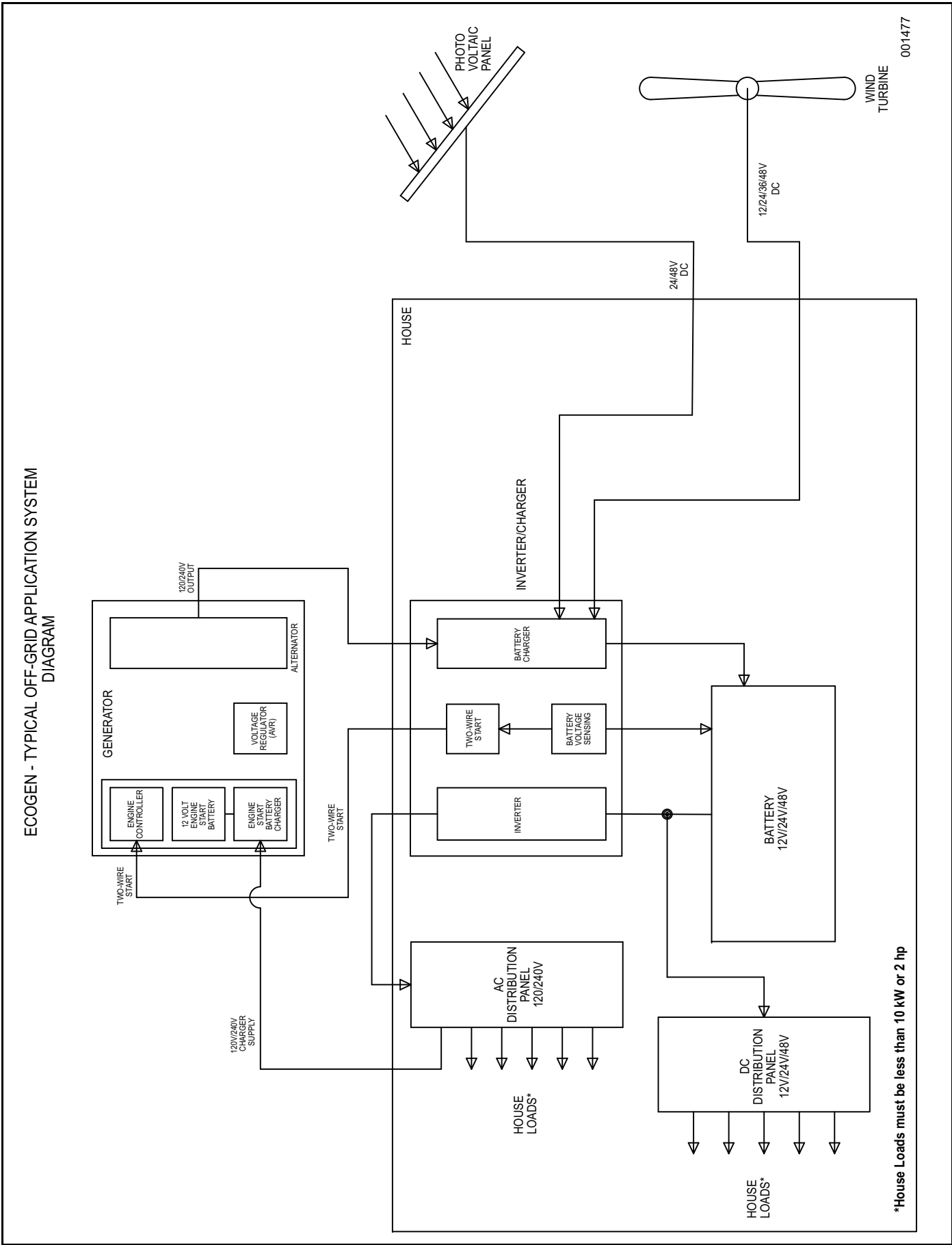


\*\*ALL DIMENSIONS IN:  
MILLIMETERS [INCHES]

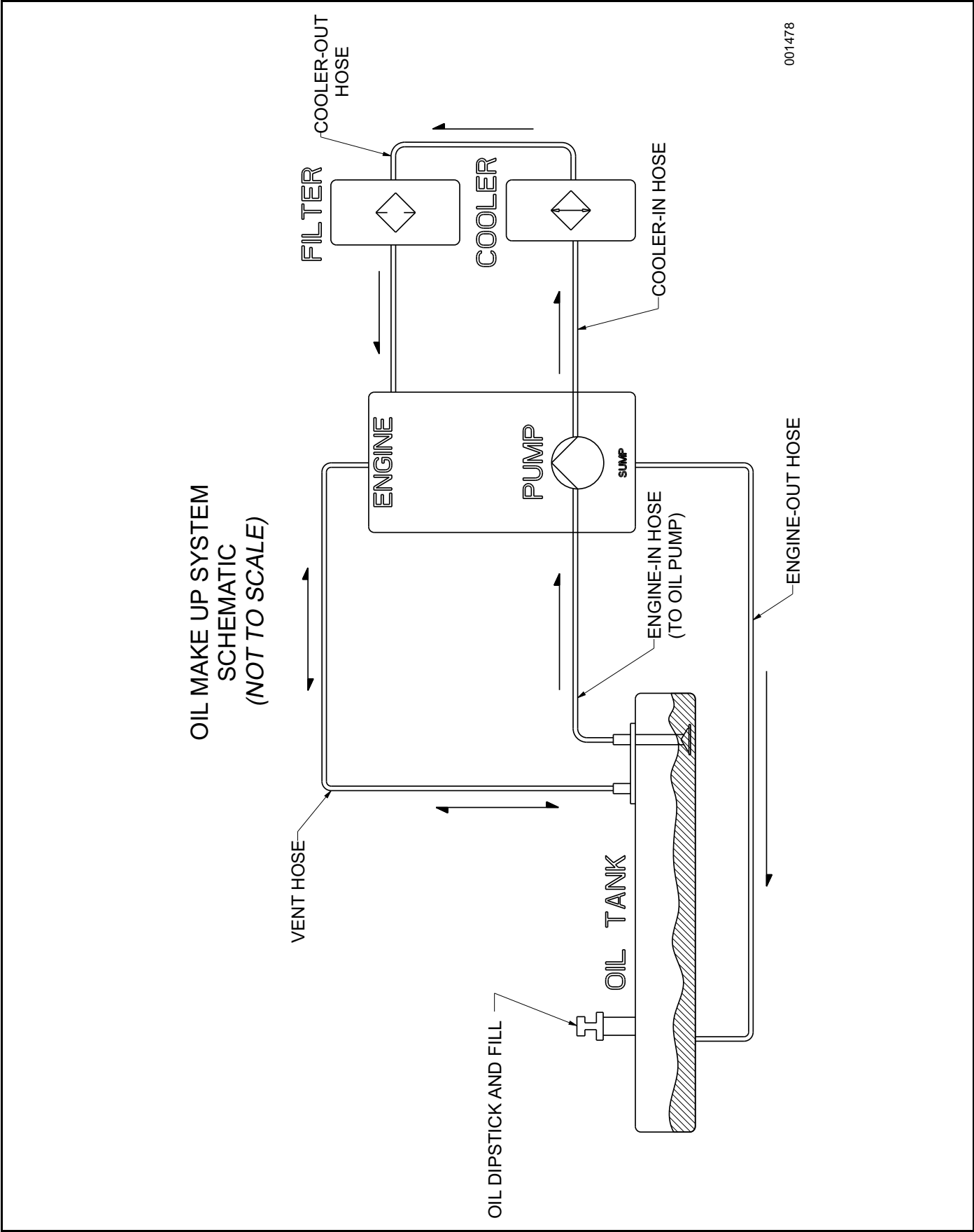
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# Off Grid Mode Application Schematic



Oil Make Up System Schematic



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