Installation Manual

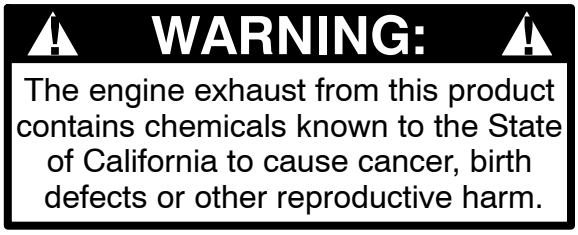
Cummins **Onan**

Performance you rely on.™

Home Standby Generator Set

GSAA (Spec A & C)

English–Orignal Instructions 6–2012 983–0603 (Issue 10)


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

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS – This manual contains important instructions that should be followed during installation and maintenance of the generator and batteries.

Before operating the generator set (genset), read the Operator Manual (983–0104) and become familiar with it and the equipment.

Note: Safe and efficient operation can be achieved only if the equipment is properly operated and maintained. Many accidents are caused by failure to follow fundamental rules and precautions.

The following symbols, found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel, or the equipment.

⚠ DANGER ***This symbol warns of immediate hazards which will result in severe personal injury or death.***

⚠WARNING ***This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.***

⚠ CAUTION ***This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.***

FUEL AND FUMES ARE FLAMMABLE

Fire, explosion, and personal injury or death can result from improper practices.

- All persons handling propane are required to be trained and qualified, according to NFPA code.
  - Natural gas is lighter than air, and will tend to gather under hoods. Propane is heavier than air, and will tend to gather in sumps or low areas.
- Be sure all fuel supplies have a positive shutoff valve.
- Be sure battery area has been well-ventilated prior to servicing near it.
  - Lead-acid batteries emit a highly explosive hydrogen gas that can be ignited by arcing, sparking, smoking, etc.

EXHAUST GASES ARE DEADLY

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

- Be sure the unit is well ventilated.
  - Provide an adequate exhaust system to properly expel discharged gases away from enclosed or sheltered areas and areas where individuals are likely to congregate.
  - Exhaust height should be tall enough to help clear gases, avoid accumulation of snow or in accordance with local mechanical code.
- Do not use exhaust gases to heat a compartment.
- Visually and audibly inspect the exhaust daily for leaks per the maintenance schedule.
  - Make sure that exhaust manifolds are secured and not warped.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not wear loose clothing or jewelery and keep your hands away from all moving parts.
  - Loose clothing and jewelry can become caught in moving parts.
  - If adjustment must be made while the unit is running, use extreme caution around hot manifolds, moving parts, etc.
- Before starting work on the generator set, disconnect battery charger from its AC source, then disconnect starting batteries, negative (-) cable first. This will prevent accidental starting.
- To prevent accidental air starting, make sure the air supply line is connected until the generator set is ready to start.
- Make sure that fasteners on the generator set are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.

BATTERIES CAN EXPLODE CAUSING SEVERE SKIN AND EYE BURNS AND RELEASE TOXIC ELECTROLYTES

- Wear safety glasses.
- Do not smoke.
- Do not dispose of the battery in a fire.
  - The battery is capable of exploding.
- Do not open or mutilate the battery.
  - Released electrolytes has been known to be harmful to the skin and eyes, and be toxic.
- Remove watches, rings and other metal objects, and use tools with insulated handles.
  - Batteries present the risk of high short circuit current.
- To prevent arcing when disconnecting the battery, first disconnect the battery charger, then the negative (–) battery cable and finally the positive (+) cable.
- To prevent arcing when reconnecting the battery, first reconnect the positive (+) cable, then the negative (–) cable, and finally, reconnect the battery charger.
- When replacing the generator set battery, always use a 26 R, maintenance free, 12 volt battery with a minimum battery CCA of 530.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

⚠ DANGER ***Use extreme caution when working on electrical components. High voltages can cause injury or death. DO NOT tamper with interlocks.***

- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag and lock open switches to avoid accidental closure.
- Do not connect the generator set directly to any building electrical system.

⚠ CAUTION ***Hazardous voltages can flow from the generator set into the utility line. This creates a potential for electrocution or property damage. Connect only through an approved isolation switch or an approved paralleling device.***

- Remove electric power before removing protective shields or touching electrical equipment.
- Use rubber insulative mats placed on dry wood platforms over floors that are metal or concrete when around electrical equipment.
- Do not wear damp clothing (particularly wet shoes) or allow skin surface to be damp when handling electrical equipment.
- Do not wear jewelry.
  - Jewelry can short out electrical contacts and cause shock or burning.

MEDIUM VOLTAGE GENERATOR SETS (601V to 15kV)

⚠ DANGER ***Improper use or procedures will result in severe personal injury or death.***

- Special equipment and training is required to work on or around medium voltage equipment. Operation and maintenance must be done only by persons trained and qualified to work on such devices.

⚠ WARNING ***Do not work on energized equipment, as this can cause severe personal injury or death.***

- Plan the time for maintenance with authorized personnel so that the equipment can be de-energized and safely grounded.
  - Due to the nature of medium voltage electrical equipment, induced voltage remains even after the equipment is disconnected from the power source.
- Unauthorized personnel must not be permitted near energized equipment.

GENERAL SAFETY PRECAUTIONS

⚠WARNING ***DO NOT open a radiator or heat exchanger pressure cap while the engine is running.***

- Allow the generator set to cool and bleed the system pressure first.
  - Coolants under pressure have a higher boiling point than water.

⚠WARNING ***Used engine oils have been identified by some state or federal agencies as causing cancer or reproductive toxicity.***

- When checking or changing engine oil, take care not to ingest, breathe the fumes, or contact used oil.
- Keep multi-class ABC fire extinguishers handy.
  - Class A fires involve ordinary combustible materials such as wood and cloth (ref. NFPA No. 10)
  - Class B fires, combustible and flammable liquid fuels and gaseous fuels (ref. NFPA No. 10)
  - Class C fires, live electrical equipment. (ref. NFPA No. 10)
- Make sure that rags are not left on or near the engine.
- Make sure generator set is mounted in a manner to prevent combustible materials from accumulating under the unit.
- Remove all unnecessary grease and oil from the unit.
  - Accumulated grease and oil can cause overheating and engine damage which present a potential fire hazard.
- Keep the generator set and the surrounding area clean and free from obstructions. Remove any debris from the set and keep the floor clean and dry.
- Do not work on this equipment when mentally or physically fatigued, or after consuming any alcohol or drug that makes the operation of equipment unsafe.

⚠WARNING ***Substances in exhaust gases have been identified by some state or federal agencies as causing cancer or reproductive toxicity.***

- Take care not to breathe or ingest or come into contact with exhaust gases.
- Do not store any flammable liquids, such as fuel, cleaners, oil, etc., near the generator set. A fire or explosion could result.
- Wear hearing protection when going near an operating generator set.

⚠WARNING ***Avoid contact with hot metal parts such as the radiator, turbo charger and exhaust system to prevent serious burns.***

KEEP THIS MANUAL NEAR THE GENSET FOR EASY REFERENCE

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1. Introduction

ABOUT THIS MANUAL

This manual is a guide for the installation of the generator set(s) listed on the front cover. Proper installation is essential for top performance, reliable operation and safety. *The installation must comply with all applicable building codes.* Read through this manual before starting the installation.

Information For After Installation

⚠WARNING ***Improper installation can result in severe personal injury, death and damage to equipment. The installation must comply with all applicable building codes. It is strongly recommended that the installer be properly trained and licensed to perform electrical and mechanical equipment installations, however a person with the proper knowledge and experience in installing electrical and mechanical equipment installations may also install this genset.***

Refer to *Appendix E. Specifications* for specific information about the system and its components.

Refer to *Appendix F. Outline and System Drawings* for specific information about the installation and the wiring connections.

See the Operator Manual for operation and maintenance instructions.

Note: Manuals are updated from time to time to reflect changes in the equipment and its specifications. See an authorized Cummins Onan representative for current manuals.

PRE-INSTALLATION CONSIDERATIONS

The location of the generator set affects all other aspects of the installation, such as the lengths of electric wiring and gas lines, and is one of the first decisions to be made. The installation cannot be completed without connections to an automatic transfer switch and a source of fuel, Natural Gas or Propane, which must be inspected by the gas and electric utilities.

Decide where to locate the generator set and automatic transfer switch, how fuel supply will be provided, what materials are required (wiring, fuel lines, etc.), and what site preparations are necessary (access to and preparation of the site, trenches, etc.). Prior co-ordination will reduce delays and the amount of time power has to be interrupted.

IMPORTANT NOTICE: Depending on the locality and use of the generator set, it may be necessary to obtain an air quality emissions permit before installation begins. Check with the local pollution control or air quality authority.

Automatic Transfer Switch

The Model GSAA generator set is for installation only with Cummins Onan Model RSS automatic transfer switches. Use of other makes and models of transfer switches voids the Model GSAA generator set Warranty.

Install the transfer switch in accordance with its Installation Manual and make connections to the generator set in accordance with *Section 4. Electrical Connections*.

SPECIFICATIONS

FUEL CONSUMPTION:	Natural Gas Installation (1000 BTU/ft^3)	Propane Installation (2500 BTU/ft^3)
@ 1/2 Load	122 ft^3/hr (3.5 m^3/hr)	53 ft^3/hr (1.5 m^3/hr)
@ Full Load	191 ft^3/hr (5.4 m^3/hr)	88 ft^3/hr (2.5 m^3/hr)
Fuel Supply Pressure	5–11 H_2O	7–11 H_2O
Recommended LP Tank Size (necessary to run the generator set for seven days)	500 Gallon (Contact you local gas company to verify the tank size required for your application)	
GENERATOR: Brush-Type, 2-Pole Rotating Field, Single-Bearing		
Power (@1.0 power factor)	10.5 kW	12 kW
Voltage	120/240	120/240
Frequency	60 Hz	60 Hz
Number of Phases	1	1
Output Current	87.5/43.75 Amps	100/50 Amps
Circuit Breaker	50 amp, 2-pole	50 amp, 2-pole
ENGINE: 2-Cylinder-V, OHV, Air-Cooled, 4-Stroke, Spark Ignited, 3600 RPM		
Displacement	40.9 in^3 (720 cc)	
Compression Ratio	8.3:1	
Spark Plug Gap	0.030 in (0.76 mm)	
Spark Plug Type	NGK-BPR6ES (P/N 167–1658)	
Spark Plug Tightening Torque	10 ft-lbs (13.5 N-m)	
Cylinder Compression Test	180 psi (12.4 bar)	
Valve Lash: Intake & Exhaust (cold)	0.004in (0.10 mm)	
Oil Capacity	1.7 quart (1.6 liter)	
CONTROLLER: Integrated Microprocessor-Based Engine, Generator and Transfer Switch Controller		
DC SYSTEM:		
Nominal Battery Voltage	12 volts	
Battery Group	26 R	
Battery Type	Maintenance Free	
Minimum Battery CCA (Cold Cranking Amps)	530	
WEIGHT (WET): 460 lbs (209 kg)		
SIZE (L x W x H): 48 x 43 x 31.5 in (1219 x 864 x 800 cm)		
SOUND LEVEL: Less than 64 dB(A) @ 23 ft (7 meters) and 12 kW of Load		

Generator Set Location

⚠WARNING ***EXHAUST GAS IS DEADLY! Install the generator set out-of-doors only, away from doors, windows and other openings into the house and where the exhaust gases will disperse away from the house.***

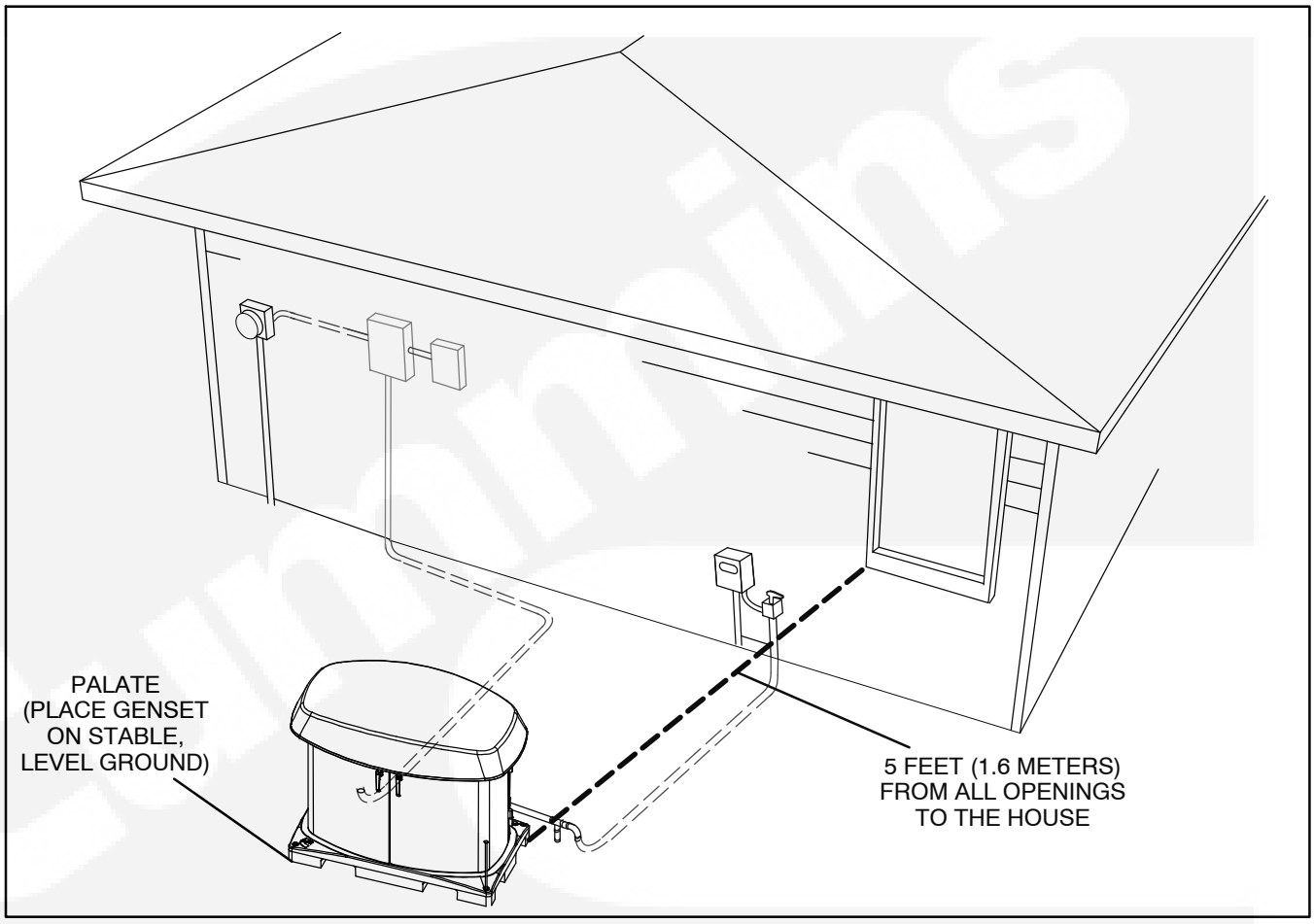


FIGURE 1-1. GENERATOR SET LOCATION

Generator set (genset) location is critical for safety and good performance. Follow the guidelines below :

- Install out-doors only.
  - Call the local utilities to mark the locations of buried utility services (gas, electric, telephone) before digging trenches for fuel and electric lines.
  - Ask the homeowner for the location of any other buried components.
- Locate and orient the genset such that the prevailing winds will carry exhaust gases and fuel leaks away from the house.
  - Genset must be at least 5 feet (1.6 meters) away from all openings to the house.
  - **Do not** locate the genset in a three-sided niche of the house, under an overhang or in a low-lying area or next to a basement.
  - **Do not** locate the genset where snow drifts, plant growth, lawn clippings and other objects are likely to block the ventilation openings.
- Locate the genset as far away as practical from noise sensitive areas such as bedrooms, living room windows and neighbors.
- Locate the genset where it will be protected from vehicular traffic and vandalism.
- Locate the genset as close as practical to the house to reduce the lengths electric wiring and fuel lines.
- Place the genset on stable ground, not subject to flooding.

Note: The area should be leveled and compacted with sand or pea gravel.

Natural Gas Supply

The Natural Gas supply meter may need to be exchanged for a higher capacity meter to supply the additional gas consumed by the generator set. At full load, the generator set alone requires 191,000 BTU/hr. To determine the required meter capacity, generator set consumption must be added to the gas consumed for heating, cooking, clothes drying, etc. A typical installation might require a 400,000 BTU meter.

Consideration should also be given to utilizing high pressure gas supply (2 psi), if available, to reduce the required size, and therefore cost, of gas piping, especially if the location of the generator set requires a long supply line.

Note: An older site might require upgrading and repair of the gas supply system, which should be scheduled to minimize power and gas supply interruptions.

Materials Required

The installer must provide the following materials to complete the installation:

1. Gas line and step down regulators (as required) for gas connections:
   A. Natural Gas at 191,000 BTU/hour
   B. Propane at 220,000 BTU/ hr or 2.4 gallons/ hour
   C. Gas pressure at generator set: 5–11 inch WC
2. UL listed pipe dope
3. Electrical Conduit sealing putty
4. Cat 5 Ethernet cable (optional)
5. Four wall anchors and 4 No. 6 black screws for mounting the Operator Panel.
6. AC Power Output Wiring: Four 8 AWG 90°C wires for runs up to 125 feet. (L1, L2, N and GND)
7. AC Accessory Supply Wiring: Two 12 AWG 90°C wires for runs up to 125 feet. (Hot and Neutral)
8. AC Conduit for Items 6 and 7, which may be run in the same conduit.
9. Control/Communications Wiring: Up to twelve 18 AWG wires, depending on Transfer Switch. (Generator set TB1-1 through TB1-12)

   Note: The wire size varies, depending on distance (see Table 4-1).
10. Communications Wiring Connectors: Up to twelve UL listed 18 AWG fork terminals for Item 9 wires (Cummins Part Number 0332–2527).
11. DC Conduit for Item 9 wires.
12. One or two 12 volt relays for load management (optional)

Note: It is recommended that the two 18AWG wires from Generator set terminals TB1-7 and TB1-8 for load management be pulled along with the other control/communications wires at the time of installation so that they are available if it is determined later that load management is necessary.

Tools Required

Use a forklift to move the generator set and set it in place. Alternatively, a one-man hand dolly designed to fit the generator set base is available to move the generator set and set it in place (P/N 0541-1624).

Hand tools required include the following:

1. Wire stripper and lug crimper for terminating the twelve communications wires.
2. Rachet set with 10 mm socket and extension.
3. Two pipe wrenches for gas connections.
4. Phillips-head and flat-blade screwdrivers.

Loose Parts Shipped With the Generator

The following loose parts are shipped with the GSAA generator set.

- Oil Drain Hose (P/N 0503–2151)
- Flexible Fuel Hose Assembly (P/N 0501–0776–06)
- Four Base Spikes (Ground Stakes) (P/N 0403–4365)
- Snap Bushing (P/N 0508–0208–05)
- In-Home Display (P/N 0300–6385)
- Pigtail Harness for In-Home Display (P/N 0338–5023)
- LP Orifice for LP Fuel Changeover (Wire tied to the engine lifting bracket) (P/N 0148–1385)
- Two Keys (P/N A026G567)
- Quick Connect Guide (located in the battery box)
- Literature – Operator Manual, Installation Manual, Setup Guide, and Warranty Statement

INSTALLATION CODES AND STANDARDS FOR SAFETY

⚠WARNING ***The generator set installer bears sole responsibility for following all applicable local codes and regulations.***

The following list of Installation Codes and Standards for Safety applies to the installation and operation of standby generator sets. This list is for reference only and not intended to be inclusive of all applicable codes and standards. The address of each agency is listed so that copies of the codes may be obtained for reference. Installation codes and recommendations are subject to change, and may vary by location or over time.

TABLE 1-1. INSTALLATION CODES AND SAFETY RECOMMENDATIONS

NFPA 70 National Electric Code NFPA 37 Installation and Use of Stationary Combustion Engines and Gas Turbines NFPA 54 National Fuel Gas Code NFPA 58 Storage and Handling of Liquefied Petroleum Gases	National Fire Protection Association, 470 Atlantic Avenue Boston, MA 02210
CSA Electrical Bulletin CSA C22.2 No. 100 CSA C22.2 No. 14	Canadian Standards Association, Housing and Construction Materials Section 178 Rexdale Blvd. Rexdale, Ontario, Canada M9W 1R3
California Administrative Code - Title 25 Chapter 3	State of California Documents Section P.O. Box 1015 North Highlands, CA 95660
Underwriters Laboratories UL2200 Stationary Engine Generator Assemblies	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062-2096

2. Step-by-Step Outline of Installation

INTRODUCTION

⚠WARNING ***The installer is responsible for complying with all applicable installation codes and safety requirements.***

This section is a step-by-step overview of a typical installation. This section includes:

- Locating the site
- Generator set Clearances
- Preparing the site
- Moving the generator set
- Placing the generator set
- Connecting the generator set

Review this section, then refer to the detailed instructions that are given in the following sections for specific procedures and important safety precautions before starting the installation.

LOCATING THE SITE

These generator sets are housed in a weather-protective enclosure for installation out-of-doors on a non-combustible base.

Choose a site close to the electric service and Natural Gas meter or Propane tank. The main distribution, transfer switch, and sub-panels are usually inside the house.

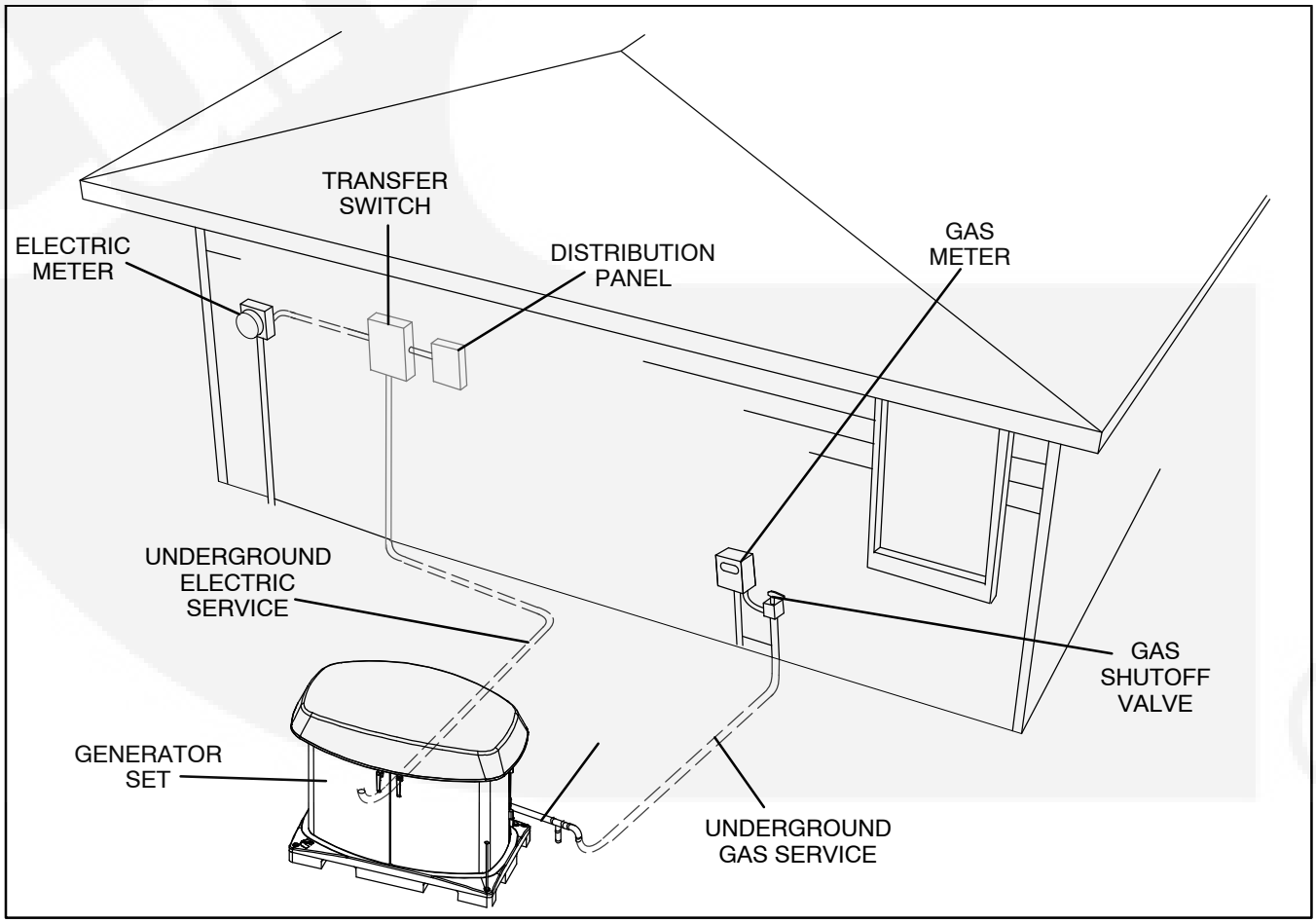


FIGURE 2-1. TYPICAL GENERATOR SET SITE

GENERATOR SET CLEARANCES

The generator set must be a minimum of 3 ft (915 mm) from combustible material (NFPA 37). Leave at least 3 ft (915 mm) all around the generator set enclosure for access to the inside (NEC Art. 110-26a, Art. 110-26b). The generator set must be at least 5 ft (1524 mm) from any opening (window, door, vent, etc.) in the wall, and the exhaust must not be able to accumulate in any occupied area.

Refer to the Outline Drawing (page F-7) for the clearance required to fully open the maintenance and service doors.

PREPARING THE SITE

If the site is not on level ground prepare an area large enough to easily hold the generator set so that it can be mounted level. If you add fill to the site, be sure to tamp the ground until it is firm and stabilized.

Prepare a site at least 48 in by 34 in (1219 mm by 864 mm) on firm ground. Sites on inclines require more area. Add a layer of sand or pea gravel deep enough so that you can level the generator set. Remove any combustible material that would be under and around the generator set.

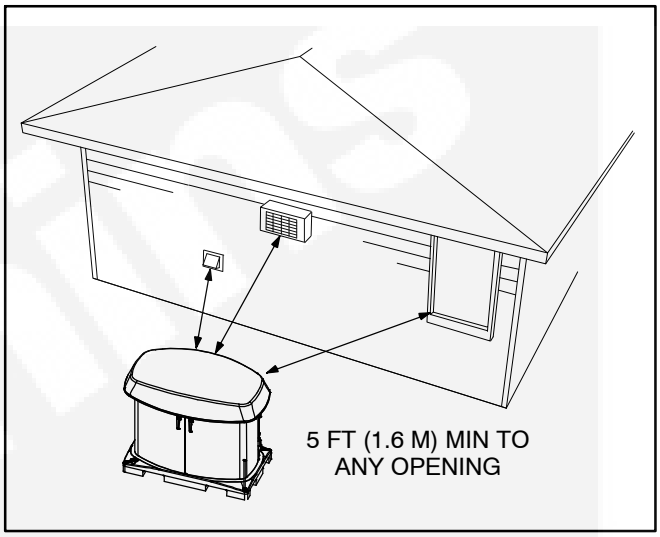


FIGURE 2-2. GENERATOR SET CLEARANCES

LIFTING AND MOVING GENERATOR SET

⚠WARNING ***The generator set is heavy. Dropping the generator set can cause severe personal injury or death. Keep feet and hands clear when lifting the generator set.***

⚠CAUTION ***The generator set is shipped with oil in the crankcase. Keep it upright.***

The generator set is heavy and must be handled with care. Use a forklift to move the generator set and set it in place. Alternatively, a one-man hand dolly designed to fit the generator set base is available to move the generator set and set it in place.

STAKING GENERATOR SET IN PLACE

⚠WARNING ***Pounding the stakes into electric, gas, or telephone service lines can result in severe personal injury or death. Observe the utility company markings.***

Set the generator set in place and pound the four corner stakes into the ground to secure the generator set in place.

ELECTRICAL WIRING CONNECTIONS

Refer to *Appendix F Outline and System Drawings* for the locations of the electrical conduit openings on the side of the generator set and the alternative stub-up opening in the base for all power and communications wiring connections between the generator set and transfer switch.

Route the wires from the transfer switch through conduit and connect the wires to the mating terminals in the generator set terminal board compartment. Two separate conduits are required. One is for all A/C voltage connections on TB2 and TB3. The other is for all TB1 and ethernet cables.

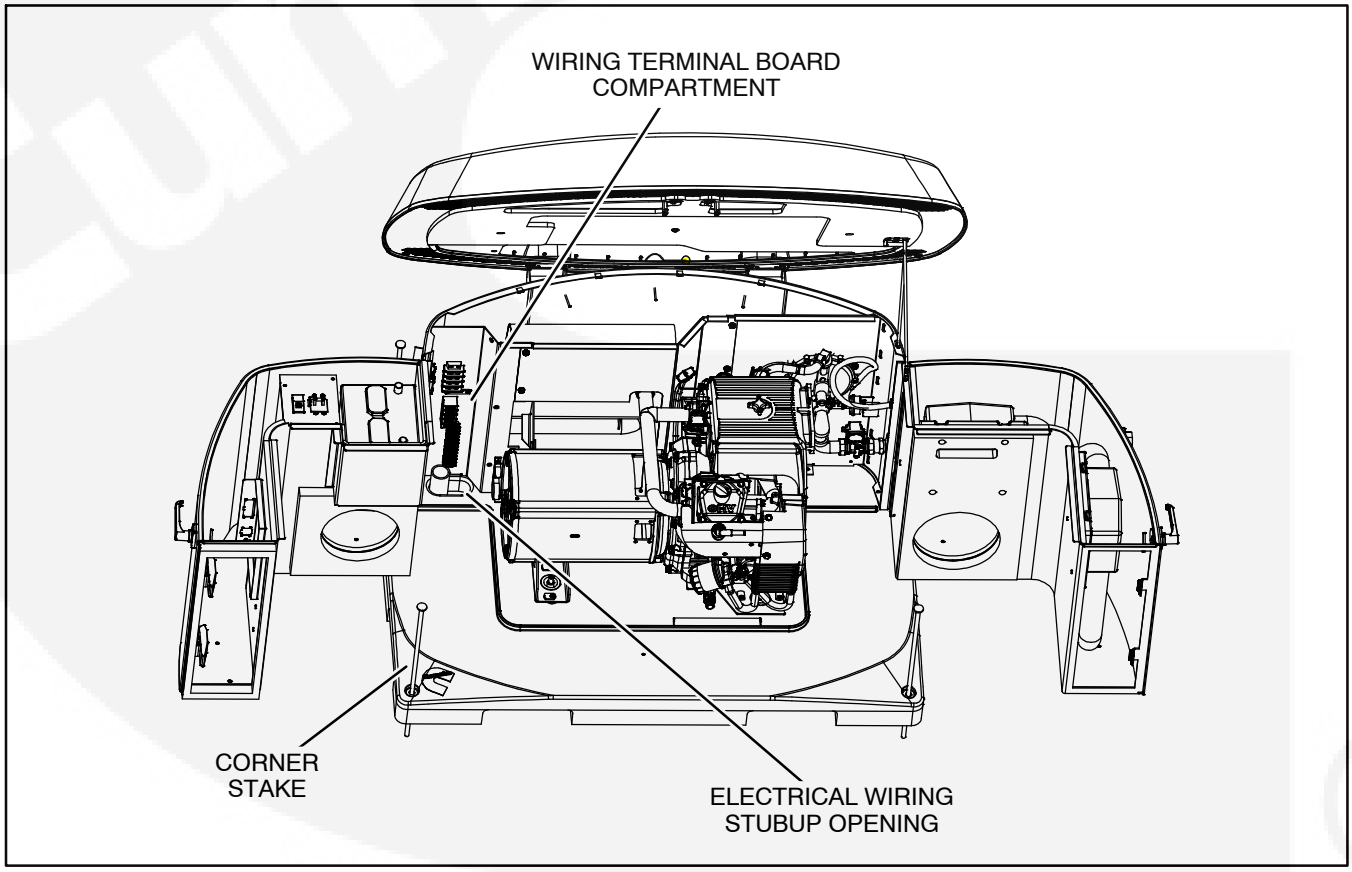


FIGURE 2-3. ELECTRICAL WIRING TERMINAL BOARDS AND STUBUP OPENING

GAS LINE CONNECTIONS

⚠WARNING ***Fuel presents the hazard of fire or explosion that can result in severe personal injury or death. Do not smoke or allow any flame, spark, pilot light, or other ignition sources near fuel or in the installation area. Read the important safety precautions in the*** **Fuel System** ***section.***

Refer to *Appendix F Outline and System Drawings* for the location of the fuel supply connection through the side of the generator set. A flexible fuel hose is packaged inside the generator set (Assembly part number: 0501−0776−06). Connect it between the 3/4 NPT fitting on the generator set and the fuel supply line.

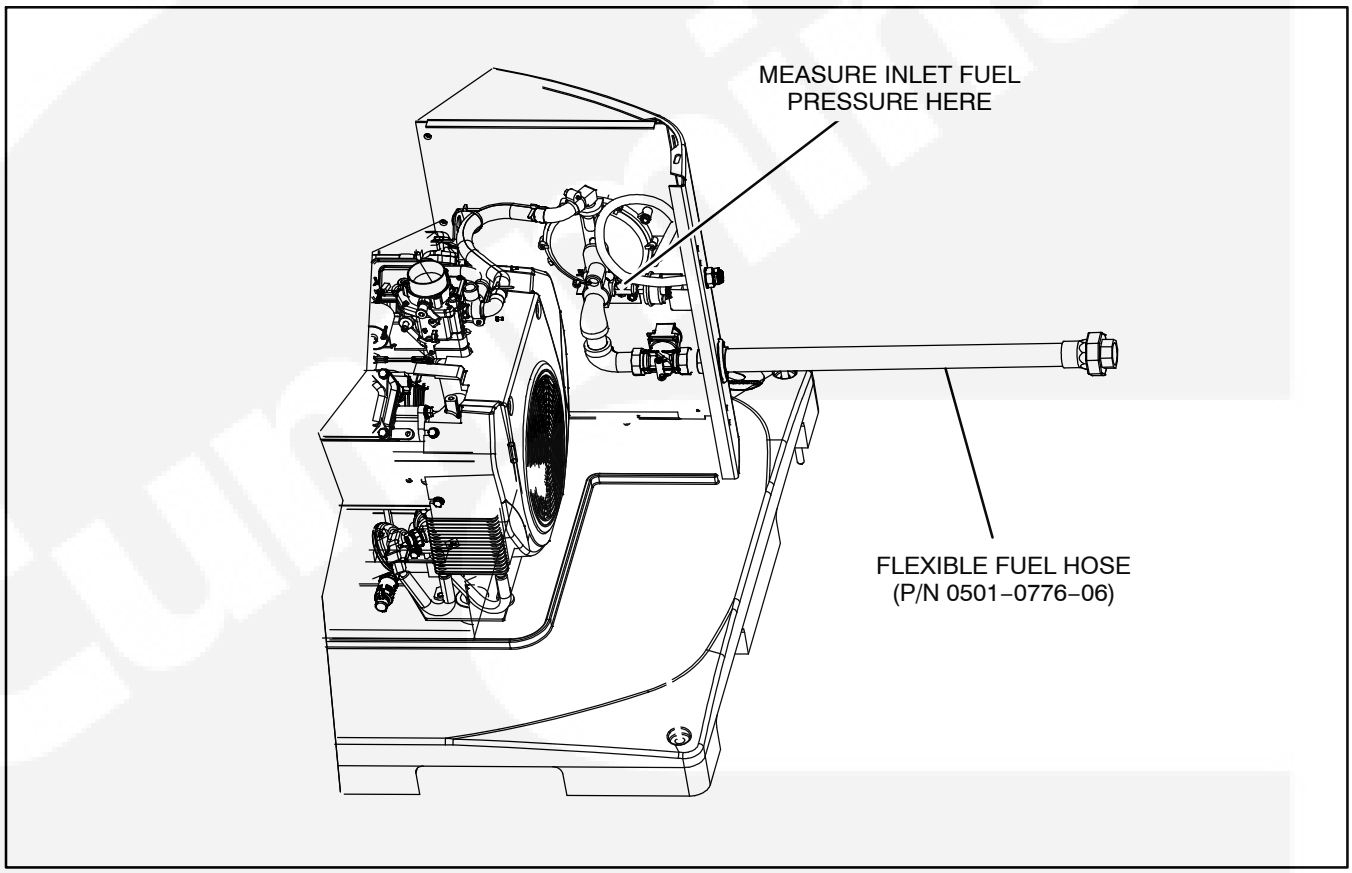


FIGURE 2-4. GAS LINE CONNECTIONS

3. Mechanical

LOCATION AND ACCESS

These generator sets are designed for installation out-of-doors in its weather-protective enclosure.

Factors to consider when deciding where to locate the generator set include:

- Proximity of generator set, transfer switch, loads and Natural Gas fuel lines or Propane tanks.
- Access for maintenance and service. Refer to the Outline Drawing (page F-7) for the clearance required to fully open the maintenance and service doors.
- Security from vandalism, flooding and vehicular traffic.
- Noise levels and proximity of property lines.
- Safe dispersal of engine exhaust and cooling air away from buildings, habitable areas, and people.
- Possible obstructions to ventilation caused by snowdrifts, plant growth, lawn clippings, falling leaves, etc.
- See *Locating the Site* in Section 2.

ENGINE EXHAUST

The exhaust system of this generator set was designed for this engine and is complete. Do not modify or add to the exhaust system of this generator set.

⚠WARNING ***EXHAUST GAS IS DEADLY! The exhaust system must terminate away from building vents, windows and doors and sheltered spaces that may not have ample fresh air ventilation.***

Do not use generator set discharge air or engine exhaust for heating a room or enclosed space.

⚠WARNING ***Engine discharge air and exhaust carry carbon monoxide gas (odorless and invisible) which can cause asphyxiation and death. Never use engine discharge air or exhaust for heating a room or enclosed space.***

FUEL SYSTEM

⚠WARNING ***Fuel systems must be installed by qualified service technicians. Improper installation presents hazards of fire and improper operation, resulting in severe personal injury or property damage.***

The generator set name plate is marked to indicate the fuel type, Natural Gas or Propane.

⚠WARNING ***Gaseous fuels are flammable and explosive and can cause severe personal injury or death. Do not smoke if you smell gas or are near fuel tanks or fuel-burning equipment or are in an area sharing ventilation with such equipment. Keep flames, sparks, pilot lights, electrical arcs and arc-producing equipment and all other sources of ignition well away. Keep a type ABC fire extinguisher handy.***

In all fuel system installations, cleanliness is of the upmost importance. Make every effort to prevent entrance of moisture, dirt, excess thread sealant, or contaminants of any kind. Clean all fuel system components before installing.

The section of flexible fuel hose supplied with the generator set must be used between the engine's fuel system and fuel supply line to protect the fuel system from damage caused by vibration, expansion and contraction. The fuel hose must be installed according to all applicable codes and standards.

Gaseous-fuel supply system design, materials, components, fabrication, assembly, installation, testing, inspection, operation and maintenance must comply with the applicable codes. See NFPA Standards No. 37, No. 54, and No. 58.

Most codes require a manual shutoff valve ahead of a flexible fuel hose. The manual valve should be of the indicating type. The generator set has an electric (battery-powered) shutoff valve included between the fuel supply and the carburetor.

Until the generator set is connected, cap the fuel line stub-up at the generator set to prevent dirt from en-

tering and gas discharging if the gas supply shutoff valve is opened inadvertently.

Refer to *Appendix E. Specifications* for the fuel inlet size.

NATURAL GAS FUEL SYSTEM

The generator set requires an adequate fuel supply to operate correctly at full load. The length of the fuel supply pipe from the gas service entrance to the generator set must be known to determine the correct fuel pipe size. Refer to Table 3-1 to find the fuel supply requirement for your generator set. Pipe must be minimum of schedule 40 subject to the authority having jurisdiction.

Natural Gas Supply Line Size

The generator set requires up to 191,000 BTU/hr (191 cubic feet/hr) delivered to the generator set inlet at 5–11 inches (28 mm) WC (Water Column). If the meter serves other gas appliances such as a furnace, water heater, or stove, you must consult with the local Natural Gas utility to determine whether the Natural Gas meter is adequate.

It is important to consider other loads operated from the fuel supply pipe. Other loads, such as space heating and water heating equipment, must also be determined to correctly size the fuel pipe. Use the total load requirement of the fuel supply line to determine the size of the fuel supply pipe. Use Table 3-1 to determine the correct pipe size. (typically, 1 ft^3/hr =1000 BTU/hr,)

Note: When the fuel delivery value falls between two columns, use the larger value.

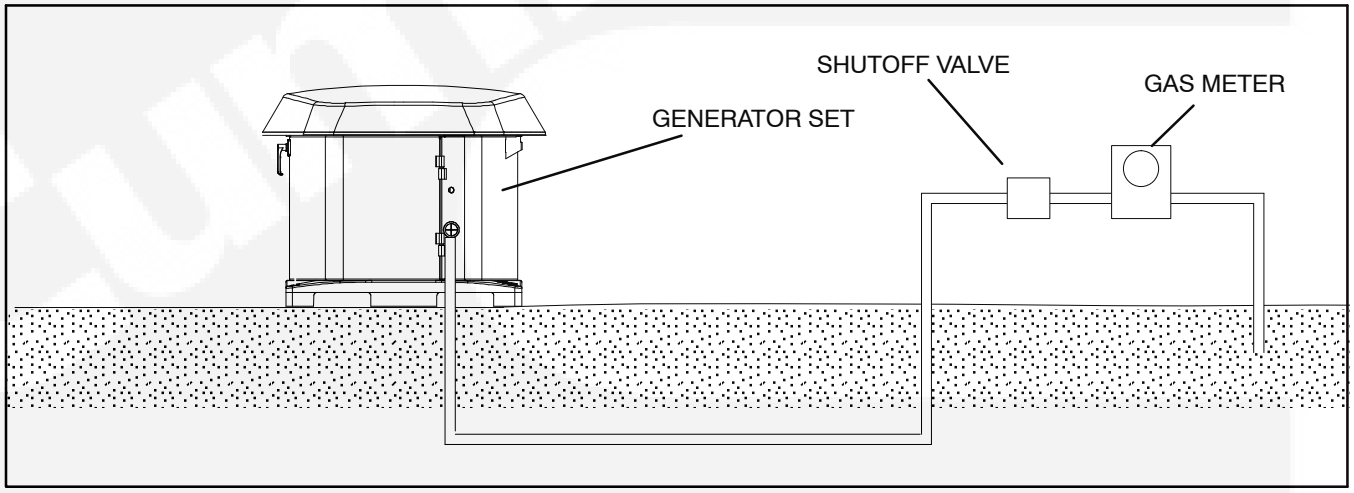


FIGURE 3-1. TYPICAL NATURAL GAS INSTALLATION

TABLE 3-1. NATURAL GAS PIPE CAPACITY—CUBIC FEET OF GAS PER HOUR

NOMINAL IRON PIPE SIZE (INCHES)	LENGTH OF PIPE IN FEET													
	10	20	30	40	50	60	70	80	90	100	125	150	175	200
3/4	360	250	200											
1	680	465	375	320	285	260	240	220	205	195				
1-1/4	1400	950	770	660	580	530	490	460	430	400	360	325	300	280
Maximum pipe capacity in cubic feet per hour of 0.60 specific gravity Natural Gas with a pressure drop of 0.5 inches (1.27 mm) WC over the length														

PROPANE FUEL SYSTEM

⚠WARNING ***NFPA Standard No. 58 requires all persons handling and operating Propane to be trained in proper handling and operating procedures.***

⚠WARNING ***Fuel leaks can lead to explosive accumulations of gas. Propane sinks in air and can accumulate inside housings, basements and other below-grade spaces. Prevent gas leaks and the accumulation of gaseous fuel in the event of a leak.***

Converting from Natural Gas to Propane (Vapor Withdrawal)

The generator set leaves the factory set up for Natural Gas. The generator set must be converted as follows for use with Propane vapor:

1. Disconnect the fuel hose at the gas/air mixer and thread in the gas orifice wire-tied to the engine lifting bracket (Figure 3-2).
2. Insert the air orifice supplied with the flexible gas hose into the inlet of the air intake resonator (Figure 3-3). (Orifice used only on spec A units)
3. Configure the control for Propane (page **5–1**).

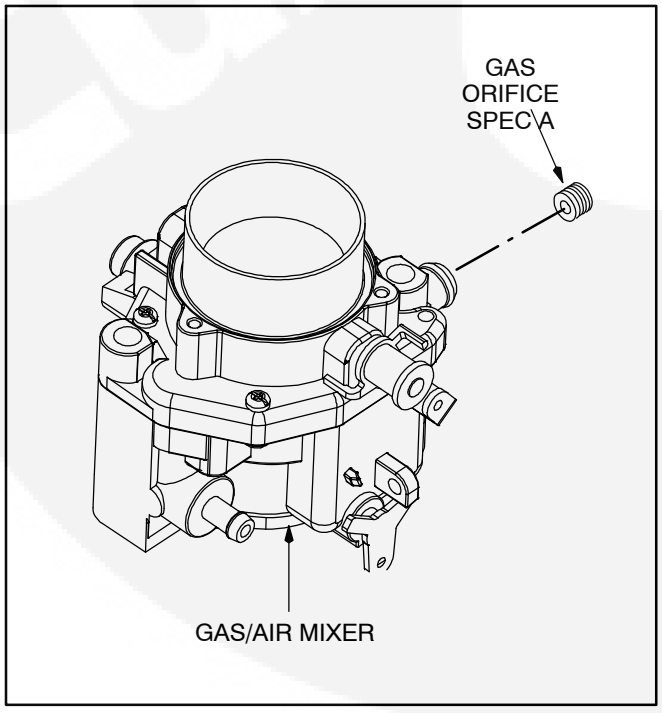


FIGURE 3-2. INSTALLING THE PROPANE GAS ORIFICE

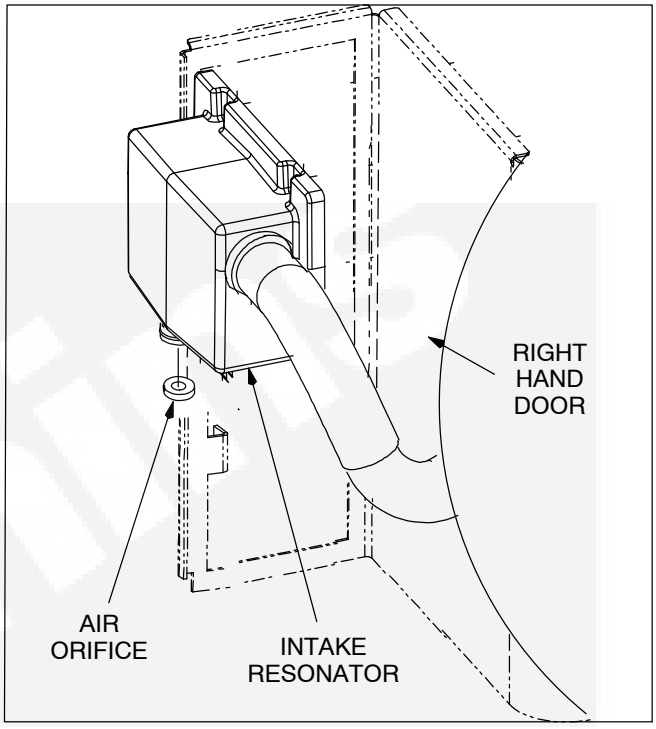


FIGURE 3-3. INSTALLING THE AIR ORIFICE (SPEC A ONLY)

Propane Vapor Fuel Supply Line Size and Pressure

Fuel line size depends on the amount of fuel needed to run the generator set at full load at the distance the fuel must be moved. The generator set requires 88 ft^3/hr of Propane Vapor at full load delivered to the generator set inlet at 7–11 inches WC (Water Column) gas pressure. Figure 3-4 shows a typical Propane Vapor installation and Table 3-2 lists fuel capacity for given distances and pipe size.

Size the fuel line so that the Propane vapor pressure drops no more than 2 inches WC from no load to full load.

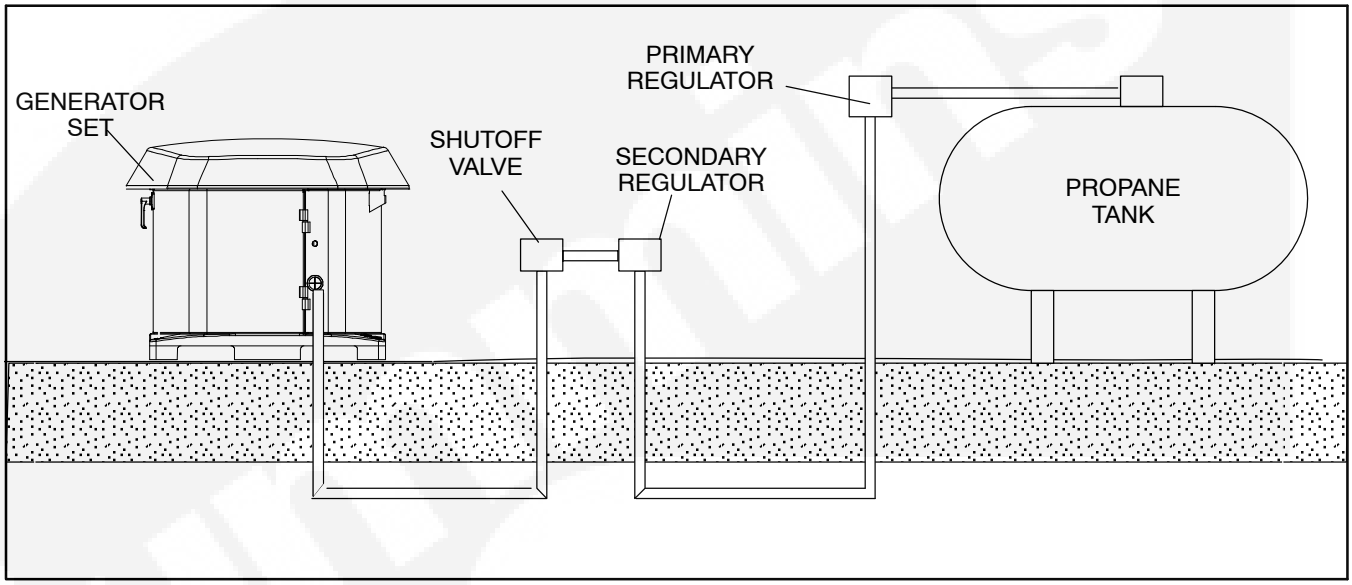


FIGURE 3-4. TYPICAL PROPANE VAPOR WITHDRAWAL INSTALLATION

TABLE 3-2. PROPANE VAPOR PIPE CAPACITY—CUBIC FEET OF GAS PER HOUR

NOMINAL IRON PIPE SIZE (INCHES)	LENGTH OF PIPE IN FEET											
	10	20	30	40	50	60	70	80	90	100	125	150
3/4	227	157	126	107	95							
1	428	293	236	201	179	164	151	138	129	123	110	101
1-1/4	882	598	485	416	365	333	308	289	207	252	230	204
1-1/2	1323	920	743	624	567	570	472	434	409	390	346	315
2	2488	1732	1386	1197	1058	958	882	819	768	724	642	598
Maximum pipe capacity in cubic feet per hour of Propane vapor with a pressure drop of 0.5 inches (1.27 mm) WC over the length												

Fuel Pressure

⚠WARNING ***High gas supply pressure can cause gas leaks which can lead to fire and severe personal injury or death. Gas supply pressure must be adjusted to Specifications by trained and experienced personnel.***

Satisfactory performance requires that the Propane Vapor be supplied at a pressure within the range of 7-11 inches WC (water column).

When measuring supply pressure, the most accurate reading would be on the input side of the solenoid valve.

Recommended Fuel

Use clean, fresh HD-5 grade Propane or equivalent product consisting of at least 90 percent Propane. Commercial Propane may contain more than 2.5 percent butane which can result in poor fuel vaporization and low tank pressure resulting in poor engine starting in low ambient temperatures (below 32°F (0°C).

⚠WARNING ***Propane presents the hazard of fire or explosion that can cause severe personal injury or death. Do not permit any flame, spark, arc-producing equipment, switch, pilot light, cigarette, or other ignition source near the fuel system. Keep an ABC type fire extinguisher nearby.***

Propane Tank Size

To assist in the proper selection of the Propane tank, follow the guidelines below.

- Propane tanks are sized by the number of gallons of water they can hold, not the amount of fuel they hold. See Table 3-3.
- Propane tanks are generally filled to only 80% of their water capacity. Therefore, a 500 lb tank results in 400 lb tank capacity.
- Low ambient temperatures affect the amount of fuel available from the Propane tank.
- Approximately 60% of the fuel (in gallons) filled in the tank can be effectively used. Therefore, a 500 lb tank results in 300 gallon capacity.
- Propane tanks must be fitted with a pressure reducing regulator before connection to the generator set to prevent fuel system damage.
- Propane tanks must be located at least 10 ft (3048 mm) from any source of combustion (including the generator set).

TABLE 3-3. REQUIRED PROPANE TANK SIZE IN GALLONS (LITERS) FOR INDICATED TEMPERATURES WHEN KEPT AT LEAST HALF FULL

WITHDRAWAL RATE	LOWEST AVERAGE WINTER TEMPERATURE						
	32°F(0°C)	20°F(–7°C)	10°F(–12°C)	0°F(–18°C)	–10°F(–23°C)	–20°F(–29°C)	–30°F(–34C)
100 cfh (250,000 BTU/hr) [2.8 m^3/hr (264 MJ/hr)]	**250 (945)**	**250 (945)**	**250 (945)**	**400 (1515)**	**500 (1890)**	**1000 (3785)**	**1500 (5675)**
150 cfh (375,000 BTU/hr) [4.2 m^3/hr (395.6 MJ/hr)]	**300 (1135)**	**400 (1515)**	**500 (1890)**	**500 (1890)**	**1000 (3785)**	**1500 (5675)**	**2500 (9640)**
200 cfh (500,000 BTU/hr) [5.7 m^3/hr (527.5 MJ/hr)]	**400 (1515)**	**500 (1890)**	**750 (2840)**	**1000 (3785)**	**1200 (4540)**	**2000 (7570)**	**3500 (13250)**
300 cfh (750,000 BTU/hr) [8.5 m^3/hr (791.2 MJ/hr)]	**750 (2840)**	**1000 (3785)**	**1500 (5675)**	**2000 (7570)**	**2500 (9460)**	**4000 (15140)**	**5000 (18925)**

Testing Fuel System for Leaks

Before operating the set, test the Propane fuel system for leaks. Energize the fuel solenoid from a separate 12-volt DC source before testing the fuel system. Testing must conform to procedures listed in NFPA-58, or to the UL recommended test procedure, as follows:

After assembly and before initial operation, all fuel system connections, hose valves, regulators, and fittings must be tested and proven free of leaks using a soap-and-water (or equivalent) solution while the system is under gas or air pressure of at least 1.5 times the supply pressure or 3 psi (20.7 kPa) minimum.

Other approved methods of detecting leaks can be used if appropriate. DO NOT use a flame to test for gas leaks.

⚠WARNING ***Propane presents the hazard of explosion or fire which can result in severe personal injury or death. Do not smoke or allow any flame, spark, pilot light, arc-producing equipment, switch, or other ignition sources around fuel or fuel components.***

4. Electrical Connections

AC POWER SUPPLY CONNECTIONS

⚠WARNING ***Electrical connections must be made by a licenced electrician. Improper installation can lead to electrocution and damage to property.***

Automatic startup of the generator set during installation can cause severe personal injury or death. Push the control switch Off and disconnect the negative (–) cable from the battery to keep the generator set from starting.

Wiring

Refer to the requirements of The National Electrical Code (NFPA No. 70) for all AC wiring connections.

For access to the wiring connection terminal boards, open the top of the generator set, swing the left service door wide open and remove the cover from the terminal board compartment (Figure 4-1).

Use 8 AWG 90°C conductors for the four AC power output wires (L1, L2, N and GND), connect them to the AC output terminal board (TB-2). Torque the termninals to 25 lb–inch (2.8 N–m).

Refer to *Appendix F. Outline and System Drawings* for connections at the transfer switch.

The wires must be routed to the transfer switch in approved liquid-tight conduit. The conduit can be stubbed up through the bottom stubup opening or connected to the conduit opening on the side of the generator set. If the stubup opening is used, fill in the stubup opening with duct seal or mastic tape to keep out insects and rodents.

Note: See ACCESSORY SUPPLY WIRING (page 4-2) for AC wiring that may share the same conduit as AC output wiring.

⚠CAUTION ***AC wiring can induce false signals in control and communications wiring. Do not route in the same conduit.***

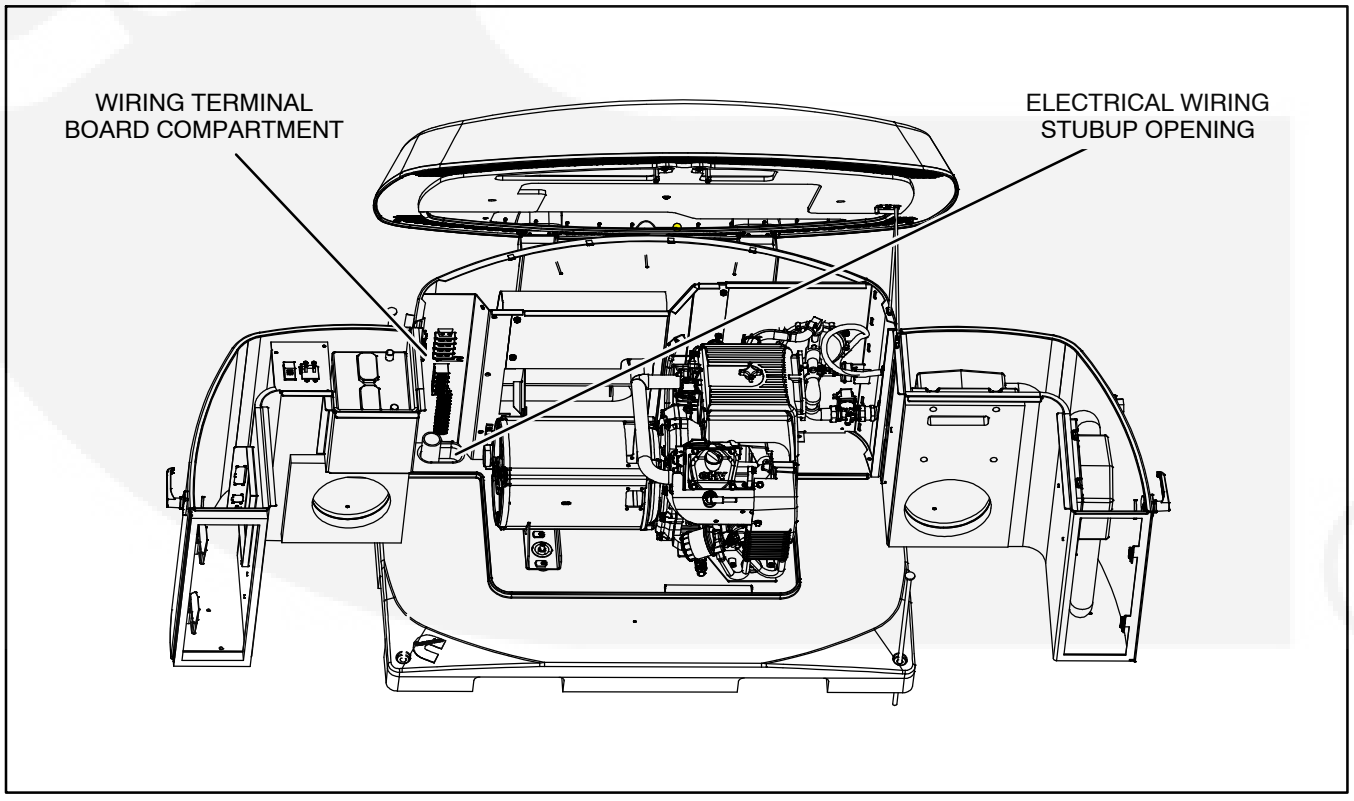


FIGURE 4-1. WIRING TERMINAL BOARDS

ACCESSORY SUPPLY CONNECTIONS

To supply 120 VAC to power the GFCI outlet on the side of the generator set, optional battery heater (P/N 0333–0770) and optional engine oil and carburetor heater (P/N 0333-0771), connect two 12 AWG 90°C wires to generator set terminal block TB3 (Hot and Neutral) from a 15 amp protected circuit in the main distribution panel in the house. The wires may be run through the same conduit as the power supply wires.

Grounding

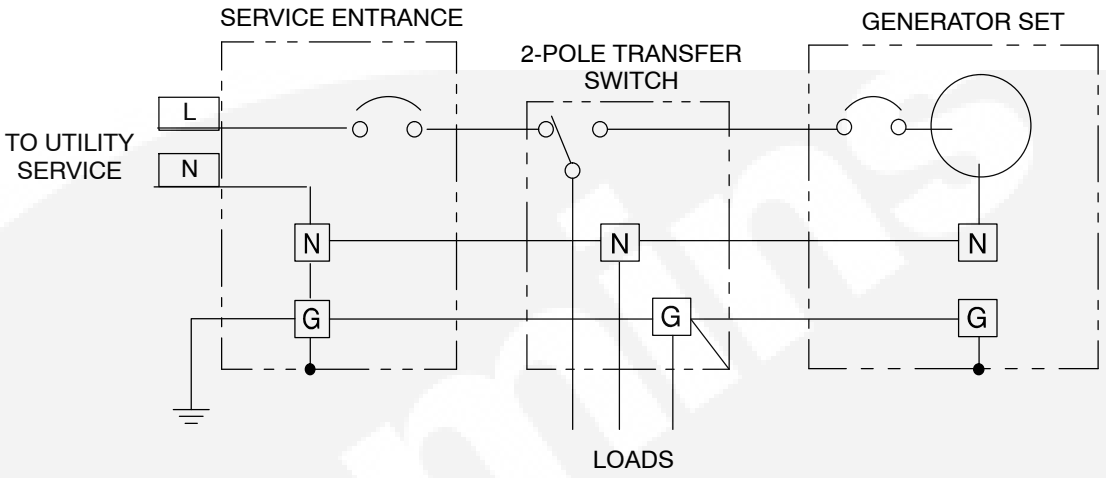
The generator set, transfer switch, power supply wiring, and all connected electrical equipment must be bonded to a common grounding point in accordance with applicable codes or standards (Figure 4-2).

⚠WARNING ***The generator set grounding terminal (TB2-4) must be connected to the grounding terminal in the transfer switch. Do not provide a separate grounding rod for the generator set.***

Note that generator neutral is not grounded at the generator set, but at the common system grounding point.

⚠WARNING ***Contact with electrical equipment can result in severe personal injury or death. It is extremely important that bonding and equipment grounding be properly done. All metallic parts that could become energized under abnormal conditions must be properly grounded.***

GROUNDING WITH MODEL RSS 100–6634 AND RSS 200–6635 TRANSFER SWITCHES



GROUNDING WITH MODEL RSS 100–6868 AND RSS 200–6869 TRANSFER SWITCHES

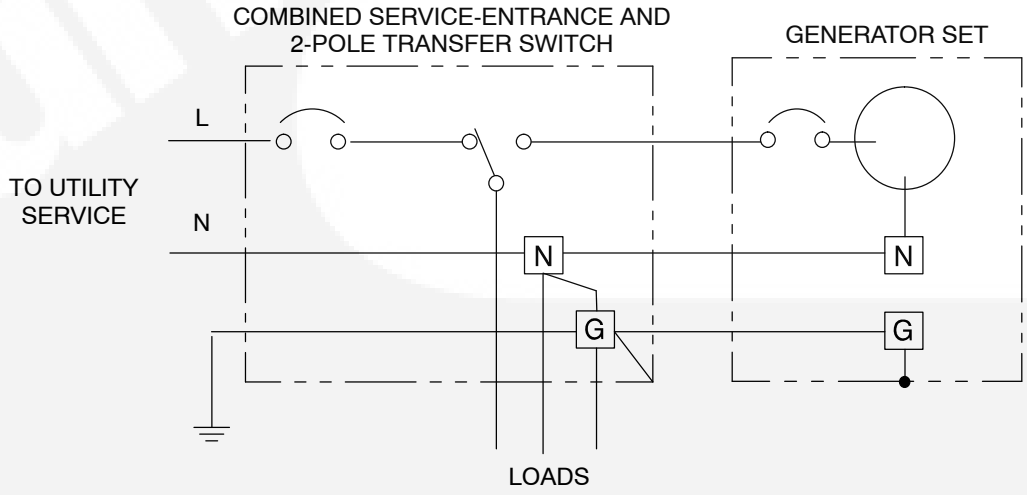


FIGURE 4-2. TYPICAL SYSTEM GROUNDING ONE-LINE DIAGRAMS

Transfer Switch

⚠WARNING ***Interconnecting the generator set and the public utility can lead to the electrocution of personnel working on the utility lines, damage to equipment and fire. An approved switching device must be used to prevent interconnections.***

The Model GSAA generator set is designed to be installed with Cummins Onan Model RSS automatic transfer switches. Use of other makes and models of transfer switches with the Model GSAA generator will result in a reduced warranty. Reference the Warranty statement for further details.

Install the transfer switch in accordance with its Installation Manual. Refer to *Appendix F. Outline and System Drawings* for wiring connections between the generator set and transfer switch.

See Wiring (page 4-1) regarding wiring to use for AC power output connections between the generator set and transfer switch.

Use 18 AWG conductors for the control/communications wires (generator set TB1 to transfer switch terminal TB4). It is recommended that all twelve conductors (nine conductors for RSS 100−6634 and RSS 200−6635) be pulled through the conduit at the time of installation to be ready for functions that might be activated later, such as load control.

Note: The wire used must be sized to accommodate any specific voltage drop. Refer to Table 4-1 to determine the correct wire size.

TABLE 4-1. WIRE SIZE SPECIFICATIONS

Wire Size (AWG)	Distance in Feet, One Way (Multiply by 0.3 for Meters)
16	90
14	150
12	225
10	350
8	600
6	1000

Block diagrams showing partial or full load coverage are shown on the following pages. Figures 4-3 and 4-4 show installations without a controller (RSS 100-6634 and RSS 200−6635) and Figures 4-5 and 4-6 show installations with a controller (RSS 100−6868 and RSS 200−6869). The RSS100 transfer switch models can be connected for full or partial load coverage equal to the capacity of the generator set. The RSS200 transfer switch models can be connected for full load coverage greater than the capacity of the generator set. If the transfer switch is connected for full load coverage which exceeds generator set rating, it may be necessary to shed large loads such as air conditioners. Refer to *Appendix F. Outline and System Drawings* for connecting load shed relays to generator set load control terminals TB1−1 and TB1-2.

TABLE 4-2. TITLE???

TRANSFER SWITCH MODEL	CONNECTION CAPABILITIES	
	FULL LOAD (GREATER THAN CAPACITY OF GENSET)	FULL OR PARTIAL LOAD (EQUAL TO CAPACITY OF GENSET)
RSS 100−6634		X
RSS 200−6635	X	
RSS 100−6868		X
RSS 200−6869	X	
1. XXXXXXXXXXXXXXXXXXXXXXXXXXXX		

Note: Model RSS100−6634 and RSS200−6635 Transfer Switches do not incorporate a utility circuit breaker and therefore must be connected through a Service Entrance Utility Panel incorporating the utility circuit breaker.

Perform GENERATOR SET CONFIGURATION (page 5-1) when ready start up the generator set.

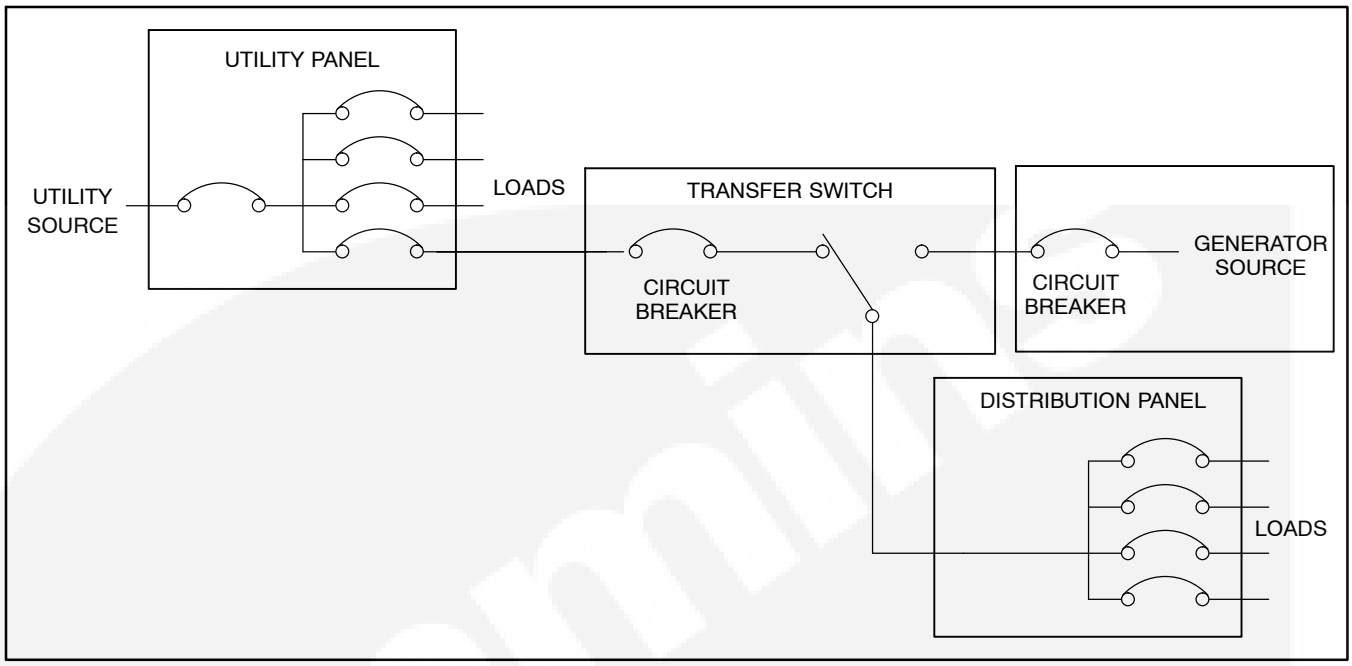


FIGURE 4-3. PARTIAL COVERAGE LOAD CONNECTIONS (TRANSFER SWITCH WITHOUT CONTROLLER)

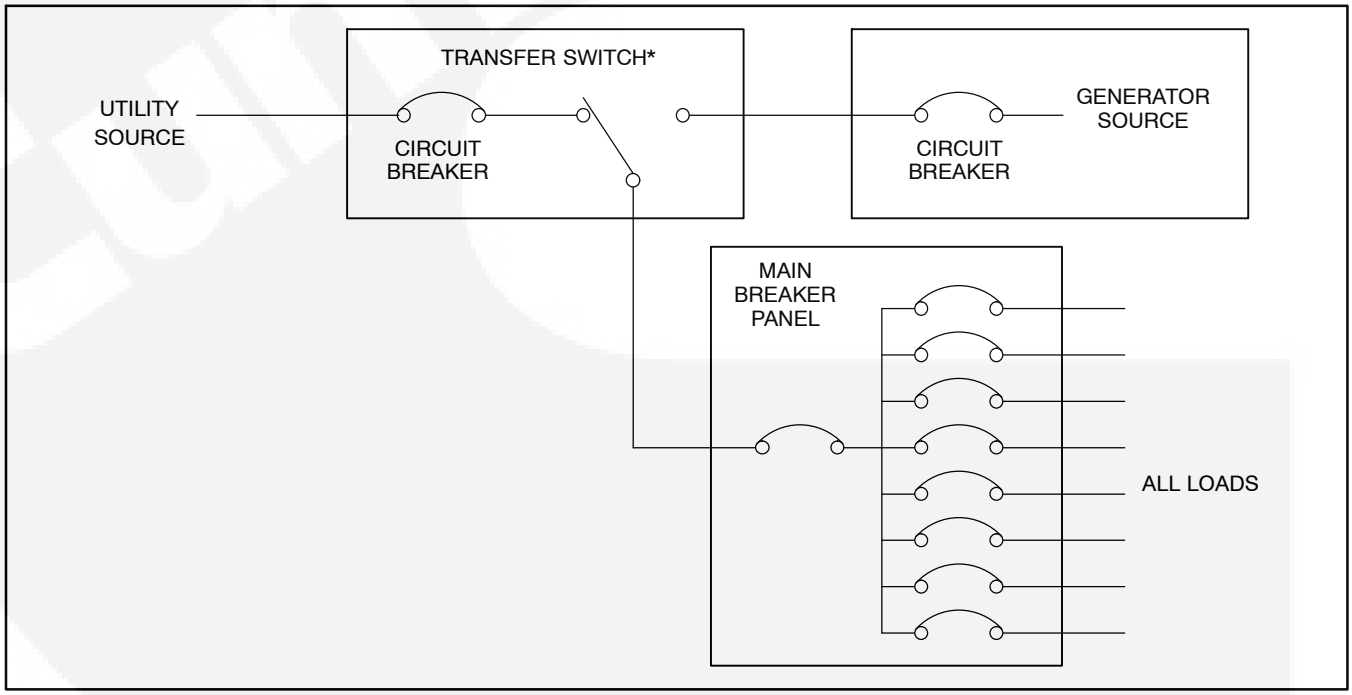


FIGURE 4-4. FULL COVERAGE LOAD CONNECTIONS (TRANSFER SWITCH WITHOUT CONTROLLER, ONE CIRCUIT BREAKER)

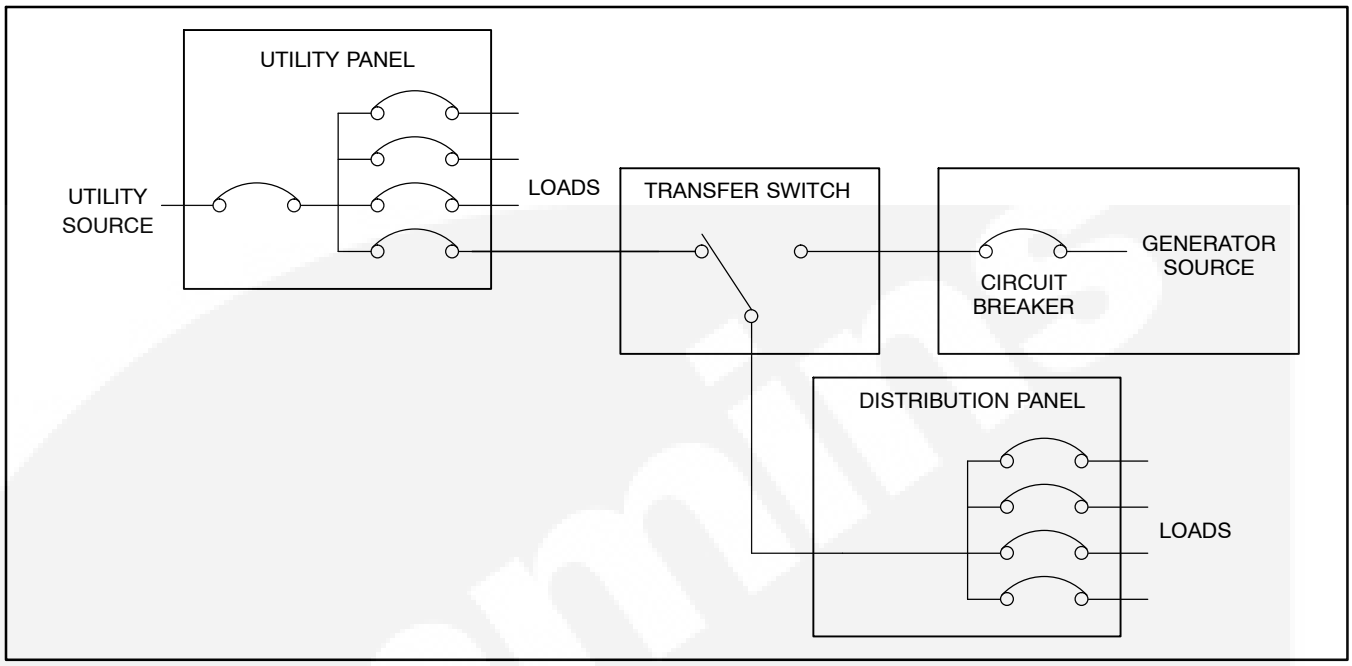


FIGURE 4-5. PARTIAL COVERAGE LOAD CONNECTIONS (TRANSFER SWITCH WITH CONTROLLER)

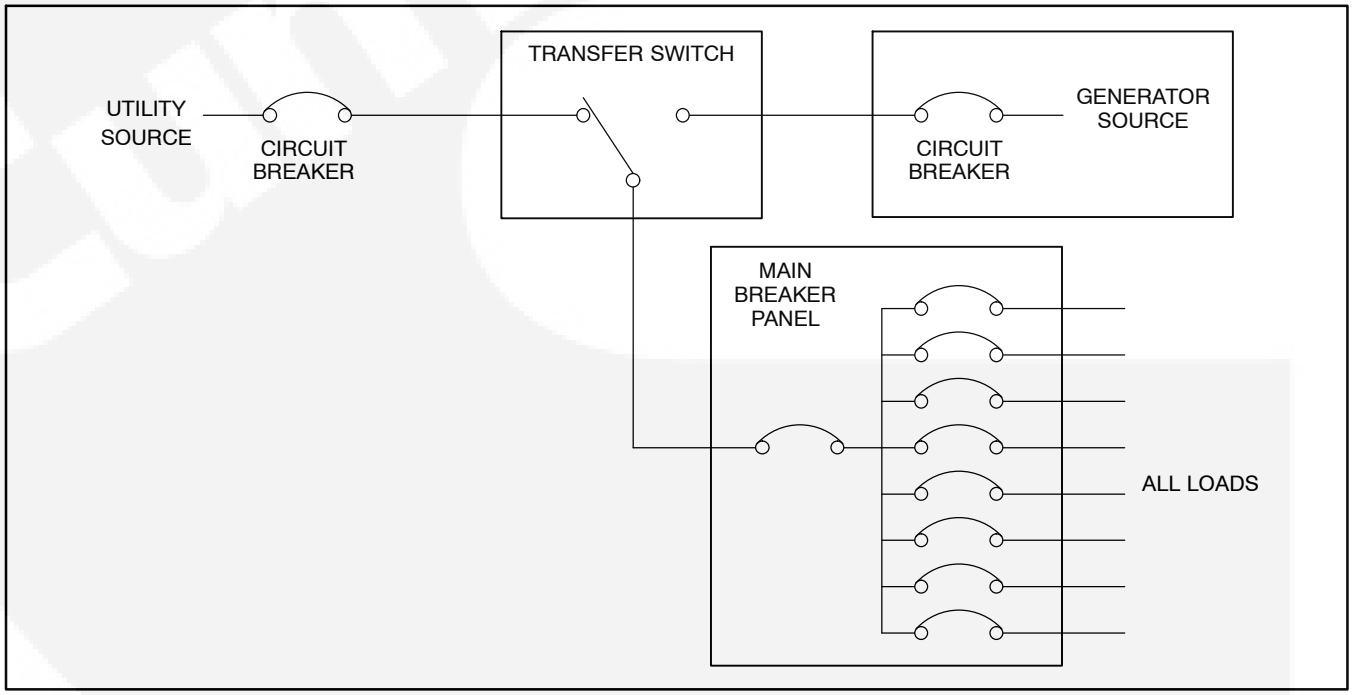


FIGURE 4-6. FULL COVERAGE LOAD CONNECTIONS (TRANSFER SWITCH WITH CONTROLLER)

OPERATOR PANEL

See the Operator Manual for operating and monitoring the generator set using the Operator Panel.

Mount the generator set Operator Panel on a wall at a convenient location, such as next to the house thermostat. To install the Operator Panel cut out an opening in the wall as shown in Figure 4-7 and mount it with four No. 6 wood screws or wall anchors.

Refer to *Appendix F. Outline and System Drawings* for connecting the Operator Panel to the generator set. Use the plug-in connection harness (shipped loose with the generator set) to connect to the wiring from the generator set. Use 18 AWG wires.

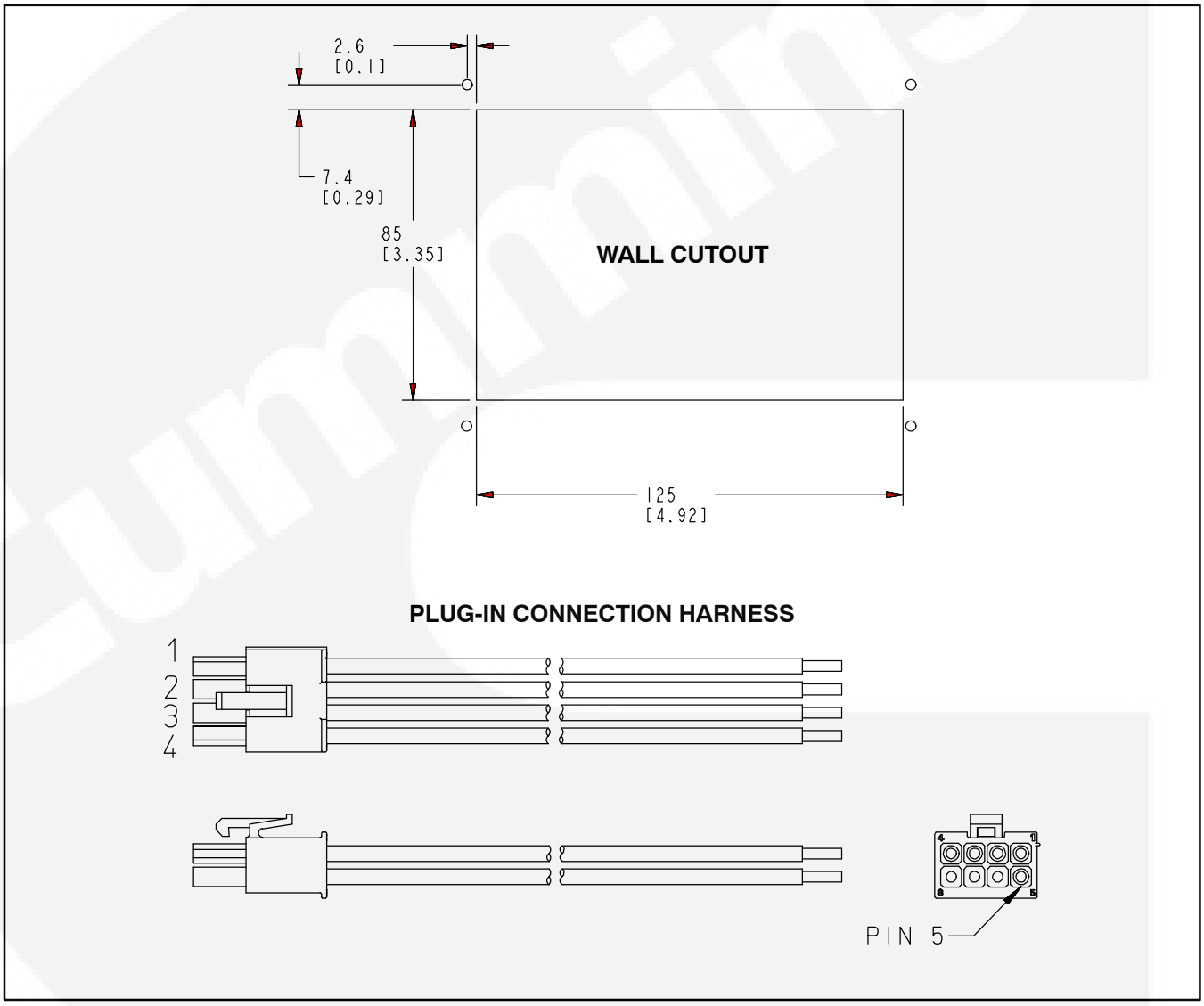


FIGURE 4-7. CUTOUT FOR OPERATOR PANEL AND CONNECTION HARNESS

ETHERNET CONNECTIONS (OPTIONAL)

The generator set control board has a connector for Cat 5 Ethernet cable for connection to a remote modem/router. See *Appendix B. Ethernet/Email Interface* for setup and operation.

Use Cat 5 Ethernet cable and route it separately into the house or along with the control/communications wiring. At the generator set route the Cat 5 cable along with other wiring from the control to the wiring terminal board compartment and then into the conduit to the house.

Note: The Internet/Email interface requires "high speed" or "broadband" cable or DSL service to the house.

Wiring connections to the Ethernet RJ-45 plug are shown in Figure 4-9. Utilize an appropriate Ethernet stripping and crimping tool for these connections.

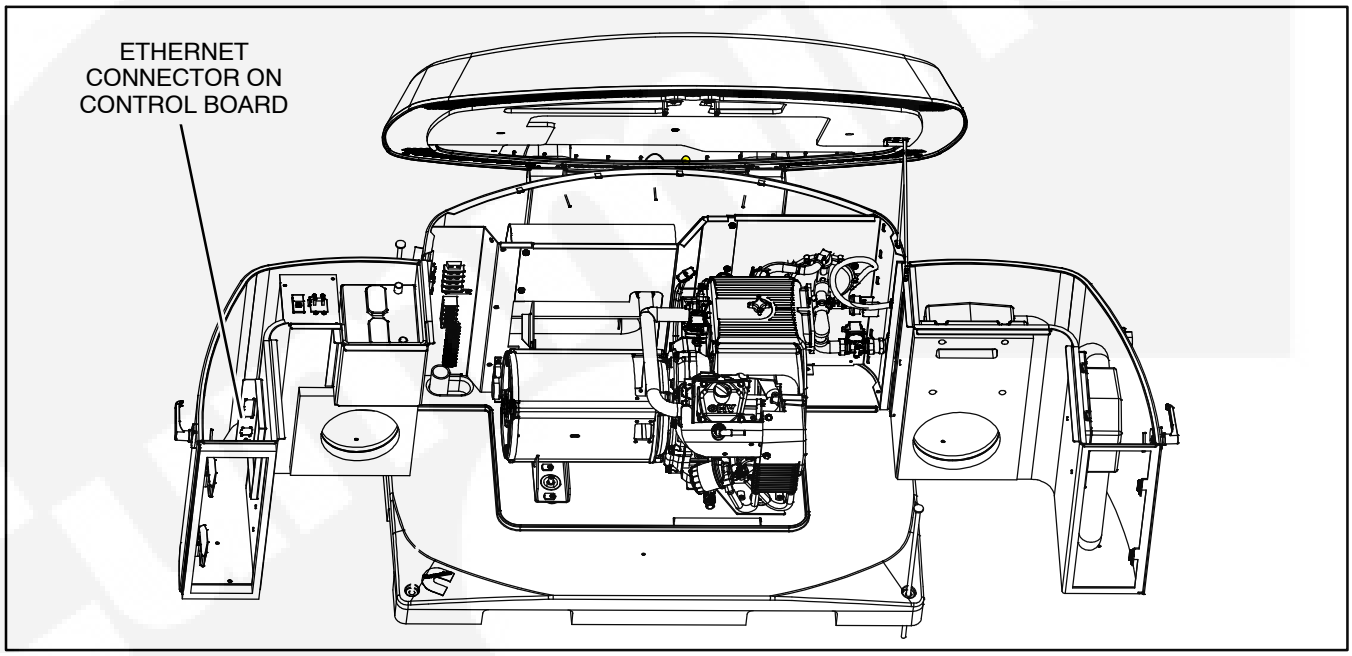


FIGURE 4-8. ETHERNET CONNECTOR

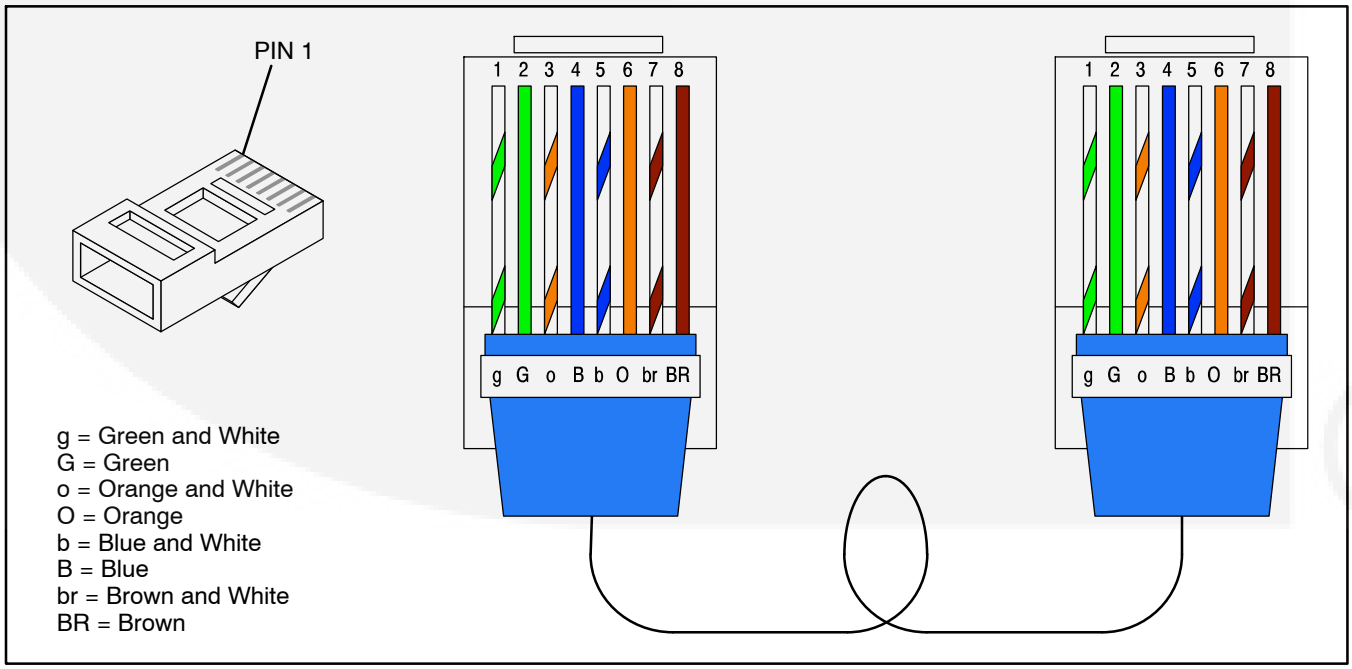


FIGURE 4-9. ETHERNET RJ-45 CONNECTOR WIRING

BATTERY

The generator set has a 12 VDC, negative-ground control and engine cranking system. The engine has a battery charger for recharging during generator set operation. A battery charger located in the transfer switch keeps the battery charged during generator set standby.

Refer to *Appendix E. Specifications* regarding battery specifications.

An optional thermostatically controlled battery heater is available for more reliable starting in ambient temperatures down to –20° F (–28.8° C). The heater wraps around the battery. The heater cord is connected to the 120V, accessory connection block. Install the heater in accordance with the kit instructions.

To prevent injury due to accidental start-up, do not connect the battery cables to the battery until the installation has been completed and it is time to start the set. See *Section 5. Installation Review and Startup*

⚠WARNING ***Automatic startup of the generator set while performing maintenance or service can cause severe personal injury or death. Push the control switch to Off and disconnect the negative (–) battery cable from the battery to keep the generator set from starting up while working on it.***

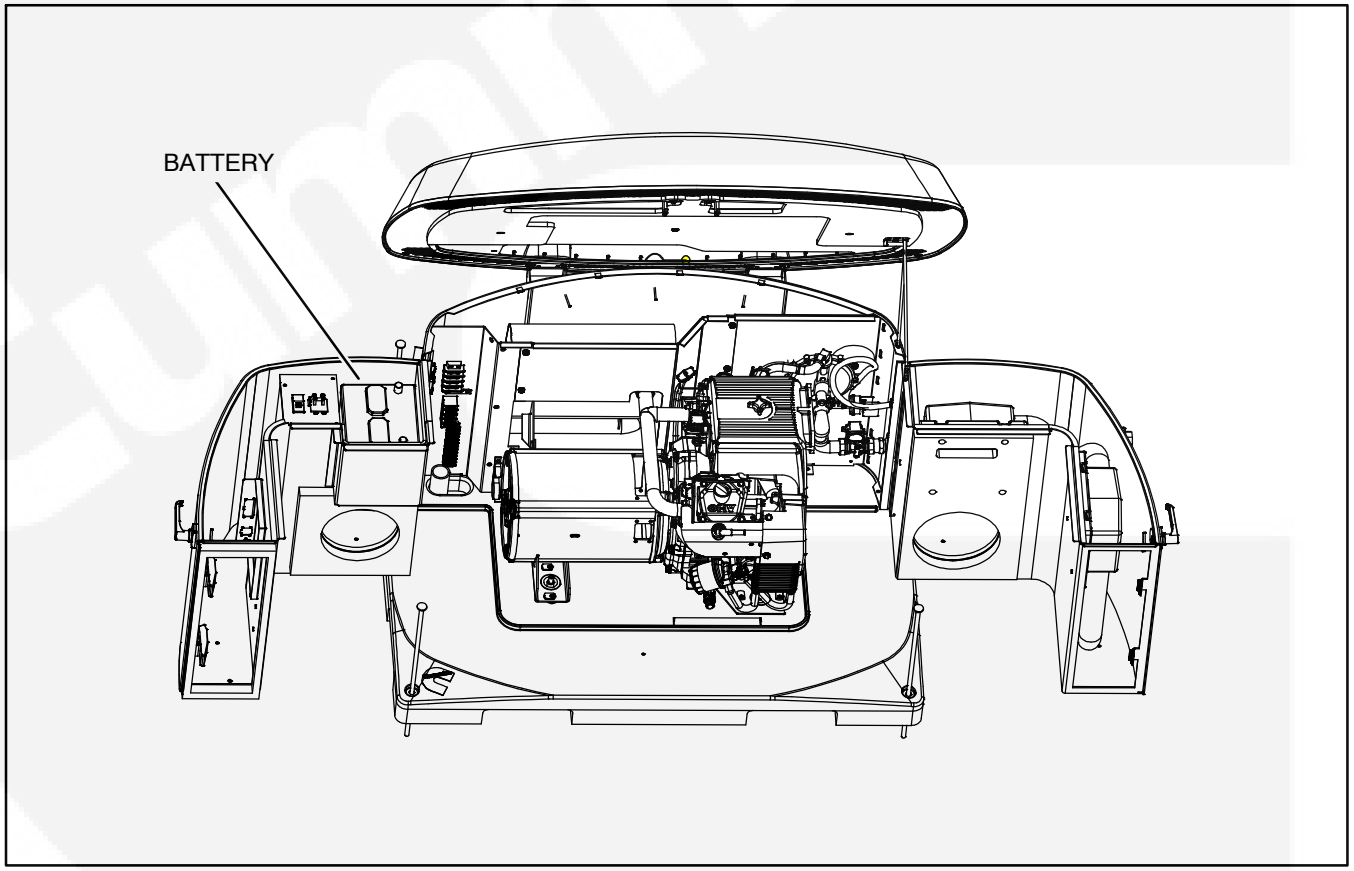


FIGURE 4-10. BATTERY INSTALLATION

5. Startup and Configuration

INSTALLATION REVIEW

Before starting the genset inspect the installation and check off (√) each of the following questions if it can be answered "YES". If a question cannot be checked off, review the appropriate section in the manual.

[ ] Can the top and the maintenance and service access doors be swung fully open for operation, maintenance and service?

[ ] Are the cooling air inlet and outlet openings free of obstructions?

[ ] Have the AC output connections been made properly?

[ ] Has the transfer switch been installed properly to prevent connecting the generator set to the utility?

[ ] Has a properly sized battery been installed?

[ ] Are all fuel connections tight?

[ ] Is fuel supply pressure correct?

[ ] Are electrical and fuel lines properly separated?

[ ] Does engine exhaust disperse away from buildings?

STARTUP

When all installation requirements have been met, connect the battery cables to the battery, positive (+) cable first.

⚠WARNING ***Automatic startup of the generator set during installation can cause severe personal injury or death. Push the control switch Off and disconnect the negative (–) cable from the battery to keep the generator set from starting.***

Read through the Operator's Manual and perform the maintenance and pre-start checks instructed. The genset is shipped from the factory with the proper level of engine oil, but should be checked before the genset is started. Start and operate the genset, following all the instructions and precautions in the Operator Manual.

Perform GENERATOR SET CONFIGURATION (page 5-1).

Note: Before leaving the site, if the genset is ready to be placed in service, set the control switch to the AUTO position to provide automatic standby power.

GENERATOR SET CONFIGURATION

The Operator Panel has a menu with four generator set/transfer switch parameters that must be configured for the installation.

Generator Configuration

To configure the generator set:

1. Press the MENU button on the home screen.
2. Press and hold the blank button on the menu screen for at least 5 seconds to go to the Config Menu.
3. Press the up or down arrow button on the Config Menu screen to select Generator Config.
4. Press Enter on the Config Menu to go to the Generator Config screen.
5. Press the NEXT button on the Generator Config Menu screen to select the Config, Frequency or Rating field.
6. Press the up or down arrow button to increase or decrease the configuration parameter.
   A. Config: Select "12" for Natural Gas or "13" for Propane.
   B. Frequency: "60" Hz cannot be changed at this time.
   C. Rating: Select "50" Amps for Propane or "43" Amps for Natural Gas. Select lower values if it is necessary to derate for high altitude or hot climates. (Selecting the correct Amps value is necessary for displaying the correct genset load on the Operator Panel.
7. Press the BACK button to save the setting and return to the home screen.

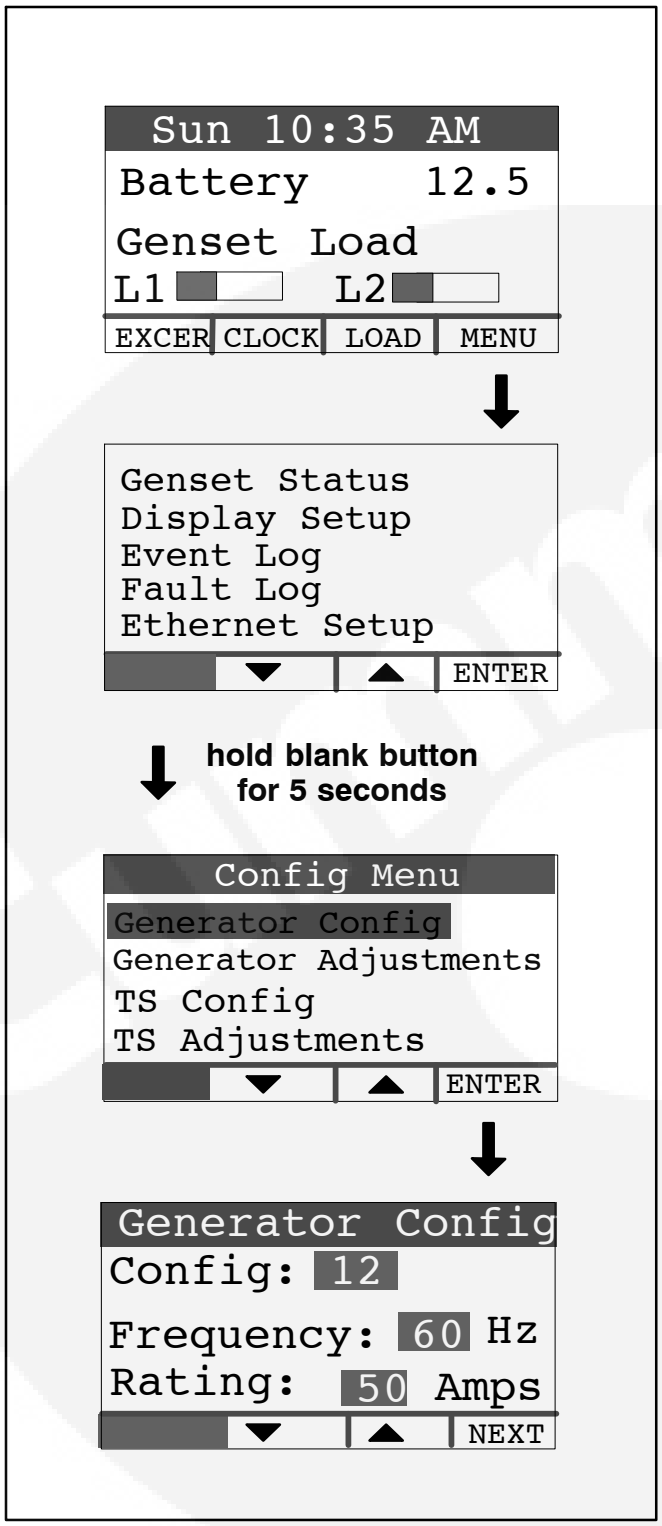


FIGURE 5-1. GENERATOR CONFIGURATION

GENERATOR ADJUSTMENTS

Refer to Figure 5-2. To adjust the Operator Panel voltage display and hour meter, access the Adjustment Menu Screen as follows:

1. Press the MENU button on the home screen.
2. Press and hold the blank button on the menu screen for at least 5 seconds to go to the Config Menu.
3. Press the up or down arrow button on the Config Menu screen to select Generator Adjustments.
4. Press Enter on the Config Menu to go to the Adjustments screen.

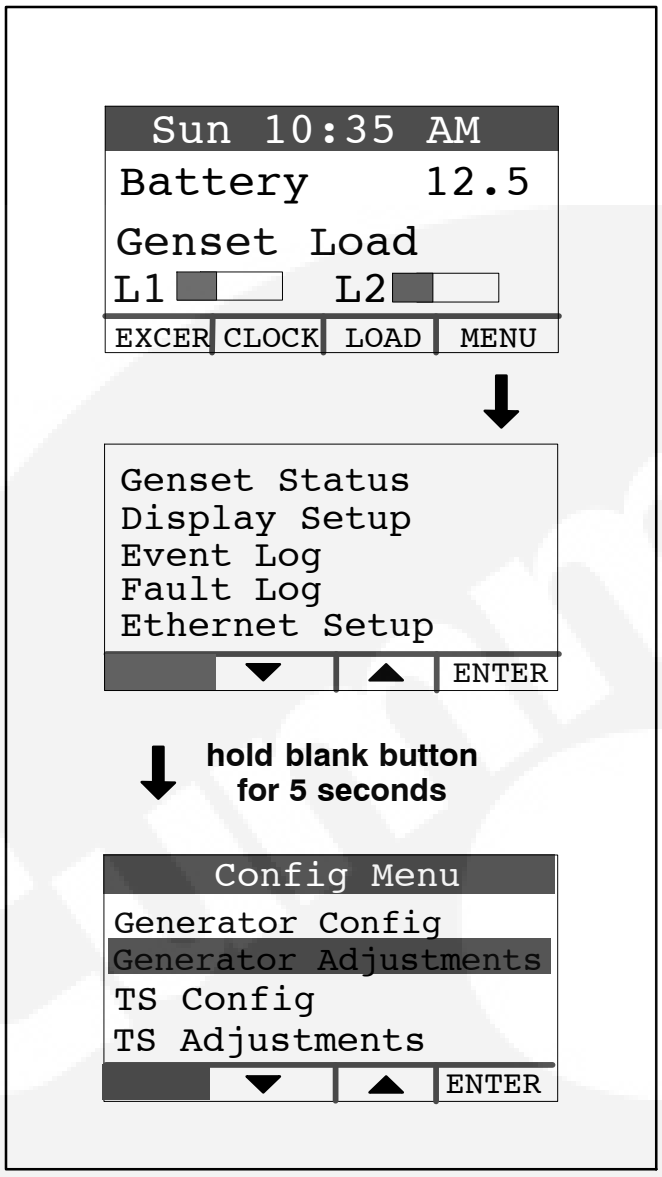


FIGURE 5-2. GENERATOR ADJUSTMENTS

To Adjust the Output Voltage – Use the following procedure:

1. Connect an accurate AC volt meter across L1 and L2 while the generator set is running.
2. With Output Volts selected on the Adjustments Menu screen, press the up or down arrow button to adjust the voltage to the desired setting (Figure 5-3).
3. The control allows an adjustment of 240 VAC ± 7% (17 VAC).
4. Press the BACK button to save the settings and return to the home screen.

To Calibrate the Display Meter – Use the following procedure:

1. Connect an accurate AC volt meter across L1 and L2 while the generator set is running.
2. Press the NEXT button to select the Display Cal field (screen not shown).
3. Press the up or down arrow to adjust the voltage reading on the screen until it matches the meter reading.
4. Press the BACK button to save the settings and return to the home screen.

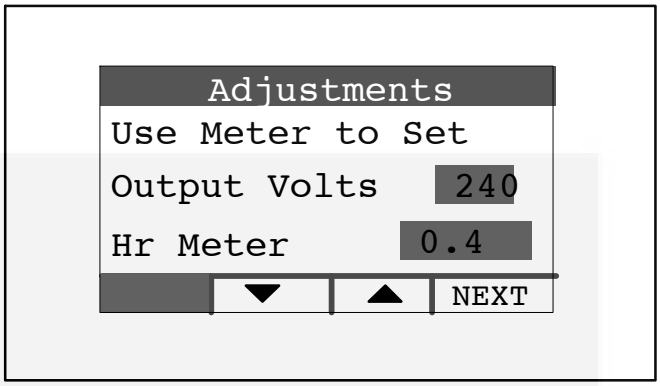


FIGURE 5-3. ADJUSTMENT MENU SCREEN

Transfer Switch Configuration

To configure the generator set for the transfer switch being used:

1. Press the MENU button on the home screen.
2. Press and hold the blank button on the menu screen for at least 5 seconds to go to the Config Menu.
3. Press the up or down arrow button on the Config Menu screen to select TS Config.
4. Press Enter on the Config Menu to go to the Transfer Switch screen.
5. Press the up or down arrow button to select between two choices: “RSS100–6868 and RSS200–6869” or “RSS100–6634 and RSS200–6635,” which must match the model number of the transfer switch being used.
6. Press the BACK button to save the setting and return to the home screen.

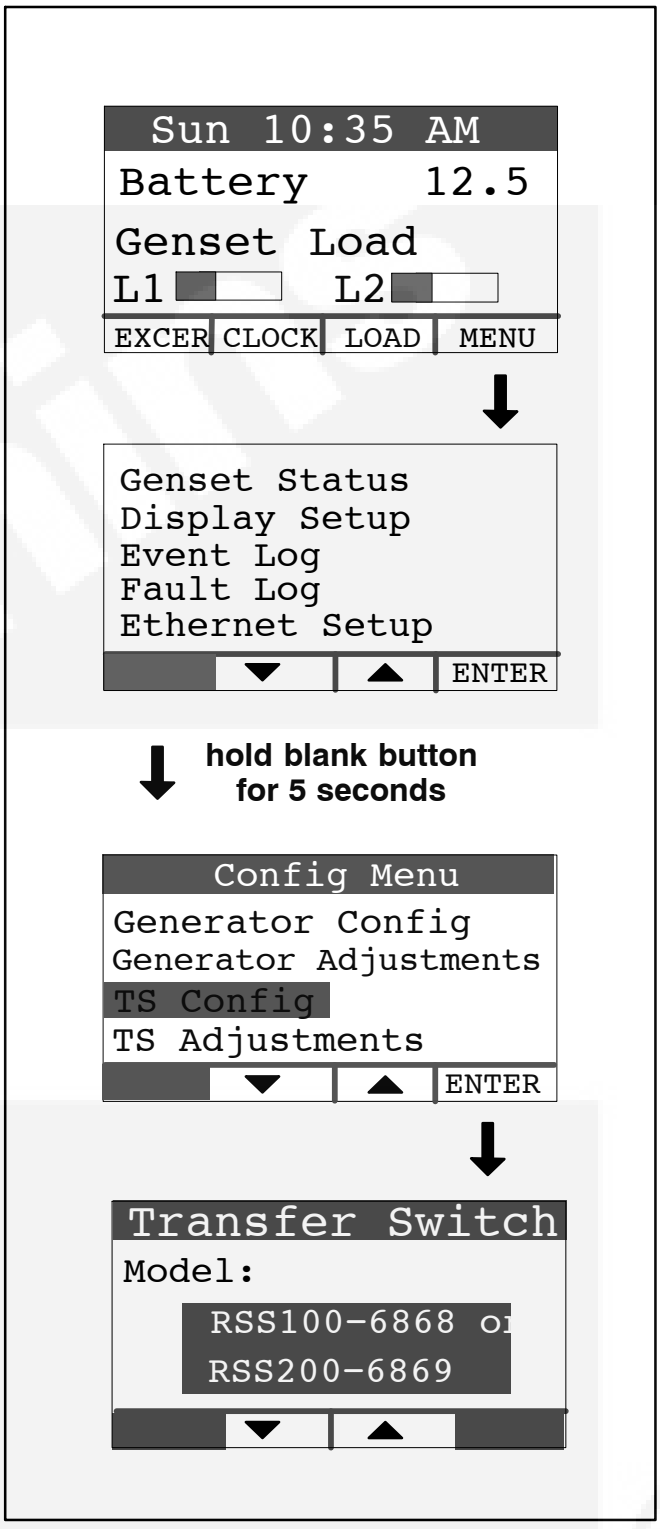


FIGURE 5-4. TRANSFER SWITCH CONFIGURATION

Transfer Switch Parameter Adjustments

Model RSS100–6634 and RSS200–6635 Transfer Switches: Refer to Transfer Switch Installation Manual 962–0620 to set the parameters inside the transfer switch.

Model RSS100–6868 and RSS200–6869 Transfer Switches: To make transfer switch parameter adjustments:

1. Press the MENU button on the home screen.
2. Press and hold the blank button on the menu screen for at least 5 seconds to go to the Config Menu.
3. Press the up or down arrow button on the Config Menu screen to select TS Adjustments.
4. Press Enter on the Config Menu to go to the Transfer Switch screen.
5. Press the NEXT button on the Generator Config Menu screen to select the Pickup, Dropout or Nominal field.
6. **To set Nominal** – Press the up or down double-arrow button to increase or decrease the nominal utility voltage parameter to match actual (Present) utility voltage. The Pickup and Dropout parameters are percentages of the nominal voltage parameter.
7. **To set Pickup**– Press the up or down double-arrow button to increase or decrease the minimum utility voltage to which the transfer switch will connect. Default is 90% of nominal. It can be increased to 95% of nominal.
8. **To set Dropout**– Press the up or down double-arrow button to increase or decrease the minimum utility voltage at which the transfer switch will disconnect. Default is 85% of nominal. It can be decreased to 80/75/70% of nominal.
9. Press the BACK button to save the setting and return to the home screen.

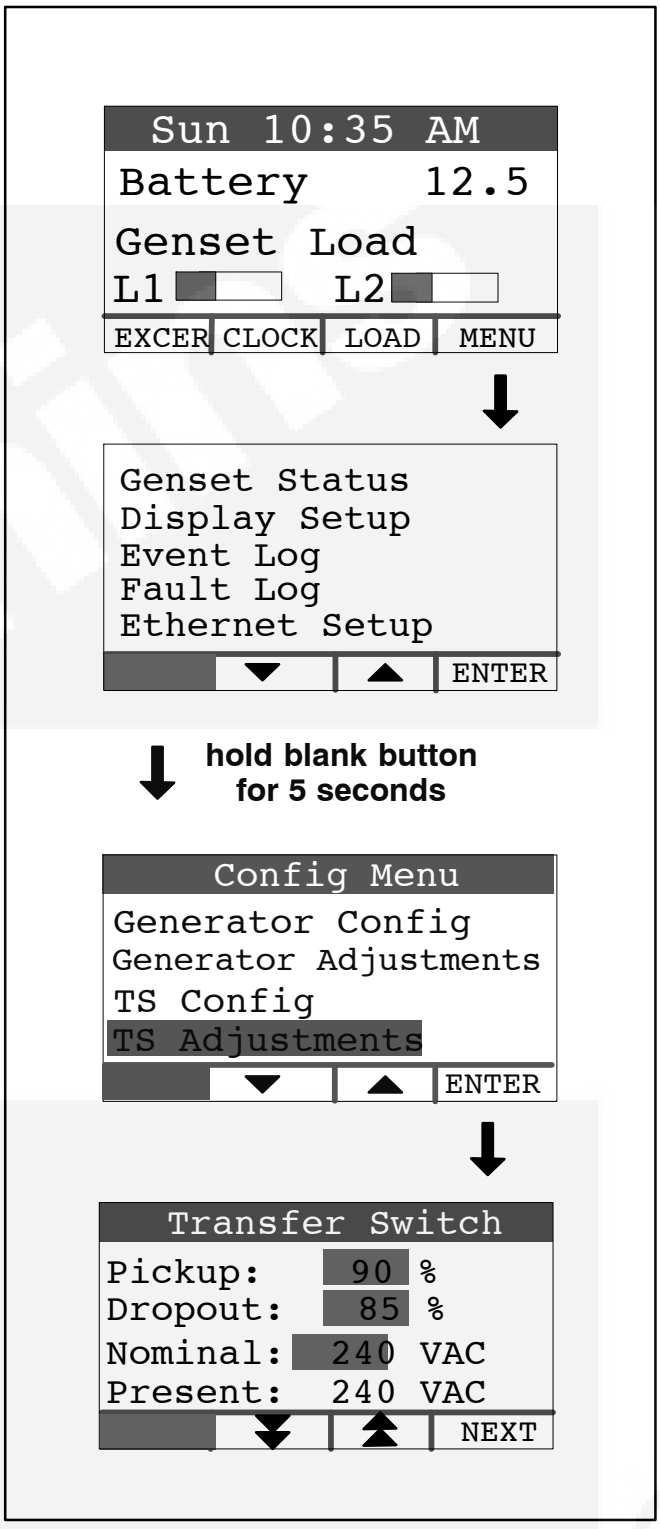


FIGURE 5-5. TRANSFER SWITCH ADJUSTMENTS

Appendix A. Operation

IN-HOME OPERATOR PANEL

The in-home generator set Operator Panel (Figures A-1 and A-2) is intended for wall mounting at a convenient location inside the house. The Operator Panel must be hard-wired to the generator set for the generator system to operate. Refer to *Appendix B. Internet / Email Interface* for an alternative interface to operate and monitor the generator set. The in-home operator panel and Internet/Email interface can be used simultaneously.

The Operator Panel has two UTILITY status lamps, three GENERATOR status lamps, three action buttons (BACK, STANDBY ON/OFF and START/STOP) and an LCD display screen with four navigation buttons.

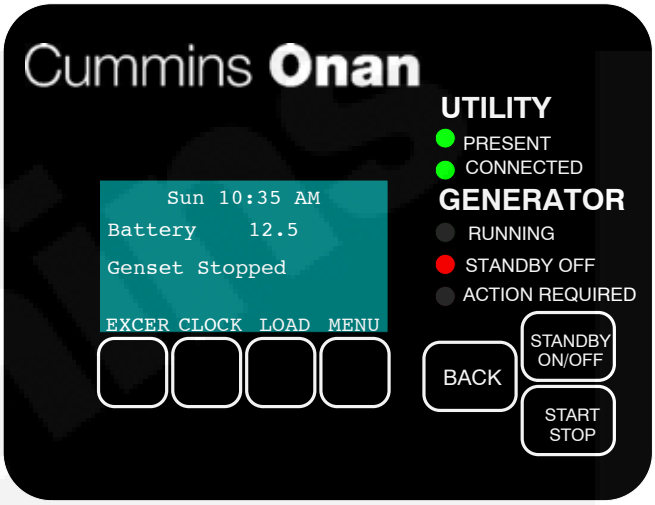


FIGURE A-1. UTILITY PRESENT AND CONNECTED—STANDBY OFF LAMP ON

BACK Button

When navigating through the LCD menus, press the BACK button to return to the main operating screen.

STANDBY ON/OFF Button

See Page A-3 to enable / disable generator set STANDBY.

START STOP Button

See Page A-3 to manually START / STOP the generator set.

TYPICAL OPERATION

Normal Operation—Utility Power Available and Connected

As long as utility power is available and connected, both of the green UTILITY lamps (PRESENT and CONNECTED) will stay on and the LCD screen will indicate “Genset Stopped”.

If the red GENERATOR **STANDBY OFF** light is on, the generator set will not start up automatically if utility power is interrupted. See Page A-3 to enable STANDBY so that the generator set will automatically supply power if utility power is interrupted.

Emergency Operation—Utility Power Interrupted

If utility power is interrupted,

1. The green UTILITY PRESENT lamp will go out
2. The generator set will start automatically and the green GENERATOR RUNNING lamp will come
3. The UTILITY CONNECTED light will go out when the generator set is connected to supply power.

The LCD screen will provide a visual indication of “Genset Load” (bar graphs). The bar graphs indicate how much of the available power is being used in each supply line (L1 and L2).

If the red **ACTION REQUIRED** light comes on, either the generator shut down or periodic maintenance has come due. The LCD screen will indicate what maintenance is due or which fault occured.

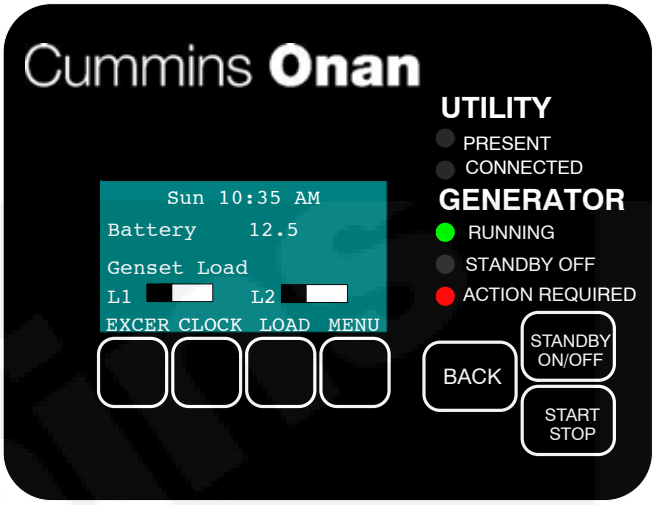


FIGURE A-2. GENERATOR SET RUNNING—ACTION REQUIRED LAMP ON

TO ENABLE / DISABLE STANDBY

You should normally not have occasion to disable generator set STANDBY. STANDBY should always be enabled (ON) except during maintenance/service.

STANDBY will have to be re-enabled (STANDBY OFF light on) if the generator set is started or stopped manually (normally a maintenance/service function) or a fault shutdown has occurred.

⚠CAUTION ***When STANDBY is disabled the generator set will NOT automatically start to supply power if utility power is interrupted.***

To enable or disable generator set standby:

1. Press the STANDBY ON/OFF button on the Operator Panel (Figure A-1), which takes you to the Standby ON/OFF screen (Figure A-3).
2. Press the up or down arrow button to select ON or OFF.
3. **To enable STANDBY** select ON and press the BACK button. The STANDBY OFF lamp will go out and the display will state: “Standby ready enabled by user.”
4. **To disable STANDBY** select OFF and press the BACK button. The STANDBY OFF lamp will come on and the display will state: “Standby ready disabled by user.”

TO MANUALLY START / STOP GENERATOR SET

Normally only the maintenance/service technician has occasion to manually start and stop the generator set. Starting the generator set will result in the generator powering the house loads.

⚠CAUTION ***Manually starting or stopping the generator set disables generator set STANDBY. The generator set will not automatically start to supply power if utility power is interrupted.***

To manually start or stop the generator set:

1. Press the START STOP button on the Operator Panel (Figure A-1), which takes you to the Genset START/STOP screen (Figure A-4). The screen will display “Genset Stopped” or “Genset Running,” as appropriate.
2. Press START to manually start the generator set and connect it to supply power to the house. The STANDBY OFF lamp will come on and the display will state: “Genset started manually (Standby Ready Disabled).”
3. Press STOP to manually stop the generator set and disconnect it. The STANDBY OFF lamp will come on and the display will state: “Genset stopped manually (Standby Ready Disabled).”

Note: To start the generator set without connecting loads pick Exercise Now on the Exerciser Clock screen (page A-10).

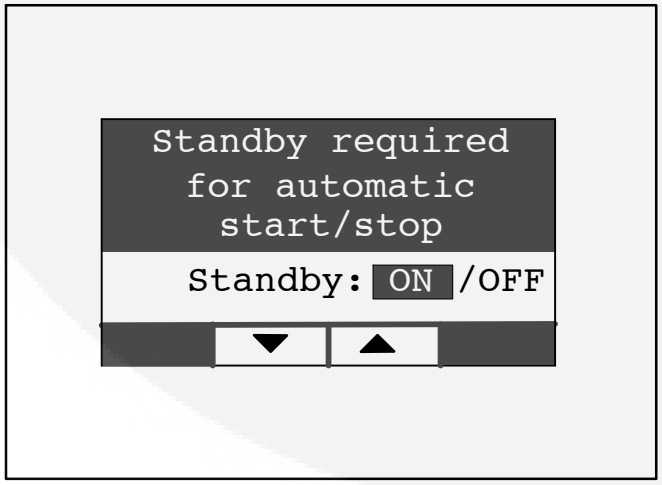


FIGURE A-3. ENABLE/DISABLE STANDBY SCREEN

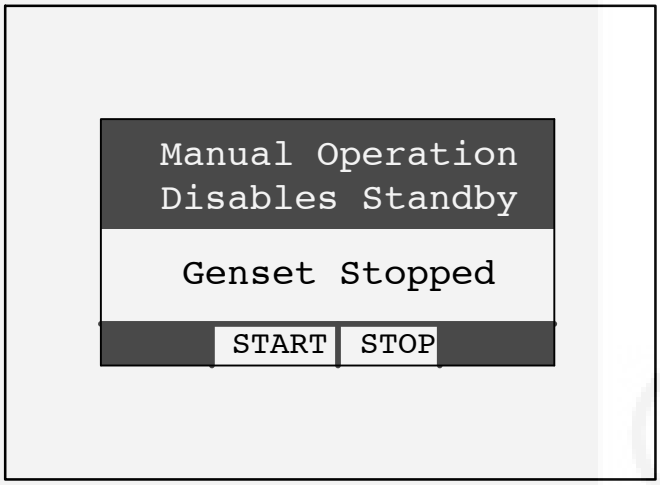


FIGURE A-4. GENSET START/STOP SCREEN

FAULT, MAINTENANCE AND NEW EVENT SCREENS

Various warning and event screens may appear on the Operator Panel during Normal or Emergency Operation.

Fault Screen

If a generator set shutdown fault occurs, a FAULT warning appears (Figure A-5) with the following information:

- Brief description of the warning or fault
- The two-digit Fault Code Number
- The time of occurrence of the fault

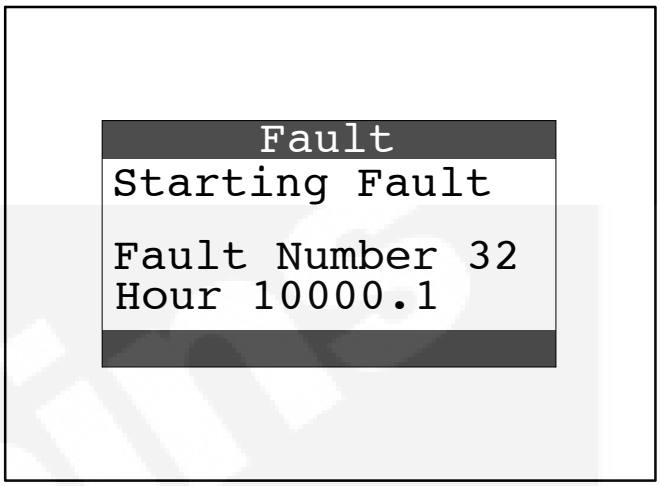


FIGURE A-5. TYPICAL FAULT SCREEN

Maintenance Due Screen

A maintenance due screen appears (Figure A-5) when a scheduled maintenance operation is due. Perform the maintenance due. The warning does not time out.

Press the BACK button to return to the home screen.

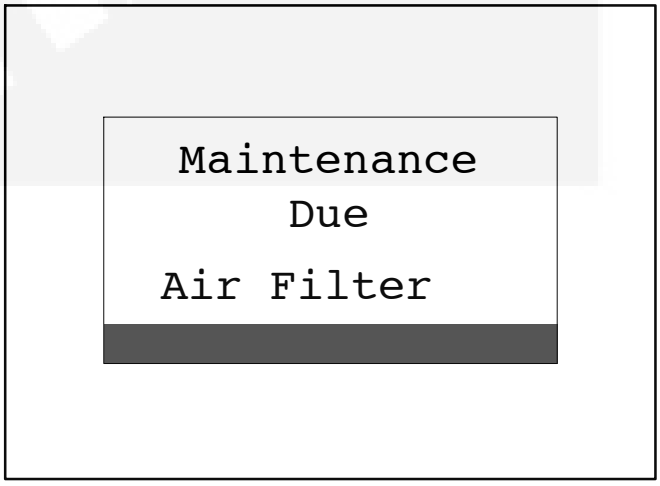


FIGURE A-6. TYPICAL MAINTENANCE DUE SCREEN

New Event Screen

A New Event screen appears (Figure A-5) whenever system status changes, such as when there is an interruption of utility power. The screen provides a brief description of the event along with the time and date of the event.

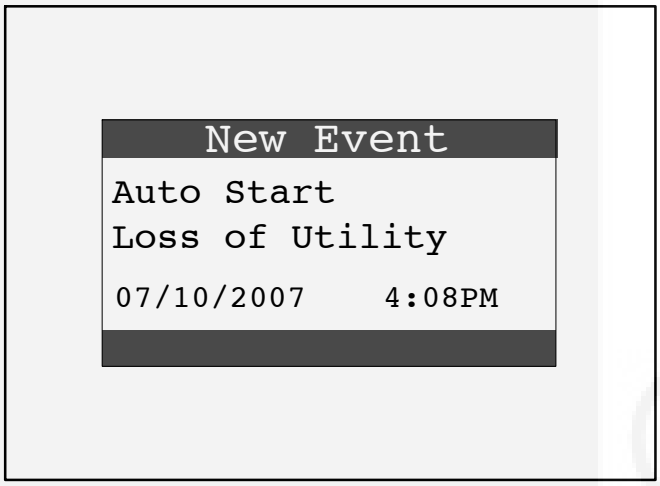


FIGURE A-7. TYPICAL NEW EVENT SCREEN

GENSET STATUS

To check generator set output voltage and frequency and the total numbers of hours run:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Genset Status.
3. Press the ENTER button on the menu screen and note the values displayed on the Genset Status screen.
4. Press the BACK button to return to the home screen.

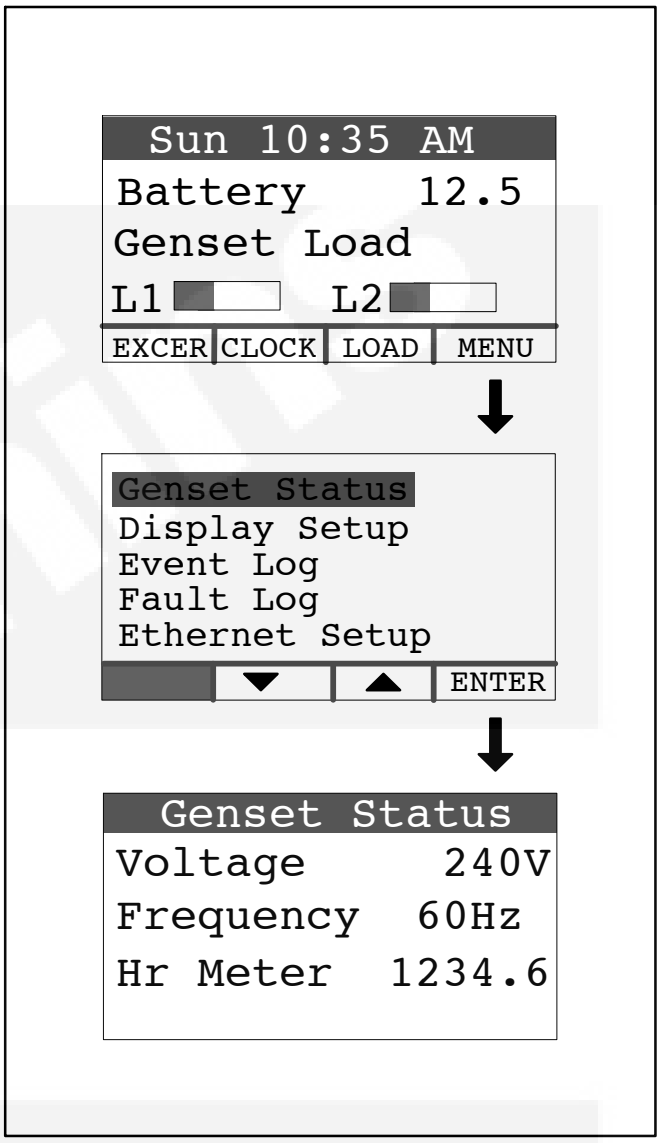


FIGURE A-8. GENERATOR SET STATUS SCREEN

DISPLAY SETUP AND SOFTWARE INFO

Brightness and Contrast

To change the Brightness and Contrast of the display screen:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Display Setup.
3. Press the ENTER button on the menu screen.
4. Press the NEXT button to select Brightness or Contrast.
5. Press the increase or decrease arrow button to increase or decrease brightness.
6. Change Contrast the same way as Brightness.
7. Press the BACK button to save the settings and return to the home screen.

Software Info

To check on the generator set and display software:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Display Setup.
3. Press the ENTER button on the menu screen.
4. Press the INFO button on the Display Setup screen and note the values displayed on the Software Info screen.
5. Press the BACK button to return to the home screen.

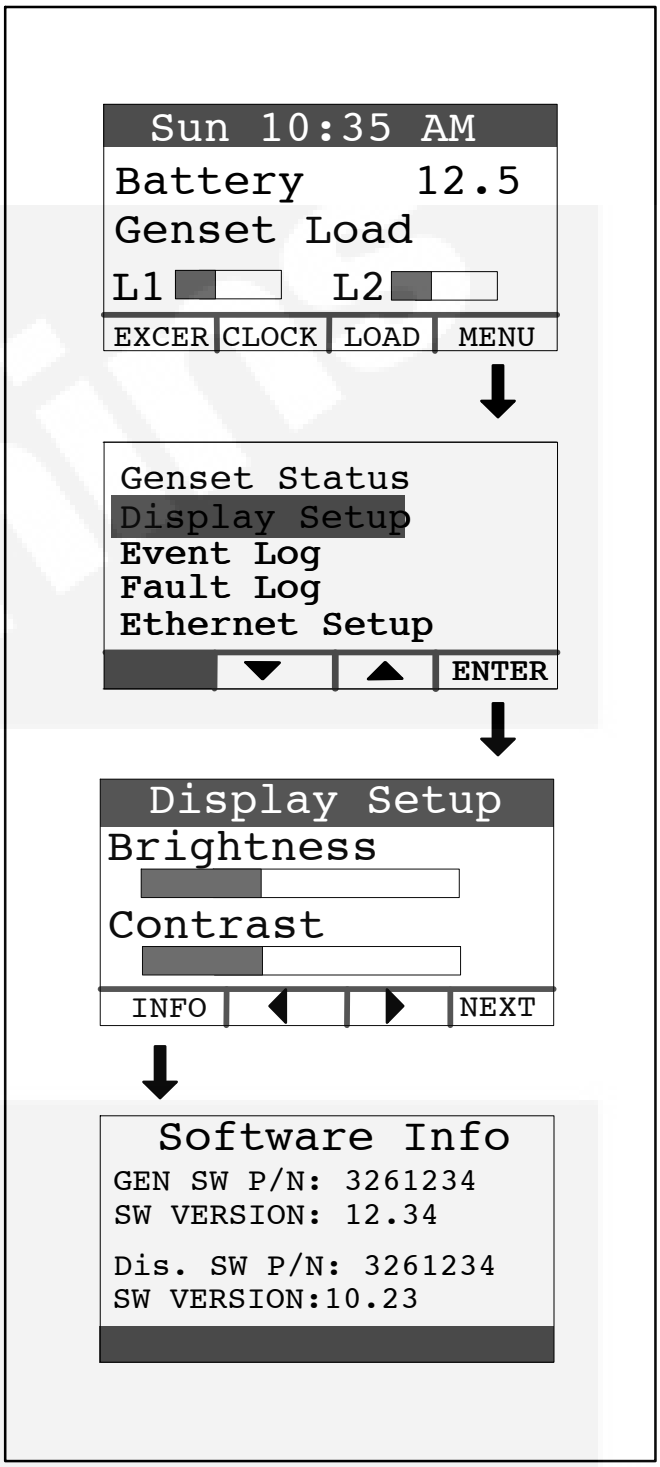


FIGURE A-9. DISPLAY SETUP AND SOFTWARE INFO SCREENS

EVENT LOG

To Check Log of Last 20 Events

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Event Log.
3. Press the ENTER button on the menu screen.
4. Scroll through the event log with the up and down double-arrow buttons. Each screen provides a brief description of the event along with the time and date of the event.
5. Press the BACK button to return to the home screen.

List of Recordable Events

1. “Genset started manually (Standby Ready Disabled)”
2. “Genset stopped manually (Standby Ready Disabled)”
3. “Genset exercise started”
4. “Genset exercise completed”
5. “’Genset started due to loss of utility”
6. “Genset stopped with return of utility”
7. “Switch on genset moved to remote position”
8. “Switch on genset moved to run position”
9. “Switch on genset moved to off position”
10. “Standby ready disabled by user”
11. “Standby ready enabled by user”
12. “Utility lost – not in Standby Ready”
13. “Utility returned – not in Standby Ready”
14. “Maintenance reminder – Change oil and check valve lash”
15. “Maintenance reminder – Change oil & filter, air filter, adjust valve lash, clean and check battery & engine cooling fins”
16. “Genset fault – (Fault description appended)”
17. “Genset warning – Transfer Switch Signal Failure”
18. “Genset warning – Transfer Switch Failed to Transfer to Utility”
19. “Genset warning – Low Battery or Battery Charger Failure”

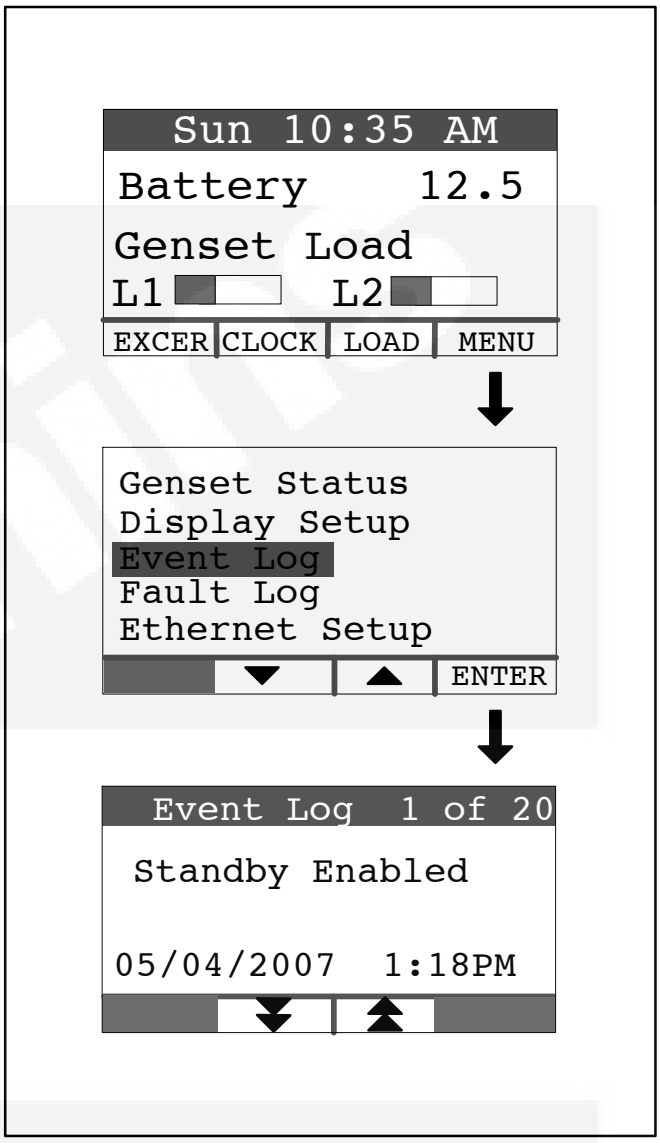


FIGURE A-10. EVENT LOG SCREEN

FAULT LOG

To check the log of the last 5 faults:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Fault Log.
3. Press the ENTER button on the menu screen.
4. Scroll through the fault log with the up and down double-arrow buttons. Each screen provides a brief description of the fault, the fault code number and the time and date of the fault.
5. Press the BACK button to return to the home screen

Note: If there are no faults recorded, the "No Stored Faults" screen will appear.

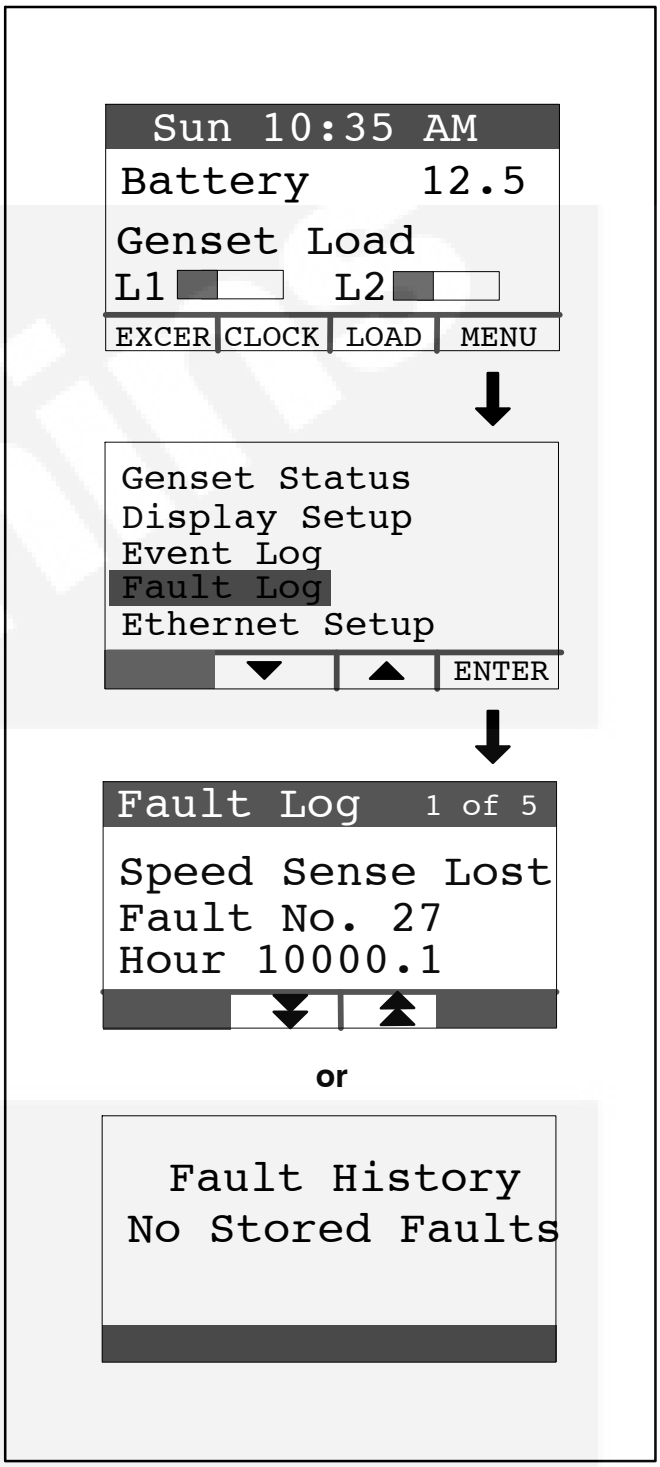


FIGURE A-11. FAULT LOG SCREEN

ETHERNET SETTINGS

This feature allows for in-home or remote access to your generator set through a web page. On this web page, you can start or stop your generator set, adjust the exerciser day and time, determine if utility power is available, and view the last 20 events/faults on the generator set.

This feature is useful for homeowners who travel or have a second home and want to be able to remotely interface with their generator set. This feature can also help to reduce troubleshooting time and service calls when the service technician has access to the same web page.

Use of the ethernet is not required if you do not use web access. To set up your generator set for web access, complete installation instructions are included in the Network Setup Guide (Appendix C).

Note: Ethernet setup must be done at the generator set location. It cannot be done via the web from a different location. An available Ethernet port and a high-speed internet are required for functionality.

To reset the Internet and email interface IP address and password:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Ethernet Setup.
3. Press the ENTER button on the menu screen.
4. Press the NEXT button to select the field to change.
5. **To Reset Password –** If you have forgotten your password, select the Reset Password field and press an up or down arrow. The password will be reset to “cummins”. Press the BACK button to go back to the home screen.
6. **IP Address –** If DHCP is ON (factory setting), the modem/router will assign the generator set IP address displayed here. This is the address you enter in your internet browser address bar at the *http://* location (page B-1). The address assigned to the generator set may change over time. If, for example, the modem/router is unplugged, it will probably re-assign new addresses to all of the devices in the home that it serves. If the IP address you have been using does not work any longer, copy down the new address and enter it on the browser page.
7. **DHCP ON/OFF** – DHCP leaves the factory ON. If more advanced features are desired, the modem/router probably can be configured for DHCP to be OFF. Refer to the Network Setup Guide (Appendix C) regarding the permanent generator set IP address to assign.
8. **Manually Enter IP Address—DHCP OFF** – If DHCP is OFF, it will be necessary to manually enter the IP address, which consists of four three-digit numbers. To enter a number select the hundreds, tens or units field in each three digit number field by pressing the NEXT and PREV buttons. Push the up or down arrow to increase or decrease the number in the selected field. Numbers in the units fields will increase by one, in the tens fields by ten and in the hundreds field by one hundred. Refer to the Network Setup Guide in Appendix C to make sure setup is complete.

Note: If utilizing a remote internet access to the generator set, it is recommended that a UPS battery backup be connected to your router and/or modem.

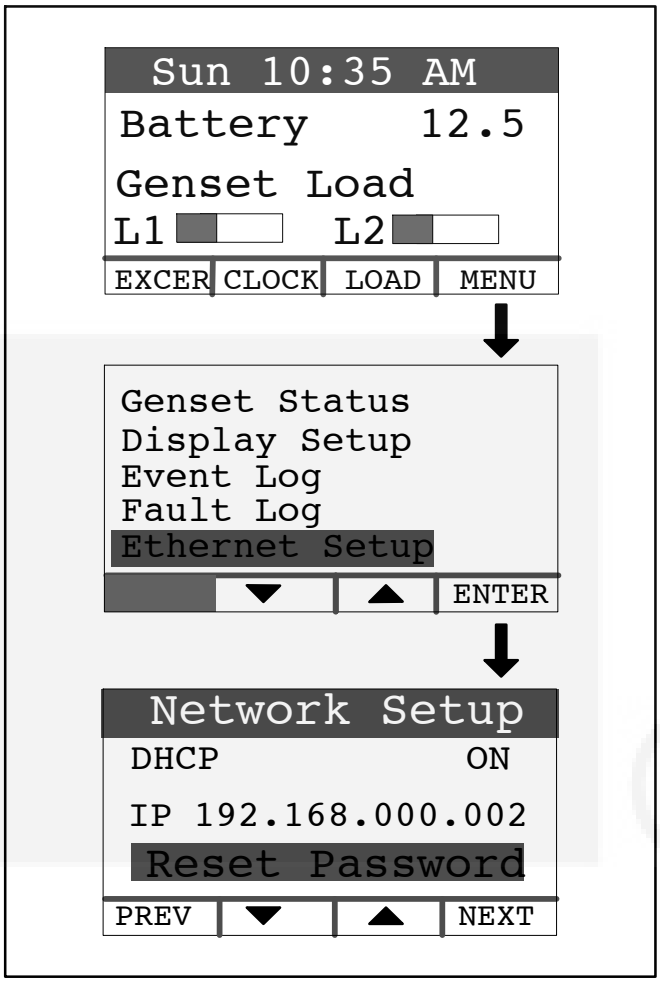


FIGURE A-12. NETWORK SETUP SCREEN

EXERCISE SETTINGS

To set the generator set exercise schedule:

1. Press the EXCER button on the home screen.
2. Press the NEXT button on the Exerciser Clock screen to select the field to change.
3. Press the up or down arrow button to increase or decrease the frequency of exercise and the day of the week and time of day for exercise. Frequency selections are: Weekly, Bimonthly, Monthly or Never.
4. Press the BACK button to save the settings and return to the home screen.
5. If you want to exercise the generator set now, select “Exercise Now”, and press either the up or down arrow.

Note: Scheduled or prompted exercise does not transfer the house loads to the generator set.

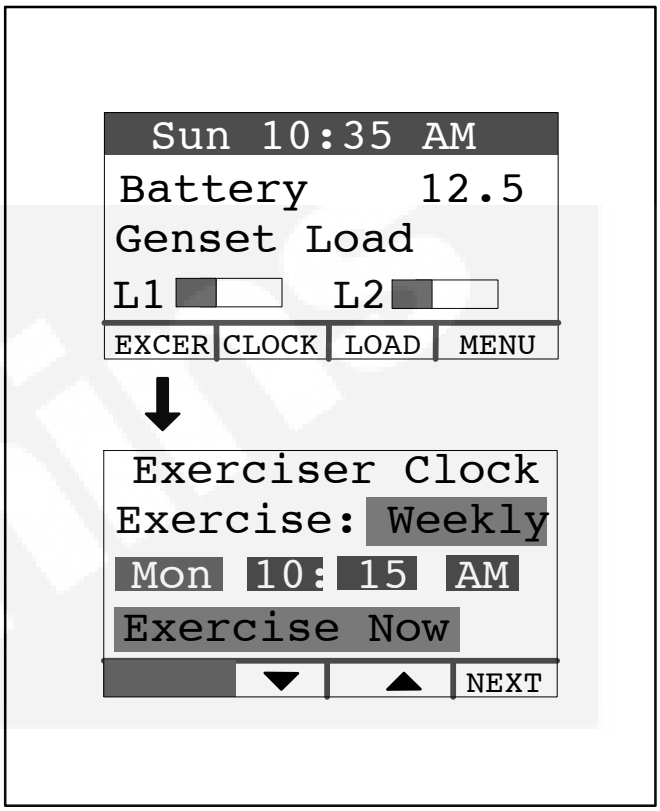


FIGURE A-13. EXERCISE CLOCK SCREEN

TIME SETUP

To set up the generator set clock for the current date and time:

1. Press the CLOCK button on the home screen.
2. Press the NEXT button on the Time Setup screen to select the field to change.
3. Press the up or down arrow button to increase or decrease or change the date or time.
4. Press the BACK button to save the settings and return to the home screen.

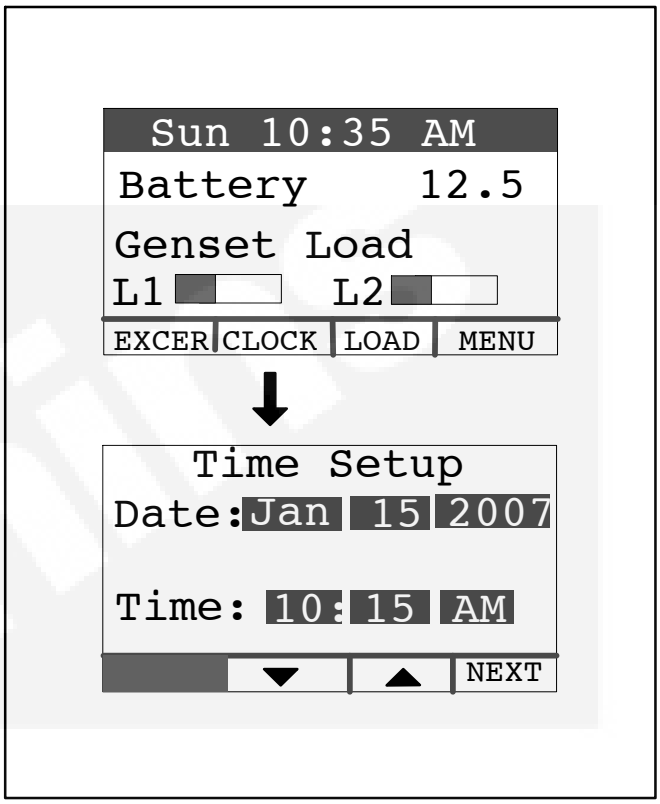


FIGURE A-14. TIME SETUP SCREEN

LOAD MANAGEMENT

The generator set may have been set up at installation to connect and disconnect certain large loads, such as air conditioners, to manage the total load so as not to overload the generator set. This requires the installation of two relays which allow for the connection of two large loads. Load management can be set to operate in automatic or manual mode (Figure A-15).

Whether in automatic or manual mode, there is a delayed start. Load 1 is enabled three minutes after the generator set is connected to the house loads, and Load 2 is enabled six minutes after the generator set is connected to the house loads.

Automatic Load Management

When set to automatic mode, the user takes no action and can only view which loads are connected. Three minutes after the generator starts, the load that is connected to genset load L1 is connected. After a delay of three more minutes, the load that is connected to genset load L2 is connected. If the connection of loads L1 and L2 exceeds 95% of the generator's load capacity, they are disconnected by the generator. Following another three minute delay, the control reconnects both loads following the same connection sequence used in the first attempt (three minutes apart). If generator load capacity is exceeded again, both loads are disconnected, and no further reconnection is tried.

To select automatic load management and view whether the selected loads are connected while the generator set is running:

1. Press the LOAD button on the home screen.
2. Press the up or down arrow button to select Automatic.
3. Note which loads are connected or disconnected.
4. Press the BACK button to return to the home screen.

Manual Load Management

⚠ CAUTION ***To reduce unnecessary loss of service, it is highly recommended that manual load management be undertaken only by an authorized Cummins Onan dealer.***

When set to manual mode, the user is able to view, connect, and disconnect loads. If the connection of loads L1 and L2 exceeds generator capacity, the AC circuit breaker trips.

To select manual load management when the generator is running:

1. Press the LOAD button on the home screen.
2. Press the up or down arrow button to select Manual.
3. Note which loads are connected or disconnected.
4. Press the double-down arrow button to go the the load connect/disconnect screen.
5. Connect or disconnect Load 1 or Load 2 as necessary by pressing either button under Load 1 or Load 2.
6. Press the BACK button to save the setting and return to the home screen.

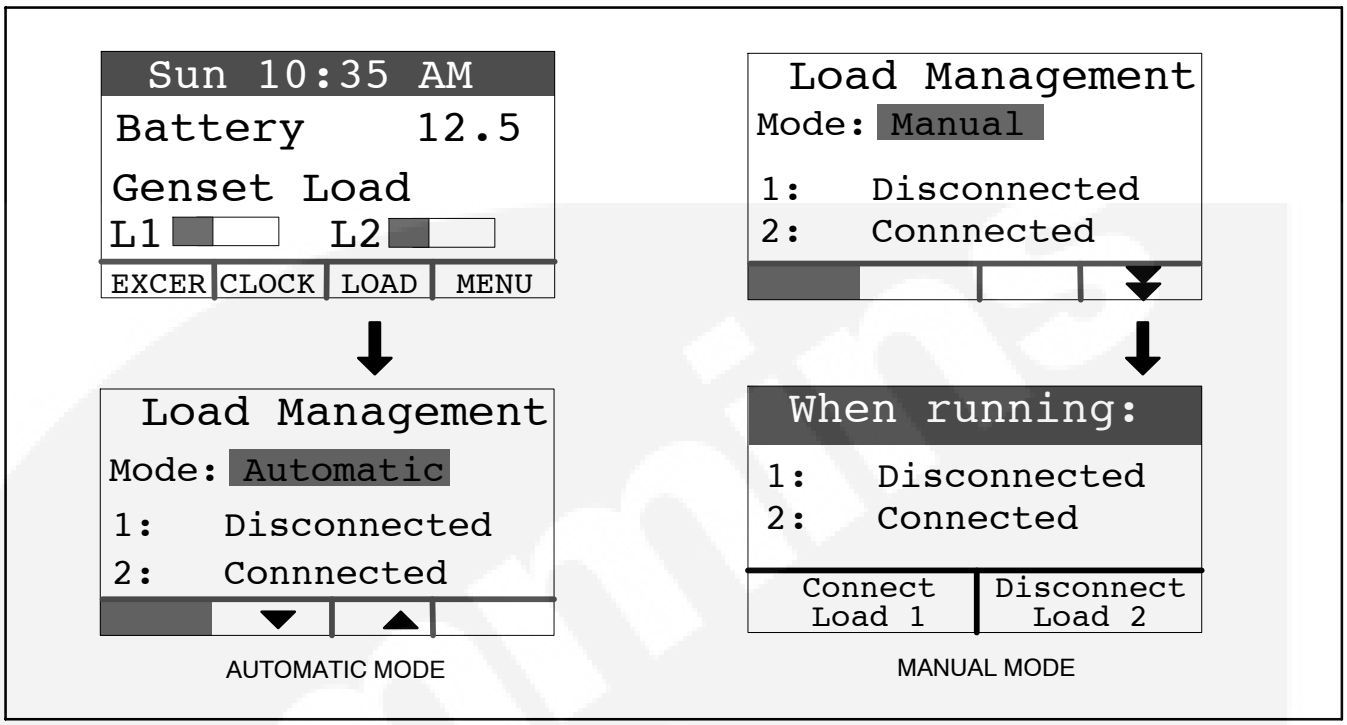


FIGURE A-15. LOAD MANAGEMENT SCREEN

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Appendix B. Internet / Email Interface

INTRODUCTION

Refer to *Section A. Operation* for use of the remote Operator Panel to operate and monitor the generator set. The Internet / Email Interface makes the same fault, maintenance and event notices available to you and to your generator set service contract agency wherever Internet Service is established.

HOME PAGE

Enter the generator set IP address (listed on the My Cummins Onan Generator sheet, see page B-5) in your internet browser address bar at the *http://* location. If you are on a computer that is connected to the same network as your generator set, use Generator In-Home IP address; otherwise, use the Public IP Address. Enter your User Name and Password in the browser dialog box that pops up. Use **admin** for the Username. The password set at the factory is **cummins**. See ETHERNET SETUP (p. A-9) to reset the password to "cummins" if you have forgotten the password you set up (p. B-4).

Note: If the internet cable/dsl is out of order, communication with your generator set will be suspended until your internet connection is restored.

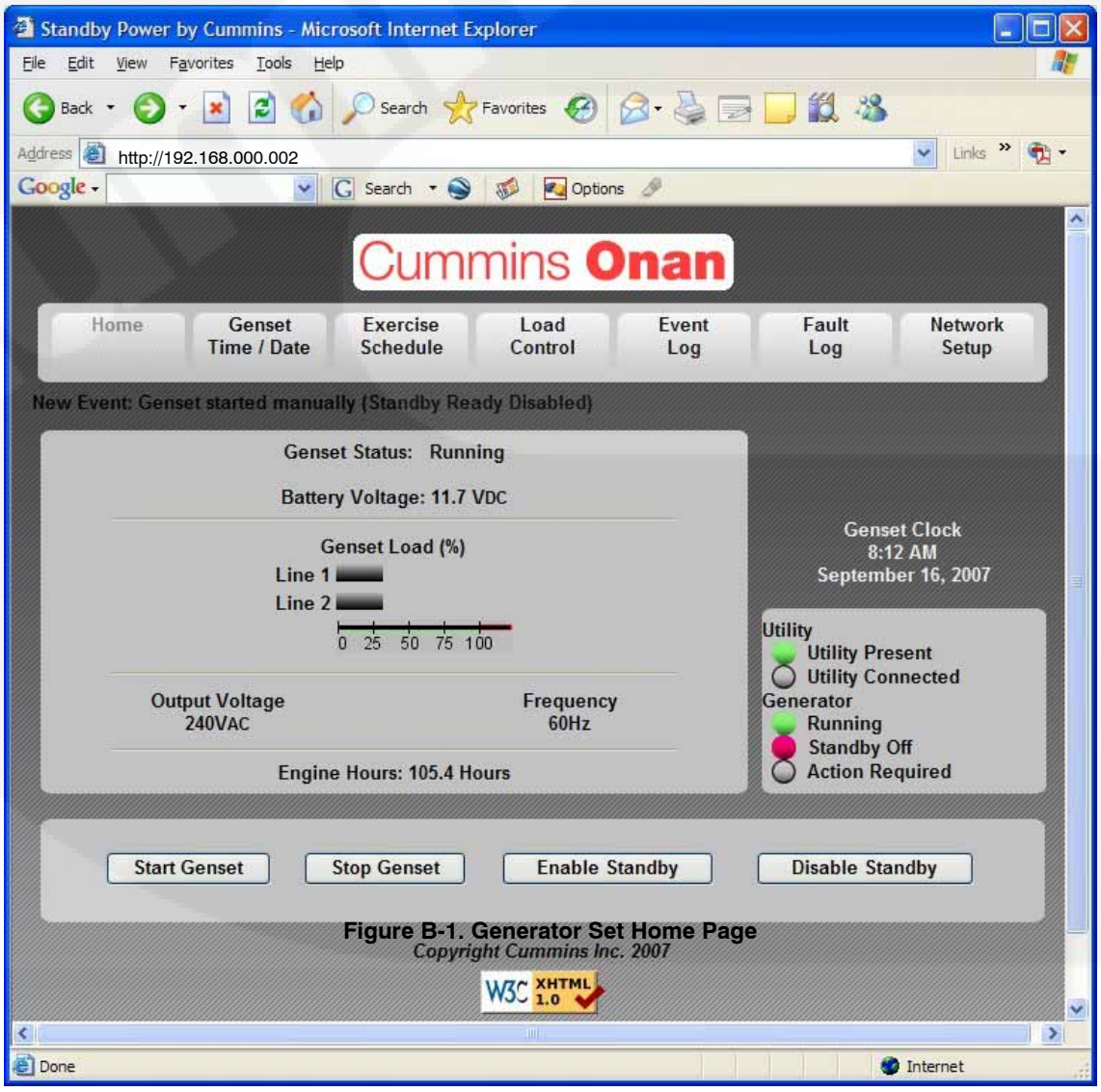

Figure B-1. Generator Set Home Page

FIGURE B-2. HOME PAGE

See ETHERNET SETUP (p. A-9) to view and copy down the generator set IP address, if for some reason it has changed.

The home page displays the current status of the system. Use the tabs to navigate in the site.

SETTING TIME AND DATE

Select the Genset Time/Date Tab on the Home Screen to set the time and date for the generator set control.

FIGURE B-3. SET GENSET TIME AND DATE

SET EXERCISE SCHEDULE

Select the Exercise Schedule Tab on the Home Screen to set the generator set exercise schedule.

Note: The generator set will exercise on the first scheduled day for which it is programmed. After that it exercises on that day at the scheduled interval. For example, if the generator set is scheduled on a Wednesday for Saturdays with a monthly interval, the generator set starts on the next available Saturday. After that it exercises on Saturdays one month apart.

FIGURE B-4. SET EXERCISE SCHEDULE

LOAD CONTROL (MANAGEMENT)

Select the Load Control Tab on the Home Screen to enable Automatic or Manual Load Control. In Automatic mode, the user can only view which loads are connected. In Manual mode, the user can view loads and also connect or disconnect them. See LOAD MANAGEMENT (p. A-12) for details.

FIGURE B-5. GENSET LOAD MANAGEMENT

EVENT LOG

Select the Event Log Tab on the Home Screen to review the last 20 events. See EVENT LOG (p. A-7) for a list of all of the recordable events.

FIGURE B-6. EVENT LOG

FAULT LOG

Select the Fault Log Tab on the Home Screen to review the last 5 faults.

FIGURE B-7. FAULT LOG

NETWORK SETUP

Select the Network Setup Tab on the Home Screen to set up the network parameters. Click on "Click here to start Network Setup" to go to the first of three screen pages to setup network and email parameters. Press the NEXT button to go to the next page and the Done button on the last page to save the settings on all three pages. Click on "Click here to continue..." to go back to the Home Page.

Change Password

You may change the password by entering 8 characters in the password field and clicking on "Save Password". See ETHERNET SETUP (p. A-9) to reset the password to "cummins."

Network Setup Parameters

Refer to Appendix C for complete setup instructions and Appendix D for troubleshooting.

DHCP ON – All of the fields will be filled in by the modem/router.

Assess From Internet – To access your generator set Internet site from anywhere on the Internet, ask your Internet Service Provider (ISP) for your Internet IP address. Alternatively, enter the Gateway address that appears on Page 1 of the Network Setup screens (Figure B-9).

DHCP OFF – If more advanced features are desired, the modem/router probably can be configured for DHCP to be OFF. Refer to the manufacturer's instructions regarding the permanent generator set IP address to assign.

Email Setup Parameters

Set Alert Level – Click on Alert Level drop-down box arrow. Select "Never", "All Events", "Maintenance and Attention Required", or "Attention Required Only". This will determine which events will initiate emails to the selected addresses.

Outgoing Server (SMTP) Settings – Ask your Internet Service Provider (ISP) for the Server Name, User Name and Password to enter.

Note: An Email account capable of SMTP authentication via port 25 is required. The User Name must include the domain name (i.e. username@domainname).

Email Addresses

You may enter up to three Email addresses to whom to send generator set status and event messages.

FIGURE B-8. NETWORK SETUP SCREEN

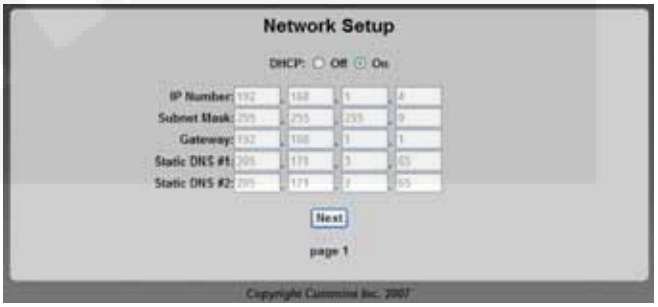

FIGURE B-9. NETWORK SETUP PARAMETERS

FIGURE B-10. EMAIL SETUP PARAMETERS

FIGURE B-11. EMAIL ADDRESSES

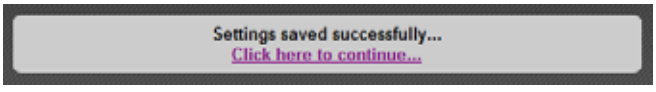

FIGURE B-12. RETURN TO HOME PAGE

My Cummins **Onan** Generator

Generator Model Number:_____
Generator Serial Number:_____
Transfer Switch Model Number:_____
Transfer Switch Serial Number:_____

Internet Access to Generator Set-up Information:
1. Public IP Address: _____
2. Generator In-Home IP Address: _____
3. Password (default: cummins):_____

Email Alerts from Generator Set-up Information:
4. Alert Level: _____
5. Server Name:_____
6. User Name:_____
7. Password:_____
8. Address #1: _____
9. Address#2:_____
10. Address#3:_____

----------Cut Here----------

My Customer's Cummins **Onan** Generator

Customer's Name:_____
Customer's Address:_____
Customer's Phone Number:_____

Generator Model Number:_____
Generator Serial Number:_____
Transfer Switch Model Number:_____
Transfer Switch Serial Number:_____

Internet Access to Generator Set-up Information:
1. Public IP Address: _____
3. Password (default: cummins):_____
4. Alert Level:_____
8. Address#1:_____

FIGURE B-13. MY CUMMINS ONAN GENERATOR INFORMATION SHEET

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Appendix C. Cummins Onan Model RS12000 Generator Set Network Setup Guide

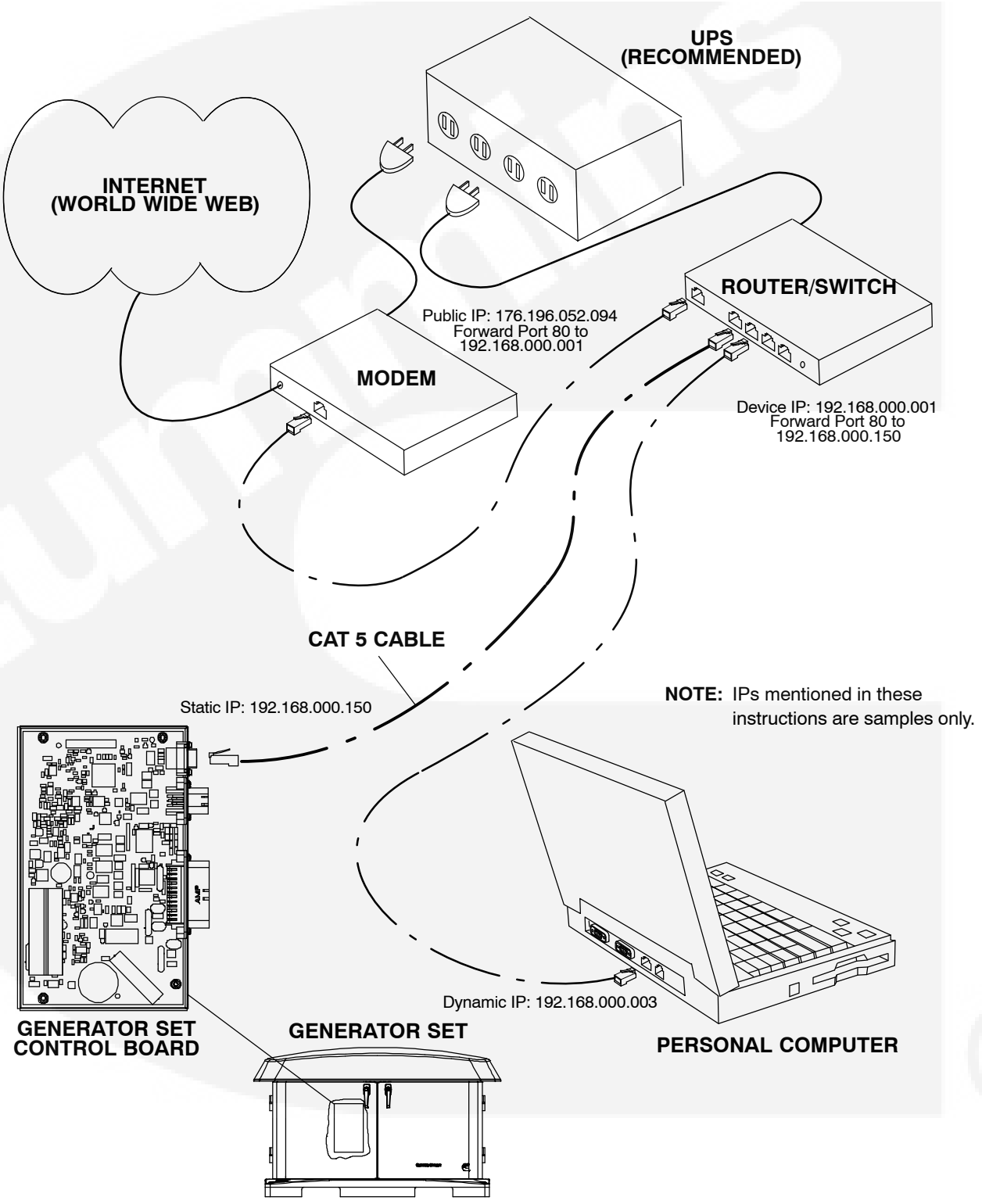

FIGURE C-1. NETWORK CONNECTIONS

SETTING UP IN-HOME NETWORK ACCESS TO THE GENERATOR SET

1. Connect an Ethernet cable* from the generator set control board to a router that has enough ports to connect the generator set and a computer.
2. Write down the IP Address shown on the Network Setup screen (Figure C-2) on the generator set's in-home Operator Panel. (Note: Leave DHCP on.) Add this *Generator In-Home IP Address* to the Information Sheet located on page B-5 of the Operator Manual or page C-5 of the Installation Manual under "Internet Access to Generator Set-up Information" only if remote access to the generator is not utilized.
3. Type the IP address in the address bar of the web browser of a computer established on the same in-home network as the generator set. The computer's web browser will display the generator set's web page (Figure C-3).

* If you are making your own ethernet connections, follow the ethernet cable instructions in the Installation Manual.

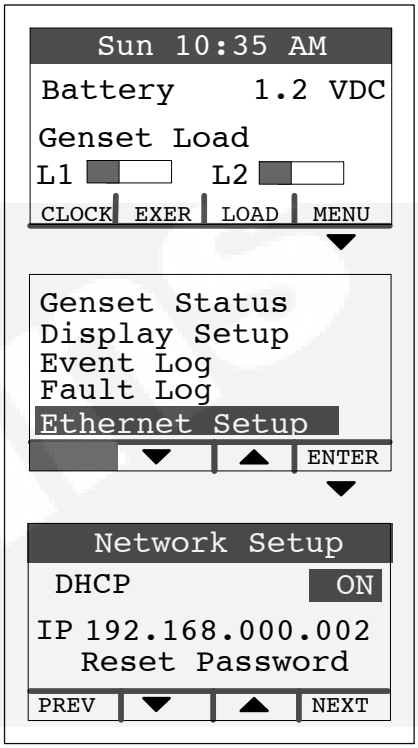

FIGURE C-2. NETWORK SETUP SCREEN ON THE IN-HOME OPERATOR PANEL

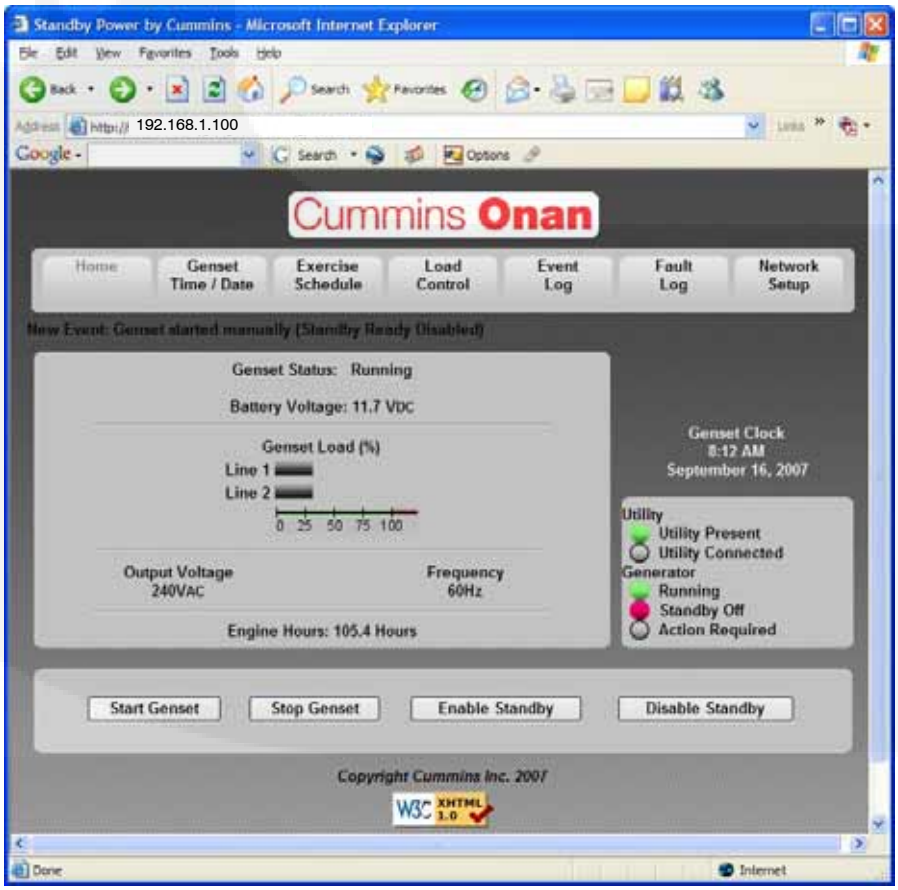

FIGURE C-3. GENERATOR SET HOME PAGE

SETTING UP CONSOLE INTERNET ACCESS TO THE GENERATOR SET

1. Have a public IP address established for the in-home computer network. Typically, it will be necessary to contact the customer's ISP (Internet Service Provider). Note: The ISP might take several days to establish the IP address and an additional service cost may be incurred. Add this *Public IP Address* to the Information Sheet located on page B-5 of the Operator Manual or page C-5 of the Installation Manual under "Internet Access to Generator Set-up Information."
2. Set up in-home computer access to the generator set. See Figure C-1.
3. Click **Network Setup** on the home page (Figure C-3).
4. Change the password and click **Save Password** (Figure C-4)[1]. Add this *Password* to the Information Sheet located on page B-5 of the Operator Manual or page C-5 of the Installation Manual under "Internet Access to Generator Set-up Information."
5. Click **Click here to start Network Setup** (Figure C-4).
6. Click **Off** to turn off generator set **DHCP** (Figure C-5).
7. In the **IP Number** fields enter a unique in-home network address for the generator set (the 192.168.000.150 in this example) that is not likely to have been assigned to any other device. Note: You must use the same first nine digits as the router (192.168.000 in this example). Add this *Generator In-Home IP Address* to the Information Sheet located on page B-5 of the Operator Manual or page C-5 of the Installation Manual under "Internet Access to Generator Set-up Information".
8. The **Subnet Mask, Static DNS #1 and #2**, and **Gateway** numbers establish the connections between the modem/router and generator set and do not need to be changed.
9. Press **Next** on the subsequent screens to get to page 3 of the setup screens or continue by setting up the email alerts.
10. Press **Done** to complete set up and save the settings. (Note: The web page will eventually time out unless the new IP address is entered.)
11. Follow the router setup instructions to forward port 80 to the IP Address entered in Step 7. Typically, this is done on a Port Forwarding or Virtual Server setup screen. (Note: To maintain connections to all devices connected to the modem/router, do not turn off modem/router DHCP.)
12. Follow the modem setup instructions to forward port 80 to the router IP Address (192.168.000. 001 in this example). Typically, this is done on a Port Forwarding or Virtual Server setup screen. (Note: To maintain connections to all devices connected to the modem/router, do not turn off modem/router DHCP.) (Note: If the router is capable of being set up as a switch, plug the input from the modem into one of the open router outputs instead of accomplishing this step.)
13. To access the generator set's web page on any computer or wireless device not connected to the same modem/router as the generator set, type in the customer's public IP Address (179.196.052.094 in this example)[2].
14. To access the generator set's web page on any computer or wireless device connected to the same modem/router as the generator set, type in the unique in-home network address of the generator set (192.168.000.150 in this example).

FIGURE C-4. NETWORK SETUP SCREEN

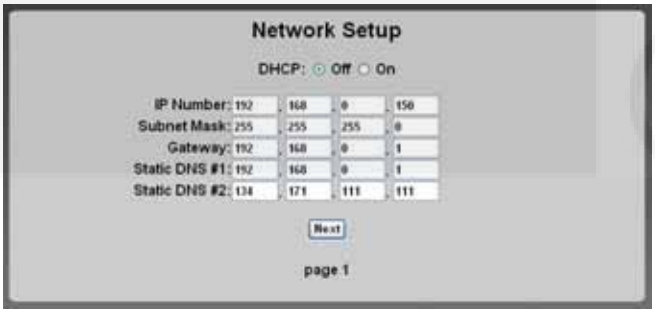

FIGURE C-5. NETWORK SETUP (PAGE 1)

FIGURE C-6. EMAIL SETUP SCREEN (PAGE 2)

SETTING UP EMAIL ALERTS FROM THE GENERATOR SET

1. Set up in-home computer access to the generator set. See C-2.
2. Click **Network Setup** on the home page (Figure C-3).
3. Continue to the **Email Setup** screen (Figure C-6).
4. Select the **Alert Level** you would like to receive. Add this Alert Level to the Information Sheet located on page B-5 of the Operator Manual or page C-5 of the Installation Manual under “Email Alerts from Generator Set-up Information.”
5. Enter your email **Server Name**, **User Name** (inclusive of domain – for example, user name@yahoo.com), and **Password** (Figure C-6). Typically, it will be necessary to contact the customer’s email service provider. (Note: The email account must allow SMTP via port 25; verify with your ISP). Add this information to the Information Sheet located on page B-5 of the Operator Manual or page C-5 of the Installation Manual under “Email Alerts from Generator Set-up Information.”
6. Continue to the **Destination Email Addresses** screen (Figure C-7). Add these addresses to the Information Sheet located on page B-5 of the Operator Manual or page C-5 of the Installation Manual under “Email Alerts from Generator Set-up Information.”
7. Enter up to three different email addresses to receive generator set alerts.
8. Press **Done**. (Note: The web page will eventually time out if a new IP address was entered in Step 7 while setting up Internet access.)

FIGURE C-7. EMAIL ADDRESSES (PAGE 3)

HELP HOTLINE

1–800–888–6626 option 1
Available Monday–Friday 9–5 CST

1 – If you can’t remember your password, reset it to “cummins” by selecting Reset Password on the Network Setup screen on the in-home Operator Panel and pressing the up or down arrow (Figure C-1).

2 – The customer’s public IP address must be a static IP address. If the customer’s public IP address is dynamic, the customer must either obtain a static IP address from their service provider or set up a domain name that manages the dynamic IP address.

FREQUENTLY ASKED QUESTIONS

Question: Do I need another router?

Answer: Yes, a router or switch is required to allow for the connection of more than one device (computer, generator set, etc.) with each other and the Internet. Typically, your Internet modem also serves as a router. If you have an available ethernet connection on your router-enabled modem, you may not need to add an additional router.

Question: Do I need another modem?

Answer: A modem is required if you want to utilize the email and remote Internet access features of the generator set. If you already have an Internet connection, you have a modem. Only one modem is required.

Question: What is an IP address?

Answer: An IP address, or Internet Protocol address, is a unique address that devices such as a computer or your home generator set use to communicate with each other, both on your in-home network (LAN network) or with the World Wide Web.

Question: What is the difference between Static and Dynamic IP addresses?

Answer: On your in-home network, the router (with DHCP enabled) will assign a dynamic IP address to all devices (computer, home generator set, etc.) connected to the router. As devices are added and removed from the router, the devices are automatically updated with new IP addresses. This means that your computer and generator set IP addresses will not always be the same unless static IP addresses are assigned. A static IP address is an unique address that is permanently assigned to a device. On the World Wide Web, your typical ISP (internet service provider) assigns a dynamic IP address to your Internet connection. This is the IP address you type into your Internet browser to access your generator set from the World Wide Web. A static IP address is required for you to establish a constant address you can always access from the World Wide Web. Contact your ISP to set up a static IP address for your Internet connection.

Question: What is DHCP?

Answer: DCHP, or Dynamic Host Configuration Protocol, automatically assigns IP addresses, subnet masks, and gateways to devices, allowing them to communicate with each other. Your router and generator set are equipped with DHCP. Default is for DHCP to be on.

Question: Why do I need a static IP address?

Answer: As discussed in the question about “differences between Static and Dynamic IP addresses”, this is required for your generator to access the World Wide Web.

Question: What is a UPS device and why is it recommended?

Answer: A UPS (Uninterruptible Power Supply) device is battery backup to keep devices such as computers and modems powered during short-term power outages. We recommend that the modem/router be powered through a UPS device to ensure that your generator set is able to send emails and be remotely accessed at all times. For example, if your generator set shuts down during a utility power outage, the generator set can still send you an email letting you know that the power has failed and that the generator set shut down.

Question: When do I need to use a Static IP address?

Answer: Static IP addresses are required if you plan to access your generator set remotely via the Internet.

Question: I used the IP addresses shown on the front of this guide, but why was I not able to access the generator set?

Answer: The IP addresses shown in this guide are only examples and are not likely to be the ones that will work on your network setup.

Question: The IP address consists of four numbers ranging from 0 to 255 which are separated by dots; 179.168.052.094, for example. Are leading zeros necessary?

Answer: No, the IP address, 192.168.0.1, for example, is equivalent to 192.168.000.001. The address can be entered either way.

Question: How do I get my IP number, Subnet Mask, and Gateway?

Answer: On a PC: 1) disable the PC's wireless function, 2) establish an ethernet connection between the computer and generator set via a common modem, 3) on the computer, Click Start>Run, 4) on the run menu that appears type "**cmd**" and click ok, 5) type "**ipconfig**" on the DOS window that appears.

Question: Why do I need two IP addresses to access my generator set?

Answer: You can access your generator set from two networks, your in-home or local network, and from the World Wide Web, thus requiring two addresses. Your local IP address is different from your World Wide Web IP address. From your in-home network you use the generator set's Static IP address. From the World Wide Web you first need to access your modem, which is accomplished by typing in the Static IP address of your Internet connection. Your modem will then automatically forward you to your generator set on the local network.

Appendix D. Communication Troubleshooting

IN-HOME NETWORK ACCESS TO GENERATOR SET TROUBLESHOOTING

⚠WARNING ***Some Generator Set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform Generator Set service.***

Possible Causes: Bad connections or bad communications

Corrective Actions:

1. Check connections.
   a. Verify that the Ethernet cable is plugged into the generator set control and the router.
   b. Verify that the computer is connected to the same router as the generator set via an Ethernet cable.
   c. Verify that the wireless card on the computer is turned off.
   d. Check to see if both ends of the Ethernet cable are assembled and crimped as described in the installation instructions. If not, reassemble and crimp as described in the installation instructions.
   e. Verify that the Ethernet cable connections between the generator set and the router are solid and correct.
   f. Proceed to “Check communications.”
2. Check communications.
   a. Check to see if you can access a standard web page with the computer connected to the same router as the generator set. If not, contact your router manufacturer for troubleshooting information.
   b. Check to see if the green and orange lights are illuminated at the Ethernet connection port on the generator set control board (see Figure D-1). If not, disconnect the Ethernet cable from the generator control board and connect it to the computer. Check to see if you can access a standard web page with the computer connected to the generator side of the Ethernet cable.
      1) If you can access a standard web page, call Cummins Support at 1-800-888-6626 and select option 1.
      2) If you cannot access a standard web page, go to “Check connections” above.
   c. Check to see if the correct generator IP address has been entered, as described in step 3 (page C-2) of the Network Setup Guide (i.e. http://xxx.xxx.xxx.xxx). If not, enter the correct IP address.
   d. Check to see if you can access the generator set via the in-home network. If not, call Cummins Support at 1-800-888-6626 and select option 1.

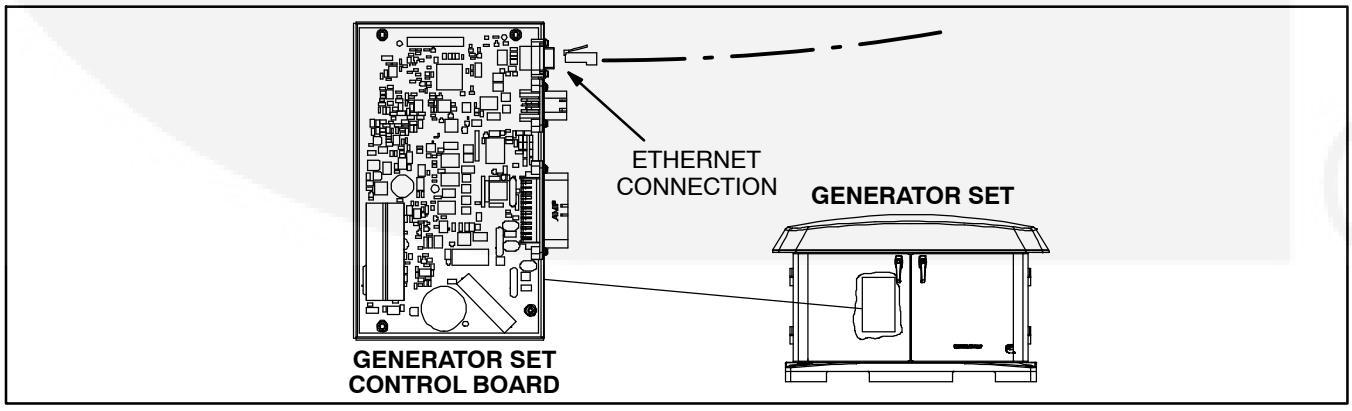

FIGURE D-1. NETWORK CONNECTIONS

REMOTE INTERNET ACCESS TO GENERATOR SET TROUBLESHOOTING

⚠WARNING ***Some Generator Set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform Generator Set service.***

Possible Causes: An improper setup, no high-speed internet connection, the public IP address is not active or properly set up, an incorrect IP address is entered, the computer is connect to the same router or network and the generator set, or the internet connection is bad,

Corrective Actions:

1. Check to see if you are able to access the generator set with your in-home computer. If not, refer to the “In-home Network Access Troubleshooting” procedures.
2. Verify that you followed the network setup procedures. Refer to the Network Setup Guide in Appendix C.
3. Verify that you are using a high-speed internet connection.
4. Verify that the public IP address is active and set up properly with the ISP (Internet Service Provider). If necessary, contact the ISP to verify your setup.*****
5. Verify that the correct public IP address is entered into the web browser of the computer (i.e. xxx.xxx.xxx.xxx).
6. Verify that the computer is not connected to the same router or network as the generator set. The computer used for internet access must be connect to a different internet connection than the generator set.
7. Check to see if you can access a standard web page from a computer. If not, contact the ISP to troubleshoot the internet connection.
8. Verify all settings, as described in the Network Setup Guide.
9. If the previous steps do not correct the problem, contact a computer network specialist to diagnose.

***** To verify your IP address, access “whatismyipaddress.com” from the browser of a computer connected to the internet and on the same network as the generator set. This web page displays your current IP address which should match the IP address assigned to you by your ISP.

EMAIL ALERT TROUBLESHOOTING

⚠WARNING ***Some Generator Set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform Generator Set service.***

Possible Causes: An improper setup, the alert level is not set to “all events,” emails cannot be received, the outgoing email address is not included in your contact list, the email account is not capable of using port 25 with plain SMTP for the outgoing SMTP server setup, the domain name is not included in the user name filed of the Network Setup screen, or the DNS #1 and #2 values are incorrect on the Network Setup screen.

Corrective Actions:

1. Check to see if you are able to access the generator set with your in-home computer. If not, refer to “In-Home Computer Access Troubleshooting.”
2. Verify that you followed the network setup instructions. Refer to the Network Setup Guide in Appendix C.
3. Verify that the alert level is set to “All Events” (see Figure D-4). To verify that your generator set can send emails, select “Disable Standby” (see Figure D-3) and wait several minutes to verify that you did receive an email. Then select “Enable Standby” and wait a few more minutes to verify that you did receive a second email.
4. Send an email to the destination email address and check to see if you received this email. If not, contact your email service provider or your ISP (internet service provider) to diagnose.
5. Check to see if the destination email accounts have spam filtering.
   a. If spam filtering is present, add the outgoing email address to your contact list.
   b. If spam filtering is not present, proceed to step 6.
6. Check to see if you are using an email account capable of using port 25 with plain authentication SMTP server setup (see Figure D-4). If necessary, obtain an email account capable of using port 25 with plain authentication SMTP and enter detail into the network setup screen (see Figure D-4).
7. Verify that the domain name is included in the user name field of the Network Setup screen shown in Figure D-4 (i.e. username@domainname).**
8. Verify with your ISP that the Static DNS (Domain Name Server) #1 and #2 are correct (see Figure D-2).
9. If the previous steps do not correct the problem, contact a computer network specialist to diagnose.

** “No authentication” is possible by leaving the username and password fields blank.

IMPORTANT NOTE: Changes are not saved unless you navigate through all three Network Setup screens and click on “Done” (see Figure D-5). The message “Settings Saved Successfully” is then displayed.

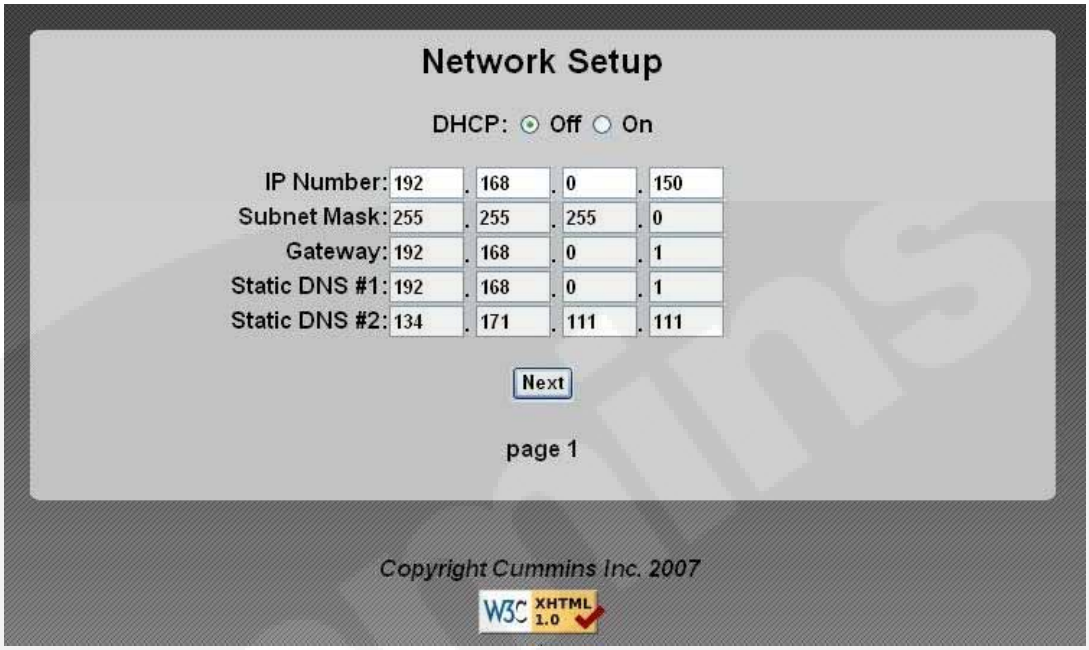

FIGURE D-2. NETWORK SETUP – PAGE 1

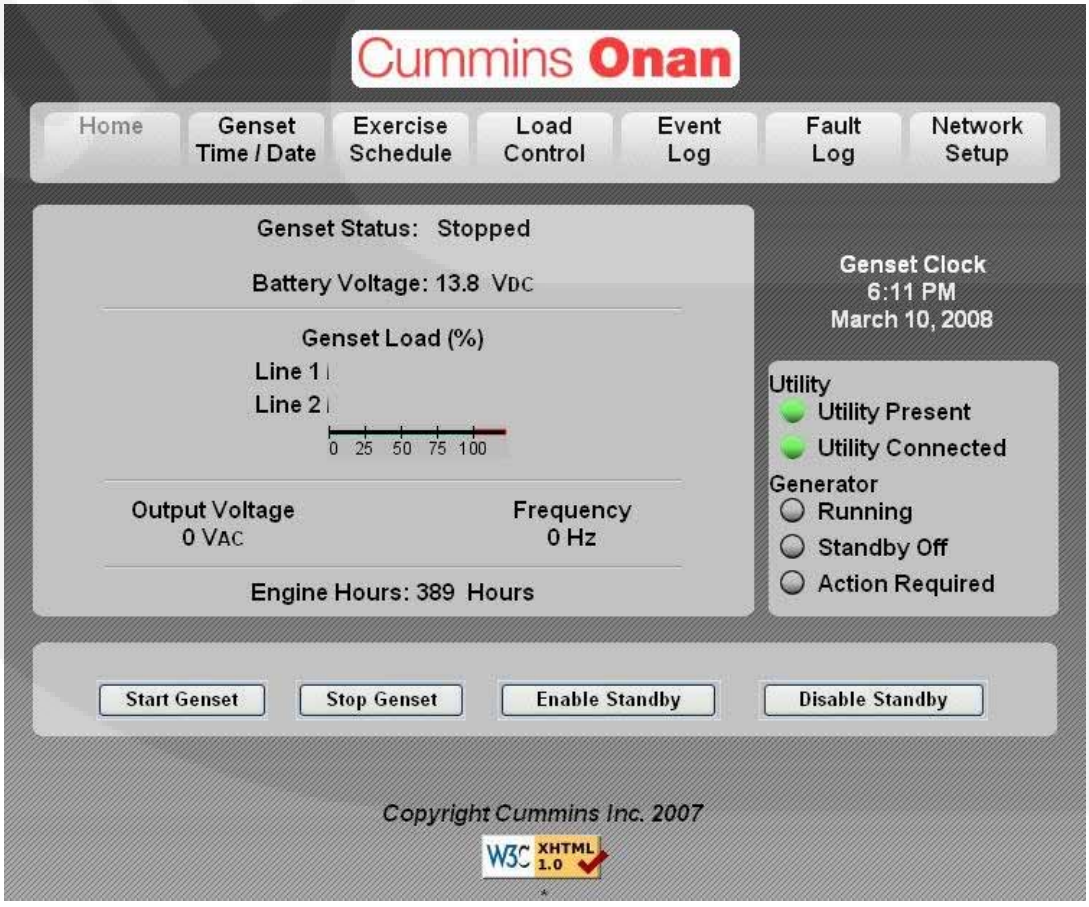

FIGURE D-3. GENERATOR SET HOME PAGE

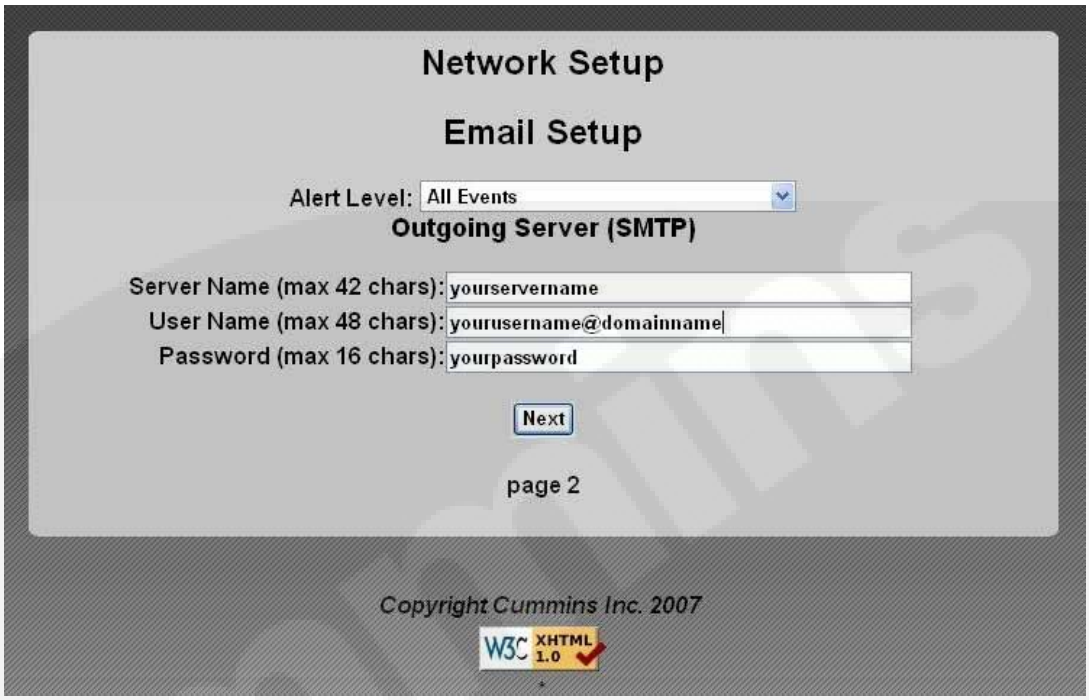

FIGURE D-4. NETWORK SETUP – PAGE 2

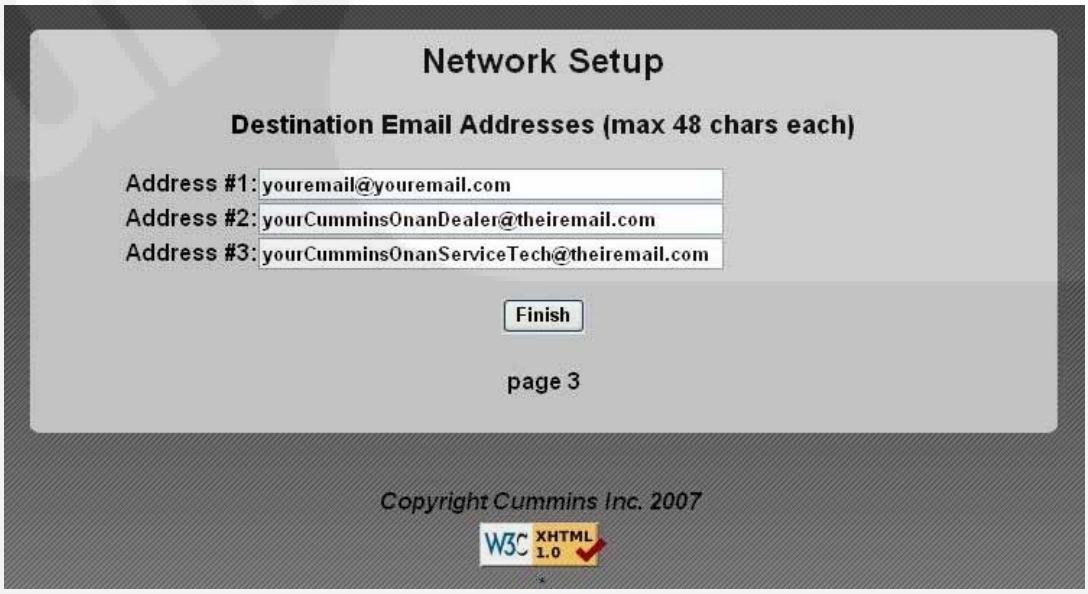

FIGURE D-5. NETWORK SETUP – PAGE 3

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Appendix E. Specifications

FUEL CONSUMPTION:	Natural Gas Installation (1000 BTU/ft^3)	Propane Installation (2500 BTU/ft^3)
@ 1/2 Load	122 ft^3/hr (3.5 m^3/hr)	53 ft^3/hr (1.5 m^3/hr)
@ Full Load	191 ft^3/hr (5.4 m^3/hr)	88 ft^3/hr (2.5 m^3/hr)
Fuel Supply Pressure	5–11 H_2O	7–11 H_2O
GENERATOR: Brush-Type, 2-Pole Rotating Field, Single-Bearing		
Power (@1.0 power factor)	10.5 kW	12 kW
Voltage	120/240	120/240
Frequency	60 Hz	60 Hz
Number of Phases	1	1
Output Current	87.5/43.75 Amps	100/50 Amps
Circuit Breaker	50 amp, 2-pole	50 amp, 2-pole
ENGINE: 2-Cylinder-V, OHV, Air-Cooled, 4-Stroke, Spark Ignited, 3600 RPM		
Displacement	40.9 in^3 (720 cc)	
Compression Ratio	8.3:1	
Spark Plug Gap	0.030 in (0.76 mm)	
Spark Plug Type	NGK-BPR6ES (P/N 167–1658)	
Spark Plug Tightening Torque	10 ft-lbs (13.5 N-m)	
Cylinder Compression Test	180 psi (12.4 bar)	
Valve Lash: Intake & Exhaust (cold)	0.004in (0.10 mm)	
Oil Capacity	1.7 quart (1.6 liter)	
CONTROLLER: Integrated Microprocessor-Based Engine, Generator and Transfer Switch Controller		
DC SYSTEM:		
Nominal Battery Voltage	12 volts	
Battery Group	26 R	
Battery Type	Maintenance Free	
Minimum Battery CCA (Cold Cranking Amps)	530	
WEIGHT (WET): 460 lbs (209 kg)		
SIZE (L x W x H): 48 x 43 x 31.5 in (1219 x 864 x 800 cm)		
SOUND LEVEL: Less than 64 dB(A) @ 23 ft (7 meters)		

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Appendix F. Outline and System Drawings

SCHEMATIC **PAGE**

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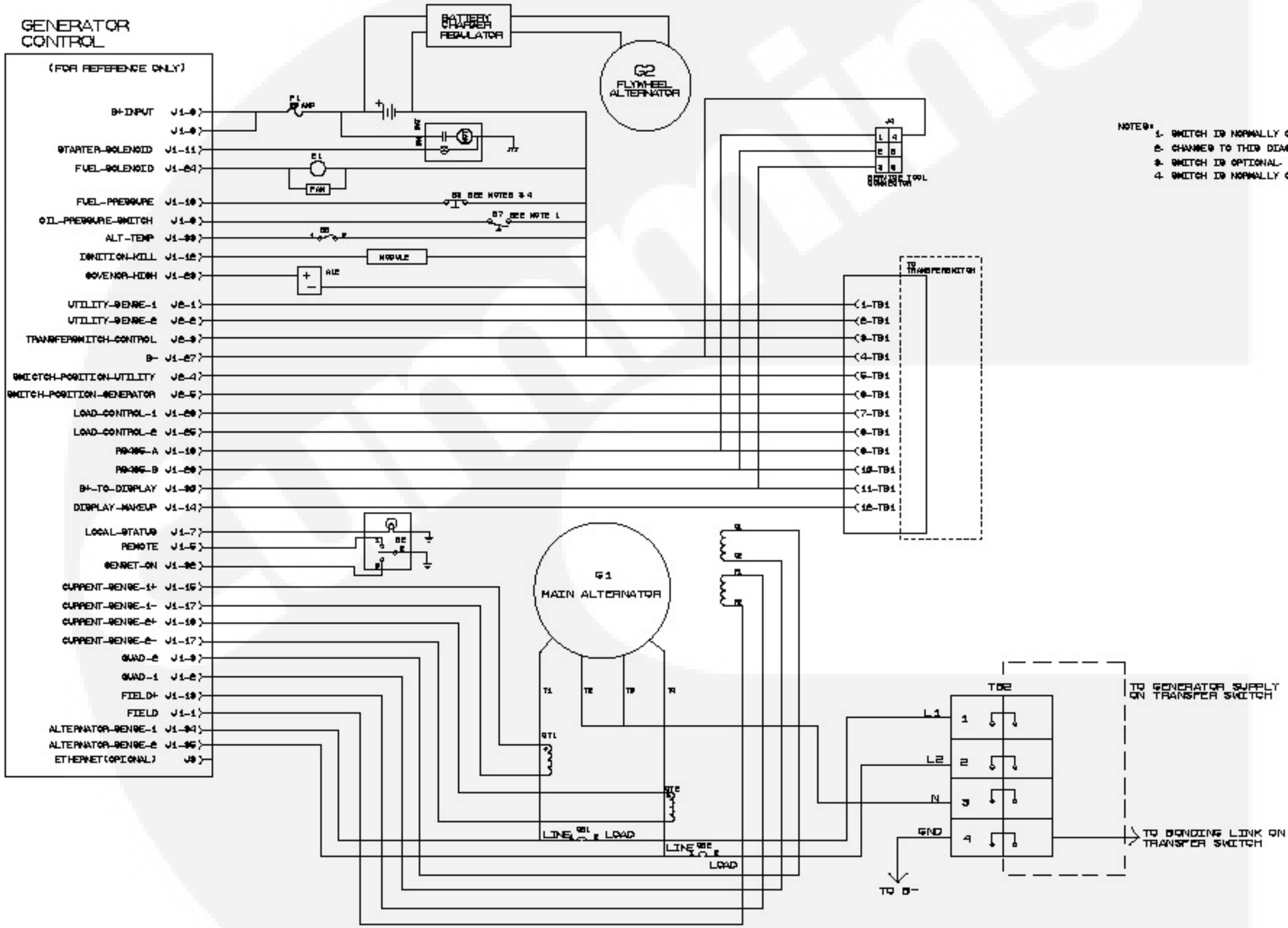
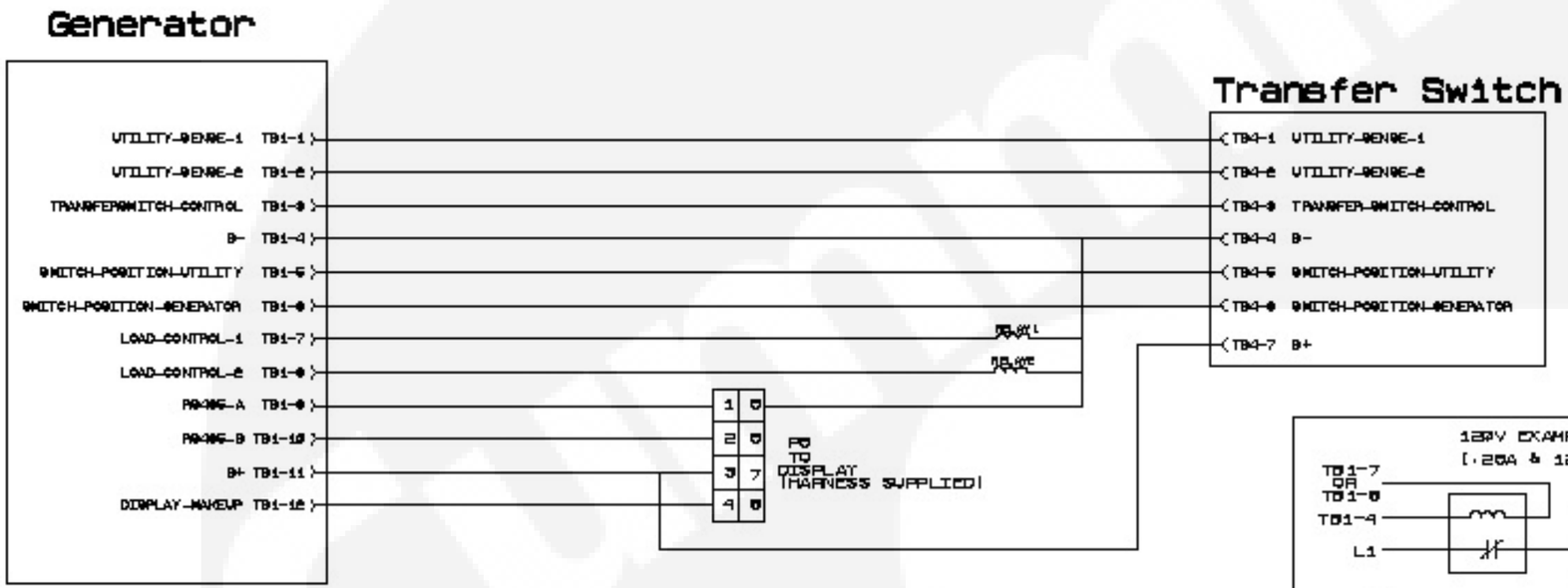


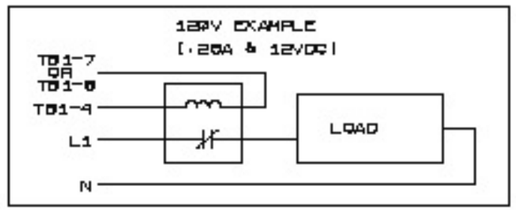
NOTES:
1. SWITCH IS NORMALLY OPEN.
2. CHANGES TO THIS DIAGRAM SHEET MUST BE TRANSFERED TO 0300-0774.
3. SWITCH IS OPTIONAL.
4. SWITCH IS NORMALLY CLOSED.

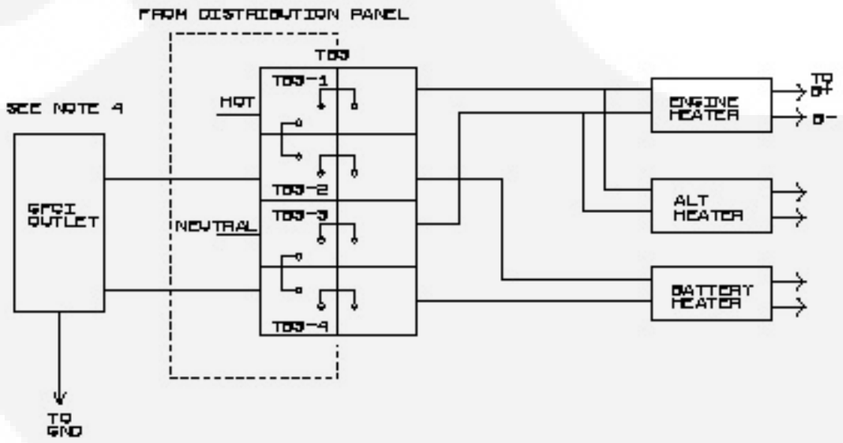
WIRING DIAGRAM (SHEET 1 OF 2)

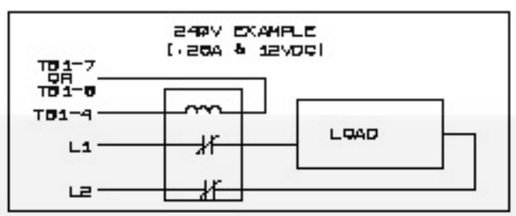
NOTES:

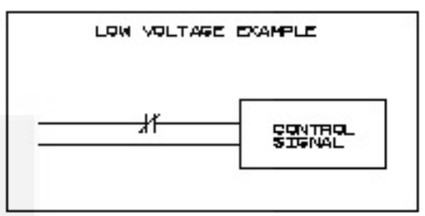
1. ALL WIRING AND RELAYS ON THIS PAGE ARE CUSTOMER SUPPLIED.
2. CHANGES TO THIS DIAGRAM SHEET MUST BE TRANSFERED TO RXGM-0770.
3. LABEL RXGM-0770 MUST BE UPDATED WITH RXSM-3614 UPDATES.
4. OPTIONAL.











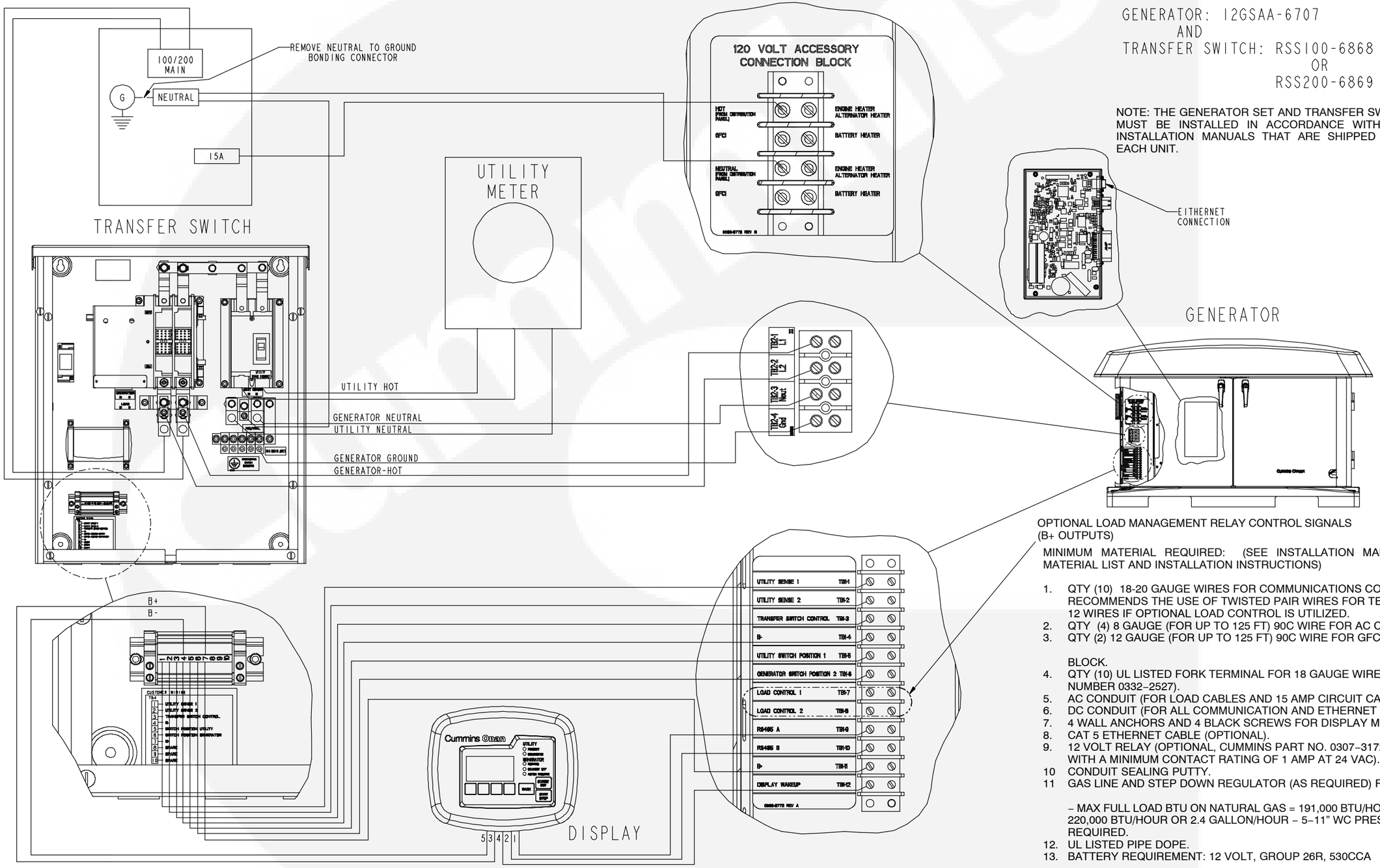
0630-3514_Rev F

WIRING DIAGRAM (SHEET 2 OF 2)

QUICK CONNECT GUIDE FOR USE WITH

GENERATOR: 12GSAA-6707
AND
TRANSFER SWITCH: RSS100-6868
OR
RSS200-6869

NOTE: THE GENERATOR SET AND TRANSFER SWITCH MUST BE INSTALLED IN ACCORDANCE WITH THE INSTALLATION MANUALS THAT ARE SHIPPED WITH EACH UNIT.



OPTIONAL LOAD MANAGEMENT RELAY CONTROL SIGNALS
(B+ OUTPUTS)

MINIMUM MATERIAL REQUIRED: (SEE INSTALLATION MANUAL FOR COMPLETE MATERIAL LIST AND INSTALLATION INSTRUCTIONS)

1. QTY (10) 18-20 GAUGE WIRES FOR COMMUNICATIONS CONNECTIONS. CUMMINS RECOMMENDS THE USE OF TWISTED PAIR WIRES FOR TB1-9 AND TB1-10. 12 WIRES IF OPTIONAL LOAD CONTROL IS UTILIZED.
2. QTY (4) 8 GAUGE (FOR UP TO 125 FT) 90C WIRE FOR AC CONNECTIONS.
3. QTY (2) 12 GAUGE (FOR UP TO 125 FT) 90C WIRE FOR GFCI AND AC DISTRIBUTION BLOCK.
4. QTY (10) UL LISTED FORK TERMINAL FOR 18 GAUGE WIRES (CUMMINS PART NUMBER 0332-2527).
5. AC CONDUIT (FOR LOAD CABLES AND 15 AMP CIRCUIT CABLES).
6. DC CONDUIT (FOR ALL COMMUNICATION AND ETHERNET CABLES).
7. 4 WALL ANCHORS AND 4 BLACK SCREWS FOR DISPLAY MOUNTING.
8. CAT 5 ETHERNET CABLE (OPTIONAL).
9. 12 VOLT RELAY (OPTIONAL, CUMMINS PART NO. 0307-3172 OR ANY 12 VDC COIL WITH A MINIMUM CONTACT RATING OF 1 AMP AT 24 VAC).
10. CONDUIT SEALING PUTTY.
11. GAS LINE AND STEP DOWN REGULATOR (AS REQUIRED) FOR GAS CONNECTIONS

    – MAX FULL LOAD BTU ON NATURAL GAS = 191,000 BTU/HOUR AND ON PROPONE = 220,000 BTU/HOUR OR 2.4 GALLON/HOUR – 5–11" WC PRESSURE AT GENERATOR REQUIRED.
12. UL LISTED PIPE DOPE.
13. BATTERY REQUIREMENT: 12 VOLT, GROUP 26R, 530CCA

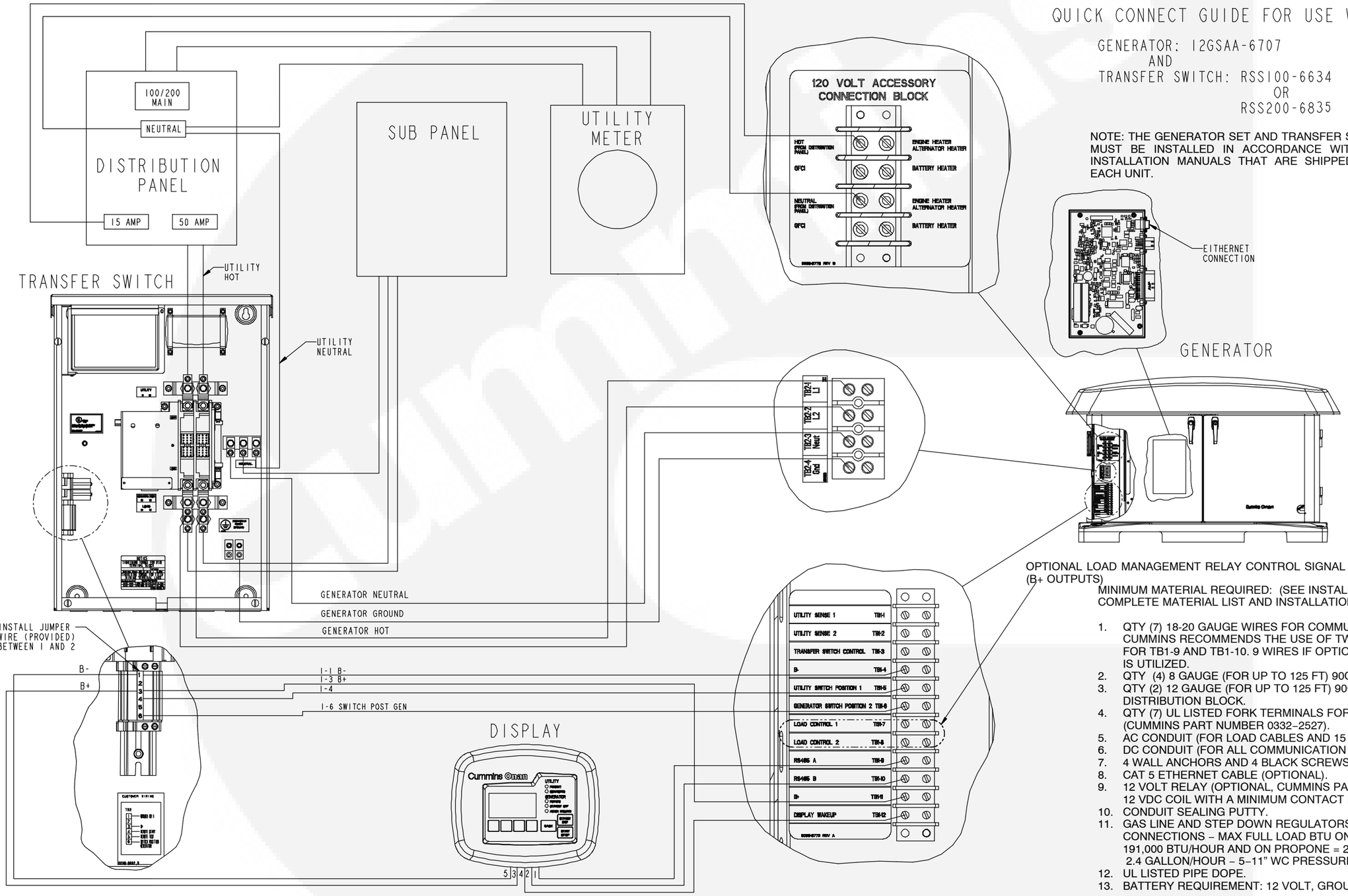
0630-3707

CONNECTIONS TO TRANSFER SWITCH RSS100–6868 OR RSS200–6869

QUICK CONNECT GUIDE FOR USE WITH

GENERATOR: 12GSAA-6707
AND
TRANSFER SWITCH: RSS100-6634
OR
RSS200-6835

NOTE: THE GENERATOR SET AND TRANSFER SWITCH MUST BE INSTALLED IN ACCORDANCE WITH THE INSTALLATION MANUALS THAT ARE SHIPPED WITH EACH UNIT.



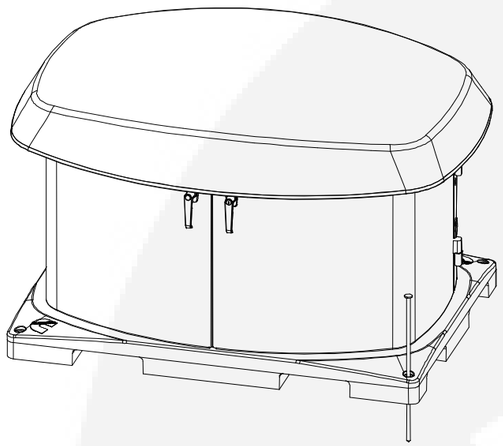
OPTIONAL LOAD MANAGEMENT RELAY CONTROL SIGNAL
(B+ OUTPUTS)

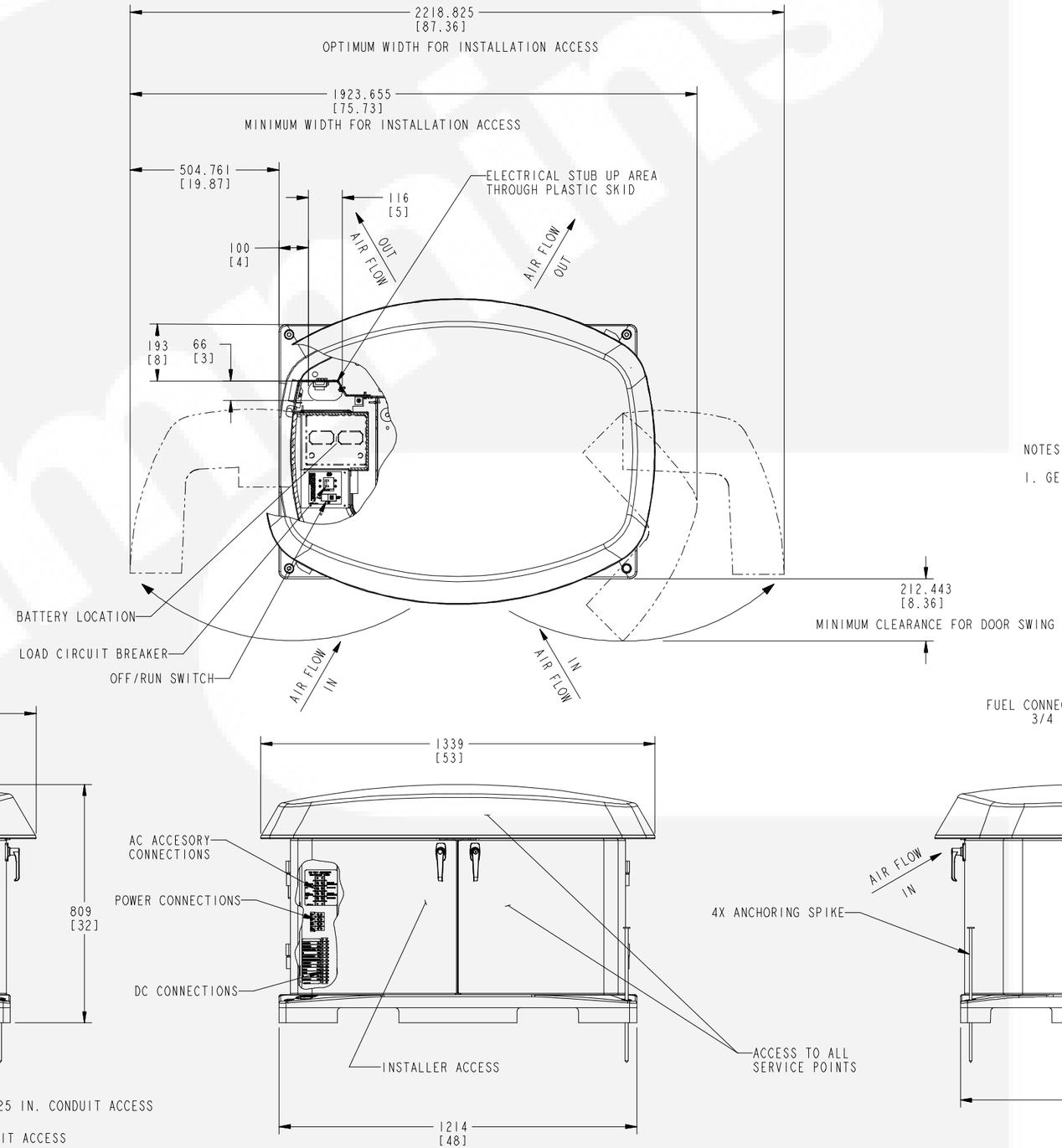
MINIMUM MATERIAL REQUIRED: (SEE INSTALLATION MANUAL FOR COMPLETE MATERIAL LIST AND INSTALLATION INSTRUCTIONS)

1. QTY (7) 18-20 GAUGE WIRES FOR COMMUNICATIONS CONNECTIONS. CUMMINS RECOMMENDS THE USE OF TWISTED PAIR WIRES FOR TB1-9 AND TB1-10. 9 WIRES IF OPTIONAL LOAD CONTROL IS UTILIZED.
2. QTY (4) 8 GAUGE (FOR UP TO 125 FT) 90C WIRE FOR AC CONNECTIONS.
3. QTY (2) 12 GAUGE (FOR UP TO 125 FT) 90C WIRE FOR GFCI AND AC DISTRIBUTION BLOCK.
4. QTY (7) UL LISTED FORK TERMINALS FOR 18 GAUGE WIRES (CUMMINS PART NUMBER 0332-2527).
5. AC CONDUIT (FOR LOAD CABLES AND 15 AMP CIRCUIT CABLES).
6. DC CONDUIT (FOR ALL COMMUNICATION AND ETHERNET CABLES).
7. 4 WALL ANCHORS AND 4 BLACK SCREWS FOR DISPLAY MOUNTING.
8. CAT 5 ETHERNET CABLE (OPTIONAL).
9. 12 VOLT RELAY (OPTIONAL, CUMMINS PART NO. 0307-3172 OR ANY 12 VDC COIL WITH A MINIMUM CONTACT RATING OF 1 AMP AT 24 VAC).
10. CONDUIT SEALING PUTTY.
11. GAS LINE AND STEP DOWN REGULATORS (AS REQUIRED) FOR GAS CONNECTIONS – MAX FULL LOAD BTU ON NATURAL GAS = 191,000 BTU/HOUR AND ON PROPONE = 220,000 BTU/HOUR OR 2.4 GALLON/HOUR – 5–11" WC PRESSURE AT GENERATOR REQUIRED.
12. UL LISTED PIPE DOPE.
13. BATTERY REQUIREMENT: 12 VOLT, GROUP 26R, 530CCA

0630-3707

CONNECTIONS TO TRANSFER SWITCH RSS100-6634 OR RSS200-6635



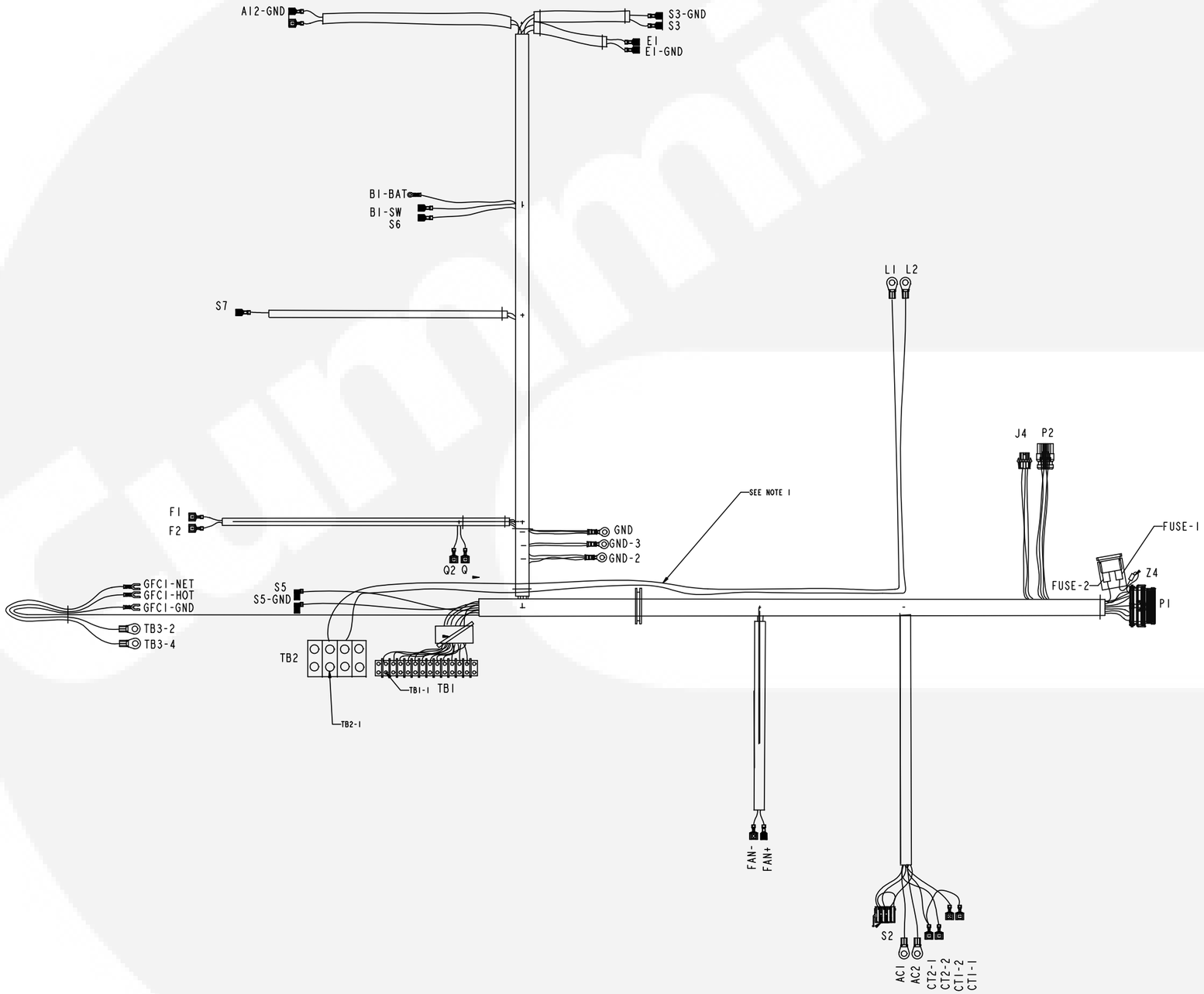


NOTES:

1. GENSET WEIGHT: 460 LBS.

OUTLINE DRAWING

F-7



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