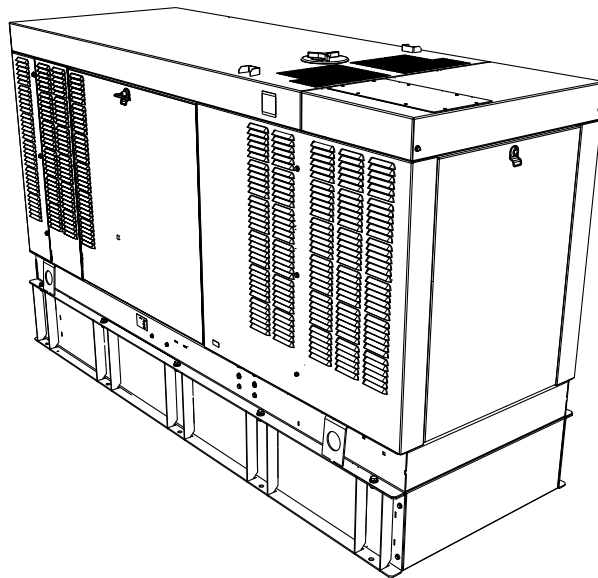


Installation Guidelines

Stationary Diesel Generators

Residential and Commercial
15–50 kW, 12–50 kVa

**WARNING**

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

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

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

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

SAVE THIS MANUAL FOR FUTURE REFERENCE

Use this page to record important information about this generator.

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

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

Always supply the complete model number and serial number of the unit when contacting an Independent Authorized Service Dealer (IASD) about parts and service.

Operation and Maintenance: Correct maintenance and care of the generator ensures a minimum number of problems and keeps operating expenses at a minimum. It is the operator's responsibility to perform all safety checks, to verify that all maintenance for safe operation is performed promptly, and to have the equipment inspected periodically by an IASD. Normal maintenance, service, and replacement of parts are the responsibility of the owner/operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage may contribute to the need for additional maintenance or service.

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

www.generac.com/Dealer-Locator.

 WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to

www.P65Warnings.ca.gov/diesel. (000394)

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Section 1: Safety Rules & General Information

Introduction

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

The engine and generator are factory installed in an all-weather, metal enclosure intended exclusively for outdoor installation. The engine operates on ultra low sulfur diesel fuel.

NOTE: This generator is suitable for supplying typical residential and commercial loads such as induction motors (sump pumps, refrigerators, air conditioners, furnaces, etc.), electronic components (computer, monitor, TV, etc.), lighting loads, and microwaves, when sized correctly.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Read This Manual Thoroughly



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

If any section of this manual is not understood, contact the nearest Independent Authorized Service Dealer (IASD) or Generac Customer Service at 1-888-436-3722 (1-888-GENERAC), or visit www.generac.com for starting, operating, and servicing procedures. The owner is responsible for correct maintenance and safe use of the unit.

This manual must be used in conjunction with all other supporting product documentation supplied with the product.

SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions that must be followed during placement, operation, and maintenance of the unit and its components. Always supply this manual to any individual that will use this unit, and instruct them on how to correctly start, operate, and stop the unit in case of emergency.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The alerts in this manual, and on tags and decals affixed to the unit, are not all inclusive. If using a procedure, work method, or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others and does not render the equipment unsafe.

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



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

(000001)



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

(000002)



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

(000003)

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

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

How to Obtain Service

When the unit requires servicing or repairs, contact Generac Customer Service at 1-888-GENERAC (1-888-436-3722) or visit www.generac.com for assistance.

When contacting Generac Customer Service about parts and service, always supply the complete model and serial number of the unit as given on its data decal located on the unit. Record the model and serial numbers in the spaces provided on the front cover of this manual.

General Hazards

⚠ DANGER

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

⚠ DANGER

Automatic start-up. Disconnect utility power and render unit inoperable before working on unit. Failure to do so will result in death or serious injury. (000191)



⚠ WARNING

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

⚠ WARNING

Equipment damage. This unit is not intended for use as a prime power source. It is intended for use as an intermediate power supply in the event of temporary power outage only. Doing so could result in death, serious injury, and equipment damage. (000247a)



⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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



⚠ WARNING

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



⚠ WARNING

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



⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

Exhaust Hazards



⚠ DANGER

Asphyxiation. Carbon monoxide can kill in minutes. Operate this unit outdoors only. Failure to do so will cause death or serious injury.

(000525)



⚠ DANGER

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

(000103)



⚠ WARNING

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

(000178a)

⚠ WARNING

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

(000146)

Electrical Hazards



⚠ DANGER

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

(000144)



⚠ DANGER

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

(000150)

⚠ DANGER

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

(000237)



⚠ DANGER

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

(000152)



⚠ DANGER

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

(000188)



⚠ DANGER

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

(000104)



⚠ DANGER

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

(000145)

Fire Hazards



⚠ WARNING

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

(000217)



⚠ WARNING

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

(000218)



⚠ WARNING

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

(000219)



⚠ WARNING

Electrocution. Refer to local codes and standards for safety equipment required when working with a live electrical system. Failure to use required safety equipment could result in death or serious injury.

(000257)



⚠ WARNING

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

Comply with regulations the Occupational Safety and Health Administration (OSHA) has established, or with equivalent standards. Also, verify that the unit is applied, used, and maintained in accordance with the manufacturer's instructions and recommendations. Do nothing that might alter safe application/usage and render the unit in noncompliance with the aforementioned codes, standards, laws, and regulations.

Explosion Hazards



⚠ DANGER

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

⚠ DANGER

Explosion and fire. Connection of fuel source must be completed by a qualified professional technician or contractor. Incorrect installation of this unit will result in death, serious injury, and property and equipment damage.

(000151a)



⚠ DANGER

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

(000174)



⚠ WARNING

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

(000110)

Lifting Hazards



⚠ DANGER

Risk of electrocution. Avoid touching overhead power lines when lifting or hoisting generator. Failure to do so will result in death or serious injury. (000245)

⚠ WARNING

Personal injury. Excessive weight. Use only appropriate lifting eyes and lifting equipment to lift unit. Improper lifting techniques could result in equipment damage, death or serious injury. (000224)



⚠ WARNING

Personal injury. Failure to properly connect lifting cables, chains, or straps could result in death, serious injury, or property damage.

(000346)

⚠ WARNING

Personal Injury. Do not use lifting hook if there are signs of damage or corrosion. Doing so could result in death, serious injury, or property damage.

(000349)

⚠ WARNING

Personal Injury. Do not use lifting eye if there are signs of damage or corrosion. Doing so could result in death, serious injury, or property damage.

(000433)

⚠ WARNING

Personal Injury. Verify all fasteners are properly tightened prior to lifting unit. Failure to do so could result in death, serious injury, or property damage.

(000351)

General Rules

⚠ DANGER

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

(000190)

⚠ DANGER

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

(000237)

⚠ WARNING

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

(000182a)

**⚠ WARNING**

Electrocution. Refer to local codes and standards for safety equipment required when working with a live electrical system. Failure to use required safety equipment could result in death or serious injury.

(000257)

⚠ WARNING

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

(000228)

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

- Follow all safety precautions in the owner's manual, installation guidelines manual, and other documents included with the equipment.
- Never energize a new system without opening all disconnects and breakers.
- Always consult local code for additional requirements for where unit is being installed.
- Incorrect installation can result in personal injury and damage to the unit. It may also result in the warranty being suspended or voided. All instructions listed below must be followed including location clearances and pipe sizes.

Before You Begin

- Contact local inspector or city hall to be aware of all federal, state, and local codes which could impact installation. Secure all required permits before installing.
- Fully comply with all relevant NEC, NFPA, and OSHA standards, as well as all federal, state, and local building and electric codes. This unit must be installed in accordance with current NFPA 37 and

NFPA 70 standards, and any other federal, state, and local codes for minimum distances from other structures.

Standards Index**⚠ WARNING**

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

(000209b)

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

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

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

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

* www.nfpa.org

** www.iccsafe.org

*** www.nerc.org Rural Electricity Resource Council P.O.
Box 309 Wilmington, OH 45177-0309

**** www.asabe.org American Society of Agricultural &
Biological Engineers 2950 Niles Road, St. Joseph, MI 49085

Section 2: Installation Planning

Protector Diesel Installation Planning Checklist

☐ The local building code administrator or fire marshal has verified the generator must be located a minimum of _____ ft (_____m) from a house or other structure.

NOTE: Minimum distance will be based on local zoning and code requirements.

☐ The local AHJ has advised me regarding requirements for electrical and/or building permits, as well as those regulations relating to emissions and fuel storage.

☐ I have been advised of local requirements for construction of a concrete base pad, and whether anchoring requirements are needed for installation on a flood plain.

☐ I have verified with the appropriate authorities the generator must be located a minimum of _____ ft (_____m) from a property line.

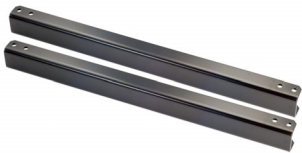
☐ I have been advised whether the local fire marshal (or other third party) is required to be present at start up, or when the fuel tank is filled for the first time.

☐ I have verified the installation site is applicable to optional standby only and does not require an NFPA 110 capable generator.

☐ The local fire marshal has verified I am required to extend the fuel tank vents _____ ft (_____m) above the surrounding grade.

☐ The local fire marshal has verified that local codes require installation of the diesel product safety accessories designated on the next page.

Safety Accessories

Item	Description	Part Number	Required
	Emergency stop switch	G006510-0	☐ YES ☐ NO
	90% Fuel fill level alarm <i>(Domestic product only)</i>	G006504-0	☐ YES ☐ NO
	Five gallon spill box <i>(Domestic product only)</i>	G006502-0	☐ YES ☐ NO
	Spill box drain back <i>(Domestic product only)</i>	G006511-0	☐ YES ☐ NO
	Fuel fill drop tube	G006507-0	☐ YES ☐ NO
	Fuel tank support risers	G006505-0 (15 & 20 kW) G006506-0 (30, 48, & 50 kW)	☐ YES ☐ NO ☐ YES ☐ NO
	Stainless steel fuel lines	G007660-0 (15 & 20 kW) G007661-0 (30 kW) G007662-0 (48 & 50 kW)	☐ YES ☐ NO ☐ YES ☐ NO ☐ YES ☐ NO
	Lockable fuel fill cap	G006512-0	☐ YES ☐ NO
Photo not available.	Ultrasonic Cleaning Solution	A000018981	☐ YES ☐ NO
Photo not available.	All Surface Protectant	A000019001	☐ YES ☐ NO

Unit Drawings

Installation Drawings

See [Figure 2-1](#). Installation drawings show weights, dimensions, clearances, exhaust details, connection locations, wiring stub-ups, lifting locations, and other information. Use unit specific installation drawings when designing a site installation plan. Thoroughly read the NOTES section of each drawing for important details.

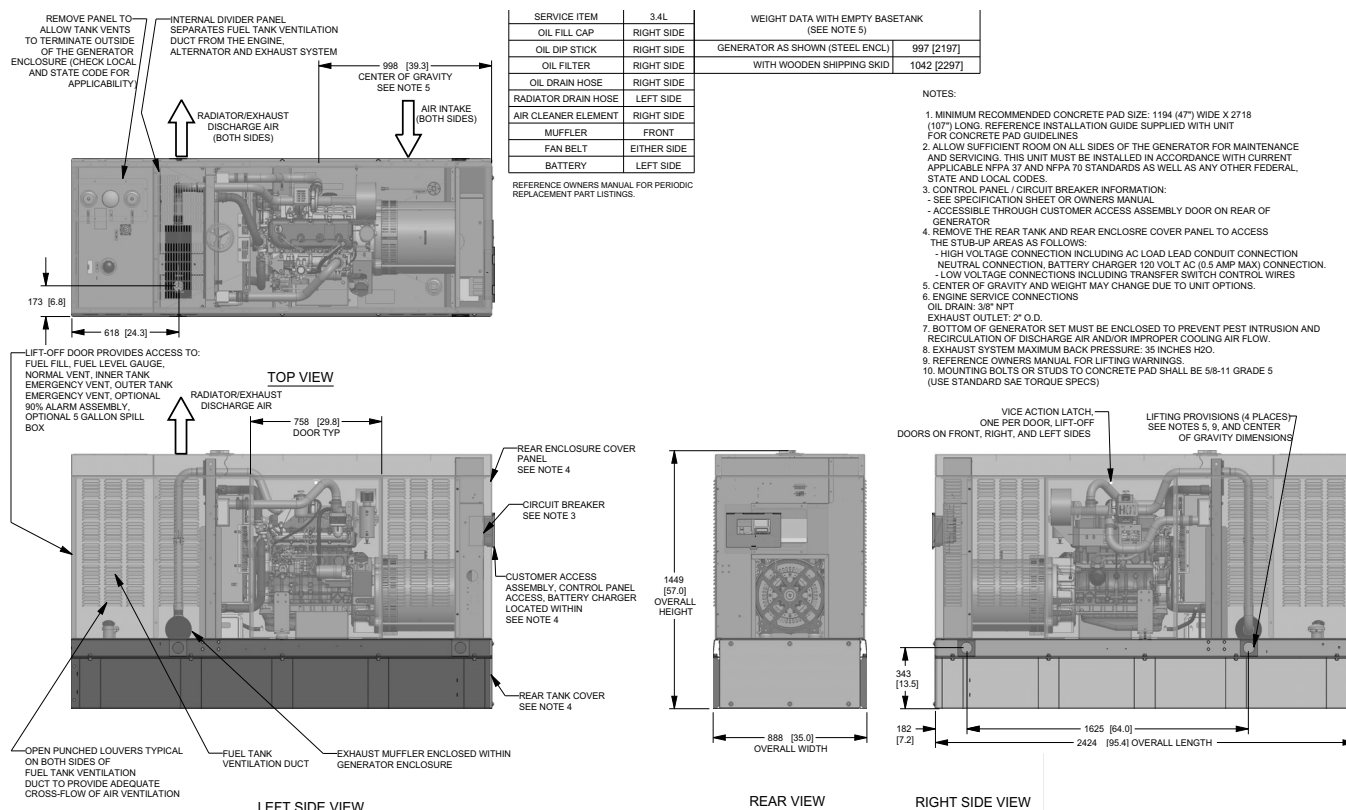


Figure 2-1. Typical Installation Drawing

Wiring Diagrams

Wiring and schematic diagrams show connection points for control wiring, load wiring, and any service power supply required for battery chargers, block heaters, etc. Always use unit specific wiring diagrams during planning and installation. See [Installation Drawings](#) for more information.

Receiving

Receiving and Unpacking

Handle shipping cartons and crates with care to avoid damage. Store and unpack cartons with the correct side up, as noted by label on shipping carton.

Inspection

Carefully inspect generator and all contents of cartons for any damage that may have occurred during shipment. See shipping documentation for any provisions or guidance when damage is incurred. Correct all damage or deficiencies before installing generator.

Storage Before Installation

Long Term Storage

If unit will be stored (or installed and not started) for six months or more, store unit in accordance with the manufacturer's instructions. Contact an IASD to obtain the Long Term Preservation and Storage Manual (Part No. 0G4018) and the Preservation Checklist (Part No. 0G4018A).

Short Term Storage

If unit will be stored (or installed and not started) for less than six months, proceed as follows:

- All units are provided with an enclosure.
- Place unit on a smooth flat surface. Do not leave unit on shipping pallet, as it leaves the bottom open for entry of dirt, debris, insects, rodents, etc.
- Leave exhaust system openings covered.
- Leave plastic plugs in fuel connection points.
- Use anti-rodent plugs and other enclosure features to prevent entry of birds, small animals, and foreign objects.

Lifting



⚠ DANGER

Risk of electrocution. Avoid touching overhead power lines when lifting or hoisting generator. Failure to do so will result in death or serious injury.

(000245)

⚠ WARNING

Personal injury. Excessive weight. Use only appropriate lifting eyes and lifting equipment to lift unit. Improper lifting techniques could result in equipment damage, death or serious injury.

(000224)



⚠ WARNING

Personal injury. Failure to properly connect lifting cables, chains, or straps could result in death, serious injury, or property damage.

(000346)

⚠ WARNING

Personal Injury. Do not use lifting hook if there are signs of damage or corrosion. Doing so could result in death, serious injury, or property damage.

(000349)

⚠ WARNING

Personal Injury. Do not use lifting eye if there are signs of damage or corrosion. Doing so could result in death, serious injury, or property damage.

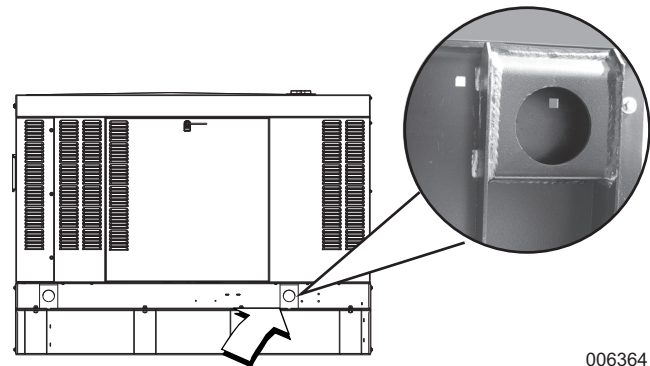
(000433)

Generators weighing more than 900 lbs (408 kg) require correct tools, equipment, and qualified personnel to be used in all phases of handling and unpacking.

To ensure personal safety and prevent damage to unit, use only correctly sized equipment intended for safe rigging, lifting, and moving of heavy machinery. See [Lifting Hazards](#).

Use a spreader bar to prevent damage to unit. **Failure to use a spreader bar will result in scratches and damage to painted surfaces.**

See [Figure 2-2](#). Installation drawings show lifting points for rigging and lifting purposes. Always attach lifting and rigging devices at designated points only. Do not use lifting points of the engine or alternator to move generator.



006364

Figure 2-2. Lifting Points (Four Places)

Generator Location



⚠ DANGER

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

(000103)

IMPORTANT NOTE: Generator exhaust contains carbon monoxide (CO)—a poisonous, potentially lethal gas that cannot be seen or smelled. Generator must be installed in a well ventilated area away from windows, doors, and openings. The selected location should not allow exhaust gases to be drawn into structures where people or animals may be present.

Locate generator set where it is readily accessible for maintenance, repair, and firefighting purposes. Comply with code requirements for minimum distance from combustible walls and building openings. Verify generator location with the local AHJ for code compliance before positioning generator.

General Location Guidelines

Consider the following:

- See NFPA 37, Section 4.1.3 for rooftop or platform installations.
- See NFPA 30 for fuel storage tank requirements.
- The supporting structure must be adequate for the generator and its accessories.
- Verify installation site is clean, dry, not subject to flooding, and provided with adequate drainage in the event of heavy rains.
- Verify installation site permits noise and vibration to be effectively isolated.
- Verify installation site provides easy access to generator for maintenance, repair, and firefighting purposes.
- Keep a minimum of 5 ft (1.5 m) of clearance around each side of generator to facilitate service or maintenance.
- Verify installation site permits engine exhaust gases to be safely evacuated from inhabited or occupied areas. Consider the direction of prevailing winds to prevent exhaust gases from being carried back to the engine area or to the fresh air intake vents of nearby buildings.
- Installation site must allow for provision of an adequate fuel supply. Consider ease of accessibility for refueling purposes.
- Verify installation site permits sufficient air flow for cooling and ventilation. Consider proximity of any walls, fences, or other noise abatement or security

barriers. Do NOT face radiator discharge end of the enclosure into prevailing wind.

- Consider cold weather kit options and accessories for the generator in cold weather locations.
- Verify unit is securely fastened to mounting pad to prevent movement caused by vibration.
- Verify all electrical connections have flexible sections to isolate vibration.

NOTE: Failure to comply with location guidelines can result in damage to generator or surrounding area and may cause the warranty to be suspended or voided. Extra repair labor or equipment may not be covered under warranty if service access is difficult or restricted.

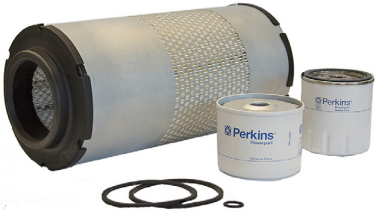
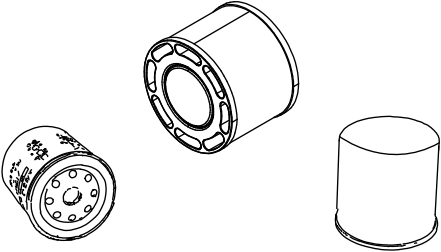
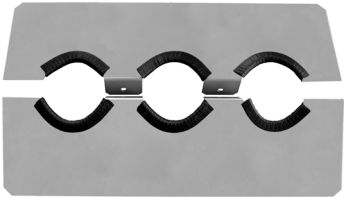
Weather Considerations

Consider local weather conditions during installation. There are various accessories available to promote fast, reliable starting and operation regardless of local climatic conditions. Optional cold weather kits make engine starting more dependable and reliable.

Product Accessories

The following product accessories are available. Contact an IASD for additional information.

1	Scheduled Maintenance Kit (Part No. G007640-0: 15/20 kW, 12/16 kVa)
2	Scheduled Maintenance Kit (Part No. G007641-0: 30 kW, 30 kVa)
3	Scheduled Maintenance Kit (Part No. G007642-0: 48/50 kW, 40/50 kVa)
4	Cold Weather Kit (Part No. G007651-0: 15/20 kW, 12/16 kVa; Part No. G007651-0: 30 kW, 30 kVa; Part No. G007652-0: 48/50 kW, 40/50 kVa)
5	Vent Extension Support Kit (Part No. G006588-1)
6	Touch-Up Paint Kit (Part No. G005703-0)
7	Local Wireless Remote (Part No. G006664-0)
8	Wireless Remote Extension Harness (<i>not shown</i>) (Part No. G006665-0)
9	Mobile Link® 4G LTE Cellular Device (Part No. G007169-0) Mobile Link® Wi-Fi & Ethernet Device (Part No. G007170-0)
10	Harness Adapter Kit (<i>not shown</i>) (Part No. G006478-0)

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Section 3: Site Selection and Preparation

Site Selection



⚠ DANGER

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

(000103)

Generator must be installed **outdoors** in a location allowing sufficient clearance around all sides for reasons of safety, maintenance, and servicing.

Placement requirements for a diesel storage tank vary by municipality. Contact the local building code department and fire marshal for code compliance before selecting a location for the generator. See NFPA 37 and NFPA 30 for additional requirements for placement of a diesel storage tank. See [Installation Checklists](#) for additional details.

NOTE: Local codes may be different and more restrictive than what is described here. Contact local AHJ to determine which standards and codes apply in the area.

Install generator, in its protective enclosure, outdoors, where adequate cooling and ventilating air is always available. Consider these factors:

- Installation of the diesel generator must strictly comply with NFPA 30, NFPA 37, NFPA 54, NFPA 58 and NFPA 70 standards.
- Install unit where air inlet and outlet openings will not become obstructed by leaves, grass, snow, etc. Consider using a windbreak to protect unit if prevailing winds will cause blowing or drifting.
- Install generator on high ground where water levels will not rise and endanger it. It should not operate in or be subjected to standing water.
- Allow sufficient room on all sides of generator for maintenance and servicing. This unit must be installed in accordance with any codes that are in place in your country or local jurisdiction for minimum distances from other structures.
- Clearance from ends and front of generator must meet the requirements of NFPA 30, NFPA 37, and all additional local code requirements.
- Clearances under a deck or structure must meet requirements of NFPA 30, NFPA 37, and all additional local code requirements.
- Install unit where rain gutter downspouts, roof run-off, landscape irrigation, water sprinklers, or sump pump discharge does not flood unit or spray enclosure, including any air inlet or outlet openings.
- Install unit where services will not be affected or obstructed, including concealed, underground, or

covered services such as electrical, fuel, phone, air conditioning, or irrigation. This could affect warranty coverage.

- Face generator air inlet openings to the prevailing winds if strong prevailing winds blow from one direction.
- In the absence of local codes regarding placement or clearance, the manufacturer recommend following the guidelines in this section.
- Install generator as close as possible to transfer switch. **REMEMBER THAT LAWS OR CODES MAY REGULATE THE DISTANCE AND LOCATION.**
- Generator must be installed on a level surface, and must be level within 0.5 in (13 mm) all around.

Installation Guidelines for Stationary Fuel Storage Tanks

⚠ DANGER

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

(000191)

National Fire Protection Association standard NFPA 30 indicates spacing requirements of a stationary fuel storage tank with a mounted, enclosed generator from a structure, wall, or property line. Verify all spacing requirements are correct with the assistance of local code officials prior to finalizing genset location.

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

Site Preparation

Generator Foundation

Install generator on a concrete pad or base slab able to support its weight and accessories. All applicable codes should be followed. A correct foundation is needed to resist dynamic loading and reduce transmitted noise and vibration. The exact composition of the mounting pad must follow standard engineering practices for the required loading and application. **Securely fasten generator to foundation using suitable grade, size, and style fasteners.** Holes are provided in the base frame for this purpose.

Concrete Pad

Follow all federal, state, and local codes when designing a concrete pad or base slab.

Seat concrete pad on a prepared solid subsurface and use appropriate reinforcing bar or expanded wire mesh. A common specification calls for 2,500 psi (17.24 MPa) concrete reinforced with 8 gauge wire mesh.

Dimensions

Extend concrete pad beyond the frame of the unit at least 6 in (15.2 cm). This provides space for maintenance and repair.

The base pad must be:

- Capable of supporting 125% of unit wet weight for single unit applications.
- Flat and level to within 0.5 in (13 mm).
- Capable of withstanding severe torque reactions.

To calculate depth of concrete pad, the following formula may be used:

$$\text{Depth of Base} = \frac{W}{\text{Density} \times B \times L}$$

W = Total wet weight of generator set in lbs (kg)

Density = Density of the concrete:

- 150 pounds per cubic foot
- 2,400 kilograms per cubic meter

B = Foundation width in ft (meters)

L = Foundation length in ft (meters)

Suggested mixture of concrete (by volume) is 1:2:3 of cement, sand, and aggregate with a maximum 4 in (100 mm) slump with a 28 day compression strength of 3,000 psi (20.7 MPa).

Unit Clearance

Verify installation site provides easy access to generator for maintenance, repair, and firefighting purposes. Keep a minimum of 5 ft (1.5 m) of clearance around each side of the generator to facilitate service or maintenance.

Stub-Up Area

For load conduit, auxiliary power conduit (high voltage), and control wiring conduit (low voltage), see unit installation drawings for the location and dimensions of the stub-up area. **Figure 3-1** illustrates a typical stub opening (A).

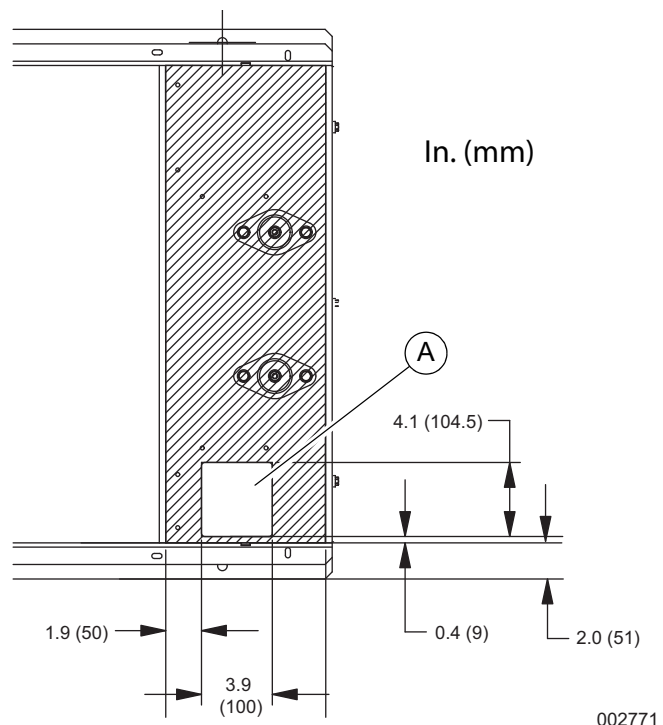


Figure 3-1. Installation Drawing Stub-Up Detail (Typical)

Mounting

Fixed Foundation

Use mounting holes in base frame to fasten unit to foundation. Always use hardware of a suitable grade, size, and style.

Connections

All electrical connections must have flexible sections to isolate vibration if they connect to the unit base rails. Correctly support and secure all piping before installing flexible connection.

Combustible Floor and Roof Protection

Engines, and their weatherproof housings, if provided, that are installed on roofs of structures shall be located at least 5 ft (1.5 m) from openings in walls and at least 5 ft (1.5 m) from structures having combustible walls. Per NEC 110.26(E)(2), a minimum separation of 3 ft (0.91 m) is permitted if the adjacent wall of the structure has a fire resistance rating of at least 1 hour.

An oil containment system consisting of a curb or dike having a capacity at least equal to the total capacity of the lubricating oil system or the liquid fuel system, whichever is greater, shall be provided. This system shall also comply with applicable requirements of NFPA 37, Chapter 6.

The surface beneath the engine and beyond the engine and the oil containment dike shall be noncombustible to a minimum distance of 12 in (300 mm).

NOTE: Local building codes may have additional requirements for placement of fuel storage tanks on top of a roof or structure. Contact the local building code department or fire marshal for code compliance before placing generator on top of roof or structure.

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Section 4: Diesel Fuel Systems

General Information

Because diesel fuels are less volatile than gasoline or gaseous fuels, they are sometimes considered safer. Due to this perception, careless installation practices can occur which may lead to serious problems with generator set performance and reliability.

Periodically inspect and test the system to verify all components remain in good working order.

Diesel Fuel Base Tank

See [Figure 4-1](#). Units provided are typically mounted on their own base/fuel tank. These are plumbed at the factory. Tank construction is typically double-wall. The base tank is the main fuel tank and incorporates the following items:

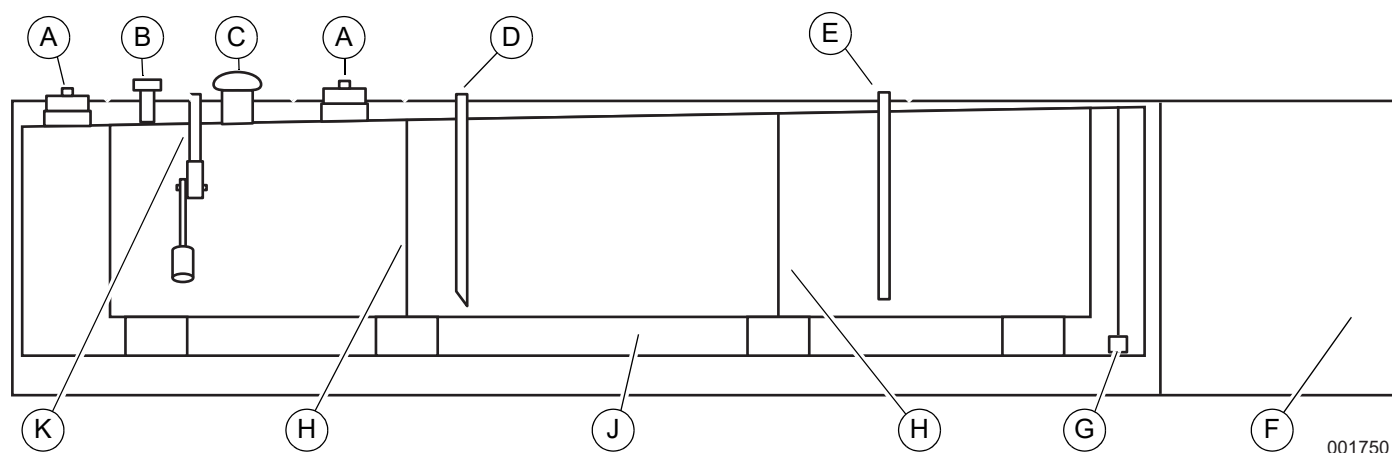


Figure 4-1. Typical Integrated Diesel Fuel Base Tank

A	Emergency vent—on main tank and rupture basin
B	Fuel fill
C	Vent
D	Fuel return line—from engine; sometimes supplied with a check valve
E	Fuel supply line—to engine fuel pump; includes in-line check valve
F	Stub-up area
G	Rupture basin leak detector
H	Baffle
J	Leak containment area
K	Fuel level sensor—electrical, mechanical, or both

NOTE: Some fill lines are equipped with overflow containment.

Some applications require extending the vent line outside of an enclosure or to outside air along with adequate spill containment.

Diesel Fuel Recommendations

IMPORTANT NOTE: DO NOT use home heating oil or bio-diesel fuel.

Use **No. 2D** diesel fuel when temperatures are above freezing. When temperatures are below freezing, blend **No. 1D** diesel fuel and **No. 2D** diesel fuel together for a climate adjusted fuel ratio.

Diesel fuel must also meet the following requirements:

- Sulfur content of 15 parts per million (ppm) maximum.
- Minimum Cetane index of 40.

NOTE: Low ambient temperatures as well as engine operation at high altitudes may require the use of fuels with higher Cetane ratings.

Allow at least 5% of tank capacity for fuel expansion. **DO NOT OVERFILL!**

Fuel Maintenance

Diesel fuel must be treated for long term storage. Use approved fuel additive and water abatement material. Test stored fuel every 90 days and add treatment as required. Periodically inspect and dry abatement as needed.

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Section 5: Electrical System

General Information

All wiring must be correctly sized, routed, supported, and connected. All wiring must comply with NEC and local codes.

The generator uses Customer Connection Interface (CCI) panels to separate high voltage and customer control wiring connections. These two panels are clearly labeled. The wiring diagrams for each specific unit show the connection points in their corresponding sections. Terminal boards are clearly labeled and correspond to the same terminal connections shown in the wiring diagrams. Always use unit specific wiring diagrams when making wiring connections.

NOTE: See [Alternator AC Lead Connections](#).

Connecting Generator Feeder Conductors



⚠ DANGER

Electrocution. Turn utility and emergency power supplies to OFF before connecting power source and load lines. Failure to do so will result in death or serious injury. (000116)

Installation and interconnection diagrams are provided at the back of this manual.

NOTE: All installations must comply with national, state, and local codes. It is the responsibility of the installer to perform an installation that will pass the final electrical inspection.

The generator supply connection is made at the generator disconnect circuit breaker terminals. Conductor sizes must be adequate to handle the maximum current to which they will be subjected, based on the 75 °C column of tables, charts, etc. used to size conductors. The installation must fully comply with all applicable codes, standards, and regulations.

All power cables can enter the enclosure through the knockouts provided.

NOTE: Apply corrosion inhibitor to conductors if aluminum conductors are used.

Tighten terminal lugs to the torque values as noted on the decal located on the inside of the door. After tightening terminal lugs, carefully wipe away any excess corrosion inhibitor.

⚠ CAUTION

Equipment damage. Verify all conductors are tightened to the factory specified torque value. Failure to do so could result in damage to the switch base.

(000120)

Connect generator conductors to clearly marked terminal lugs in generator as follows:

1. Connect generator conductors to disconnect circuit breaker.
2. Connect generator neutral to neutral terminal bar.
3. Connect equipment ground to equipment ground lug.

Connecting Start Circuit Wires

Control system interconnections may consist of N1, N2, and T1, and leads 23 and 194. The generator control wiring is a Class 1 signaling circuit. See instruction manual of specific engine generator for wiring connection details. Recommended wire gauge sizes for this wiring depends on the wire length, as recommended in the following chart:

Maximum Wire Length	Recommended Wire Size
1–115 ft (0.3–35 m)	No. 18 AWG
116–185 ft (36–56 m)	No. 16 AWG
186–295 ft (57–89 m)	No. 14 AWG
296–460 ft (90–140 m)	No. 12 AWG

Exception: Conductors of AC and DC circuits, rated 1,000 volts nominal, or less, shall be permitted to occupy the same equipment, cable, or conduit. All conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the equipment, cable, or conduit. See NEC 300.3(C)(1).

Removing Rear Panel and Stub-Up Cover

Proceed as follows to remove rear panel and stub-up cover:

1. See [Figure 5-1](#). Remove six screws with nylon washers to release rear panel (A) from enclosure. For best results, rotate left side of panel outward away from enclosure before disengaging right side.

NOTE: Disconnect wire harness from switch located in the customer access assembly housing. This will allow door to be completely removed.

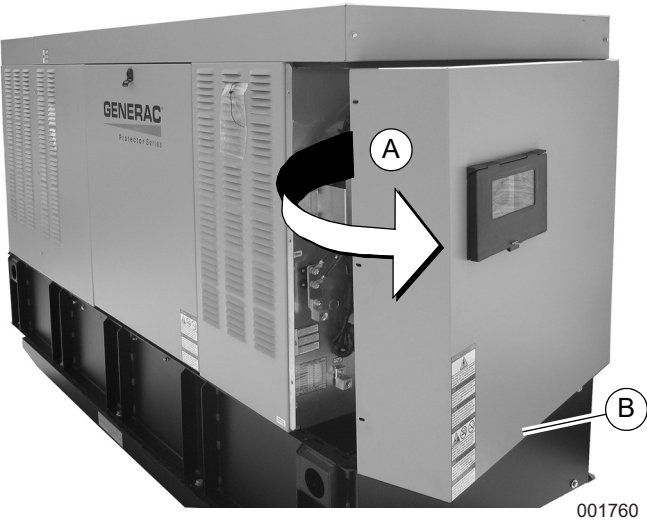


Figure 5-1. Remove Rear Panel and Stub-Up Cover

2. Remove four screws with nylon washers to release fascia from control panel.
3. The stub-up cover (B) and five screws with flat washers are shipped loose and found inside the enclosure.

Table 5-1. Frame Breakers

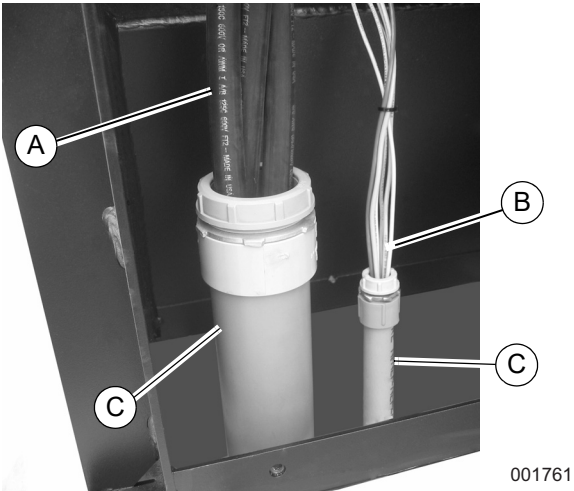
Frame Breaker	Generac 225 AF 2 Pole	Generac 225 AF 3 Pole	Generac 400 AF 2 Pole	Generac 400 AF 3 Pole
Range	125A-200A	50A-200A	225A-400A	225A-400A
Wire Type	Cu/Al			
Wire Temperature Rating	167 °F (75 °C)			
Lug AWG Range (Number of Conductors)	6-350 kcmil (1)		1/0-250 kcmil (2)	1/0-250 kcmil (2) or 4-600 kcmil (1)

NOTE: Lug torque specifications are located on breaker data tag.

Typical Load Leads and Control Wiring in Stub-Up

NOTE: The illustration in [Figure 5-3](#) is for reference only. See installation drawings for unit-specific details.

NOTE: See 300.3(C) and Article 725 in the NEC for routing of Class 1 control wires and power wires. The installation of a single conduit is permitted.



A	Load leads	C	Stub-ups
B	Control wiring	—	—

Figure 5-2. Load Leads and Control Wiring in Stub-Up (Typical)

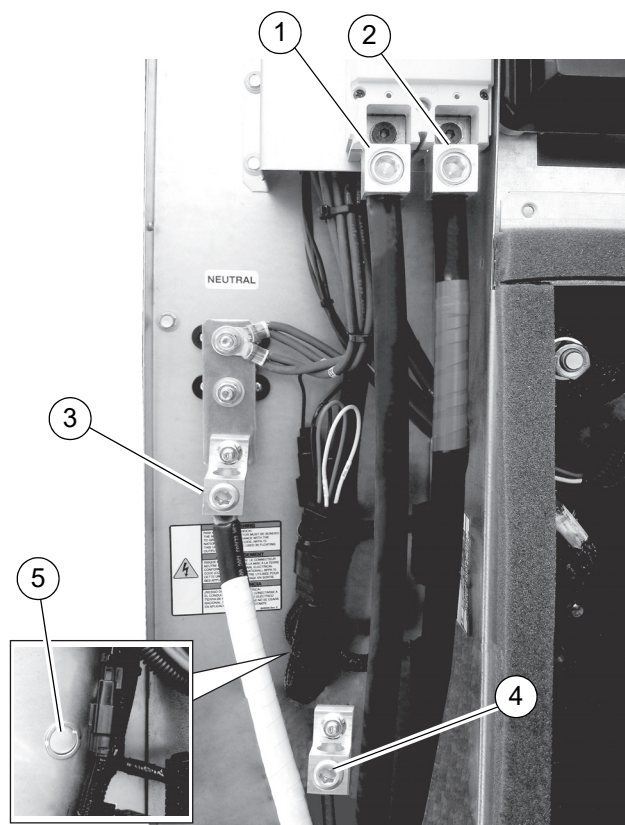
Customer Load Wiring

Customer load wiring consists of single-phase or three-phase connections between generator main line circuit breaker (MLCB) and transfer switch. The wiring connects to lugs E1, E2, E3 (if three-phase on MLCB), neutral, and equipment ground at generator and runs to corresponding lugs in transfer switch. All load wires, neutral, and ground should be marked and terminated in correct lugs in transfer switch. Verify all wiring is correctly mounted and terminated at the appropriate connection points in both the generator and transfer switch. For general information regarding wire type, temperature rating, size range, and wire lug torque specifications, see [Table 5-1](#). Always see NEC tables for specific requirements.

NOTE: For three-phase applications, use phase rotation meter to verify generator phase rotation matches rotation of utility.

NOTE: For three-phase, delta configured alternators (voltage code J) the second leg (N2) must be bonded to all second legs in the entire system.

See [Installation Drawings](#) for more information.



001758

Load Wiring Connections

1	E1	4	Ground
2	E2	5	Knock out plug (cold weather kit)
3	Neutral		

Notes:

Single-phase installation shown.

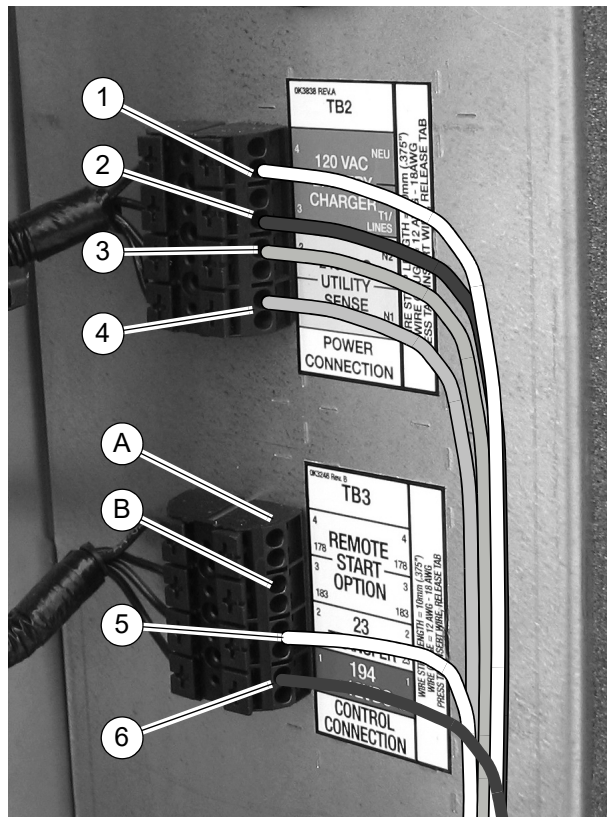
See [Figure 5-4](#) for typical control wiring connections.**Figure 5-3. High Voltage Connections (Typical)**

Control Wiring Connections

The control wire customer connection block is where all of control wiring is connected.

NOTE: All wiring must comply with NEC, state, and local AHJ requirements. Control wiring shall be installed per the requirements of NEC Articles 300.3(C) and 725.46. If installing conductors with different voltage insulation ratings, a 600V rated electrical sleeve is provided and can be found in the manual bag.

See **Figure 5-4**. Depending on the type of system, control wiring includes the following. (Wire colors shown for illustration purposes only):



TB2 Terminal Block			
Terminal		Function	Voltages
1	Neutral	Neutral for T1 battery charger	Neutral
2	T1	Power for T1 battery charger	120 VAC
3	N2	Utility Sensing from transfer switch	208-277 VAC
4	N1	Utility Sensing from transfer switch	208-277 VAC
TB3 Terminal Block			
Terminal		Function	Voltages
A	178	Two wire start control [GTS]	5-12 VDC
B	183	Two wire start control [GTS]	5-12 VDC
5	23	Transfer relay control wire	12-0 VDC
6	194	Power for transfer relay	12 VDC

Figure 5-4. Control Wiring Connections (Typical)

RTS Series Transfer Switch With T1 Fuse/Connection

NOTE: The control wire customer connections require the use of Class 1 Wiring Methods. Always follow the standards and methods appropriate to circuits being wired.

NOTE: T1 is the 120 VAC power supply for control panel battery charger. This circuit must be powered whether transfer switch is in utility or standby mode. Control board will generate a warning (Battery Charge AC Fail) if circuit loses power.

NOTE: Observe maximum wire size for terminal strip connections shown in unit wiring diagram.

(1) For battery charging, connect neutral in TB2 to neutral in transfer switch. See **NOTE** below for transfer switches without T1.

(2) Connect T1 in TB2 to T1 in transfer switch. This is 120 volt supply to unit's battery charger (normal RTS transfer switch).

(3) (4) Connect N1, N2 sensing wires in TB2 to N1 and N2 in transfer switch. These two wires are utility sensing wires.

(5) (6) Connect 23 in TB3 to 23 in transfer switch. Connect 194 in TB3 to 194 in transfer switch. These are transfer switch control wires.

RTS Series Transfer Switch Without T1 Fuse/Connection

Use a 120 volt generator protected circuit from the panel board to power the battery charger circuit (dedicated 15/20 amp circuit). See installation manual.

Two-Wire Start

To convert transfer switches to two-wire start mode of operation, contact an IASD for panel conversion and connection of terminals 178 and 183 in TB3. Use a 120 volt generator protected circuit from panel board to power battery charger circuit (dedicated 15/20 amp circuit).

The generator controller will have to be re-programmed for two-wire start by an IASD.

Figure 5-5. Control Wiring Schematic (Typical)

Optional Accessory Power

- Accessory power for optional items (battery warmer and block heater) should come from a customer utility supply source (with appropriate sized breaker), which is also powered by emergency power during an outage.
- Optional user installed GFCI receptacles provide a place to plug in optional battery warmer and block heater.

NOTE: See [Figure 5-1](#). Remove knockout plug and route accessory wiring to customer supplied weather-proof junction box. Verify wires do not contact moving or vibrating engine parts, as abraded wires can result in electrical problems.

Installing Stub-Up Cover and Rear Panel

Proceed as follows to install stub-up cover and rear panel:

1. Install five screws with flat washers to secure stub-up cover.
2. Install four screws with nylon washers to fasten fascia over control panel.
3. Connect wiring harness to switch located in customer access assembly housing.
4. Install rear panel. For best results, first engage right side of panel and then rotate left side inward toward enclosure. Alternately work left and right sides in until slots are aligned with screw holes on both sides. Install six screws with nylon washers and tighten until snug.

Transfer Switch Location

The location of the transfer switch is important. Consider the following:

1. Locate transfer switch as close to emergency load as practical to avoid interruptions of emergency power system due to natural disasters or equipment failures.
2. Locate transfer switch in a clean, dry, well ventilated location, away from excessive heat. Allow adequate working space around transfer switch. See latest NEC, state, and local AHJ requirements for details.
3. Install power and control wires as per NEC requirements. In a three-phase system, all power conduits from generator must contain all three phases.
4. Conduit, wire, circuit protective device sizes, insulation etc. must conform to applicable national and local codes and regulations.

Battery

General Safety Precautions



⚠ WARNING

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

(000137a)



⚠ WARNING

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

(000138a)



⚠ WARNING

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

(000133)

⚠ WARNING

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

(000228)

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

- Stationary emergency generators installed with automatic transfer switches will crank and start automatically when NORMAL (UTILITY) source voltage is removed or is below an acceptable pre-set level. To prevent automatic startup and possible injury to personnel, do not connect battery cables until NORMAL source voltage at transfer switch is correct and system is ready to be placed into operation.
- Storage batteries give off explosive hydrogen gas. This gas can form an explosive mixture around battery for several hours after charging. The slightest spark can ignite gas and cause an explosion. An explosion can shatter battery and cause blindness or other injury. Any area that houses a storage battery must be correctly ventilated. Do not allow smoking, open flame, sparks, or any spark producing tools or equipment near battery.

- When working on battery, always remove watches, rings, or other metal objects, and only use tools that have insulated handles. Do not lay tools or metal parts on top of battery.
- Discharge static electricity from body before touching battery by first touching a grounded metal surface.
- Wear full eye protection, protective clothing, and gloves when handling a battery.
- Immediately wash down spilled electrolyte with an acid neutralizing agent. Use a solution of 1 lb (500 g) bicarbonate of soda to 1 gal (4 L) of water. Add the bicarbonate of soda solution until evidence of reaction (foaming) has ceased. Flush resulting liquid with water.

Battery Requirements

The ability to start the engine depends upon battery capacity, ambient temperatures, and coolant and oil temperatures. The engine/generator set data sheet lists minimum recommended battery capacity at various ambient temperatures. The recommended battery capacities are listed under cold cranking amps (CCA) at 0 °F (-18 °C). The recommended battery for this unit is Group 27F, 700 CCA. 30kW units can be upgraded to a Group 31 925 CCA battery.

NOTE: Battery capacities decrease as ambient temperatures decrease, so it is important to specify batteries with the appropriate CCA rating at a temperature no higher than minimum ambient temperature for the application.

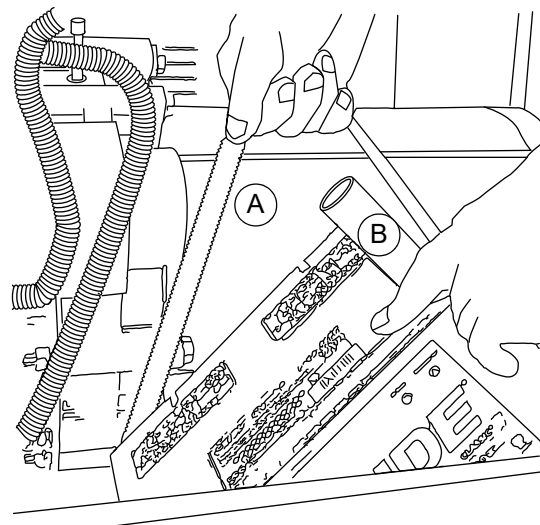
Battery Installation

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

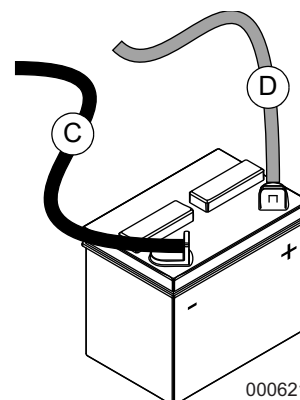
Use appropriate tools when working with battery terminals. The use of terminal pullers, expansion pliers, and terminal cleaning brushes will greatly extend the life of battery terminals.

1. See [Figure 5-6](#). Install rubber protective cover (B) over positive (+) battery terminal.
2. Grasp battery strap (A) and lift battery.
3. Set battery onto battery tray.
4. Tighten two screws with nylon washers to secure hold-down clamp to battery tray, or tighten strap over top of battery.
5. Remove rubber protective cover from positive (+) battery terminal.
6. Install positive battery cable (D) (red) on positive (+) battery terminal.
7. Install negative battery cable (C) (black) on negative (-) battery terminal.

NOTE: The unit is equipped with an internal battery charger. The internal battery charger is powered by the T1 wire. Verify power supply (T1 wire) has been safely disconnected before performing any work on battery.



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000621

Figure 5-6. Battery Cable Connections

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Section 6: Operational Checks

Introduction

⚠ CAUTION

Equipment damage. Perform functional tests in the exact order they are presented in the manual. Failure to do so could result in equipment damage.

(000121)

NOTE: The following procedures require special tools and skills. Contact an IASD to perform these tasks.

Self Test

This controller goes through a system self test at startup, which checks for utility voltage on DC circuits. This check prevents damage if installer incorrectly connected AC utility power sense wires into DC terminal block. The controller displays a warning message and locks out generator if utility voltage is detected, preventing damage to controller. Remove power to controller to clear this warning.

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

Complete the following before starting:

1. Verify generator is in OFF mode. Red LED above OFF on control panel keypad illuminates to verify system is OFF.
2. Verify generator MLCB (generator disconnect) is OFF (OPEN).
3. Turn off all circuit breakers/electrical loads to be supplied by generator.
4. Check engine crankcase oil level, coolant level, and fuel level. Fill if necessary.
5. Prime fuel system according to procedure specified in owner's manual.
6. Verify both auxiliary shutdown switches are ON (I).

During initial startup only, generator may exceed normal number of start attempts and experience an "over crank" fault. This is due to accumulated air in the fuel system during installation. Reset control board and restart up to two more times, if necessary. Contact an IASD for assistance if unit fails to start.

Checking Manual Transfer Switch Operation



⚠ DANGER

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

(000132)



⚠ DANGER

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

(000129)

See Manual Transfer Operation section of owner's manual for procedures.

NOTE: Also use appropriate transfer switch owner's manual for manual and automatic system test.

Electrical Checks

IMPORTANT NOTE: If unit is three-phase, validate and match phase rotation of utility, load, and generator.

Proceed as follows to complete electrical checks:

1. Verify generator is in OFF mode. Red LED above OFF on control panel illuminates to verify system is OFF.
2. Verify generator MLCB (generator disconnect) is OFF (OPEN).
3. Turn off all circuit breakers/electrical loads to be supplied by generator.
4. Turn on utility power supply to transfer switch using the means provided (such as a utility MLCB).

IMPORTANT NOTE: Transfer switch is now electrically "hot."

5. Use an accurate AC voltmeter to verify utility power source voltage across transfer switch terminals N1, N2, and N3 (if three-phase). Normal line-to-line voltage should be equivalent to rated unit voltage.
6. Verify utility power source voltage across terminals N1, N2, and N3 (if three-phase) and transfer switch neutral lug.
7. Turn off utility power supply to transfer switch when utility supply voltage is compatible with transfer switch and load circuit ratings.
8. Verify both auxiliary shutdown switches are ON (I).

9. Press MANUAL on control panel to crank and start engine.
10. Allow engine to warm up for approximately five minutes. Set generator MLCB (generator disconnect) to ON (CLOSED).

IMPORTANT NOTE: Generator power voltage is now supplied to transfer switch.

11. Connect an accurate AC voltmeter and a frequency meter across transfer switch terminal lugs E1, E2, and E3 (if three-phase).
12. Connect AC voltmeter test leads across terminal lugs E1, E2, and E3 (if three-phase) and neutral; then across E2 and neutral. Voltage reading in each case should match utility voltage reading. If system is three-phase, verify generator phase rotation matches utility phase rotation.
13. Set generator MLCB (generator disconnect) to OFF (OPEN).
14. Press OFF on control panel to shut engine down.

IMPORTANT NOTE: Do not proceed unless generator AC voltage and frequency are correct and within stated limits.

Testing Generator Under Load



⚠ DANGER

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

(000132)

Proceed as follows to test generator with electrical loads applied:

1. Verify generator is in OFF mode. Red LED above OFF on control panel illuminates to verify system is OFF.
2. Turn off all circuit breakers/electrical loads to be supplied by generator.
3. Turn off utility power supply to transfer switch, using the means provided (such as a utility MLCB).
4. Manually set transfer switch to STANDBY, i.e., load terminals connected to generator's E1, E2, and E3 (if three-phase) terminals. Transfer switch operating lever should be down.
5. Verify both auxiliary shutdown switches are ON (I).
6. Press MANUAL on control panel. Engine should crank and start immediately.
7. Allow engine to warm up for approximately five minutes.
8. Set generator MLCB (generator disconnect) to ON (CLOSED). Loads are now powered by standby generator.

9. Turn on circuit breakers/electrical loads to be supplied by generator.
10. Connect a calibrated AC voltmeter and a frequency meter across terminal lugs E1, E2, and E3 (if three-phase). Voltage should be approximately unit rated voltage.
11. Allow generator to run at full rated load for 20–30 minutes. Listen for unusual noises, vibration, or other indications of abnormal operation. Inspect for oil leaks, evidence of overheating, etc.
12. Turn off electrical loads when testing under load is complete.
13. Set generator MLCB (generator disconnect) to OFF (OPEN).
14. Allow engine to run at no-load for 2–5 minutes.
15. Press OFF on control panel to shut engine down.

Testing Auxiliary Shutdown Switch Operation

⚠ CAUTION

Equipment Damage. The auxiliary shutdown switch is not to be used to power down the unit under normal operating circumstances. Doing so will result in equipment damage.

(000399)

Proceed as follows to test auxiliary shutdown switches to verify correct operation:

1. Verify auxiliary shutdown switches are ON (I).
2. Press MANUAL on control panel to start engine.
3. With engine running, set one auxiliary shutdown switch to OFF (O). Engine will shut down immediately.
 - If engine stops, set auxiliary shutdown switch to ON (I), clear alarm on controller, and restart engine to verify generator is operating normally. After verifying normal operation of first auxiliary shutdown switch, verify operation of second auxiliary shutdown switch.
 - If engine does not stop, auxiliary shutdown switch is not functioning correctly. Stop generator through control panel, and inspect wiring installation. Contact Generac Technical Support if problem cannot be identified or if assistance is needed.

Auxiliary shutdown switches are not intended to be a primary means to shut down generator under normal operating conditions. Accidental activation of an auxiliary shutdown switch will prevent generator from operating during a power outage.

Checking Automatic Operation

Proceed as follows to check system for correct automatic operation:

1. Verify generator is in OFF mode. Red LED above OFF on control panel illuminates to verify system is OFF.
2. Install front cover over transfer switch.
3. Turn on utility power supply to transfer switch, using the means provided (such as a utility MLCB).

NOTE: Transfer switch will transfer to utility position.

4. Set generator MLCB (generator disconnect) to ON (CLOSED).
5. Verify both auxiliary shutdown switches are ON (I).
6. Press AUTO on control panel. System is now ready for automatic operation.
7. Turn off utility power supply to transfer switch.

With generator ready for automatic operation, engine will crank and start when utility source power is turned off after a 10 second delay (factory default setting). After starting, transfer switch connects load circuits to standby side. Allow system to operate through entire automatic sequence of operation.

With generator running and loads powered by generator AC output, turn on utility power supply to transfer switch. System transfers back to utility position and then runs through cool down cycle and shuts down.

Installation Summary

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

Shutting Generator Down While Under Load or During a Utility Outage



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

(000191)

IMPORTANT NOTE: To avoid equipment damage, follow these steps, in order, during utility outages. Shutdowns may be required during utility outages to perform routine maintenance or to conserve fuel.

To turn generator OFF:

1. Set utility MLCB to OFF (OPEN).
2. Set generator MLCB (generator disconnect) to OFF (OPEN).
3. Allow generator to run for cool-down for approximately one minute.
4. Set generator to OFF at the controller.
5. Remove 7.5A fuse from controller.

To turn generator back ON:

1. Install 7.5A fuse in controller.
2. Verify generator MLCB (generator disconnect) is OFF (OPEN).
3. Set generator to AUTO mode at the controller.
4. Generator will start and run. Allow generator to run and warm up for a few minutes.
5. Set generator MLCB (generator disconnect) to ON (CLOSED).
6. Set utility MLCB to ON (CLOSED).

The system now operates in automatic mode.

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Section 7: Installation Checklists

Safety Checklist

NOTE: See [Safety Rules & General Information](#) for more information.

- ☐ Are manuals, wiring diagrams, and other documentation readily available?
- ☐ Is there any evidence of freight damage?
- ☐ Does enclosure have scratches or damage to painted surfaces (which would indicate lifting without a spreader bar)?
- ☐ Are all guards, covers, insulation blankets, and other protective devices in place?
- ☐ Are any parts or components worn, damaged, or missing?
- ☐ Is generator correctly grounded?
- ☐ Is a fire extinguisher kept near generator?
- ☐ Is there any evidence of oil or coolant leaks?
- ☐ Are any combustible materials left in generator compartment?
- ☐ Is area surrounding generator clean and free of debris?
- ☐ Do these parameters meet all applicable codes and local jurisdiction?

Installation Planning Checklist

NOTE: See [Installation Planning](#) for more information.

- ☐ Is generator readily accessible for maintenance, repair, and firefighting purposes?
- ☐ Is installation site clean and dry? Is installation site provided with adequate drainage?
- ☐ Is there a minimum of 5 ft (1.5 m) of clearance around generator to facilitate repair or replacement of major components?
- ☐ Have adequate provisions been made for installation of fuel supply?
- ☐ Do these parameters meet all applicable codes and local jurisdiction?

Foundations and Mounting Checklist

NOTE: See [Site Selection and Preparation](#) for more information.

- ☐ Is generator installed on a concrete pad capable of supporting its weight and accessories?
- ☐ Is generator securely fastened to concrete pad using suitable grade, size, and style fasteners?
- ☐ Is concrete pad seated on a prepared solid subsurface using appropriate reinforcing bar or expanded wire mesh?
- ☐ Does concrete pad extend beyond frame rails at least 6 in (15.2 cm) on all sides?
- ☐ Is concrete pad flat and level to within 0.5 in (13 mm)?
- ☐ Are plugs installed in tie-down holes of frame rail?
- ☐ If installed on a roof or combustible floor, is generator seated on a layer of sheet metal and non-combustible insulation? Do the sheet metal and insulation extend beyond generator base at least 6 in (15.2 cm) on all sides?
- ☐ Is base frame stub-up cover plate installed?
- ☐ Do all fuel, coolant, exhaust, and electrical lines have flexible sections where they connect to generator?
- ☐ Is all piping correctly supported and secured?
- ☐ Do these parameters meet all applicable codes and local jurisdiction?

Ventilation System Checklist

NOTE: See [Site Selection and Preparation](#) for more information.

- ☐ Is there sufficient air flow for cooling and ventilation?
- ☐ Are all bushes, shrubs, and other vegetation a minimum of 3 ft (1 m) away?
- ☐ Does air inlet face the direction of prevailing winds?
- ☐ Has system been correctly protected from freeze up and corrosion?
- ☐ Have standby equipment heaters been specified?
- ☐ Have system drain valves and air eliminators been installed?
- ☐ Does air outlet face noise sensitive areas without noise attenuating devices?

- ☐ Does installation appear to have necessary accessories to allow fast, reliable starting and operation in adverse weather conditions (such as engine block heaters, battery warmers, etc.)?
- ☐ Do these parameters meet all applicable codes and local jurisdiction?

Exhaust System Checklist

NOTE: See [Diesel Fuel Systems](#) for more information.

- ☐ Are exhaust discharges directed away from combustible surfaces and inhabited areas?
- ☐ Is exhaust piping kept clear of fuel supply, fuel lines, etc.?
- ☐ Is off-engine exhaust piping covered with high temperature insulation blankets where necessary?
- ☐ Do these parameters meet all applicable codes and local jurisdiction?

Fuel System Checklist

NOTE: See [Diesel Fuel Systems](#) for more information.

- ☐ Was an approved pipe sealant or joint compound used on all threaded fittings?
- ☐ Was installation of an emergency safety shutoff required? Was correct operation of emergency shutoff verified?
- ☐ Was Final Operating Test performed to verify system operates correctly in all modes of operation?
- ☐ Is there any evidence of leakage at any hoses, clamps, or fittings?
- ☐ Do these parameters meet all applicable codes and local jurisdiction?

Electrical System Checklist

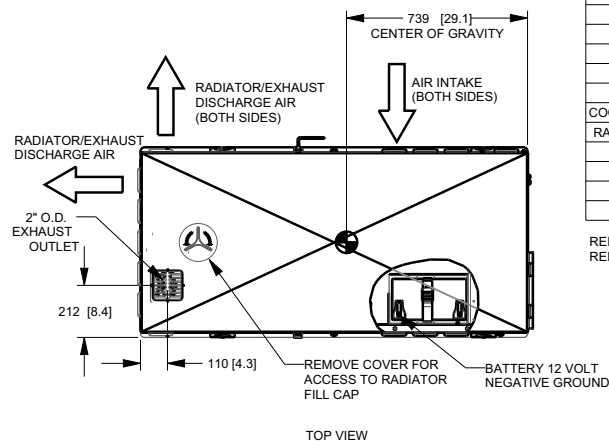
NOTE: See [Electrical System](#) for more information.

- ☐ Is all wiring correctly sized for load and length of run?
- ☐ Is all wiring correctly routed?
- ☐ Is all wiring correctly connected?
- ☐ Are wire lugs fastened to buss bars using appropriate hardware? Is hardware correctly tightened to specified torque?
- ☐ Are all other terminals correctly tightened using specified torque?
- ☐ Are batteries correctly sized?
- ☐ Are batteries correctly installed?
- ☐ Are battery fluid levels correct?

- ☐ Are battery cables and connections clean and free of corrosion?
- ☐ Are battery cables correctly connected? Are terminal lugs correctly tightened?
- ☐ Is battery condition and state of charge acceptable?
- ☐ Is area housing storage battery correctly ventilated?
- ☐ Are batteries located near a source of flame or spark?
- ☐ Are AC wire sizes and connections correct?
- ☐ Are DC and communication wire sizes and connections correct?
- ☐ Are block heaters, battery charger, etc. correctly matched with utility supply voltage?
- ☐ Are battery charger and block heater correctly connected?
- ☐ Are remote start Wires 178 & 183 pulled and connected inside lower control panel of generator and inside transfer switch?
- ☐ Is AUTO/OFF/MANUAL mode OFF? (Leave in AUTO when installation is completed.)
- ☐ Is block heater operational?
- ☐ Is battery charger operational?
- ☐ Are all AC electrical connections tight at circuit breaker and transfer switch?
- ☐ Are two auxiliary shutdown switches ON (I)?
- ☐ Are all electrical connections (wiring, wire ties, clamps, terminal ends, connectors) on generator tight?
- ☐ Are all electrical plugs throughout generator seated correctly and fully inserted into their receptacles?
- ☐ Is there correct voltage and phase rotation at transfer switch?
- ☐ Is manual operation of transfer switch smooth and non-binding?
- ☐ Do these parameters meet all applicable codes and local jurisdiction?

Section 8: Installation Drawings

D2.5L G2 Single Wall (10000022175, page 1 of 2)

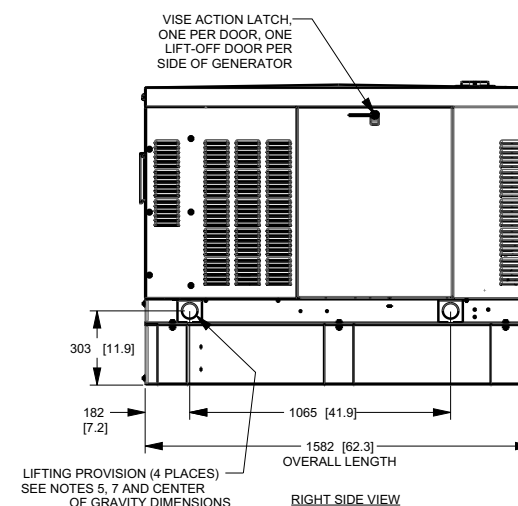
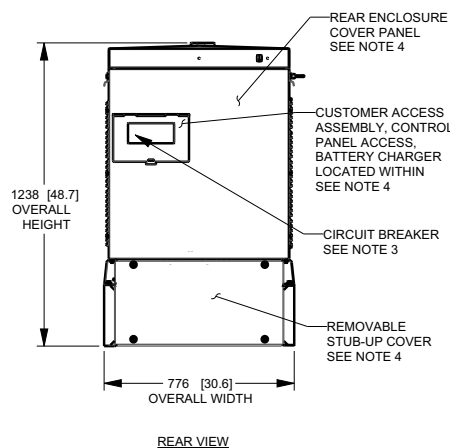
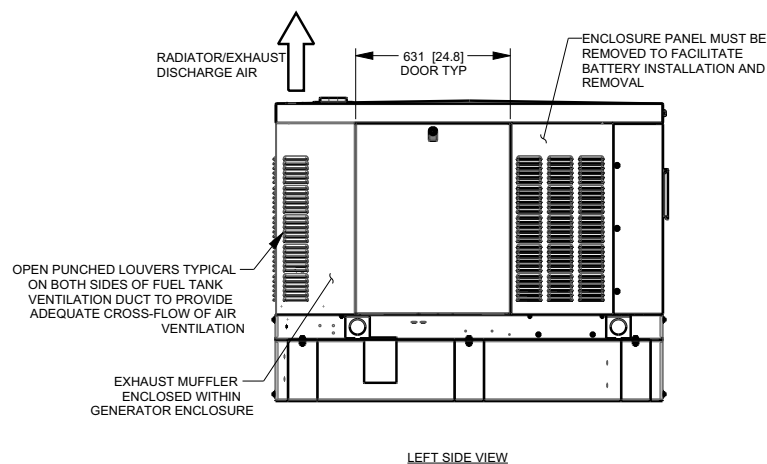


SERVICE ITEM	2.5L	WEIGHT DATA WITH EMPTY BASETANK (SEE NOTE 5)
OIL FILL CAP	RIGHT SIDE	GENERATOR AS SHOWN 622 [1372]
OIL DIP STICK	RIGHT SIDE	WITH WOODEN SHIPPING SKID 661 [1457]
OIL FILTER	RIGHT SIDE	
OIL DRAIN HOSE	LEFT SIDE	WEIGHT: KG [LBS]
RADIATOR DRAIN HOSE	LEFT SIDE	DIMENSIONS: MM [INCH]
COOLANT RECOVERY BOTTLE	LEFT SIDE	
RADIATOR FILL CAP ACCESS	ROOF	
AIR CLEANER ELEMENT	LEFT SIDE	
MUFFLER	FRONT	
FAN BELT	EITHER SIDE	
BATTERY	LEFT SIDE	

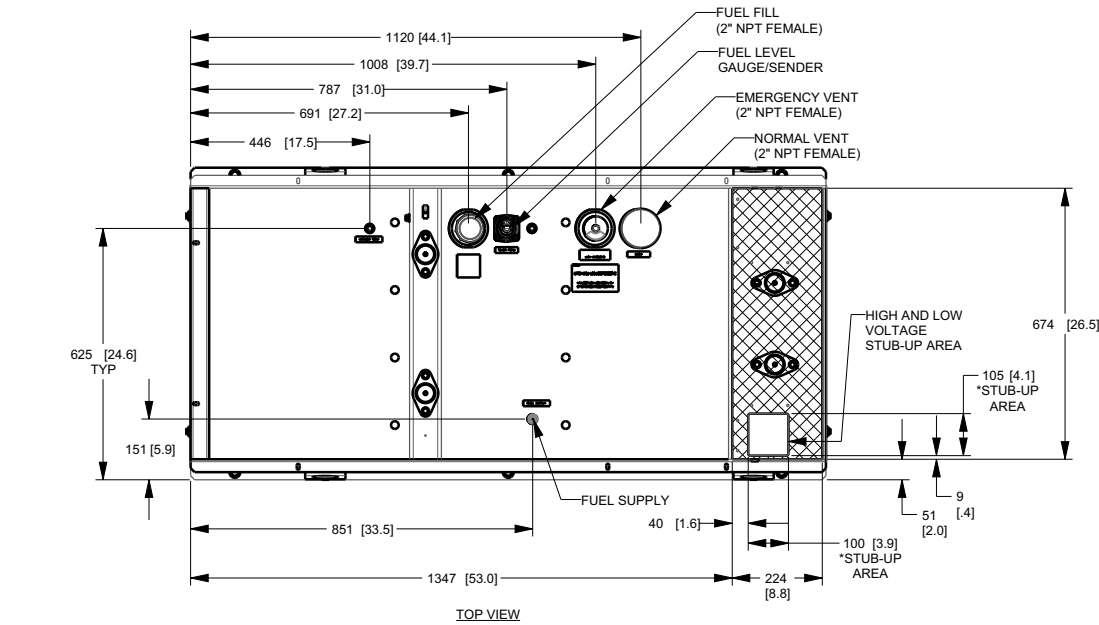
REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS

NOTES:

1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1092 (43") WIDE X 1887 (74.3") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES.
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
 - SEE SPECIFICATION SHEET OR OWNERS MANUAL
 - ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY DOOR ON REAR OF GENERATOR.
4. REMOVE THE REAR STUB-UP AND REAR ENCLOSURE COVER PANEL TO ACCESS THE STUB-UP AREAS AS FOLLOWS:
 - HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, AND BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
 - LOW VOLTAGE CONNECTION INCLUDING TRANSFER SWITCH CONTROL WIRES AND ACCESSORY RELAY CONNECTION (QTY 4)
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
7. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
8. MOUNTING BOLTS OR STUDS TO MOUNTING SURFACE SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)
9. MUST ALLOW FREE FLOW OF INTAKE AIR, DISCHARGE AIR AND EXHAUST. SEE SPEC SHEET FOR MINIMUM AIR FLOW AND MAXIMUM RESTRICTION REQUIREMENTS.
10. GENERATOR MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND THAT DISCHARGE AIR FROM RADIATOR IS NOT RECIRCULATED.



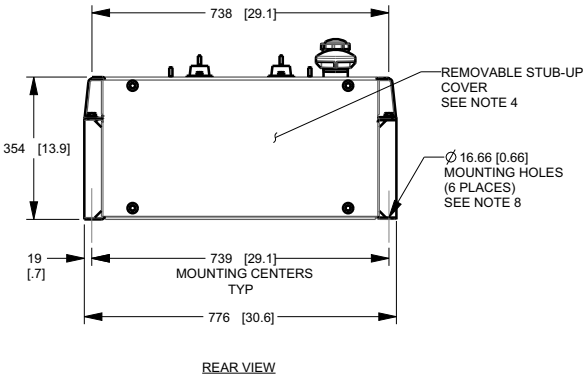
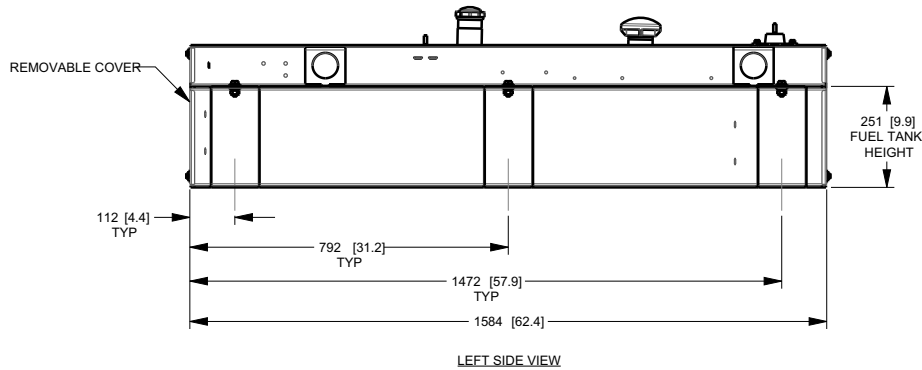
D2.5L G2 Single Wall (10000022175, page 2 of 2)



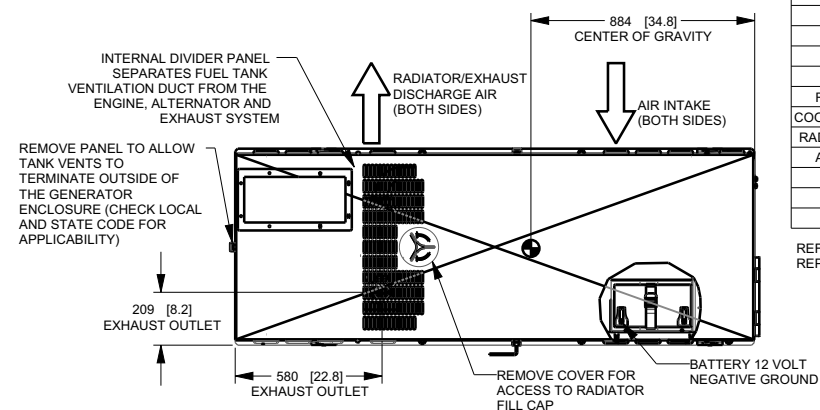
FUEL TANK	
TOTAL CAPACITY	169 [44]
USABLE CAPACITY	151 [40]

CAPACITY: LITER [GALLON]
DIMENSIONS: MM [INCH]

*NOTE: STUB-UP AREA FOR HIGH AND LOW VOLTAGE CONNECTIONS, CIRCUIT BREAKER, NEUTRAL AND CUSTOMER CONNECTION OPENING.



D2.5L G2 Extended Tank (10000018189, page 1 of 2)



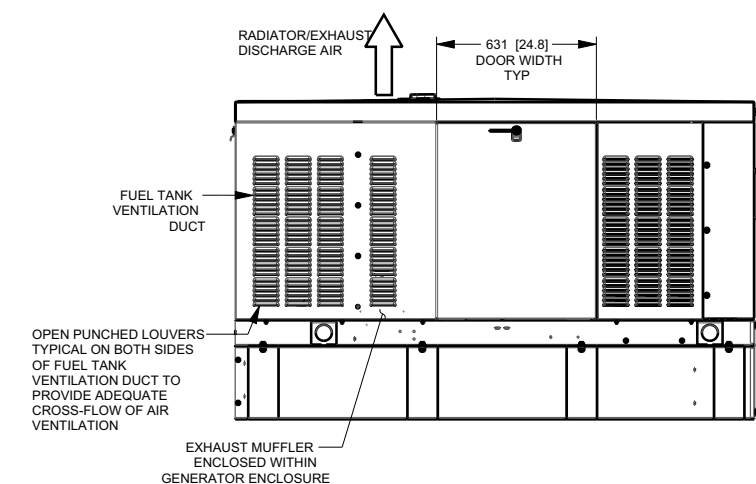
TOP VIEW

SERVICE ITEM	2.5L	WEIGHT DATA WITH EMPTY BASE TANK (SEE NOTE 5)
OIL FILL CAP	RIGHT SIDE	GENERATOR AS SHOWN 693 [1528]
OIL DIP STICK	RIGHT SIDE	WITH WOODEN SHIPPING SKID 731.6 [1600]
OIL FILTER	RIGHT SIDE	
OIL DRAIN HOSE	LEFT SIDE	WEIGHT: KG [LBS]
RADIATOR DRAIN HOSE	LEFT SIDE	DIMENSIONS: MM [INCH]
COOLANT RECOVERY BOTTLE	LEFT SIDE	
RADIATOR FILL CAP ACCESS	ROOF	
AIR CLEANER ELEMENT	LEFT SIDE	
MUFFLER	FRONT	
FAN BELT	EITHER SIDE	
BATTERY	LEFT SIDE	

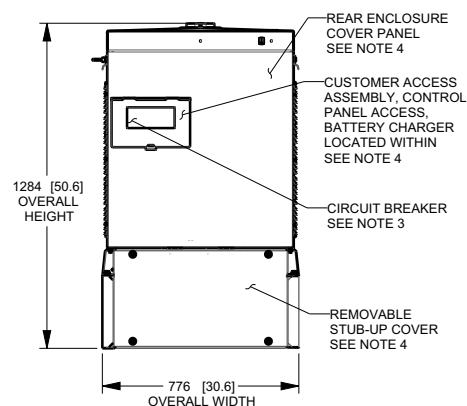
REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS.

NOTES:

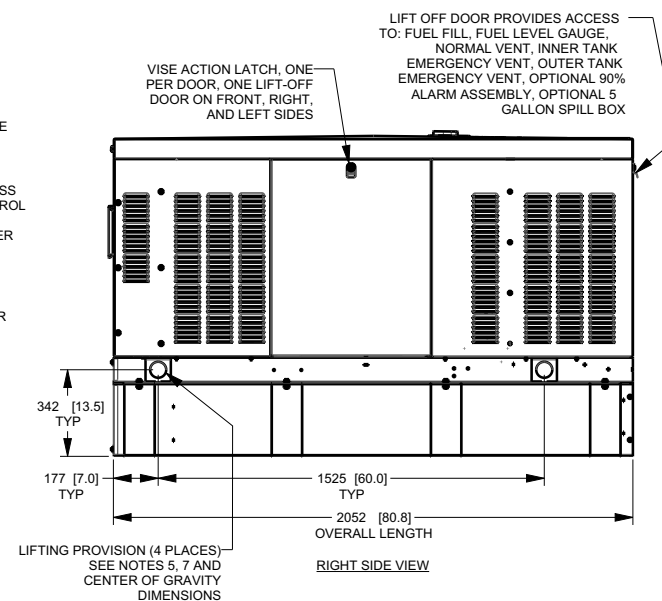
1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1092 (43") WIDE X 1887 (74.3") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES.
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
 - SEE SPECIFICATION SHEET OR OWNERS MANUAL
 - ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY DOOR ON REAR OF GENERATOR.
4. REMOVE THE REAR STUB-UP AND REAR ENCLOSURE COVER PANEL TO ACCESS THE STUB-UP AREAS AS FOLLOWS:
 - HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, AND BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
 - LOW VOLTAGE CONNECTION INCLUDING TRANSFER SWITCH CONTROL WIRES AND ACCESSORY RELAY CONNECTION (QTY 4)
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
7. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
8. MOUNTING BOLTS OR STUDS TO MOUNTING SURFACE SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)
9. MUST ALLOW FREE FLOW OF INTAKE AIR, DISCHARGE AIR AND EXHAUST. SEE SPEC SHEET FOR MINIMUM AIR FLOW AND MAXIMUM RESTRICTION REQUIREMENTS.
10. GENERATOR MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND THAT DISCHARGE AIR FROM RADIATOR IS NOT RECIRCULATED.



LEFT SIDE VIEW

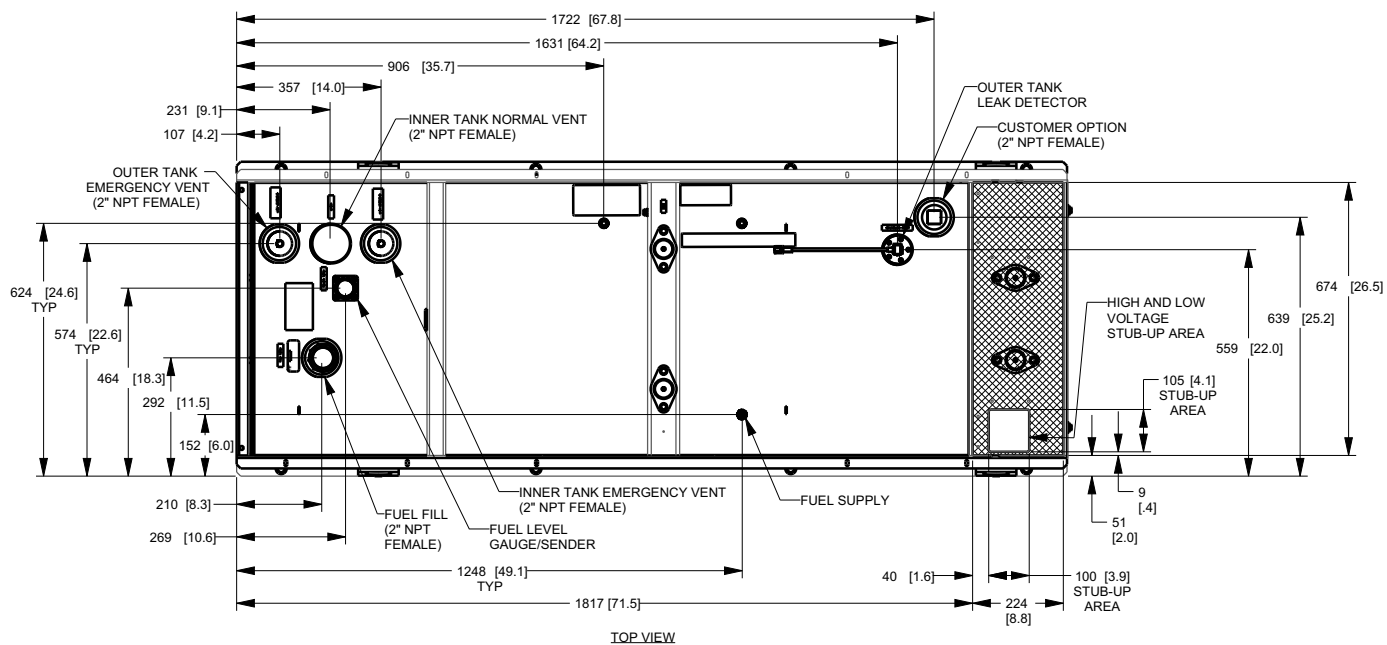


REAR VIEW



RIGHT SIDE VIEW

D2.5L G2 Extended Tank (10000018189, page 2 of 2)

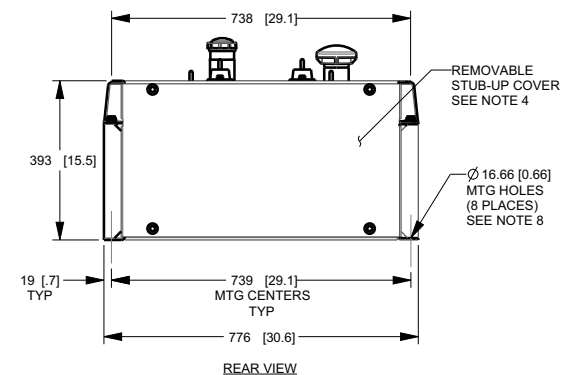
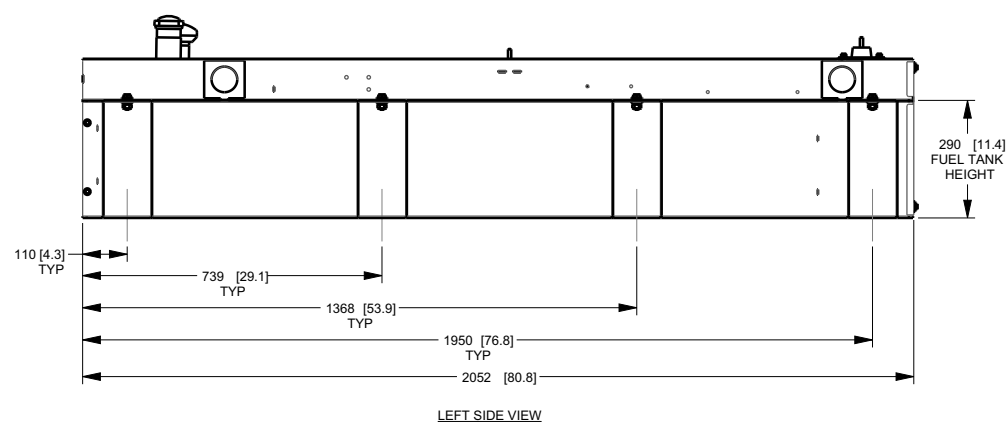


FUEL TANK	
TOTAL CAPACITY	127 [33.5]
USABLE CAPACITY	121 [32]

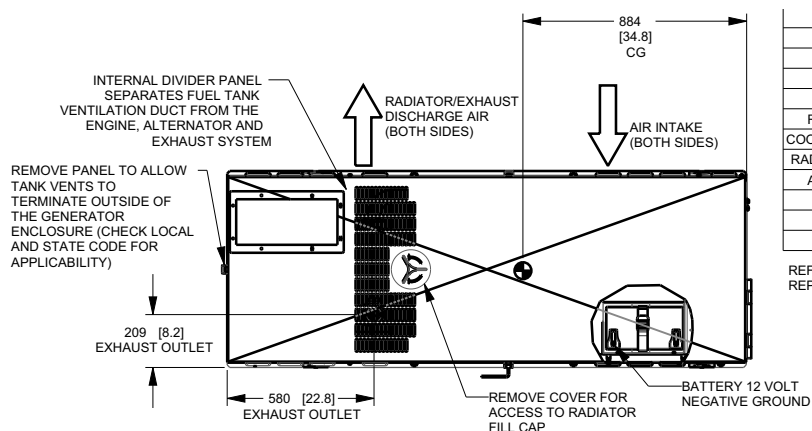
CAPACITY: LITER [GALLON]
DIMENSIONS: MM [INCH]

TANK IS LISTED TO UL142 AND ULC5601

NOTE: STUB-UP AREA FOR HIGH AND LOW VOLTAGE CONNECTIONS, CIRCUIT BREAKER, NEUTRAL AND CUSTOMER CONNECTION OPENING.



D2.5L G2-95 Gal Tank (10000028999, page 1 of 2)

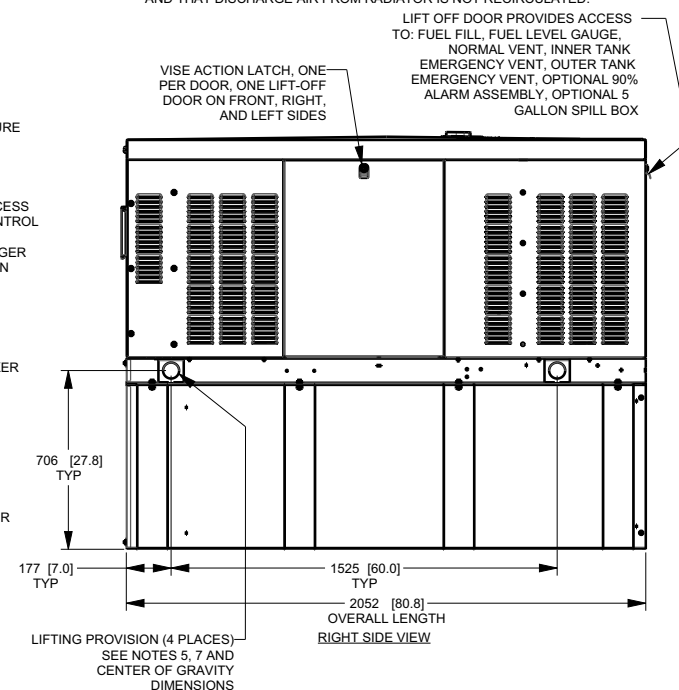
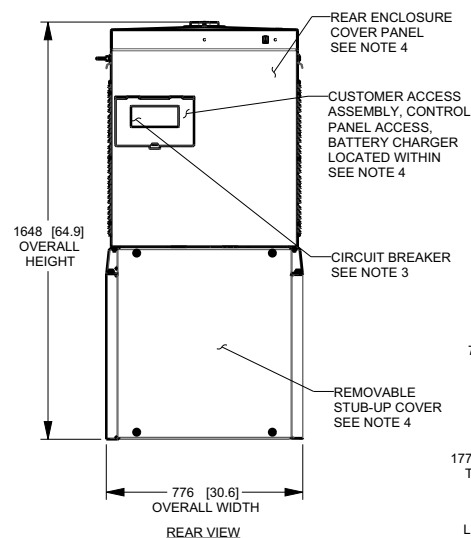
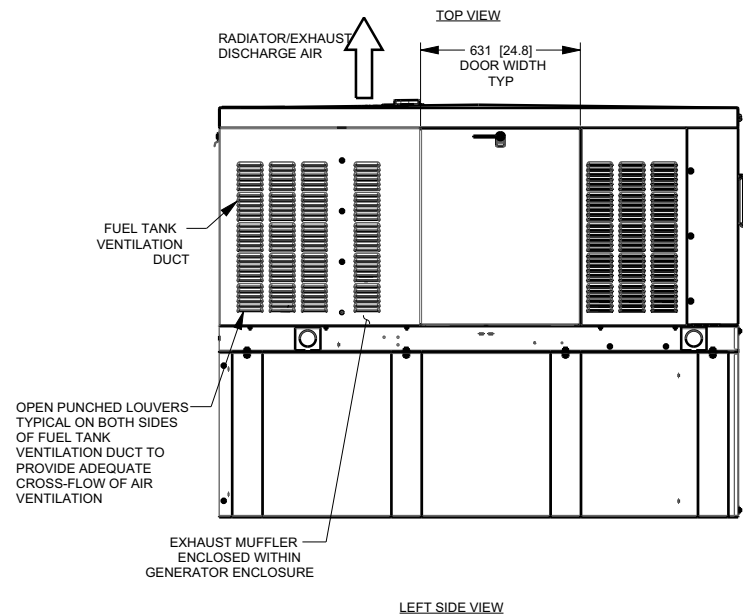


SERVICE ITEM	2.5L	WEIGHT DATA WITH EMPTY BASE TANK (SEE NOTE 5)
OIL FILL CAP	RIGHT SIDE	GENERATOR AS SHOWN 797 [1757]
OIL DIP STICK	RIGHT SIDE	WITH WOODEN SHIPPING SKID 835 [1841]
OIL FILTER	RIGHT SIDE	
OIL DRAIN HOSE	LEFT SIDE	WEIGHT: KG [LBS]
RADIATOR DRAIN HOSE	RIGHT SIDE	DIMENSIONS: MM [INCH]
COOLANT RECOVERY BOTTLE	LEFT SIDE	
RADIATOR FILL CAP ACCESS	ROOF	
AIR CLEANER ELEMENT	LEFT SIDE	
MUFFLER	FRONT	
FAN BELT	EITHER SIDE	
BATTERY	LEFT SIDE	

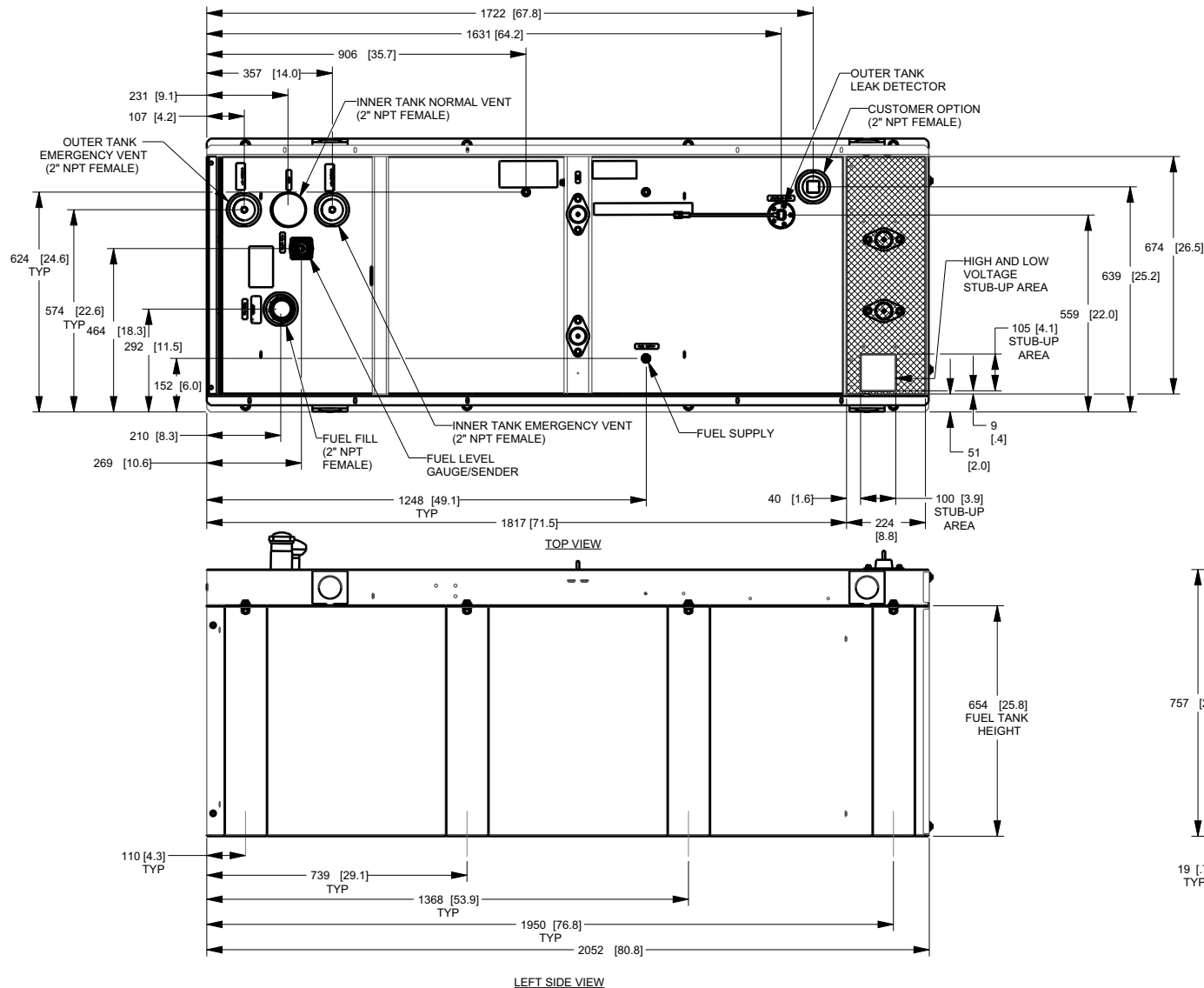
REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS.

NOTES:

1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1092 (43") WIDE X 1887 (74.3") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES.
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
- SEE SPECIFICATION SHEET OR OWNERS MANUAL
- ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY DOOR ON REAR OF GENERATOR.
4. REMOVE THE REAR STUB-UP AND REAR ENCLOSURE COVER PANEL TO ACCESS THE STUB-UP AREAS AS FOLLOWS:
- HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, AND BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
- LOW VOLTAGE CONNECTION INCLUDING TRANSFER SWITCH CONTROL WIRES AND ACCESSORY RELAY CONNECTION (QTY 4)
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
7. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
8. MOUNTING BOLTS OR STUDS TO MOUNTING SURFACE SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)
9. MUST ALLOW FREE FLOW OF INTAKE AIR, DISCHARGE AIR AND EXHAUST. SEE SPEC SHEET FOR MINIMUM AIR FLOW AND MAXIMUM RESTRICTION REQUIREMENTS.
10. GENERATOR MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND THAT DISCHARGE AIR FROM RADIATOR IS NOT RECIRCULATED.



D2.5L G2-95 Gal Tank (10000028999, page 2 of 2)

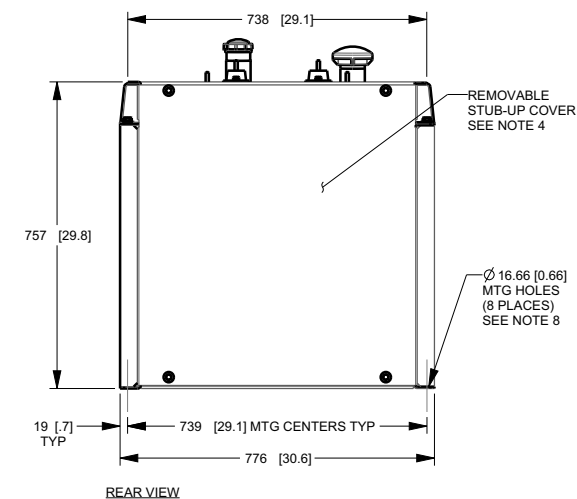


FUEL TANK	
TOTAL CAPACITY	373 [98.5]
USABLE CAPACITY	360 [95]

CAPACITY: LITER [GALLON]
DIMENSIONS: MM [INCH]

TANK IS LISTED TO UL142 AND ULC5601

NOTE: STUB-UP AREA FOR HIGH AND LOW VOLTAGE CONNECTIONS, CIRCUIT BREAKER, NEUTRAL AND CUSTOMER CONNECTION OPENING.



D2.2L G22 Single Wall (10000018294, page 1 of 2)

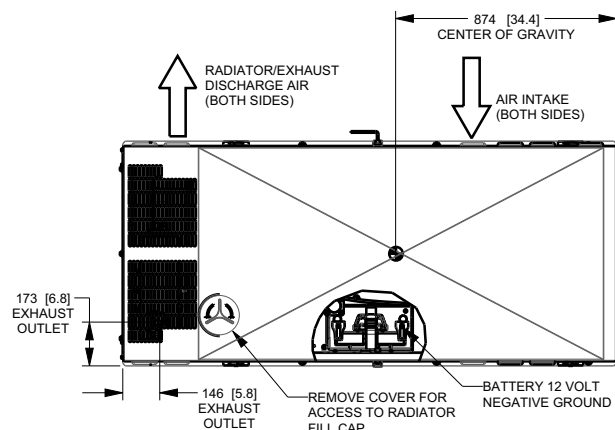
SERVICE ITEM	2.2L	WEIGHT DATA WITH EMPTY BASE TANK (SEE NOTE 5)
OIL FILL CAP	RIGHT SIDE	GENERATOR AS SHOWN 783 [1726]
OIL DIP STICK	RIGHT SIDE	WITH WOODEN SHIPPING SKID 819 [1806]
OIL FILTER	RIGHT SIDE	
OIL DRAIN HOSE	RIGHT SIDE	
RADIATOR DRAIN HOSE	LEFT SIDE	
COOLANT RECOVERY BOTTLE	LEFT SIDE	
RADIATOR FILL CAP ACCESS	ROOF	
AIR CLEANER ELEMENT	RIGHT SIDE	
MUFFLER	FRONT SIDE	
FAN BELT	EITHER SIDE	
BATTERY	LEFT SIDE	

REFERENCE OWNERS MANUAL FOR
PERIODIC REPLACEMENT PART LISTINGS

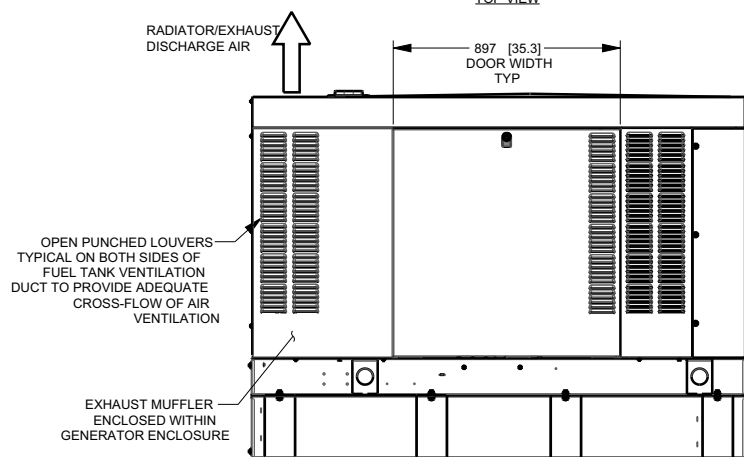
WEIGHT: KG [LBS]
DIMENSIONS: MM [INCH]

NOTES:

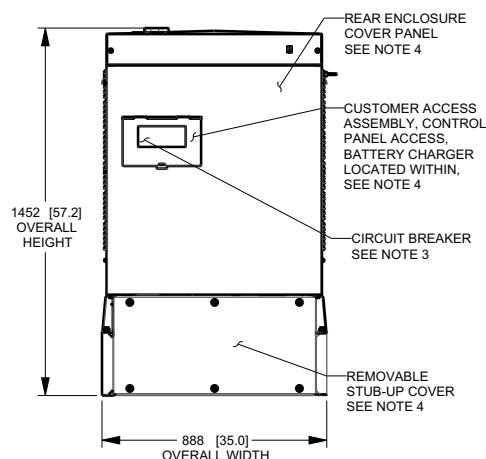
1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1194 (47") WIDE X 2261 (89") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
 - SEE SPECIFICATION SHEET OR OWNERS MANUAL
 - ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY DOOR ON REAR OF GENERATOR
4. REMOVE THE REAR TANK AND REAR ENCLOSURE COVER PANEL TO ACCESS THE STUB-UP AREAS AS FOLLOWS:
 - HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
 - LOW VOLTAGE CONNECTIONS INCLUDING TRANSFER SWITCH CONTROL WIRES
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. ENGINE SERVICE CONNECTIONS
 - OIL DRAIN: 3/8" NPT
 - EXHAUST OUTLET: 2" O.D.
7. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
8. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
9. MOUNTING BOLTS OR STUDS TO CONCRETE PAD SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)



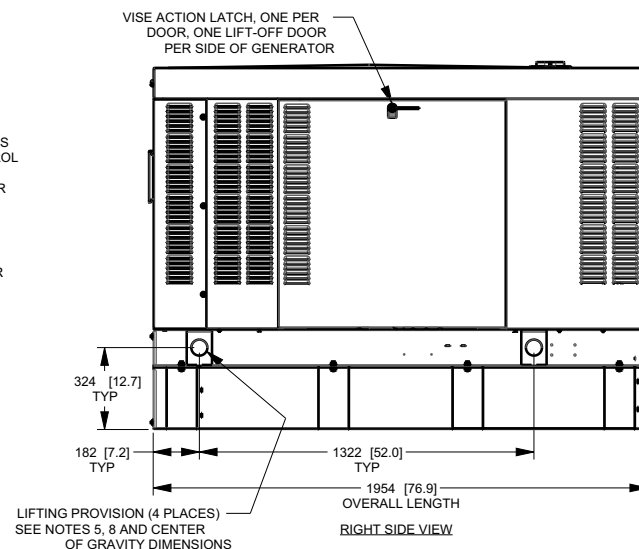
TOP VIEW



LEFT SIDE VIEW

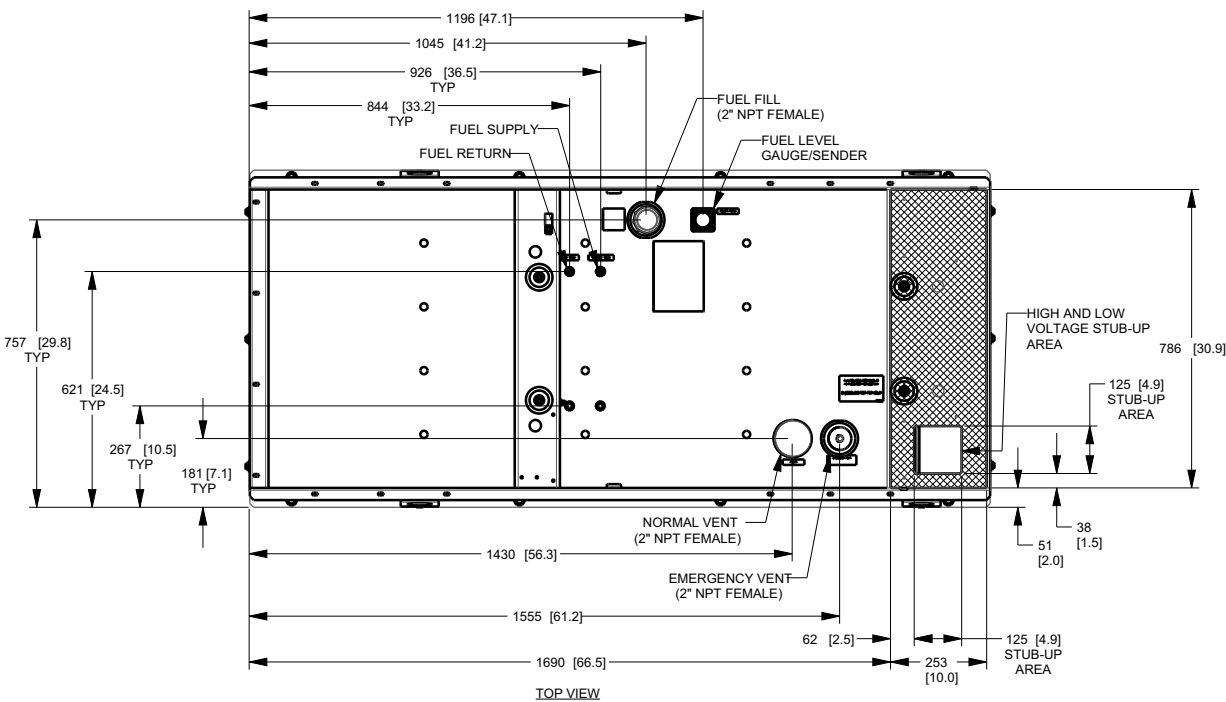


REAR VIEW



RIGHT SIDE VIEW

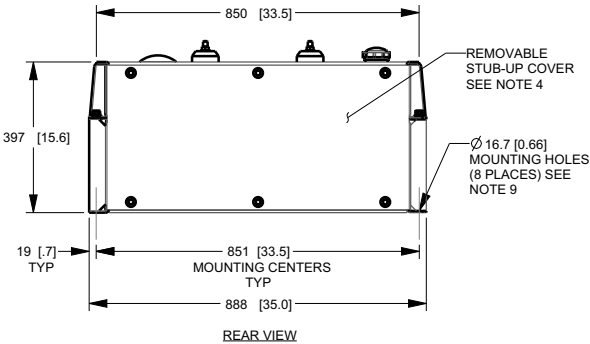
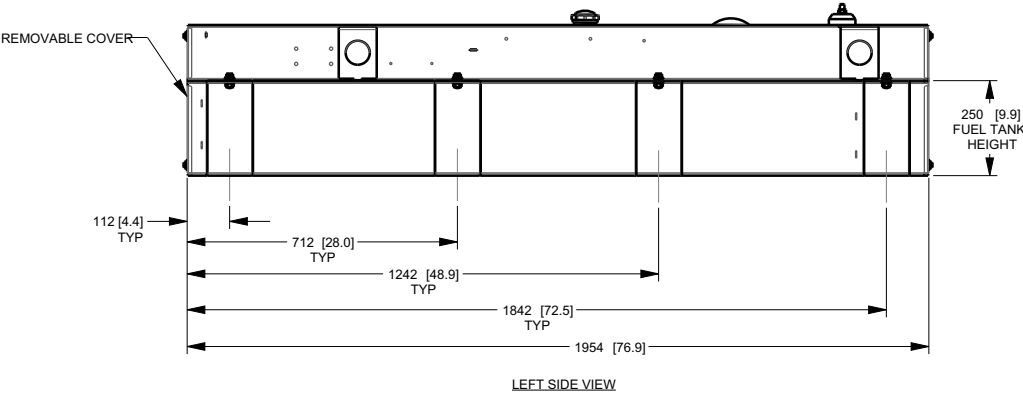
D2.2L G22 Single Wall (10000018294, page 2 of 2)



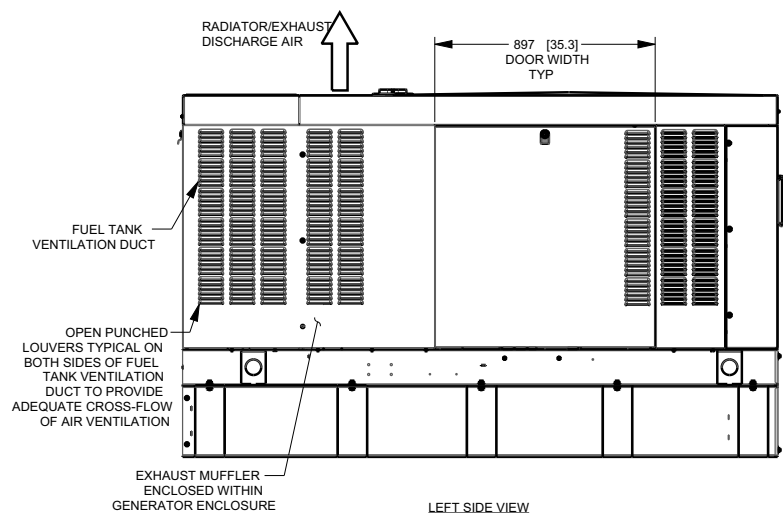
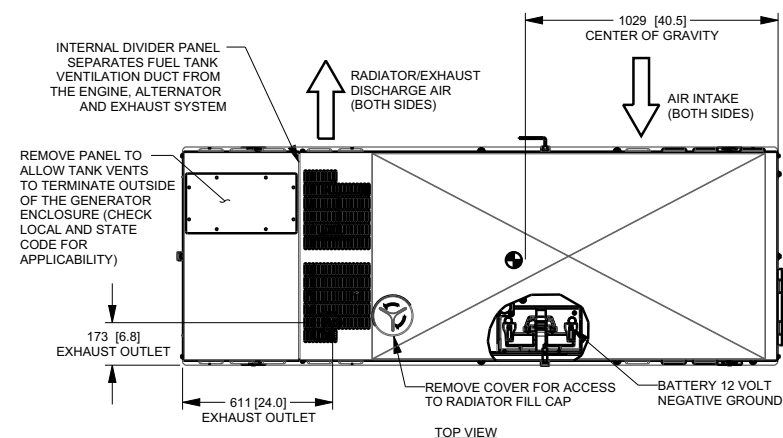
FUEL TANK	
TOTAL CAPACITY	253.6 [67]
USABLE CAPACITY	230.9 [61]

CAPACITY: LITER [GALLONS]
DIMENSIONS: MM [INCH]

*NOTE: STUB-UP AREA FOR HIGH AND LOW VOLTAGE CONNECTIONS, CIRCUIT BREAKER, NEUTRAL AND CUSTOMER CONNECTION OPENING.



D2.2L G22 Extended Tank (10000018412, page 1 of 2)



SERVICE ITEM	2.2L
OIL FILL CAP	RIGHT SIDE
OIL DIP STICK	RIGHT SIDE
OIL FILTER	RIGHT SIDE
OIL DRAIN HOSE	RIGHT SIDE
RADIATOR DRAIN HOSE	LEFT SIDE
COOLANT RECOVERY BOTTLE	LEFT SIDE
RADIATOR FILL CAP ACCESS	ROOF
AIR CLEANER ELEMENT	RIGHT SIDE
MUFFLER	FRONT SIDE
FAN BELT	EITHER SIDE
BATTERY	LEFT SIDE

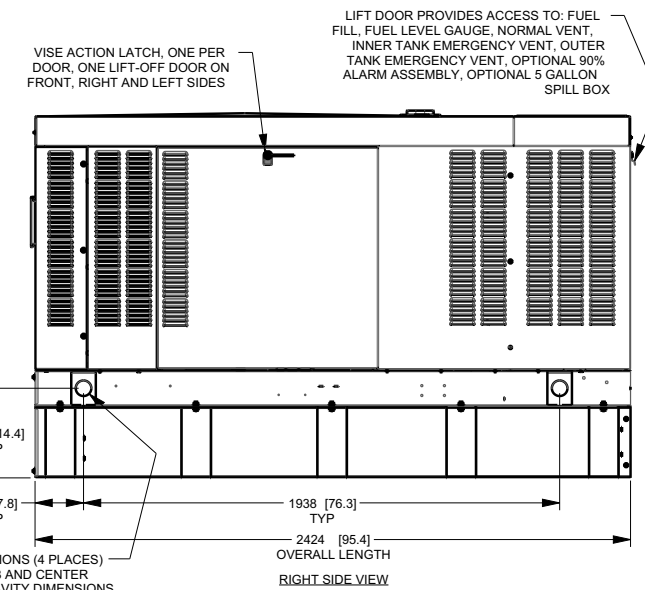
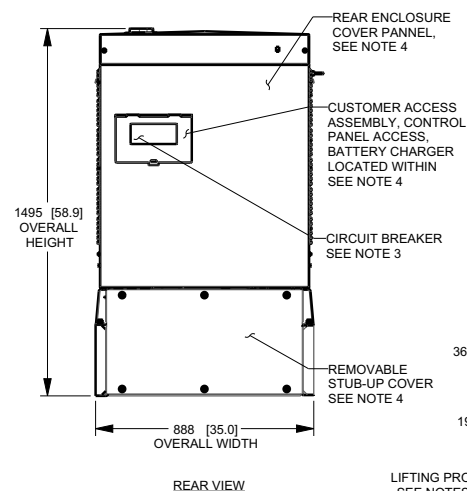
REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS

WEIGHT DATA WITH EMPTY BASETANK (SEE NOTE 5)	
GENERATOR AS SHOWN	842 [1857]
WITH WOODEN SHIPPING SKID	888 [1957]

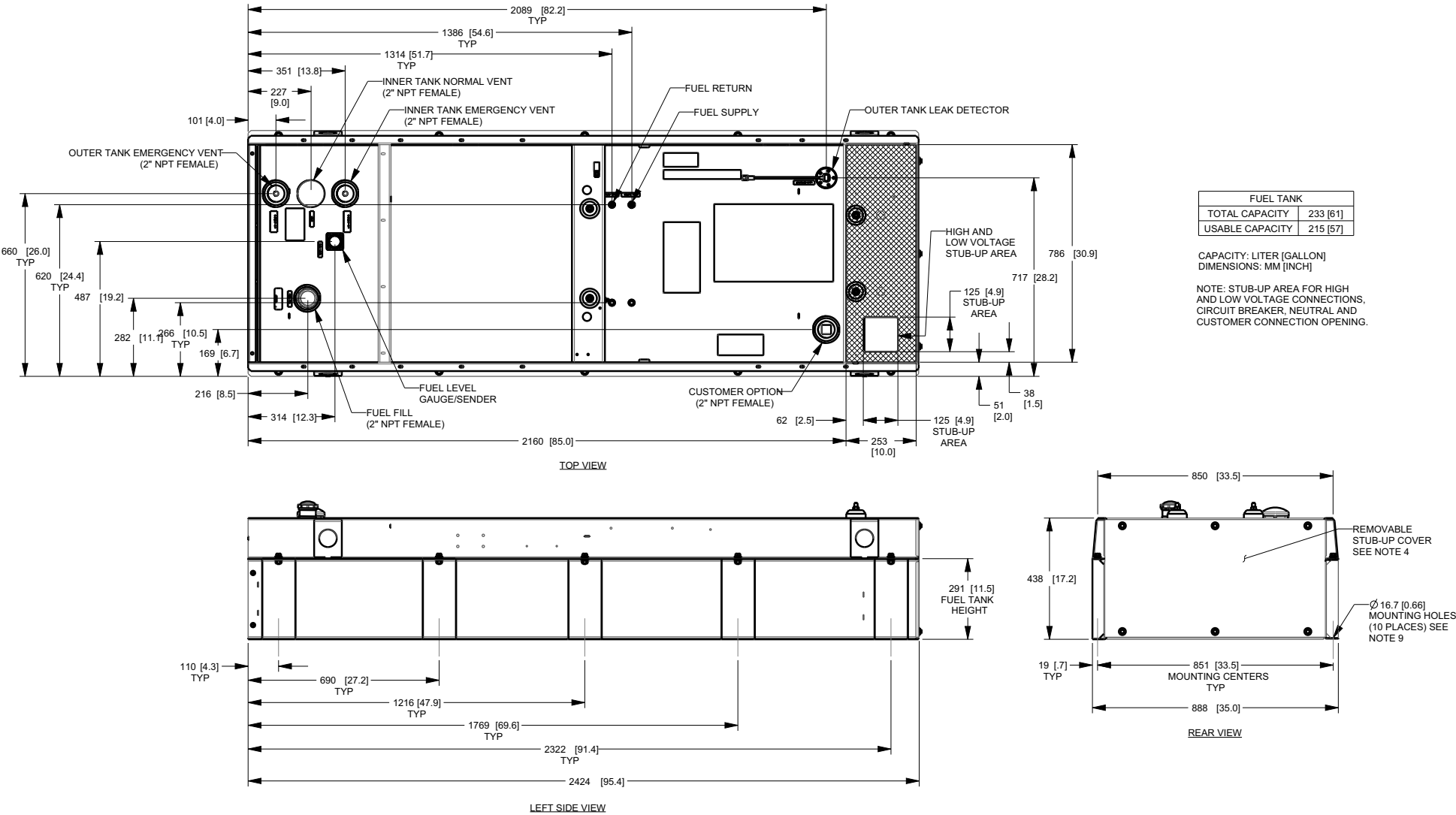
WEIGHT: KG [LBS]
DIMENSIONS: MM [INCH]

NOTES:

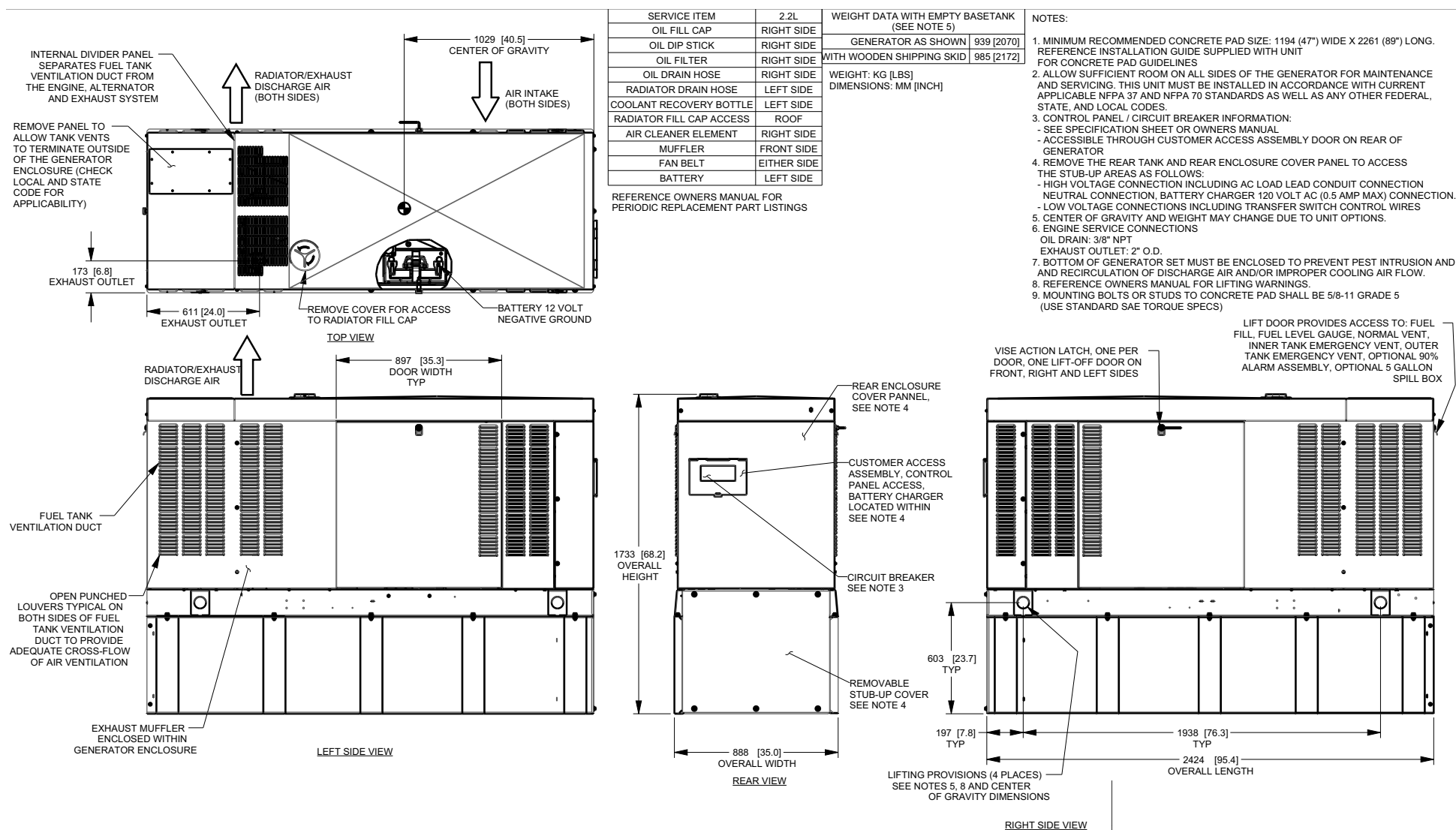
1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1194 (47") WIDE X 2261 (89") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
- SEE SPECIFICATION SHEET OR OWNERS MANUAL
- ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY DOOR ON REAR OF GENERATOR
4. REMOVE THE REAR TANK AND REAR ENCLOSURE COVER PANEL TO ACCESS THE STUB-UP AREAS AS FOLLOWS:
- HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION
- NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
- LOW VOLTAGE CONNECTIONS INCLUDING TRANSFER SWITCH CONTROL WIRES
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. ENGINE SERVICE CONNECTIONS
OIL DRAIN: 3/8" NPT
EXHAUST OUTLET: 2" O.D.
7. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
8. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
9. MOUNTING BOLTS OR STUDS TO CONCRETE PAD SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)

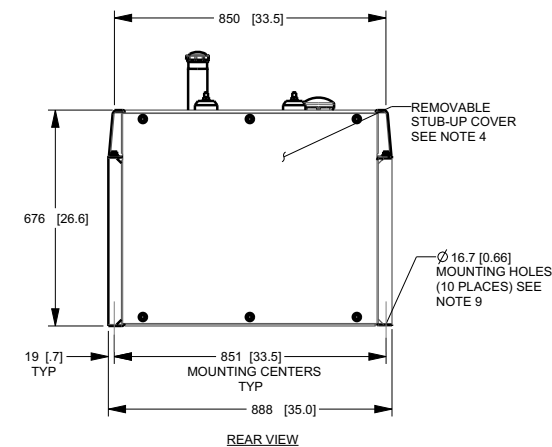
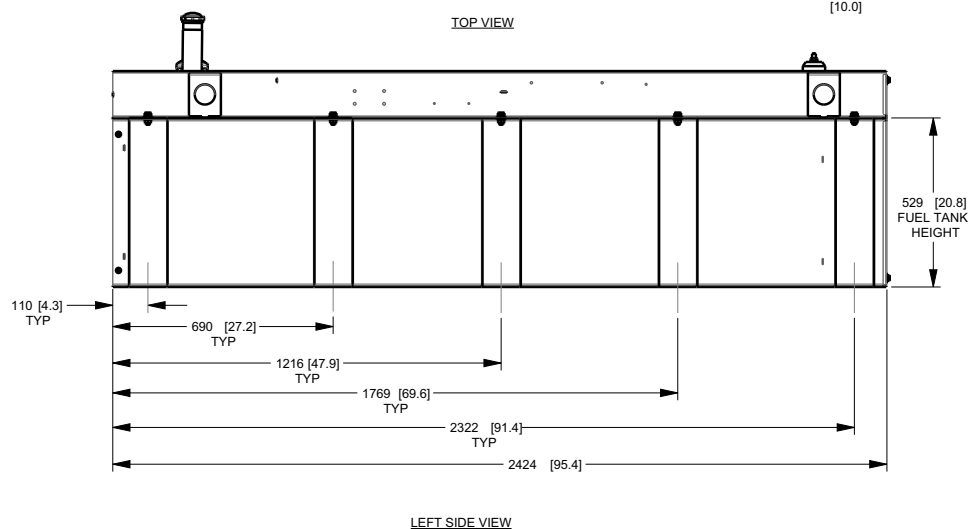


D2.2L G22 Extended Tank (10000018412, page 2 of 2)

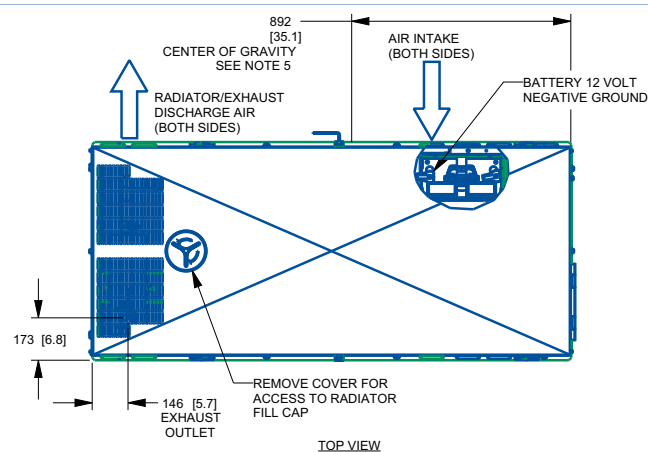


D2.2L G22-132 Gal Tank (10000029492, page 1 of 2)





D3.3L G16 Single Wall (10000018867, page 1 of 2)

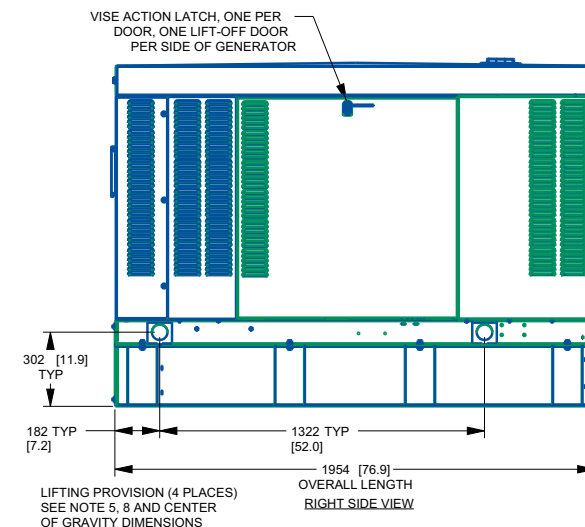
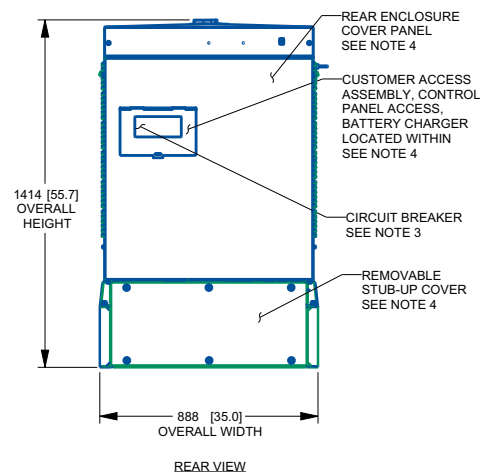
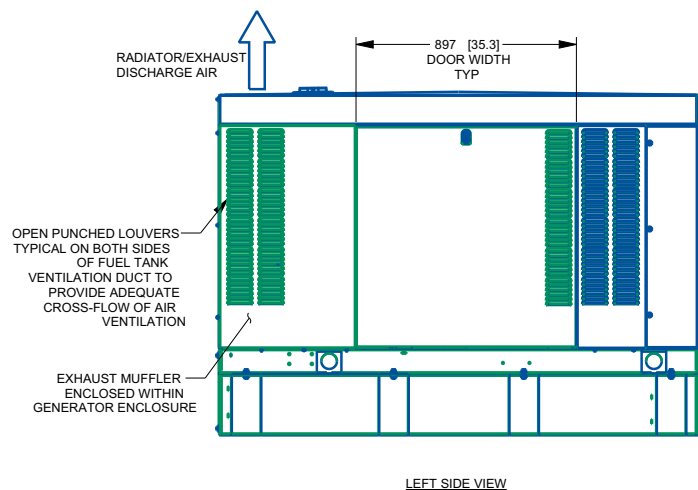


SERVICE ITEM	3.3L	WEIGHT DATA WITH EMPTY BASE TANK (SEE NOTE 5)
OIL FILL CAP	LEFT	GENERATOR AS SHOWN 894 [197]
OIL DIP STICK	LEFT	WITH WOODEN SHIPPING SKID 933 [205]
OIL FILTER	LEFT	
OIL DRAIN HOSE	RIGHT	WEIGHT: KG [LBS]
RADIATOR DRAIN HOSE	RIGHT	DIMENSIONS: MM [INCH]
COOLANT RECOVERY BOTTLE	RIGHT	
RADIATOR FILL CAP ACCESS	ROOF	
AIR CLEANER ELEMENT	RIGHT	
MUFFLER	FRONT	
FAN BELT	EITHER	
BATTERY	RIGHT	

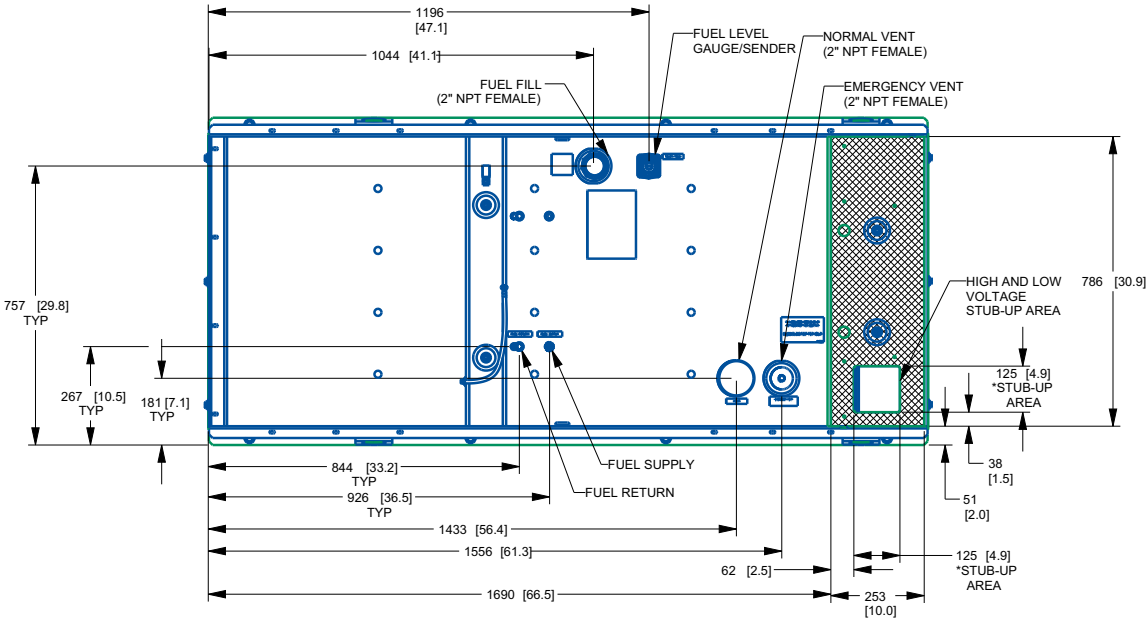
REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS

NOTES:

1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1194 (47") WIDE X 2261 (89") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
 - SEE SPECIFICATION SHEET OR OWNERS MANUAL
 - ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY DOOR ON REAR OF GENERATOR
4. REMOVE THE REAR TANK AND REAR ENCLOSURE COVER PANEL TO ACCESS THE STUB-UP AREAS AS FOLLOWS:
 - HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION
 - NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
 - LOW VOLTAGE CONNECTIONS INCLUDING TRANSFER SWITCH CONTROL WIRES
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. ENGINE SERVICE CONNECTIONS
 - OIL DRAIN: 3/8" NPT
 - EXHAUST OUTLET: 2" O.D.
7. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
8. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
9. MOUNTING BOLTS OR STUDS TO CONCRETE PAD SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)



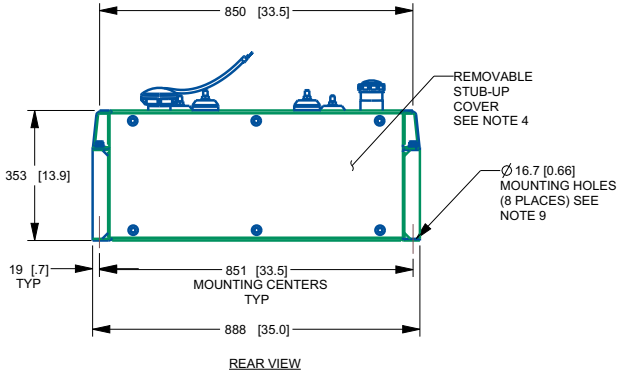
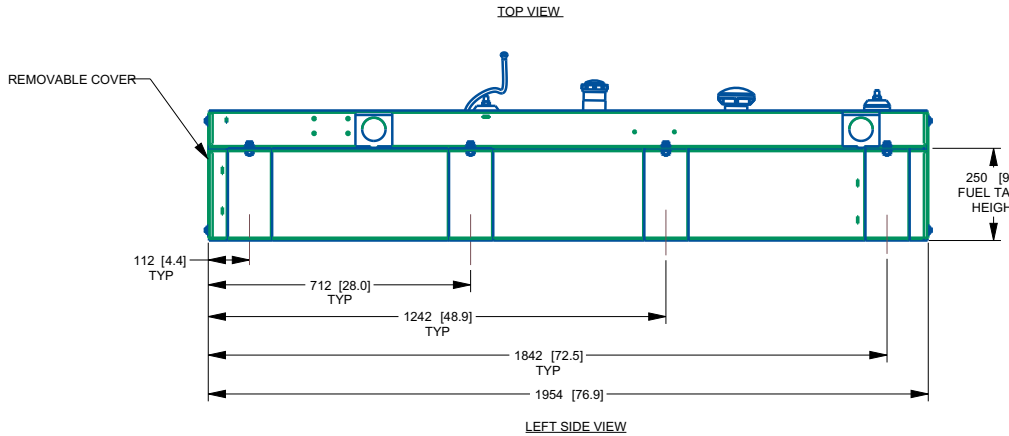
D3.3L G16 Single Wall (10000018867, page 2 of 2)



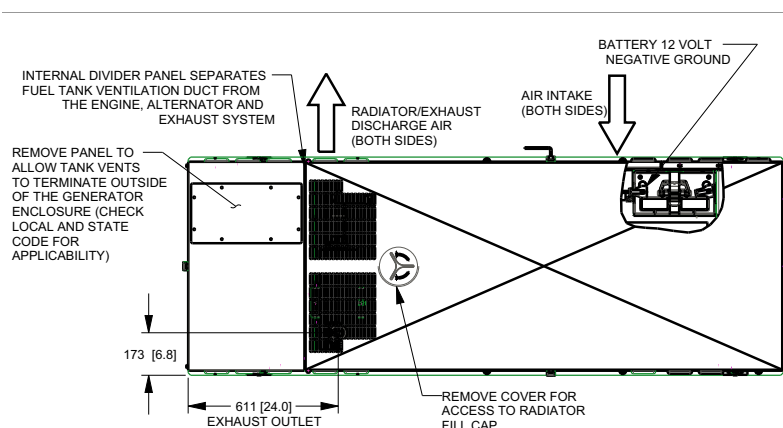
FUEL TANK	
TOTAL CAPACITY	253.6 [67]
USABLE CAPACITY	230.9 [61]

CAPACITY: LITER [GALLONS]
DIMENSIONS: MM [INCH]

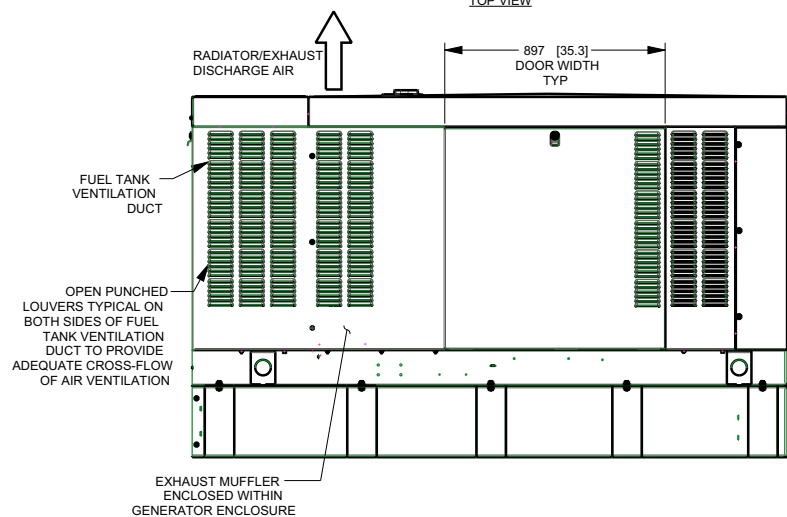
*NOTE: STUB-UP AREA FOR HIGH AND LOW VOLTAGE CONNECTIONS, CIRCUIT BREAKER, NEUTRAL AND CUSTOMER CONNECTION OPENING.



D3.3L G16 Extended Tank (10000018949, page 1 of 2)



TOP VIEW



LEFT SIDE VIEW

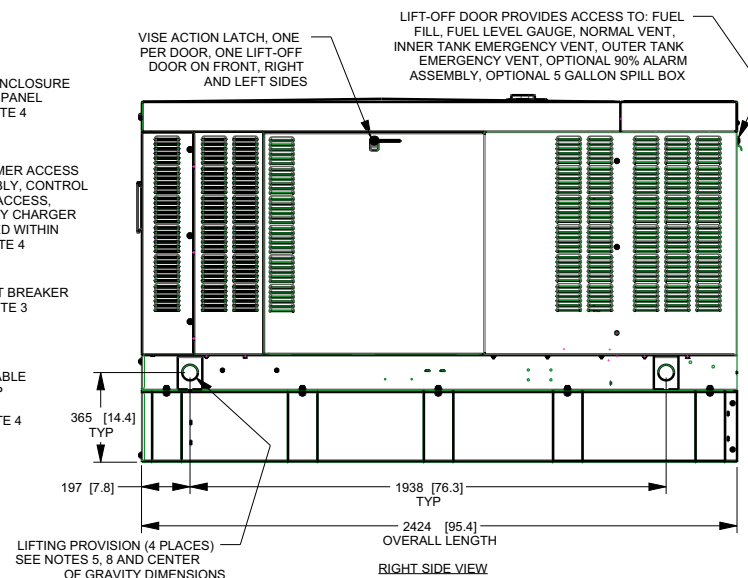
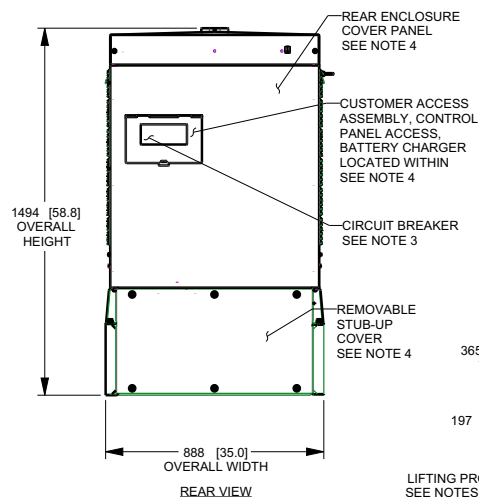
SERVICE ITEM	3.3L
OIL FILL CAP	LEFT
OIL DIP STICK	LEFT
OIL FILTER	LEFT
OIL DRAIN HOSE	RIGHT
RADIATOR DRAIN HOSE	RIGHT
COOLANT RECOVERY BOTTLE	LEFT
RADIATOR FILL CAP ACCESS	ROOF
AIR CLEANER ELEMENT	RIGHT
MUFFLER	FRONT
FAN BELT	EITHER
BATTERY	RIGHT

REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS

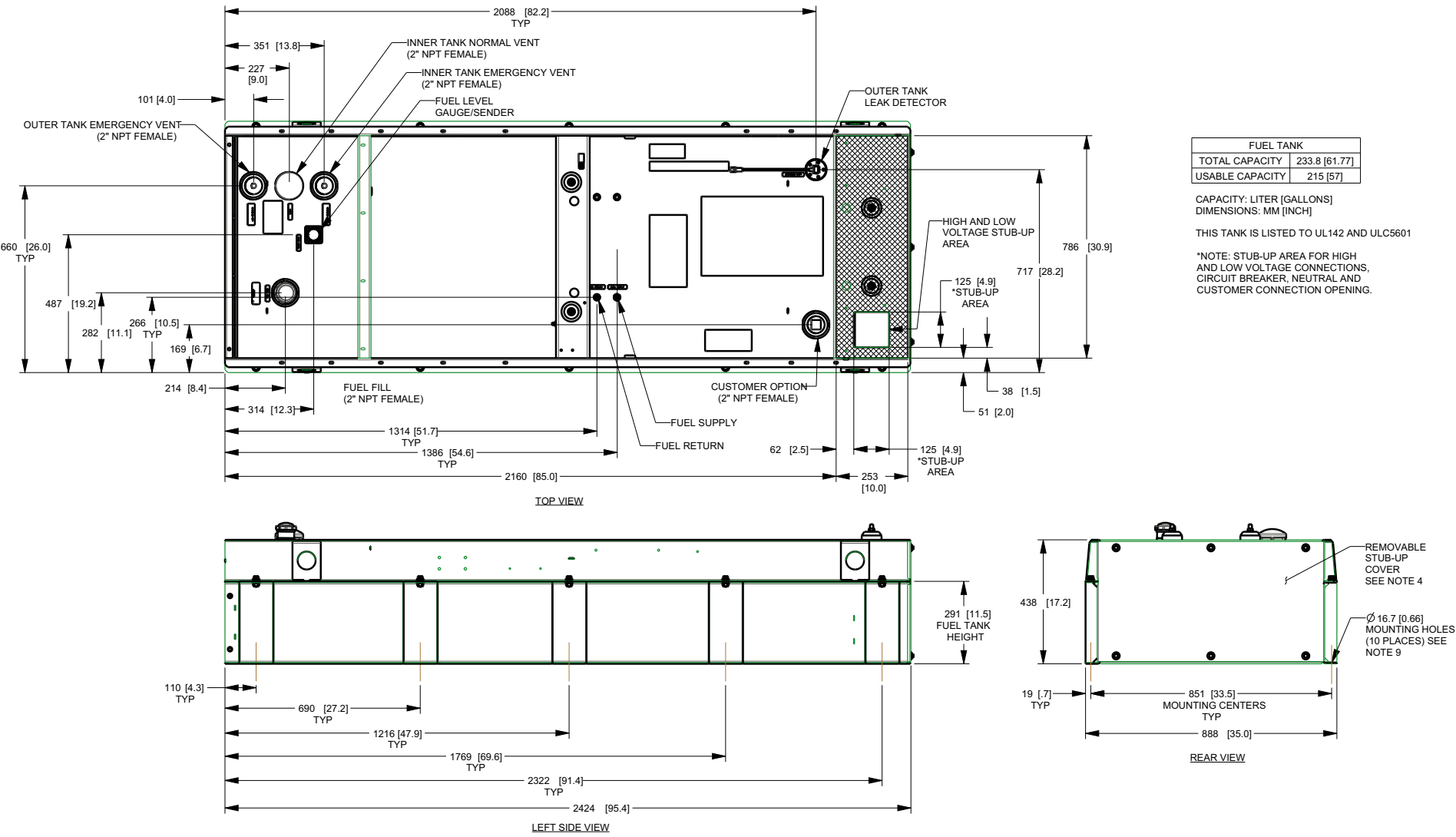
WEIGHT DATA WITH EMPTY BASE TANK (SEE NOTE 5)
GENERATOR AS SHOWN ##### [####]
WITH WOODEN SHIPPING SKID ##### [####]
WEIGHT: KG [LBS]
DIMENSIONS: MM [INCH]

NOTES:

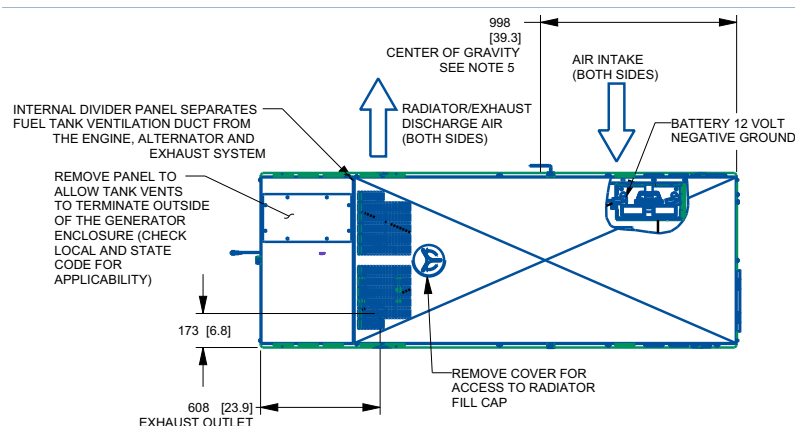
1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1194 (47") WIDE X 2718 (107") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
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 - HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION
 - NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
 - LOW VOLTAGE CONNECTIONS INCLUDING TRANSFER SWITCH CONTROL WIRES
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. ENGINE SERVICE CONNECTIONS
 - OIL DRAIN: 3/8" NPT
 - EXHAUST OUTLET: 2" O.D.
7. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
8. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
9. MOUNTING BOLTS OR STUDS TO CONCRETE PAD SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)



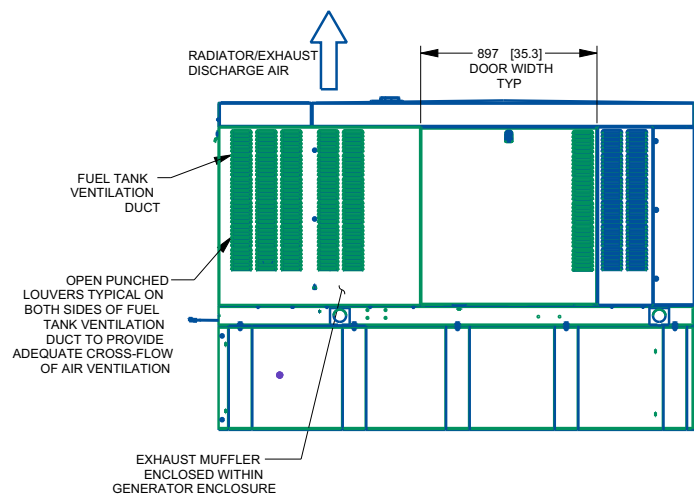
D3.3L G16 Extended Tank (10000018949, page 2 of 2)



D3.3L G16 – 132 Gal Tank (10000031343, page 1 of 2)



TOP VIEW



LEFT SIDE VIEW

SERVICE ITEM	D3.3L
OIL FILL CAP	LEFT
OIL DIP STICK	LEFT
OIL FILTER	LEFT
OIL DRAIN HOSE	RIGHT
RADIATOR DRAIN HOSE	RIGHT
COOLANT RECOVERY BOTTLE	RIGHT
RADIATOR FILL CAP ACCESS	ROOF
AIR CLEANER ELEMENT	RIGHT
MUFFLER	FRONT
FAN BELT	EITHER
BATTERY	RIGHT

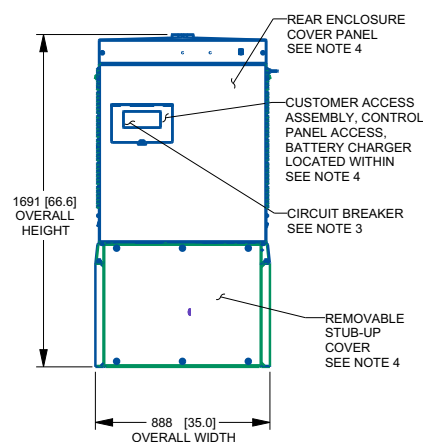
REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS

WEIGHT DATA WITH EMPTY BASE TANK (SEE NOTE 5)
GENERATOR AS SHOWN 1102 [2429]
WITH WOODEN SHIPPING SKID 1147 [2529]

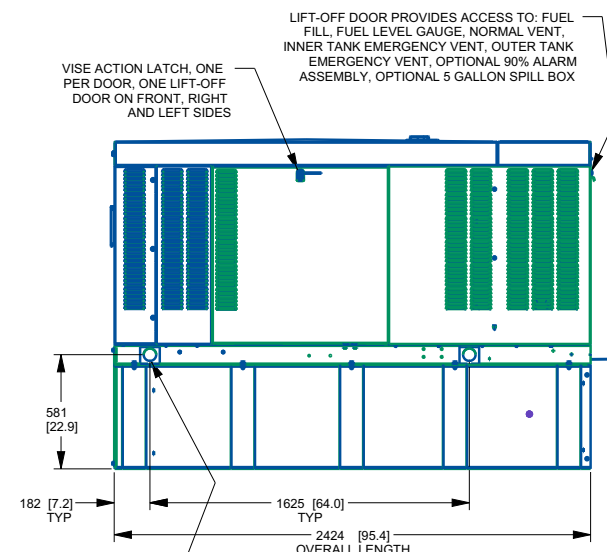
WEIGHT: KG [LBS]
DIMENSIONS: MM [INCH]

NOTES:

1. MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1194 (47") WIDE X 2718 (107") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES
2. ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
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- HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION
- NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
- LOW VOLTAGE CONNECTIONS INCLUDING TRANSFER SWITCH CONTROL WIRES
5. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
6. ENGINE SERVICE CONNECTIONS
OIL DRAIN: 3/8" NPT
EXHAUST OUTLET: 2" O.D.
7. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
8. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
9. MOUNTING BOLTS OR STUDS TO CONCRETE PAD SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)



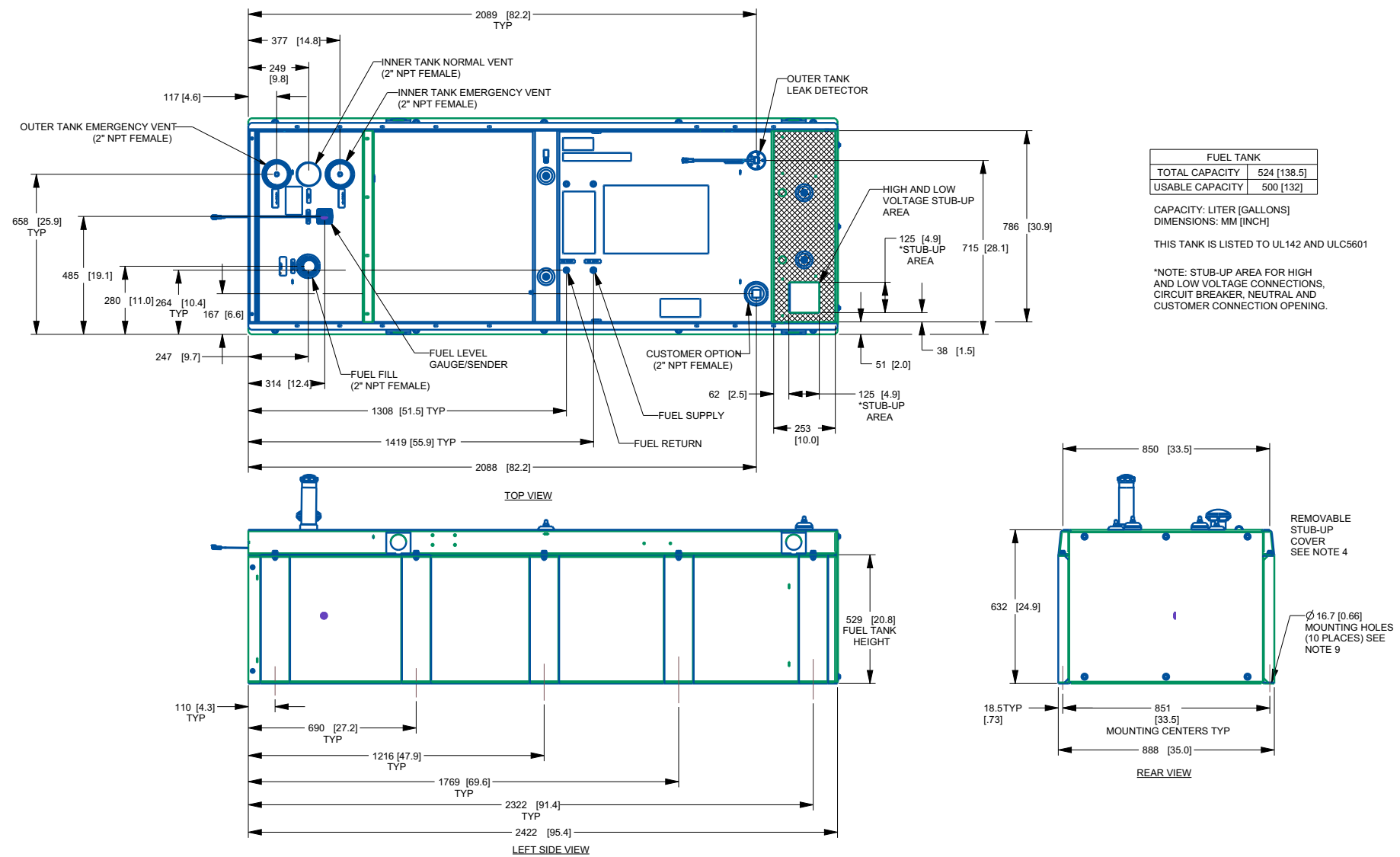
REAR VIEW



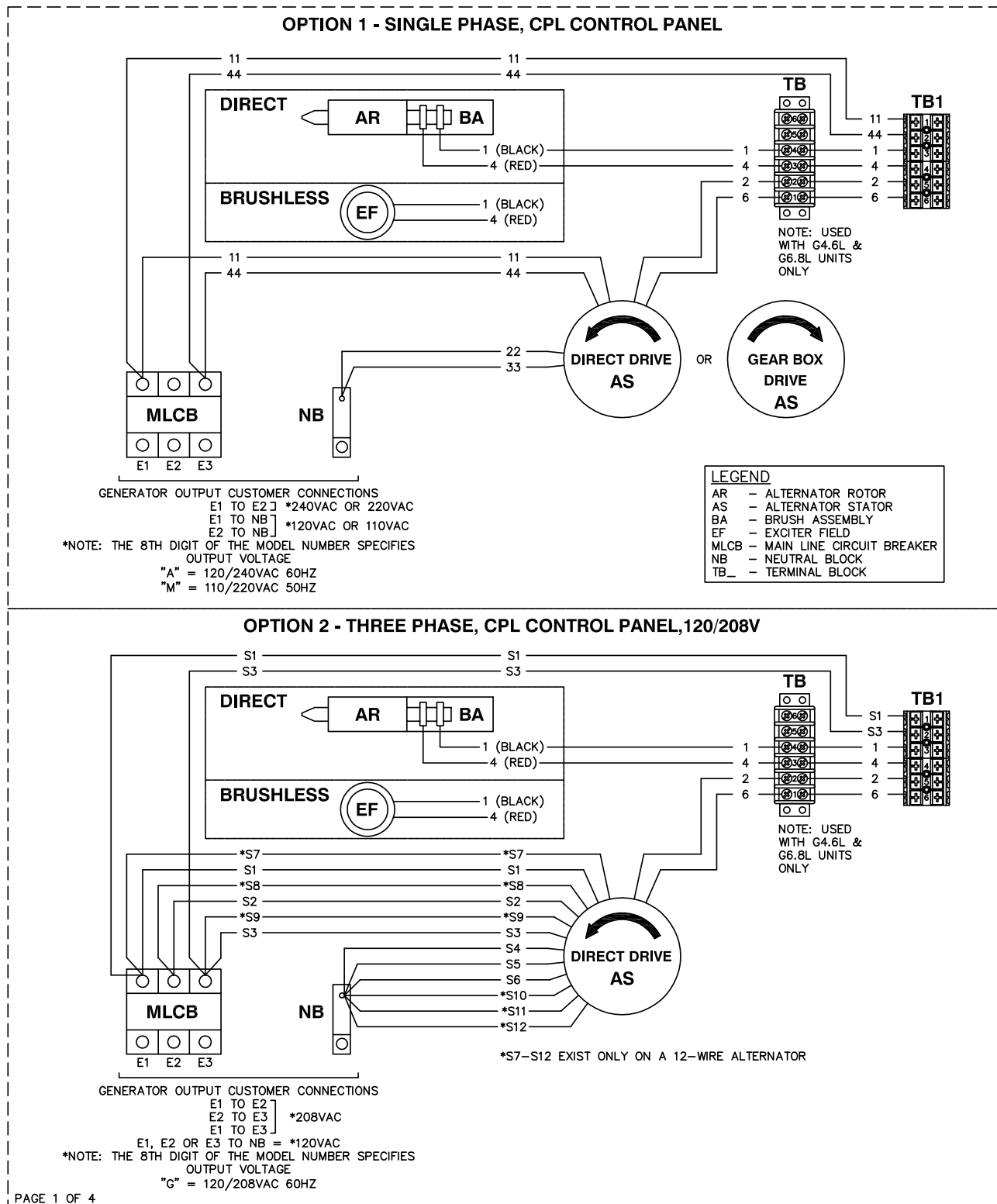
RIGHT SIDE VIEW

LIFTING PROVISION (4 PLACES)
SEE NOTES 5, 8 AND CENTER OF GRAVITY DIMENSIONS

D3.3L G16 – 132 Gal Tank (10000031343, page 2 of 2)



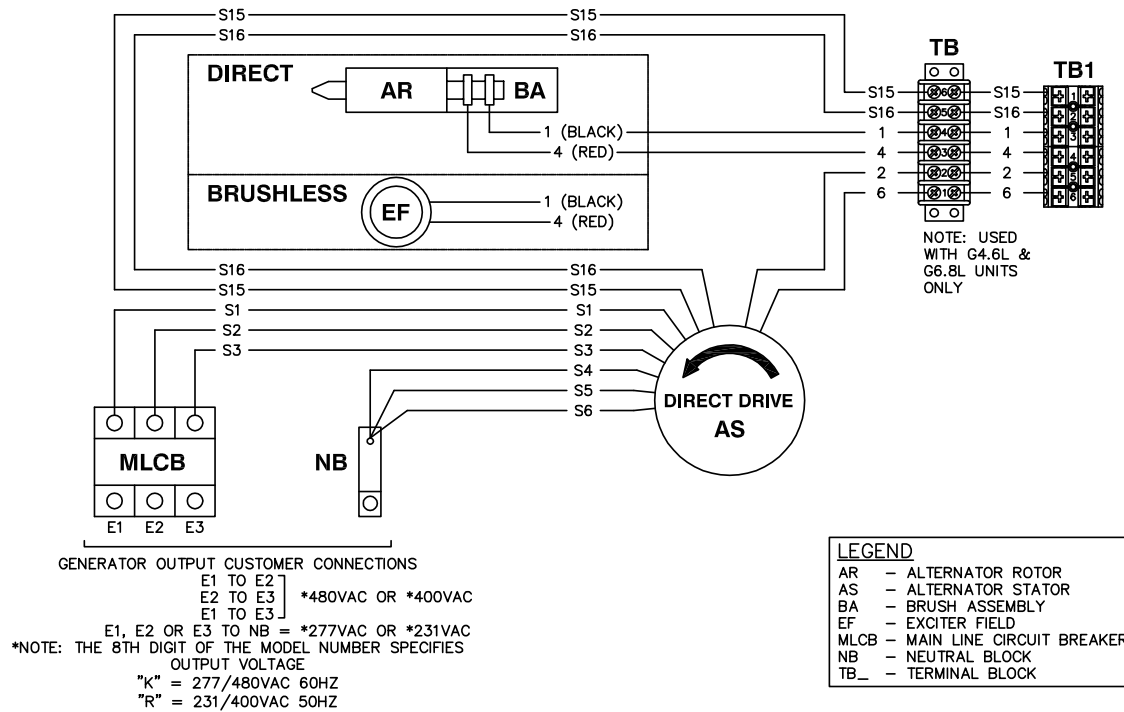
Alternator Wiring Diagram (1 of 2)



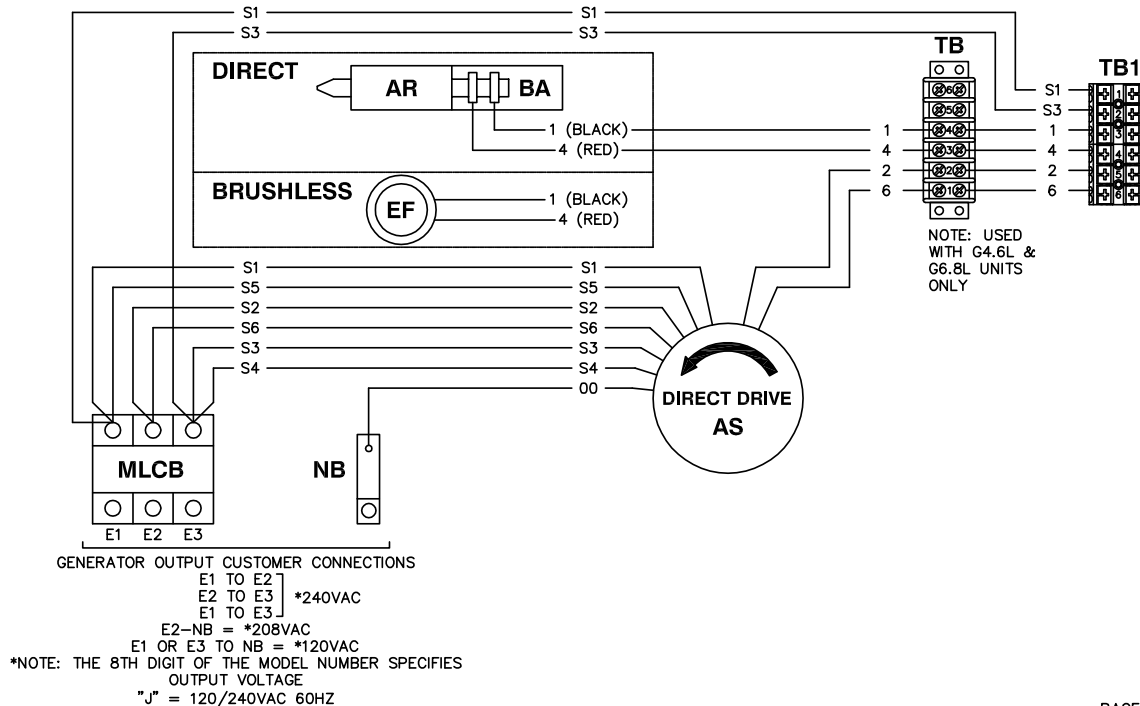
PAGE 1 OF 4

Alternator Wiring Diagram (2 of 2)

OPTION 3 - THREE PHASE, CPL CONTROL PANEL, 6-WIRE 277/480V



OPTION 4 - THREE PHASE DELTA, CPL CONTROL PANEL, 7-WIRE 120/240V



Alternator AC Lead Connections

The electrical wires in the unit's AC connection (lower) panel should be installed according to number of leads and voltage/phase required for the application. The voltage and phase are described on the generator data label. The number of lead wires can be identified using the Specifications section and power output rating on the generator data label. For example, if generator produces 130kW, 277/480 volt, three-phase power, generator has 12 alternator output leads. **Figure 8-3** describes the stator power winding connection for the generator.

Four-Lead, Single-Phase Stator

See **Figure 8-1**. Four-lead alternators are designed to supply electrical loads with voltage code "A" (240V, 1-phase, 60 Hz). Electrical power is produced in the stator power windings. These windings were factory-connected to the main circuit breaker as shown.

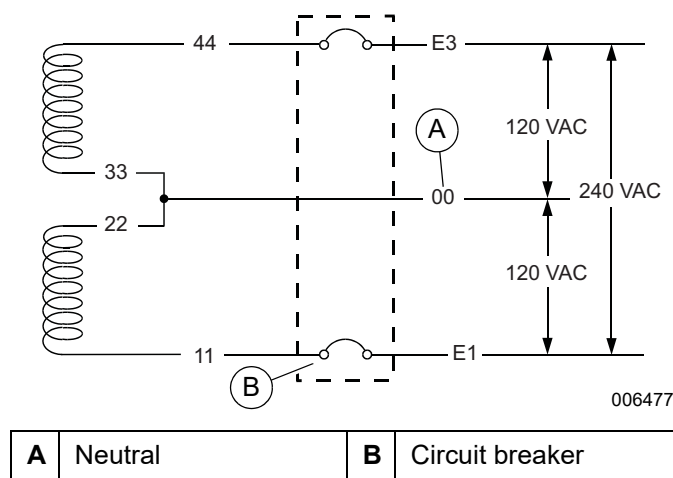


Figure 8-1. Four-Lead, Single-Phase Stator

Rated voltage between each circuit breaker terminal is 240V. The rated voltage between each circuit breaker terminal and the neutral point 00 is 120V.

Alternator Power Winding Connections

Three-Phase Alternators ("Y" Configuration)

The Stationary Emergency Generator is designed to supply three-phase electrical loads. Electric power is produced in the alternator power windings. These windings were factory-connected to the main circuit breaker with a "Y" configuration as shown in **Figure 8-2** through **Figure 8-6**.

Rated voltage between circuit breaker terminals E1–E2, E1–E3 and E2–E3 is 480V, 208V or 600V depending on model.

Rated voltage between each circuit breaker terminal and the neutral point 00 is 277V, 120V, or 346V depending on model.

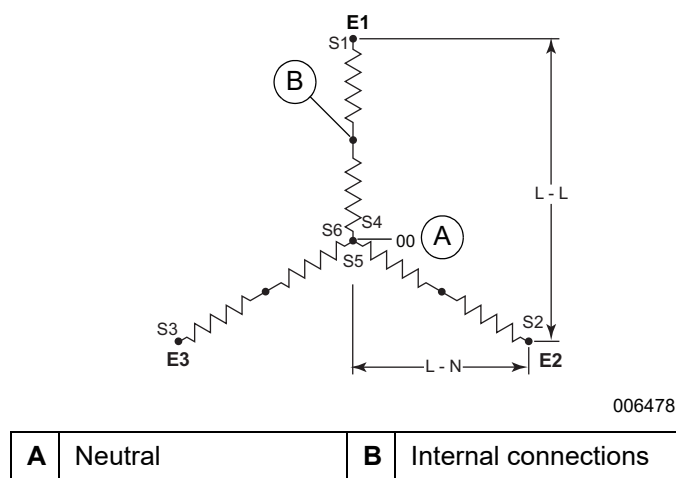


Figure 8-2. Stator Power Winding Connections—3-phase, 277/480V (6 Lead)

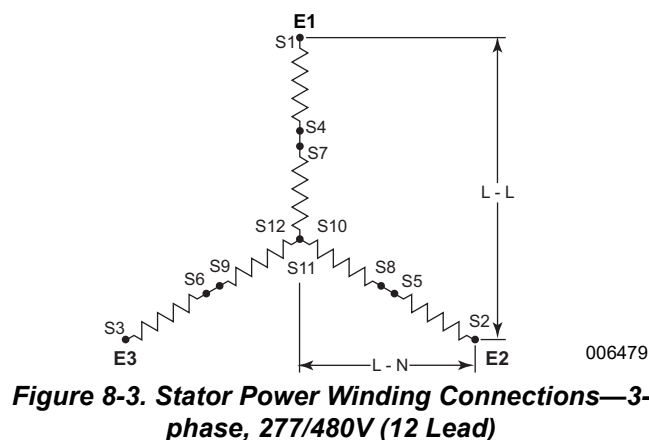


Figure 8-3. Stator Power Winding Connections—3-phase, 277/480V (12 Lead)

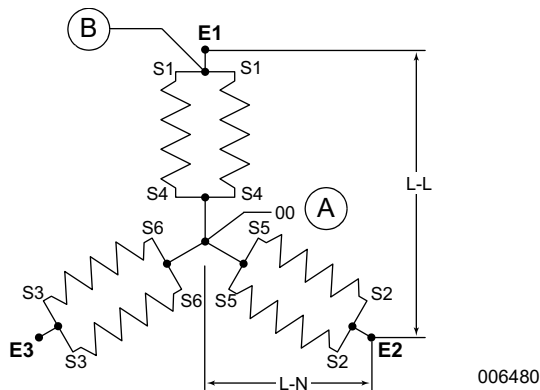


Figure 8-4. Stator Power Winding Connections—3-phase, 120/208V (6 Lead)

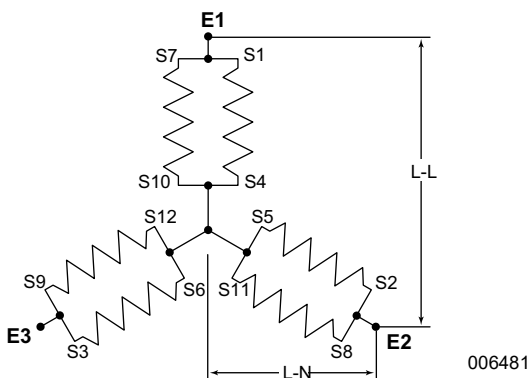
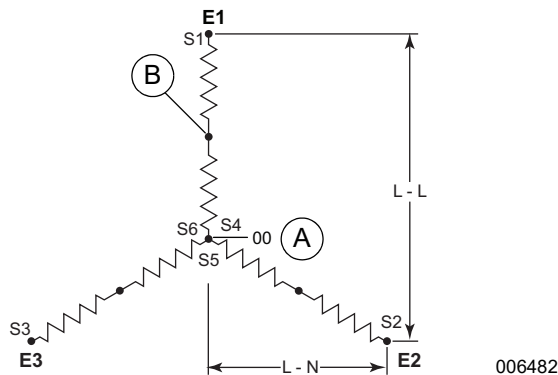


Figure 8-5. Stator Power Winding Connections—3-phase, 120/208V (12 Lead)



A	Neutral	B	Internal connections
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Figure 8-6. Stator Power Winding Connections—3-phase, 346/600V (6 Lead)

Three-Phase Alternators (“Delta” Configuration)

The Stationary Emergency Generator is designed to supply three-phase electrical loads. Electric power is produced in the alternator power windings. These windings were factory-connected to the main circuit breaker with a “Delta” configuration as shown in [Figure 8-7](#) and [Figure 8-8](#).

Rated voltage between circuit breaker terminals E1–E2, E1–E3 and E2–E3 is 240V.

Rated voltage between E2 and the neutral point 00 is 208V. The rated voltage E1–00 and E3–00 is approximately 120V.

NOTE: Voltage measured from E2 to 00 can greatly vary when single-phase load is placed on alternator.

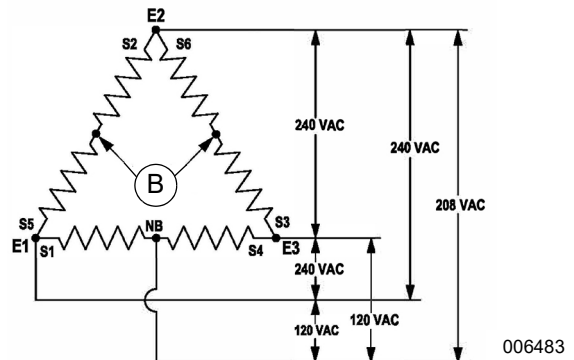


Figure 8-7. Stator Power Winding Connections—3-phase, 120/240V (6 Lead)

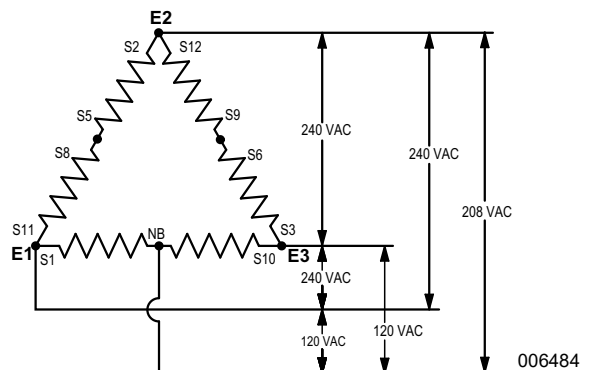


Figure 8-8. Stator Power Winding Connections—3-phase, 120/240V (12 Lead)

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