



## DIESEL GENERATOR MCG1000MT2



01857

## OPERATING MANUAL

Parts manuals available online at [www.generacmobile.com](http://www.generacmobile.com)

**⚠ WARNING**

**CALIFORNIA PROPOSITION 65 WARNING:** Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

**⚠ WARNING**

**CALIFORNIA PROPOSITION 65 WARNING:** This product contains or emits chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm.

## Introduction

This manual provides information and procedures to safely operate and maintain the Generac Mobile Products unit. For your own safety and protection from physical injury, carefully read, understand, and observe the safety instructions described in this manual. Keep a copy of this manual with the unit at all times. Additional copies are available from Generac Mobile Products, or can be found at **www.generacmobile.com**. *The information contained in this manual was based on machines in production at the time of publication. Generac Mobile Products reserves the right to change any portion of this information without notice.*

Read all of the manuals included with the unit. Each manual details specific information regarding items such as setup, use and service requirements. An engine operator's manual provides detailed operation and maintenance procedures for the engine. Additional copies of the engine operator's manual are available from the engine manufacturer.

**DO NOT MODIFY** or use this equipment for any application other than for which it was designed.

Generac Mobile Products recommends that a trained and licensed professional perform all electrical wiring and testing functions. Any wiring should be in compliance with the National Electrical Code (NEC), state and local regulations and Occupational Safety and Health Association (OSHA) guidelines.

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**For technical or parts QUESTIONS, please contact the Generac Mobile Products Customer Support or Technical Support team at 1-800-926-9768. Please have your serial number available.**

**To ORDER SERVICE PARTS, please contact the dealer from which you purchased the unit, or call Generac Mobile Products to locate a dealer in your area.**

Engine Make: \_\_\_\_\_

Engine Serial Number: \_\_\_\_\_

Engine Model Number: \_\_\_\_\_

Generator Make: \_\_\_\_\_

Generator Model Number: \_\_\_\_\_

Generator Serial Number: \_\_\_\_\_

Unit Model Number: \_\_\_\_\_

Unit Serial Number: \_\_\_\_\_

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# Section 1 - Safety

## SAFETY NOTES



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

This manual contains DANGERS, WARNINGS, CAUTIONS, NOTICES and NOTES which must be followed to prevent the possibility of improper service, damage to the equipment, personal injury or death. The following formatting options will apply when calling the readers attention to the DANGERS, WARNINGS, CAUTIONS, NOTICES and NOTES.

### **DANGER**

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

### **WARNING**

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

### **CAUTION**

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

### **NOTICE**

Indicates a hazardous situation which, if not avoided, may result in property or equipment damage.

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

## OPERATING SAFETY



Before using the unit, be sure you read and understand all of the instructions. This equipment was designed for specific applications; **DO NOT** modify or use this equipment for any application other than which it was designed for. Equipment operated improperly or by untrained personnel can be dangerous. Read the operating instructions and familiarize yourself with the location and proper use of all instruments and controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate or set up the unit. The following points should be practiced at all times:

- The area immediately surrounding the unit should be dry, clean, and free of debris.
- Position and operate the unit on a firm, level surface.
- **NEVER** start a unit in need of repair.
- If the unit is equipped with a frame grounding stud, follow any local, state, and National Electrical Code (NEC) guidelines when connecting.
- **NEVER** operate the unit on a combustible surface.
- **NEVER** operate a unit while tired, distracted, or under the influence of drugs or alcohol.
- Keep all body parts, clothing and other loose items away from moving parts.
- **DO NOT** fill fuel tank near an open flame, while smoking, or while engine is running. **DO NOT** fill tank in an enclosed area with poor ventilation.
- **DO NOT** operate with the fuel tank cap loose or missing.
- Shut the engine down if any of the following conditions exist during operation:

1. Noticeable change in engine speed.
2. Loss of electrical output.
3. Equipment connected to the unit overheats.
4. Sparking occurs.
5. Engine misfires or there is excessive engine/generator vibration.
6. Protective covers are loose or missing.
7. If the ambient air temperature is above 120°F (49°C).

### ENGINE SAFETY



Internal combustion engines present special hazards during operation and fueling. Failure to follow the safety guidelines described below could result in severe injury or death. Read and follow all safety warnings described in the engine operator's manual. A copy of this manual was supplied with the unit when it was shipped from the factory.

- **DO NOT** run engine indoors or in an area with poor ventilation unless exhaust hoses are used. Engine exhaust contains carbon monoxide, a deadly, odorless and colorless gas which, if inhaled, can cause nausea, fainting or death. Make sure engine exhaust cannot seep into closed rooms or ventilation equipment.
- **DO NOT** touch or lean against hot exhaust pipes or engine components.
- **DO NOT** clean air filter with gasoline or other types of low flash point solvents.
- **DO NOT** operate the unit without a functional exhaust system.
- Prolonged exposure to sound levels in excess of 85 dB(A) can cause permanent hearing loss. Wear hearing protection when working around a running engine.
- Batteries contain sulfuric acid which can cause severe injury or death. Sulfuric acid can cause eye damage, burn flesh or eat holes in clothing. Protective eye wear and clothing are necessary when working on or around the battery. Always disconnect the negative (-) battery cable from the corresponding terminal before performing any service on the engine or other components.
- **NEVER** open the radiator cap or oil drain plug while the engine is running or before the engine has cooled down. Pressurized coolant and hot engine oil can cause severe burns. Allow the unit to cool completely before attempting any service work.
- Keep area around exhaust pipes and air ducts free of debris to reduce the chance of an accidental fire.

### SERVICE SAFETY



All service work must be performed by qualified personnel who are familiar with the equipment. Only a qualified electrician should troubleshoot or repair electrical problems occurring in this equipment. Follow the safety guidelines described below to prevent hazardous situations which could result in severe injury or death.

- **NEVER** wash the unit with high pressure hoses, power washers, or steam cleaners. Water may collect in the unit, causing damage to electrical parts.
- **ALWAYS** use extreme caution when servicing this unit in damp conditions. Do not service the unit if your skin or clothing is wet. Do not allow water to collect around the base of the unit.
- Inspect condition of electrical wiring. **DO NOT** use the unit if wires are damaged or insulation is cut or worn through.
- Replace all missing and hard to read decals. Decals provide important operating instructions and warn of dangers and hazards.
- Before servicing the unit, make sure the Control Power switch and battery disconnect are in the OFF position. **NEVER** perform even routine service (oil/filter changes, cleaning, etc.) unless all electrical components are shut down.



- **NEVER** start the unit under load. The circuit breaker must be off when starting the unit.

## **REPORTING TRAILER SAFETY DEFECTS**

If you believe your trailer has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Generac Mobile Products LLC.

If NHTSA receives similar complaints, it may open an investigation; and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in an individual problem between you, your dealer, or Generac Mobile Products LLC.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-888-327-4236 (TTY:1-800-424-9153), go to <http://www.safercar.gov>; or write to:

Administrator  
NHTSA  
1200 New Jersey Avenue S.E.  
Washington, DC 20590

You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

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## Section 2 - General Information

### SPECIFICATIONS

#### GENERAC MODEL

**MCG1000MT2**

#### Engine

Make/Brand .....	Mitsubishi
Model .....	S12H-Y2PTAW-1
EPA Tier .....	2
Aspiration .....	Turbocharged, Intercooled
Horsepower - Prime <b>hp (kW)</b> .....	1528 (1140)
Operating Speed <b>rpm</b> .....	1800
Displacement <b>in<sup>3</sup> (L)</b> .....	37.1 (2265)
Cylinders - qty .....	12
Fuel Consumption - 100% prime <b>gph (Lph)</b> .....	70.9 (268.4)
Battery Type .....	Group 8D
Battery Voltage (Quantity per Unit) .....	24V (4)
Battery Rating .....	1100 CCA

#### Generator

Make/Brand .....	Marathon
Model .....	741RSL8045
Type, Insulation .....	Brushless, H

#### Generator Set (Engine/Generator)

3Ø - Standby <b>kW (kVA)</b> .....	1000 (1250)
Amps - 3Ø Standby (480V) <b>A</b> .....	1503
3Ø - Prime <b>kW (kVA)</b> .....	900 (1125)
Amps - 3Ø Prime (480V) <b>A</b> .....	1353
Frequency <b>Hz</b> .....	60
Power Factor .....	0.8 (3Ø)

#### Weights

Operating Weight <b>lbs (kg)</b> .....	42110
--	-------

#### Capacities

Fuel Tank Volume <b>gal (L)</b> .....	1360 (5148)
Coolant (incl. engine) <b>qt (L)</b> .....	106 (401)
Oil (incl. filter) <b>qt (L)</b> .....	52.8 (200)

#### AC Distribution

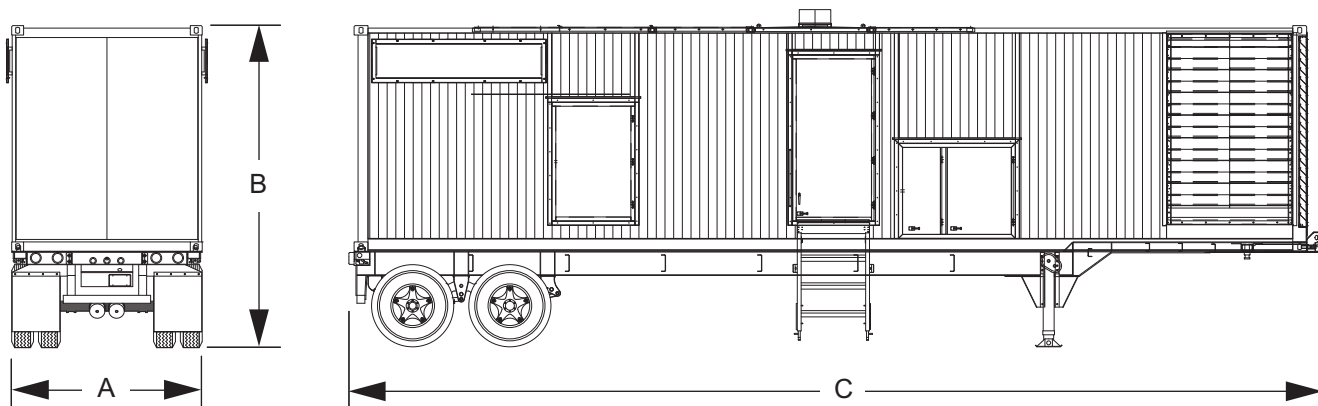
Circuit Breaker Size .....	1600A
Voltages Available 3Ø .....	277/480

#### Trailer

Number of Axles .....	2
Capacity - Axle Rating <b>lbs (kg) ea.</b> .....	22500 (10205)
Tire Size <b>in</b> .....	11R22.5
Tire Load Range .....	G 14PR
Maximum Tire Pressure <b>psi</b> .....	105

*Specifications are subject to change without notice.*

## Unit Dimensions



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**Figure 1 - Unit Dimensions**

	<b>A</b>	<b>B</b>	<b>C</b>
<b>MCG1000MT2</b>	96 in. (2.43 m)	157.5 in. (4.0 m)	488 in. (12.4 m)

*Specifications are subject to change without notice.*

## Engine Oil Recommendations

Generac Mobile Products recommends the use of 15W-40 engine oil, with a minimum American Petroleum Institute (API) Service Class of CF class 1. Refer to the engine operation manual, included with this unit, for more detailed oil grade and viscosity information.

## Coolant Recommendations

### **⚠ WARNING**

**Risk of poisoning. Do not use mouth to siphon coolant. Doing so could result in death or serious injury.**

### **⚠ WARNING**

**Disconnect the negative battery terminal before servicing to prevent accidental engine rotation. Failure to do so could result in death or serious injury.**

Use of improper coolants can damage the engine cooling system. Use demineralized water or distilled water for best results. Hard water causes scale deposits, which reduces cooling efficiency and raises internal temperatures, possibly leading to engine damage. Use an anticorrosive to prevent rot in summer and anti-freeze to prevent freezing in winter.

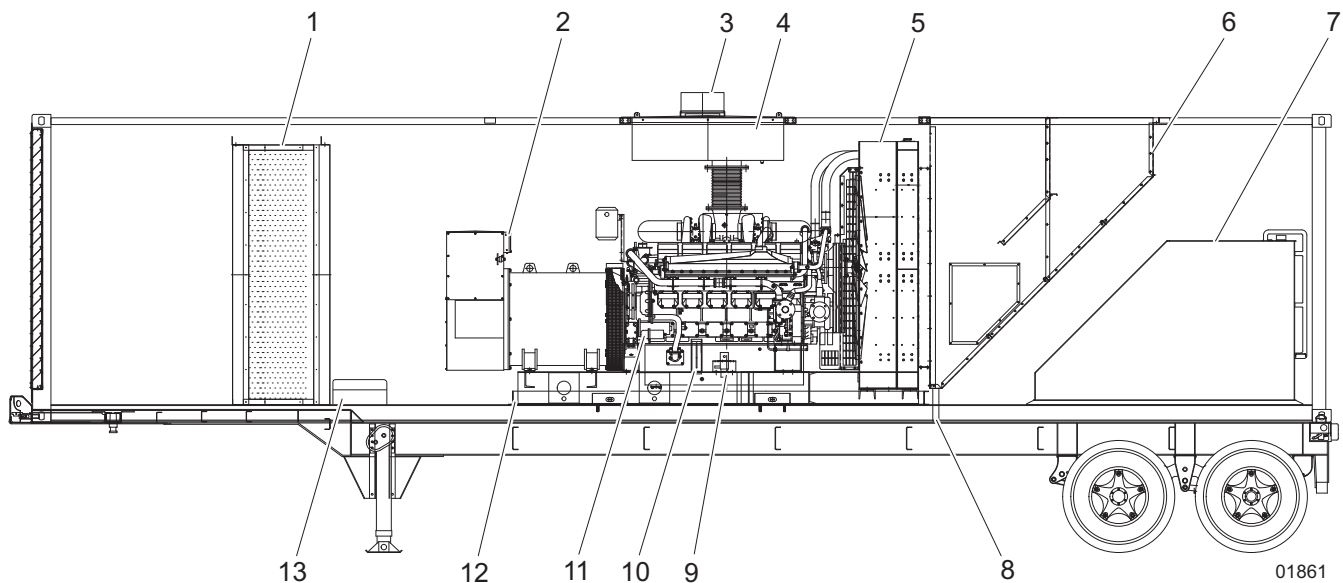
Dilute the anti-freeze based on a theoretical temperature that is 9-18°F (5-10°C) below the lowest temperature expected in the area. A ratio of 40-60% is most common.

**Note:** Use only Peak Fleet-Charge® 50/50 ethylene glycol type coolant (available from any authorized Generac dealer). Be sure to use maroon colored coolant for diesel engines.

Freezing Point °F (°C)	3 (-16)	-13 (-25)	-31 (-35)	-58 (-50)	-54 (-48)
Coolant (% Volume)	30	40	50	60	70
Water (% Volume)	70	60	50	40	30

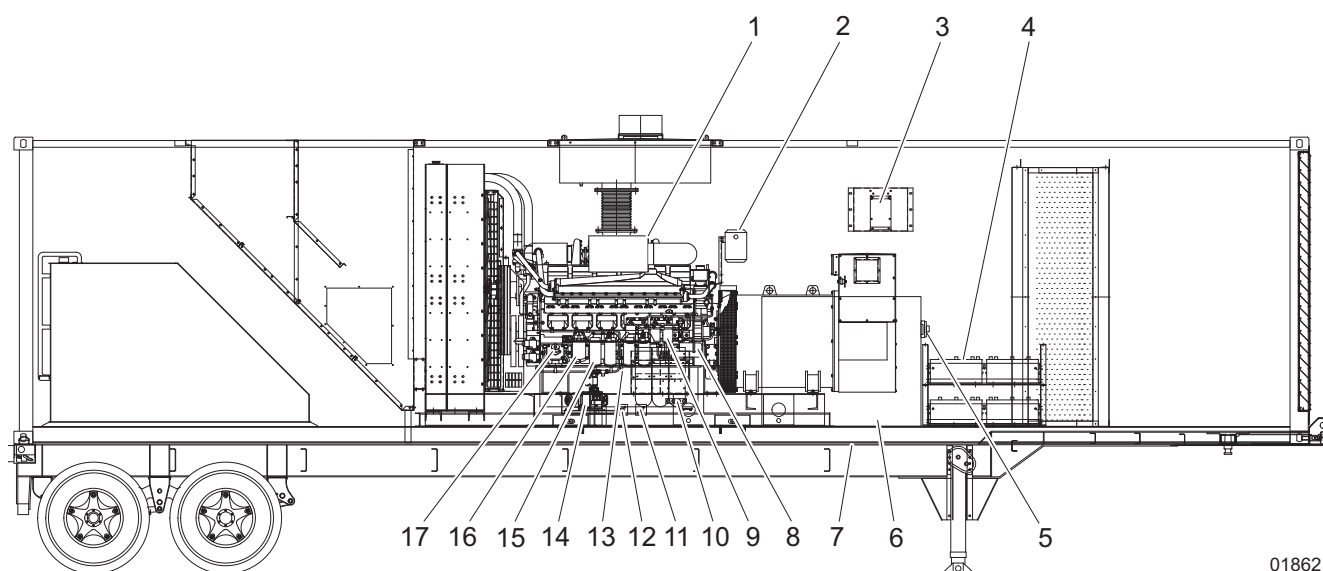


## COMPONENT LOCATIONS



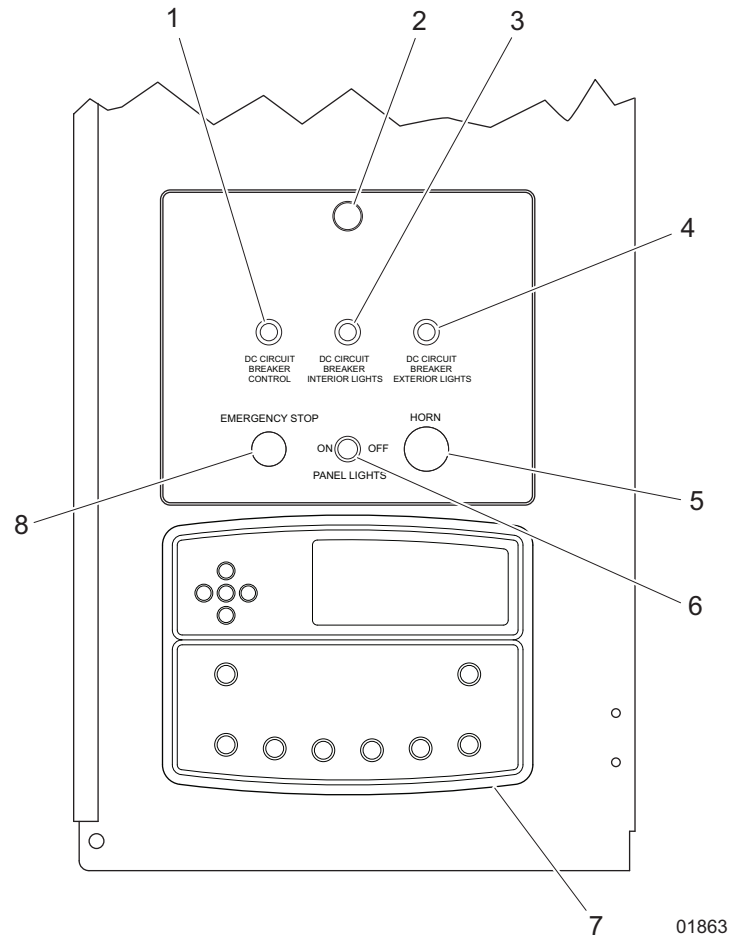
**Figure 3 - Left Side**

- |   |                                      |
|---|--------------------------------------|
| 1. Sound attenuation baffles (3)        | 8. Plenum drain (in container floor) |
| 2. Digital speed control                | 9. Block heater (aftercooler)        |
| 3. Diffuser                             | 10. Oil level indicator              |
| 4. Muffler                              | 11. Starter                          |
| 5. Radiator                             | 12. Spill containment pan            |
| 6. Discharge plenum                     | 13. Storage box (manuals)            |
| 7. Fuel tank - 1360 gallon (5148 liter) |                                      |

**Figure 4 - Right Side**

- |                                       |                                 |
|---------------------------------------|---------------------------------|
| 1. Air filter (2)                     | 10. Fuel/water separator        |
| 2. Crankcase vent                     | 11. Engine oil drain            |
| 3. Battery charger                    | 12. Coolant drain               |
| 4. Batteries - 8D (4)                 | 13. Engine oil dipstick         |
| 5. Battery disconnect switch          | 14. Block heater (jacket water) |
| 6. Control panel                      | 15. Oil filter                  |
| 7. Receptacle panel (under container) | 16. Bypass oil filter           |
| 8. Starter                            | 17. Engine oil fill port        |
| 9. Fuel filter (4)                    |                                 |

## CONTROL PANEL



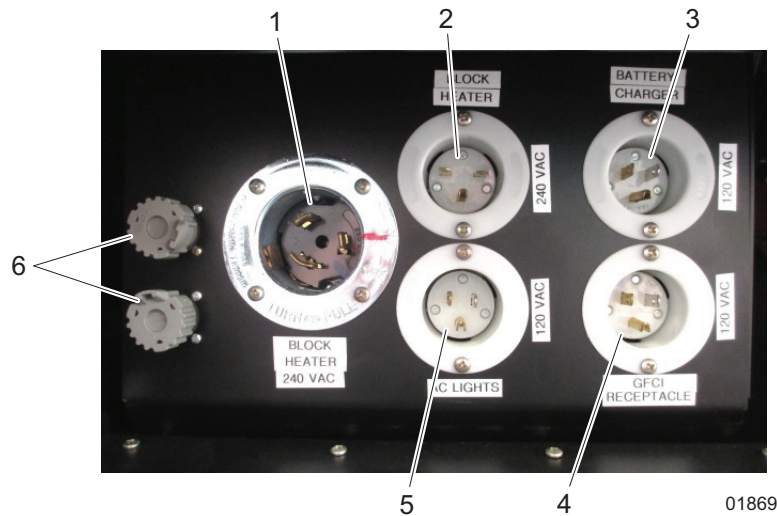
**Figure 5 - Control Panel**

- |   |                          |
|---|--------------------------|
| 1. DC circuit breaker - control         | 5. Alarm horn            |
| 2. Control panel light                  | 6. Panel lights          |
| 3. DC circuit breaker - interior lights | 7. Digital controller    |
| 4. DC circuit breaker - exterior lights | 8. Emergency stop switch |



## CONNECTION PANEL

Connections for the block heaters, battery charger, AC lights, etc. are located in a swing-down panel located under the container, on the right side of the unit (beneath the circuit breaker panel). Two receptacles are provided for paralleling multiple units. These receptacles are not routed through the main circuit breaker.

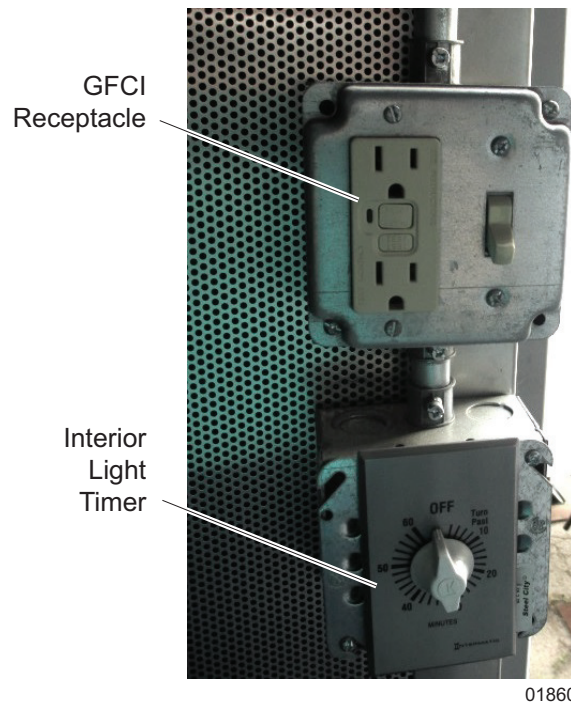


**Figure 6 - Input Receptacles**

- |   |  |
|---|--|
| 1. Block heater - 240VAC (50A) twist-lock | 4. GFCI receptacle - 120VAC NEMA 5-15P |
| 2. Block heater - 240VAC NEMA 6-15P       | 5. AC lights - 120VAC NEMA 5-15P       |
| 3. Battery charger - 120VAC NEMA 5-15P    | 6. CAN connection receptacle (2)       |

The GFCI receptacle is located directly inside the door on the left side of the container. Refer to [Figure 7](#). The GFCI receptacle receives power from the connection in the swing-down panel.

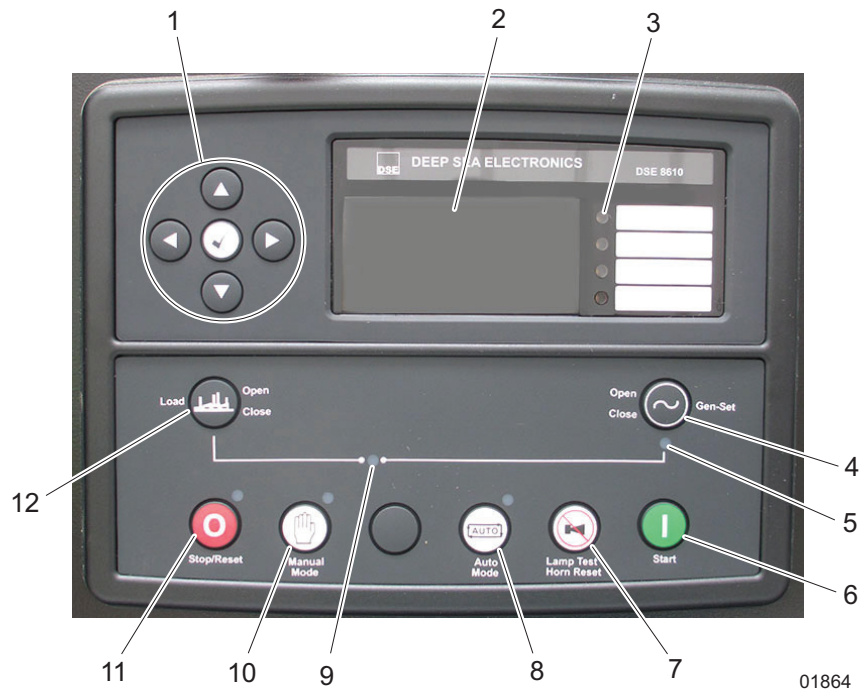
Numerous lights are provided throughout the container and inside the main circuit break box. Sixty minute timers are provided for delayed shut off of the lights.



**Figure 7 - GFCI Receptacle and Interior Light Timer**

## DIGITAL CONTROLLER

The DSE8610 is a synchronizing auto start control module suitable for use in a multi-generator loadshare system. It is designed to synchronize up to 32 generators, including electronic and non-electronic engines. Refer to *“Parallel Setup and Operation” on page 16* for more information on paralleling.



**Figure 8 - Controller Features**

- |   |   |
|---|---|
| 1. Menu navigation buttons  | 7. Mute alarm/lamp test   |
| 2. Main status and instrumentation display  | 8. Select Auto mode   |
| 3. Configurable LEDs (4)  | 9. Close generator LED - On when generator required to be on load |
| 4. Gen-Set (close main circuit breaker)   | 10. Select Manual mode  |
| 5. Generator available LED - On when generator is within limits and able to take load | 11. Select Stop mode  |
| 6. Start engine (manual mode)   | 12. Load (open main circuit breaker)                              |

The DSE8610 monitors the generator and indicates operational status and fault conditions, automatically starting or stopping the engine on load demand or fault condition. System alarms are displayed on the LCD screen (multiple language options available), illuminated LED, and audible alarm.

The event log will record 250 events to facilitate easy maintenance. An extensive number of fixed and flexible monitoring, metering and protection features are included, as well as comprehensive communication and system expansion options. Refer to the DSE8610 Control and Instrumentation Operators Manual included with this unit for more information.

## ENGINE/GENERATOR PROTECTIVE DEVICES

The unit may be required to operate for long periods of time without an operator on hand to monitor conditions such as coolant temperature, oil pressure, voltage, frequency, etc. For this reason, the unit has numerous sensors to provide the control panel with the information it needs to protect both the engine and generator. The control panel is designed to shut down the engine if potentially damaging conditions occur. These conditions can include low oil pressure, high coolant temperature, low coolant level, engine overspeed, over or under voltage, over or under frequency, etc. These settings are configured at the factory and can be adjusted by an Authorized Service Technician if required.

## FUEL/WATER FILTERING SYSTEM

The fuel/water separator assemblies protect engine components from dirt, rust, algae, varnishes, and water, which is prevalent in engine fuels. They remove contaminants from the fuel using a three stage process.

### Stage One: Separation

As fuel enters the filter assembly, it moves through the internal check valve, then through the turbine centrifuge where it flows in a spiraling direction, spinning off large solids and water droplets which fall to the bottom of the collection bowl.



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**Figure 9 - Fuel/Water Separators**

### Stage Two: Coalescing

Small water droplets bead up on the surface of the conical baffle and cartridge element. When heavy enough, they too fall to the bottom of the bowl.

### Stage Three: Filtration

The cartridge elements repel water and remove contaminants from the fuel down to 30 micron (nominal).

**Note:** All valves must be open during operation. Check prior to starting the unit.

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# Section 3 - Operation

## PRESTART CHECKLIST



Before starting the unit, all items in the prestart checklist must be completed. This checklist applies to both manual and remote starting of the unit.

- ☐ Read and understand **ALL** safety sections at the beginning of this manual.
- ☐ Verify all maintenance procedures are up to date. For more information, refer to *"Maintenance Schedule" on page 28*.
- ☐ The unit must be level.
- ☐ The unit must be dry. Check for any water inside, on, or near the unit; dry if needed.
- ☐ For grounding requirements, follow any local, state, or National Electrical Code (NEC) guidelines.
- ☐ Verify the DC circuit breakers on the control panel are pushed in (closed).
- ☐ Verify the main circuit breaker is in the open (O) position.
- ☐ Plug in cables for the block heaters, battery charger, AC lights, and GFCI receptacle (receptacles located in swing-down panel below control panel).

**Note:** Depending on the ambient temperature, allow up to 48 hours for the block heaters to bring the oil up to operating temperature. The block heaters are not needed if the temperature is above 100°F (38°C).

- ☐ Inspect all electrical cords; repair or replace any that are cut, worn, or bare.
- ☐ Check oil, coolant, and fuel levels. For more information, refer to *"Daily Walk Around Inspection" on page 25*.
- ☐ Verify battery connections are secure.
- ☐ Check engine fan belt tension and condition.
- ☐ Check engine exhaust system for loose or rusted components.
- ☐ Verify all covers are in place and secure.
- ☐ Verify all electrical connections at the connection lugs, if equipped, are tight and wired correctly.
- ☐ Verify the emergency stop switch is pulled out.
- ☐ Verify the radiator and surrounding shroud are clear of debris.
- ☐ Verify fuel tank supply valve is open.

## MANUALLY STARTING THE UNIT

1. Turn the battery disconnect switch to the ON position.
2. Push the Manual Mode (  ) button on the controller.
3. Push the Start (I) button.
4. Allow the engine to warm sufficiently (about 15 minutes) before adding a load.
5. Push the Gen-Set (  ) button on the controller to close the main circuit breaker.

For more information, refer to the controller manual provided with this unit.

## AUTO (REMOTE) STARTING OF THE UNIT

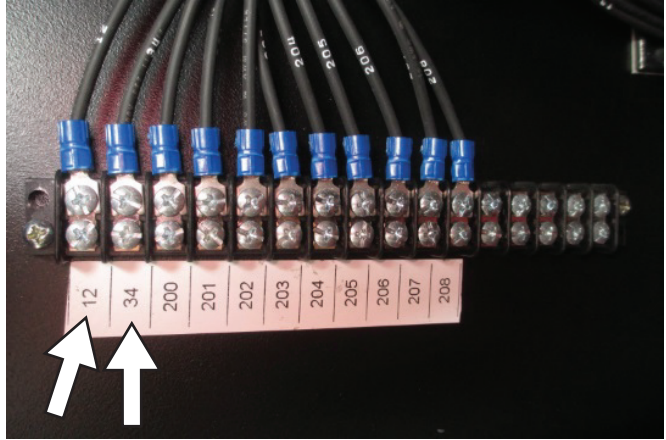
Auto mode is used when the unit is started from a location other than the control panel by using a transfer switch. Auto (remote start) is the normal setting when the unit is being used as a standby power supply. Follow all safety warnings and information on isolating the generator with a transfer switch if the unit is to be used as a standby power supply. Refer to *"Transfer Switch" on page 19*. Then continue with the steps described below:



1. Perform a manual start of the unit at least once to verify that the engine is operating correctly.

**Note:** If a check of the remote start circuit is desired, press the Auto Mode button on the controller. The LCD window should show “Auto Mode” at the top of the screen. Attach a jumper wire (minimum 16 gauge) across the #12 and #34 terminals on TB4 (located in the main circuit breaker panel). This applies a ground to the controller to close the starting circuit contacts. The engine should crank, start and run

2. Connect the remote start wires to terminals #12 and #34 on TB4. Terminal board 4 is located behind the main circuit breaker panel, on the left side.
3. Remove the jumper wire from the terminal block and the engine will stop. Reconnect any necessary wires from the remote start switch (transfer switch) to the terminal block.
4. Confirm the unit is in Auto Mode. The LCD window should show “Auto Mode” at the top of the screen.
5. The unit is now ready for remote starting.



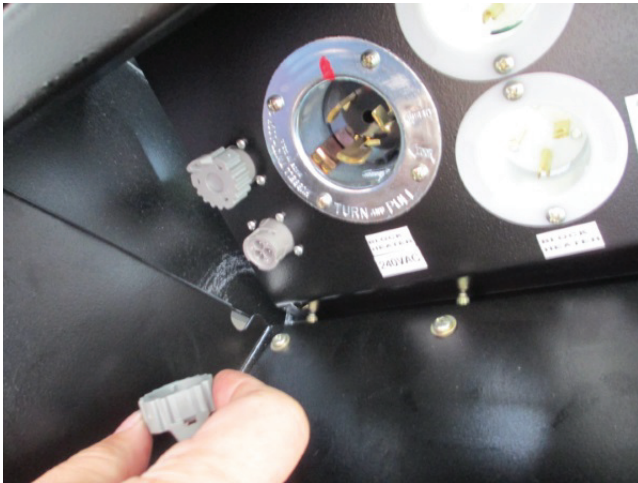
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**Figure 10 - Remote Start Terminals**

## PARALLEL SETUP AND OPERATION

The unit can be operated in parallel with other parallel-capable units. To make sure that the units to be used in parallel are appropriate for the load, contact Generac Mobile Products Technical Service at 1-800-926-9768.

Before running units in parallel, make sure each unit is operating properly according to this manual. Set up auto (remote) starting on each unit. Refer to [“Auto \(Remote\) Starting of the Unit” on page 15](#) for more information.



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**Figure 11 - CAN Connection Receptacles**

Two CAN receptacles, used to connect units for parallel operation, are located on the swing-down panel located below the main circuit breaker panel. A link cable and two 120 ohm resistor plugs are provided in the manual storage box supplied with the unit.

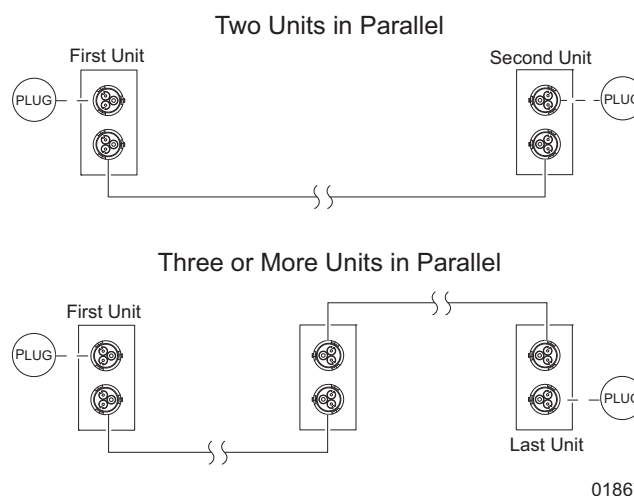
To set up only two units for parallel operation, connect each unit to the load following standard procedure. Remove the receptacle covers from the CAN receptacles (refer to [Figure 11](#)). Using the provided link cable, connect a CAN receptacle on the first unit to a CAN receptacle on the next unit. Insert the provided 120 ohm resistor plug into the

unused CAN receptacles on both units.

To parallel more than two units, connect another link cable from the unused CAN receptacle on the second unit (remove resistor plug, if necessary) to a CAN receptacle on the next unit. Continue chaining the parallel units. Insert the 120 ohm resistor plugs into the unused CAN receptacle **on the first and last units in the series**.

Once the units are set up in parallel, they will share the load evenly during normal operation. If parallel units are in Auto Mode and one unit is shut down, the load will transfer to the remaining units on line. If all paralleled units are in Manual mode, press the Gen-Set (⌚) button on the controller, and the load gradually transitions to the other units.

**Note:** When one or more units shut down, any remaining units will shut down if the increase in proportional load is greater than what the unit is rated for. Contact Generac Mobile Products Technical Service to verify that the units to be used in parallel are appropriate for the planned load.



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**Figure 12 - Parallel Operation Connections**

## DERATING FOR ALTITUDE

All units are subject to derating for altitude and temperature; this will reduce the available power for operating tools and accessories connected to the receptacles. Typical reductions in performance are 2-4% for every 1000 ft (305 m) of elevation and 1% per 10°F (5.6°C) increase in ambient air temperature over 72°F (22°C).

## WET STACKING

The unit is powered by a diesel engine. Diesel engines are susceptible to wet stacking if lightly loaded. Wet stacking occurs when an engine is run at less than 30% of its full load capacity, causing unburned fuel to accumulate in the exhaust system. Wet stacking can be detected by continuous black exhaust when the unit is under a constant load. It can also cause fouling of injectors and buildup on engine valves. Diesel engines operate properly when applied loads are between 30% and 100% capacity. Appropriate generator sizing is determined by the anticipated load. If the unit is in a wet stack condition, load the unit heavily for five hours or until the exhaust is clear.

**Note:** If the unit has a 15% or less load for 10 minutes, “Wet Stacking Alarm” will pop up. The unit will still run but the controller will be inaccessible. The alarm needs to be acknowledged in order to allow the controller to be accessible again by pressing the Alarm Mute button.

## GENERATOR OUTPUT CONNECTIONS

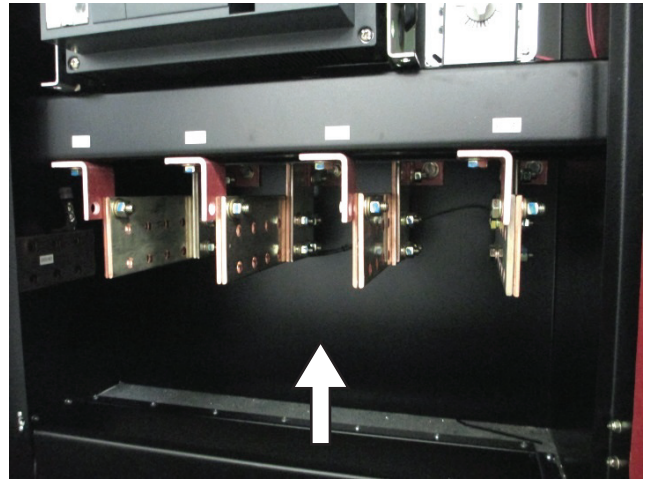
The unit is equipped with bus bars, located beneath the main circuit breaker on the right side of the unit. The bus bars provide connection points for attachment of external loads to the generator.

### ⚠ WARNING

**It is HIGHLY RECOMMENDED that only a trained and licensed electrician perform any wiring and related connections to the generator. Installation should be in compliance with the National Electrical Code (NEC), state and local regulations. Failure to follow proper installation requirements may result in equipment or property damage, personal injury, or death.**

**⚠ WARNING**

**Before any connections are made to the unit, make sure that the main circuit breaker is open and the battery disconnect switch is in the OFF position. Potentially lethal voltages may be present at the generator bus bars.**



01868

**Figure 13 - Cable Routing**

Connections to the bus bars can be made by opening the output connection box door and the swing-down access panel located beneath the container (under the output connection box door). Route the power cables up through the provided opening in the swing-down panel and through the opening in the bottom of the connection box. **DO NOT** make any connections directly to the bus bars without routing the cables through the slot.

The output connection box door is equipped with a safety interlock switch that will trip the main circuit breaker and disable the voltage regulator if the door is opened while the unit is operating.

**⚠ DANGER**

**NEVER ATTEMPT TO DISABLE OR MODIFY THE CONNECTION BOX DOOR SAFETY SWITCH. EQUIPMENT DAMAGE, PERSONAL INJURY, OR DEATH MAY RESULT.**

A ground connection is included (bus bar to far left). Installation of a ground should be in compliance with the National Electrical Code (NEC), state and local regulations.

**⚠ DANGER**

**IMPROPER OR INCORRECT CONNECTIONS TO A BUILDING'S ELECTRICAL SYSTEM CAN CAUSE POTENTIALLY LETHAL VOLTAGES TO BACKFEED INTO UTILITY LINES. THIS MAY RESULT IN INJURY OR ELECTROCUTION TO UTILITY WORKERS NEARBY. MAKE SURE THE GENERATOR IS SUPPLYING POWER TO AN ISOLATED OBJECT OR BUILDING THAT IS NOT CONNECTED TO ANY UTILITY LINES.**



## VOLTAGE REGULATOR

This unit is equipped with a Marathon DVR2000E+ Digital Voltage Regulator (DVR). The voltage regulator controls the output of the generator by regulating the current into the exciter field. The DVR is powered by a single phase permanent magnet generator (PMG). Refer to the Marathon DVR operating manual provided with this unit for more information.

The voltage regulator is adjusted before shipment from the factory. Contact Generac Mobile Products before attempting to adjust the voltage regulator.

## MAIN CIRCUIT BREAKER

The main circuit breaker is located to the right of the control panel (right side of the unit). When the breaker is in the open (O) position, power is interrupted between the bus connections and the generator. The input receptacles will continue to receive power, even when the main circuit breaker is closed.

Once connections have been made to the bus bars and the generator has been started and allowed to reach normal operating temperature, push the Gen-Set (⌚) button on the controller, which will switch the main circuit breaker to the close position.



01870

Figure 14 - Main Circuit Breaker

### ⚠ CAUTION

**DO NOT** use the buttons on the main circuit breaker to open or close the breaker. **ONLY** use the buttons on the controller. If the circuit breaker buttons are pressed, the unit will shutdown immediately. It is especially important to only use the controller when operating in a parallel configuration, as the controller will determine when the breaker can be opened and closed based on generator phase rotation and load levels.

The main circuit breaker will be tripped, disconnecting power to the bus connections, if any of the following conditions occur while the unit is running:

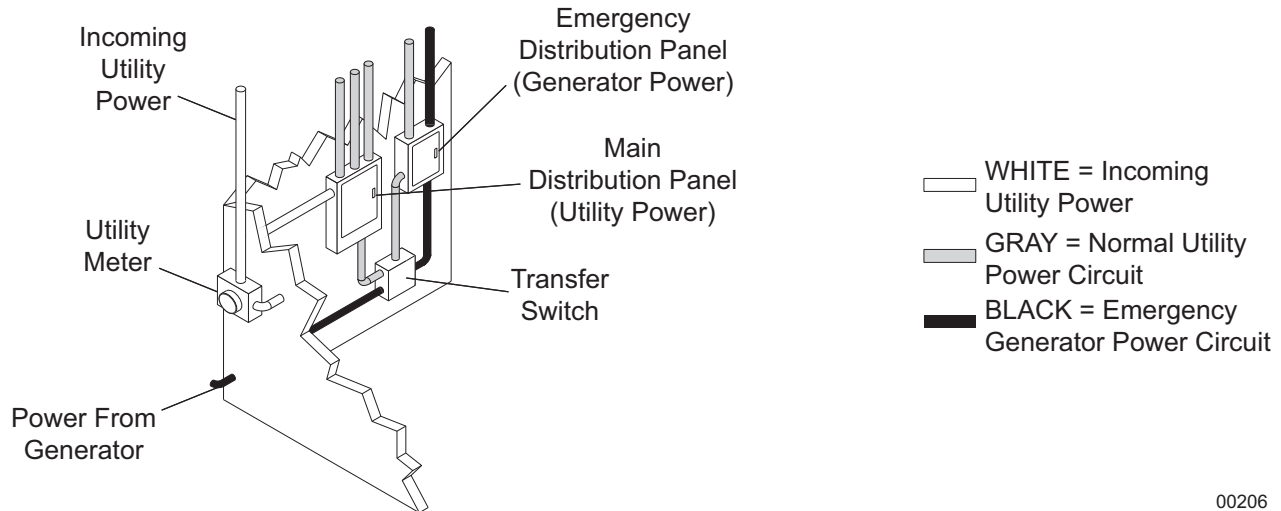
- Overload of the generator circuits to the bus connections. At 105% load, there will be an audible warning. At 110% load, the breaker opens and power will be disconnected.
- The customer connection box door is opened.
- If the emergency stop switch is activated.

Make sure that any problems that cause the main circuit breaker to trip are corrected before returning the switch to the close (I) position.

## TRANSFER SWITCH

When the unit is used as a standby power supply, it must be equipped with a transfer switch which isolates it from the utility's distribution system. A transfer switch is designed to transfer electrical loads from the normal power source (utility) to the emergency power source (generator) when normal voltage falls below a prescribed level. The transfer

switch automatically returns the load back to the normal source when power is restored back to operating levels.



00206

**Figure 15 - Transfer Switch Operation**

### **⚠ DANGER**

**FAILURE TO ISOLATE THE GENERATOR FROM THE NORMAL POWER UTILITY CAN CAUSE POTENTIALLY LETHAL VOLTAGE TO BACKFEED INTO THE UTILITY LINES. THIS MAY RESULT IN INJURY OR ELECTROCUTION OF UTILITY WORKERS NEARBY. MAKE SURE THE GENERATOR IS ISOLATED BY A TRANSFER SWITCH FROM ANY LOCAL UTILITY LINES. THIS ALSO APPLIES IF THE GENERATOR IS BEING USED AS A BACKUP TO SOME OTHER TYPE OF POWER SUPPLY.**

Installation of a transfer switch or other type of remote starting device is the responsibility of the user. Installation of such devices must be performed by following all directions supplied by the manufacturer of the switch. If attaching the unit to a power supply normally serviced by a utility company, notify the utility company and check state and local regulations. Familiarize yourself with all instructions and warning labels supplied with the switch.

### **⚠ WARNING**

**ONLY a licensed electrician should perform wiring and related connections to the generator. Installation should be in compliance with the National Electrical Code (NEC), state and local regulations. Failure to follow these procedures could result in property damage, personal injury or death. Before any connections are attempted, make sure the unit is shut down, the battery disconnect switch is in the OFF (O) position, and that the negative (-) battery cables are disconnected from the batteries.**

### **NOTICE**

When using the unit as a standby or substitute power supply, make sure the output voltage and phase rotation of the generator match those of the local power utility. Improper voltage or phase rotation may cause equipment damage or malfunction.

## **SHUTTING DOWN THE UNIT**

Prior to shutting down the unit, check with personnel using power supplied by the generator and let them know that the power is going to be turned off. Make sure the power shut down will not create any hazards by accidentally turning off equipment that needs to be kept on (pumps, compressors, lights, etc.).

1. Open the Main Circuit Breaker (MCB) by pushing the Gen-Set (⌚) button on the controller.

2. Allow the unit to cool down (running at no-load) for approximately five minutes to prevent damage to critical engine components.
3. Push the Stop (O) button on the controller.
4. Turn the battery disconnect switch to the OFF position.

**Note:** For extended storage time, disconnect the batteries. Refer to the engine operator's manual for extended storage requirements.

## EMERGENCY STOP SWITCH

The unit is equipped with one emergency stop switch on the control panel. Refer to [“Control Panel” on page 10](#). Activate the emergency stop switch by pushing the button in until it locks down. This will trip the main circuit breaker which will open the contact, disconnecting the load to the bus connections. This will also open the fuel circuit, shutting down the engine. The emergency stop fault will be displayed on the controller.

The switch will remain locked until it is pulled out.

### NOTICE

Use the emergency stop switch only when the unit must be shut down immediately. For any other shut down, refer to [“Shutting Down the Unit” on page 20](#).

Shut the engine down if any of the following conditions exist during operation:

1. Noticeable change in engine speed.
2. Loss of electrical output.
3. Equipment connected to the unit overheats.
4. Sparking occurs.
5. Engine misfires or there is excessive engine/generator vibration.
6. Protective covers are loose or missing.
7. If the ambient air temperature is above 120°F (49°C).

## TRANSPORTING THE UNIT

Do not move the unit with over 200 gallons (757 liters) of diesel fuel in the tank. Severe movement of the fuel can potentially damage the fuel tank or cause the tank to rupture. To determine fuel level, check the percentage on the controller.

1. Go to the Engine screen, using the left (◀) or right (▶) navigation buttons.
2. Push the up (▲) or down (▼) arrows until you get to Engine Fuel Level.
3. Tank should be at 15% or less for transporting.

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## Section 4 - Maintenance

Poorly maintained equipment can become a safety hazard. In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary. **NEVER** perform routine service (oil/filter changes, cleaning, etc.) unless all electrical components are shut off.

Before servicing the unit, read the Service Safety section of this operating manual. Follow the instructions listed below, before beginning any maintenance.

### SHUTTING DOWN AND RESTARTING THE GENERATOR

1. Ensure that power to the load can be interrupted (warn any equipment users that there will be a temporary power disruption). There may be other procedures that must be done before shutting a unit down, depending on the application.
2. Push the Gen-Set (⌚) button on the controller to open the Main Circuit Breaker (MCB).
3. Allow the unit to cool down (running at no-load) for approximately five minutes to prevent damage to critical engine components.
4. Push the Stop/Reset (O) button on the controller.
5. Turn the battery disconnect switch to the OFF position.
6. Perform the necessary maintenance checks or tasks (based on the hourly requirements).
7. When all checks or maintenance tasks have been completed, turn the battery disconnect to the ON position.
8. Push the Start (I) button on the controller.
9. When the unit is running, and all engine/generator parameters (voltage, frequency, coolant temp, oil pressure, etc.) have been verified as correct, push the Gen-Set (⌚) button on the controller to close the Main Circuit Breaker (MCB). The unit will accept and carry the load.
10. Make a last visual inspection of the unit to make sure it is operating properly.

### RAISING AND LOWERING THE STAIRS

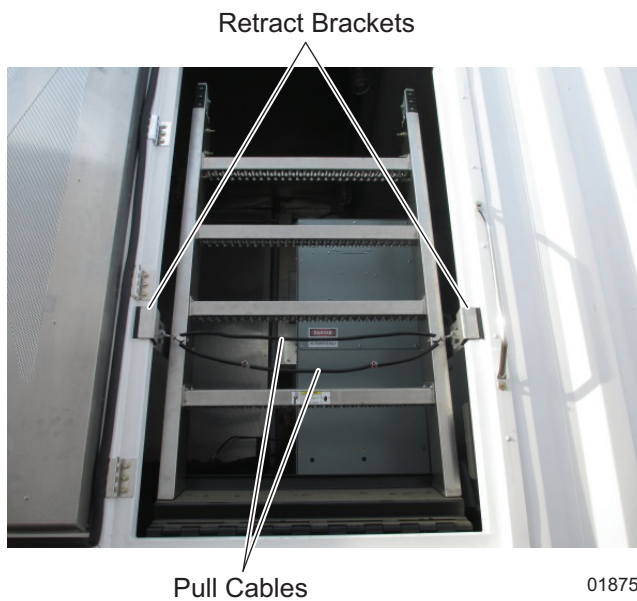
To access the unit for inspection or servicing, you will need to lower the stairs. There is one set on each side of the unit. The steps are heavy, so it is recommended that more than one person assist in raising and lowering the stairs.

#### Lowering the Stairs

1. Release the stairs from the side guides by grasping both cables and pulling toward you. Make sure you are adequately supporting the stairs as you begin to pull them down.

**⚠ WARNING**

The stairs are very heavy. Serious injury can result if the stairs are not supported properly or allowed to drop suddenly. It is recommended that more than one person raise and lower the stairs.



**Figure 16 - Lowering the Stairs**

2. After lowering the stairs, pull out the bottom tab on the side rail.



01876

**Figure 17 - Pull Tab Out**

3. Push down on the tab (may use your foot) to lower the stair foot to the desired height. Repeat for other side.

4. To release or reposition the stairs, push down on the top tabs until the feet are at the desired height.



01877

**Figure 18 - Push Down on Tab**

**Note:** The stair angle may need to be adjusted in order to close the door while the stairs are down.

## Raising the Stairs

1. Push the lower tab in.
2. Push down on the upper tab until the foot is fully retracted.
3. Repeat for other side.
4. Lift the stairs up and let the side brackets settle slowly into the side guards of the door. You may need to pull the cable to retract the side brackets so they engage properly.

### **⚠ CAUTION**

**DO NOT** let the stairs go beyond the door opening. The stairs can fall through and strike the equipment, causing damage.

## DAILY WALK AROUND INSPECTION

### **NOTICE**

Failure to perform a daily inspection may result in serious damage to the prime mover.

Look for conditions that could hinder performance or safety, such as (but not limited to) oil/coolant/fuel leakage, blocked vents, loose/missing hardware, and electrical connections.

Visually inspect the fan belt for cracks, fraying, stretching, and verify the belt is properly seated in the pulley grooves. Replace the belt according to the manufacturer's recommendations.

### **NOTICE**

Refer to the original equipment manufacturer's operating manual for a complete list of maintenance requirements. Failure to comply with the procedures as described in the engine operator's manual will nullify the warranty, decrease performance and cause equipment damage or premature equipment failure. Maintenance records may be required to complete a warranty request.



### Checking the Coolant Level

Refer to the engine operator's manual for coolant recommendations and proper mixture.

- Coolant can be checked visually through the coolant sight gauge, located near the top of the radiator.
- When engine is stopped and completely cool, coolant may be added directly to the radiator.

### Checking the Oil Level

This unit is equipped with an oil level indicator. The gauge is pre-set to the approximate oil level while the engine is in operation.

A sight gauge allows the operator to check the condition and level of the oil without shutting down the unit. With the engine running, the oil level should be approximately midway or above in the sight glass.

The oil level controller can also be wired so an alarm will sound if the float touches the high or low contacts. Refer to the installation instructions included with the unit for more information.

#### **⚠ CAUTION**

Perform all wiring connections with the battery disconnected. Observe all contact ratings and voltages.



01871

**Figure 19 - Oil Level Controller**

Refer to the engine operator's manual for the proper viscosity grade of oil, including special operating conditions such as a change in season or climate.

- **DO NOT** start the unit if oil is not visible in the oil level controller sight gauge or is below the add mark on the dipstick.
- Normal operating level is in the cross-hatch pattern between the full and add markings on the dipstick.
- Add oil only if the oil level is below the add mark on the bottom of the cross-hatch pattern on the dipstick. **DO NOT OVERFILL** the crankcase.

To check the engine oil using the dipstick:

1. Locate the engine oil dipstick. Refer to *"Component Locations" on page 8*.
2. The most accurate oil level readings are measured when the engine is cold. If the engine was running, wait at least 10 minutes before proceeding.
3. Remove the dipstick and wipe it dry with a clean, lint free cloth.
4. Slowly insert the clean dipstick into the tube. Visually confirm that the dipstick is fully seated in the dipstick tube. A visual inspection is required because some dipsticks will require more effort than others to fully seat.
5. After 10 seconds, remove the dipstick and look at the oil level on both sides. The lower of the two readings will be the correct oil level measurement.
6. Add oil (if necessary) to adjust the level. After adding or changing the oil, the engine should run for one minute before checking the oil level. Remember to wait 10 minutes to allow the engine to cool and oil to fully drain into the oil pan.



Typical causes of inaccurate oil level readings:

- Reading the high level of the dipstick.
- Reading the dipstick before the oil fully drains into the oil pan.
- Inserting and removing the dipstick too quickly.
- The dipstick is not fully seated in the dipstick tube.

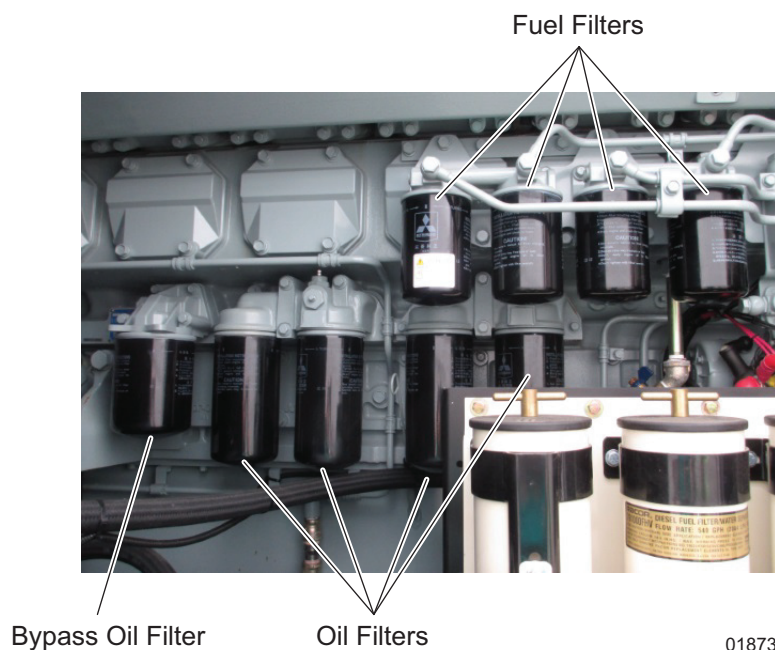
## Changing the Oil

Change the engine oil, oil filters and bypass oil filter at the same time. Checking or analyzing the oil properties is recommended when changing the engine oil.

### ⚠ CAUTION

Hot engine oil and parts may cause burns. Wear gloves when draining oil or changing the oil filters.

1. Ensure the oil drain valve is closed and remove the drain plug from the right side of the skid frame.
2. Attach a drain hose to the bung and route the hose into an approved container with sufficient capacity (refer to *"Specifications" on page 5*).
3. Ensure the oil level controller valve is open. Open the drain valve at the engine oil pan.
4. Allow the oil to drain completely into the container.
5. Clean around the oil filters.



**Figure 20 - Oil Filter Locations**

6. Using a filter wrench, remove the oil filters, one at a time.

**Note:** Check the filter elements for metal particles. If particles are found, contact the engine dealer.

7. Discard the filters and gaskets.
8. Thoroughly wipe off oil on the oil filter mounting surface with a cloth.

9. Before installing the new oil filters, lubricate the new gaskets with a thin film of clean engine oil.
10. Install the new oil filters, turning 3/4 to full turn after initial gasket contact.

### ⚠ CAUTION

Do not use a filter wrench to install the oil filter and bypass oil filter. Do not dent or scratch the oil filter surfaces.

11. Close the engine oil drain valve and reinstall the plug at the skid frame drain port.
12. Remove the cap from the oil fill port on the engine and add fresh oil. Refer to *“Specifications” on page 5* for oil capacities and *“Engine Oil Recommendations” on page 6* for oil type.
13. Check that the fuel level is between the Full and Add marks on the dipstick.
14. After running the unit, ensure the oil level is at the halfway mark or above in the oil level controller sight glass.

### ⚠ CAUTION

Dispose of waste oil in accordance with local regulations.

## MAINTENANCE SCHEDULE

Periodic inspection, service, and maintenance of this unit is critical in ensuring its reliable operation. The following is the manufacturer’s recommended maintenance schedule for a unit in “Regular Use”. (Refer to the engine manual for the definition of “Regular Use” and “Emergency Use” to determine the best maintenance schedule for your unit.) The maintenance items will need to be performed more frequently if the unit is used in severe applications (such as very high or very low ambient conditions or extremely dirty/dusty environments). Use the unit hour meter or calendar time, whichever occurs first, from the previous maintenance interval to determine the next required maintenance interval. Some checks are based on hours of operation.

Be sure to follow all applicable safety and caution statements found in the unit operating manual or engine service/maintenance manual before performing any maintenance checks or service.

This maintenance schedule reflects the minimum tasks that need to be accomplished to ensure that the unit remains operational. Some of the tasks can be performed by an authorized operator and others must be performed by a Authorized Service Dealer Technician.

**Note:** An authorized operator is one who has been trained by a Manufacturer Authorized Service Dealer in the proper operation and inspection of this unit.

Use the schedule in the following table as a guide for regular maintenance intervals. For additional maintenance information, refer to the engine operator’s manual.

**Table 1 - Basic Maintenance Schedule (Regular Use)**

Item	Daily	50 Hours	250 Hours	1000 Hours	2000 Hours
Check Oil Level	◆				
Check Coolant Level	◆				
Check Fuel Level	◆				
Check Tire Pressure	◆				
Check All Electrical Connections	◆				
Inspect Radiator Fins for Debris, Clean as Required	◆				
Service Battery - Inspect/Clean Battery Connections, Check Electrolyte Level	◆				

**Table 1 - Basic Maintenance Schedule (Regular Use)**

Item	Daily	50 Hours	250 Hours	1000 Hours	2000 Hours
Drain Fuel/Water Separator		◆			
Change Engine Oil and Replace All Oil Filters		◆**	◆		
Inspect and Adjust Valve Clearance			◆†		◆
Service Battery - Inspect/Clean Battery Connections, Check Electrolyte Level			◆		
Replace Fuel Filter Elements				◆	
Replace Fuel/Water Separator Element				◆	
Clean Gauze Filter				◆	
Replace Air Filter				◆	
Inspect and Adjust Belt and Belt Tension				◆	
Clean Fuel Tank					◆
Inspect and Adjust Fuel Injection Timing					◆
Inspect Fuel Pipe					◆
Inspect Oil Pipe					◆**
Check Movement of the Rack (during operation) of the Unit Injector (including the governor)					◆*

\* Requires special tools or large equipment. For the servicing of these items, contact Generac Mobile Products Technical Service.

\*\* Change the oil and oil filters after the first 50 hours, then every 250 hours.

† Inspect and adjust valve clearance after first 250 hours, then every 2000 hours.

**Table 2 - Extended Maintenance Schedule**

Item	3000 Hours	4000 Hours	8000 Hours	As Required
Replace Unit Injector Nozzle Tip (Check the spray condition and adjust the fuel injection pressure after replacement.)	◆*			
Overhaul Top End of Engine (Remove cylinder head, and inspect and service the combustion chambers.)		◆*		
Inspect Turbocharger		◆		
Inspect Damper		◆		
Inspect Starter		◆		
Replace Unit Seal and Oil Seal of Water Pump		◆*		
Check Coolant Concentration		◆*		
Overhaul Engine (refer to engine manual)			◆*	
Inspect and Test Unit Injector (replace if necessary)			◆*	
Inspect and Test Governor (replace if necessary)			◆*	
Repair and Replace Protection Devices (refer to engine manual)			◆*	
Check Auxiliary Devices Operation (refer to engine manual)			◆*	
Change Engine Coolant			◆**	
Bleed Air from Fuel System				◆
Check and Clean Radiator Fins				◆
Check, Clean, and Replace Air Cleaner Element				◆
Clean Inside Engine Breathers				◆*

**Table 2 - Extended Maintenance Schedule**

Item	3000 Hours	4000 Hours	8000 Hours	As Required
Inspect or Replace Stop Solenoid				◆*
Inspect or Replace Couplings				◆*
Inspect Vibration-Isolating Rubber				◆*

\* Requires special tools or large equipment. For the servicing of these items, contact Generac Mobile Products Technical Service.

\*\* Or every two years.

## FUEL/WATER FILTERING SYSTEM MAINTENANCE

### Draining the Fuel/Water Separators

Large articulates and water droplets, heavier than fuel, fall to the bottom of the collection bowl. Smaller water droplets bead up along and on the sides of the internal components and on the surface of the filter element. When heavy enough, they will fall into the bowl. When enough has collected, the bowls should be drained.



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**Figure 21 - Fuel/Water Separators**

1. Place a container under the drain cocks of the water separators.
2. Open the drain cocks and drain the water.
3. Close all the drain cocks.

### Replacing the Filter Element

Refer to the engine manual for instructions.

# Section 5 - Troubleshooting

## GENERAL TROUBLESHOOTING

Some of the more common problems are listed in the table below. This information is intended to be a check or verification that simple causes can be located and fixed. It does not cover all types of problems. Refer to the engine operator's manual for additional troubleshooting information. For controller fault finding, refer to the controller manual provided with this unit. Procedures that require in-depth knowledge or skills should be referred to a trained technician.

**Table 3 - General Troubleshooting Guide**

Problem	Possible Cause	Solution
Engine Cranks But Will Not Start		Refer to engine manual or contact Generac Mobile Products Technical Service.
Engine Will Not Crank (Electric Start)		Refer to engine manual or contact Generac Mobile Products Technical Service.
Engine Starts But Will Not Run Smoothly		Refer to engine manual or contact Generac Mobile Products Technical Service.
Engine Overheats		Refer to engine manual or contact Generac Mobile Products Technical Service.
No Output Voltage	Circuit breaker tripped or failed	Reset or replace circuit breaker.
	Internal failure of alternator	Check electrical connections.
High Output Voltage	Excessive speed	Verify engine RPM. Check AVR adjustment.
Low Output Voltage	Incorrect speed	Verify engine RPM. Check AVR adjustment.
Electrical Shock When Frame Is Touched	Static charge	Ground unit frame at local reference ground.
	Grounded armature or field coil.	Contact Generac Mobile Products Technical Service.
Mechanical Noise	Internal failure of alternator	Contact Generac Mobile Products Technical Service.
	Loose flexplate	Tighten flexplate to flywheel and alternator shaft.
	Engine fan or belts issues	Contact Generac Mobile Products Technical Service.
Low Fuel Level Shut-down	Low fuel level	Check fuel level in LCD window of controller.
	Unit not level	Confirm that unit is sitting level to ensure an accurate reading.
	Fuel tank leaking	Check tank for leaks.
	Damaged fuel sender or wiring	Check for continuity between sender and engine controller. (Refer to DC wiring diagram.)
Low Oil Pressure Shut-down	Low oil level	Check oil level on dipstick. Add oil, if needed.
	Oil leaking from engine	Visually inspect the engine for leaks. Restart unit and verify loss of pressure. Shut down immediately if pressure does not reach 5 psi (34 kPa) within five seconds.
	Oil pressure sender	Refer to engine operator's manual to identify corrective action.

**Table 3 - General Troubleshooting Guide**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Low Coolant Level Shutdown	Low coolant level	Allow engine to cool, then check coolant level in radiator. Add coolant, if needed.
	Coolant hoses leaking	Inspect hoses for leaks. Repair or replace as necessary.
	Engine block or water pump leaking	Visually inspect for leaks. Check engine oil to verify no coolant has mixed with the oil (oil will appear milky). Refer to engine operator's manual for additional information.
High Coolant Temperature Shutdown	Low coolant level	Add coolant if needed. Allow engine to cool, then check coolant level in radiator. Restart engine and check coolant temperature (on controller). Stop engine immediately if coolant temperature is 210°F (99°C) or more.
	Blockage in radiator	Check radiator shroud and ducting for blockage and remove any foreign matter.
	Leakage in coolant hoses, engine block, or water pump	Inspect for visible leaks. Check tension of water pump serpentine drive belt. Remove load on generator and restart engine. Check coolant temperature and shut engine down immediately if it starts to overheat. Refer to the engine operator's manual for additional information on engine overheating.
Overcrank Shutdown	Fuel level low	Check fuel level in tank. Check fuel pump operation. Check air filter for blockage. Refer to engine operator's manual for additional information.
Overspeed or Under-speed Shutdown	Frequency setting incorrect	Disconnect all loads and restart unit. Read frequency (Hz) in the LCD window on controller. Frequency should read 60 Hz. If frequency is above 60 Hz, engine speed will need to be adjusted. Refer to the engine operator's manual for throttle adjustment information.

## Service Log

OIL GRADE: \_\_\_\_\_ BRAND: \_\_\_\_\_

COOLANT MIXTURE: \_\_\_\_\_ BRAND: \_\_\_\_\_

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## Notes

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