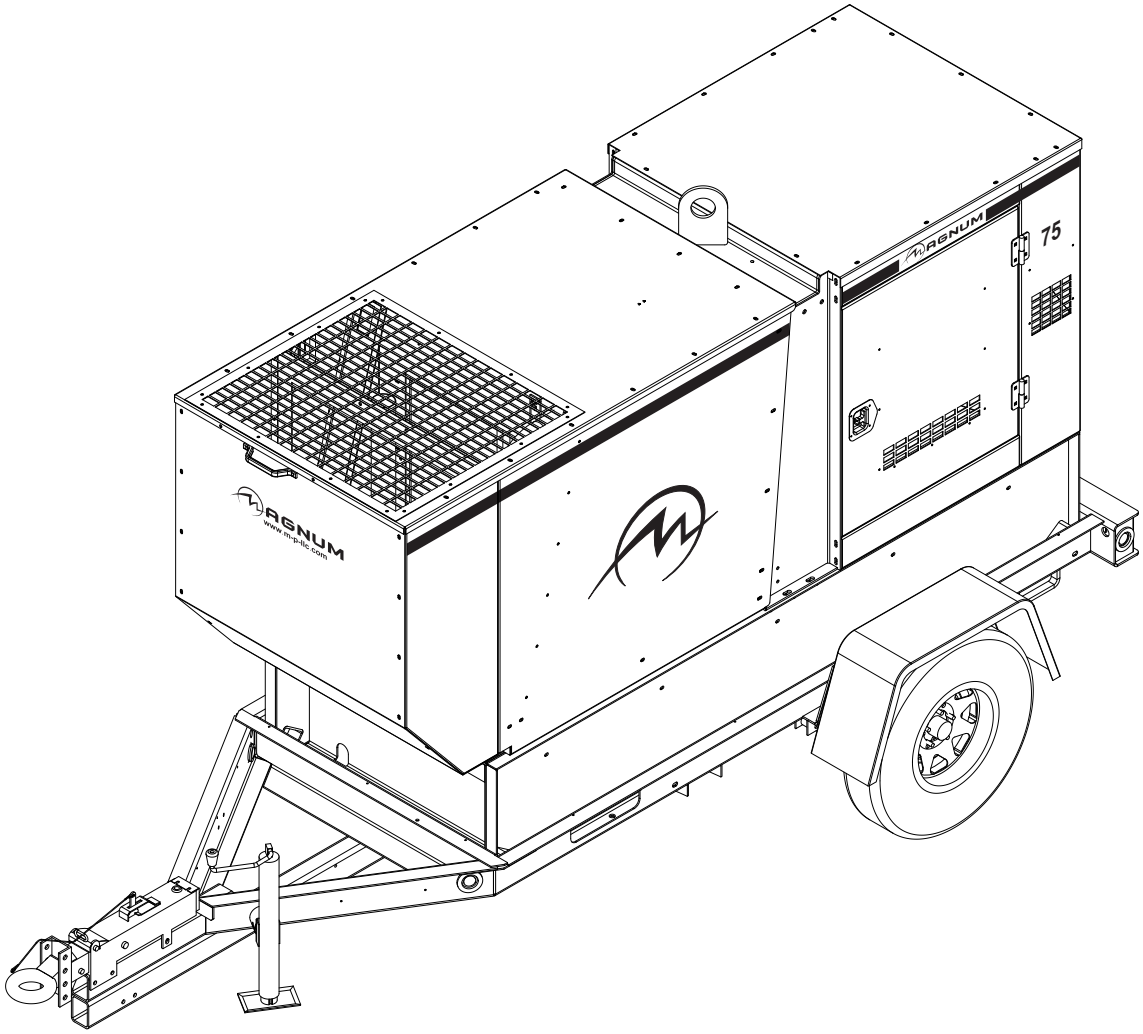
MAGNUM™

POWER PRODUCTS LLC

DIESEL GENERATOR
MMG75D • MMG100D

With ***Power Zone***™ Controller



OPERATING MANUAL

Parts manuals available online! www.m-p-llc.com

INTRODUCTION

This manual provides information and procedures to safely operate and maintain the Magnum Power Products LLC 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 Magnum Power Products LLC, or can be found at **www.m-p-llc.com**.*The information contained in this manual was based on machines in production at the time of publication. Magnum Power Products LLC 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 which it was designed for.

Magnum Power Products LLC 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 codes and Occupational Safety and Health Association (OSHA) guidelines.

MAGNUM POWER PRODUCTS LLC

215 Power Drive • Berlin, WI 54923
U.S.A.
Phone: 920-361-4442
FAX: 920-361-4416
Toll Free: 1-800-926-9768
www.m-p-llc.com

For technical or parts QUESTIONS, please contact the Magnum Power Products LLC 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 Magnum Power Products LLC 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: _____

⚠ 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.

TABLE OF CONTENTS

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 reader's 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, could 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 generator, 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 generator. The following points should be practiced at all times:

- The area immediately surrounding the generator should be dry, clean, and free of debris.
- **NEVER** start a unit in need of repair.
- Make certain the generator is securely fastened to a good earthen ground before use.
- **NEVER** operate the unit on a combustible surface.
- **NEVER** operate the generator 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 generator 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).
- Make sure slings, chains, hooks, ramps, jacks, and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the equipment safely. Always remain aware of the position of other people around you when lifting the equipment.
- **NEVER** operate unit while tired, distracted, or under the influence of drugs or alcohol.

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 unit when it was shipped from the factory.

- **DO NOT** run engine indoors or in an area with poor ventilation. Diesel engine exhaust contains carbon monoxide, a deadly, odorless and colorless gas which, if inhaled, can cause nausea, fainting or death. Only use this unit outside and away from windows, doors, and ventilation equipment.
- **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.
- **DO NOT** touch or lean against hot exhaust pipes or engine cylinders.
- **DO NOT** clean air filter with gasoline or other types of low flash point solvents.
- **DO NOT** remove engine coolant cap while engine is hot.
- **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.
- Keep hands, feet and loose clothing away from moving parts on the generator and engine.
- Keep area around exhaust pipes and air ducts free of debris to reduce the chance of an accidental fire.
- 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.

ELECTRICAL SAFETY

The unit is powered by a generator driven by a diesel engine. While the engine is running, potentially lethal voltages are present at the 120V Ground Fault Circuit Interrupt (GFCI) receptacles and the 240V twist-lock recpetacles located on the control panel, and at the connection lugs and optional cam lock receptacles. Failure to follow the safety guidelines described below could result in severe injury or death.

- Only a qualified and licensed electrician should make connections to the generator.
- **NEVER** wash the unit with high pressure hoses or power washers.
- **NEVER** start the unit under load. The circuit breakers must be in the “OFF/O” position when starting the unit in MANUAL mode. The circuit breakers can be in the “ON/I” position only when started in the AUTO mode. A transfer switch must be used in the AUTO mode to deflect the load upon start up.
- **ALWAYS** disconnect the negative (-) battery cable from the corresponding terminal before performing any service on the engine, generator, or any other components. Remove the negative (-) battery cable from the corresponding terminal if the unit is to be stored or transported.
- **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.
- **ALWAYS** connect the unit to a good earthen ground before use. Follow all local, state or United States National Electrical Code (NEC) guidelines.

TOWING SAFETY

Towing a trailer requires care. Both the trailer and vehicle must be in good condition and securely fastened to each other to reduce the possibility of an accident. Also, some states require that large trailers be registered and licensed. Contact your local Department of Transportation office to check on license requirements for your particular unit.

- Check that the hitch and coupling on the towing vehicle are rated equal to, or greater than, the trailer's Gross Vehicle Weight Rating (GVWR).
- Check tires on trailer for tread wear, inflation, and condition.
- **NEVER** tow trailer using defective parts. Inspect the hitch and coupling for wear or damage.
- Make sure the trailer hitch and the coupling are compatible. Make sure the coupling is securely fastened to the vehicle.
- Connect safety chains in a crossing pattern under the tongue and **ATTACH THE BREAKAWAY CABLE TO THE REAR BUMPER OF THE TOWING VEHICLE.** Do not attach the cable to the trailer hitch.
- Make sure directional and brake lights on the trailer are connected and working properly.
- Check that lug nuts holding wheels are tight and that none are missing.
- Maximum recommended speed for highway towing is 45 mph (72 km/h). Recommended off-road towing speed is not to exceed 10 mph (16 km/h) or less, depending on terrain.

Before towing the trailer, check that the weight of the trailer is equal across all tires. On trailers with adjustable height hitches, adjust the angle of the trailer tongue to keep the trailer as level as possible. On units equipped with a tandem axle trailer, a large angle between the trailer and tow vehicle will cause more weight to be carried by one axle, which could cause premature wear on the tires and axles and cause potentially unsafe operating conditions.

The trailer is equipped with hydraulic surge brakes or electric surge brakes. Check the operation of the brakes by braking the vehicle at a slow speed before entering traffic. Both the trailer and the vehicle should brake smoothly. If the trailer seems to be pushing, check the level in the surge brake fluid reservoir.

When towing, maintain extra space between vehicles and avoid soft shoulders, curbs and sudden lane changes. If you have not pulled a trailer before, practice turning, stopping, and backing up in an area away from heavy traffic.

A film of grease on the coupler will extend coupler life and eliminate squeaking. Wipe the coupler clean and apply fresh grease each time the trailer is towed.

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 Magnum Power 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 Magnum Power Products LLC.

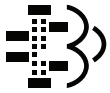
To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-888-327-4236 (TTY:1-800-424-9153), go to http://www.safercar.gov; or write to:

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.

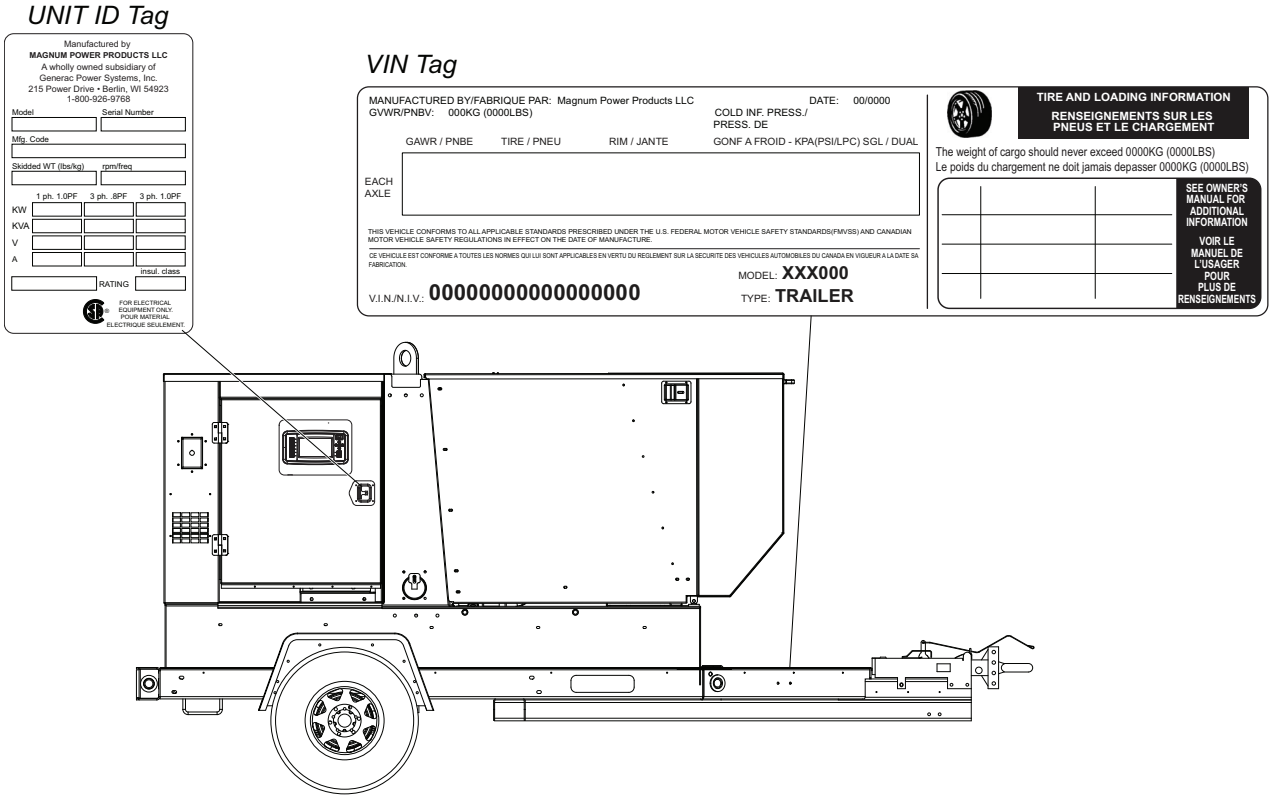
SAFETY SYMBOL SUMMARY

This equipment has been supplied with numerous safety and operating decals. These decals provide important operating instructions and warn of dangers and hazards. Replace any missing or hard-to-read decals and use care when washing or cleaning the unit. Decal placement and part numbers can be found in the parts manual. Below is a summary of the intended meanings for the symbols used on the decals.

	Safety alert symbol; used to alert you to potential personal injury hazards.		Asphyxiation hazard; operate in well ventilated area.
	Hot surface(s) nearby.		Dangerous voltage may be present.
	Belt/entanglement hazard; keep body parts clear of this area.		Anchor/tie down point.
	Fan hazard; keep body parts clear of this area.		Isolate generator to prevent electrocution hazard.
	Never change switch position while engine is running.		Use clean diesel fuel only.
	Stop engine before making connections.		Remove negative battery cable before performing any service on unit.
	Stop engine before fueling.		Read and understand the supplied operator's manual before operating unit.
	Hearing protection required while operating unit with doors open.		Unit electrical ground.
	Lift here only.		Fire/explosion hazard; keep open flames away from unit.
	Engine running.		Burn/scald hazard; pressurized steam.
	Auto Exhaust Filter Cleaning enabled.		Auto Exhaust Filter Cleaning disabled.
	Manual/Service Regeneration activation.		

UNIT SERIAL NUMBER LOCATIONS

Refer to the illustration to locate the unit ID tag and Vehicle Identification Number (VIN) tag on the unit. Important information, such as the unit serial number, model number, VIN and tire loading information are found on these tags. Record the information from these tags so it is available if the tags are lost or damaged. When ordering parts or requesting assistance, you may be asked to provide this information.



SPECIFICATIONS - MMG75D

MAGNUM MODEL	MMG75D	MMG75D Super Start
Engine		
Make/Brand	John Deere	John Deere
Model	PE4045HFG92	PE4045HFG92
Horsepower - prime **hp (kW)**	97 (72)	97 (72)
Horsepower - standby **hp (kW)**	107 (80)	107(80)
Operating Speed **rpm**	1800	1800
Displacement **in³ (L)**	274 (4.5)	274 (4.5)
Cylinders - qty	4	4
Fuel Consumption - 100% prime **gph (Lph)**	4.78 (18.1)	4.78 (18.1)
Battery Type	Group 24	Group 24
Battery Voltage (Quantity per Unit)	12V (1)	12V (1)
Battery Rating	720 CCA	720 CCA
Generator		
Make/Brand	Marathon Electric	Marathon Electric
Model	361PSL1602 (1647)	363PSL1607 (1661)
Type, Insulation	Brushless, H	Brushless, H
Generator Set (Engine/Generator)		
3Ø - Standby **kW (kVA)**	69 (86)	70 (88)
Amps - 3Ø Standby **480V (208V) A**	103 (239)	106 (244)
3Ø - Prime **kW (kVA)**	62 (77)	63 (79)
Amps - 3Ø Prime **480V (208V) A**	93 (214)	95 (219)
1Ø - Standby **kW (kVA)**	60 (60)	66 (66)
Amps - 1Ø Standby - **240V A**	250	275
1Ø - Prime **kW (kVA)**	56 (56)	60 (60)
Amps - 1Ø Prime - **240V A**	233	250
Frequency **Hz**	60	60
Power Factor	1 (1Ø), 0.8 (3Ø)	1 (1Ø), 0.8 (3Ø)
Weights		
Dry Weight, Skid Mounted **lbs (kg)**	3530 (1600)	3860 (1750)
Operating Weight, Skid Mounted **lbs (kg)**	4700 (2131)	5040 (2286)
Dry Weight, Trailer Mounted* **lbs (kg)**	4240 (1923)	4570 (2073)
Operating Weight, Trailer Mounted* **lbs (kg)**	5410 (2454)	5750 (2608)
*Standard trailer only. Consult factory for custom trailer weights.		
Capacities		
Fuel Tank Volume **gal (L)**	165 (625)	165 (625)
Usable Fuel Volume **gal (L)**	151 (572)	151 (572)
Coolant (incl. engine) **qt (L)**	22.0 (20.8)	22.0 (20.8)
Oil (incl. filter) **qt (L)**	15.5 (14.7)	15.5 (14.7)
Maximum Run Time **hrs**	31	31
AC Distribution		
Circuit Breaker Size	300	300
Voltage Selection	3 Position Switch (lockable)	3 Position Switch (lockable)
Voltage Regulation	+/- 1%	+/- 1%
Voltages Available 1Ø	120, 139, 208, 220, 240, 277	120, 139, 208, 220, 240, 277
Voltages Available 3Ø	208, 220, 440, 480	208, 220, 440, 480
Trailer		
Number of Axles	1	1
Capacity - Axle Rating **lbs (kg)**	6000 (2722)	6000 (2722)
Tire Size **in**	15	15
Brakes	Surge	Surge
Hitch - Standard	3" Ring	3" Ring
Maximum Tire Pressure **psi**	65	65

Specifications are subject to change without notice.

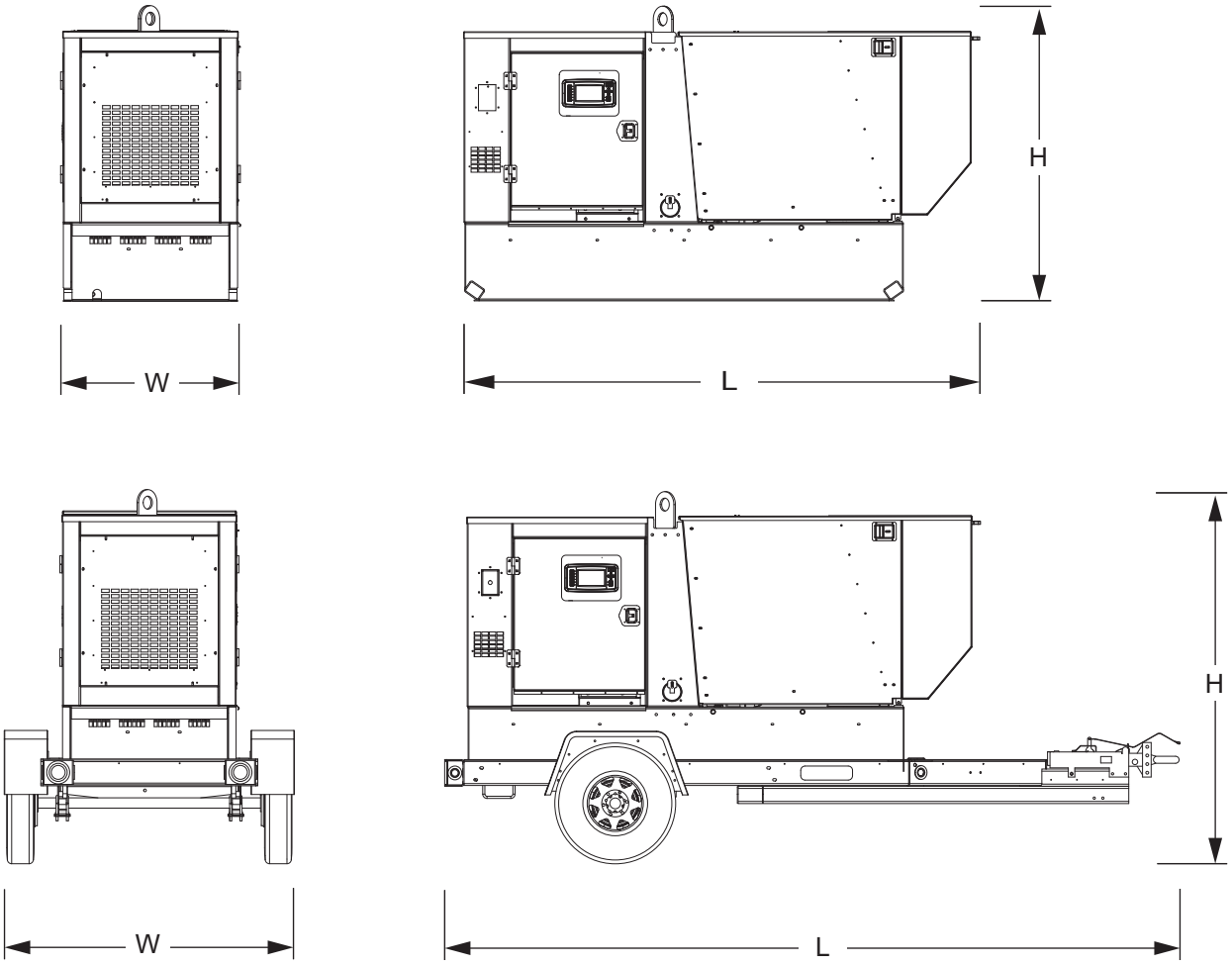
SPECIFICATIONS - MMG100D

MAGNUM MODEL	MMG100D	MMG100D Super Start
Engine		
Make/Brand	John Deere	John Deere
Model	PE4045HFG92	PE4045HFG92
Horsepower - prime **hp (kW)**	121 (90)	121 (90)
Horsepower - standby **hp (kW)**	133 (99)	133 (99)
Operating Speed **rpm**	1800	1800
Displacement **in³ (L)**	275 (4.5)	275 (4.5)
Cylinders - qty	4	4
Fuel Consumption - 100% prime **gph (Lph)**	6.2 (23.5)	6.2 (23.5)
Battery Type	Group 24	Group 24
Battery Voltage (Quantity per Unit)	12V (1)	12V (1)
Battery Rating	720 CCA	720 CCA
Generator		
Make/Brand	Marathon Electric	Marathon Electric
Model	362PSL1606 (1650)	363PSL1607 (1661)
Type, Insulation	Brushless, H	Brushless, H
Generator Set (Engine/Generator)		
3Ø - Standby **kW (kVA)**	86 (107)	88 (110)
Amps - 3Ø Standby **480V (208V) A**	129 (297)	132 (305)
3Ø - Prime **kW (kVA)**	78 (98)	80 (100)
Amps - 3Ø Prime **480V (208V) A**	118 (272)	120 (278)
1Ø - Standby **kW (kVA)**	75 (75)	78 (78)
Amps - 1Ø Standby - **240V A**	313	325
1Ø - Prime **kW (kVA)**	71 (71)	72 (72)
Amps - 1Ø Prime - **240V A**	296	300
Frequency **Hz**	60	60
Power Factor	1 (1Ø), 0.8 (3Ø)	1 (1Ø), 0.8 (3Ø)
Weights		
Dry Weight, Skid Mounted **lbs (kg)**	3780 (1714)	3930 (1782)
Operating Weight, Skid Mounted **lbs (kg)**	4740 (2150)	4890 (2218)
Dry Weight, Trailer Mounted* **lbs (kg)**	4480 (2032)	4630 (2100)
Operating Weight, Trailer Mounted* **lbs (kg)**	5440 (2467)	5590 (2535)
*Standard trailer only. Consult factory for custom trailer weights.		
Capacities		
Fuel Tank Volume **gal (L)**	165 (625)	165 (625)
Usable Fuel Volume **gal (L)**	151 (572)	151 (572)
Coolant (incl. engine) **qt (L)**	22.0 (20.8)	22.0 (20.8)
Oil (incl. filter) **qt (L)**	15.5 (14.7)	15.5 (14.7)
Maximum Run Time **hrs**	24	24
AC Distribution		
Circuit Breaker Size	400	400
Voltage Selection	3 Position Switch (lockable)	3 Position Switch (lockable)
Voltage Regulation	+/- 1%	+/- 1%
Voltages Available 1Ø	120, 139, 208, 220, 240, 277	120, 139, 208, 220, 240, 277
Voltages Available 3Ø	208, 220, 440, 480	208, 220, 440, 480
Trailer		
Number of Axles	1	1
Capacity - Axle Rating **lbs (kg)**	6000 (2722)	6000 (2722)
Tire Size **in**	15	15
Brakes	Surge	Surge
Hitch - Standard	3" Ring	3" Ring
Maximum Tire Pressure **psi**	65	65

Specifications are subject to change without notice.

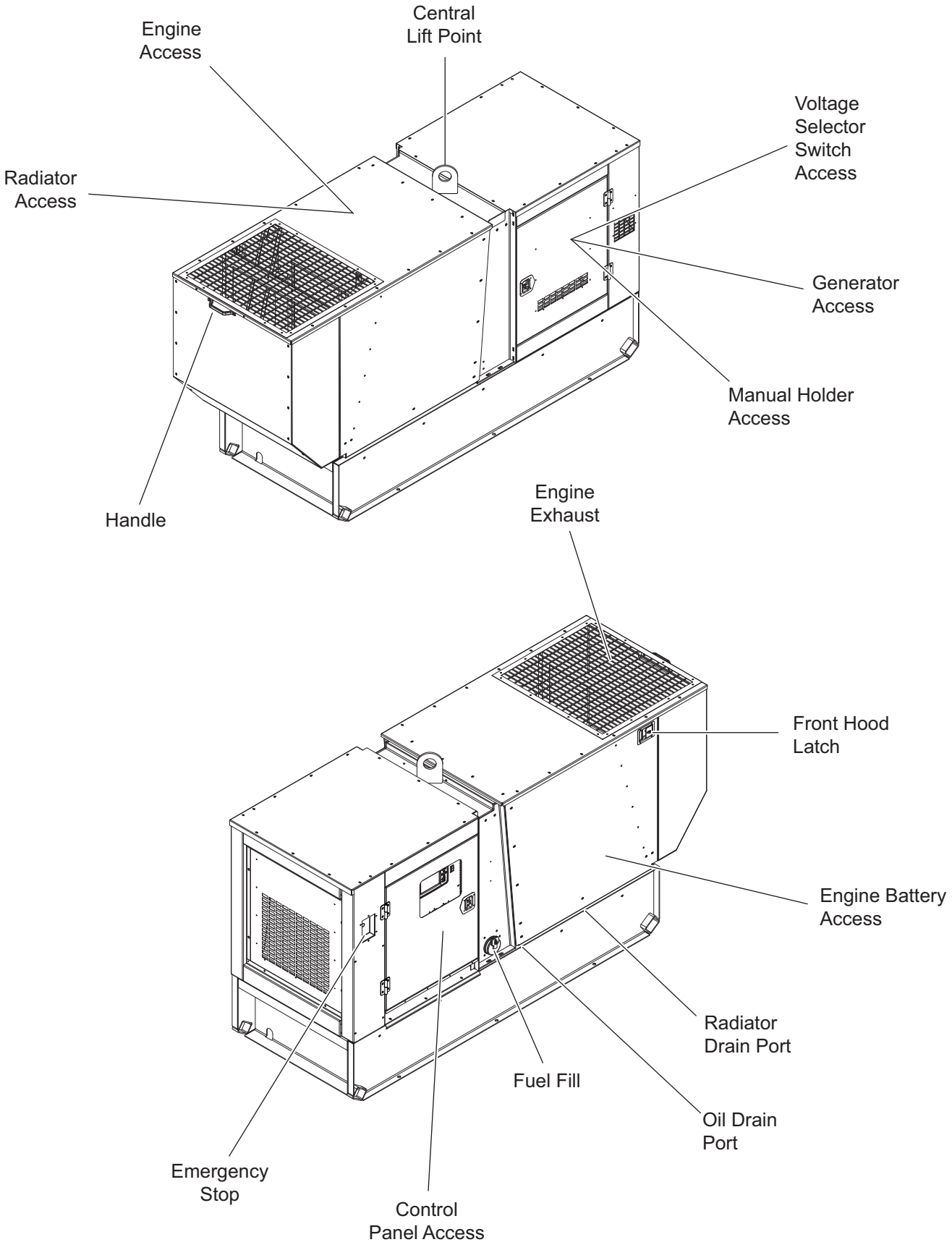
UNIT DIMENSIONS

MAGNUM MODEL	MMG75D/100D
Dimensions (L x W x H)	
Skid Mounted **in (m)**	119 x 40 x 62 (3.02 x 1.02 x 1.57)
Trailer Mounted **in (m)**	170 x 69 x 80 (4.32 x 1.75 x 2.03)

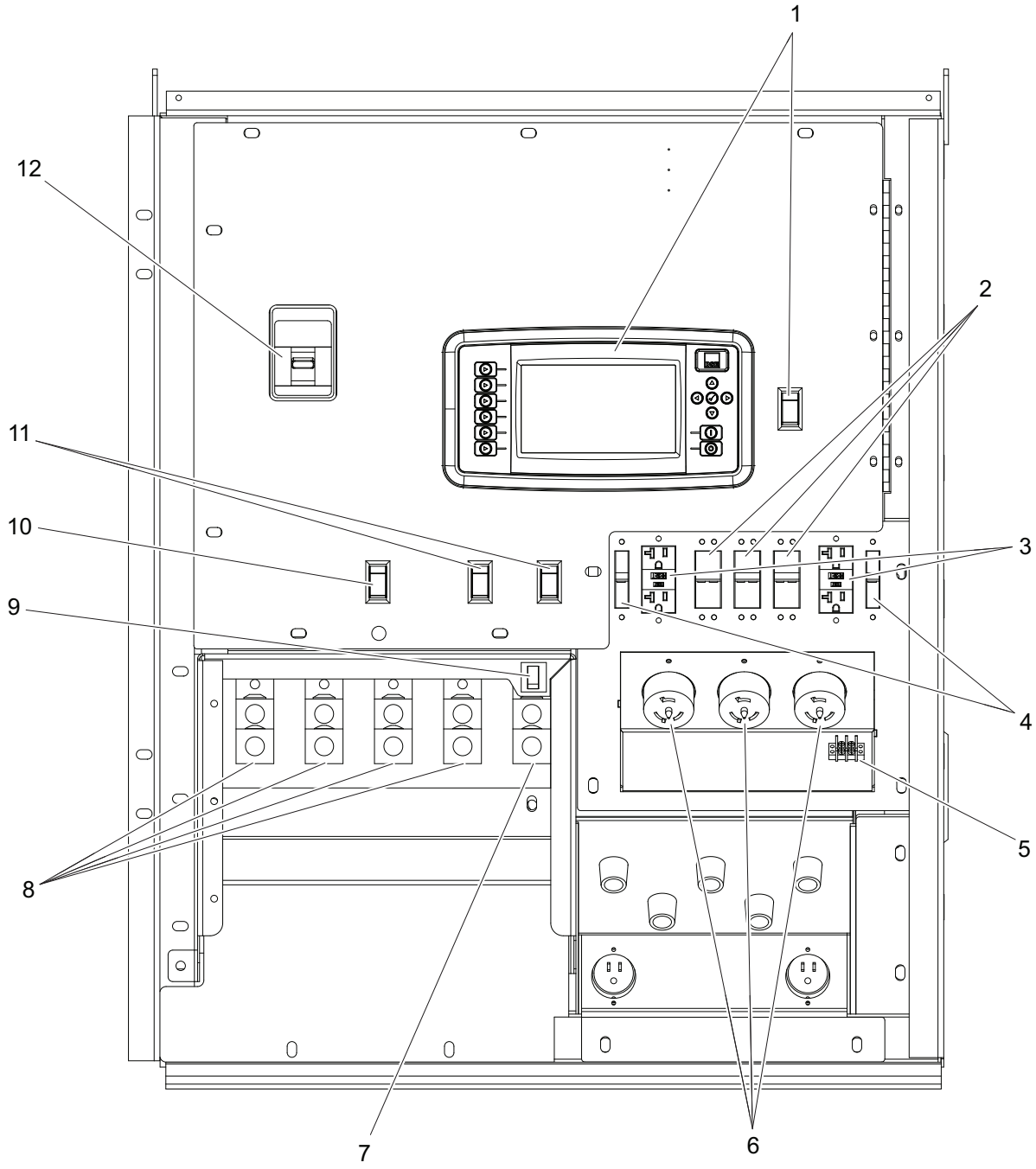


Specifications are subject to change without notice.

COMPONENT LOCATIONS



MAIN CONTROL PANEL FEATURES, STANDARD



1. **POWER ZONE™ CONTROLLER:** Refer to *page 16* for additional information.

2. **50A CIRCUIT BREAKERS (3):** Circuit breakters for the 120/240V twist-lock receptacles.

3. **120V GFCI DUPLEX RECEPTACLES (2):** Receptacles for additional equipment that may require Ground Fault Circuit Interrupt (GFCI) protection.

4. **20A CIRCUIT BREAKERS (2):** Circuit breakters for the 120V GFCI receptacles.

5. **REMOTE START TERMINAL BLOCK:** Used to connect the generator to a dry-contact closure switch for remote starting of the generator.

6. **120/240V TWIST-LOCK RECEPTACLES (3):** These receptacles are used for connecting additional loads or equipment to the generator in 240 and 208 voltage selections only.

7. **GENERATOR GROUND CONNECTION LUG:** This lug is for connecting a good earthen ground per local, state or National Electrical Code (NEC) guidelines before starting the generator.

8. **GENERATOR OUTPUT CONNECTION LUGS:** These lugs allow appropriate loads to be wired directly to the generator.

9. **DOOR SAFETY SWITCHES:** The connection lug door is equipped with safety interlock switches that will trip the main circuit breaker and disable the voltage regulator if the door is opened while the unit is operating.

10. **DIESEL EXHAUST FILTER CLEANING SWITCH:** This switch toggles between enabling and disabling the auto exhaust cleaning feature and entering manual regeneration. Refer to *page 29* for more information on diesel exhaust filter cleaning operation.

11. **AUXILLIARY LIGHT SWITCHES (OPTIONAL):** These switches operate the control panel and interior lights.

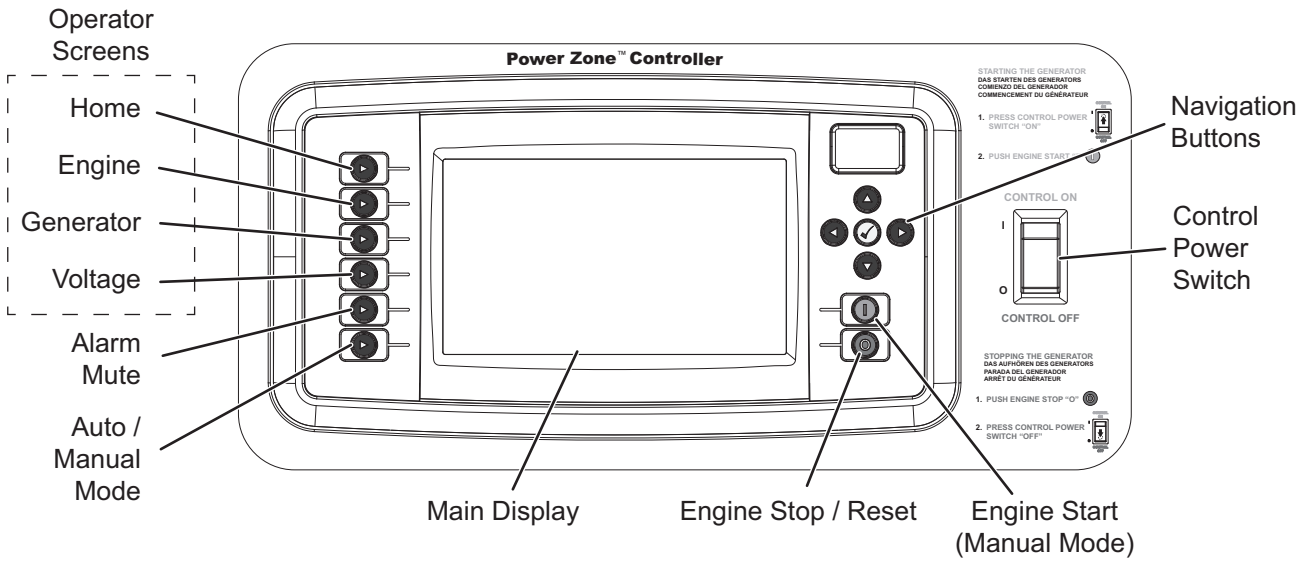
12. **MAIN CIRCUIT BREAKER:** This breaker will disconnect power to the connection lugs (items 8-9). It **WILL NOT** disconnect power to the receptacles when the engine is running.

POWER ZONE™ CONTROLLER

The Power Zone™ controller is an auto start controller that monitors the unit and indicates operational status and fault conditions. The controller can be programmed to automatically start or stop on based time schedule, fault condition, or load demand.

The controller constantly monitors vital generator and engine functions for a number of preprogrammed alarm and fault conditions. When a fault condition occurs, the engine can be shut down automatically and the main display will show the fault that caused the shut down; to resume operation, the fault condition must be resolved.

This controller also records a history of unit performance which may be viewed at any time and will not be lost when the controller is powered down.



CONTROLLER FEATURES AND FUNCTIONS

OPERATOR SCREENS

Refer to *"Operator Screens" on page 17* for more information.

ALARM MUTE

The Alarm Mute button silences the audible alarm. Additional action will be required to fully disable the active alarm.

AUTO/MANUAL MODE

The Auto/Manual mode button is used to change the startup and shutdown modes of the unit. When pressed once, the unit enters "Manual Mode" and when pressed and held for five seconds, the unit enters "Auto Mode". If in "Auto Mode", pressing once will return the unit to "Manual Mode".

NAVIGATION BUTTONS

These buttons are used to navigate and interact with the Power Zone™ controller screens. Pressing any directional arrow ("▲", "►", "▼", "◄") while on any of the Operator screens will open the Maintenance screens, and navigate the tabs and pages within the Maintenance screens. The Enter "✓" button is used to select menus, confirm alarms, and confirm altered settings.

CONTROL POWER SWITCH

Use this switch to start up and shut down the Power Zone™ controller. This switch should not be turned off when the unit is running.

ENGINE START

Pressing the Engine Start “I” button while the controller is in “Manual Mode” will start the unit, provided there are no shutdown errors, and the engine satisfies the start status. If the controller is in “Auto Mode”, the engine start button has no effect.

ENGINE STOP/RESET

Pressing the Engine Stop/Reset “O” button will shut down the unit and put the controller into Stop Mode, whether in “Manual Mode” or “Auto Mode”.

⚠ CAUTION

In case of an emergency, always press the Emergency Stop switch located on the side of the unit to stop the engine immediately. The Engine Stop/Reset “O” button may delay the engine shutdown if stop faults exist.

NOTICE

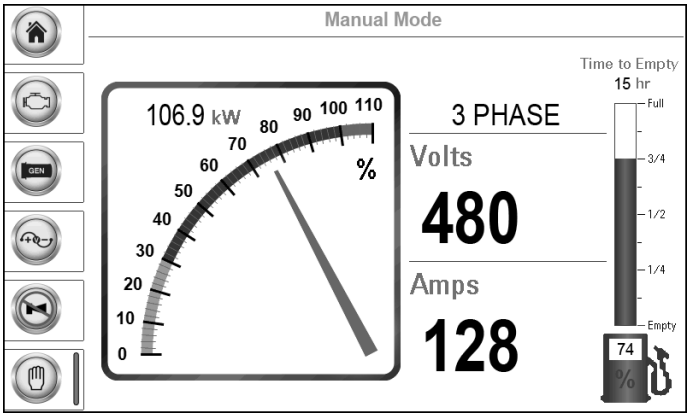
To prevent damage to the generator and connected equipment, remove all loads from the generator by opening all circuit breakers (turn to “OFF/O”) before pressing the Engine Stop/ Reset “O” button.

OPERATOR SCREENS

The Operator screens display the most relevant and critical information an operator will need to properly configure and utilize a unit. From these four screens the operator can access engine, generator and power transmission information necessary to operate the unit under normal conditions.

HOME SCREEN

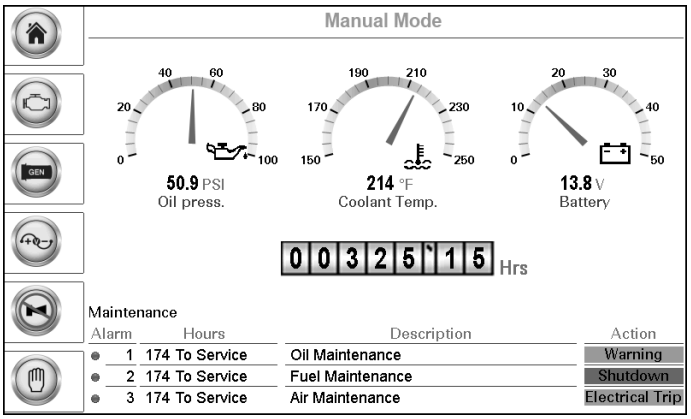
The Home screen is the default screen of the controller and will display after the controller is powered up and the unit management software is loaded. It displays a live readout of the kW meter, percent of load used (gauge), selected phase, volts and amps being produced by the generator, and the fuel level with time until empty. The controller will automatically return to this screen from any other screen after a period of inactivity.



ENGINE SCREEN

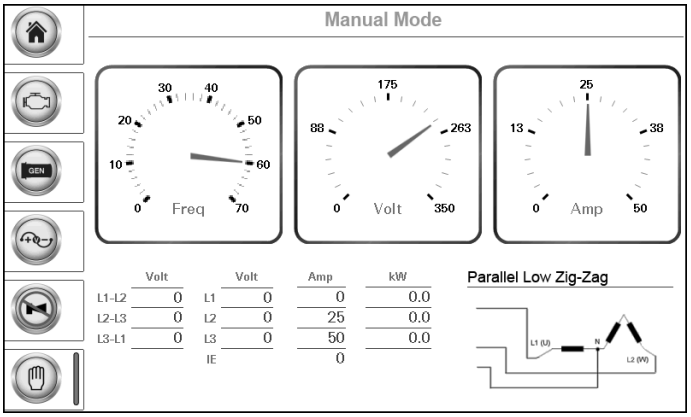
The Engine screen displays the oil pressure, coolant temperature and battery voltage on three main gauges. Below the gauges is an hour gauge displaying the total run time on the engine. This screen also displays maintenance

alarm status with the time remaining (black text) or the time past (red text) a scheduled maintenance tasks.



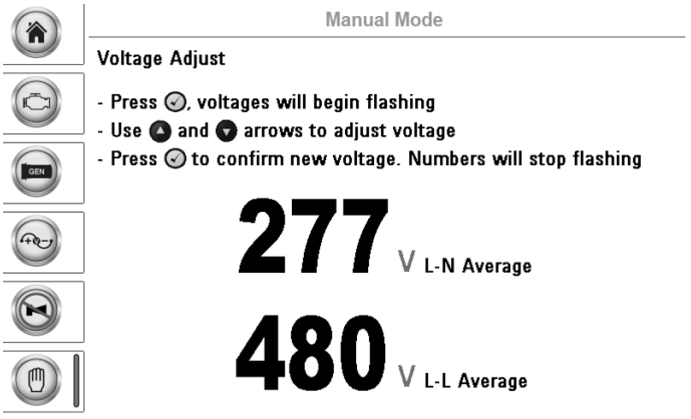
GENERATOR SCREEN

The Generator screen displays the average voltage frequency, volts and amps from the generator, as well as line-to-line voltage, and individual line-to-neutral voltage, amperage and power (kW). This screen also displays the generator winding configuration set by the voltage selector switch in the lower right corner.



VOLTAGE ADJUST SCREEN

The Voltage Adjust screen displays the line-to-neutral and line-to-line voltage averages. The operator can electronically adjust the voltage within limits to prevent under-voltage or over-voltage conditions using the on-screen instructions. This feature replaces a traditional potentiometer. Refer to *"Fine Voltage Adjustment" on page 24* for more information.



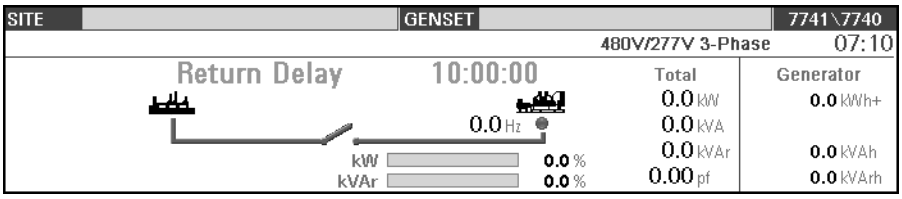
MAINTENANCE SCREENS

All of the data inputs from the engine, generator, inputs/outputs, schedule and Power Zone™ controller are visible on the Maintenance screens.

The information displayed on the Maintenance screens can be used to identify, diagnose and troubleshoot unit shutdown conditions and poor unit performance. The Maintenance screens can be accessed from any Operator screen by pressing any directional arrow (”▲”, ”►”, ”▼”, “◄”).

GENERATOR SUMMARY

The Generator Summary can be found at the top of all Maintenance screens and provides an overview of the system.

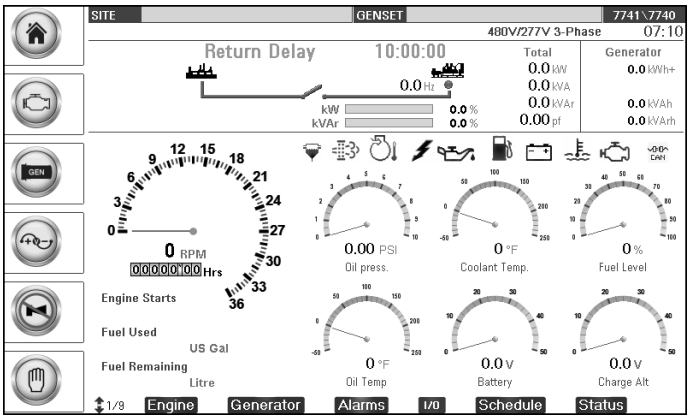


The bottom of the screens have a list of available tabs, with the currently displayed tab highlighted in blue. To the left of the tabs, the current/available pages are displayed. Whenever a new tab is selected, the current page will always be page 1.

ENGINE TAB

The “Engine” tab contains maintenance and instrumentation data gathered from the engine itself.

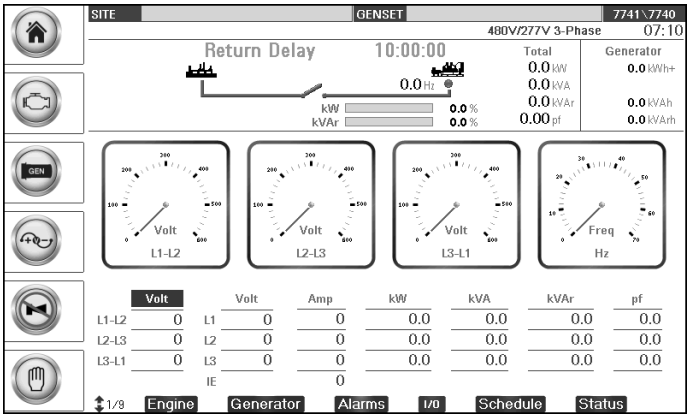
Note: *The content may change depending upon the selected engine and the features supported by the engine.*



GENERATOR TAB

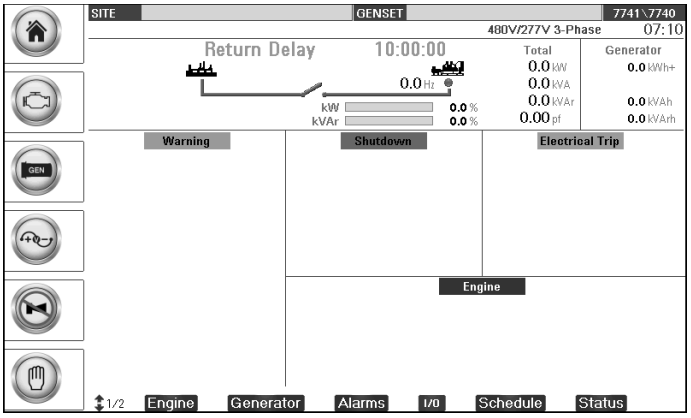
The “Generator” tab contains maintenance and instrumentation data gathered from the generator and electrical sensing components within the unit.

Note: *The content may change depending upon the selected generator and the features supported by the generator.*



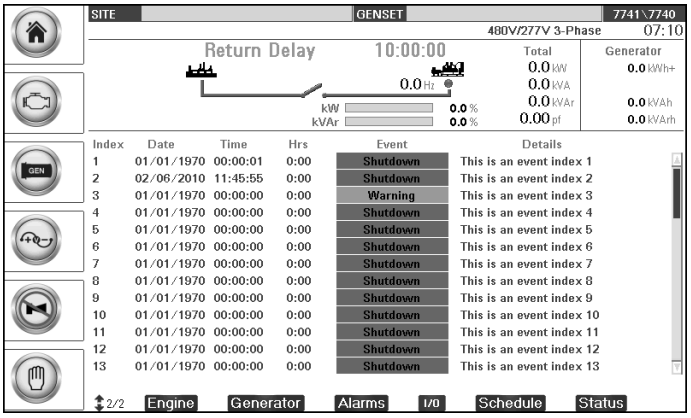
ALARMS TAB

The “Alarms” tab display any warnings, electrical trip and shutdown alarms and any engine Diagnostic Trouble Codes (DTC) that are occurring or have occurred previously. The first page on the “Alarms” tab displays the alarms that are currently active. They are organized by alarm type.



Alarm Level	Color - Background/Text	Graphic
Warning	Yellow/Black	Warning
Electrical Trip	Purple/Black	Electrical Trip
Shutdown	Red/Black	Shutdown
ECU Code	Blue/White	Engine

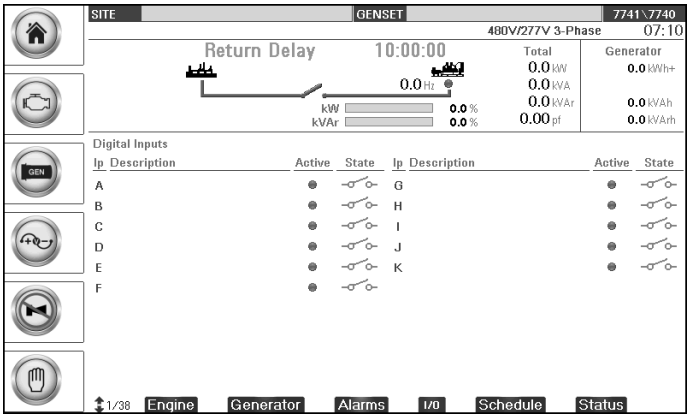
The second page of the “Alarms” tab shows the event log with a list of events including normal operation events and alarm notifications with the most recent events at the top of the list. All indexed events include the date and time of the event, hours of runtime on the engine when it occurred, along with the event name or alarm type and details.



To scroll down within the event log, press the Enter “✓” button. The scroll bar will change to blue, signifying it is active. Press the “▲” or “▼” buttons to scroll up or down in the event log. When finished, press the Enter “✓” button again.

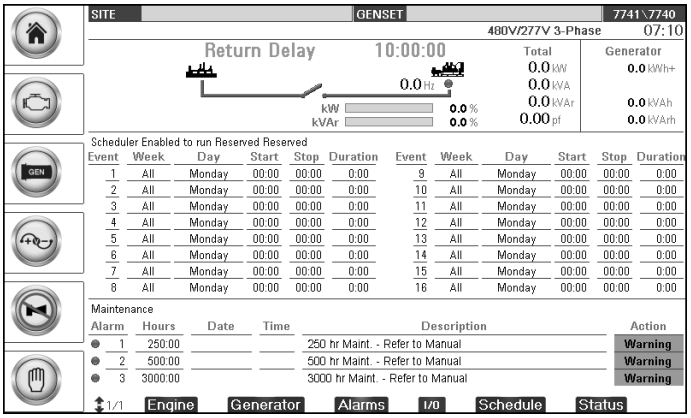
INPUT/OUTPUT TAB

The Input/Output (“I/O”) tab shows a list of digital inputs and outputs connected to the controller, whether they are active and the current state of the input.



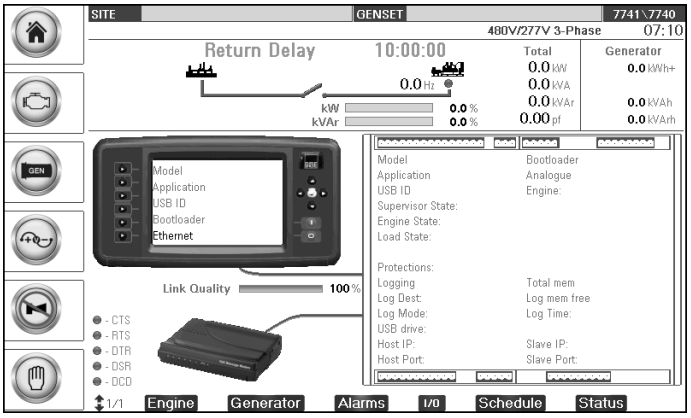
SCHEDULE TAB

The “Schedule” tab shows the current configuration and status of the scheduler, as well as maintenance configuration status and time remaining until an alarm, electrical trip or shutdown will occur.



STATUS TAB

The “Status” tab contains the status and configuration of the controller, firmware and data connections.



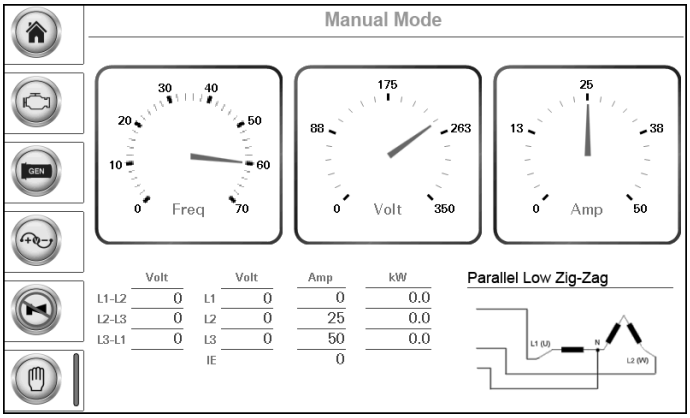
GENERATOR MONITORING

Generator information is displayed on both the Generator screen and “Generator” tab within the Maintenance screens.

GENERATOR SCREEN

The Generator screen displays the average voltage frequency, volts and amps from the generator, as well as line-to-line voltage, and individual line-to-neutral voltage, amperage and power (kW). This screen also displays the current voltage selector switch current setting.

Note: *When loading the generator, it is important to observe the amperage to determine the load balance on each line of the generator. Minor load unbalances, usually ten percent or less, will not cause any particular problems. Every effort should be made to distribute the load equally between all lines.*



- **Freq**: Displays the output frequency in Hertz (Hz). Normal operating frequency is 60 Hz.
- **Volts**: Displays the nominal voltage in Volts (V).
- **Amps**: Displays the AC output amperage produced by the generator in Amps (A).

Additional information can be found on the electric power table at the bottom-left side of the screen. This provides an overview of all three lines and average voltage and amperage readouts.

GENERATOR TAB - MAINTENANCE SCREENS

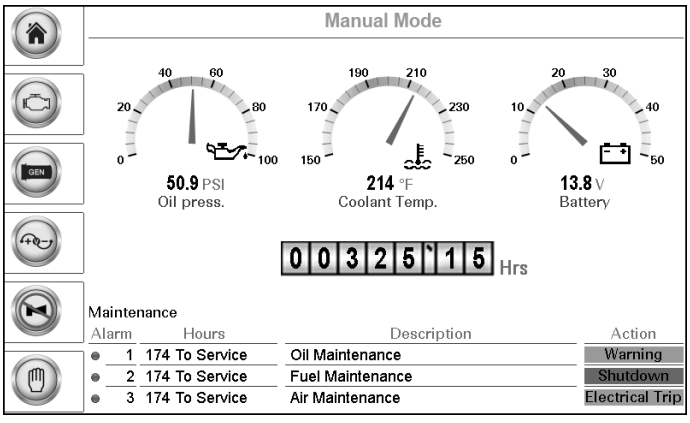
Additional generator information can be viewed on the Maintenance screens by pressing the left or right arrow and highlighting the “Generator” tab. Refer to *“Maintenance Screens” on page 18* for more information.

ENGINE MONITORING

Engine information is displayed on both the Engine screen and “Engine” tab within the Maintenance screens.

ENGINE OPERATOR SCREEN

The Engine Operator screen displays the oil pressure, coolant temperature and battery voltage from the engine on the three main gauges. Total run time is displayed below the three main gauges on the hour meter and the maintenance configuration status at the bottom of the screen.



The maintenance configuration status displays upcoming maintenance procedures in black text, and past due

maintenance in red text. A description of the maintenance procedure and the action that will take place when the timer trips the alarm.

Note: *If the measured value is outside the range of a gauge, the needle will not be displayed. The digital value below the gauge will still show the measured value.*

- **Oil Press:** Displays engine oil pressure. Current coolant temperature is displayed directly below the gauge at all times. The gauge registers oil pressure between 0-100 psi (10-689 kPa). Normal operating pressure is between 35-80 psi (241-552 kPa).
- **Coolant Temp**: Displays engine coolant temperature. Current coolant temperature is displayed directly below the gauge at all times. The gauge displays coolant temperature between 150°-250°F (66°-121°C). Normal operating temperature of the unit is between 180°-200°F (82°-93°C) with an average ambient air temperature of 70°F (21°C).
- **Battery**: Displays the engine battery voltage. Current battery voltage is displayed directly below the gauge at all times. The gauge displays battery voltage between 0-50V. A normal reading is 12-14V on 12 volt systems and 24-26V on 24 volt systems (with the engine running).

ENGINE TAB - MAINTENANCE SCREENS

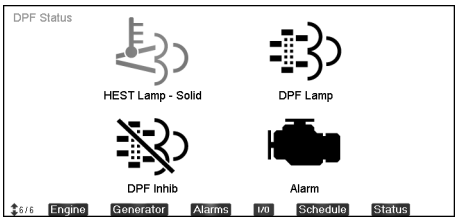
Additional engine information can be viewed on the Maintenance screens by pressing the left or right arrow and highlighting the “Engine” tab. Refer to *“Maintenance Screens” on page 18* for more information.

DIESEL EXHAUST FILTER MONITORING

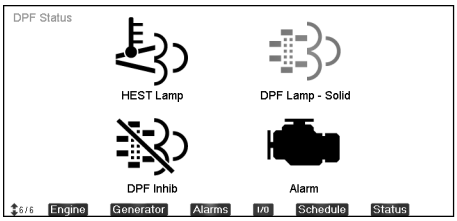
This unit is equipped with a Diesel Particulate Filter (DPF) to meet current EPA emissions standards. This section gives an explanation of the indicators that are displayed on the “DPF Status” screen on the Power Zone™ controller. Diesel particulate filter information can be found on the “Engine” tab within the Maintenance screens.

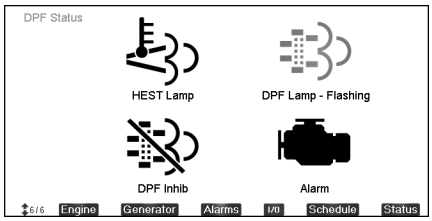
To access the DPF Status page, press any direction arrow (“▲”, “►”, “▼”, “◄”) to enter the Maintenance screens, and then press the “▼” directional arrow on the “Engine” tab to toggle through pages until the “DPF Status” page appears. There are four areas on the “DPF Status” screen that communicate various information to the operator. The areas and indicators that appear in those areas are explained here:

- **HEST Lamp (High Exhaust System Temperature):** This area will display the Regeneration Underway indicator above the words “HEST Lamp - Solid” when the unit is in the process of diesel exhaust filter regeneration. During the regeneration process, the exhaust temperature will be very high.

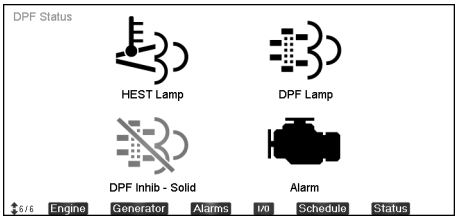


- **DPF Lamp:** This area will display the Regeneration indicator above the words “DPF Lamp - Solid” when auto exhaust filter cleaning is enabled. When the unit is being operated with auto exhaust filter cleaning disabled, the indicator will begin to flash above the words “DPF Lamp -Flashing” if the soot load level goes above 80%.

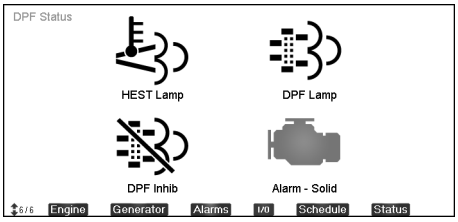




- **DPF Inhib:** This area will display the Disabled Regeneration indicator above the words “DPF Inhib - Solid” when auto exhaust filter cleaning is disabled.



- **Alarm:** This area will display the Engine Alarm indicator above the words “Alarm - Solid” when an alarm condition occurs. This area displays different text depending upon which alarm condition occurs.



For more information on the operation of auto exhaust filter regeneration and service regeneration, refer to *“Exhaust Filter Cleaning Operations” on page 29*.

WET STACKING

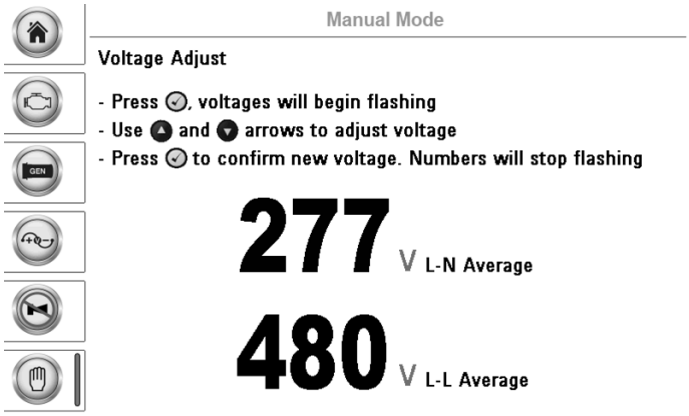
The unit is powered by a diesel engine. Diesel engines are susceptible to wet stacking if lightly loaded. Wet stacking occurs when an engine is run at less than 30% of its full load capacity, causing unburned fuel to accumulate in the exhaust system. Wet stacking can be detected by continuous black exhaust 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.

Wet stacking in the exhaust system is less likely to occur in iT4-certified engines because of regeneration of the Diesel Particulate Filter (DPF). During the regeneration process, exhaust temperatures are increased to burn off accumulated particulate, and in the process also removes any un-burned diesel fuel or engine oil in the exhaust system. Wet stacking may still be present in the engine due to low cylinder temperatures.

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.*

FINE VOLTAGE ADJUSTMENT

Adjustment of the output voltage from the generator is necessary to provide the correct voltage to the end of the power line. Voltage adjustment can be carried out at any time on the “Voltage Adjust” screen.



1. With the unit running, press the “Voltage Adjust” screen button.

2. Press the Enter “✓” button. The voltages displayed will begin flashing.

3. Use the up and down directional arrows “▲”, “▼” to adjust the voltage.

4. Press the Enter “✓” button to confirm the new voltage. The voltages displayed will stop flashing.

PRESTART CHECKLIST

Before starting the generator, carefully read the prestart checklist. Make sure that all of the items are checked before trying to start the generator. This checklist applies to both manual and remote starting of the generator.

- ❒ Read and understand **ALL** safety sections at the beginning of this manual.
- ❒ Make sure the control power switch is in the “CONTROL OFF/O” position.
- ❒ Make sure the circuit breakers are switched “OFF/O”.
- ❒ Check that the generator is properly grounded to a good earthen ground per local and NEC regulations.
- ❒ Check all electrical connections at the connection lugs. Are they wired correctly?
- ❒ Are the connection lugs tight?
- ❒ Check the voltage selector switch and make sure that it is set to the desired voltage.
- ❒ Is the voltage selector switch locked?
- ❒ Is the generator sitting level?
- ❒ Thoroughly check for any water inside, on, or near the generator. Dry the unit before starting.
- ❒ Check oil, coolant, and fuel levels and engine battery connections.
- ❒ Check the engine fan belt tension and condition.
- ❒ Check the engine fan belt guard.
- ❒ Check the engine exhaust system for loose or rusted components.
- ❒ Check the radiator and surrounding shroud for debris.
- ❒ Are any of the generator covers loose or missing?
- ❒ Are all preventive maintenance procedures up to date?
- ❒ Check that the battery disconnect switch is in the “ON” position, if equipped.

ENGINE BREAK-IN REQUIREMENTS

Note: *During the first 20 hours of operation, avoid long periods of no load or sustained maximum load operation. If the generator is to run for longer than five minutes without a load, shut the generator down.*

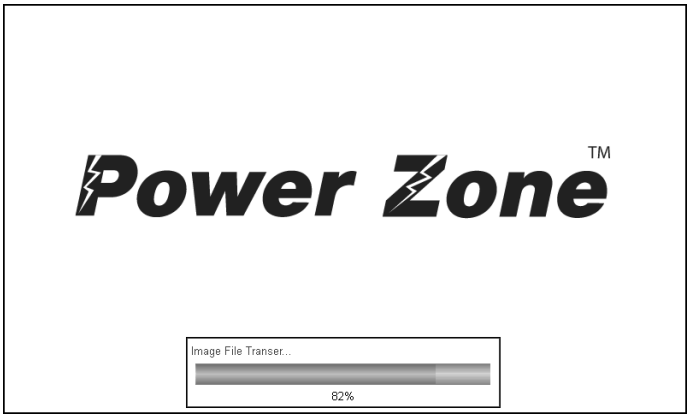
John Deere engines are supplied with engine break-in oil from the factory. Extra care during the first 100 hours of engine operation will result in better performance and longer engine life. DO NOT exceed 100 hours of operation with the break-in oil. Operate the engine at heavy loads (60-90% of maximum) as much as possible. If the engine has spent significant time at idle, constant speeds and/or light load or if makeup oil is required, a longer break-in period may be needed. Consult the engine operator’s manual for a full description of necessary procedures on the addition of break-in oil and extension of the break-in period. Use the schedule table above as a guide for regular maintenance intervals.

MANUAL STARTING OF THE GENERATOR

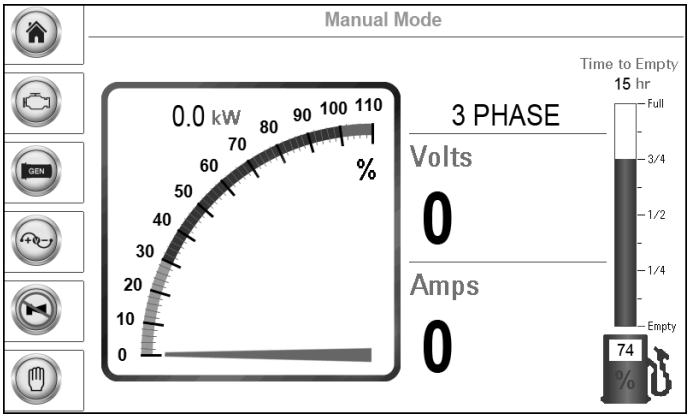
All generators equipped with the Power Zone™ controller will initially start up in “Manual Mode”. This provides the operator the ability to start the generator as soon as the controller is powered up. Use the following procedure to start the generator in “Manual Mode”:

1. Move the control power switch to the “CONTROL ON/I” position.

2. The main display will show the prestart diagnosis and the controller will load the unit management software.



3. When the software is loaded, the Home screen will be displayed and the controller will be in “Manual Mode” as indicated at the top of the screen.



Note: *The controller can be started from any screen when it is in “Manual Mode.”*

4. Press the green Engine Start “I” button on the controller. The controller will initiate the startup procedure and start the engine, provided there are no engine faults preventing the unit from starting.

Note: *It may take a few seconds for the engine to run smoothly and reach its governed operating speed. During this time, the display will show a voltage different from that set with the voltage selector switch.*

5. If the engine does not start after the first cranking attempt, the engine will pause for 15 seconds to allow the starter to cool. The main display will show “Manual Mode - Crank Rest.” The engine will make two more attempts to start for a total of three crank cycles.

6. Should the engine not start and run within three starting cycles, the main display will show the “Fail to Start” alarm. The starting sequence may be repeated after the starter has had a minimum of two minutes to cool. Press the Enter “✓” button to clear the alarm and reset the controller.

Note: *The engine controller may skip the preheat engine steps on some of the larger models.*

7. Once the engine starts, it will immediately begin speeding up to a constant 1800 rpm. The engine may hunt or change speeds until operating speed is reached. After a few minutes of operation, the engine will be warmed up and the Operator screens will show engine and generator operating parameters.

8. Check the generator for excessive noise or vibration and any coolant, oil, or fuel leaks before applying any loads.

9. Check that the AC output voltage is correct. The output voltage can be fine adjusted by using the Voltage Adjust screen as described on *page 18*.

10. Check that the frequency (Hz) is correct on the Generator screen. With no loads connected to the generator, the frequency should read approximately 60 Hz, depending on the type of engine governing used.

11. If all wiring connections have been made correctly, switch the main circuit breaker to the “ON/I” position and then add any loads attached to the receptacles by switching the respective circuit breaker to the “ON/I” position. You will notice a slight change in engine sound when a load is applied to the unit.

AUTOMATICALLY STARTING THE GENERATOR

The Power Zone™ controller is capable of starting and stopping the unit automatically, based on a programmable schedule.

Generators installed in a standby application should be exercised regularly to maintain operating condition and to ensure responsiveness in an emergency situation. Use the following procedures to operate the generator in “Auto Mode”:

ACCESSING THE CONFIGURATION MENU

1. With the unit stopped, navigate to the Maintenance screens by pressing any directional arrow (“▲”, “►”, “▼”, “◄”) from any of the Operator screens.

2. While on any Maintenance screen, press the Enter “✓” button and the Engine Stop/Reset “O” button simultaneously. The controller will display the Configuration Menu.

3. To save any changes and exit the Configuration Menu, press and hold the Enter “✓” button for five seconds. To cancel any changes and return to the Maintenance screen, press and hold the Engine Stop/Reset “O” button for five seconds.

SET THE CONTROLLER CLOCK

The schedule runs based off the time set in the controller clock. Use the following procedure to set the controller clock BEFORE setting the schedule:

1. Navigate to the “Maintenance” group and access it by pressing the right arrow “►”.

2. Select the “Time” section by pressing the right arrow “►”.

3. Set the time and date to the correct local time.

SET THE SCHEDULE

1. Access the “Scheduler” group by pressing the right arrow “►”.

The “Scheduler” group is made up of the “Scheduler Options” and “Scheduler Setup” sections. Each section can be accessed and exited using the right “►” and left “◄” arrows.

2. Access the “Scheduler Options” section. Within this section, the scheduler can be enabled, run mode selected, and load mode selected.

Item	Values
Enable	Yes/No
Run Mode	Monthly/Weekly
Load	Idle, In Island, On Load, Off Load

3. Access the “Scheduler Setup” section. Within this section, each schedule entry can be modified by pressing the Enter “✓” button to select the item and the up “▲” and down “▼” arrows to define them.

Item	Values
Schedule Entry	1-16
Start Time	00:00-23:59
Duration	00:00-99:59
Day	Monday-Sunday
Week (of month)	First, Second, Third, Fourth

Note: *The controller must be in “Auto Mode” to run at the programmed time. Use a trickle or solar battery charger to prevent the controller from draining the battery while in “Auto Mode.”*

SET THE UNIT TO AUTO MODE

1. From any Operator or Maintenance screen, press and hold the Auto/Manual Mode button for five seconds, or until the “AUTO” icon is shown on the main display.

Note: *If any of the scheduled time slots are currently active, the controller will begin the starting sequence and start the unit provided there are no shutdown conditions present.*

“AUTO” (REMOTE) STARTING OF THE GENERATOR

“Auto Mode” is used when the generator is started from a location other than the control panel by using a transfer switch. “AUTO” (remote start) is the normal setting when the generator is being used as a standby power supply. Before putting the generator in the “AUTO” mode, review the Prestart Checklist and Manual Starting of the Generator on *page 25*. Also 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 *“PreStart Checklist” on page 25*. Then continue with the steps described below:

1. Perform a manual start of the generator at least once to verify that the engine is operating correctly.
2. If a check of the remote start circuit is desired, remove the wires from the remote start terminal block. Press the Auto/Manual Mode button, the main display should show the “AUTO” icon. Attach a jumper wire (minimum 16 gauge) across the two terminals on the remote start terminal block. This applies a ground to the Power Zone™ Controller to close the starting circuit contacts. The engine should crank, start and run.
3. Remove the jumper wire from the remote start terminal block and the engine will stop. Reconnect any necessary wires from the remote start switch (transfer switch) to the remote start terminal block.
4. Confirm unit is in “Auto Mode.” The main display should show “Auto Mode” at the top of the screen.
5. Close the main circuit breaker (set to “ON/I”).
6. Secure the generator by closing and locking all access doors.
7. The generator is now ready for remote starting.

SHUTTING DOWN THE GENERATOR

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. Remove all loads from the generator by opening all circuit breakers (turn to “OFF/O”).

2. Let the engine run for approximately five minutes to allow it to cool down.

3. Push the red Engine Stop/Reset “O” button. Pressing the Engine Stop/Reset “O” button will result in the generator going into the shutdown cycle and starting a 15 second shutdown timer called “Stopping.” If the unit does not shut down within 15 seconds, a “Stop Fail” alarm will be displayed on the main display.

4. After the unit shuts down, move the control power switch to the “CONTROL OFF/O” position.

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

EXHAUST FILTER CLEANING OPERATIONS

When enabled, the exhaust filter system goes through an automatic cleaning process known as regeneration. Under normal circumstances, regeneration occurs without interruption of unit operation and with minimal operator involvement. In the event there are conditions requiring the operation of the unit with auto exhaust filter cleaning disabled, the operator may be required to perform procedures to enable or disable the auto exhaust filter cleaning. The operator may also be required to perform a manual regeneration. The following procedures describe how to perform these functions.

⚠ WARNING

The area above and surrounding the exhaust system during an auto or manual exhaust filter cleaning should be clear of any people and objects. Exhaust gases and components can reach temperatures hot enough to ignite and melt common materials.

Note: *Always park the unit in a safe location for elevated exhaust temperatures and check for adequate fuel level before beginning the exhaust filter cleaning process. The cleaning cycle can take an extended period of time (approximately 45 minutes). Cleaning is complete when the Regeneration indicator remains off.*

DISABLE AUTOMATIC (AUTO) EXHAUST FILTER CLEANING

The auto exhaust filter cleaning feature should always be enabled unless doing so would cause an unsafe working environment. In the event that an unsafe working environment would occur, use the following procedure to disable the auto exhaust filter cleaning feature:

1. Open the control door and locate the switch labeled “EXHAUST FILTER CLEANING.”
2. Move the rocker switch into the “DISABLED (O)” position.
3. Toggle to the “DPF Status” page on the Power Zone™ controller and verify the Disabled Regeneration indicator appears above the words “DPF Inhib” (refer to *“Diesel Exhaust Filter Monitoring” on page 23* for information regarding the “DPF Status” screen and indicators).

NOTICE

Disabling Auto mode is not recommended for any situation unless it is safety related or if the fuel tank lacks the required fuel to complete the cleaning process.

FORCE A MANUAL EXHAUST FILTER CLEANING

If running the unit with the exhaust filter cleaning function disabled, the “DPF Status” screen may display a red alarm, prompting the operator to force a manual exhaust filter cleaning. Use the following procedure to force a manual exhaust filter cleaning feature:

1. Open the control door and locate the switch labeled “Auto Exhaust Filter Cleaning.”
2. Move and hold the rocker switch into the “ON / FORCED (I)” position for five seconds.
3. Toggle to the “DPF Status” screen on the Power Zone™ controller and verify the Regeneration indicator appears above the words “DPF Lamp” (refer to *“Diesel Exhaust Filter Monitoring” on page 23* for information regarding the “DPF Status” screen and indicators).

ENABLE EXHAUST FILTER CLEANING

If the environment no longer requires the function to be disabled and there are no alarms present on the “DPF Status” screen, the auto exhaust filter cleaning function should be enabled. Use the following procedure to enable the auto exhaust filter cleaning feature:

1. Open the control door and locate the switch labeled “EXHAUST FILTER CLEANING.”
2. Move the switch into the “ON / AUTO (I/O)” position.

Toggle to the “DPF Status” screen on the Power Zone™ controller and verify the Regeneration indicator appears above the words “DPF Lamp” (refer to *“Diesel Exhaust Filter Monitoring” on page 23* for information regarding the “DPF Status” screen and indicators).

POWER ZONE™ CONTROLLER INFORMATION DISPLAYS, FUNCTIONS, AND RESET

The Power Zone™ controller constantly monitors vital generator and engine functions for a number of operation, alarm and fault conditions. When a fault condition occurs, the engine will shut down automatically and the main display will show the fault that has caused the shutdown. To resume operation, the fault condition must be resolved. To reset the controller and resume operation, press the Enter “✓” button.

RESETTING THE MAINTENANCE ALARMS

The Power Zone™ controller will display a warning message when the unit is due for maintenance or service. The maintenance or service interval is set at 500 hours of engine running time. Once the unit has been serviced, the “Maintenance Alarm” reminder needs to be reset. The following procedure demonstrates how to reset the running hours to zero:

1. With the unit shut down, move the control power switch to the “CONTROL ON/I” position. After initialization, the controller will toggle automatically to the Home screen.

2. Press any directional arrow (“▲”, “►”, “▼”, “◄”) to enter the Maintenance screens.

3. Press the Enter “✓” button and the Engine Stop/Reset “O” button simultaneously. The next screen will display the Configuration Menu**.**

4. Press “▼” to move the cursor (blue highlighted text) down to the “Maintenance” group.

5. Press “►” to access the sections. Press “▼” to highlight the “Maintenance” section.

6. Press “►” to access the parameters and highlight the maintenance alarm that needs to be reset.

7. Press the Enter “✓” button to select the editable parameters. The cursor will highlight “Not Reset” under the selected maintenance alarm. Press “▲” to highlight “Reset”.

8. Press the Enter "✓" button to reset the selected maintenance alarm.

Note: *If the selected maintenance alarm does not need to be reset, press the "▼" button to highlight "Not Reset" and press the Enter "✓" button return to the parameters section.*

1. To perform additional maintenance alarm resets, repeat steps 6-8.
2. To save changes, press and hold the Enter "✓" button for five seconds. To discard changes made, press and hold the Engine Stop/Reset "O" button for five seconds.

TROUBLESHOOTING AUTOMATIC SHUTDOWN CONDITIONS

⚠ WARNING

Allow engine to cool before performing any troubleshooting procedures. Contacting the engine when it is hot will cause severe personal injury.

LOW FUEL LEVEL SHUTDOWN

1. Check the fuel level on the Home screen. Confirm that the generator is sitting level to ensure an accurate reading.
2. Check for leaks in the fuel tank. The fuel tank should not run dry under normal circumstances. The engine controller will shut the engine down when there is five percent of fuel remaining in the tank. This is done to keep the fuel lines from running dry.
3. If the fuel level is good and no leaks are found, check the fuel level sender and the connecting wiring for damage. To check for continuity between the sender and the engine controller, remove the appropriate bolts from the control panel to access the inside of the control box. Consult the DC wiring diagram in the back of this manual for the proper path between the engine controller and the fuel level sender.

LOW OIL PRESSURE SHUTDOWN

1. Check the level of the engine oil with the dipstick because the Power Zone™ controller will shut the engine down when the oil pressure is less than 20 psi (138 kPa). Add oil if required.
2. Visually inspect the engine for oil leaks.
3. If the oil level is good, restart the unit and verify the loss of oil pressure. Shut the engine down immediately if the oil pressure value does not read 5 psi (34 kPa) within five seconds.
4. Check the oil pressure sender. To identify corrective action, refer to the troubleshooting section of the engine operator's manual provided with the unit.

LOW COOLANT LEVEL SHUTDOWN

1. Allow the engine to cool.
2. Check the coolant level in the radiator. To access the radiator cap, you must remove the access panel from the top of the enclosure directly above the radiator. Add coolant until it is 3/4 in. (1.9 cm) below the filler neck. Secure the radiator cap back into its original position.
3. Inspect coolant hoses, engine block and water pump for visible leaks.
4. Check engine oil to verify no coolant has mixed with it (oil will appear milky if coolant is present). Consult the engine operator's manual for additional information.

HIGH COOLANT TEMPERATURE SHUTDOWN

1. Check the coolant level in the overflow jug.
2. Restart the engine and read the coolant temperature to verify a high coolant temperature shutdown. Stop the engine immediately if the coolant temperature is 230°F (110°C) or more.
3. Allow the engine to cool. Add coolant to the overflow jug if it is low and then check the level of coolant in the radiator. To access the radiator cap, you must remove the access panel from the top of the enclosure directly above the radiator. Add coolant until it is 3/4 in. (1.9 cm) below the filler neck. Secure the radiator cap back into its original position.
4. Check the radiator shroud and ducting for blockage and remove any foreign matter.
5. Inspect coolant hoses, engine block and water pump for visible leaks.
6. Check the tension of the serpentine drive belt for the water pump.
7. If no other problems are found, remove the load on the generator and restart the engine. Check the coolant temperature and shut the engine down immediately if it starts to overheat. Consult the engine operator's manual for additional information on engine overheating.

OVERCRANK SHUTDOWN

1. Check the fuel level in the tank.
2. Check for proper operation of the fuel pump.
3. Check the air filter for blockage.
4. If the engine will not start, consult the engine operator's manual for additional information on trouble-shooting starting problems.

OVERSPEED OR UNDERSPEED SHUTDOWN

1. Disconnect all loads and restart the generator. Read the frequency (Hz) on the LCD display. With no loads on the generator, the frequency should read 60.0 Hz.
2. If the frequency is above or below 60.0 Hz, the engine speed will have to be adjusted. Refer to the engine operator's manual for throttle adjustments on mechanically governed units and refer to the electronic governor manual for electronically controlled units.

GENERATOR OUTPUT CONNECTION LUGS

The generator is equipped with connection lugs behind the lug box door located on the lower portion of the control box. The lugs provide connection points for attachment of external loads to the generator. A large decal on the inside of the connection lug door details the proper connections for selected voltages.

⚠ 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) as well as any local or state guidelines as required by law. 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 generator, make sure that the main circuit breaker and control power switch are in the "OFF/O" position. Potentially lethal voltages may be present at the generator connection lugs.

⚠ DANGER

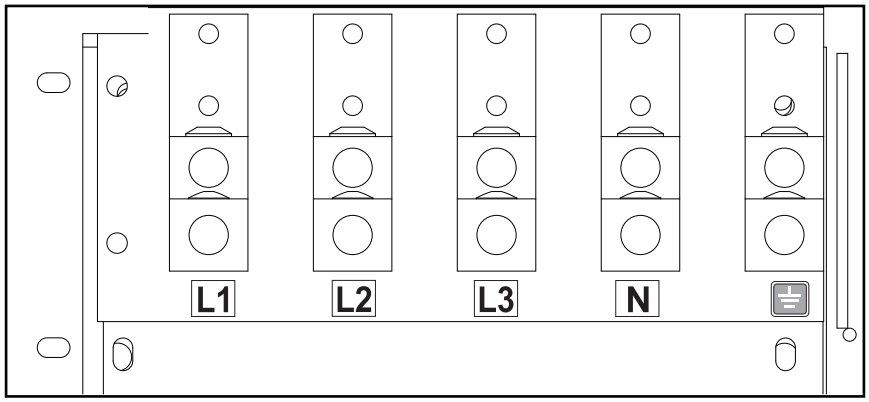
IMPROPER OR INCORRECT CONNECTIONS TO A BUILDING'S ELECTRICAL SYSTEM CAN CAUSE POTENTIALLY LETHAL VOLTAGES TO BACKFEED INTO UTILITY LINES. THIS MAY RESULT IN INJURY OR ELECTROCUTION TO UTILITY WORKERS NEARBY. MAKE SURE THE GENERATOR IS SUPPLYING POWER TO AN ISOLATED OBJECT OR BUILDING THAT IS NOT CONNECTED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

Connections to the lugs should be made by running the power cables up through the slot in the bottom of the box. Use a hex-wrench to tighten the cable connections. The connection lug door is equipped with safety interlock switches that will trip the main circuit breaker and disable the voltage regulator if the door is opened while the unit is operating.

⚠ WARNING

Never attempt to disable or modify the lug door safety switches. Equipment damage, personal injury or death may result.

A ground connection is located next to the connection lugs. The unit **MUST HAVE** this ground lug connected to a good earthen ground for proper operating safety. The generator neutral is bonded to ground when it is shipped from the factory. The bonding plate will need to be removed when the generator is used as a standby power source. **INSTALLATION SHOULD BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE (NEC), AS WELL AS ANY STATE OR LOCAL GUIDELINES OR CODES.**



RUN CABLES THROUGH SLOTS

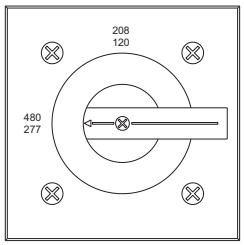
VOLTAGE SELECTOR SWITCH

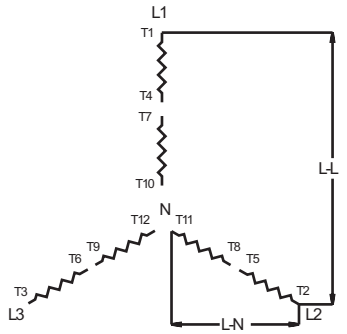
The voltage selector switch is located on a panel attached to the generator behind the door located next to the fuel tank filler. The selector switch is a three position switch that mechanically changes the connections between the generator output leads and the connection lugs on the main control panel. Voltage ranges are selected by rotating the handle on the switch to the desired voltage.

NOTICE

NEVER CHANGE THE VOLTAGE SELECTOR SWITCH WHILE THE ENGINE IS RUNNING. This will cause severe arcing and damage to the switch and generator windings.

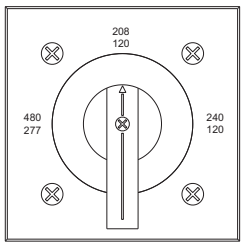
480/277V
3-Phase

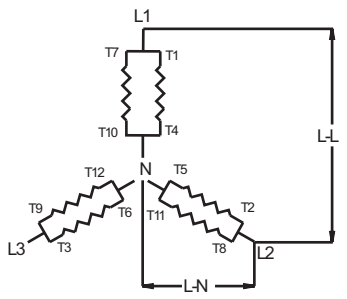




L1 - L2 = 480V L1 - N = 277V
L2 - L3 = 480V L2 - N = 277V
L3 - L1 = 480V L3 - N = 277V
N = ⏚

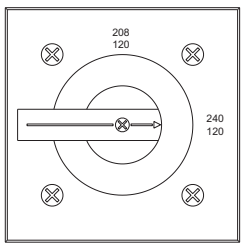
208/120V
3-Phase

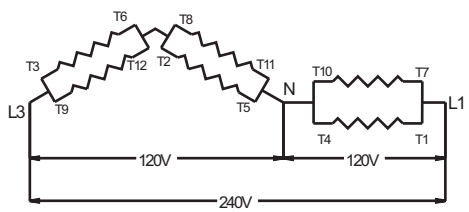




L1 - L2 = 208V L1 - N = 120V
L2 - L3 = 208V L2 - N = 120V
L3 - L1 = 208V L3 - N = 120V
N = ⏚

240/120V
1-Phase





L1 - L3 = 240V L2 - N = -------
L1 - N = 120V L3 - N = 120V

The voltage selector switch is equipped with a locking mechanism. Once the proper voltage has been selected, push the red latch on the inside of the switch handle up and insert a padlock through the handle. By locking the handle in place, you will prevent unauthorized personnel from changing the switch settings.

Note: *UNITS WITHOUT A RECEPTACLE BUCK TRANSFORMER: When the voltage selector switch is in position for 480/277V 3Ø, voltage at the two GFCI duplex receptacles is 139 volts and the voltage at the three twist-lock receptacles is 240/139 volts. When the voltage selector switch is in position for 208/120V 3Ø, voltage at the three twist-lock receptacles and the two GFCI receptacles is 208/120 volts.*

NOTICE

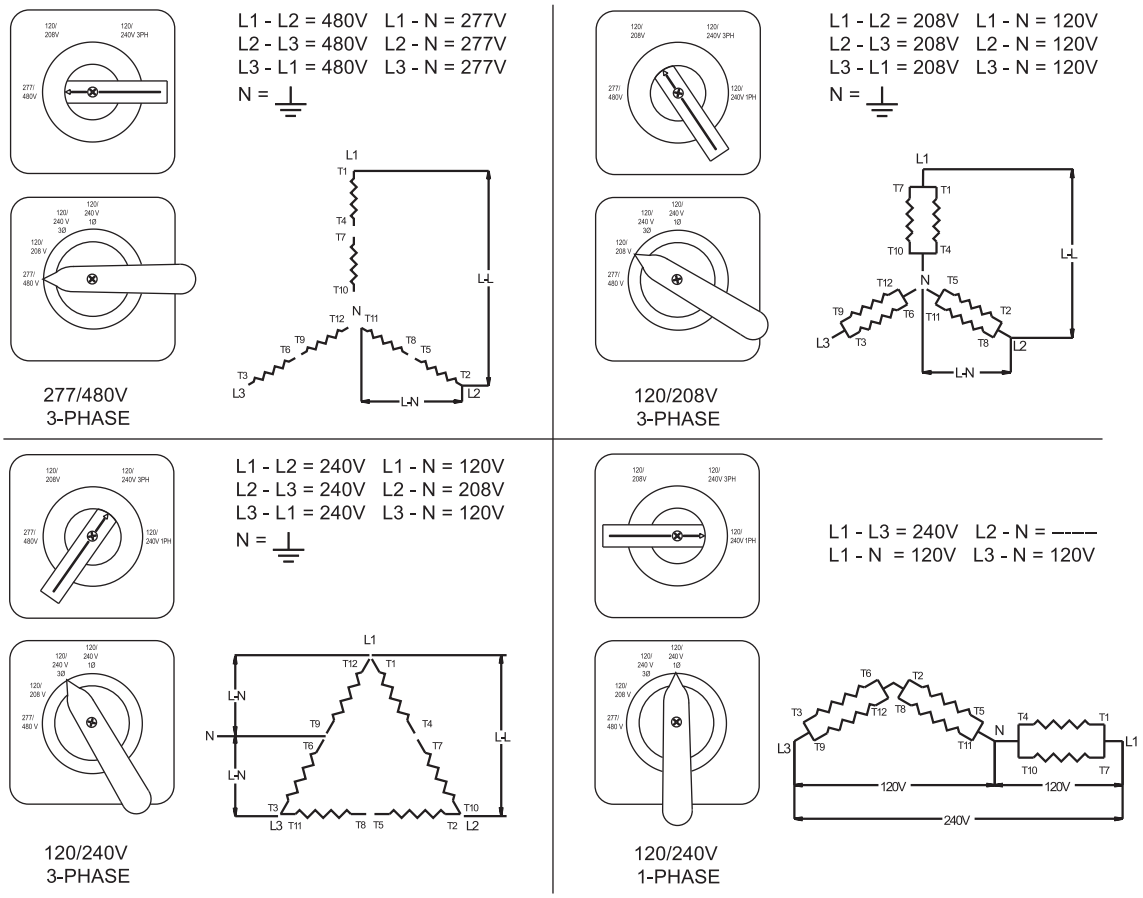
Receptacles should not be used in the 480/277 voltage setting as the voltage will be higher and equipment damage could result.

4-POSITION VOLTAGE SELECTOR SWITCH OPTION

The optional four position voltage selector switch is located on a panel attached to the generator behind the door located next to the fuel tank filler. The voltage selector is a four position switch that mechanically changes the connections between the generator output leads and the connection lugs on the main control panel. Voltage ranges are selected by rotating the handle on the switch to the desired voltage.

NOTICE

NEVER CHANGE THE VOLTAGE SELECTOR SWITCH WHILE THE ENGINE IS RUNNING. This will cause severe arcing and damage to the switch and generator windings.



The voltage selector switch is equipped with a locking mechanism. Once the proper voltage has been selected, push the red latch on the inside of the switch handle up and insert a padlock through the handle. By locking the handle in place, you will prevent unauthorized personnel from changing the switch settings.

Note: *UNITS WITHOUT A RECEPTACLE BUCK TRANSFORMER: When the voltage selector switch is in position for 277/480V 3Ø, voltage at the two GFCI duplex receptacles is 139 volts and the voltage at the three twist-lock receptacles is 139/240 volts. When the voltage selector switch is in position for 120/208V 3Ø, voltage at the two GFCI duplex receptacles is 120 volts and the voltage at the three twist-lock receptacles is 120/208 volts. When the voltage selector switch is in position for 120/240 3Ø (DELTA), voltage at the two GFCI duplex receptacles is 120 volts and the* ***THREE TWIST-LOCK RECEPTACLES SHOULD NOT BE USED****. When the voltage selector switch is in position for 120/240V 1Ø, voltage at the two GFCI duplex receptacles is 120 volts and the voltage at the three twist-lock receptacles is 120/240 volts.*

NOTICE

Receptacles should not be used in the 480/277 voltage setting as the voltage will be higher and equipment damage could result.

EMERGENCY STOP SWITCH

The unit is equipped with one Emergency Stop switch. For location of the Emergency Stop switch, refer to *"Component Locations" on page 13*. The red switch is clearly labeled "EMERGENCY STOP." The switch can be accessed and activated with all doors closed and locked.

Activate the Emergency Stop switch by pushing the red button in until it locks down. This will trip the main circuit breaker which will open the contact, disconnecting the load to the connection lugs. This will also open the fuel circuit, shutting down the engine. The emergency stop fault will be displayed on the control panel.

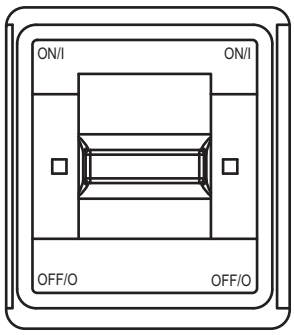
The switch will remain closed until it is pulled out.

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 Generator" on page 29*.

MAIN CIRCUIT BREAKER

The main circuit breaker is located on the main control panel. When the breaker is in the "OFF/O" position, power is interrupted between the customer connection lugs and the generator. Once the connections have been made to the connection lugs and the generator has been started and allowed to reach normal operating temperature, the breaker may be switched to the "ON/I" position. Use the breaker handle extension supplied with this unit to apply additional leverage to the switch.



The main circuit breaker will be tripped, disconnecting power to the connection lugs, if any of the following items occur while the unit is running:

1. Overload of the generator circuits to the connection lugs (208/120V only).
2. The door covering the customer connection lugs is opened.
3. 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 "ON/I" position.

⚠ WARNING

The main circuit breaker interrupts power to the customer connection lugs only. The customer receptacles have power even if the main circuit breaker is in the "OFF/O" position. To disconnect power to the receptacles, use the individual circuit breakers located near each receptacle.

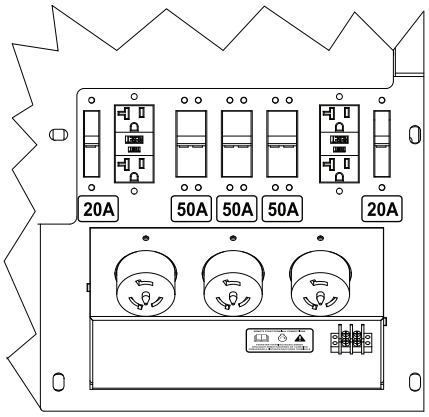
VOLTAGE REGULATION

The electronic voltage regulator controls the output of the generator by regulating the current into the exciter field. The regulator has six screwdriver adjustable potentiometers that may be adjusted for U/F dip, under frequency protection (U/F), droop, stabilty, voltage, and trim. The voltage regulator on your unit is adjusted before shipment from the factory. Contact Magnum Power Products LLC for additional information before attempting to adjust the voltage regulator.

Note: *For units equipped with a Marathon DVR2000E+ digital voltage regulator, please refer to the Marathon operating manual provided with the unit.*

CONTROL PANEL RECEPTACLES

The generator is equipped with five receptacles. The large receptacles are 240/120VAC twist-lock receptacles rated at 50A each. The smaller receptacles are 120VAC duplex receptacles rated at 20A each with Ground Fault Circuit Interrupt (GFCI) protection. These receptacles are not routed through the main circuit breaker. Each receptacle has its own circuit breaker, located directly above or next to the receptacle. Each breaker is sized to the maximum rating of the corresponding receptacle.



NOTICE

Power to the receptacles is available any time the generator is running, EVEN IF THE MAIN CIRCUIT BREAKER IS “OFF/O”. MAKE SURE THAT ANY EQUIPMENT CONNECTED TO THE RECEPTACLES IS TURNED OFF BEFORE TURNING THE BREAKERS ON. Make sure that the voltage selector switch is in the proper position and that the output voltage is correct for the equipment that is connected to the receptacles. Improper voltage may cause equipment damage or malfunction.

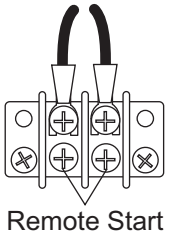
Note: *When the voltage selector switch is in position for 480/277V 3Ø, voltage at the two GFCI duplex receptacles is 139 volts and the voltage at the three twist-lock receptacles is 240/139 volts. When the shorting board is in position for 208/120V 3Ø, voltage at the three twist-lock receptacles and the two GFCI receptacles is 208/120 volts.*

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 10ºF (5.6ºC) increase in ambient air temperature over 72ºF (22ºC).

REMOTE START TERMINAL BLOCK

The remote start terminal block provides a connection for installation of a remote start switch which will allow the unit to be started by a remote dry-contact closure switch. For location of the remote start terminal block, refer to *“Main Control Panel Features, Standard” on page 14*



Remote Start Switch Terminals

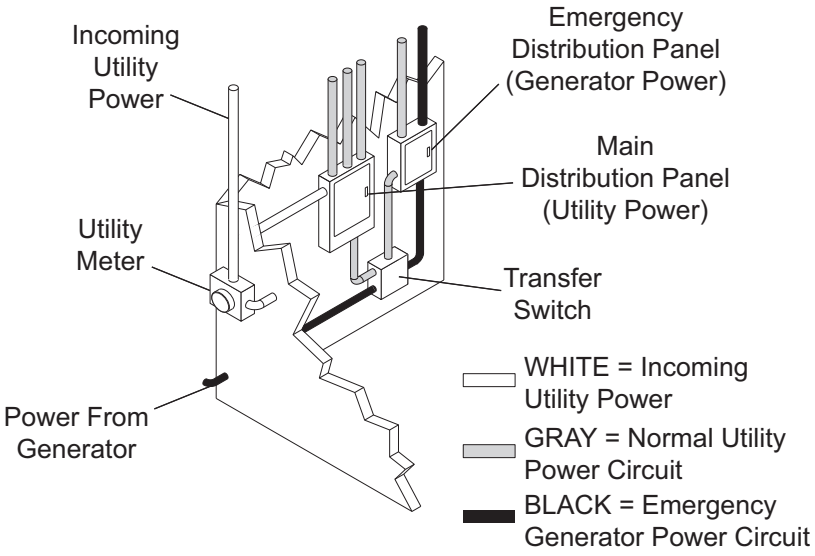
Before entering Auto mode, verify that the contacts on any remote switch linked to the unit are **OPEN**. If the contacts on a remote switch are closed, the engine will crank and start when Auto mode is entered. Attach the switch leads to the two unused terminals on the unit’s remote start terminal block. For additional information on, refer to *““Auto” (Remote) Starting of the Generator” on page 28*.

TRANSFER SWITCH

When the generator 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.

⚠ 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 BACK UP TO SOME OTHER TYPE OF POWER SUPPLY.



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

⚠ WARNING

It is strongly recommended that ONLY a licensed electrician perform any wiring or any related connections to the generator. Installation should be in compliance with the National Electrical Code (NEC) as well as any state or local codes or regulations. Failure to follow these procedures could result in property damage, personal injury or death. Before any connections are attempted, make sure the main circuit breaker switch is in the "OFF/O" position and the engine is turned off by pressing the Engine Stop/Reset "O" button.

NOTICE

When using the generator 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.

BELT TENSION

John Deere engines use two types of belt tensioners: manual and automatic. Adjust the belt using the manual tensioner according to the manufacturer's specifications. The automatic tensioner cannot be adjusted or repaired and is designed to maintain proper tension over the belt's life. Units with the automatic belt tensioner must be inspected according to the manufacturer's specifications.

ENGINE AND GENERATOR MAINTENANCE

Check the engine oil level daily before starting the engine. **DO NOT** start the generator if the oil level is below the "ADD" mark on the dipstick. The normal operating level for the engine oil is anywhere in the crosshatch pattern between the "FULL" and "ADD" markings. Add oil to the engine only if the level is below the "ADD" mark on the bottom of the crosshatch pattern. **DO NOT OVERFILL** the crankcase. Consult the engine operator's manual for the proper grade of oil, including special operating conditions such as a change in season or climate.

Check the coolant level daily. The coolant is checked by visually inspecting the level in the coolant overflow jug, located near the radiator. The normal operating level is anywhere between the "FULL" and "ADD" markings on the overflow jug, with the optimum level noted as "NORMAL RANGE". **WHEN THE ENGINE IS STOPPED AND COMPLETELY COOL,** coolant may be added directly to the overflow jug. Consult the engine operator's manual for coolant recommendations and proper mixture.

Check the condition of the air filter by viewing the level of vacuum draw on the filter minder gauge. Replace the air filter when the yellow center bar reaches the red section on the gauge (20 in. H_20).

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 even routine service (oil/filter changes, cleaning, etc.) unless all electrical components are shut off. When servicing this equipment always follow the instructions listed below.

- Make sure the engine start switch is turned to the "OFF/O" position.
- Verify that all circuit breakers are open ("OFF/O").
- Activate (push in) the "EMERGENCY STOP" switch.
- Disconnect the negative (-) terminal on the battery.
- Attach a "DO NOT START" sign to the control panel. This will notify everyone that the unit is being serviced and will reduce the chance of someone inadvertently trying to start the unit.
- If the unit is connected to a remote start or transfer switch, make sure the remote switch is also off and tagged.
- Never wash the unit with a high pressure hose or with any kind of power washer.
- Never wash the engine block or fuel tank with a power washer or steam cleaner. Water may enter the cabinet and collect in the generator windings or other electrical parts, causing damage.
- If the unit is stored outside, check for water inside the cabinet and generator before each use. If wet, dry the unit thoroughly before starting.

DAILY WALK AROUND INSPECTION

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 that the belt is properly seated in pulley grooves. Replace the belt according to the manufacturer's recommendations.

Note: *At the 500 hour/12 month service interval, it is recommended that the belt be removed and checked for wear. While the belt is removed, inspect pulleys and bearings. Rotate and feel for hard turning or unusual sounds. If pulleys or bearings need replacement, contact John Deere.*

⚠ CAUTION

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

BASIC MAINTENANCE SCHEDULE - JOHN DEERE ENGINE

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 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.

Use the schedule in the following table as a guide for regular maintenance intervals. For additional or replacement copies of the engine operator's manual, contact an authorized dealer in your area.

Item	Daily	250 Hrs.	500 Hrs./12 Months	3000 Hrs./ 36 Months	As Required
Check Oil Level	♦				
Check Coolant Level	♦				
Check Fuel Level	♦				
Check Tire Pressure	♦				
Check All Electrical Connections	♦				
Inspect Radiator Fins For Debris, Clean As Required	♦				
Check Fuel Filter/Water Separator Bowl	♦				
Check Air Cleaner Dust Valve Restriction Indicator Gauge	♦*				
Perform Visual Walkaround Inspection	♦				
Check Oil Vapor Recirculation System/Non-Return Valve		♦			
Change Engine Oil and Replace Oil Filter			♦**		
Replace Oil Vapor Recirculation Filter			♦		
Service Battery			♦		
Replace Fuel Filter Elements			♦		
Check Engine Mounts			♦		
Check Air Intake Hoses, Connections, and System			♦		
Check Engine Electrical Ground Connection			♦		
Check Automatic Belt Tensioner and Belt Wear			♦		
Check Cooling System			♦		
Lubricate Leveling Jack(s)			♦		
Check Generator Drive Plate Torque (see *page 41*)			♦		
Test Thermostats				♦	
Replace Air Cleaner Elements					♦
Replace Alternator and Fan Belts					♦
Check Fuses					♦
Add Coolant					♦
Check Electrical Wiring and Connections					♦

* *Replace primary air cleaner when dust valve restriction indicator gauge shows a vacuum of 25 in. H_2O.*

** *Change the oil and oil filter after the first 100 hours, then every 500 hours. If not using John Deere Plus 50 II engine oil, the interval must be decreased to every 250 hours.*

EXHAUST FILTER SERVICE REQUIREMENTS

The exhaust filter system contains a Diesel Particulate Filter (DPF). Over time, the DPF will require professional servicing to remove ash buildup. The expected service interval will be at least 3000 or 4500 hours based on engine power and operating conditions. Actual service should take place when the indicator light appears on the control panel LCD. The DPF should be cleaned or replaced by an authorized service provider only. The removal of DPF

ash must be done by removing the DPF from the unit and placing it into specialized equipment.

⚠ CAUTION

Do not remove ash by using water or other chemicals. Removing ash by these methods may cause equipment damage and create unsafe operating conditions.

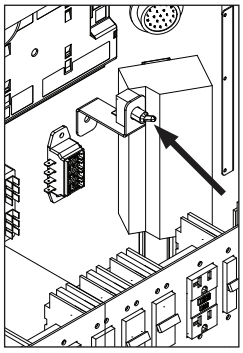
⚠ CAUTION

Only a qualified service provider should remove, handle and dispose of diesel particulate filters and ash. These materials may be considered hazardous under federal, state and local regulations, and must be handled and disposed of properly.

To avoid unnecessary buildup of diesel particulates or soot in the exhaust filter system;

1. Utilize the Automatic (AUTO) Exhaust Filter Cleaning mode.
2. Avoid unnecessary idling.
3. Use proper engine oil (refer to engine operator's manual).
4. Use only ultra low sulfur diesel fuel (refer to engine operator's manual).

ECU OVERRIDE SWITCH

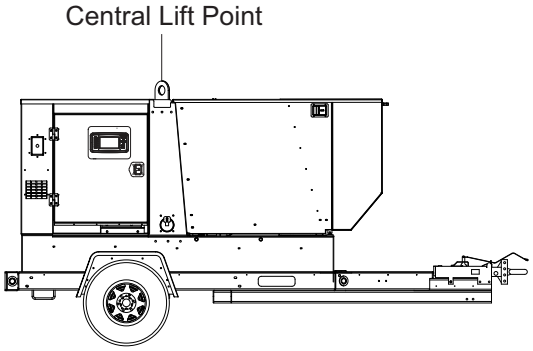


The ECU Override switch is located inside the control box. This toggle switch powers up the ECU without having to start the engine. Use the ECU Override switch to turn the ECU off. If the generator needs to be shutdown immediately, use the "EMERGENCY STOP" switch. Refer to *"Emergency Stop Switch" on page 35* for additional information.

NOTICE

Use the ECU Override switch for programming or diagnostic purposes only. Starting the engine while the switch is on could result in damage to the ECU.

LIFTING THE GENERATOR



A central lift point is located on the top of the generator. The central lift point is connected to a lift structure inside the unit. Attach a sling or hook directly to the central lift point only if the devices are in good condition and the equipment being used to raise the unit has sufficient capacity. Approximate weights can be found starting on *page 10*. Always remain aware of others around you when moving or lifting the generator. Keep the cabinet doors closed and locked.

TOWING THE TRAILER

1. Use the jack to raise or lower the trailer onto the hitch of the towing vehicle. Lock the hitch coupling and attach the safety chains or cables to the vehicle. Raise the jack foot completely.

2. Connect any trailer wiring to the tow vehicle. Check for proper operation of the stop and signal lights.

3. Make sure all doors are properly latched.

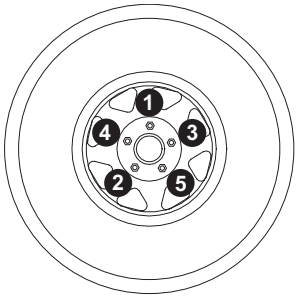
4. Check for proper inflation of the trailer tires. Maximum tire pressures can be found starting on *page 10*.

5. Check the wheel lugs. Tighten or replace any that are loose or missing. If a tire has been removed for axle service or replaced, tighten the lugs in the order shown to the following specifications:

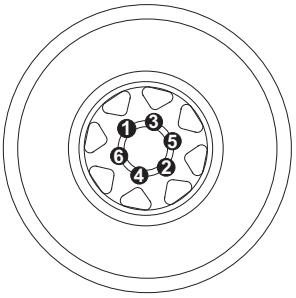
   A. Start all lug nuts by hand.
   B. First pass tighten to 20-25 ft-lbs (27-33 Nm).
   C. Second pass tighten to 50-60 ft-lbs (67-81 Nm).
   D. Third pass tighten to 90-120 ft-lbs (122-162 Nm).

After the first road use, re-torque the lug nuts in sequence.

6. Maximum recommended speed for highway towing is 45 mph (72 km/h). Recommended off-road towing speed is not to exceed 10 mph (16 km/h) or less, depending on terrain.



5-Stud Sequence



6-Stud Sequence

TRAILER WHEEL BEARINGS

The trailer axles are equipped with a grease zerk fitting to allow lubrication of the wheel bearings without the need to disassemble the axle hub. To lubricate the axle bearings, remove the small rubber plug on the grease cap, attach a standard grease gun fitting to the grease zerk fitting and pump grease into the fitting until new grease is visible around the nozzle of the grease gun. Use only a high quality grease made specifically for lubrication of wheel bearings. Wipe any excess grease from the hub with a clean cloth and replace the rubber plug when finished. The minimum recommended lubrication is every 12 months or 12,000 miles (19,312 km). More frequent lubrication may be required under extremely dusty or damp operating conditions.

CHECKING GENERATOR DRIVE PLATE TORQUE

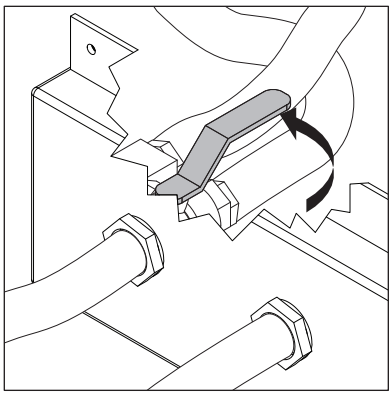
Follow the procedure below to check the torque of the generator drive plate bolts in accordance with the maintenance chart on *page 39*.

1. Disconnect the engine starting battery.
2. Remove the generator fan guard.
3. Torque each of the drive plate bolts to the appropriate specification shown in the table below.

Unit	ft-lb (Nm)
MMG75D	36 (49)
MMG100D	36 (49)

4. Reinstall the generator fan guard. Reconnect the battery.

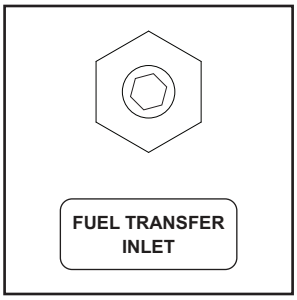
AUXILIARY FUEL TANK OPTION



The auxiliary fuel tank option is designed so the unit can run from an external fuel tank. The unit is still programmed to shut down when the internal tank's fuel level drops below five percent. In order for the unit to run off of an auxiliary tank, the fuel level in the internal tank must remain over five percent. To operate the unit using an auxiliary fuel tank, use the following procedure:

1. Shut down the unit and check that the level of fuel in the tank is above five percent.
2. Attach the auxiliary fuel tank's fuel lines to the "AUXILIARY FUEL INLET" and "AUXILIARY FUEL OUTLET" fittings on the unit.
3. Open the "AUXILIARY FUEL INLET" and "AUXILIARY FUEL OUTLET" valves located inside of the right front door.

FUEL TRANSFER PUMP OPTION



The fuel transfer pump option allows the fuel tank to be refilled from an external bulk fuel source. When the fuel transfer switch is on, anytime the fuel level drops below 15% the fuel transfer pump will begin pumping fuel from an external bulk fuel source into the fuel tank on the unit. The fuel transfer pump will shut off when the fuel level of the internal tank reaches 90%. The pump will also be monitored to ensure a certain percentage increase in fuel level over a given period of time to prevent the pump from running dry. To operate the fuel transfer system, use the following procedure:

1. Shut down the unit.

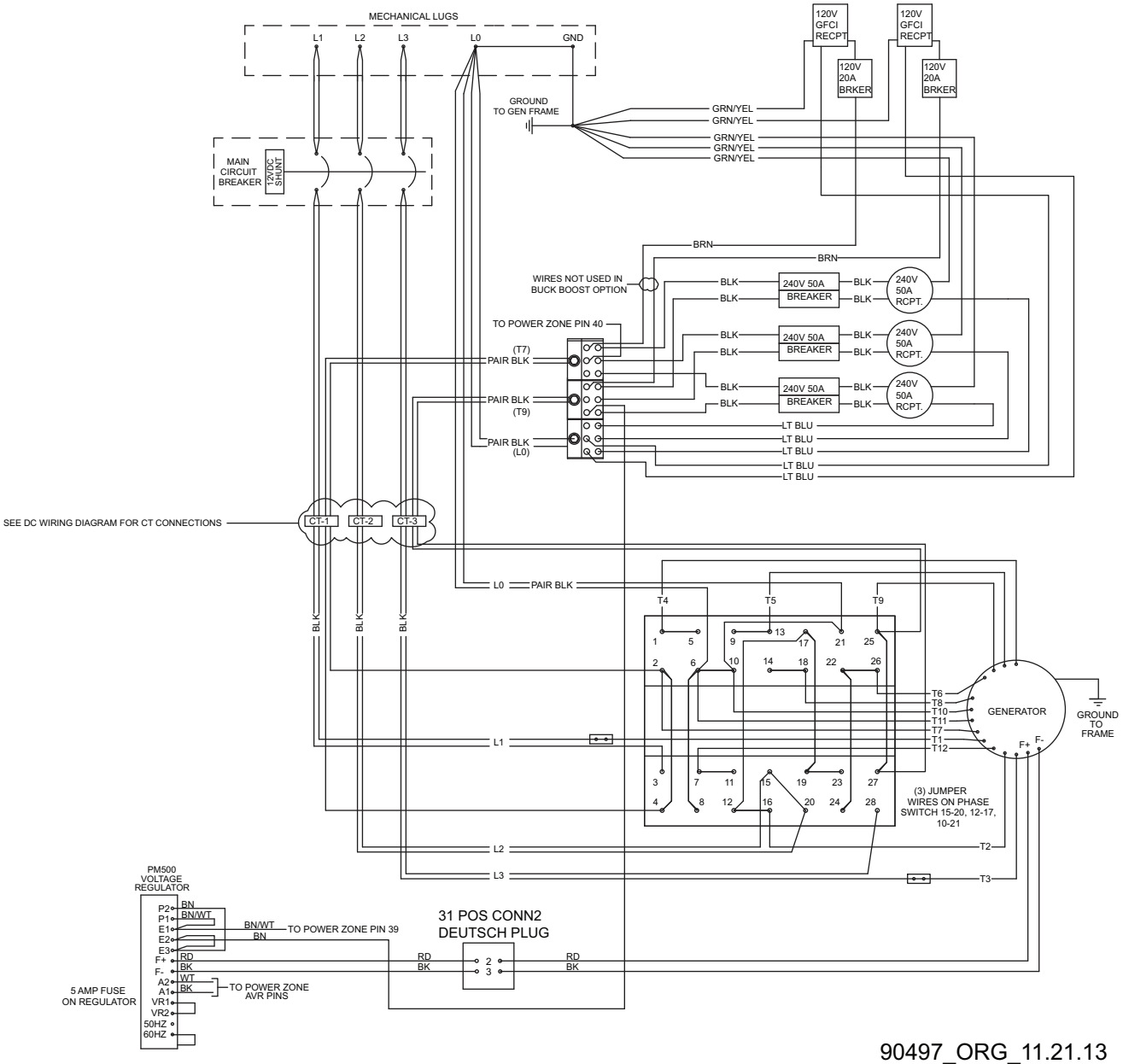
Note: *If the external bulk fuel supply is already connected, the unit does not have to be shut down to turn the fuel transfer pump option on or off.*

2. Attach the external bulk fuel supply to "FUEL TRANSFER INLET" fitting on the unit.
3. Turn on the fuel transfer switch.

VISCOUS FAN CLUTCH OPTION

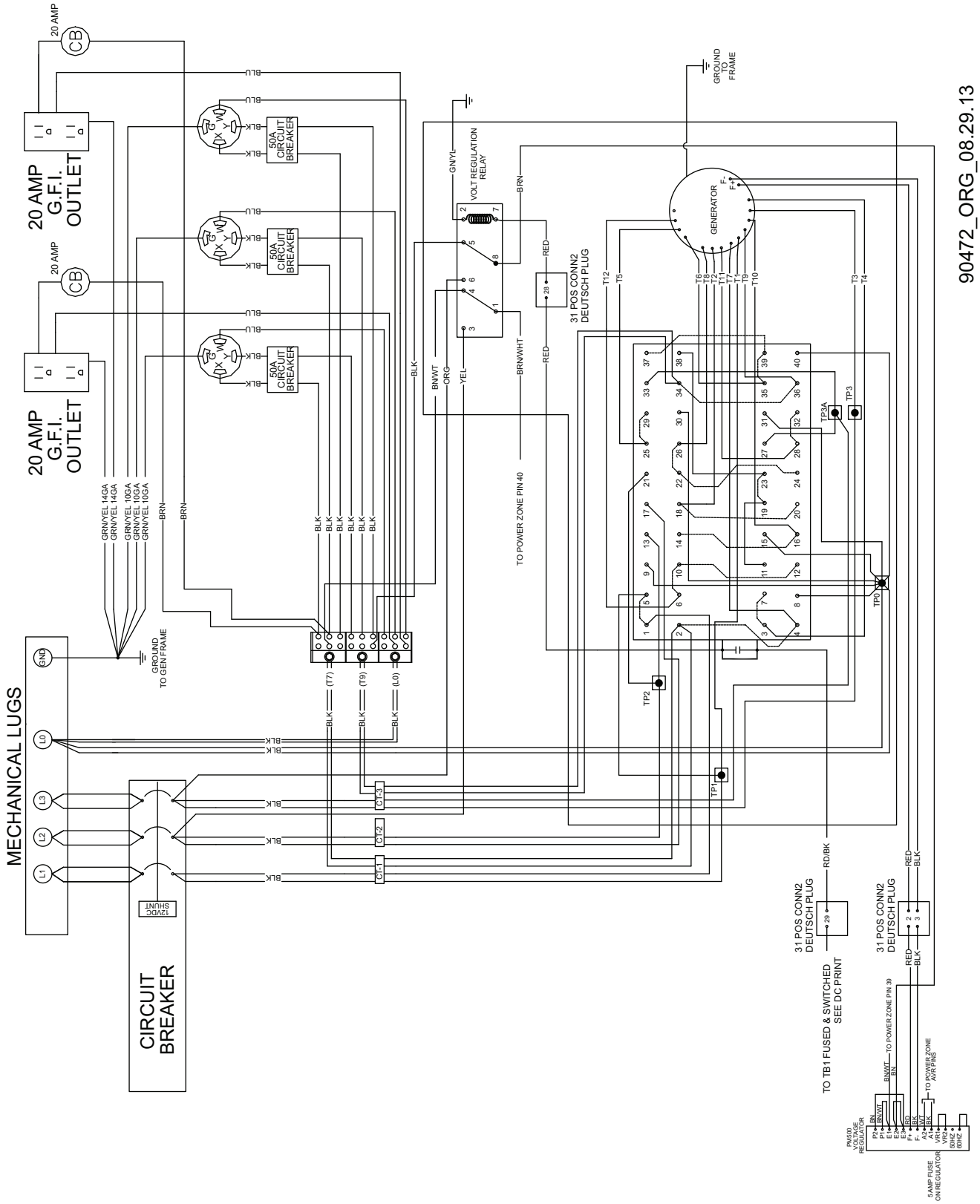
The viscous fan clutch option allows the engine cooling fan to engage at lower speeds, and disengage at higher speeds, increasing cooling system efficiency. The cooling fan will engage at full speed when the coolant temperature rises. When the fan is operating at full speed, it will switch to a slower speed when the coolant temperature drops. There will be an audible difference when the engine cooling fan switches speeds. Depending on unit model, the temperature ranges vary between 170ºF (77ºC) and 200ºF (93ºC).

AC WIRING DIAGRAM - 3 POSITION VOLTAGE SELECTOR SWITCH

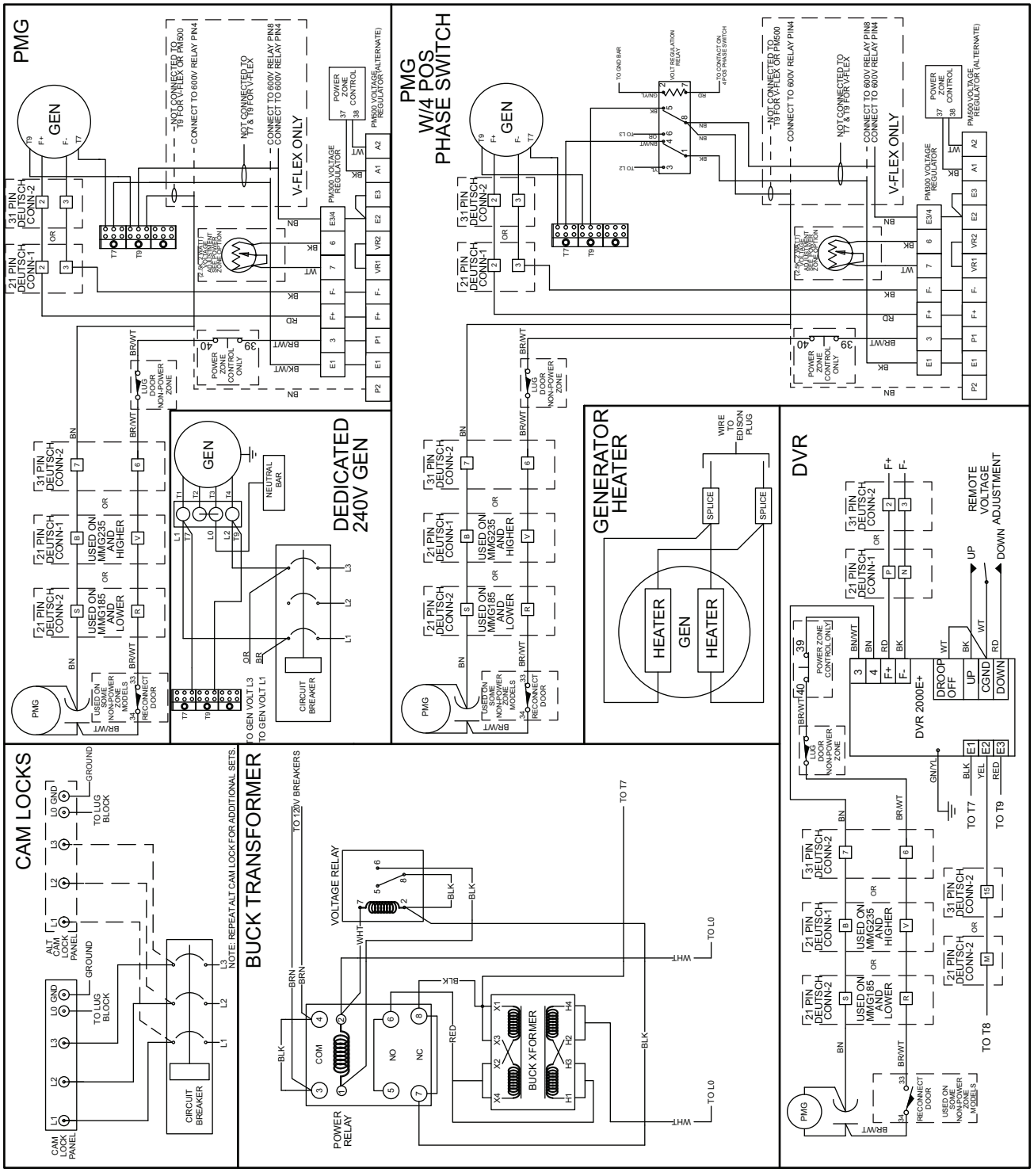


90497_ORG_11.21.13

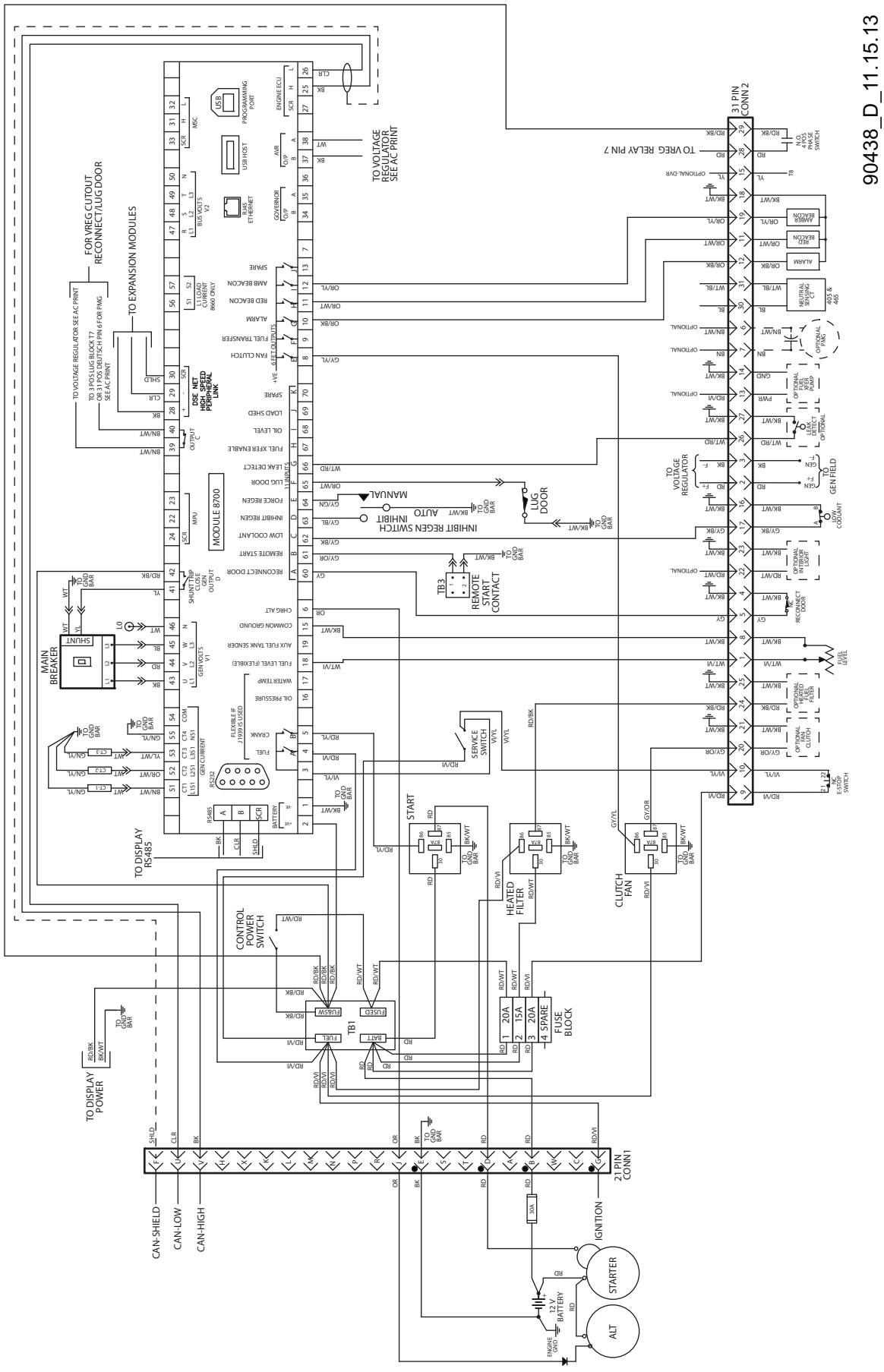
AC WIRING DIAGRAM - 4 POSITION VOLTAGE SELECTOR SWITCH OPTION



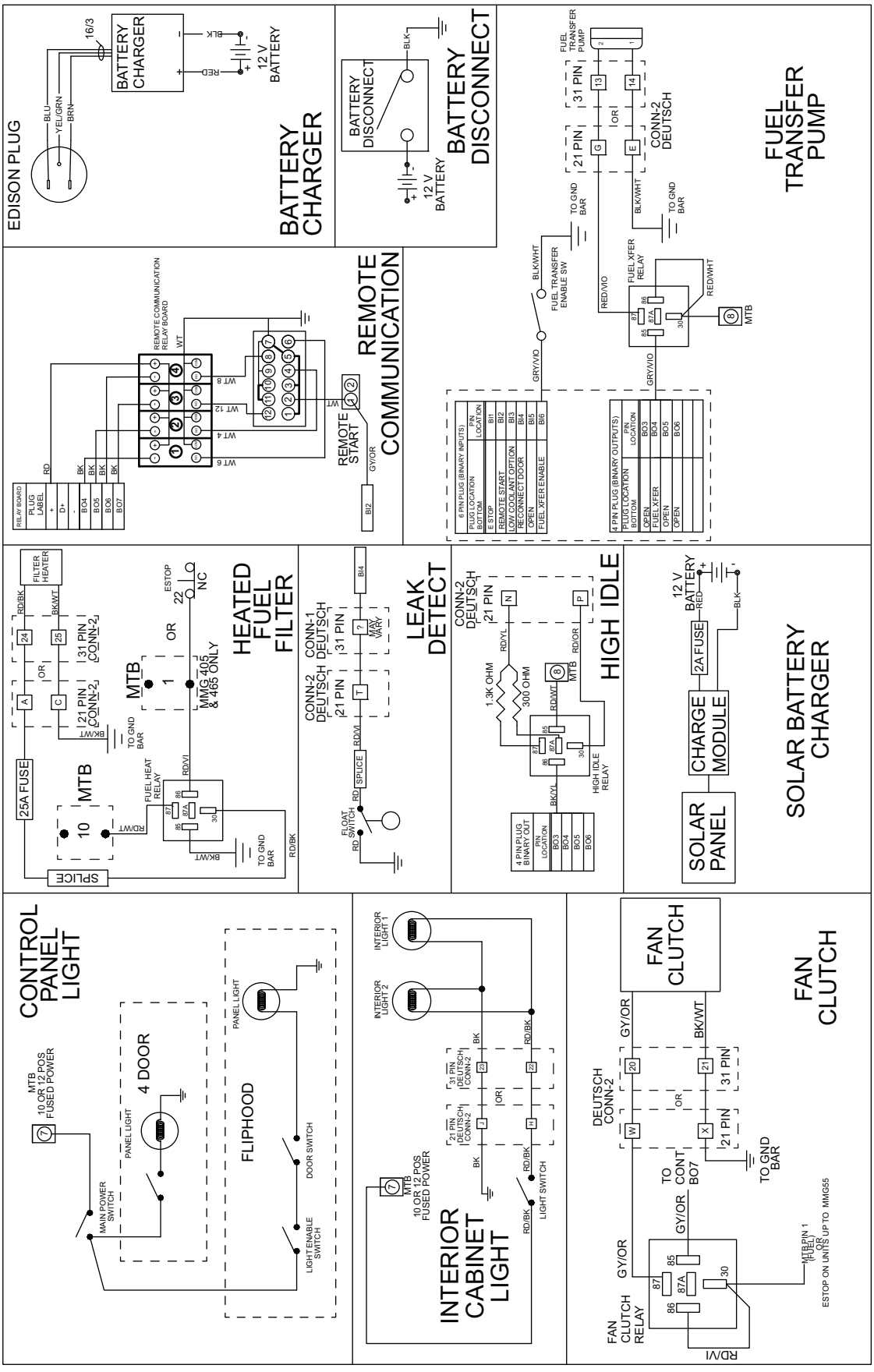
AC WIRING DIAGRAMS FOR OPTIONAL EQUIPMENT



DC WIRING DIAGRAM



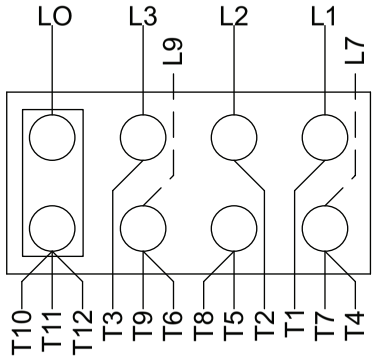
DC WIRING DIAGRAMS FOR OPTIONAL EQUIPMENT



90416_K_06.27.13

480/277V 3PH HIGH WYE

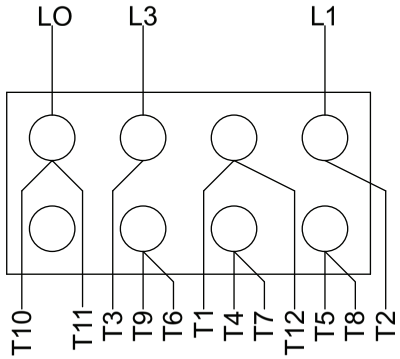
TO CONTROL BOX



TO GENERATOR

480/240V 1 PH HIGH ZIG ZAG

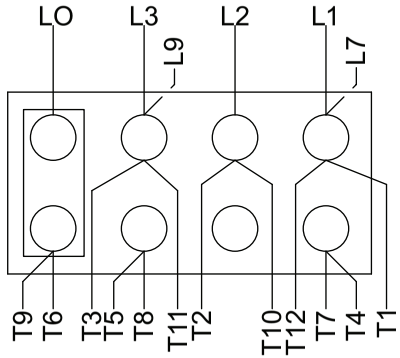
TO CONTROL BOX



TO GENERATOR

240/120V 3PH HIGH DELTA

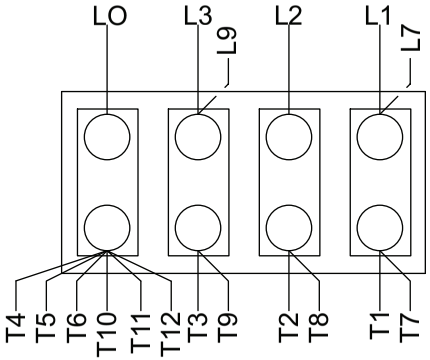
TO CONTROL BOX



TO GENERATOR

208/120V 3PH LOW WYE

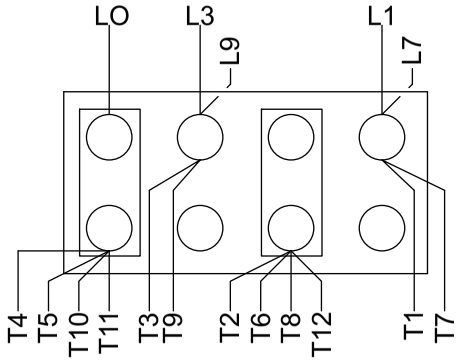
TO CONTROL BOX



TO GENERATOR

240/120V 1 PH LOW ZIG ZAG

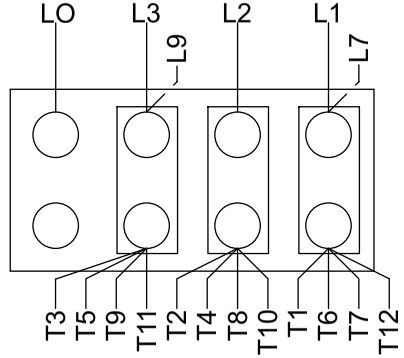
TO CONTROL BOX



TO GENERATOR

120V 3PH LOW DELTA

TO CONTROL BOX

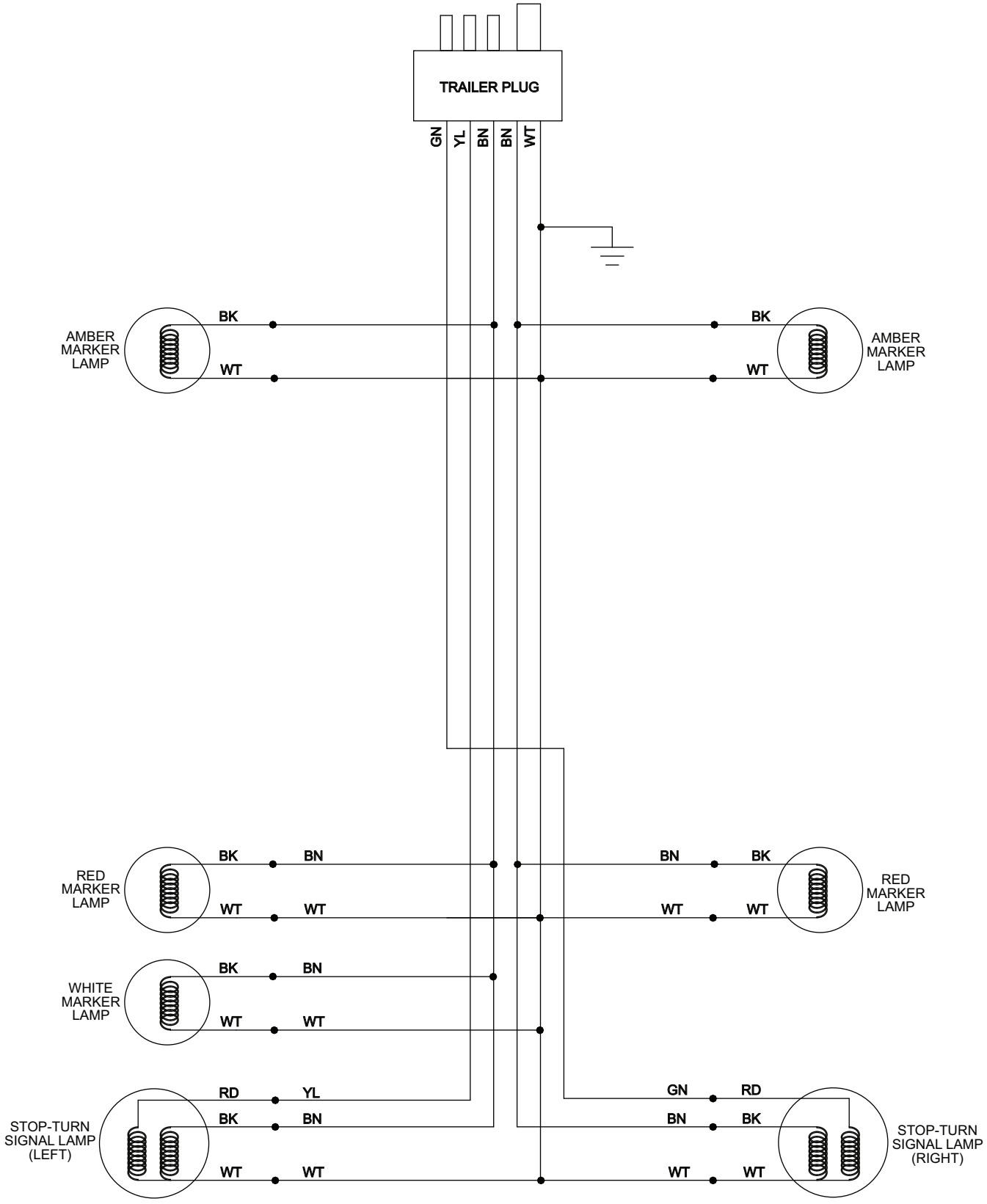


TO GENERATOR

NOTE:

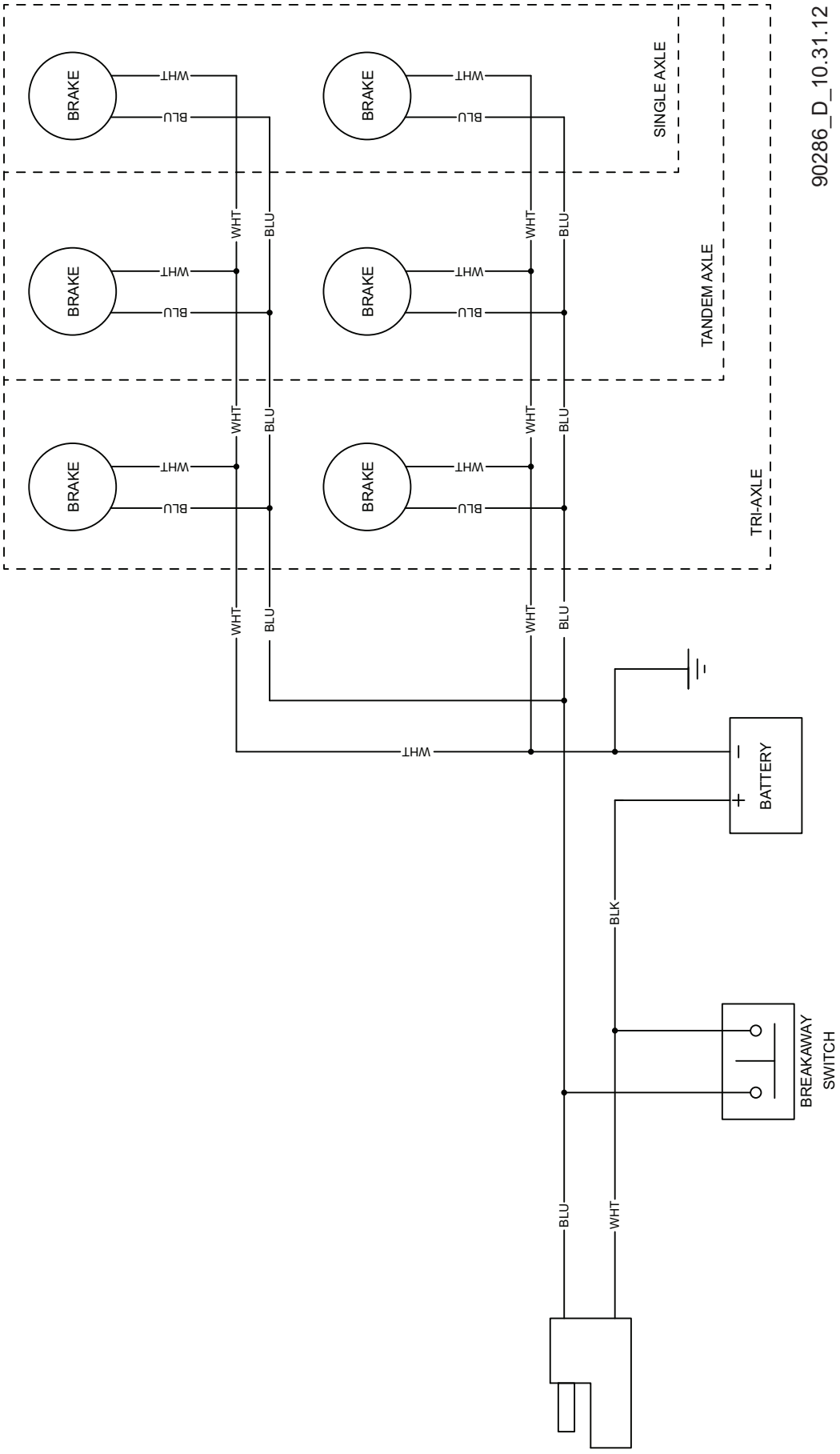
1. CABLES TO CONTROL BOX MAY CONTAIN 1, 2 OR 3 WIRES DEPENDING ON THE MODEL AND VOLTAGE.
2. APPLIES TO ALL 12 LEAD GENERATORS TO BE HARD WIRED IN GEN BOX.

TRAILER WIRING DIAGRAM



90431_ORG_09.11.12

WIRING HARNESS - ELECTRIC BRAKE OPTION



SERVICE LOG

OIL GRADE AND TYPE: ______________________________ BRAND: ______________________________

COOLANT MIXTURE: ______________________________ BRAND: ______________________________

Date	Hours to service	Oil level	Coolant level

Date	Hours to service	Oil level	Coolant level

REV: A
PART NO: 33701
11.25.13