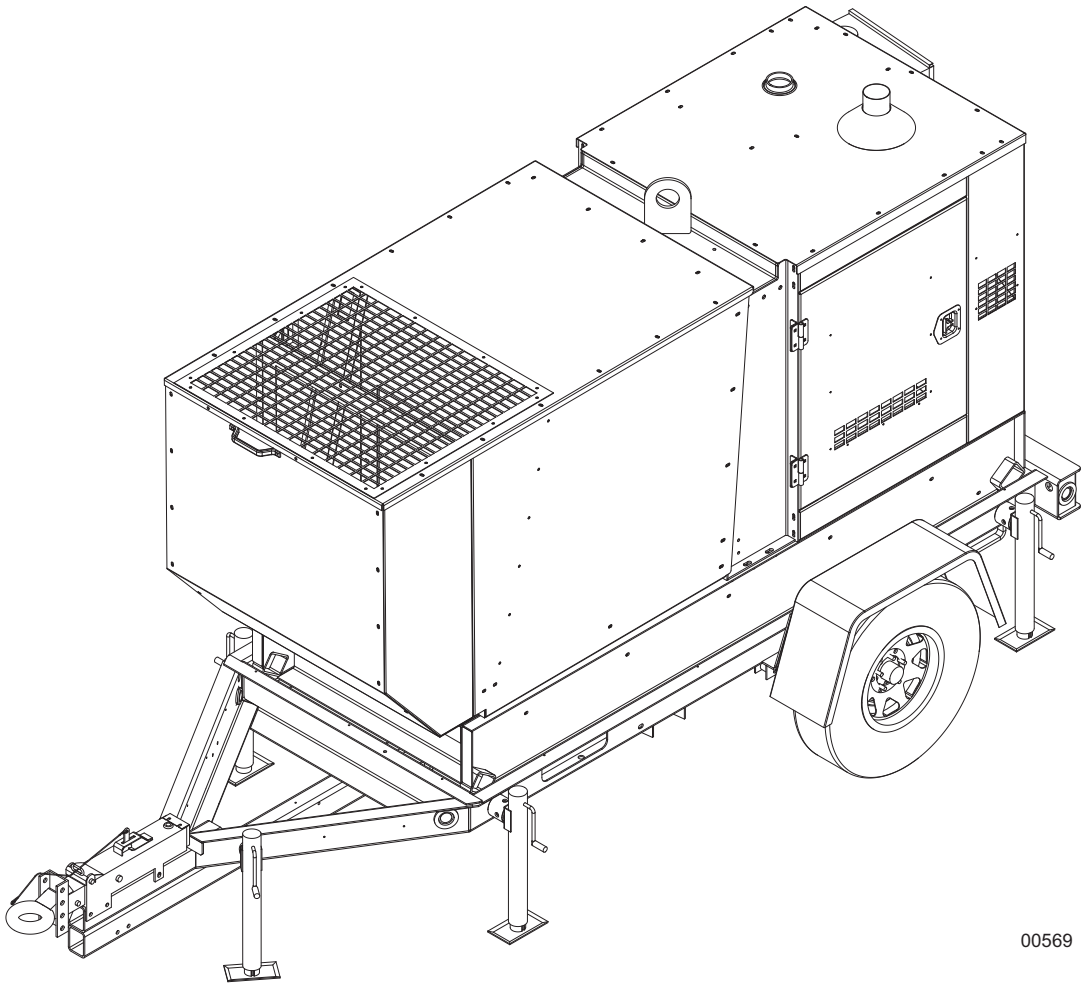
MAGNUM™

A Generac Company

GASEOUS GENERATOR
MGG100M



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OPERATING MANUAL

36833 Rev. B
July, 2014

Parts manuals available online at 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.

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.

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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: _____

Dealer Name:_____
Dealer Phone Number: _____

Table of Contents

Section 1 - Safety

SAFETY NOTES

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

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

Indicates a hazardous situation which, if not avoided, could 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. 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:

- All fuel types are potentially FLAMMABLE and/or EXPOSIVE and should be handled with care. Comply with all laws regulating the storage and handling of fuels. Inspect the unit's fuel system frequently and correct any leaks immediately. Fuel supply lines must be properly installed, purged, and leak tested according to applicable fuel-gas codes before placing the equipment into service.
- 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 a 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 the unit when it was shipped from the factory.

- **DO NOT** run engine indoors or in an area with poor ventilation. 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** smoke around generator. Ensure that no combustible materials are left on or near generator, as FIRE or EXPLOSION may result.
- **DO NOT** touch or lean against hot exhaust pipes or engine block.
- **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 gaseous engine. While the engine is running, potentially lethal voltages are present at the 120V Ground Fault Circuit Interrupt (GFCI) receptacle located on the side of the disconnect switch box 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 the National Electrical Code (NEC), state and local regulations.

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. 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 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 online parts manual at www.m-p-llc.com. 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.		No open flames.
	Unit electrical ground.		Dangerous voltage may be present.
	Wear protective gloves.		Use protective eyewear.
	Explosion hazard.		Lift here only.
	Fire hazard.		Read and understand the supplied operator's manual before operating unit.
	Burn/scald hazard; pressurized steam.		Belt/entanglement hazard; keep body parts clear of this area.
	Hot surface(s) nearby.		Fan hazard; keep body parts clear of this area.
	Engine running.		Anchor/tie down point.

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Section 2 - General Information

SPECIFICATIONS

MAGNUM MODEL	MGG100M
Engine	
Make/Brand	Generac
Model	G9.0L G18
Type	Naturally Aspirated
Horsepower - prime (natural gas) **hp (kW)**	80 (60)
Horsepower - standby (natural gas) **hp (kW)**	134 (100)
Operating Speed **rpm**	1800
Displacement **in^3 (L)**	540 (8.9)
Cylinders - qty	8
Spark plug gap **in (mm)**	0.015 (.381)
Fuel Consumption (natural gas) - 100% load **gph (Lph)**	1116(31.6)
Fuel Consumption (natural gas) - 75% load **gph (Lph)**	904 (25.6)
Fuel Consumption (natural gas) - 50% load **gph (Lph)**	669 (19.0)
Battery Type - Group Number	GRP 24
Battery Voltage (quantity per unit)	12V (1)
Battery Rating	720 CCA
Generator	
Make/Brand	Marathon
Model	362PSL1606
Type, Insulation	H Type
Generator Set (Engine/Generator)	
3Ø - Standby **kW (kVA)**	60 (75)
Amps - 3Ø Standby **480V**	90 (208)
Frequency **Hz**	60
* Power Factor	1 (1Ø), 0.8 (3Ø)
AC Distribution	
Circuit Breaker Size	200
Voltage Regulation	+/- 1%
Voltages Available 1Ø	120, 240
Capacities	
Coolant (incl. engine) **qt (L)**	22.7 (6.0)
Oil (incl. filter) **qt (L)**	9 (8.5)
Oil Reservoir	16
Maximum Run Time **hrs.**	250
Weights	
Operating Weight, Skid Mounted **lbs (kg)**	3250 (1474)
Operating Weight, Trailer Mounted** **lbs (kg)**	4000 (1814)
Trailer	
Number of Axles	1
Capacity - Axle Rating **lbs (kg)**	6000 (2721)
Tire Size **in**	15
Brakes - Standard	Surge
Hitch - Standard	2" lunette ring
Maximum Tire Pressure **psi**	80

* Refer to the data plate on the generator for rated watts, amperes, frequency, voltage, phase and other important information.

** Standard trailer only. Consult factory for custom trailer weights.

Specifications are subject to change without notice.

UNIT DIMENSIONS

MAGNUM MODEL	MGG100M
Dimensions (L x W x H)	
Trailer Mounted **in (m)**	168 x 69 x 83 (4.26 x 1.75 x 2.1)

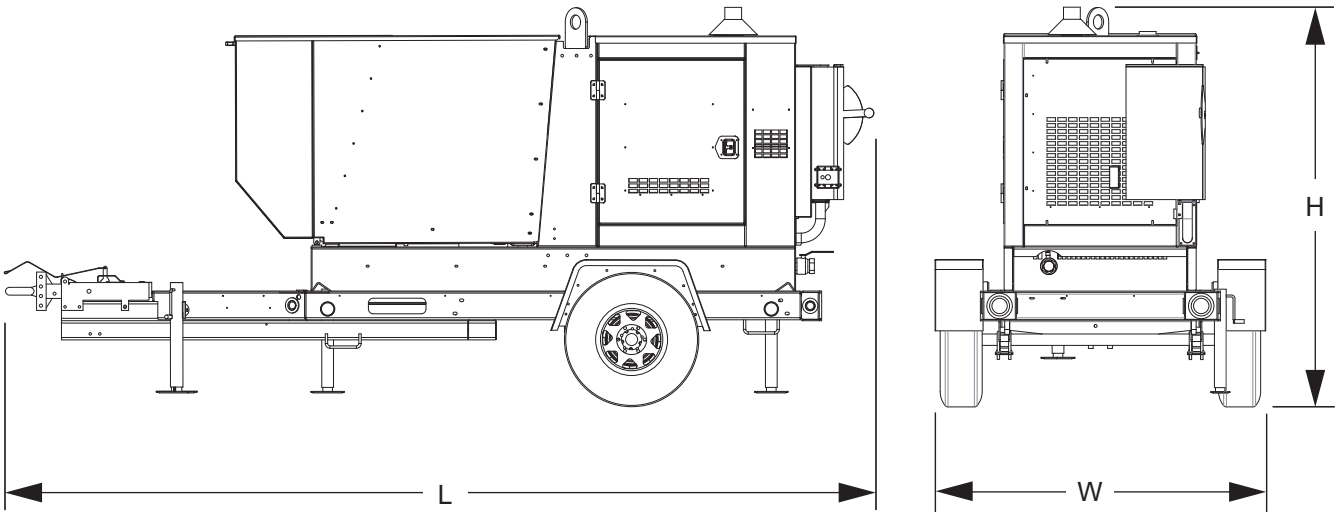

Figure 1 - Unit Dimensions

Specifications are subject to change without notice.

Engine Oil Recommendations

The engine has been filled with factory engine oil of a grade recommended by the engine supplier as follows:

- Gaseous Engines: Displacement larger than 6.8L - SAE 40.

The manufacturer recommends an initial oil and filter change after the first 50 hours (or first 3 months) of service operation. Use a high quality detergent oil with an appropriate classification and viscosity for the engine type and ambient temperature conditions. Consult your Authorized Servicing Dealer for oil recommendations. Recommended API Service Category for gaseous engines: SJ, SL, SM, or SN.

Coolant Recommendation

Use only deionized or distilled water and Ethylene glycol antifreeze (Propylene glycol can also be used but do not mix with Ethylene glycol). When adding coolant, always add the recommended 50-50 mixture.

⚠ DANGER

DO NOT REMOVE THE RADIATOR PRESSURE CAP WHILE THE ENGINE IS HOT. SERIOUS BURNS FROM BOILING LIQUID OR STEAM COULD RESULT.

⚠ DANGER

ETHYLENE GLYCOL BASE ANTIFREEZE IS POISONOUS. DO NOT USE MOUTH-TO-SIPHON COOLANT FROM THE RADIATOR, RECOVERY BOTTLE, OR ANY CONTAINER. WASH HANDS THOROUGHLY AFTER HANDLING. NEVER STORE USED ANTIFREEZE IN AN OPEN CONTAINER BECAUSE ANIMALS ARE ATTRACTED TO THE SMELL AND THE TASTE OF ANTIFREEZE EVEN THOUGH IT IS POISONOUS.

⚠ CAUTION

Do not use any chromate base rust inhibitor with propylene glycol base antifreeze. Using any high silicate antifreeze boosters or additives also will cause overheating. The manufacturer also recommends that any soluble oil inhibitor is **NOT USED** for this equipment.

UNIT SERIAL NUMBER LOCATIONS

Refer to the locations illustrated below to find the unit ID tag and VIN tag on your unit. Important information, such as the unit serial number, model number and Vehicle Identification Number (VIN) for your trailer 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 technical assistance, you may be asked to provide this information.

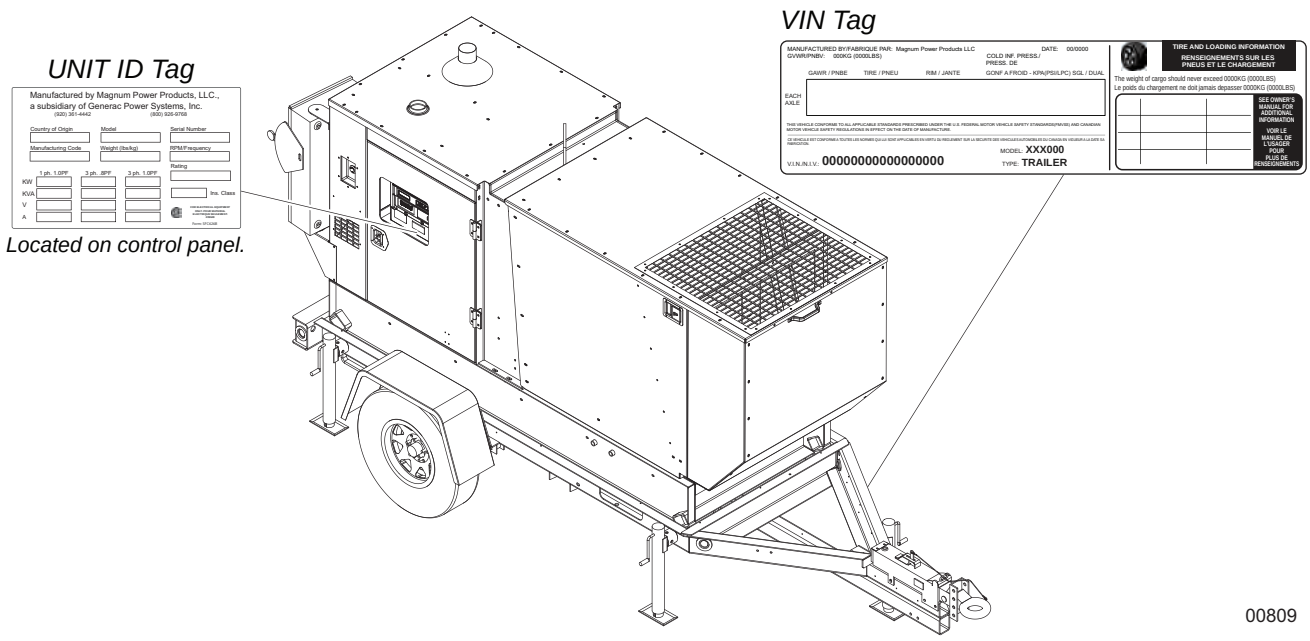

Figure 2 - Serial Number Locations

COMPONENT LOCATIONS

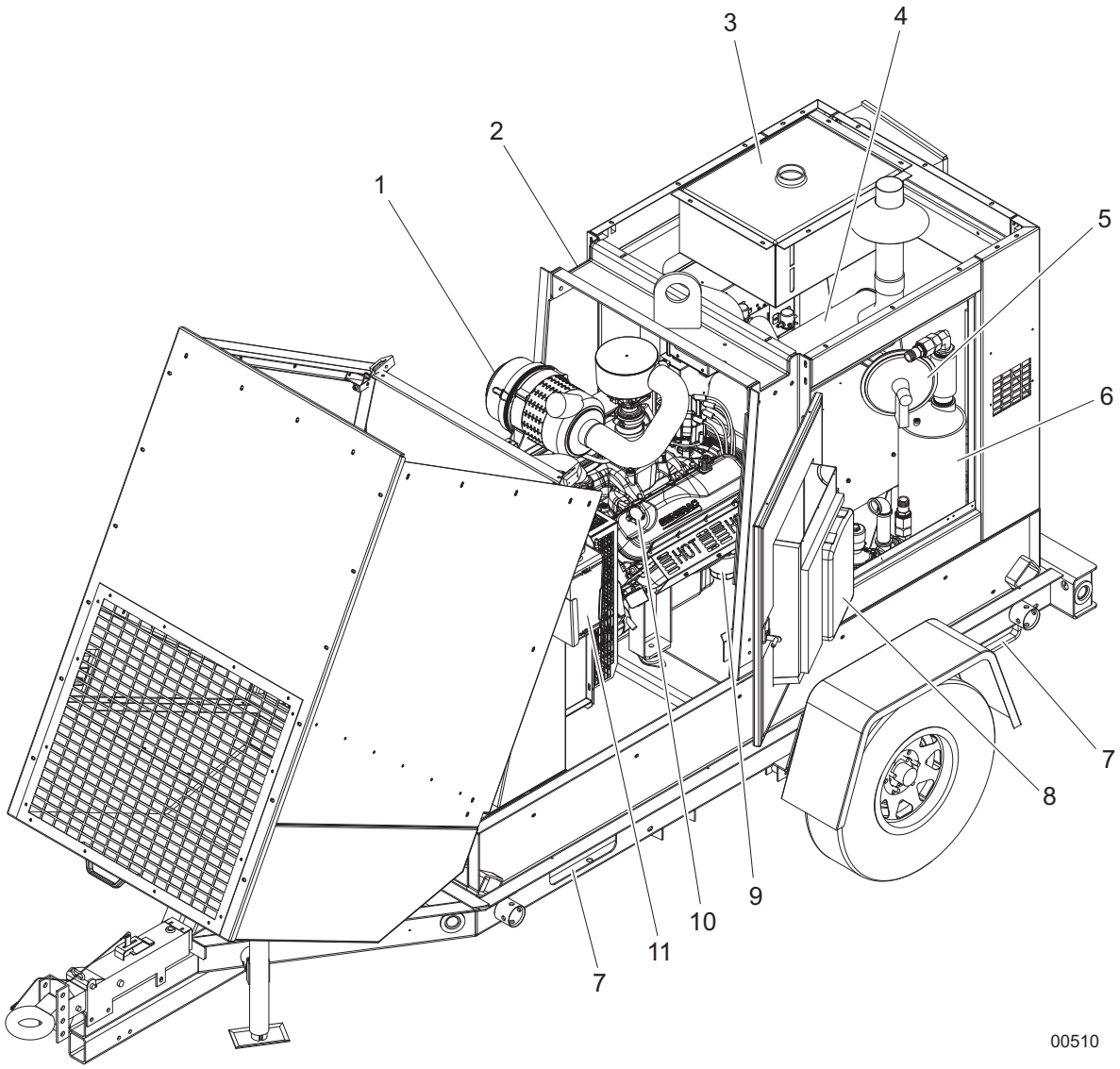

Figure 3 - Component Locations - Left Side

1. Air filter
2. Lift structure
3. Oil reservoir
4. Catalyst exhaust muffler
5. Main fuel regulator
6. Gas/water separator tank
7. Fork lift slots
8. Manual holder
9. Oil filter
10. Oil fill
11. Coolant jug

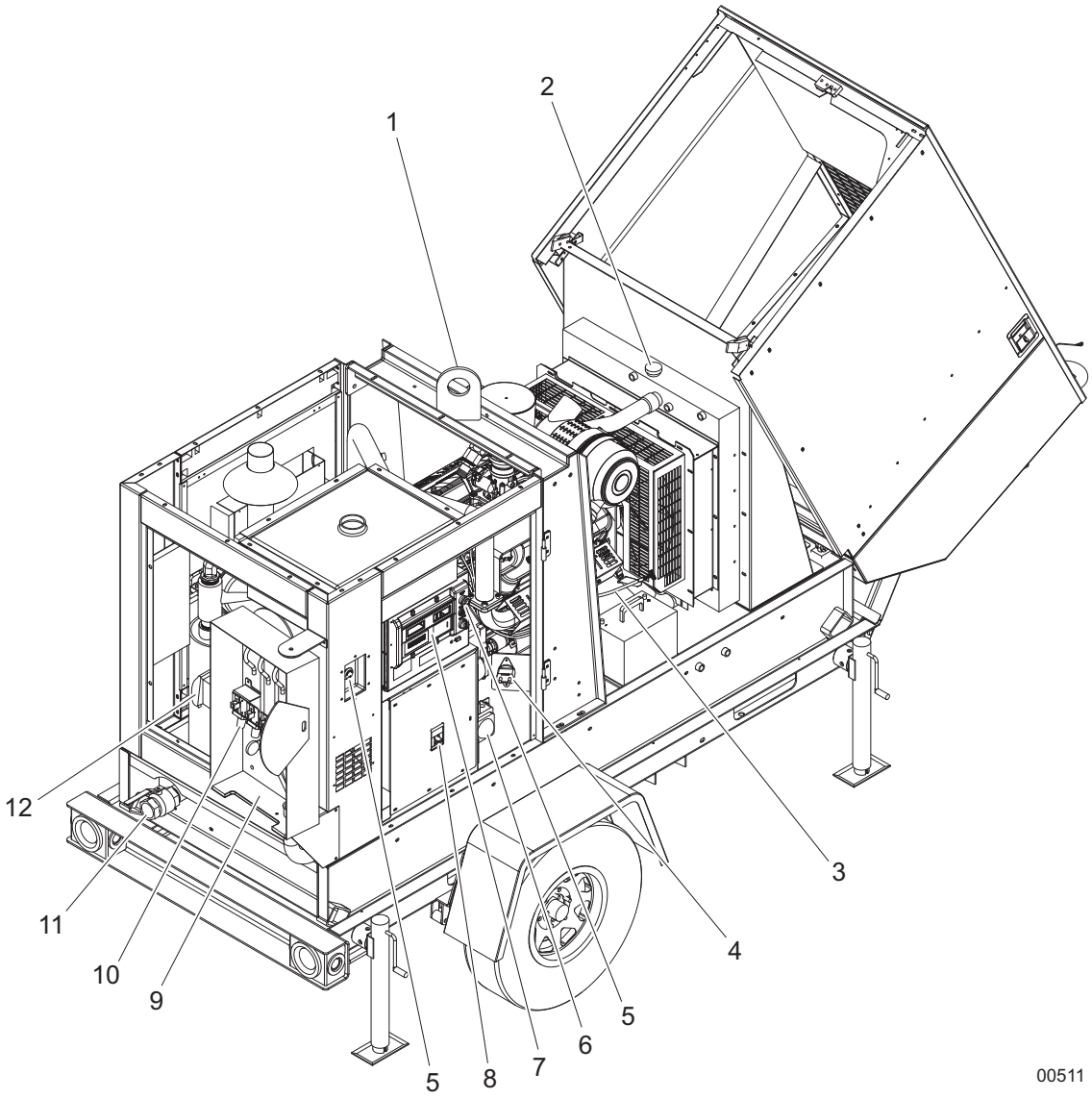

Figure 4 - Component Locations - Right Side

1. Central lift point
2. Coolant pressure cap
3. Dipstick
4. Battery disconnect switch
5. Emergency stop button
6. Oil level controller
7. H-100 controller
8. Main circuit breaker
9. Customer disconnect switch box
10. Cam locks (optional)
11. Fuel inlet valve
12. Customer convenience receptacle

EQUIPMENT DESCRIPTION

This equipment is a revolving field, alternating current type generator set. The generator is designed to supply electrical power for the operation of compatible electrical loads when the utility power supply is not available or has dropped to an unacceptable level.

The generator's revolving field is directly connected to and driven by an engine by means of flexible discs. Generators with a four-pole rotor are driven at a rated speed of 1,800 rpm to supply a frequency of 60 Hertz. Four-pole rotors operating at 50 Hertz are driven at 1,500 rpm.

Refer to the data label affixed to the unit for rated AC voltage, wattage, amperage, number of phases, etc.

Standard Generator Features

The generator incorporates the following features:

- The rotor insulation system is Class H rated, and the stator insulation is Class H rated as defined by NEMA MG1-22.4 and NEMA MG1-1.65.
- The generator is self-ventilated and drip-proof constructed.
- The voltage waveform deviation, total harmonic content of the AC waveform and telephone influence factor have been evaluated and are acceptable according to NEMA MG1-22.
- All prototype tested models have passed three-phase symmetrical short circuit test to ensure system protection and reliability.

Note: *This manual assumes that the generator set has been properly selected, installed and interconnected by a competent, qualified electrician or installation contractor. Once the installation is complete, do nothing that may result in non-compatibility between the generator and connected electrical loads.*

Generator and Load Compatibility

The generator must be fully compatible with the rated voltage, phase, and frequency of the connected electrical loads. The generator, connected electrical devices, or both, can be damaged if voltage, phase, and frequency are not compatible.

ENGINE/GENERATOR PROTECTIVE DEVICES

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

The MGG100M leaves the factory with the controller warning set at 65kW (5 second delay) and shutdown set at 70kW (5 second delay). Our testing indicates that knocking will occur somewhere above 70kW. To operate the unit above 70kW, an adjustment must be made within the generator controller. This must be done by an authorized owner or service technician.

Note: *Engine/generator protective devices are only mentioned here for the owner/operator's general information. For details, refer to the applicable control panel technical manual. The list below is not all inclusive.*

Coolant Temperature Sensor

The control panel automatically shuts down the engine if the engine coolant temperature rises above a safe level.

Low Coolant Level Sensor

Should the engine coolant level drop below the level of the low coolant temperature sensor, it is possible for the engine to overheat without automatic shutdown. To prevent such overheating, the engine has a low coolant level sensor. If the level of engine coolant drops below the level of the low coolant level sensor, the control panel will shut the engine down.

Oil Pressure Sensor

This sensor monitors engine oil pressure. If oil pressure drops below a safe level, the control system automatically shuts down the engine.

Overspeed Shutdown

A speed circuit controls engine cranking, startup, operation, and shutdown. Engine speed signals are delivered to the control panel whenever the unit is running. Should the engine overspeed above a safe, preset value, the control panel initiates an automatic engine shutdown.

Overcrank Shutdown

After a pre-specified duration of cranking, this function ends the cranking if the engine has failed to start. The default settings are:

- The unit will attempt to start (crank) three times.
- Each crank cycle lasts either 10 or 15 seconds, followed by a five second rest (to cool the starter).
- After three starting attempts, the unit will shutdown.

RPM Sensor Loss Shutdown

If the speed signal to the control panel is lost, engine shutdown will occur.

Low Fuel Pressure Warning

Some gaseous units are equipped with a low fuel pressure warning switch which will trigger a Warning alarm if the fuel pressure drops below a minimum setting.

DC FUSES

Located inside the front panel, the fuses protect the control panel wiring and components from damaging overload. For fuse location and identification, refer to Figure 3 on *page 15*.

FUEL SYSTEM

This type of fuel system runs on natural gas or well gas. Natural gas is supplied by the well site in its vapor state through above or below ground piping.

Note: *This unit is factory set to 18° BTDC.*

⚠ DANGER

ALL FUEL TYPES ARE POTENTIALLY FLAMMABLE AND/OR EXPOSIVE AND SHOULD BE HANDLED WITH CARE. COMPLY WITH ALL LAWS REGULATING THE STORAGE AND HANDLING OF FUELS.

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Section 3 - Operation

UNIT SET UP

A well gas chromatography analysis must be performed prior to installation of the unit. A copy of the test report must be sent to, and preapproved by, Magnum Power Products LLC. Refer to the Magnum General Warranty for more information. The owner is responsible for ensuring the unit's emission control system meets all applicable state and local regulations.

Note: *If the unit is moved to a new location, a new well gas test must be performed.*

Normal maintenance service and replacement of parts are the responsibility of the owner/operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. It is strongly recommended that the equipment be periodically checked by a Magnum Authorized Dealer.

GENERATOR CONTROL AND OPERATION

Read the operating manual thoroughly and understand all instructions before using the equipment. Study the Safety section to understand all safety rules and hazards. Installation, operation, servicing and repair of this equipment must always comply with applicable codes, standards, laws, and regulations.

It is strongly recommended that a Magnum Authorized Dealer provide instruction to the operator for the safe inspection, starting, operating, and stopping of the unit. When the generator requires servicing or repairs, contact an authorized dealer for assistance.

H-100 PANEL INTERFACE

The H-100 Panel Interface mounted on the generator allows the operator to monitor, and if necessary, manually start the generator.

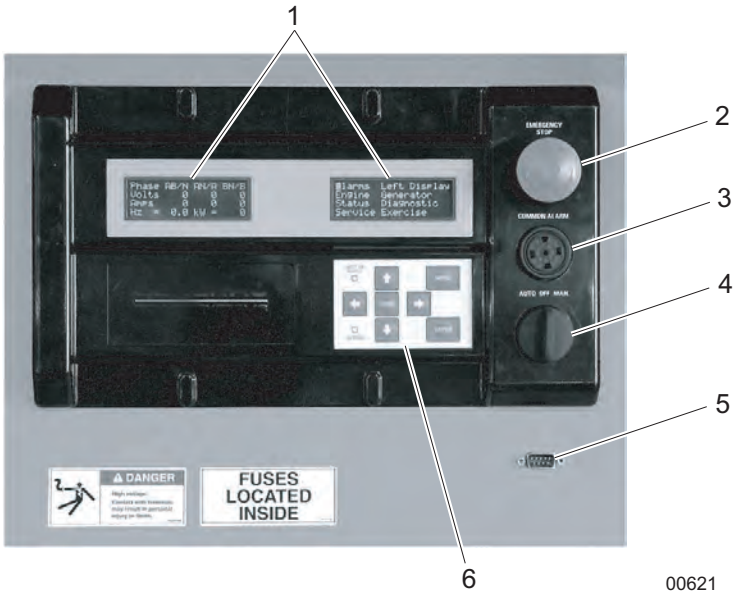

Figure 5 - H-100 Control Panel Interface

1. Liquid Crystal Display (LCD) windows
2. Emergency stop button
3. Common alarm horn
4. Control power key switch
5. Programming port (for dongle)
6. Arrow keys pad

Emergency Stop Button

The red emergency stop button is the top button on the right side of the panel. Pressing the button while the unit is

running will immediately shut the generator down. To restart the unit, the emergency stop button must be manually reset, the key switch turned to the OFF position, and then turned to either the AUTO or MAN position, depending on the desired mode of operation.

Common Alarm Horn

Directly below the emergency stop button is a Common Alarm Horn. The Common Alarm and Digital Output Function #1 are activated whenever a fault condition is set for Alarm and if the fault is Active. The common alarm will not activate on Warnings or DTC fault conditions. Pressing the Enter button on the key pad will acknowledge the alarm and silence the horn. The manufacturer recommends that the local service dealer be notified of any alarm condition in order for qualified service personnel to assess and correct the situation.

Control Power Switch

A manual three-position key switch is located beneath the common alarm horn. The positions are:

- **AUTO:** The generator will automatically start when a properly connected automatic transfer switch senses a loss or reduction of available utility power.
- **OFF:** Immediately shuts down the generator and/or prevents it from starting automatically.
- **MAN:** Immediately starts the generator.

Left Display Window

The Left Display Window can be configured to display different menus. Refer to the H-100 Control Panel Operations Manual for more information. Normally, the following information is displayed:

- Volts
- Hertz
- Amps
- Kilowatts
- Frequency

Right Display Window

The Right Display Window displays:

- Alarm information
- HOME menu: basic engine menu information, such as oil pressure, oil temperature, water temperature, battery voltage
- MENU: main menu navigation screen

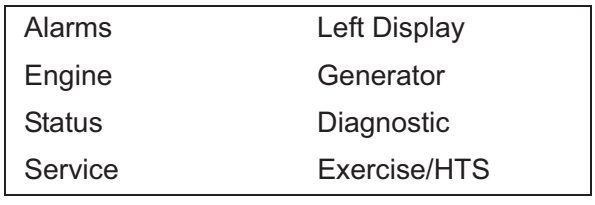

Figure 6 - Right Display Window (Press MENU)

Arrow Keys Pad

The key pad contains four arrow keys, a Home key, a Menu key, and an Enter key. Two LEDs are also present, one labeled “NOT IN AUTO” and the other “ALARM”.

Use the arrow keys to navigate through the menus displayed in the display windows. For example, when the Home key is pressed, the Home menu is displayed in the right display window. When a flashing cursor appears within a line of the text, move the cursor up, down, left, or right by pressing the corresponding arrow key.

The Not In Auto LED flashes once each second when the key switch is moved to the Off or Man positions.

During normal operation when no alarms are present, the Alarm LED flashes for one second every 30 seconds (approximate) to indicate that the panel is operational. When an active alarm condition is detected, the Alarm LED flashes once each second. The LED remains on if the alarm condition is acknowledged, but still active.

Fuse Block

The fuse block is located inside the control panel at the back lower left corner. The 10 amp fuse in the F2 slot is the control panel fuse.

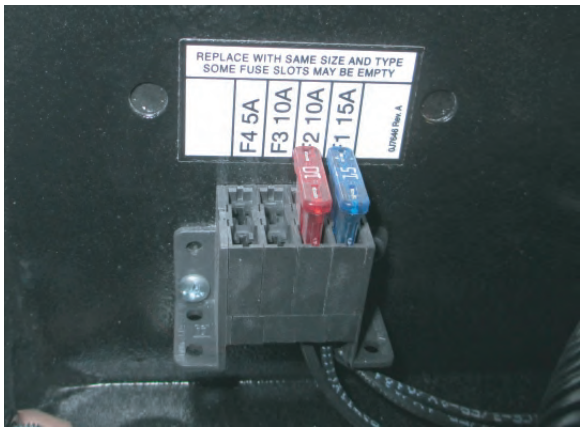

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Figure 7 - Panel Fuse Block

Main Circuit Breaker

A Main Line Circuit Breaker (MLCB) is located on the panel below the controller. Refer to *“Component Locations” on page 8*. The MLCB serves as the means of disconnect at the generator.

ALARM RESPONSE PROCEDURES

The generator is protected by factory set alarms and warnings. The alarms and warnings alert the owner/operator of a fault condition that requires attention and action to keep the generator operating in an efficient and safe running order.

Alarm Types

When any alarm is triggered, the Common Alarm Horn sounds, the Alarm LED flashes, and the Alarm Page in the Right Display Window becomes active.

Note: *Not all faults can be corrected and cleared by the owner/operator. Some Warnings and most Alarm conditions must be safely cleared by a qualified dealer or trained technician.*

Warnings

Warnings are the lowest level alarm, and are generated to alert the operator that an operating condition has changed and may require action or inspection. Warnings clear once they are no longer active.

Non-Shutdown Alarms

Non-shutdown alarms are more urgent than warnings, and indicate a system parameter which is approaching or has exceeded a safe operating limit. Non-shutdown alarms require some form of action, such as inspection, close monitoring, etc. These types of alarms clear when they are no longer active and have been acknowledged.

Shutdown Alarms

Shutdown alarms protect the generator from damage and indicate a system fault that if continued without immediate inspection or correction would result in damage to the unit. Shutdown alarms are cleared only after the control power switch has been placed in the OFF position and they are no longer active.

Alarm Display Window

Three system warning and alarm pages can be displayed in the right display window. Each page is capable of displaying three warnings and/or alarms. If there are more than nine total warnings/alarms, only the most recent are displayed. All warnings and alarms remain in the list until they are cleared.

- Warnings clear when they are no longer active.
- Alarms clear when they have been acknowledged and the alarm condition has been corrected.
- Shutdown alarms clear only after they have been acknowledged, the alarm condition has been corrected, the control power switch has been cycled from the AUTO to the OFF position, and the alarm is no longer active.

Any active warning or alarm condition will sound the Common Alarm Horn, and the Right Display Window immediately changes to the first alarm page.

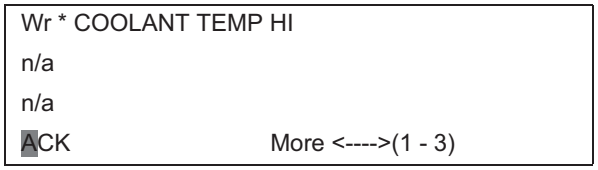


Figure 8 - System Alarm Warning Page

The alarm page display indicates the following:

Wr	=	Warning (Al = Alarm, SD = Shutdown alarm).
*	=	Indicates the alarm has not been acknowledged.
COOLANT TEMP HI	=	Indicates the fault condition. (Hi = tripped by being above the threshold; Lo = tripped by being below the threshold).
n/a	=	Indicates that no additional alarms or warnings exist and that these lines are vacant.
Cursor flashes on the “A” in “ACK”	=	Press ENTER to acknowledge the alarm. The horn stops and the asterisk (*) is removed from the display.
More <--->(1-3)	=	Indicates that as many as three pages of alarm information may be available.

General Fault Response Procedure

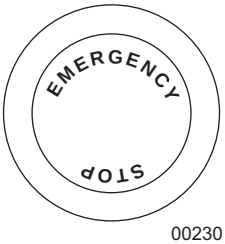
1. Press ENTER to acknowledge the fault, silence the alarm horn, and switch the Alarm LED from flashing to On.
2. Carefully read each line of the Alarm Warning Page to determine what fault condition is present. If there is more than one fault, the most recent is listed first.
3. Press MENU to display the main menu navigation screen.
4. Depending on the fault condition, use the arrow keys to toggle to the corresponding area and press ENTER.

5. Observe the information displayed for the affected area.
6. Determine corrective action necessary.
7. When the fault condition is cleared, the ALARM LED will turn off.

Refer to the H-100 Control Panel Operation Manual for more information.

EMERGENCY STOP BUTTON

This unit is equipped with two emergency stop buttons. One is located on the panel interface and one is located on the outside of the rear enclosure panel. The red emergency stop button located on the enclosure panel is clearly labeled “EMERGENCY STOP.”



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Activate the switches by pushing the buttons in until they lock 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 switch will remain closed until it is pulled out.

NOTICE

Use the emergency stop buttons only when the unit must be shut down immediately. For any other shut down, refer to *“Shutdown and Restarting an Operating Generator” on page 21*.

MAIN CIRCUIT BREAKER

The main circuit breaker is located on the main control panel (refer to *Figure 4 on page 9*). When the breaker is in the Off (O) position, power is interrupted between the 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.

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 customer disconnect switch box door covering the 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 connection lugs only. The customer convenience receptacles have power even if the main circuit breaker is in the Off (O) position. To disconnect power to the convenience receptacles, use the individual circuit breakers located near each receptacle.

CONVENIENCE RECEPTACLE

The generator is equipped with a convenience receptacle, located on the outside of the customer disconnect switch box. Refer to *Figure 4 on page 9*. The receptacle is a 120VAC duplex outlet rated at 20A with Ground Fault Circuit Interrupt (GFCI) protection. The receptacle is not routed through the main circuit breaker. The receptacle has its own

circuit breaker, located directly next to it. The breaker is sized to the maximum rating of the receptacle.

00579

Figure 9 - Convenience Receptacle

NOTICE

Power to the receptacle 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 CONVENIENCE RECEPTACLE IS TURNED OFF BEFORE TURNING THE BREAKERS ON.

GENERATOR OUTPUT CONNECTION LUGS

The generator is equipped with connection lugs located inside the customer disconnect switch box (refer to *Figure 4 on page 9*). The lugs provide connection points for attachment of external loads to the generator. 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 Electric Code (NEC), state and local regulations. Failure to follow proper installation requirements may result in equipment or property damage, personal injury, or death.

⚠ WARNING

Before any connections are made to the generator, make sure that the main circuit breaker and the control power switch are in the Off (O) position and that the negative (-) battery cable is disconnected. 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 opening in the bottom of the box. The customer disconnect switch box 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 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 NATIONAL ELECTRIC CODE (NEC), AS WELL AS ANY STATE AND LOCAL CODES OR REGULATIONS.**

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 (3-5ºC) increase in ambient air temperature over 72ºF (22ºC).

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 in *"Specifications" on page 5*.

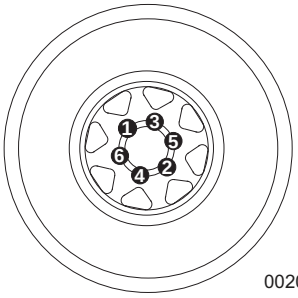
5. Check the wheel lugs. Tighten or replace any that are loose or missing. If a tire has been removed for axle service or replaced, tighten the lugs in the order shown, to the following specifications:

   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).



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Note: *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.

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.

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Section 4 - Maintenance

DISABLING A GENERATOR FOR MAINTENANCE

There are two conditions when maintenance checks may have to be performed on the unit:

1. When the unit is in standby mode (automatic) and **NOT** running. Before shutting the unit down, perform a thorough visual inspection for leaks, loose components or connections, excessive wear or damage. Any discrepancies noted should be further inspected and corrected while the unit is shut down.

2. When the unit is running and providing power to the load. To shut down the unit safely without damaging loads or the generator, follow the steps for shutting down a unit while in operation. Before shutting down an operating unit for maintenance, always make sure that personnel are warned that the power will be shut down temporarily so that equipment that might be damaged can be properly turned off or placed in standby.

To Disable the Generator From Starting

To prevent injury, **BEFORE** performing any maintenance, disable the generator set from starting and/or connecting to the load:

1. Set the control panel control power switch to the OFF position.

2. Remove the control panel fuse (F2-10A fuse).

3. Disconnect the negative battery cable.

Note: *The battery charger must be turned off* ***BEFORE*** *disconnecting the battery cable to prevent an over-current condition from burning out sensitive control panel components and circuits.*

Note: *Following any maintenance, reverse these steps to insure the unit is returned to setup for normal operation.*

Shutdown and Restarting an Operating Generator

If the unit is operating and required checks must be performed:

1. Ensure that power to the load can be interrupted (warn any equipment users that there will be a temporary power disruption). There may be other procedures that must be done before shutting a unit down, depending on application.

2. Open the generator Main Line Circuit Breaker (MLCB).

3. Allow the unit to cool down (running at no-load) for approximately 5 minutes to prevent damage to critical engine components.

4. Set the control panel control power switch to the OFF position. There may be safety tag-outs or lockouts required at this point, depending on application.

5. Perform the necessary maintenance checks or tasks (based on the hourly requirements).

6. When all checks have been completed and any discrepancies corrected, set the control panel auto/off/manual switch to the AUTO position.

7. When the generator is running, and all engine/generator parameters (voltage, frequency, coolant temp, oil pressure, etc.) have been verified as correct, close the generator Main Line Circuit Breaker (MLCB). The unit will accept and carry the load.

8. Make a last visual inspection of the generator set to make sure it is operating properly.

MAINTENANCE TASKS

Daily checks must be performed when the unit is operated continuously for extended periods of time. Daily checks and routine monthly checks can be performed by an authorized operator.

Verify the trailer is as level as possible and that the tires are blocked. Verify the radiator and exhaust areas are clear of debris.

Daily Walk Around Inspection

Look for conditions that could hinder performance or safety, such as (but not limited to) oil, coolant, gas (well, natural) leakage, blocked vents, loose or missing hardware and electrical connections. Check for foreign matter blocking the vents and on top of the unit.

When the unit is not running:

- Visually inspect the fan belt for cracks, fraying and stretching. Ensure the belt is properly seated in the pulley grooves. At 500 hours it is recommended that the belt be removed and checked for wear. While the belt is removed, inspect pulleys and bearing. Rotate and feel for hard turning or unusual sounds.
- Coolant should be checked daily. Visually check the coolant expansion tank and make sure the coolant level is between the Cold and Hot level markings. Add coolant to the expansion tank when the engine is cool (not at operating temperature/not running). Add a 50/50 mixture of the correct antifreeze and distilled or deionized water to the coolant system.
- Inspect the tire pressure. Refer to *"Specifications" on page 5* for maximum tire pressure.
- Check electrical connectors, battery and battery disconnect connections, and ground points. Look for loose or missing hardware.
- Check all flexible rubber hoses for deterioration.

Check Engine Fluids

The following checks can be performed by a trained authorized operator. Observe all safety precautions outlined in the Safety section.

Check Engine Oil Level

An authorized operator should check the levels of engine oil and engine coolant monthly (or every 24 hours of operation). The oil level should be maintained between the FULL and ADD marks on the engine dipstick. Recommended fluids are listed in subsection *"Engine Oil Recommendations" on page 6*.

Check the level on the oil controller sight glass. When the unit is off for ten minutes or more, the oil level in the sight glass should be almost to, or at, the top of the sight bubble. You may also verify the oil level by using the dipstick.

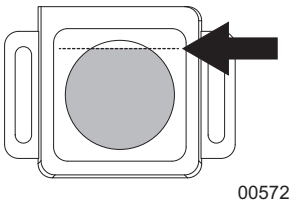

Figure 10 - Engine Stopped

When the unit is running, the engine will draw oil or throw oil though out the case, and the sight glass should show

the oil level slightly below halfway up the sight glass.

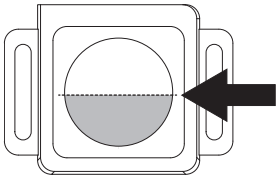

Figure 11 - Engine Running

This unit is equipped with an auxiliary engine oil reservoir and automatic float valve. When checking the engine oil, the reservoir should also be checked.

Add oil as needed via the oil reservoir. Open the valve and allow oil to drain into the controller until the sight glass is approximately halfway full while running, or near the top of the controller sight glass while the unit is shut down. The dipstick can be used to verify correct oil level while the genset is off. The valve may be left open. Close the valve before moving the unit.

To check the engine oil using the dipstick:

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

Typical causes of inaccurate oil level readings:

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

Changing the Oil

Note: *When changing oil, it is not necessary to drain the oil from the reservoir.*

1. Close the valve below the oil reservoir.
2. Place a bucket below the oil drain hose, located on the right side of the frame.
3. Remove the oil drain plug.

4. Open the drain valve, located below the front of the engine.
5. Allow the oil to drain completely into the bucket.
6. Remove the oil filter.
7. Place a new gasket on the new oil filter and install, turning one turn after initial gasket contact.
8. Close the engine oil drain valve and reinstall the hose plug.
9. Remove the oil fill cap on the engine valve cover and add fresh oil.
10. Open the oil reservoir valve.
11. Top off the oil in the reservoir.

Check Fuel System

Check gas pressure. At the well fuel inlet, the well gas should be a minumum of 10 psi (69 kPa) and a maximum of 20 psi (138 kPa).

Note: *The regulator mounted off of the fuel separator should be set to 13-1/4 in. (34 cm) WC before running, and 12-3/4 in. (32 cm) WC while running. The regulator should only be set during field set up by an Authorized Technician.*

The fuel/water separator tank should be drained every 24 hours of run time. Prior to draining the fuel/water separator, place a drain pan under the hose to collect any debris. With no open flame or other ignition source in proximity, open the valve and let the water drain only until the water flow diminishes, then immediately close the valve. Follow local and state ordinances for the proper disposal of the drained liquid/debris.

Check Coolant Level

Add coolant to the expansion tank only when the engine is cool (not at operating temperature).

⚠ DANGER

DO NOT REMOVE THE RADIATOR PRESSURE CAP WHILE THE ENGINE IS HOT. SERIOUS BURNS FROM BOILING LIQUID OR STEAM COULD RESULT.

⚠ DANGER

ETHYLENE GLYCOL BASE ANTIFREEZE IS POISONOUS. DO NOT USE MOUTH-TO-SIPHON COOLANT FROM THE RADIATOR, RECOVERY BOTTLE, OR ANY CONTAINER. WASH HANDS THOROUGHLY AFTER HANDLING. NEVER STORE USED ANTIFREEZE IN AN OPEN CONTAINER BECAUSE ANIMALS ARE ATTRACTED TO THE SMELL AND THE TASTE OF ANTIFREEZE EVEN THOUGH IT IS POISONOUS.

⚠ DANGER

DO NOT USE ANY CHROMATE BASE RUST INHIBITOR WITH PROPYLENE GLYCOL BASE ANTIFREEZE. USING ANY HIGH SILICATE ANTIFREEZE BOOSTERS OR ADDITIVES WILL CAUSE OVERHEATING. THE MANUFACTURER RECOMMENDS THAT NO SOLUBLE OIL INHIBITOR BE USED FOR THIS EQUIPMENT.

Visually check the coolant expansion tank and make sure the coolant level is between the cold and hot level markings. To add coolant to the system, add it to the expansion tank when the engine is cool (not at operating temperature, not running). Add only a 50/50 mixture of the correct antifreeze and distilled or deionized water to the coolant system.

Battery Inspection

⚠ DANGER

STORAGE BATTERIES GIVE OFF EXPLOSIVE HYDROGEN GAS. THIS GAS CAN FORM AN EXPLOSIVE MIXTURE AROUND THE BATTERY FOR SEVERAL HOURS AFTER CHARGING. THE SLIGHTEST SPARK CAN IGNITE THE GAS AND CAUSE AN EXPLOSION. AN EXPLOSION CAN SHATTER THE BATTERY AND CAUSE BLINDNESS OR OTHER INJURY. ANY AREA THAT HOUSES A STORAGE BATTERY MUST BE PROPERLY VENTILATED. DO NOT ALLOW SMOKING, OPEN FLAME, SPARKS, OR ANY SPARK PRODUCING TOOLS OR EQUIPMENT NEAR THE BATTERY.

⚠ CAUTION

Battery electrolyte fluid is an extremely caustic sulfuric acid solution that can cause severe burns. Do not permit fluid to contact eyes, skin, clothing, painted surfaces, etc. Wear protective goggles, protective clothing and gloves when handling a battery. If fluid is spilled, flush the affected area immediately with clear water.

DO NOT dispose of the battery in a fire. The battery is capable of exploding.

DO NOT open or mutilate the battery. Released electrolyte can be toxic and harmful to the skin and eyes.

The battery represents a risk of high short circuit current. When working on the battery, always remove watches, rings, or other metal objects, and only use tools that have insulated handles.

An authorized operator should inspect the engine battery system monthly. At this time, the battery fluid level should be checked and distilled water added if needed. Battery cables and connections should also be inspected for cleanliness and corrosion.

Once every six months, an Authorized Service Technician should inspect the battery system. At this time the battery condition and state of charge should be checked using a battery hydrometer. The battery should be recharged or replaced as required.

Servicing of the battery is to be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

Observe the following precautions when working on batteries:

- Remove the 10A F2 fuse from the generator control panel.
- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of the battery.
- If applicable, disconnect the charging source prior to connecting or disconnecting battery terminals. Remove the battery charger fuse (ATC style fuse, 5 amp on the 2.5 charger and 15 amp on the 10A charger).
- Wear full eye protection and protective clothing.
- Where electrolyte contacts the skin, wash it off immediately with water.
- Where electrolyte contacts the eyes, flush thoroughly and immediately with water and seek medical attention.
- Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of 1 pound (500 grams) bicarbonate of soda to 1 gallon (4 liters) of water. The bicarbonate of soda solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water.

Lead-acid batteries present a risk of fire because they generate hydrogen gas.

- **DO NOT SMOKE** when near the battery.
- **DO NOT** cause flame or spark in battery area.
- Discharge static electricity from the body before touching the battery by first touching a grounded metal surface.

Be sure the control power switch is set in the OFF position before connecting the battery cables. If the switch is set to AUTO or MANUAL, the generator can crank and start as soon as the battery cables are connected.

Be sure the utility power supply to the battery charger is turned OFF and the 10A and 15A fuses are removed from the generator control panel and the ATC style fuse removed from the battery charger, or sparking may occur at the battery posts as the cables are attached and cause an explosion.

Note: *A negative ground system is used. Battery connections are shown on the wiring diagrams. Make sure the battery is correctly connected and terminals are tight. Observe battery polarity when connecting the battery to the generator set.*

Battery Installation and Replacement

When required, the battery must be replaced with one of equivalent size, voltage, and CCA (cold crank amp capacity). Refer to *"Specifications" on page 5* or contact the local Authorized Service Dealer for proper battery sizing.

A new battery must be filled with the proper electrolyte and be fully charged before installing.

Preliminary Instructions

1. Set the control power switch on the generator control panel to the OFF position.
2. Turn the battery disconnect switch off.

Battery cables are connected to the generator connection points at the factory. Connect the cables to the battery posts as follows.

12VDC System

1. Connect the red battery cable from the starter contactor to the positive (+) battery post.
2. Connect the black battery cable from the battery disconnect to the negative (-) battery post.

Final Instructions

1. Turn the battery disconnect switch on.
2. Verify the controller has power. (Display screen should light up.)

⚠ CAUTION

Damage will result if the battery connections are made in reverse.

JACK MAINTENANCE

The following procedures should be performed at least annually.

- The internal gearing and bushings of the jack must be kept lubricated. Apply a small amount of automotive grease to the internal gearing by removing the jack cover, or if equipped, use a needle nose applicator or standard grease gun on the lubrication point found on the side of the jack near the crank. Rotate the jack handle to distribute the grease evenly.
- A lightweight oil must be applied to the handle unit at both sides of the tube.

- If equipped, the axle bolt and nut assembly of the caster wheel must also be lubricated with the same lightweight oil.

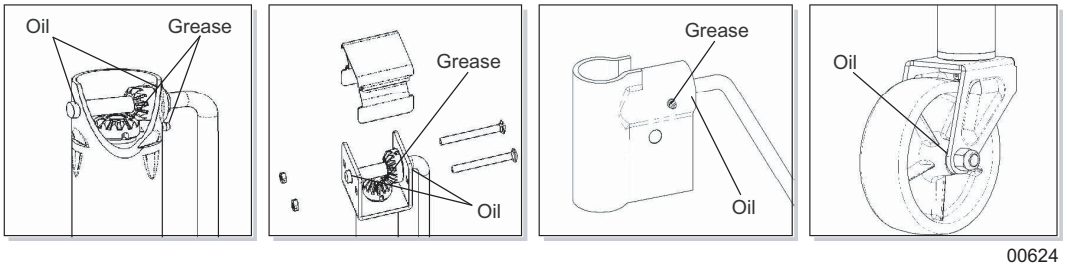

Figure 12 - Jack Lubrication Points

MAINTENANCE SCHEDULE

Periodic inspection, service, and maintenance of this unit is critical in ensuring its reliable operation. The following is the manufacturer's recommended maintenance schedule. The maintenance items will need to be performed more frequently if the unit is used in severe applications (such as very high or very low ambient conditions or extremely dirty/dusty environments). Use the unit hour meter or calendar time, whichever occurs first, from the previous maintenance interval to determine the next required maintenance interval. Note that some checks are based on hours of operation.

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

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

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

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	50 Hours	250 Hours/ 14 Days	500 Hours/ 30 Days	1000 Hours	2000 Hours/ 90 Days
Walk Around Inspection	♦					
Check Oil Level	♦					
Check Coolant Level	♦					
Visually Inspect Air Cleaner	♦					
Drain, Flush and Refill Cooling System						♦
Inspect Radiator for Signs of Obstruction or Damage	♦					
Drain Fuel Water Separator	♦					
Check Fuel Pressure Gauge on Separator (10-20 psi [69-138 kPa])	♦					
Check Electrical Wiring	♦					

Item	Daily	50 Hours	250 Hours/ 14 Days	500 Hours/ 30 Days	1000 Hours	2000 Hours/ 90 Days
Check Electrical Connections						♦
Check Tire Pressure	♦					
Check Belts	♦					
Check All Flex Hoses	♦					
Change Oil, Replace Oil Filters		♦*	♦			
Inspect Air Cleaner Filter (replace if necessary)			♦			
Service Battery				♦		
Apply Dielectric Grease to Disconnect Box Connections						♦
Replace Spark Plugs					♦	
Exhaust/Catalyst Inspection						♦**
Clean & Adjust Magnetic Pick Up						♦
Remove & Inspect Accessory Drive Belts (replace if necessary)					♦	
Check Engine and Generator Mounts						♦
Inspect Flexible Hoses (replace if necessary)						♦
Lubricate Trailer Leveling Jacks						♦
Check Battery Connections and Disconnect Switch						♦
Check Manifold/Pipe Hardware Torque (31 ft-lbs [42 Nm])						♦

* Break-in period, one time.

** When disconnecting or replacing the catalyst or exhaust pipes, the clamps and exhaust blankets **MUST** be replaced.

OTHER MAINTENANCE CHECKS

The following inspections should be performed by a qualified/authorized service technician, or a properly trained authorized operator. These maintenance items require a high level of experience and skill to evaluate and correct.

- Inspect engine accessory drive belts
- Inspect hoses and connections
- Inspect fuel supply system
- Inspect exhaust system
- Inspect exhaust blankets. Replace if deteriorated.

Note: *When disconnecting or replacing the catalyst or exhaust pipes, the clamps and exhaust blankets* ***MUST*** *be replaced.*

NOTICE

All recommended service maintenance or repairs should be completed by an authorized service technician to maintain the warranty status of a unit.

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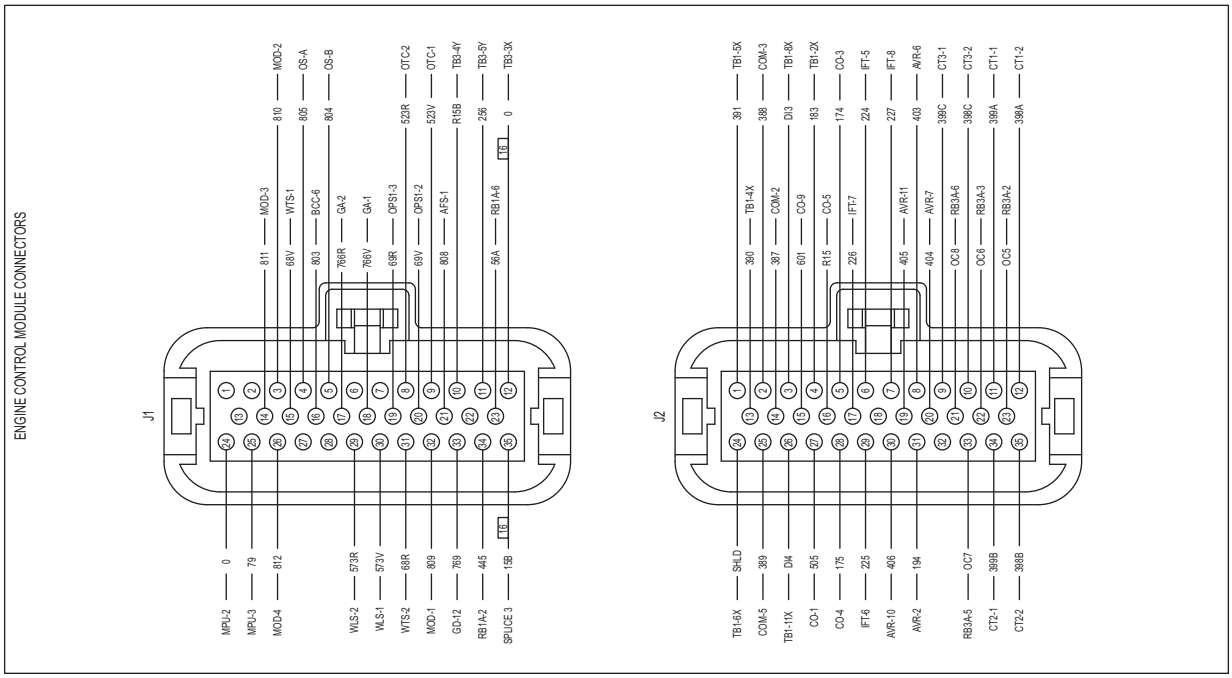
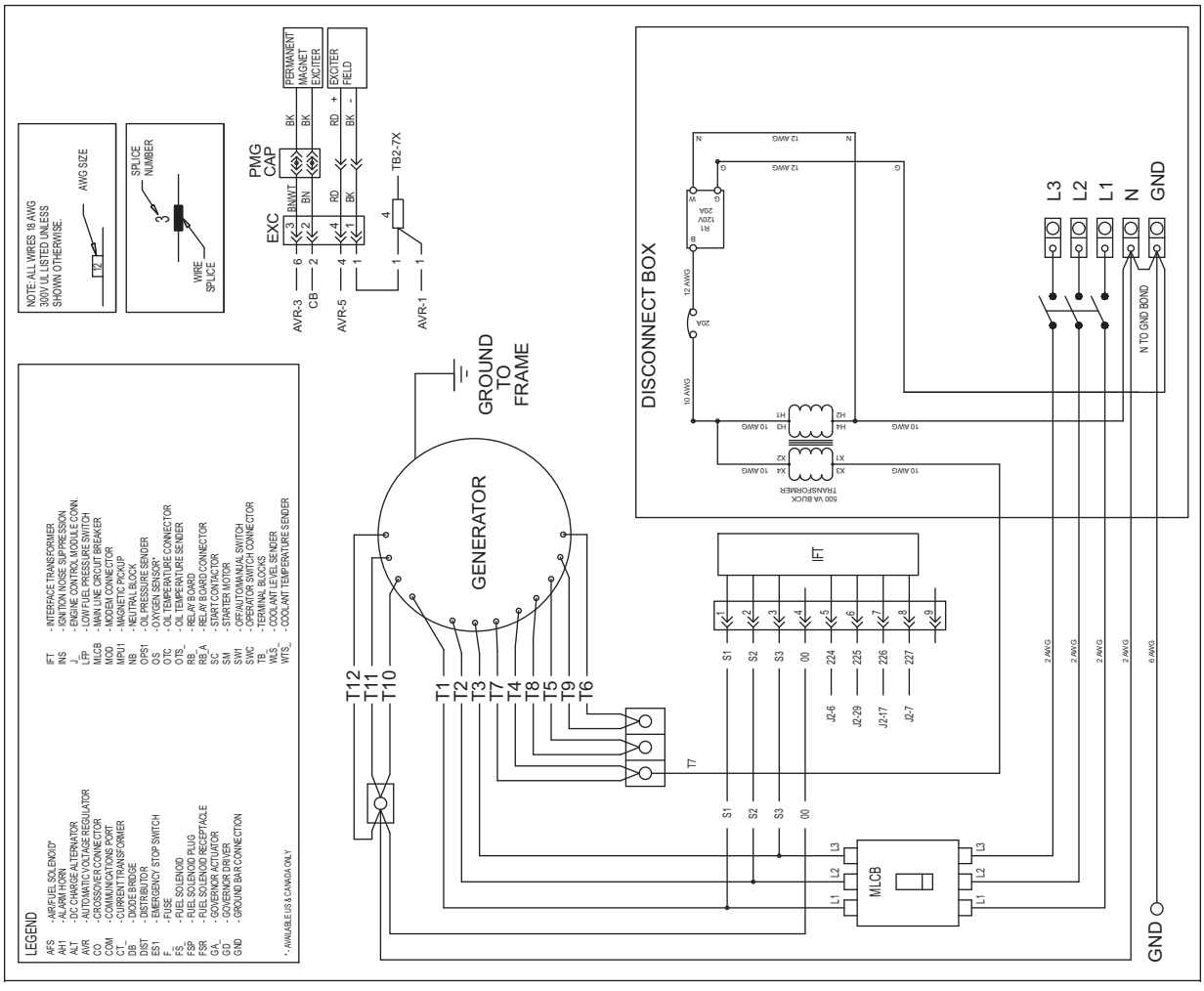
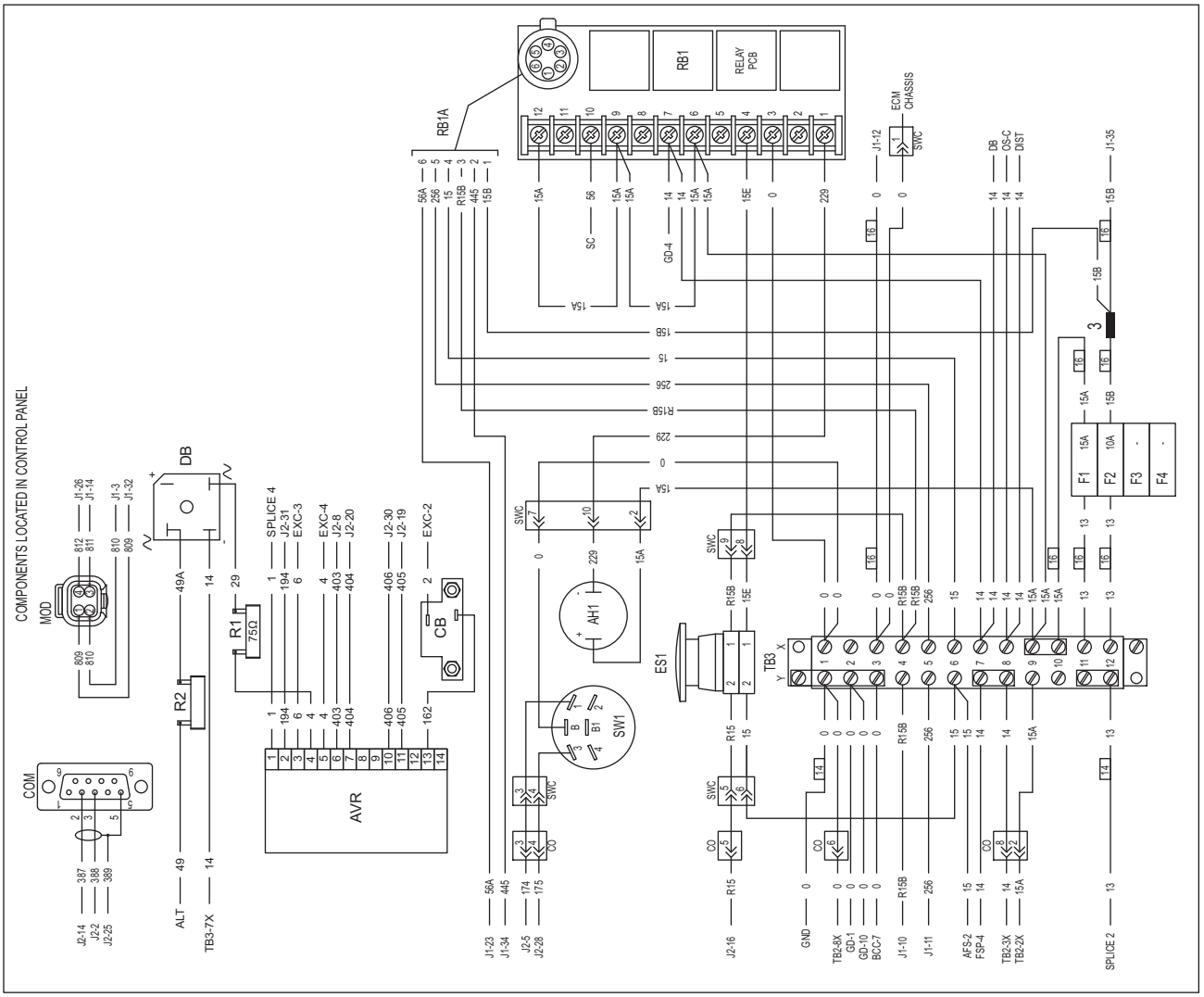
Section 5 - Wiring Diagrams

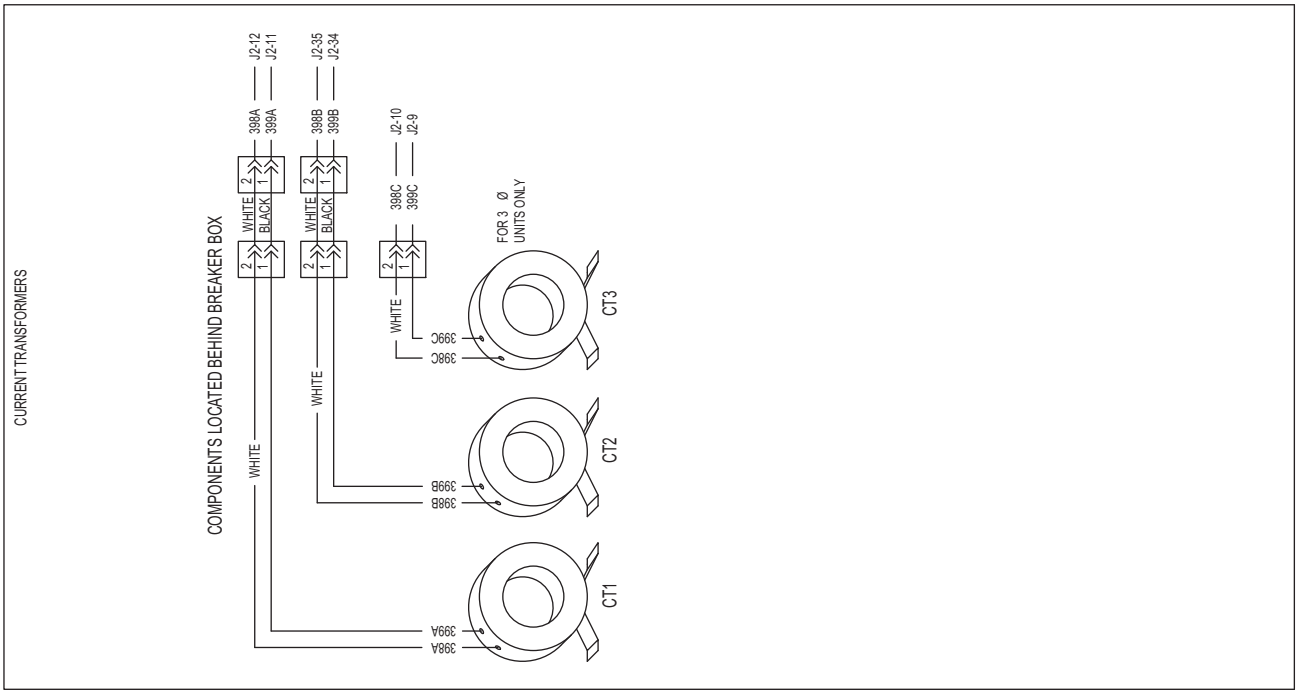
AC WIRING



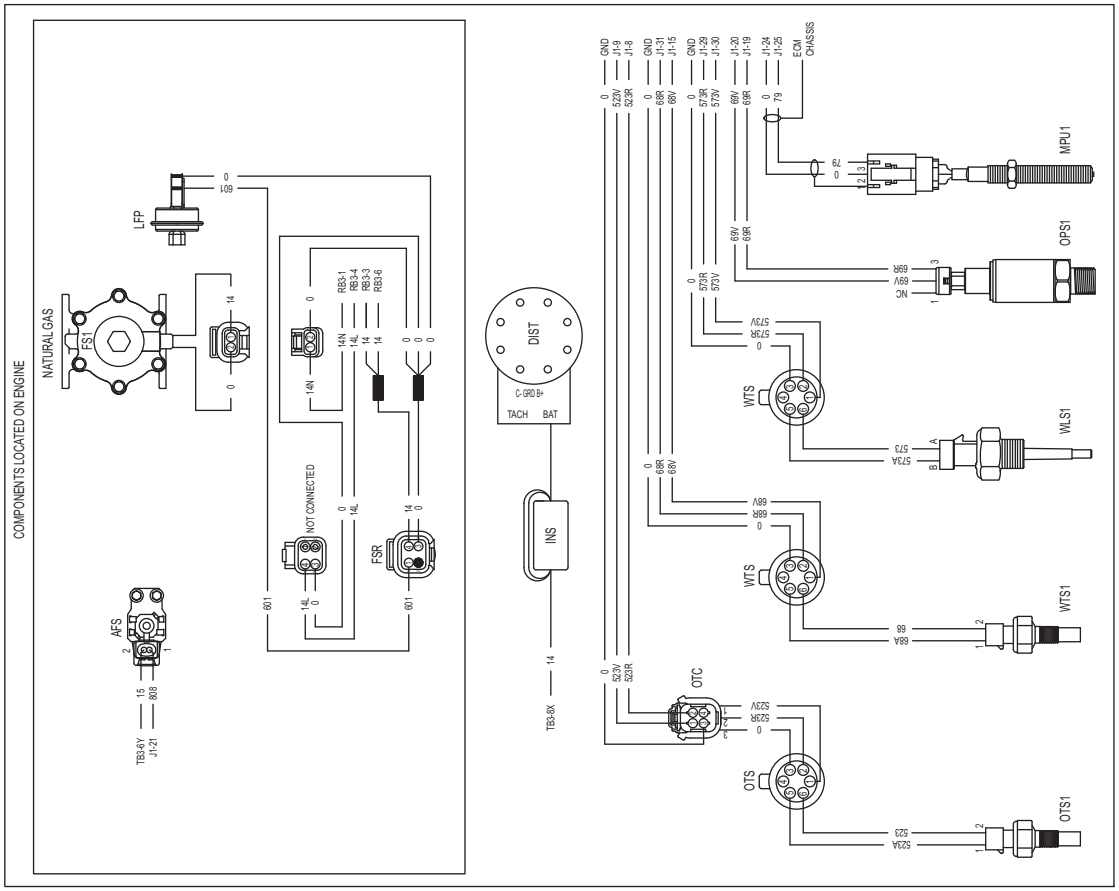


ECM

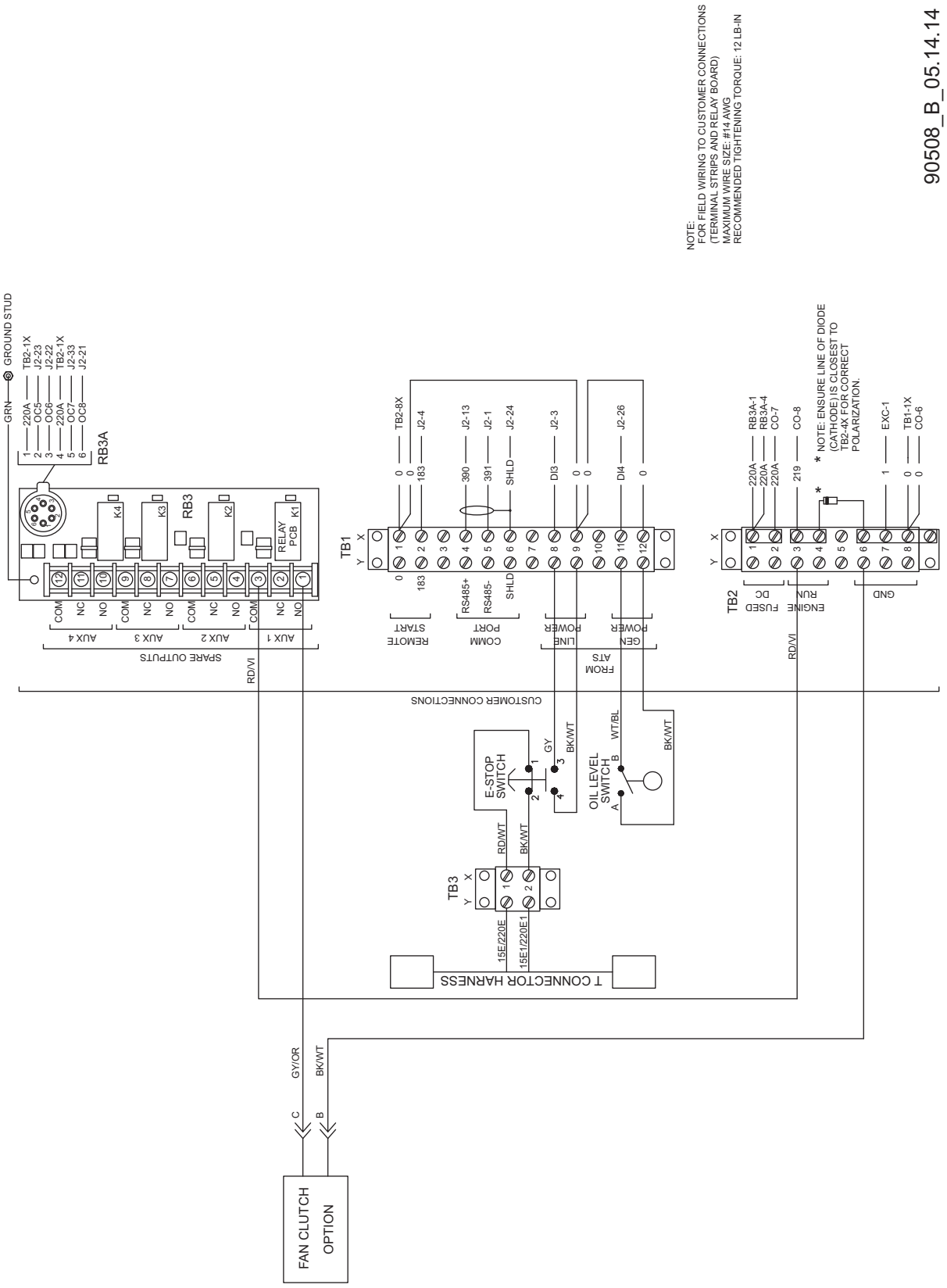

90508_B_05.14.14
COMPONENTS LOCATED IN CONTROL PANEL
RB1A
RB1
RELAY PCB
ECM CHASSIS
DB
MOD
R1
75Ω
R2
CB
AH1
SW1
ES1
TB3
AVR
COM
SPLICE 4
SWC
CO
F1
F2
F3
F4
ALT
TB3-7X
GND
SPLICE 2


CURRENT TRANSFORMERS
COMPONENTS LOCATED BEHIND BREAKER BOX
WHITE
BLACK
FOR 3 Ø UNITS ONLY
CT1
CT2
CT3

ENGINE HARNESS



OPTIONS & ACCESSORIES



Service Log

OIL GRADE: _____ BRAND: _____

COOLANT MIXTURE: _____ BRAND: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Date	Hours to Service	Oil Level	Coolant Level

Date	Hours to Service	Oil Level	Coolant Level

Notes

Notes

Notes