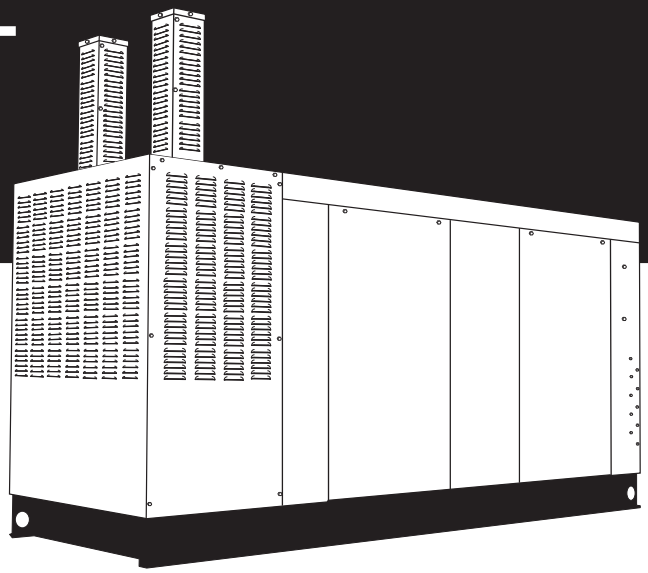
Serial Number

4.6L
80kW
Models
EPA Certified

STATIONARY EMERGENCY GENERATOR

OWNER'S MANUAL



A new standard of reliability

⚠ Not intended for use in critical life support applications. ⚠

— ⚠ CAUTION ⚠ —

ONLY QUALIFIED ELECTRICIANS OR CONTRACTORS SHOULD ATTEMPT INSTALLATION!

DEADLY EXHAUST FUMES. OUTDOOR INSTALLATION ONLY!

This manual should remain with the unit.

Part No. 0H3916

Cover184 Rev. A 08/09

Stationary Emergency Generator
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Safety Instructions

SAVE THESE INSTRUCTIONS – The manufacturer suggests that these rules for safe operation be copied and posted in potential hazard areas. Safety should be stressed to all operators, potential operators, and service and repair technicians for this equipment.

INTRODUCTION

Thank you for purchasing this model of the stationary emergency generator product line.

Every effort was expended to make sure that the information and instructions in this manual were both accurate and current at the time the manual was written. However, the manufacturer reserves the right to change, alter or otherwise improve this product(s) at any time without prior notice.

READ THIS MANUAL THOROUGHLY

If any portion of this manual is not understood, contact the nearest Service Dealer for starting, operating and servicing procedures.

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

⚠ DANGER!

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

⚠ WARNING!

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

⚠ CAUTION!

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

NOTE:

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

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

Four commonly used safety symbols accompany the DANGER, WARNING and CAUTION blocks. The type of information each indicates is as follows:

This symbol points out important safety information that, if not followed, could endanger personal safety and/or property of others.

This symbol points out potential explosion hazard.

This symbol points out potential fire hazard.

This symbol points out potential electrical shock hazard.

The operator is responsible for proper and safe use of the equipment. The manufacturer strongly recommends that the operator read this Owner's Manual and thoroughly understand all instructions before using this equipment. The manufacturer also strongly recommends instructing other users to properly start and operate the unit. This prepares them if they need to operate the equipment in an emergency.

For safety reasons, the manufacturer recommends that this equipment be installed, serviced and repaired by a Service Dealer or other competent, qualified electrician or installation technician who is familiar with applicable codes, standards and regulations. The operator also must comply with all such codes, standards and regulations.

OPERATION AND MAINTENANCE

It is the operator's responsibility to perform all safety checks, to make sure that all maintenance for safe operation is performed promptly, and to have the equipment checked periodically by a Service Dealer. Normal maintenance service and replacement of parts are the responsibility of the owner/operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of the generator ensure a minimum number of problems and keep operating expenses at a minimum. See a Service Dealer for service aids and accessories.

Operating instructions presented in this manual assume that the generator electric system has been installed by a Service Dealer or other competent, qualified contractor. Installation of this equipment is not a “do-it-yourself” project.

HOW TO OBTAIN SERVICE

When the generator requires servicing or repairs, simply contact a Service Dealer for assistance. Service technicians are factory-trained and are capable of handling all service needs.

When contacting a dealer about parts and service, always supply the complete Model Number, Serial Number and Type Code (where applicable) from the DATA LABEL that is affixed to the unit.

SAFETY RULES

Study these SAFETY RULES carefully before installing, operating or servicing this equipment. Become familiar with this Owner's Manual and with the unit. The generator can operate safely, efficiently and reliably only if it is properly installed, operated and maintained. Many accidents are caused by failing to follow simple and fundamental rules or precautions.

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are, therefore, not all inclusive. If a procedure, work method or operating technique is used that the manufacturer does not specifically recommend, ensure that it is safe for others. Also make sure the procedure, work method or operating technique utilized does not render the generator unsafe.

⚠ DANGER!

Despite the safe design of this generator, operating this equipment imprudently, neglecting its maintenance or being careless can cause possible injury or death. Permit only responsible and capable persons to install, operate or maintain this equipment.

Potentially lethal voltages are generated by these machines. Ensure all steps are taken to render the machine safe before attempting to work on the generator.

Parts of the generator are rotating and/or hot during operation. Exercise care near running generators.

GENERAL HAZARDS

- For safety reasons, the manufacturer recommends that this equipment be installed, serviced and repaired by a Service Dealer or other competent, qualified electrician or installation technician who is familiar with applicable codes, standards and regulations. The operator also must comply with all such codes, standards and regulations.
- Installation, operation, servicing and repair of this (and related) equipment must always comply with applicable codes, standards, laws and regulations. Adhere strictly to local, state and national electrical and building codes. Comply with regulations the Occupational Safety and Health Administration (OSHA) has established. Also, ensure that the generator is installed, operated and serviced in accordance with the manufacturer's instructions and recommendations. Following installation, do nothing that might render the unit unsafe or in noncompliance with the aforementioned codes, standards, laws and regulations.
- The engine exhaust fumes contain carbon monoxide gas, which can be DEADLY. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. For that reason, adequate ventilation must be provided. This should be considered prior to installing the generator. The unit should be positioned to direct exhaust gasses safely away from any building where people, animals, etc., will not be harmed. Any exhaust stacks that ship loose with the unit must be installed properly per the manufacturer's instruction, and in strict compliance with applicable codes and standards.
- Keep hands, feet, clothing, etc., away from drive belts, fans, and other moving or hot parts. Never remove any drive belt or fan guard while the unit is operating.
- Adequate, unobstructed flow of cooling and ventilating air is critical in any room or building housing the generator to prevent buildup of explosive gases and to ensure correct generator operation. Do not alter the installation or permit even partial blockage of ventilation provisions, as this can seriously affect safe operation of the generator.
- Keep the area around the generator clean and uncluttered. Remove any materials that could become hazardous.
- When working on this equipment, remain alert at all times. Never work on the equipment when physically or mentally fatigued.
- Inspect the generator regularly, and promptly repair or replace all worn, damaged or defective parts using only factory-approved parts.
- Before performing any maintenance on the generator, disconnect its battery cables to prevent accidental start-up. Disconnect the cable from the battery post indicated by a NEGATIVE, NEG or (–) first. Reconnect that cable last.
- Never use the generator or any of its parts as a step. Stepping on the unit can stress and break parts, and may result in dangerous operating conditions from leaking exhaust gases, fuel leakage, oil leakage, etc.

ELECTRICAL HAZARDS

- All stationary emergency generators covered by this manual produce dangerous electrical voltages and can cause fatal electrical shock. Utility power delivers extremely high and dangerous voltages to the transfer switch as well as the generator. Avoid contact with bare wires, terminals, connections, etc., on the generator as well as the transfer switch, if applicable. Ensure all appropriate covers, guards and barriers are in place before operating the generator. If work must be done around an operating unit, stand on an insulated, dry surface to reduce shock hazard.
- Do not handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. DANGEROUS ELECTRICAL SHOCK MAY RESULT.

- If personnel must stand on metal or concrete while installing, operating, servicing, adjusting or repairing this equipment, place insulative mats over a dry wooden platform. Work on the equipment only while standing on such insulative mats.
- The National Electrical Code (NEC) requires the frame and external electrically conductive parts of the generator to be connected to an approved earth ground. This grounding will help prevent dangerous electrical shock that might be caused by a ground fault condition in the generator or by static electricity. Never disconnect the ground wire.
- Wire gauge sizes of electrical wiring, cables and cord sets must be adequate to handle the maximum electrical current (ampacity) to which they will be subjected.
- Before installing or servicing this (and related) equipment, make sure that all power voltage supplies are positively turned off at their source. Failure to do so will result in hazardous and possibly fatal electrical shock.
- Connecting this unit to an electrical system normally supplied by an electric utility shall be by means of a transfer switch so as to isolate the generator electric system from the electric utility distribution system when the generator is operating. Failure to isolate the two electric system power sources from each other by such means will result in damage to the generator and may also result in injury or death to utility power workers due to backfeed of electrical energy.
- Stationary emergency generators installed with an automatic transfer switch will crank and start automatically when normal (utility) source voltage is removed or is below an acceptable preset level. To prevent such automatic start-up and possible injury to personnel, disable the generator's automatic start circuit (battery cables, etc.) before working on or around the unit. Then, place a "Do Not Operate" tag on the generator control panel and on the transfer switch.
- In case of accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. AVOID DIRECT CONTACT WITH THE VICTIM. Use a nonconducting implement, such as a dry rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.
- Never wear jewelry when working on this equipment. Jewelry can conduct electricity resulting in electric shock, or may get caught in moving components causing injury.

FIRE HAZARDS

- Keep a fire extinguisher near the generator at all times. Do NOT use any carbon tetra-chloride type extinguisher. Its fumes are toxic, and the liquid can deteriorate wiring insulation. Keep the extinguisher properly charged and be familiar with its use. If there are any questions pertaining to fire extinguishers, consult the local fire department.

EXPLOSION HAZARDS

- Properly ventilate any room or building housing the generator to prevent build-up of explosive gas.
- Do not smoke around the generator. Wipe up any fuel or oil spills immediately. Ensure that no combustible materials are left in the generator compartment, or on or near the generator, as FIRE or EXPLOSION may result. Keep the area surrounding the generator clean and free from debris.
- These generators may operate using one of several types of fuels. All fuel types are potentially FLAMMABLE and/or EXPLOSIVE 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 this equipment into service.
- Diesel fuels are highly FLAMMABLE. Gaseous fluids such as natural gas and liquid propane (LP) gas are extremely EXPLOSIVE. Natural gas is lighter than air, and LP gas is heavier than air; install leak detectors accordingly.

CALIFORNIA PROPOSITION 65 WARNING
Engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

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

IDENTIFICATION RECORD

DATA LABEL

Every generator set includes DATA LABEL that contains important information pertinent to the generator. The data label is attached to the lower connection box on the generator and lists the unit serial number, rated voltage, amps, wattage capacity, phase, frequency, rpm, power factor, and production date.

NOTE:

For actual information related to this particular model, please refer to the Manual Drawing Listing located at the end of this manual, or to the data label affixed to the unit.

Stationary Emergency Generator Model and Serial Number

This number is the key to numerous engineering and manufacturing details pertaining to your unit. Always supply this number when requesting service, ordering parts or seeking information.

Data Label

GENERATOR UNIT

GEN MODEL:
MODEL:
SERIAL:
ALTERNATE
PROD DATE:
COUNTRY OF ORIGIN:

GENERATOR DATA

KW KVA HZ PF
UPSIZE ALT KW KVA
VOLT / AMP
ENG RPM ALT RPM
BREAKER KW AMP
X'D X"D

3 PHASE DELTA
UNBALANCED LOAD CAPACITY-25%

ROTOR STATOR CLASS
WINDINGS @ AMBIENT TEMP
MANUF. LOC.

WAUKESHA, WI USA 0K0876

EQUIPMENT DESCRIPTION

This equipment is a revolving field, alternating current Stationary Emergency Generator. It is powered by a gaseous fueled engine operating at 1800 rpm for 4-pole direct drive units, 3600 rpm for 2-pole direct drive units and 2300 - 3000 rpm for quiet drive gear units. See the Specifications section for exact numbers. The unit comes complete with a sound attenuated enclosure, internally mounted muffler, control console, mainline circuit breaker, battery charger, and protective alarms as explained in the following paragraph.

All AC connections, including the power leads from the alternator, 120 volt battery charger input and control connections to the transfer switch are available in the main connection box.

The Stationary Emergency Generator incorporates the following alternator features:

- Rotor and Stator insulation class is rated as defined by NEMA MG1-32.6, NEMA MG1-1.66. The generator is self ventilated and drip-proof constructed. Refer to the Specifications section or the data label for the class ratings.
- The voltage waveform deviation, total harmonic content of the AC waveform and telephone influence factor have been evaluated and are acceptable according to NEMA MG1-32.

ENGINE OIL RECOMMENDATIONS

The unit has been filled with 5W-20 engine oil at the factory. Use a high-quality detergent oil classified "For Service SJ or SH." Detergent oils keep the engine cleaner and reduce carbon deposits. When changing the engine oil, be sure to use 5W-30 engine oil.

⚠ CAUTION!

Any attempt to crank or start the engine before it has been properly serviced with the recommended oil may result in an engine failure.

NOTE:

If not already equipped, it is strongly recommended to use the optional Cold Weather Start Kit for temperatures below 32° F. The part number for the Cold Weather Start Kit can be found in the Specifications section or by contacting an authorized dealer. The oil grade for temperatures below 32° F is 5W-30 synthetic oil.

COOLANT RECOMMENDATIONS

Use a mixture of half low silicate ethylene glycol base anti-freeze and deionized water. Cooling system capacity is listed in the specifications. Use only deionized water and only low silicate anti-freeze. If desired, add a high quality rust inhibitor to the recommended coolant mixture. When adding coolant, always add the recommended 50-50 mixture.

⚠ CAUTION!

Do not use any chromate base rust inhibitor with ethylene glycol base anti-freeze or chromium hydroxide ("green slime") forms and will cause overheating. Engines that have been operated with a chromate base rust inhibitor must be chemically cleaned before adding ethylene glycol base anti-freeze. Using any high silicate anti-freeze boosters or additives will also cause overheating. The manufacturer also recommends that any soluble oil inhibitor is NOT used for this equipment.

⚠ DANGER!

Do not remove the radiator pressure cap while the engine is hot or serious burns from boiling liquid or steam could result.

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 taste of antifreeze even though it is poisonous to them.

ENGINE PROTECTIVE DEVICES

The Stationary Emergency Generator may be required to operate for long periods of time without an operator on hand to monitor such engine conditions as coolant temperature, oil pressure or rpm. For that reason, the engine has several devices designed to protect it against potentially damaging conditions by automatically shutting down the unit when the oil pressure is too low, the coolant temperature is too high, the coolant level is too low, or the engine is running too fast.

NOTE:

Engine protective switches and sensors are mentioned here for the reader's convenience. Also refer to the applicable control panel manual for additional automatic engine shutdown information.

COOLANT TEMPERATURE SENSING

An analog Water Temperature Sender (WTS) is located in the engine's cooling system. This sender is connected to the panel and allows the panel to monitor and display the temperature of the coolant system.

The WTS is a resistive device whose resistance changes based on coolant temperature. The resistance of the sender results in a voltage being developed across the sender. As the Coolant temperature increases, the resistance will decrease, causing the voltage to decrease. This changing voltage is converted to 4-20mA signal by a signal conditioner module. The corresponding 4-20mA signal is read by the control panel and displayed as the coolant temperature.

The control panel will monitor and display the coolant temperature anytime the DC input to the control panel is present.

If the temperature exceeds approximately 140° C (284° F), the engine shutdown will be initiated. The generator will automatically restart and the display will reset once the temperature has returned to an operating level.

LOW COOLANT LEVEL

A Low Coolant Level (LCL) sensor is placed in the generators coolant system. This sensor allows the panel to detect a Low Coolant Level condition.

The LCL is a resistive device whose resistance changes rapidly based on the presence or absence of coolant.

The resistance of the LCL results in a voltage being developed across the LCL. This voltage changes as the resistance changes. This changing voltage is converted to 4-20mA signal by a signal conditioner module. The corresponding 4-20mA signal is read by the control panel and displayed as the low coolant level.

If the level of the engine coolant drops below the level of the low coolant level sensor, the engine shutdown will be initiated.

OIL PRESSURE SENSING

An analog Oil Pressure Sender (OPS) is used for monitoring the engine oil pressure. This sender allows the control panel to measure and display the Engine oil pressure.

The OPS is a resistive device, whose resistance changes based on engine oil pressure. The resistance of the sender results in a voltage being developed across the sender. As the oil pressure increases, the resistance will decrease, causing the voltage to decrease. This changing voltage is converted to 4-20mA signal by a signal conditioner module. The corresponding 4-20mA signal is read by the control panel and displayed as the oil pressure.

The control panel will monitor and display oil pressure anytime the DC input to the control panel is present.

Should the oil pressure drop below the 8 psi range, the engine shutdown is initiated. The unit should not be restarted until oil is added. Turn the AUTO/OFF/ MANUAL switch to the OFF position, then back to AUTO to restart.

OVERCRANK SHUTDOWN

When the control panel receives a start signal, it initiates the programmed starting sequence. The start sequence consists of the number of crank attempts, the length of each crank attempt, and the rest time between each crank attempt. If the engine has not started by the end of the final crank attempt, an Overcrank alarm is generated, the control panel will sound the alarm and display the message "Failed to start".

OVERSPEED SHUTDOWN

A speed circuit controls engine cranking, start-up, operation and shutdown. Engine speed signals are delivered to the circuit board whenever the unit is running. Should the engine over speed above a safe, preset value, the circuit board initiates an automatic engine shutdown. Contact the nearest Authorized Dealer if this failure occurs.

RPM SENSOR LOSS SHUTDOWN

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

DC FUSE

This fuse is located inside of the control panel. It protects the panel wiring and components from damaging overload. Always remove this fuse before commencing work on the generator. The unit will not start or crank if the fuse is blown. Replace the fuse with one of the same size, type, and rating. (See the exploded views and parts lists at the end of this manual for replacement part number.)

FUEL SYSTEM

FUEL REQUIREMENTS

The Stationary Emergency Generator may be equipped with one of the following fuel systems:

- Natural gas fuel system
- Propane vapor (PV) fuel system
- Liquid propane (LP) fuel system

Recommended fuels should have a Btu content of at least 1,000 Btu's per cubic foot for natural gas; or at least 2,520 Btu's per cubic foot for LP gas. Ask the fuel supplier for the Btu content of the fuel.

Required fuel pressure for **natural gas is 11 inches to 14 inches water column (0.4 to 0.5 psi); and for liquid propane, 11 inches to 14 inches of water column (0.4 to 0.5 psi).**

NOTE:

Any piping used to connect the generator to the fuel supply should be of adequate size to ensure the fuel pressure NEVER drops below 11 inches water column for natural gas or 11 inches water column for liquid propane for all load ranges. The fuel supply piping shall be sized according to the installation manual using the fuel consumption requirements identified in the Specifications section of the Owner's Manual.

NOTE:

It is the responsibility of the installer to make sure that only the correct recommended fuel is supplied to the generator fuel system. Thereafter, the owner/operator must make certain that only the proper fuel is supplied.

NATURAL GAS FUEL SYSTEM

Natural gas is supplied in its vapor state. In most cases, the gas distribution company provides piping from the main gas distribution line to the standby generator site. The following information applies to natural gas fuel systems.

- Gas pressure in a building is usually regulated by national, state and local codes.
- To reduce gas pressure to a safe level before the gas enters a building, a primary regulator is needed. The natural gas supplier may or may not supply such a regulator.
- It is the responsibility of the gas supplier to make sure sufficient gas pressure is available to operate the primary regulator.
- Gas pressure at the inlet to the fuel shutoff solenoid should not exceed approximately 14 inches water column (0.5 psi).

PROPANE VAPOR WITHDRAWAL FUEL SYSTEM

This type of system utilizes the vapors formed above the liquid fuel in the supply tank. Approximately 10 to 20 percent of the tank capacity is needed for fuel expansion from the liquid to the vapor state. The vapor withdrawal system is generally best suited for smaller engines that require less fuel. The installer should be aware of the following:

- The natural gas and LP gas systems are similar. However, the natural gas system delivers gas at a pressure of approximately five inches water column to the carburetor.
- When ambient temperatures are low and engine fuel consumption is high, the vapor withdrawal system may not function efficiently.
- Ambient temperatures around the supply tank must be high enough to sustain adequate vaporization, or the system will not deliver the needed fuel volume.
- In addition to the cooling effects of ambient air, the vaporization process itself provides an additional cooling effect.

LP FUEL SYSTEM

LP is supplied as a liquid in pressure tanks. It is usually made up of propane, butane, or a mixture of the two gases. Propane tends to vaporize readily even at temperatures as low as -20° F (-29° C). However, butane reverts to its liquid state when temperatures drop below 32° F (0° C).

LP in a liquid withdrawal system must be converted to its gaseous state before it is introduced into the engine carburetor. A vaporizer-converter is generally used to accomplish this. In such a converter, heated engine coolant is ported through the converter to provide the necessary heat for conversion of the fuel from a liquid to a gaseous state.

SPECIFICATIONS

◆ STATIONARY EMERGENCY GENERATOR

Type.....Synchronous
Rotor Insulation.....Class H
Stator Insulation.....Class H
Total Harmonic Distortion.....< 5%
Telephone Interference Factor (TIF) ..... < 50
Alternator Output Leads 3-phase.....6-wire
Bearings .....Sealed Ball
Coupling .....Flexible Disc
Load Capacity (Standby Rating) 80kW*

* NOTE: Generator rating and performance in accordance with ISO8528-5, BS5514, SAE J1349, ISO3046 and DIN 6271 Standards. KW rating is based on LPG fuel and may derate with natural gas.

Excitation System .....Brushless

Generator Output Voltage/kW - 60 Hz	kW	Amp	CB Size
120/240V, 1-phase, 1.0 pf	77	320	400
120/208V, 3-phase, 0.8 pf	80	278	300
120/240V, 3-phase, 0.8 pf	80	249	300
277/480V, 3-phase, 0.8 pf	80	120	150

Generator Locked Rotor KVA Available @ Voltage Dip of 35%
Single-phase or 208 3-phase..... 160 KVA
480V, 3-phase ..... 185 KVA

◆ ENGINE

Make .....Generac
Model .....V-type
Cylinders and Arrangement.....8
Displacement.....4.6 Liter
Bore.....3.55 in.
Stroke.....3.54 in.
Compression Ratio.....9.4-to-1
Air Intake System.....Naturally Aspirated
Valve Seats .....Hardened
Lifter Type.....Hydraulic

Engine Parameters
Rated Synchronous RPM .....60 Hz, 3600
Gross HP at rated kW .....60 Hz, 128

Exhaust System
Exhaust Flow at Rated Output 60 Hz.....720 cfm
Exhaust Temperature at Rated Output .....840° F

Combustion Air Requirements (Natural Gas)
Flow at rated power, 60 Hz.....250 cfm

Governor
Type.....Electronic
Frequency Regulation.....Isochronous
Steady State Regulation .....± .25%
Adjustments:
Speed..... Selectable
Individual parameter adjustments can be made via GenLink.

Engine Lubrication System
Type of Oil Pump .....Gear
Oil Filter .....Full Flow, Cartridge
Crankcase Oil Capacity ..... 6 U.S. qts.

◆ COOLING SYSTEM

TypeClosed
Water Pump..... Belt Driven
Fan Speed.....1600
Fan Diameter.....26 inches
Fan Mode..... Puller
Air Flow (inlet air including alternator and combustion air) ..... 5300 ft³/min.
Coolant Capacity..... (4.0 U.S. gal.)
Heat Rejection to Coolant.....316,000 Btu/h
Maximum Operating Air Temp. on Radiator..... 60° C (150° F)
Maximum Ambient Temperature ..... 50° C (140° F)

◆ FUEL SYSTEM

Type of Fuel ..... See Caution below
Carburetor..... Down Draft
Secondary Fuel Regulator..... Standard
Fuel Shut-off Solenoid..... Standard
Operating Fuel Pressure .....11 in. - 14 in. Water Column

Fuel Consumption - ft³/hr (Natural Gas/LPV)

Exercise Cycle	*25% Load*	*50% Load*	*75% Load*	*100% Load*
131/53	312/126	600/241	835/336	1154/465

⚠ CAUTION ⚠

⚠ **Engine is not field convertible between natural gas and propane. Jet size and ignition timing are factory set for the specific fuel.**

◆ ELECTRICAL SYSTEM

Battery Charge Alternator .....12V, 30 Amp
Static Battery Charger .....12V, 2 Amp
Recommended Battery..... 24F 525CCA
System Voltage..... 12 Volts

Voltage Regulator Type ..... Full Digital
Sensing 3-phase
Regulation..... ± 1/4%
Features..... Built into H-100 Control Panel
V/F Adjustable, Adjustable Voltage and Gain

Power Adjustment for Ambient Conditions
Temperature Deration
3% for every 10° C above °C 25
1.65% for every 10° above °F 77
Altitude Deration
1% for every 100 m above m.....183
3% for every 1000 ft. above ft. 600

Controller..... H-panel

◆ WEATHER AND MAINTENANCE KITS

To keep the generator running at its peak, the following kits are offered:

- Cold Weather Kit
  - ~ Recommended for climates with temperatures below 32° F.
- Extreme Cold Weather Kit
  - ~ Recommended Block Heater Kit for protection in temperatures below 32° F. This kit comes pre-installed on all industrial gaseous units.
- Scheduled Maintenance Kit
  - ~ Kit includes the recommended parts to maintain the generator. Refer to the Service Schedule for regular maintenance intervals.

For additional information, or to order any of these kits, please contact an Authorized Service Dealer or Customer Service Representative.

4.6L IGNITION DESCRIPTION

The 4.6L Ignition Module operates with an 8-cylinder. The 4.6L engine uses a 36-1 crank sensor, a CAM sensor and coil-on-plug ignition coils for each spark plug.

◆ DIAGNOSTIC BLINK PATTERNS (RED LED LOCATED ON THE IGNITION CONTROL BOARD)

During normal ignition operation the RED LED, located on the ignition control board, flashes at a 0.5 second ON and a 0.5 second OFF rate. This is considered one (1) blink.

RED LED Fault Codes are listed below, with priority as shown:

1. Overspeed Shutdown: LED blinks 4 times, is OFF for 3 seconds and then repeats.
2. No Crank Signal; LED blinks 2 times, is OFF for 3 seconds and then repeats.
3. No Cam Signal; LED blinks 3 times, is OFF for 3 seconds and then repeats.

Only one LED fault code is displayed at a time.

If multiple fault codes exist then the highest priority fault must be resolved prior to a lower priority fault code being displayed.

The LED fault code blink pattern is displayed for a minimum of two minutes after a fault has occurred and then the ignition will power itself down.

If an Ignition fault occurs, a signal is sent to the H-panel and then the H-Panel will shut the Generator down and display on it's front panel that an ignition fault has occurred.

ALTERNATOR AC LEAD CONNECTIONS

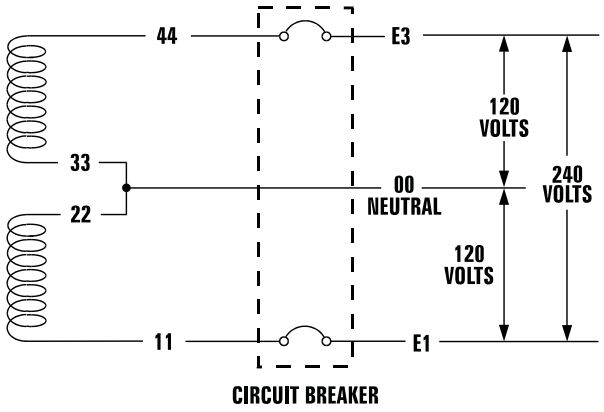
The electrical wires in the unit's AC connection (lower) panel should be installed according to the number of leads and the voltage/phase required for the application. The voltage and phase are described on the generator data label. The number of lead wires can be identified using the Specifications section and the power output rating on the generator data label. For example, if the generator produces 130kW, 277/480 Volt, 3-phase power, the generator has 12 alternator output leads. Figure 7.3 describes the stator power winding connection for the generator.

FOUR-LEAD, SINGLE-PHASE STATOR

Four-lead alternators (see Figure 7.1) are designed to supply electrical loads with voltage code "A" (240V, 1-phase, 60 Hz). Electrical power is produced in the stator power windings. These windings were connected at the factory to the main circuit breaker as shown in Figure 7.1.

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

Figure 7.1 — Four-lead, Single-phase Stator



ALTERNATOR POWER WINDING CONNECTIONS

3-PHASE ALTERNATORS ("Y" CONFIGURATION)

The Stationary Emergency Generator is designed to supply 3-phase electrical loads. Electric power is produced in the alternator power windings. These windings were connected at the factory to the main circuit breaker with a "Y" configuration as shown in Figures 7.2 through 7.6.

The rated voltage between circuit breaker terminals E1-E2, E1-E3 and E2-E3 is 480V, 208V or 600V depending on the model.

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

Figure 7.2 — Stator Power Winding Connections - 3-phase, 277/480V (6 Lead)

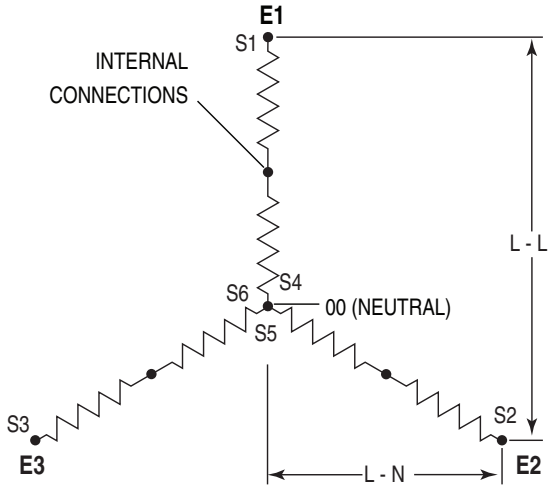


Figure 7.3 — Stator Power Winding Connections - 3-phase, 277/480V (12 Lead)

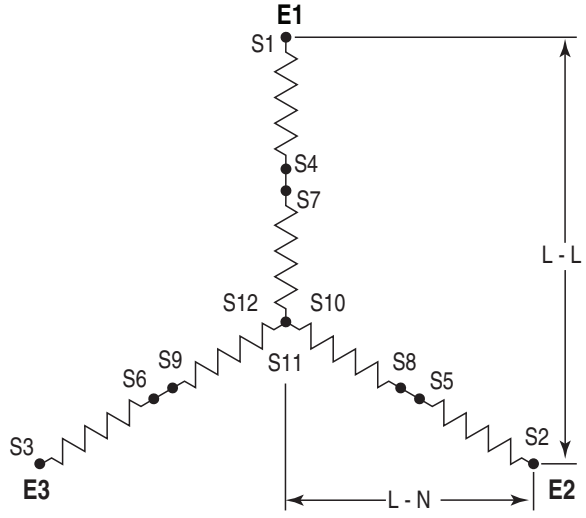


Figure 7.4 — Stator Power Winding Connections - 3-phase, 120/208V (6 Lead)

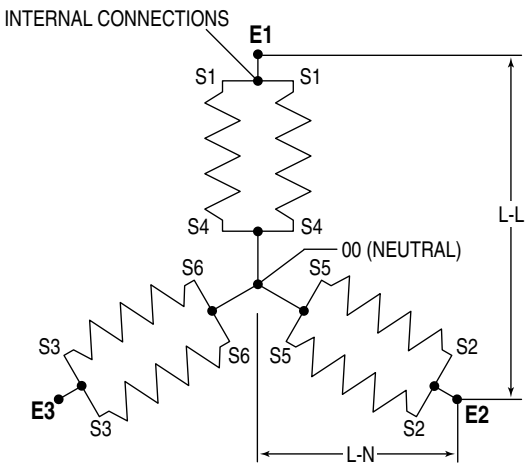


Figure 7.5 — Stator Power Winding Connections - 3-phase, 120/208V (12 Lead)

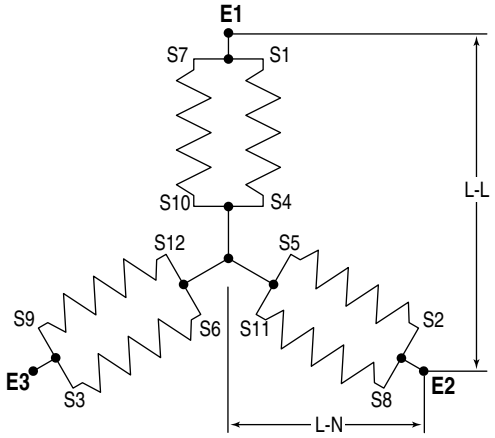
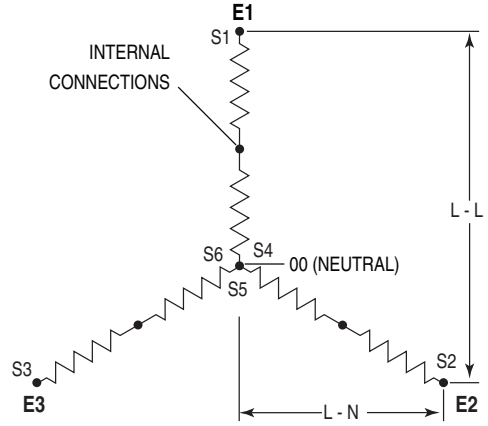


Figure 7.6 — Stator Power Winding Connections - 3-phase, 346/600V (6 Lead)



3-PHASE ALTERNATORS ("DELTA" CONFIGURATION)

The Stationary Emergency Generator is designed to supply 3-phase electrical loads. Electric power is produced in the alternator power windings. These windings were connected at the factory to the main circuit breaker with a "Delta" configuration as shown in Figures 7.7 and 7.8.

The rated voltage between circuit breaker terminals E1-E2, E1-E3 and E2-E3 is 240V.

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

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

Figure 7.7 — Stator Power Winding Connections - 3-phase, 120/240V (6 Lead)

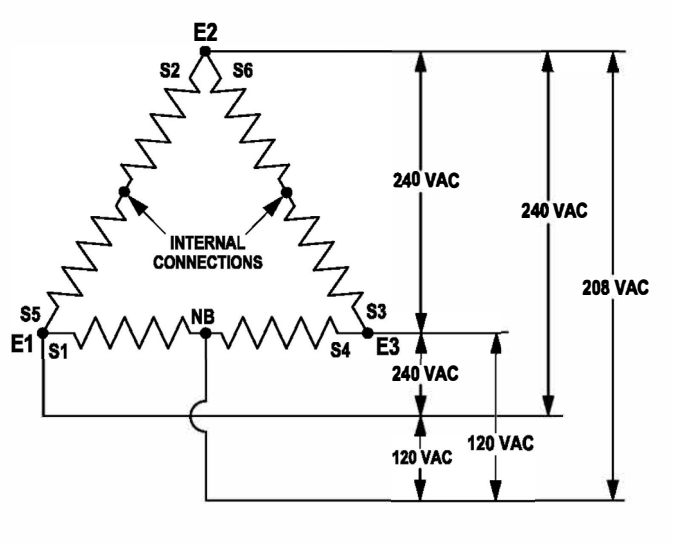
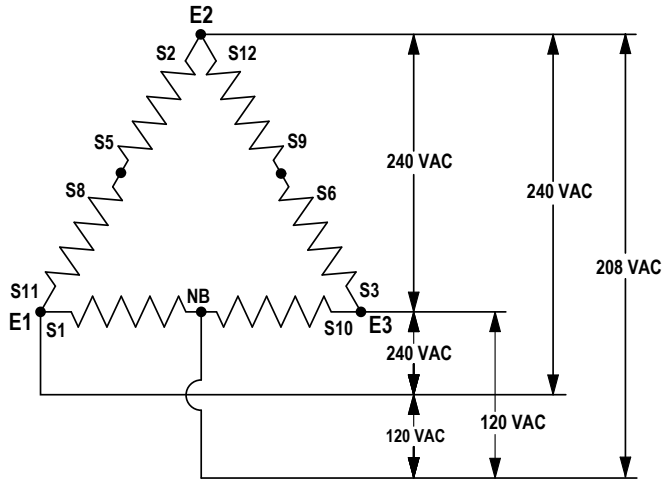


Figure 7.8 — Stator Power Winding Connections - 3-phase, 120/240V (12 Lead)



INSTALLATION

Refer to the separate “Installation Guide” supplied with the unit.

For safety reasons, the manufacturer recommends that this equipment be installed, serviced and repaired by a Service Dealer or other competent, qualified electrician or installation technician who is familiar with applicable codes, standards and regulations. The operator also must comply with all such codes, standards and regulations.

PREPARATION BEFORE START-UP

The instructions in this section assume that the Stationary Emergency Generator has been properly installed, serviced, tested, adjusted and otherwise prepared for use by a competent, qualified installation contractor. Be sure to read the “Safety Rules”, as well as all other safety information in this manual, before attempting to operate this (and related) equipment.

Before starting the generator for the first time, the installer must complete the following procedures. For follow-up maintenance information and/or service intervals, please refer to the “Maintenance” section and the “Service Schedule”.

TRANSFER SWITCH

If this generator is used to supply power to any electrical system normally powered by an electric utility, the National Electrical Code requires that a transfer switch be installed. The transfer switch prevents electrical backfeed between two different electrical systems. (For additional information, see the applicable transfer switch manual for this unit.) The transfer switch, as well as the generator and other electrical components, must be properly located and mounted in strict compliance with applicable codes, standards and regulations.

FUEL SYSTEM

Make sure the fuel supply system to the generator (a) delivers the correct fuel at the correct pressure and (b) is properly purged and leak tested according to code. No fuel leakage is permitted. See “Specifications” for more information.

GENERATOR SET LUBRICATION

Check the engine crankcase oil level before operating and add oil to the proper level – the dipstick “FULL” mark. Never operate the engine with the oil level below the dipstick “ADD” mark. See “Specifications” and “Engine Oil Recommendations”.

Check the oil level in the generator gearbox (if so equipped) prior to initial use and at the intervals indicated by the “Service Schedule.” The recommended oil is SAE 90 gear lubricant.

NOTE:

This engine is shipped from the manufacturer with “break-in” oil. This oil should be changed after 30 hours of operation.

PRIOR TO INITIAL START-UP

⚠ CAUTION!

⚠ Prior to initially starting the generator, it must be properly prepared for use. Any attempt to crank or start the engine before it has been properly serviced with the recommended types and quantities of engine fluids (oil, coolant, fuel, etc.) may result in an engine failure.

ENGINE COOLANT

Have the engine cooling system properly filled with the recommended coolant mixture. Check the system for leaks and other problems. See “Specifications” and “Coolant” sections.

BELT TENSION

Check-the engine-fan belt tension and condition prior to placing the unit into service and at recommended intervals. Belt tension is correct when a force of approximately 22 pounds (10 kg), applied midway between pulleys, deflects the belt about 3/8- to 5/8-inch (10 to 16 mm).

ELECTRICAL SYSTEM

Make sure the generator is properly connected to an approved earth ground.

Make sure the generator battery is fully charged, properly installed and interconnected, and ready for use.

NOTE:

Battery charger must be connected to 120 VAC, 15 amp circuit to operate.

Check to ensure that there are no loose electrical connections. Restrain any loose wires to keep them clear of any moving generator set components.

INITIAL INSPECTION FOR GENSET STARTUP

Inspect for the following.

- Freight Damage.
- Manuals present.
- Fluid Levels (Oil, coolant, battery, Gear Drive).
- Correct fuel piping.
- Correct muffler installation for external applications (open units only).
- Adequate air flow, clearances and ventilation per installation drawings and applicable codes.
- Correct AC and DC wire size, connections and grounding. Control and communication wiring to/from the transfer switch must be run in a separate conduit from the AC power leads.
- **Battery charger connection to 120 VAC.**
- Unit secured to pad.

START-UP CHECKLIST

⚠ WARNING!

⚠ Before working on the Stationary Emergency Generator, ensure the following:

- **The AUTO/OFF/MANUAL switch is in the OFF position.**
- **The 120VAC supply to the battery charger is switched OFF.**

PREPARATION FOR START-UP

- Ensure that the 120VAC circuit breaker to the battery charger is open.
- Remove the fuse from the the control panel. Open the front door of the control box and remove the 15 Amp ATO fuse in the lower left-hand corner of the control box.
- Connect the battery cables to the battery. Attach negative battery cable last.
- Close the 120VAC circuit breaker to the battery charger.
- Measure the voltage at the battery before and after the charger is turned on.
- Verify all AC electrical connections are tight at the circuit breaker and transfer switch.
- Visually inspect entire area looking for loose paper, plastic wrappings, leaves, etc.
- Check all hoses clamps fittings for leaks or damage.
- Check all electrical plugs throughout the generator. Ensure each plug is seated correctly and fully inserted into its receptacle.
- Verify the AUTO/OFF/MANUAL switch is in OFF position.
- Open the valve to the engine fuel line.
- Bleed the fuel system of air. (necessary for long fuel lines).
- Open the generator main line circuit breaker.
- Connect a manometer to the gas line and record the static pressure. It must be as listed in the Specifications.
- Insert the fuse into the control panel.
- Move the AUTO/OFF/MANUAL switch to the manual position. The engine should now crank and start.
- Check voltage at the generator terminals.
- For 3-phase units, check phase rotation at the transfer switch terminals. The generator phase rotation must match the utility phase rotation.
- Check for coolant, fuel, oil, and exhaust leaks.
- Close the generators main line circuit breaker.
- Turn the generator set off.
- Connect the UTILITY supply to the transfer switch.
- Set the AUTO/OFF/MANUAL switch to AUTO.
- Disconnect utility power before the transfer switch.

  Engine should start, transfer to load.

  Run at least 15 minutes on generator power. Make certain all 3-phase loads are functioning correctly (correct phase rotation).
- Reconnect Utility power

  Transfer switch will transfer back to Utility and engine will shut down within the given time parameters set up for the specific transfer switch and controller.
- Install all covers, access plates and door panels.
- Put the Owners Manual in a safe and accessible place.
- Make certain the AUTO/OFF/MANUAL switch is in the AUTO position.

STATIONARY EMERGENCY GENERATOR CONTROL AND OPERATION

Refer to the appropriate control panel operator's manual for this unit.

OPERATING UNIT WITH MANUAL TRANSFER SWITCH

If the Stationary Emergency Generator was installed in conjunction with a transfer switch capable of manual operation only, the following procedure applies. A manually operated transfer switch is one that will not provide automatic start-up and does not include an intelligence circuit.

ENGINE START-UP AND TRANSFER

For additional information, refer to the applicable control panel manual for this unit, as well as any literature pertaining to the specific transfer switch.

⚠ DANGER!

The Maintenance Disconnect Switch and the AUTO/OFF/MANUAL switches (if so equipped) must be set properly, or the generator will crank and start as soon as the utility power to the transfer switch is turned off. Refer to applicable control panel and transfer switch manuals for more information.

Do not proceed until certain that utility source voltage is available to the transfer switch and the transfer switch main contacts are set to UTILITY.

Do not attempt manual operation until all power supplies to the transfer switch have been positively turned off, or extremely dangerous - possibly lethal - electrical shock will result.

Transfer switch enclosure doors should be kept closed and locked. Only authorized personnel should be allowed access to the transfer switch interior. Extremely high and dangerous voltages are present in the transfer switch.

In order to transfer load from the utility source to the generator, follow these directions:

- Turn OFF or disconnect the utility power circuit to the transfer switch, using the means provided (such as the utility source main line circuit breaker).
- Set the transfer handle to its UTILITY (NORMAL) position with load circuits connected to the utility power supply.
- Set the generator's main line circuit breaker to its OFF (or OPEN) position.
- Start the generator.

⚠ CAUTION!

Do not crank the engine continuously for longer than 30 seconds, or the heat may damage the starter motor.

- Let engine stabilize and warm up.
- Check all applicable instrument and gauge readings. When certain that all readings are correct, move the transfer switch manual handle to the STANDBY (or EMERGENCY STANDBY) position, i.e., load circuits supplied by the generator.
- Set the generator's main line circuit breaker to its ON (or CLOSED) position.
- Load circuits are now powered by the generator.

RETRANSFER AND SHUTDOWN

For additional information, refer to the applicable control panel manual for this unit, as well as any literature pertaining to the specific transfer switch.

To transfer the load back to the utility power source and shut down the generator, follow these directions:

- Set the generator's main line circuit breaker to its OFF (or OPEN) position.
- Manually move the transfer switch handle to its UTILITY (NORMAL) position, i.e., load circuits connected to the utility.
- Turn ON the utility power supply to the transfer switch, using the means provided (such as the utility power source main line circuit breaker).
- Let the generator run at no-load for a few minutes to stabilize internal temperatures.
- Shut down the generator.

OPERATING UNIT WITH AUTOMATIC TRANSFER SWITCH

If the Stationary Emergency Generator has been installed with an automatic transfer switch, the engine may be started and stopped automatically or manually.

NOTE:

Refer to the applicable manual for your transfer switch and to "Transfer Switch Start Signal Connections". In addition, please note the dangers under "Engine Start-up and Transfer."

MAINTENANCE PERFORMED BY AUTHORIZED SERVICE FACILITIES

⚠ WARNING!

Before working on the Stationary Emergency Generator, ensure the following:

- **The AUTO/OFF/MANUAL switch is in the OFF position.**
- **The 15A fuse has been removed from the control box.**
- **The 120VAC supply to the battery charger is switched OFF.**

EVERY THREE MONTHS

1. Check battery state of charge and condition.
2. Inspect and test fuel system.
3. Check transfer switch.
4. Inspect exhaust system.
5. Check engine ignition system.
6. Check fan belts.

ONCE EVERY SIX MONTHS

1. Test Engine Safety Devices (low oil pressure, low coolant level, high coolant temperature).

ONCE ANNUALLY

1. Test engine governor. Adjust or repair, if needed.
2. Clean, inspect generator.
3. Flush cooling system.

FIRST 30 OPERATING HOURS

1. Change engine "break-in" oil and oil filter.

FIRST 100 OPERATING HOURS

1. Change engine oil and oil filter. (After initial change, service engine oil and filter at 150 operating hours or 6 months, whichever comes first.)

EVERY 500 OPERATING HOURS

1. Service air cleaner.
2. Check starter.
3. Check engine DC alternator.

COOLING SYSTEM

Air intake and outlet openings in the generator compartment must be open and unobstructed for continued proper operation. This includes such obstructions as high grass, weeds, brush, leaves and snow.

Without sufficient cooling and ventilating air flow, the engine/generator quickly overheats, which causes it to shut down.

⚠ WARNING!

The exhaust system parts from this product get extremely hot and remain hot after shutdown. High grass, weeds, brush, leaves, etc. must remain clear of the exhaust. Such materials may ignite and burn from the heat of the exhaust system.

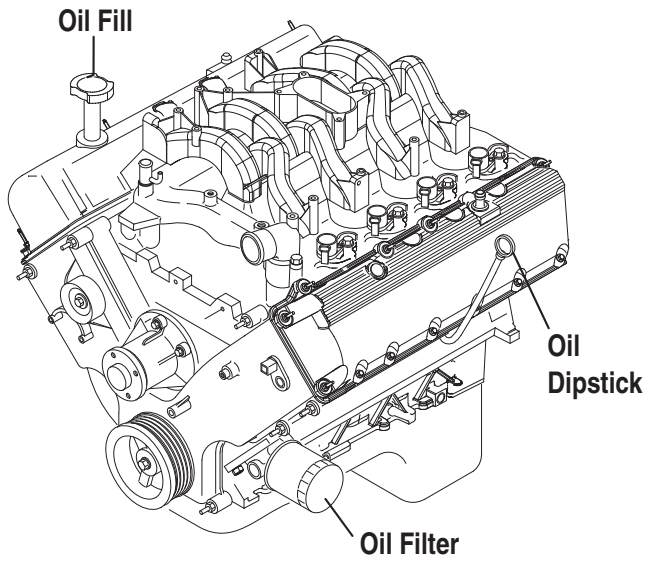
CHECKING FLUID LEVELS

CHECK ENGINE OIL

Check engine crankcase oil level (Figure 10.1) at least every 20 hours of operation, or prior to use.

- Remove oil dipstick and wipe dry with a clean, lint-free cloth.
- Install oil dipstick, then remove again.
- Oil should be between FULL and ADD marks.
- If oil level is below the dipstick ADD mark, remove oil fill cap. Add the recommended oil to bring oil level up to the FULL mark. DO NOT FILL ABOVE THE “FULL” MARK. See “Engine Oil Recommendations” for recommended oils.

Figure 10.1 - Oil Dipstick and Oil Fill Cap



BATTERY FLUID

Check battery electrolyte fluid at least once weekly. Fluid should cover separators in all battery cells. If fluid level is low, add distilled water to cover tops of separators. DO NOT USE TAP WATER IN BATTERY.

ENGINE COOLANT

Check coolant level in coolant recovery bottle. See the "Specifications" section.

- Add recommended coolant mixture as necessary.
- Periodically remove radiator pressure cap to make sure the coolant recovery system is functioning properly. Coolant should be at bottom of radiator filler neck. If coolant level is low, inspect gasket in radiator pressure cap. Replace cap, if necessary. To have pressure cap tested, contact an Authorized Service Dealer. Inspect cooling system and coolant recovery system for leaks.

MAINTENANCE OWNER/ OPERATOR CAN PERFORM

⚠ WARNING!

⚠ Before working on the generator, ensure the following:

- **The AUTO/OFF/MANUAL switch is in the OFF position.**
- **The 15A fuse has been removed from the control box.**
- **The 120VAC supply to the battery charger is switched OFF.**
- **The negative battery cable has been removed.**

CHECK ENGINE OIL LEVEL

Refer to the "Checking Fluid Levels" section.

CHECK BATTERY

- Check battery fluid level each week as outlined under "Check Fluid Levels".
- Check battery cables for condition, tightness, corrosion or damage. Clean, tighten or replace as necessary.

EXERCISE SYSTEM

Start the Stationary Emergency Generator engine at least once every seven days and let it run at least 20 minutes. For more detailed exercise information, see the respective sections in the Control Panel Technical Manual that is supplied with the unit.

INSPECT COOLING SYSTEM

- Inspect engine cooling system at least once each month.
- Check hoses for damage, deterioration, leaks, etc. Correct any discrepancies found.
- Check hose clamps for tightness.

CHECK ENGINE COOLANT LEVEL

See the "Checking Fluid Levels" section.

PERFORM VISUAL INSPECTION

Complete a thorough visual inspection of the entire engine-generator monthly. Look for obvious damage, loose, missing or corroded nuts, bolts and other fasteners. Look for fuel, oil or coolant leaks.

INSPECT EXHAUST SYSTEM

Inspect the exhaust system at least once every three months. Check all exhaust system pipes, mufflers, clamps, etc. for condition, tightness, leaks, security, damage.

CHECK FAN BELT

- Inspect fan belts every three months. Replace any damaged, deteriorated, worn or otherwise defective belt.
- Check fan belt tension. Thumb pressure, exerted midway between pulleys, should deflect about 3/8 to 5/8 inch. Adjust belt tension as required.

INSPECT ENGINE GOVERNOR

Visually inspect electronic governor.

⚠ DANGER!

⚠ Do not attempt to adjust the governor. Only qualified service facilities should adjust the governor. Excessively high operating speeds are dangerous and increase the risk of personal injury. Low speeds impose a heavy load on the engine when adequate engine power is not available and may shorten engine life. Correct rated frequency and voltage are supplied only at the proper governed speed. Some connected electrical load devices may be damaged by incorrect frequency and/or voltage. Only qualified service technicians should adjust the governed speed.

CHANGING ENGINE OIL

⚠ CAUTION!

⚠ Hot oil may cause burns. Allow engine to cool before draining oil. Avoid prolonged or repeated skin exposure with used oil. Thoroughly wash exposed areas with soap.

Refer to maintenance performed by authorized service facilities for engine oil and filter change frequencies.

Drain the oil while the engine is still warm from running. This means warm up the engine, shut it down and drain immediately as follows:

1. Remove OIL DRAIN HOSE from its retaining clip.
2. Loosen and remove OIL DRAIN HOSE CAP. Drain oil completely into suitable container.
3. When all oil has drained, install and tighten OIL DRAIN HOSE CAP, and re-install into its retaining clip.
4. Turn OIL FILTER (Figure 10.2) counterclockwise and remove. Dispose of old filter.
5. Apply light coating of new engine oil to seal of new oil filter.-Install FILTER and tighten by hand only. DO NOT OVERTIGHTEN.

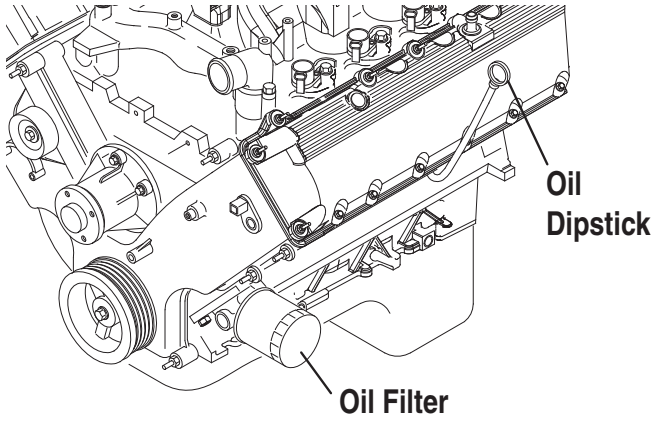
6. Remove OIL FILL CAP. Add recommended oil (see SPECIFICATIONS). DO NOT FILL ABOVE THE DIPSTICK “FULL” MARK. Crankcase oil capacity is listed in the “Specifications”.

⚠ CAUTION!

⚠ After refilling the crankcase with oil, always check oil level on dipstick. NEVER OPERATE ENGINE WITH OIL BELOW THE DIPSTICK “ADD” MARK.

7. Start engine and check for oil leaks.
8. Shut OFF engine and wait 10 minutes for the oil to settle down into the oil pan. Recheck oil level on dipstick. DO NOT fill above the dipstick "FULL" mark.
9. Dispose of used oil at a proper collection center.

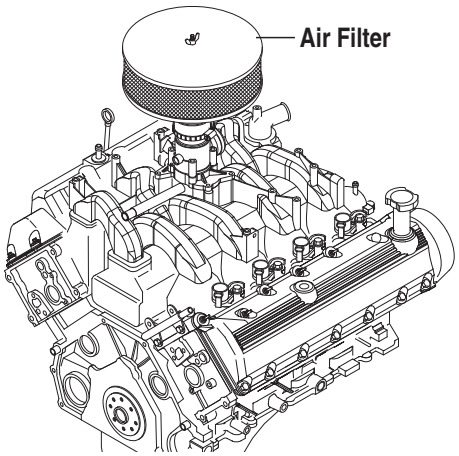
Figure 10.2 - Oil Filter



CHANGING THE ENGINE AIR CLEANER

To replace the engine air cleaner, remove the air cleaner cover and replace the air filter making sure it is positioned properly before reattaching the cover.

Figure 10.3 — Engine Air Filter



See the “Service Schedule” section for air cleaner maintenance.

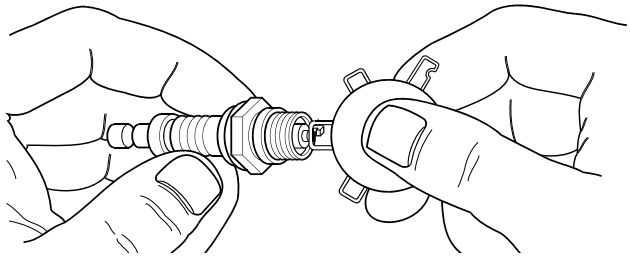
SPARK PLUGS

Reset the spark plug gap or replace the spark plugs as necessary.

1. Clean the area around the base of the spark plugs to keep dirt and debris out of the engine. Clean by scraping or washing using a wire brush and commercial solvent. Do not blast the spark plugs to clean.
2. Remove the spark plugs and check the condition. Replace the spark plugs if worn or if reuse is questionable. See the “Service Schedule” section for recommended inspection.
3. Check the spark plug gap using a wire feeler gauge. Adjust the gap per the following chart. (Figure 10.4).

Before Serial # 5576484	0.94-1.07mm (0.037"-0.042")
Serial # 5576484 and After	1.30-1.42mm (0.051"-0.056")

Figure 10.4 – Setting the Spark Plug Gap



COOLANT CHANGE

Every year, have an Authorized Service Facility drain, flush and refill the cooling system. See the “Specifications” section for cooling system recommendations.

MISCELLANEOUS MAINTENANCE

CLEANING THE STATIONARY EMERGENCY GENERATOR

Keep the generator as clean and as dry as possible. Dirt and moisture that accumulates on internal generator windings have an adverse effect on insulation resistance.

Periodically clean generator exterior surfaces. A soft brush may be used to loosen caked on dirt. Use a vacuum system or dry, low pressure air to remove any accumulations of dirt. The generator is housed inside an all-weather enclosure, clean the enclosure with a soft, damp cloth or sponge and water.

Once each year, have the generator cleaned and inspected by an Authorized Service Dealer. That dealer will use dry, low pressure air to clean internal windings. Parts inside the control console should be cleaned and inspected at this time as well.

Finally, have the insulation resistance of stator and rotor windings checked. If insulation resistances are excessively low, the generator may require drying.

BATTERY

All lead-acid storage batteries discharge when not in use. Refer to specific instructions and warnings that accompany the battery. If such information is not available, observe the following precautions when handling a battery:

- DO NOT use jumper cables and a booster battery to crank or start the generator engine.
- DO NOT recharge a weak battery while it is installed in the generator. Remove battery from generator and recharge in a well-ventilated area, away from fuel vapors, sparks, heat or flames.
- Battery electrolyte fluid is an extremely caustic sulfuric solution that can cause severe burns. DO NOT permit fluid to contact eyes, skin, clothing, painted surfaces, wiring insulation, etc. If any battery fluid is spilled, flush the affected area with clear water immediately.
- Always wear safety glasses, rubber apron and gloves when handling a battery.
- Batteries give off explosive hydrogen gas while charging. The gas can form an explosive mixture around the battery for several hours after charging. Any spark, heat or flames can ignite the gas and cause an explosion which can shatter the battery, causing blindness or other serious injury.

BATTERY MAINTENANCE

The battery should be inspected per the "Service Schedule" section. The following procedure should be followed for inspection:

1. Inspect the battery posts and cables for tightness and corrosion. Tighten and clean as necessary.
2. Check the battery fluid level of unsealed batteries and, if necessary, fill with DISTILLED WATER ONLY. DO NOT USE TAP WATER IN BATTERIES.
3. Have the state of charge and condition checked. This should be done with an automotive-type battery hydrometer.

⚠ 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. Such 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.

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 the fluid is spilled, flush the affected area immediately with clear water.

Do not use any jumper cables or booster battery to crank and start the generator engine. If the battery has completely discharged, remove it from the generator for recharging.

⚠ WARNING!

Be sure the AUTO/OFF/MANUAL switch is set to 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 120VAC power supply to the battery is turned OFF, or sparking may occur at the battery posts as the cables are attached and cause an explosion.

BATTERY REPLACEMENT

When replacing batteries, use the same number and type of battery that was supplied with the unit, and is listed in the parts list in the back of this manual.

NOTE:

The BCI number should be located directly on the battery.

REPAIR PARTS

The latter portion of this manual consists of exploded views, parts lists and electrical data pertaining to this generator set. The parts lists consist of (a) an item number, (b) a part number, (c) the quantity required, and (d) a description of the part. The item number corresponds to an identical number on the exploded view drawing.

SERVICE SCHEDULE

22 KW - 150 KW GASEOUS STATIONARY EMERGENCY GENERATOR

The following is a recommended maintenance schedule for Gaseous Stationary Emergency Generator sets from 22kW to 150 kW in size. The established intervals in the schedule are the maximum recommended when the unit is used in an average service application. They will need to be decreased (performed more frequently) if the unit is used in a severe application. Use calendar time, from the previous maintenance interval to determine the next required maintenance interval.

Service Maintenance Interval Information:

The various service maintenance intervals are designated by interval numbers as follows:

1 An early inspection of the generator set to insure it is ready to operate when required and to identify any potential problem areas.

⚠ CAUTION!

This inspection may be performed by the end user providing the following safety steps are taken to prevent the engine from starting automatically without warning:

To prevent injury, perform the following steps in the order indicated before starting any maintenance:

- **Disable the generator set from starting and/or connecting to the load by setting the control panel Auto/Off/Manual switch to the "OFF" position.**
- **Remove the 15 amp control panel fuse.**
- **Turn off the battery charger.***
- **Remove the negative battery cable.**

⚠ CAUTION!

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

Following all maintenance, reverse these steps to insure the unit is returned to standby setup for normal operation when required.

2 A wear-in service inspection of the generator set to insure it is ready to operate and carry the load when required, and to identify any potential problem areas.

*Performed **ONLY ONCE** following the first three months or the first 30 hours of operation after purchase of the unit.*

This inspection contains some maintenance tasks which require special tools, equipment, and/or knowledge to accomplish and should be performed only by a Service Dealer.

3 An operational inspection of the generator set to insure it is ready to operate and carry the load when required, and to identify any potential problem areas.

Performed semi-annually or following each 50 hours of operation of the unit.

This inspection contains some maintenance tasks which require special tools, equipment, and/or knowledge to accomplish and should be performed only by a Service Dealer.

4 A mid-level inspection of the generator set to insure it is ready to operate and carry the load when required, and to identify any potential problem areas.

Performed annually or following each 100 hours of operation of the unit.

This inspection contains some maintenance tasks which require special tools, equipment, and/or knowledge to accomplish and should be performed only by a Service Dealer.

5 A comprehensive inspection of the generator set to insure it is properly serviced and ready to operate and carry the load when required, and to identify any potential problem areas.

Performed annually or following each 250 hours of operation of the unit.

This inspection contains some maintenance tasks which require special tools, equipment, and/or knowledge to accomplish and should be performed only by a Service Dealer.

Service Schedule

Maintenance Tasks	Level 1 Recommended to be done monthly/ 10 hrs.	Task Comp. (Date-Initials)	Level 2 Required to be done 3 months/ Break-in 30 hrs.	Task Comp. (Date-Initials)	Level 3 Required to be done Semi-annually/ 50 hrs.	Task Comp. (Date-Initials)	Level 4 Required to be done Annually/ 100 hrs.	Task Comp. (Date-Initials)	Level 5 Required to be done Bi-annually/ 250 hrs.	Task Comp. (Date-Initials)
1. Disable the unit from operating per the first page warning.	⬭		⬭		⬭		⬭		⬭	
2. Check the engine oil level. Adjust as necessary.	⬭		⬭		⬭		⬭		⬭	
3. Check the engine coolant level. Adjust as necessary.	⬭		⬭		⬭		⬭		⬭	
4. Check the engine coolant thermal protection level. Correct as necessary.							⬭		⬭	
5. Check the natural gas delivery system for leaks and correct pressure on gas engine driven units. Tighten connections as necessary.	⬭		⬭		⬭		⬭		⬭	
6. Check the air inlets and outlets of the enclosure and radiator for debris. Clean as necessary.	⬭		⬭		⬭		⬭		⬭	
7. Check the battery electrolyte level and specific gravity if accessible. Adjust as necessary.	⬭		⬭		⬭		⬭		⬭	
8. Check the battery posts, cables, and charger for loose connections, corrosion, and proper operation. Correct as necessary.	⬭		⬭		⬭		⬭		⬭	
9. Check the unit wiring for loose connections, corrosion, and damage. Correct as necessary.	⬭		⬭		⬭		⬭		⬭	

Service Schedule

Maintenance Tasks	Level 1 Recommended to be done monthly/ 10 hrs.	Task Comp. (Date-Initials)	Level 2 Required to be done 3 months/ Break-in 30 hrs.	Task Comp. (Date-Initials)	Level 3 Required to be done Semi-annually/ 50 hrs.	Task Comp. (Date-Initials)	Level 4 Required to be done Annually/ 100 hrs.	Task Comp. (Date-Initials)	Level5 Required to be done Bi-annually/ 250 hrs.	Task Comp. (Date-Initials)
10. Check the engine accessory drive belts and fan coupling device if equipped for correct tension, wear, weather cracking, and damage. Replace as necessary.			⬭				⬭		⬭	
11. Check the engine valve clearance/ lash. Adjust as necessary.**							⬭		⬭	
12. Visually inspect the unit looking for leaks, wear or damage, loose connections or components, and corrosion. Correct as necessary.							⬭		⬭	
13. Test the engine and transfer switch safety devices. Correct and/or adjust as necessary.	⬭		⬭		⬭		⬭		⬭	
14. Initiate an automatic start and transfer of the unit to site load and exercise it for at least 1 hour looking for leaks, loose connections or components, and abnormal operating conditions. Correct as necessary.							⬭		⬭	
15. Replace the engine accessory drive belts.									⬭	
16. Check gearbox oil level (if equipped).	⬭		⬭		⬭		⬭		⬭	
17. Change gearbox oil (if equipped).									⬭	

** Not required for engines equipped with hydraulic lifters. See the "Specification" section for lifter type.

Service Schedule

Maintenance Tasks	Level 1 Recommended to be done monthly/ 10 hrs.	Task Comp. (Date-Initials)	Level 2 Required to be done 3 months/ Break-in 30 hrs.	Task Comp. (Date-Initials)	Level 3 Required to be done Semi-annually/ 50 hrs.	Task Comp. (Date-Initials)	Level 4 Required to be done Annually/ 100 hrs.	Task Comp. (Date-Initials)	Level5 Required to be done Bi-annually/ 250 hrs.	Task Comp. (Date-Initials)
18. Start and exercise the unit at full rated load (use a load bank if the site load is not enough) for at least 2 hours looking for leaks, loose connections or components, and abnormal operating conditions. Correct as necessary.									⬭	
19. Perform an engine oil analysis (send a sample to a lab for results). Change the engine oil and filters if the analysis results indicate this is required.							⬭			
20. Change the engine oil.			⬭				⬭		⬭	
21. Replace the engine oil filter(s).			⬭				⬭		⬭	
22. Replace engine spark plugs. Clean and re-gap or replace as necessary.							⬭			
23. Replace the engine air filter(s).									⬭	
24. Perform a 5 minute no-load operational run of the unit looking for any post service problems.			⬭						⬭	
25. Return the unit to standby setup for operation when required.	⬭		⬭		⬭		⬭		⬭	

TROUBLESHOOTING GUIDE

PROBLEM	*CAUSE*	*CORRECTION*
Engine won't crank.	1. 15 amp fuse blown. 2. Loose or corroded or defective battery cables. 3. Defective starter contactor. 4. Defective starter motor. 5. Dead or Defective Battery. 6. 5 amp fuse blown.	1. Replace fuse. 2. Tighten, clean or replace batter cables as necessary. 3. Replace contactor.* 4. Replace starter motor.* 5. Remove, change or replace battery. 6. Replace fuse.*
Engine cranks but won't start	1. Out of fuel. 2. Fuel solenoid (FS) is defective 3. Open Wire #14A from Engine Control circuit board. 4. Spark plugs defective. 5. Door on tank not closed.	1. Replenish fuel. 2. Replace solenoid.* 3. Reconnect wire. 4. Clean, regap or replace plugs. 5. Close door on tank.
Engine starts hard, runs rough.	1. Flame arrestor (air cleaner) plugged or damaged. 2. Plugged fuel line. 3. Defective spark plugs. 4. Fuel pressure incorrect.	1. Clean or replace as needed. 2. Unclog fuel line. 3. Clean, regap or replace plugs. 4. Confirm fuel pressure to regulator is as recommended in SPECIFICATIONS.
Engine starts then shuts down.	1. Engine oil level is low. 2. Engine is overheated. 3. Defective Low Oil Pressure Switch 4. Defective Coolant Temperature Switch 5. Defective Control Module circuit board. 6. Coolant Level is Low. 7. Defective Low Coolant Level Switch	1. Check oil and add oil as needed. 2. Check cooling system for leaks. 3. Replace switch.* 4. Replace switch.* 5. Replace board.* 6. Repair leak - Add coolant. 7. Replace Switch.*
AUTO/OFF/MANUAL Switch at OFF, engine continues to run	1. Defective AUTO/OFF/MANUAL switch 2. Open/disconnected wire #15A between AUTO/OFF/MANUAL switch and Control Module circuit board. 3. Defective Control Module circuit board	1. Replace switch.* 2. Reconnect/close wire. 3. Replace board.*
No AC output from generator.	1. Check main line circuit breaker. 2. Check circuit breaker & fuses. 3. Transfer switch set to NORMAL position 4. Generator internal failure. 5. Thermal circuit breaker open.	1. Reset to ON or CLOSED. 2. Reset and replace, if necessary. 3. Set to GENERATOR position. 4. * 5. Auto-reset - Wait 5 min. and attempt restart.

***Contact the nearest Dealer for assistance.**

United States Environmental Protection Agency Warranty Statement (Stationary Emergency Spark-Ignited Generators)

Warranty Rights, Obligations and Coverage

The United States Environmental Protection Agency (EPA) and Generac Power Systems, Inc. (Generac) are pleased to explain the Emission Control System Warranty on your new stationary emergency engine. If during the warranty period, any emission control system or component on your engine is found defective in materials or workmanship, Generac will repair your engine at no cost to you for diagnosis, replacement parts and labor provided it be done by a Generac Authorized Warranty Service Facility. Your emission control system may include parts such as the fuel metering, ignition, and exhaust systems and other related emission related components listed below. Generac will warrant the emissions control systems on your 2009 and later model year engines provided there has been no abuse, neglect, unapproved modification, or improper maintenance of your engine. For engines less than 130 HP the warranty period is two years from the date of sale to the ultimate purchaser. For engines greater than or equal to 130 HP the warranty period is three years or 2500 hours of operation, whichever comes first, from the date of the engine being placed into service. For high-cost warranted components, the Emission Control System warranty is valid for 5 years or 3500 hours of operation, whichever comes first.

Purchaser's/Owner's Warranty Responsibilities

As the engine purchaser/owner you are responsible for the following: 1) The engine must be installed and configured in accordance to Generac's installation specifications. 2) The completion of all maintenance requirements listed in your Owner's Manual. 3) Any engine setting adjustment must be done in accordance and consistent with the instructions in the Owner's Manual. 4) Any emission control system or component must be maintained and operated appropriately in order to ensure proper operation of the engine and control system to minimize emissions at all times.

Generac may deny any/or all Emission Control System Warranty coverage or responsibility of the engine, or an emission control system or component on your engine thereof, if it has failed due to abuse, neglect, unapproved modification or improper maintenance, or the use of counterfeit and/or “gray market” parts not made, supplied or approved by Generac. Warranty service can be arranged by contacting either your selling dealer or a Generac Authorized Warranty Service dealer, 1-800-333-1322 for the dealer nearest you. The purchaser/owner shall be responsible for any expenses or other charges incurred for service calls and/or transportation of the product to/from the inspection or repair facilities. The purchaser/owner shall be responsible for any and/or all damages or losses incurred while the engine is being transported/shipped for inspection or warranty repairs. Contact Generac Power Systems Inc. for additional Emission Control System Warranty related information, Generac Power Systems, Inc., PO. Box 8, Waukesha, WI 53187, or call 1-800-333-1322 or www.generac.com.

Important Note

This warranty statement explains your rights and obligations under the Emission Control System Warranty, which is provided to you by Generac pursuant to federal law. Note that this warranty shall not apply to any incidental, consequential, or indirect damages caused by defects in materials or workmanship or any delay in repair or replacement of the defective part(s). This warranty is in place of all other warranties, expressed or implied. Specifically, Generac makes no other warranties as to the merchantability or fitness for a particular purpose. Any implied warranties which are allowed by law, shall be limited in duration to the terms of the express warranty provided herein. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Emission Related Parts Include the Following (if so equipped)

1) Fuel Metering System

1.1) Gasoline Carburetor Assembly and Internal Components
A) Fuel Filter, B) Carburetor, C) Fuel Pump

1.2) Carburetion Assembly and Its Components
A) Fuel Controller, B) Carburetor and Its Gaskets, C) Mixer and Its Gaskets, D) Primary Gas Regulator, E) Liquid Vaporizer

1.3) Fuel Regulator

2) Air Induction System Including A) Intake Pipe/Manifold, B) Air Cleaner

3) Ignition System Including A) Spark Plug, B) Ignition Module, C) Ignition Coil, D) Spark Plug Wires

4) Exhaust System
A) Catalyst Assembly*, B) Exhaust Manifold, C) Muffler, D) Exhaust Pipe, E) Muffler Gasket

5) Crankcase Breather Assembly Including
A) Breather Connection Tube, B) PCV Valve

6) Oxygen Sensor

7) Diagnostic Emission-Control System

*High-Cost Warranted Component

United States Environmental Protection Agency Compliance Requirements (Stationary Emergency Spark-Ignited Generators)

Purchaser's/Owner's Record Keeping Responsibilities

The United States Environmental Protection Agency (EPA) and Generac Power Systems, Inc. (Generac) are pleased to explain your record keeping requirements for compliance with Subpart JJJJ- Standards of Performance for Stationary Spark Ignition Internal Combustion Engines as listed in the Electronic Code of Federal Regulations Title 40 Part 60. As the engine purchaser/owner who operates and maintains their certified emergency stationary engine and emission control system according to applicable emission related guidelines as specified in this Owner's Manual, you are required to meet the following notification and record keeping requirements to demonstrate compliance: 1) Maintain documentation that the engine is certified to meet emission standards. 2) Record keeping of maintenance conducted. 3) Record keeping of the provision allowing natural gas engines to operate using propane for a maximum of 100 hours per year as an alternate fuel solely during emergency operations provided the engine is not certified to operate on propane. 4) Meet all compliance notifications submitted to the purchaser/owner and maintain all supporting documentation. 5) Record keeping of hours of operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. For emergency engines greater than or equal to 130 HP, record keeping of hours of operation begins January 1, 2011. For emergency engines less than 130 HP, record keeping of hours of operation begins January 1, 2009; engines are equipped with non-resettable hour meters to facilitate record keeping.

Specific Air Quality Management or Air Pollution Control Districts may have different and additional record keeping/reporting requirements. Your permit to construct and/or operate the engine may be contingent upon compliance with those requirements. Check with your local Air Quality Management or Air Pollution Control District for specific requirements.

Emergency stationary internal combustion engines (ICE) may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, Generac, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The purchaser/owner may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing.

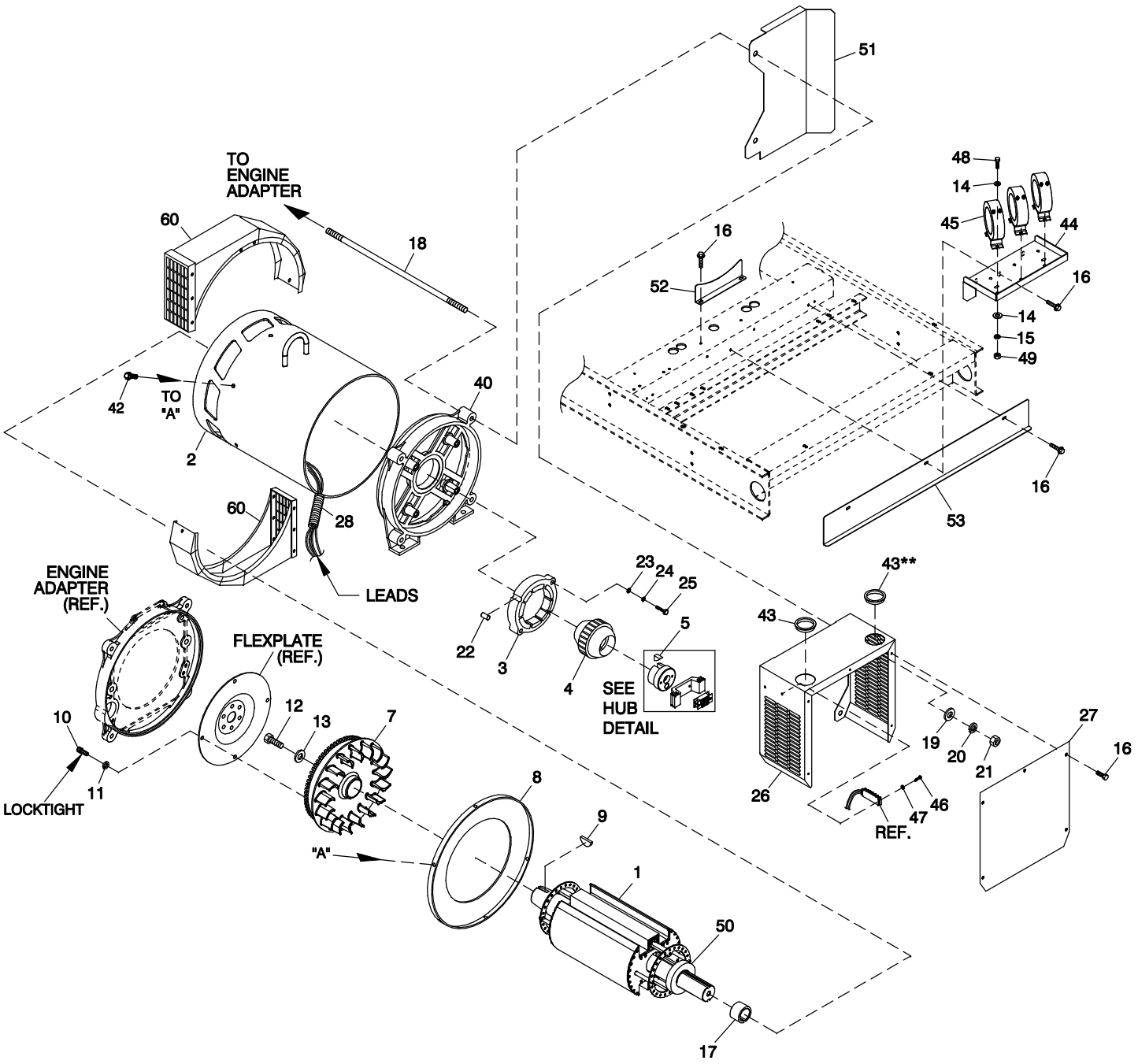
The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity. For purchaser/owner of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section is prohibited.

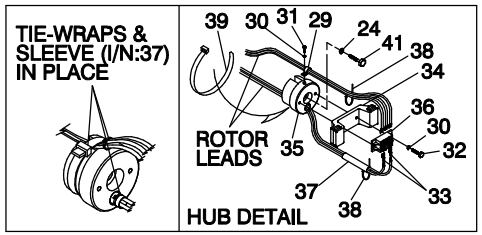
If you operate and maintain your certified emergency stationary SI internal combustion engine and emissions control systems in accordance to the specifications and guidelines in this Owner’s Manual, EPA will not require engine performance testing. If not, your engine will be considered non-certified and you must demonstrate compliance according to Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines as listed in the Electronic Code of Federal Regulations Title 40 Part 60.

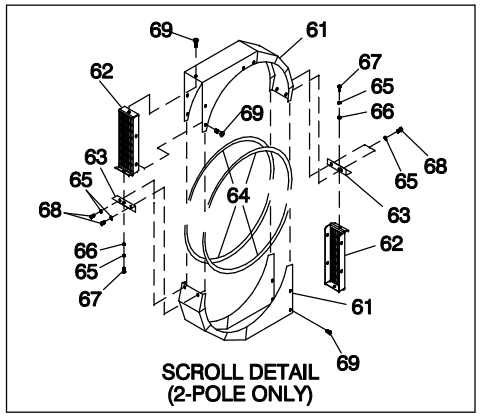
Emission-Related Installation Instructions

Your certified emergency stationary engine has pre-set emission control systems or components that require no adjustment. Inspection and replacement of an emissions related component is required to be done so in accordance with the requirements cited in the United States Environmental Protection Agency Warranty Statement or can be arranged by contacting either your selling dealer or a Generac Authorized Warranty Service dealer, 1-800-333-1322 for the dealer nearest you. Failing to follow these instructions when installing a certified engine in a piece of non-road equipment violates federal law 40 CFR 1068.105 (b), subject to fines or penalties as described in the Clean Air Act.

GROUP A







EXPLODED VIEW:

CPL ALT BRSHLSS 4.6L 80KW,6.8L 150KW 2-POLE

DRAWING #: 0F2987

REVISION: H-9107-S
DATE: 6/16/11

EXPLODED VIEW: CPL ALTERNATOR BRUSHLESS 4.6L 80KW,6.8L 150KW 2-POLE
DRAWING #: 0F2987

GROUP A

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F9952	1	ASSY ROTOR 2390 80KB3 CPL
	0F3417	1	ASSY ROTOR 390 2P 100K BRSHLS
	0F2984	1	ASSY ROTOR 390 2P 150K BRSHLS
2	0F9949	1	ASSY STATOR 80KW 1PH 2P BRSHLS
	0F3418	1	ASSY STATOR 390 2P 100K BRSHLS
	0F2985	1	ASSY STATOR 390 2P 150K BRSHLS UL
	0F9950	1	STATOR 2390 80 GB3 CPL
	0F9951	1	STATOR 2390 80 KB3 CPL
	0G6319	1	STR 2390 80 JB3 CPL
	0F6183	1	ASSY STR 390 100KW 2P 3PH 208V
	0F6187	1	ASSY STR 100KW 1PH 2P BRSHLS
	0F6184	1	ASSY STR 390 150KW 2P 3PH 208V
	0F6212	1	ASSY STR 150KW 1PH 2P BRSHLS
	0G2023	1	ASSY STR 390 150KW 2P 3PH 240V
	0F8757	1	STR-2390-150LB4 CPL
3	068405C	1	EXITER FIELD 2" LG SPD CONN
4	0F3013	1	ASSY EXCITER 2.0" STACK 2P
5	072878	1	KEY SQ 3/8 X 3-1/4 STEEL
6	0C9708	REF	HYPOT TEST PROCEDURE (NOT SHOWN)
7	0F3726B	1	ASSY FLYWHEEL CPL
8	0F2689	1	RING PRESSURE 390 STATOR CAN
9	023454	1	KEY WOODRUFF #E
10	059980	4	SCREW HHC M10-1.5 X 25 C10.9
11	046526	4	WASHER LOCK M10
12	0A2601	1	SCREW HHC M16-2.0 X 45 G8.8
13	072879	1	SPACER .69 X 2.75 X .37 ST/ZNC
14	022473	8/12	WASHER FLAT 1/4-M6 ZINC
15	022097	4/6	WASHER LOCK M6-1/4

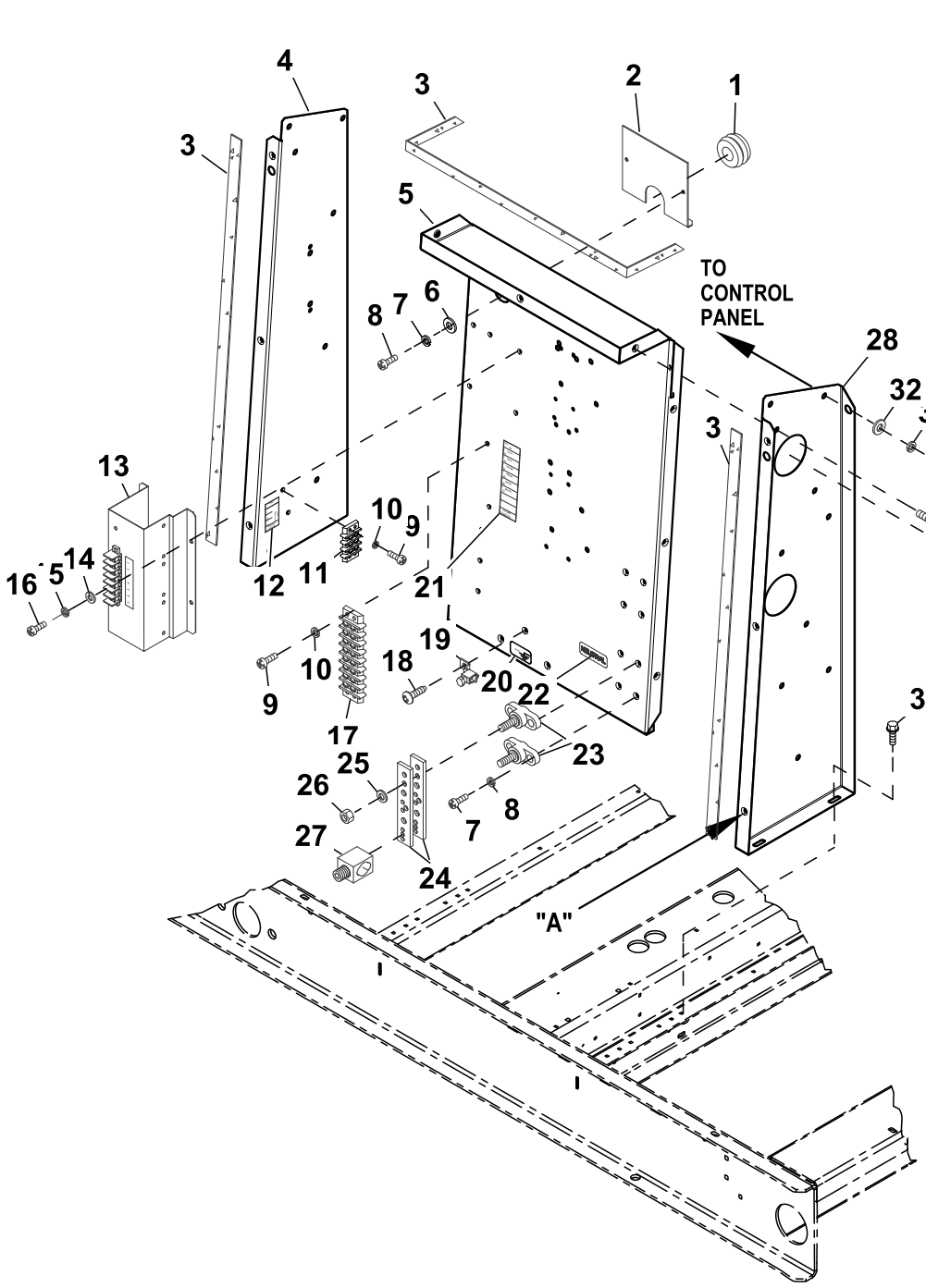
ITEM	PART #	QTY.	DESCRIPTION
16	0C2454	11	SCREW THF M6-1 X 16 N WA Z/JS
17	092950	1	COLLAR SLIP FIT 390 MM
18	04576100CF	4	STUD M14-2.0 X 760 G5 ZINC
19	052646	4	WASHER FLAT M14
20	043123	4	WASHER LOCK M14
21	051779	4	NUT HEX M14-2.0 G8 YEL CHR
22	022392	2	PIN DOWEL 1/2 X 1-1/4
23	052259	2	WASHER FLAT M12
24	051769	3	WASHER LOCK M12
25	0E7230	3	SCREW HHC M12-1.75 X 80 G10.9
26	0F3033	1	SHIELD ALT EXCITER 390
	0F9492	1	SHIELD ALT EXCITER 5.4/6.8 (1 PHASE)
27	0F2722	1	COVER EXCITER SHIELD
28	077043F	1	CONDUIT FLEX 1.25" ID
29	020151	1	CLAMP VINYL .312 X .203 Z
30	023365	3	WASHER SHAKEPROOF INT #8
31	033133	1	SCREW HHM #8-32 X 3/8
32	033143	2	SCREW HHM #8-32 X 7/8
33	086032	2	LUG RT-ANG #10/10-12
34	090063	1	BRIDGE SUPPORT DIODE 15"
35	090064	1	CAP END ROTOR 390MM
36	090152	1	ASSY BRIDGE RECTIFIER
37	022661L	1	SLEEVING UL #0 .330 ID (3" LG)
38	028739A	2	TIE WRAP UL 3.9" X .10" BLK
39	085662D	1	TIE WRAP UL 17.7 X .35 BLK HT
40	068113	1	REAR BEARING CARRIER
41	068406	1	SCREW HHC M12-1.75 X 60 G10.9
42	0F7272	6	SCREW 1/4-20 X 5/8" TAPTITE SS
43	023484N	1	BUSHING SNAP SB-2.5-31
	023484N	2	BUSHING SNAP SB-2.5-31 (FOR 5.4/6.8 1 PHASE)
44	0F6819	1	MOUNT CT'S 5.4L 100KW
45	REF.	2/3	TRANSFORMER
46	0C2428	2	SCREW PHTT #6-32 X 1/2 ZYC
47	022155	2	WASHER LOCK #6
48	042568	4/6	SCREW HHC M6-1.0 X 20 G8.8
49	049813	4/6	NUT HEX M6 X 1.0 G8 YEL CHR
50 *	052624	1	BEARING BALL 6212 SEALED
51	0F7030	1	SHROUD UPPER ALTERNATOR EXCITR
52	0F7047	1	SHROUD CENTER ALTERNATR EXCITR
53	0F7029	1	SHROUD LOWER ALTERNATOR EXCITR
60	0F3834	1	ASSY SCROLL 390 X 60MM CPL
	KIT PARTS		I/N'S: 61 THRU 69
61	0F3846B	2	SHROUD ALT SHEET METAL CPL 2P
62	0F3892	2	SCREEN, 390 SAE ALT 60MM WIDE
63	0A2496A	2	BRACKET SAE SCROLL TENSIONER
64	056326	8.4 FT.	VINYL TRIM 1/8" GAP
65	022097	6	WASHER, SPLIT 1/4"-M6
66	022473	6	WASHER FLAT 1/4 ZINC
67	045757	2	SCREW HHC M6-1.0 x 25 LONG
68	047411	4	SCREW HHC M6-1.0 X 16 G8.8
69	0A2110	12	SCREW SWAGE 1/4-20 X 1/2 Z/YC

* ROTOR REPLACEMENT PARTS.

** 1 PHASE UNITS REQUIRE SEPERATION OF LEADS.

QTY. REQ: 1 PHASE / 3 PHASE

GROUP A



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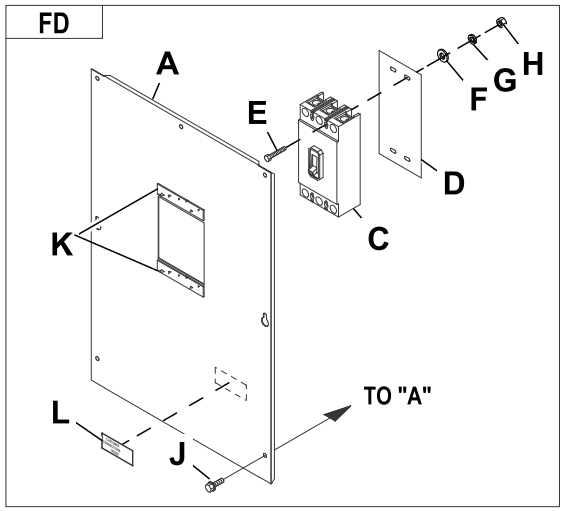

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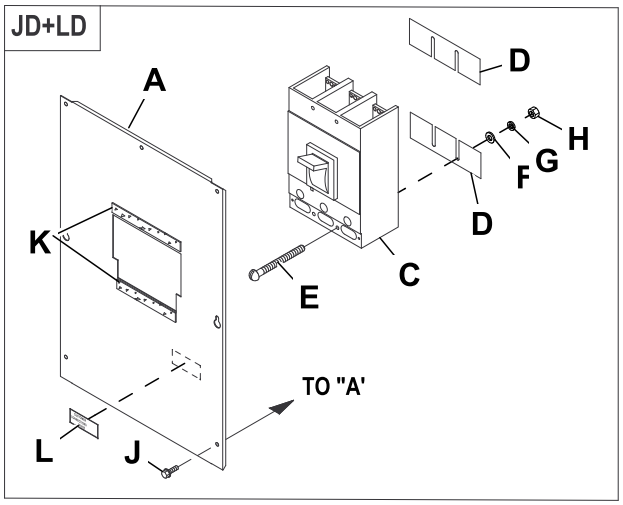
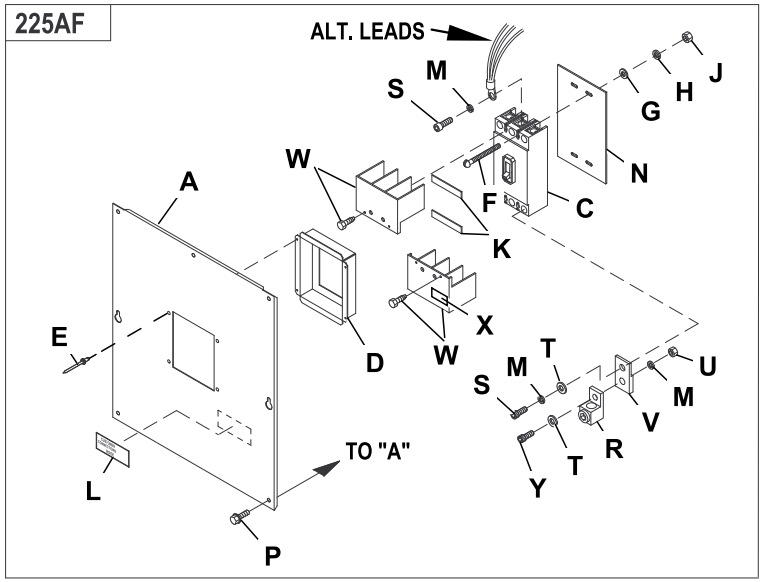


GROUP A

3.) 225AF



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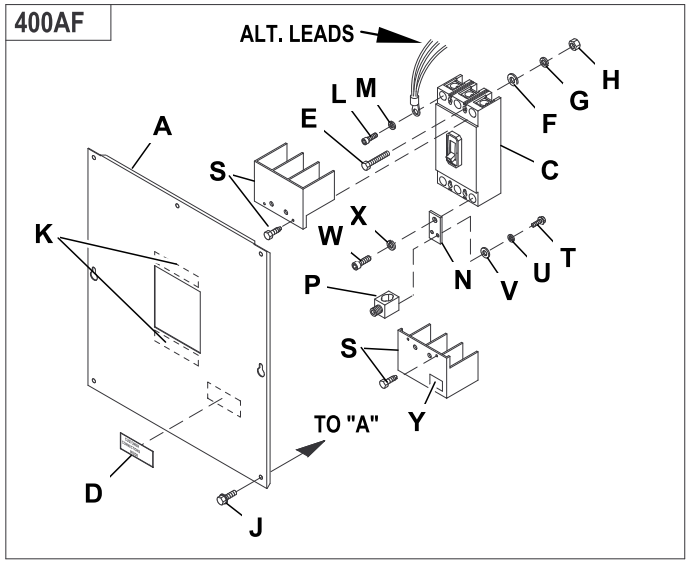

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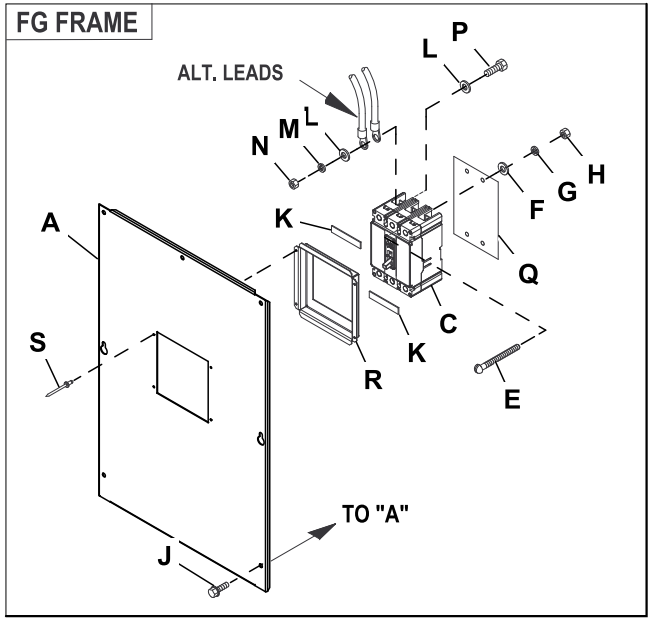

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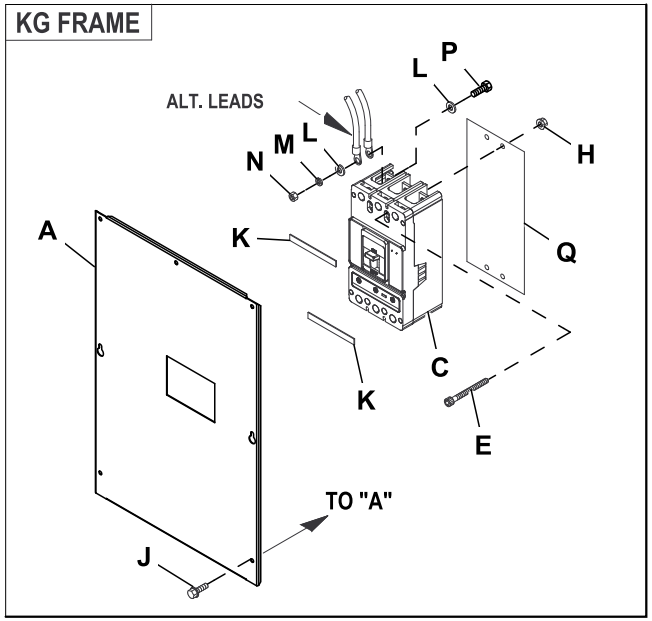

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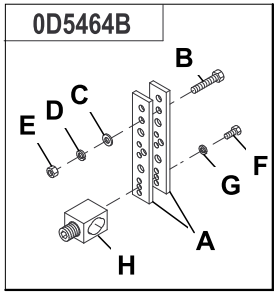

EXPLODED VIEW: CPL H CONTROL CB CONNECTION

DRAWING #: 0H3917

GROUP A

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	081008	1	GROMMET 1.25 X .25 X .75
2	0F6156	1	PLATE WIRE SNGL GALV
3	029289	1	TAPE ELEC 1/2 FOAM (AS REQ'D)
4	0F3685	1	STAND LH CONTROL C5 GRBX
5	0F2885	1	PANEL CB CONN BOX
6	051713	2	WASHER FLAT M5
7	049226	6	WASHER LOCK M5
8	0C2266	6	SCREW PHTT M5-0.8 X 16 ZYC
9	0C2428	2	SCREW PHTT #6-32 X 1/2 ZYC
10	022155	2	WASHER LOCK #6
(1) 11	0D4698	1	BLOCK TERM 20A 6 X 3 X 1100V
12	0F4464	1	DECAL CUST CONN 120V UTILITY
13	0F4677	1	ASSY PCB INTERFACE 1PH 240V
	067617030A	-	INTERFACE 3PHS 416/480V
	067617030B	-	INTERFACE 3PH 208/240V
14	043180	4	WASHER FLAT M4
15	022264	4	WASHER LOCK #8-M4
16	0C3990	4	SCREW PHTT M4-0.7 X 10 ZYC
(1) 17	057701	REF.	BLOCK TERM 20A 8 X 6 X 1100V
18	024469	1	SCREW HHTT #10-32 X 3/8 CZ
19	025433	1	LUG SLDLSS #6-14 X 13/64 CU
20	067210A	1	DECAL GROUND LUG
21	0F3618	1	DECAL CPL CUST CONN H CTRL
22	0A9457	1	DECAL NEUTRAL
23	057073	2	JUNCTION BLOCK 3/8-16
(2) 24	0D5466	REF.	BUS BAR NEUTRAL BLOCK 390
25	022237	4	WASHER LOCK 3/8
26	022241	4	NUT HEX 3/8-16 STEEL
(2) 27	0A7822	REF.	LUG SLDLSS 600/250-1/0 X 1/4-28
28	0F9637	1	STAND RH CONTROL, TWO HOLE
29	0C2454	8	SCREW THF M6-1 X 16 N WA Z/JS
30	047411	4	SCREW HHC M6-1.0 X 16 G8.8
31	022097	4	WASHER LOCK M6-1/4
32	022473	4	WASHER FLAT 1/4-M6 ZINC
33	023484N	2	BUSHING SNAP SB-2.5-31
34	077043J	4	CONDUIT FLEX 2.0" ID
35	0D6029	4	HHTT M6-1.0 X 16 ZYC
1.)		UL CIRCUIT BREAKER (FD)	
A	0F2887	1	COVER FD FRM CB
C	0D5572	REF	CB 0150A 3P 600V S FD6 LL
	0D5573	REF	CB 0175A 3P 600V S FD6 LL
	0D5575	REF	CB 0225A 3P 600V S FD6 LL
	0D5576	REF	CB 0250A 3P 600V S FD6 LL
D	0F0199	1	INSULATOR CB FD FRAME 30MIL
E	065960	4	SCREW SHC 1/4-20 X 4 G8.8 NZ
F	022473	4	WASHER FLAT 1/4-M6 ZINC
G	022097	4	WASHER LOCK M6-1/4
H	022127	4	NUT HEX 1/4-20 STEEL
J	0C2454	4	SCREW THF M6-1 X 16 N WA Z/JS
K	029289	1	TAPE ELEC 1/2 FOAM (AS REQ'D)
L	0F1733	1	DECAL CUSTOMER CONNECT INSIDE
		UL CIRCUIT BREAKER (JD+LD)	
2.)			
A	0F2721	1	COVER CIR BRKR JD/LD
C	0D5577	REF	CB 0300A 3P 600V S JD6 LL
	0D5578	REF	CB 0350A 3P 600V S JD6 LL
	0D5579	REF	CB 0400A 3P 600V S JD6 LL
	0D5581	REF	CB 0600A 3P 600V S LD6
	0D5585	REF	CB 0450A 3P 600V S LD6 LL
D	0F2353	2	INSULATOR CIRCUIT BR. JD/LD
E	022770	4	SCREW RHM 1/4-20 X 3
F	022473	4	WASHER FLAT 1/4-M6 ZINC
G	022097	4	WASHER LOCK M6-1/4
H	022127	4	NUT HEX 1/4-20 STEEL
J	0C2454	7	SCREW THF M6-1 X 16 N WA Z/JS
K	029289	1	TAPE ELEC 1/2 FOAM (AS REQ'D)
L	0F1733	1	DECAL CUSTOMER CONNECT INSIDE

(1) ITEM INCLUDED WITH HARNESS.
(2) ITEM INCLUDED WITH 0D5464B.

EXPLODED VIEW: CPL H CONTROL CB CONNECTION

DRAWING #: 0H3917 GROUP A

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
3.)	UL CIRCUIT BREAKER (225AF)		
A	0F4173	1	COVER CB C5 225AF
C	0F4165$	REF	CIRCUIT BREAKERS 200A FRAME
D	0F4186	1	COVER CB DISH 225AF
E	036261	4	RIVET POP .125 X .275 SS
F	053640	4	SCREW RHM #8-32 X 3-1/4
G	038150	4	WASHER FLAT #8 ZINC
H	022264	4	WASHER LOCK #8-M4
J	022471	4	NUT HEX #8-32 STEEL
K	029289	2	TAPE ELEC ½ FOAM
L	0F1733	1	DECAL CUSTOMER CONNECT INSIDE
M	022129	9	WASHER LOCK M8-5/16
N	0F8432	1	INSULATOR CB 225AF
P	0C2454	7	SCREW THF M6-1 X 16 N WA Z/JS
R	0F8451	3	LUG SLDLSS 300 MCM-6 AL/CU
S	049897	6	SCREW SHC M8-1.25 X 20 G8
T	022145	6	WASHER FLAT 5/16-M8 ZINC
U	045771	3	NUT HEX M8-1.25 G8 CLEAR ZINC
V	0F8843	3	BUS BAR 200A LUG ADAPTOR
(1) W	W/CB	2	TERMINAL COVER CB
X	0G3259	1	DECAL TERMINAL SHOCK HZD BI
Y	058306	3	SCREW SHC M8-1.25 X 25 G12.9
4.)	UL CIRCUIT BREAKER 400AF)		
A	0F4175	1	COVER CB C5 400AF
C	0F4166$	REF	CIRCUIT BREAKERS 400A FRAME
D	0F1733	1	DECAL CUSTOMER CONNECT INSIDE
E	042419	4	SCREW RHM 10-32 X 4
F	023897	4	WASHER FLAT #10 ZINC
G	022152	4	WASHER LOCK #10
H	022158	4	NUT HEX #10-32 STEEL
J	0C2454	7	SCREW THF M6-1 X 16 N WA Z/JS
K	029289	1	TAPE ELEC 1/2 FOAM
(2) L	052647	2/3	SCREW SHC M10-1.5 X 25 G12.9
(2) M	046526	2/3	WASHER LOCK M10
N	W/CB	3	BUS BAR CB ADAPTER 225-400 A
P	0A7822	3	LUG SLDLSS 600/250-1/0 X 1/4-28
R	022131	3	WASHER FLAT 3/8-M10 ZINC
(1) S	W/CB	2	TERM COVER CB
T	023334	6	SCREW HHC 1/4-28 X 1/2 G5
U	022097	6	WASHER LOCK M6-1/4
V	022473	6	WASHER FLAT 1/4-M6 ZINC
(2) W	W/CB	2/3	SCREW SHC M10-1.5 X 25 G12.9
(2) X	W/CB	2/3	WASHER LOCK M10
Y	0G3259	1	DECAL TERMINAL SHOCK HZD BI
5.)	UL CIRCUIT BREAKER (3P FG FRAME)		
A	0F4173	1	COVER CB G 225AF C5
C	0H5492	REF	CB 0150 3P 480V E FG LL
E	0H5721	4	SCREW PPHM #8-32 X 1-3/4 ZINC
F	038150	4	WASHER FLAT #8 ZINC
G	022264	4	WASHER LOCK #8-M4
H	022471	4	NUT HEX #8-32 STEEL
J	0C2454	7	SCREW THF M6-1 X 16 N WA Z/JS
K	029289	1	TAPE ELEC 1/2 FOAM
L	023897	6	WASHER FLAT #10 ZINC
M	049226	3	WASHER LOCK M5
N	051716	3	NUT HEX M5-0.8 G8 CLEAR ZINC
P	052619	3	SCREW HHC M5-0.8 X 20 G8.8
Q	0H4698A	1	INSULATOR CB 3P E TYPE CC/FG
R	0H5560	1	COVER CB DISH 3P E FD
S	036261	4	RIVET POP .125 X .275 SS
6.)	UL CIRCUIT BREAKER (KG FRAME)		
A	0H5871	1	COVER CB E KG FRAME C5
C	0H5582	REF	CB 0300 3P 600V E KG LL
	0H5584	REF	CB 0400 3P 600V E KG LL
E	0D2157	4	SCREW SHC M6-1.0 X 50 C8.8
H	0D3700	4	NUT FLANGE M6-1.0 NYLOK
J	0C2454	7	SCREW THF M6-1 X 16 N WA Z/JS
K	029289	1	TAPE ELEC 1/2 FOAM
L	022145	6	WASHER FLAT 5/16-M8 ZINC
M	022129	3	WASHER LOCK M8-5/16
N	045771	3	NUT HEX M8-1.25 G8 CLEAR ZINC
P	049897	3	SCREW SHC M8-1.25 X 20 G8
Q	0H5581A	1	INSULATOR CB E 3P KG

EXPLODED VIEW: CPL H CONTROL CB CONNECTION

DRAWING #: 0H3917

GROUP A

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
7.)	NEUTRAL BLOCK 390 / 200-400A.		
A	0D5466	2	BUS BAR NEUTRAL BLOCK 390
B	039287	1	SCREW HHC M8-1.25 X 45 G8.8 FT
C	022145	1	WASHER FLAT 5/16-M8 ZINC
D	022129	1	WASHER LOCK M8-5/16
E	045771	1	NUT HEX M8-1.25 G8 YEL CHR
F	045335	2	SCREW HHC 1/4-28 X 3/4 G5
G	022097	2	WASHER LOCK M6-1/4
H	0A7822	1	LUG SLDLSS 600/250-1/0X1/4-28

(1) HARDWARE FOR MTG. CB TERMINAL COVERS IS SUPPLIED WITH CIRCUIT BREAKERS.
(2) 2/3 QTY. 2POLE & 3 POLE CB.

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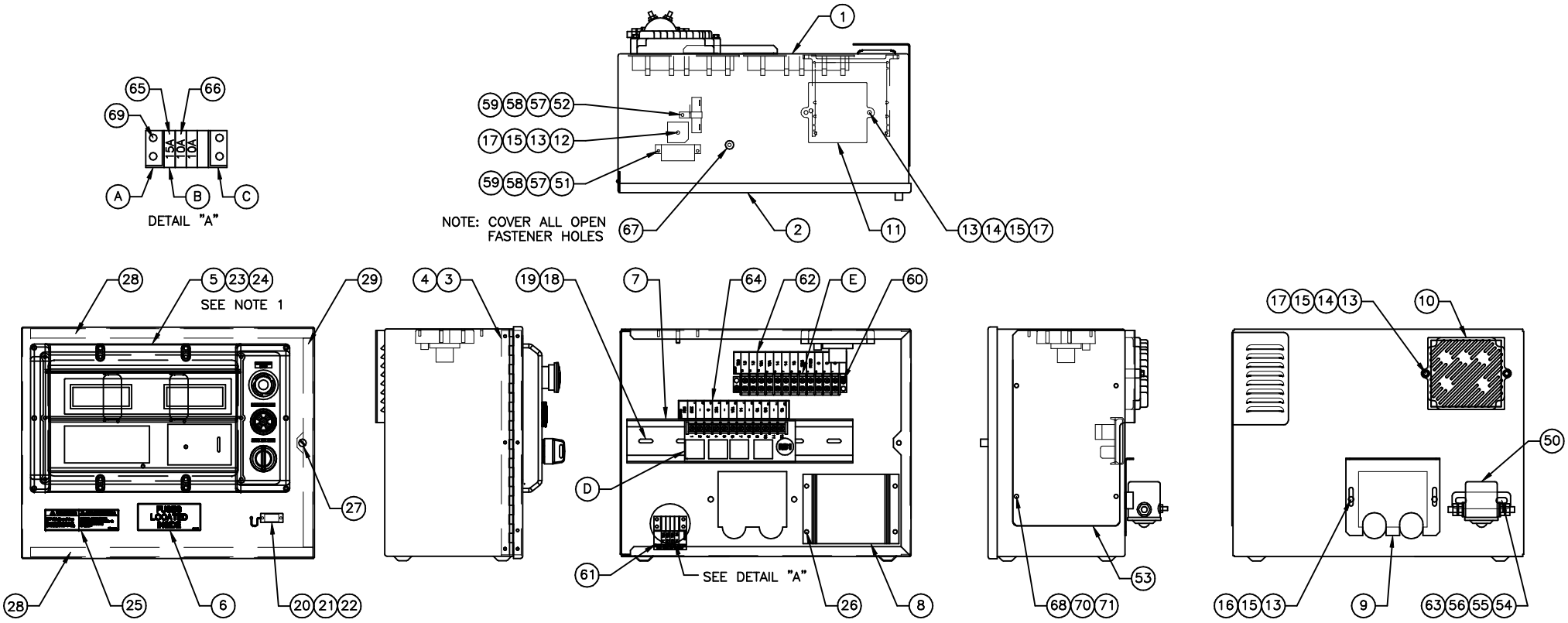
GROUP C



NOTE 1: ITEM 30 ATTACHES TO CONTACT ON REAR OF ITEM 5

REVISION: H-4623-C
DATE: 6/8/09

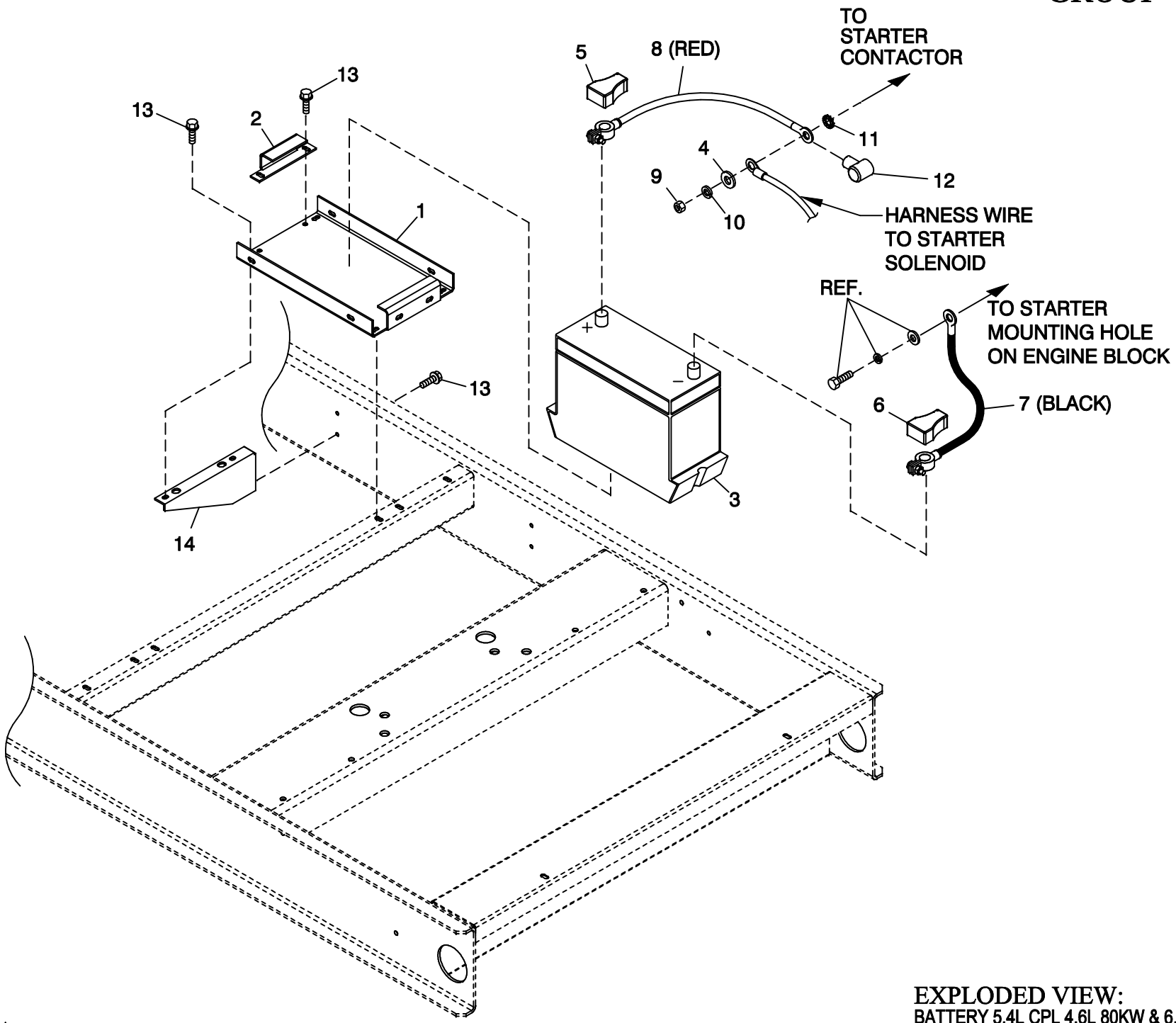
EXPLODED VIEW:
H PANEL 2A BATTERY CHARGER
DRAWING #: 0G4139D

EXPLODED VIEW: H PANEL 2A BATTERY CHARGER
DRAWING #: 0G4139D

GROUP C

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
			COMPONENTS INCLUDED IN 0G4139E
1	0F1823CST03	1	ENCL H/G CONTROL PANEL
2	0F1824AST03	1	COVER CONTROL PANEL
3	0F2606	1	HINGE CONTINUOUS H PANEL
4	036261	6	RIVET POP .125X .275SS
5	0F5763	1	ASSY PROGRAMMED H-100
6	0F1732	1	DECAL FUSES LOCATED INSIDE
7	0E9764	1	RAIL SNAPTRACK PCB HOLDER BULK (12"LG)
8	0F1725C	1	ASSY PCB 2AMP 12V UL BATT CHGR
9	0F1958	1	PLATE HARNESS CLAMP
10	0F2256	1	ASSY PCB PWR AVR W/AMP HEADER
11	0E3161	1	ASSY PCB BOSCH GOV DRIVER
12	029673	1	DIO BRIDGE 25A 600V
13	049226	7	WASHER LOCK M5
14	079224	4	SCREW PPHM M5-0.8X 30SS
15	051713	7	WASHER FLAT M5
16	0F5886	2	SCREW HHPM M5-0.8 X 12
17	051716	5	NUT HEX M5-0.8 G8 YEL CHR
18	043180	3	WASHER FLAT M4
19	0C3990	3	SCREW PHTT M4-0.7X 10ZYC
20	0F4333	1	CONN DUST CAP W/CHAIN DB9
21	0F5883	1	WASHER FLAT M3.5
22	0F5884	1	SCREW PHTT M3.5-0.6 X 10
23	055014	10	SCREW PPHM M4-0.7X 8 BLXOX
24	022264	10	WASHER LOCK #8-M4
25	0G3546	1	DECAL WRN BATT CHRG 12/24V BI
26	0C2265	4	SCREW PHTT M4-0.7X 12ZYC
27	0G3648	1	M5-0.8 CAPTIVE PANEL KNLD HD
28	0F6305	2	SEAL COVER 3.18 X12.7X 382
29	0F6305A	1	SEAL COVER 3.18 X12.7X 283
30	0G4329	1	HARNESS H-PNL INTEGRATED SW (NOT SHOWN)
			COMPONENTS INCLUDED IN WIRE HARNESS
A	0F1263	1	ADPTR RH SIDE WICKMANN 178.6191
B	0F1262	4	HOLDER FUSE WICKMANN 178.6150
C	0F1264	1	ADPTR LH SIDE WICKMANN 178.6192
D	0E9049B	1	ASSY PCB G-PANEL RELAY 12VDC
E	055911	1	BLOCK TERM 20A 12X 6 X1100V
			COMPONENTS NOT INCLUDED IN 0G4139E OR WIRE HARNESS
50	056739	1	RELAY CONTACTOR 12VDC
51	-	1	DPE BREAKER SEE DRAWING 0F9280
52	-	1	BOOST RESISTOR SEE DRAWING 0F9280
53	0F2627A	1	COVER CONTROL PANEL SIDE
54	022287	2	SCREW HHC 1/4-20X 3/4G5
55	022473	4	WASHER FLAT M6-1/4
56	022097	2	WASHER LOCK M6-1/4
57	043182	3	WASHER LOCK M3
58	051714	3	NUT HEX M3-0.5 G8 YEL CHR
59	052777	3	WASHER FLAT M3
60	0C2323	2	SCREW PHTT #6-32X 5/8ZYC
61	0F5459	1	DECAL CPL CONTROL PANEL FUSES
62	0F5461	1	DECAL CPL 5.4/6.8L TB3
63	022127	2	NUT HEX 1/4-20 STEEL
64	0F5460	1	DECAL CPL 5.4/6.8L RELAY BOARD
65	0E7403C	1	FUSE ATO TYPE 15 AMP (BLUE)
66	0E7403B	2	FUSE ATO TYPE 10 AMP (RED)
67	0F6145	A/R	SEAL WEATHER .45"DIA
68	091526	4	SCREW PPHM M5-0.8X 12ZNC
69	0C2699	2	SCREW PHTT #6-32X 3/8ZYC
70	051713	4	WASHER FLAT M5
71	049226	4	WASHER LOCK M5



EXPLODED VIEW:
BATTERY 5.4L CPL 4.6L 80KW & 6.8L 150KW
DRAWING #: 0F3675

REVISION: G-5390-A
DATE: 5/11/05

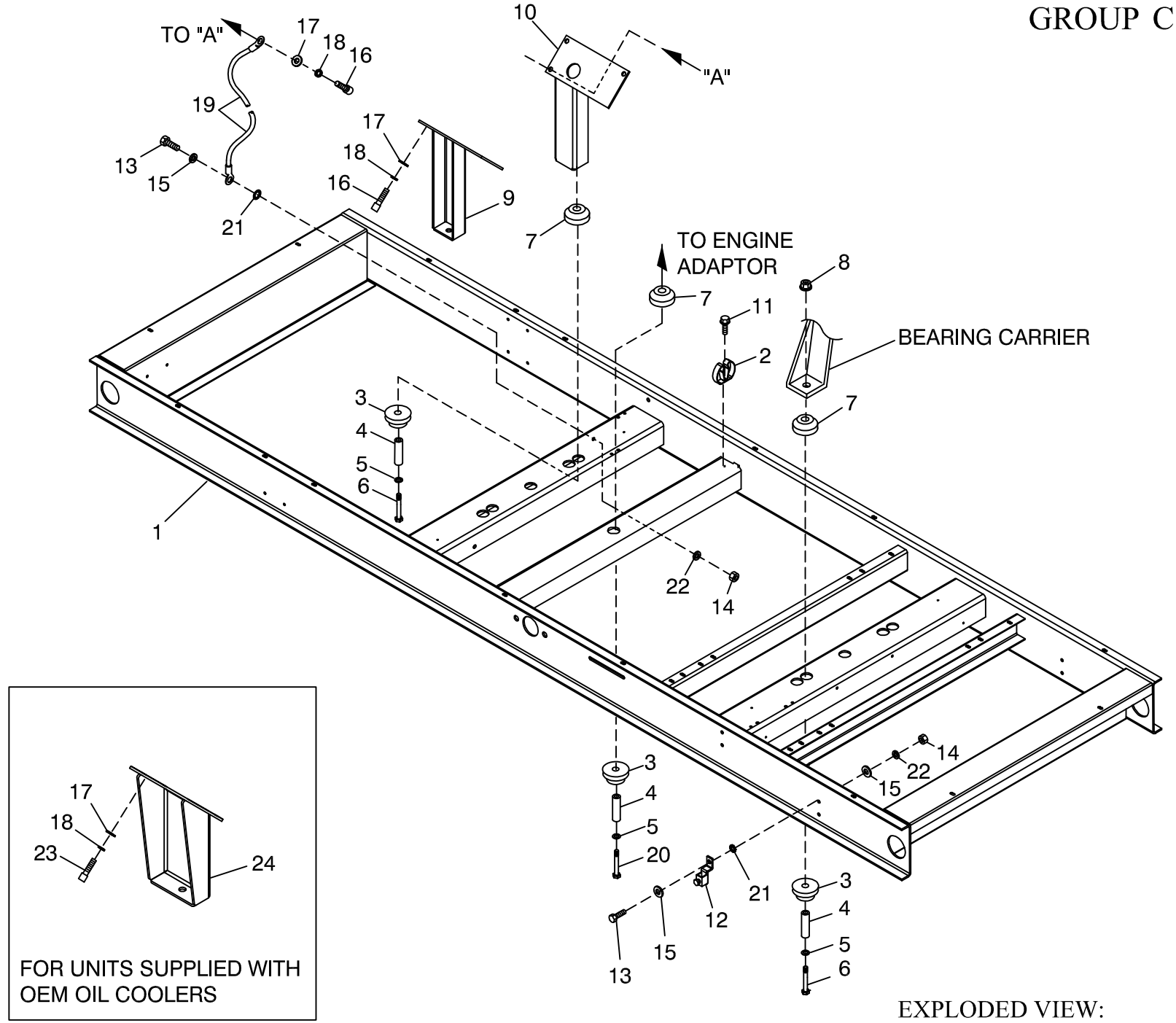
EXPLODED VIEW: BATTERY 5.4L CPL 4.6L 80KW & 6.8L 150KW
DRAWING #: 0F3675

GROUP C

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F3408	1	TRAY BATTERY
2	0F3411	1	STRAP BATTERY RETAINMENT
3	058208	1	BATT 12VDC 24F 625
4	022131	1	WASHER FLAT 3/8-M10 ZINC
5	050331A	1	BATT POST COVER RED +
6	050331	1	BATT POST COVER BLK -
7	038805U	1	CABLE BATT BLK #1 X 18.00
8	038804U	1	CABLE BATT RED #1 X 28.00
9	045771	1	NUT HEX M8-1.25 G8 YEL CHR
10	022129	1	WASHER LOCK M8-5/16
11	027482	1	WASHER SHAKEPROOF EXT 5/16 STL
12	075763	1	BOOT BATTERY CABLE
13	0C2454	8	SCREW THF M6-1X16 N WA Z/JS
14	0F3409	1	SUPPORT BATTERY TRAY

GROUP C



EXPLODED VIEW:
MOUNTING BASE 4.6L G3
DRAWING #: 0G1079

REVISION: H-8414-C
DATE: 3/1/11

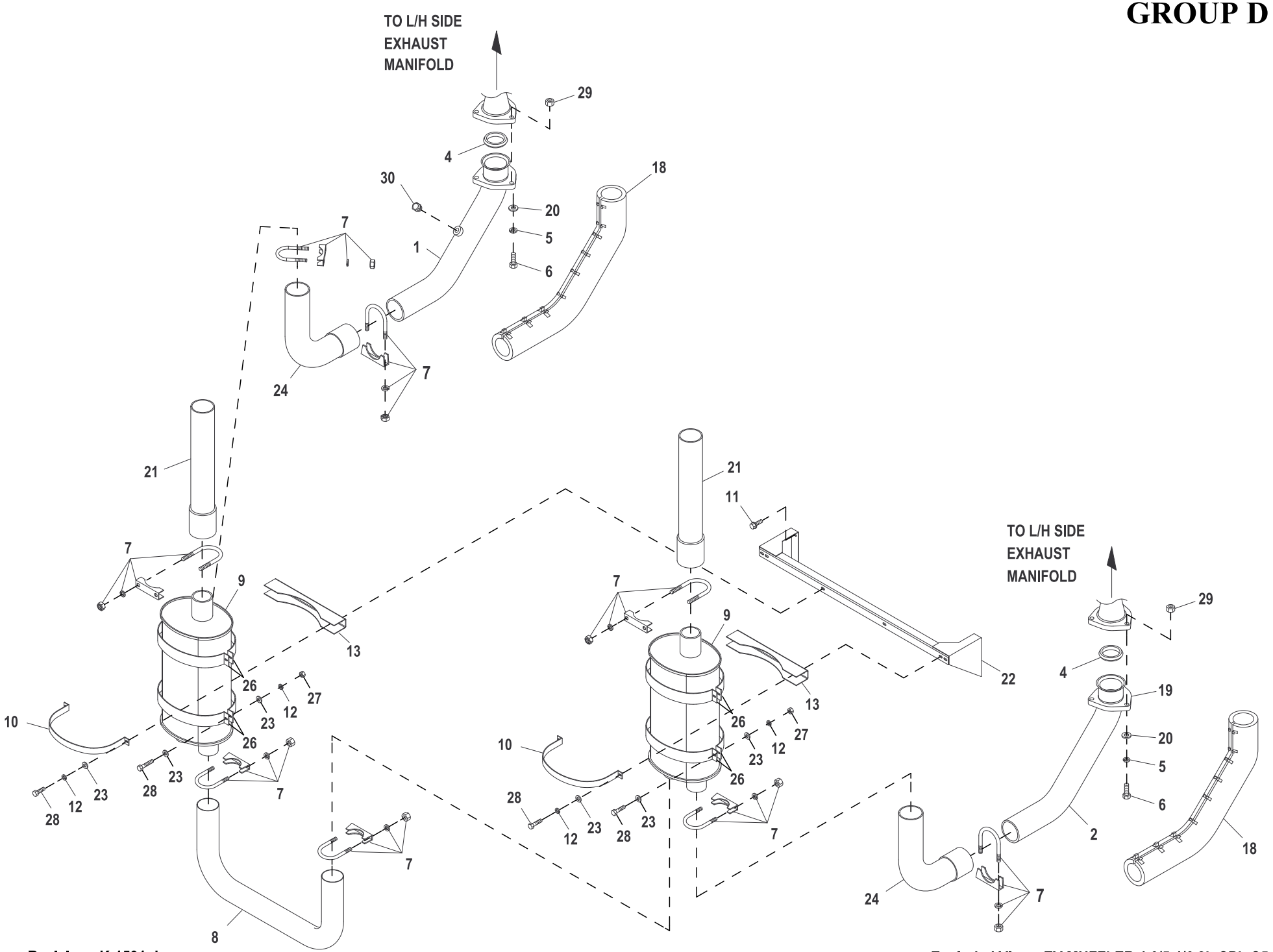
EXPLODED VIEW: MOUNTING BASE 4.6L G3
DRAWING #: 0G1079

APPLICABLE TO: 80KW

GROUP C

ITEM	PART #	QTY.	DESCRIPTION
1	0F30990ST03	1	MTG BASE C5 4.6/80KW 5.4/100KW
2	065852	1	SPRING CLIP HOLDER .37-.62
3	052252	5	DAMPENER VIBRATION
4	052257	5	SPACER .49 X .62 X 1.87 PWDR/ZINC
5	052259	5	WASHER FLAT M12
6	055597	4	SCREW HHC M12-1.75 X 85 G8.8
7	052251A	5	DAMPENER VIBRATION 50 WHITE
8	052860	4	NUT LOCKING M12-1.75
9	0F8864	1	SUPPORT ENG 4.6L LH
10	0F8865	1	SUPPORT ENG 4.6L RH
11	045764	1	SCREW HHTT M4-0.7 X 8 BP
12	061383	1	LUG SOLDERLESS 3/0-#4 X 13/32 CU
13	045757	2	SCREW HHC M6-1.0 X 25 G8.8
14	049813	2	NUT HEX M6 X 1.0 G8 YEL CHR
15	022473	3	WASHER FLAT 1/4-M6 ZINC
16	057192	6	SCREW SHC M10-1.5 X 30 G12.9
17	022131	6	WASHER FLAT 3/8-M10 ZINC
18	046526	6	WASHER LOCK M10
19	0536210410	1	ASSY WIRE 14.00”
20	0E7230	1	SCREW HHC M12-1.75 X 80 G10.9
21	027482	2	WASHER SHAKEPROOF EXT 5/16 STL
22	022097	2	WASHER LOCK M6-1/4
23	090502	3	SCREW SHC M10-1.5 X 60 C12.9
24	0J45320ST03	1	SUPPORT ENGINE LH

GROUP D



Revision : K-1591-J
Date : K-1591-J

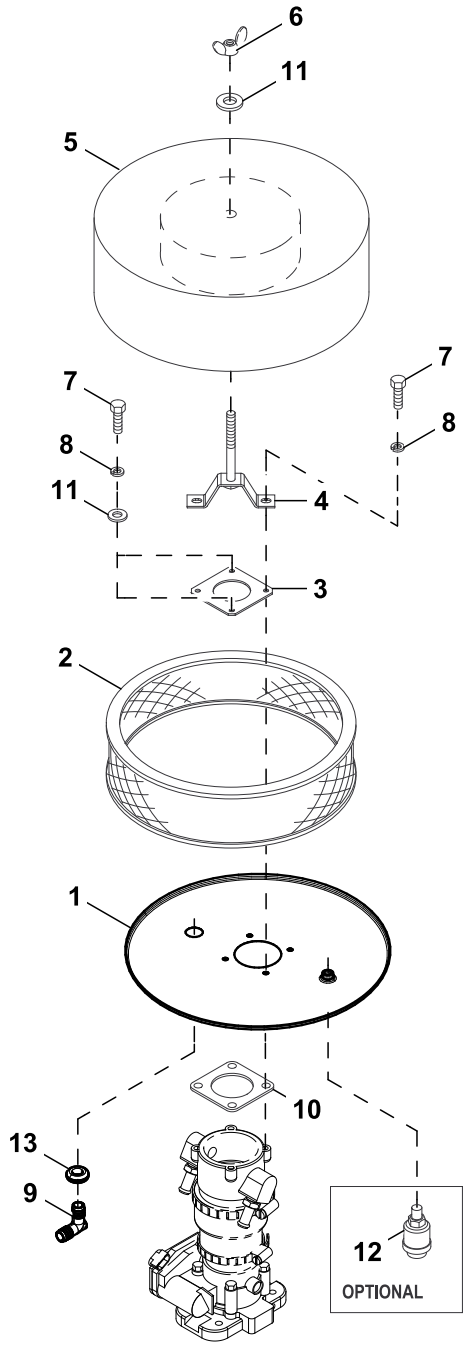
Exploded View : EV MUFFLER 4.6/5.4/6.8L CPL C5
Drawing No. : 0F2969

EXPLODED VIEW: EV MUFFLER 4.6/5.4/6.8L CPL C5

DRAWING #: 0F2969

GROUP D

ITEM	PART#	QTY.	DESCRIPTION
1	0F2807C	1	PIPE EXH MAN R/H 6.8L G/B CPL (6.8L C5)
	0F2807E	1	PIPE EXH MAN R/H 5.4L G/B & 2P (5.4L C5)
	0F9207	1	PIPE EXH MANIFOLD 4.6L RH
2	0F2807B	1	PIPE EXH MAN L/H 6.8L G/B CPL (6.8L C5)
	0F2807D	1	PIPE EXH MAN L/H 5.4L G/B & 2P (5.4L C5)
	0F9208	1	PIPE EXH MANIFOLD 4.6L LH
4	0A6765	2	RING GASKET 2.5 DIA
5	0F4710	6	WASHER LOCK M10 SS
6	0F7200	6	SCREW HHC M10-1.5 X 50 SS FTH
7	080762	8	BOLT U 3/8-16 X 2.62
8	0F2809	1	PIPE EXHAUST CROSSOVER
9	0F2981A	2	MFLR 7" X 9" X 25" (2) 2.5" IN/2.5" OUT
10	0F2962	2	MUFFLER STRAP
11	0C2454	4	SCREW THF M6-1 X 16 N WA Z/JS
12	022097	12	WASHER LOCK M6-1/4
13	0F2830	2	MUFFLER BRACKET STIFFENER
18	0F2773C	2	EXHAUST BLANKET 900MM LONG (6.8L C5)
	0F2773D	2	EXHAUST BLANKET 850MM LONG (5.4L C5)
19	0D3159	1	FLANGE EXHAUST
20	088775	6	WASHER FLAT 3/8 SS
21	0F2808	2	EXHUAST OUTLET PIPE CPL
22	0F5447	1	BRKT MUFFLER
23	022473	20	WASHER FLAT 1/4-M6 ZINC
24	0F6214	2	PIPE ELBOW EXHAUST MUFFLER
26	0L1789	8	MUFFLER STRAP UPPER/LOWER
27	049813	8	NUT HEX M6 X 1.0 G8 YEL CHR
28	049721	12	SCREW HHC M6-1.0 X 35 G8.8 BLK
29	088510	6	NUT HEX M10-1.5 SS
30	0C9748	1	PLUG M18-1.50



NG / LPV

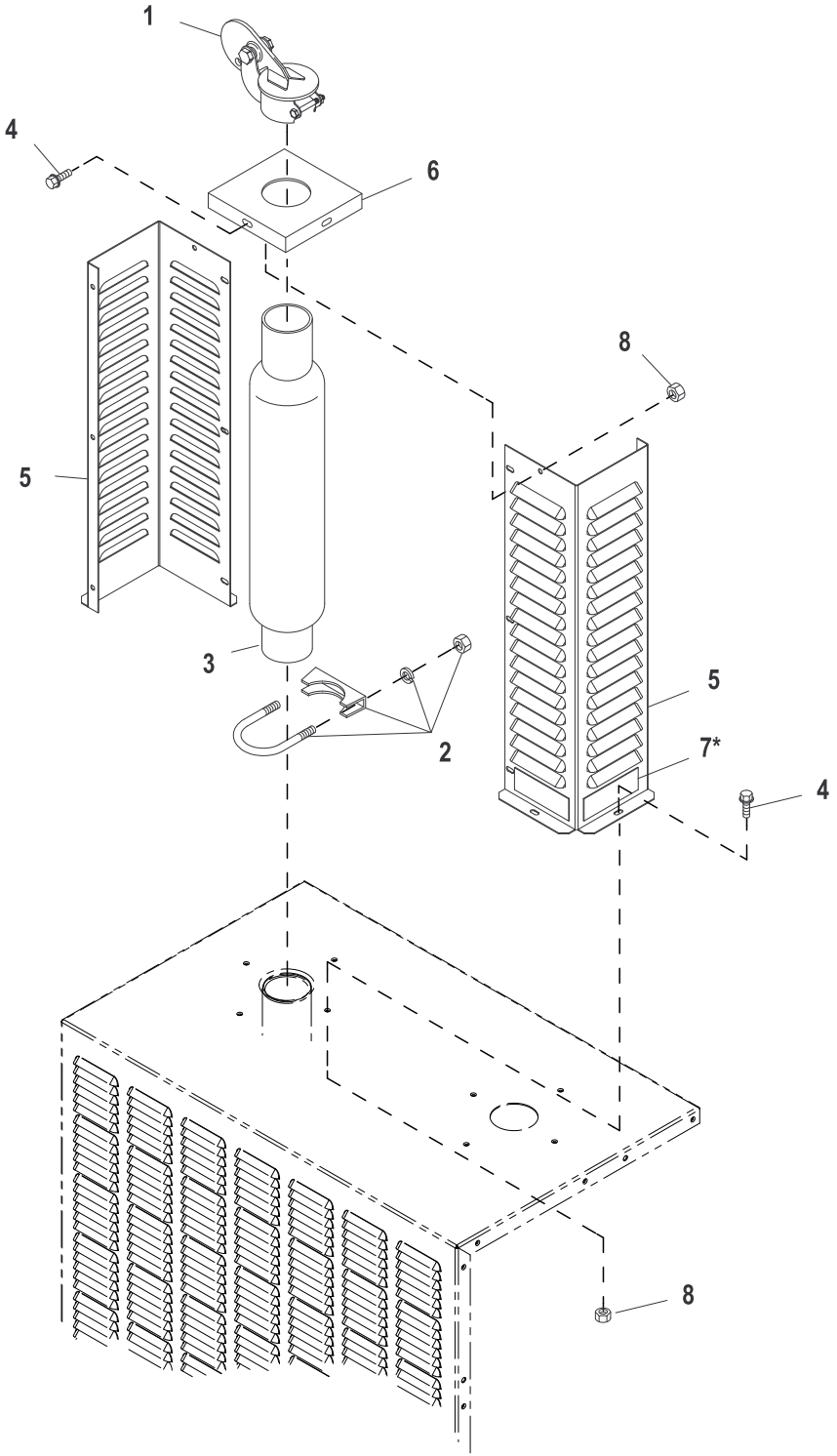
EXPLODED VIEW: EV AIR CLEANER

DRAWING #: 0F3569

GROUP D

ITEM	PART#	QTY.	DESCRIPTION
1	0D2513D	1	AIR CLNR BTM PLT W/CPLR 8.1L
	0D2513E	1	PLATE AIR CLEANER W/COUPLER
2	0F5419	1	ELEMENT AIR FILTER
3	0F4268	1	TOP PLATE VENTURI
4	0F4270A	1	HOLD DOWN AIR CLEANER PLATED
5	0F6977	1	PLATE AIR CLEAN TOP 5.4L/6.8L
6	037561	1	NUT WING 1/4-20 NYLK
7	047411	4	SCREW HHC M6-1.0 X 16 G8.8
8	022097	4	WASHER LOCK M6-1/4
9	057795B	1	BARBED EL 90 5/8 PLASTIC
10	0F4269	1	GASKET MIXER BODY
11	022473	3	WASHER FLAT 1/4-M6 ZINC
12	0A4256	1	INDICATOR FILTER MINDER (USE WITH ITEM #1 P/N 0D2513E)
13	0G5954	1	GROMMET .625 X 1.25 X .433

GROUP D



Revision : K-3230-E
Date : 7/1/15

Exploded View : EV KIT GLASS PACK SHIP LOOSE
Drawing No. : 0F6332A

EXPLODED VIEW: EV KIT GLASS PACK SHIP LOOSE

DRAWING #: 0F6332A **GROUP**

ITEM	PART#	QTY.	DESCRIPTION
1	0F4462	1	RAIN CAP 2-1/2" AL
2	080762	1	BOLT U 3/8-16 X 2.62
3	0F4505A	1	MUFF SEC 23.5" X 2.55IN/2.5OUT
4	0C2454	14	SCREW THF M6-1X16 N WA Z/JS
(2) 5	0F4367	2	HEAT SHIELD EXHAUST STACK
(2) 6	0F4368	1	CAP HEAT SHIELD EXHAUST STACK
(1) 7	0G3263	3	DECAL WARNING HOT SURFACES BI
(3) 8	077992	14	NUT HEX LOCK M6-1.0 SS NY INS

NOTE:
SOME "QT SERIES" UNITS WILL REQUIRE (2) GLASS PACK KITS.

(1) DECALS APPLIED TO EXHAUST AT THE FACTORY.
(2) PART NUMBER SHOWN IS FOR TAN. SEE GUIDE BELOW FOR AVAILABLE COLOR AND PART NUMBER FORMAT.
0FXXXX = TAN
0FXXXX0AL08 = GRAY / ALUMINUM 0FXXXX0AL13 = BISQUE / ALUMINUM
0FXXXX0AL05 = WHITE / ALUMINUM 0FXXXX0AL14 = GRAY / ALUMINUM
(3)) ALUMINUM ENCLOSURE NOTE: ITEM NUMBER 5 TO BE SECURED USING ITEM NUMBERS 4 (THREAD FORMING FASTENER) & 8 (LOCK NUT). THE LOCK NUT IS TO BE INSTALLED AFTER THREAD FORMING FASTENER HAS PENETRATED THROUGH EXTRUSIONS IN ENCLOSURE PANELS.

GLASS PACK KIT ASSEMBLY INSTRUCTIONS:

1)Disconnect battery cables to prevent accidental start-up. Disconnect the negative battery cable first from the battery post indicated by (-) or NEG.

2)Slide the U-bolt (080762, I/N 2) and muffler (0F4505, I/N 3) over the exhaust pipe protruding from the enclosure. The exhaust pipe should be inserted 2 to 3 inches into the inlet of the muffler (0F4505, I/N 3). Position the U-bolt over the inlet of the muffler and tighten.

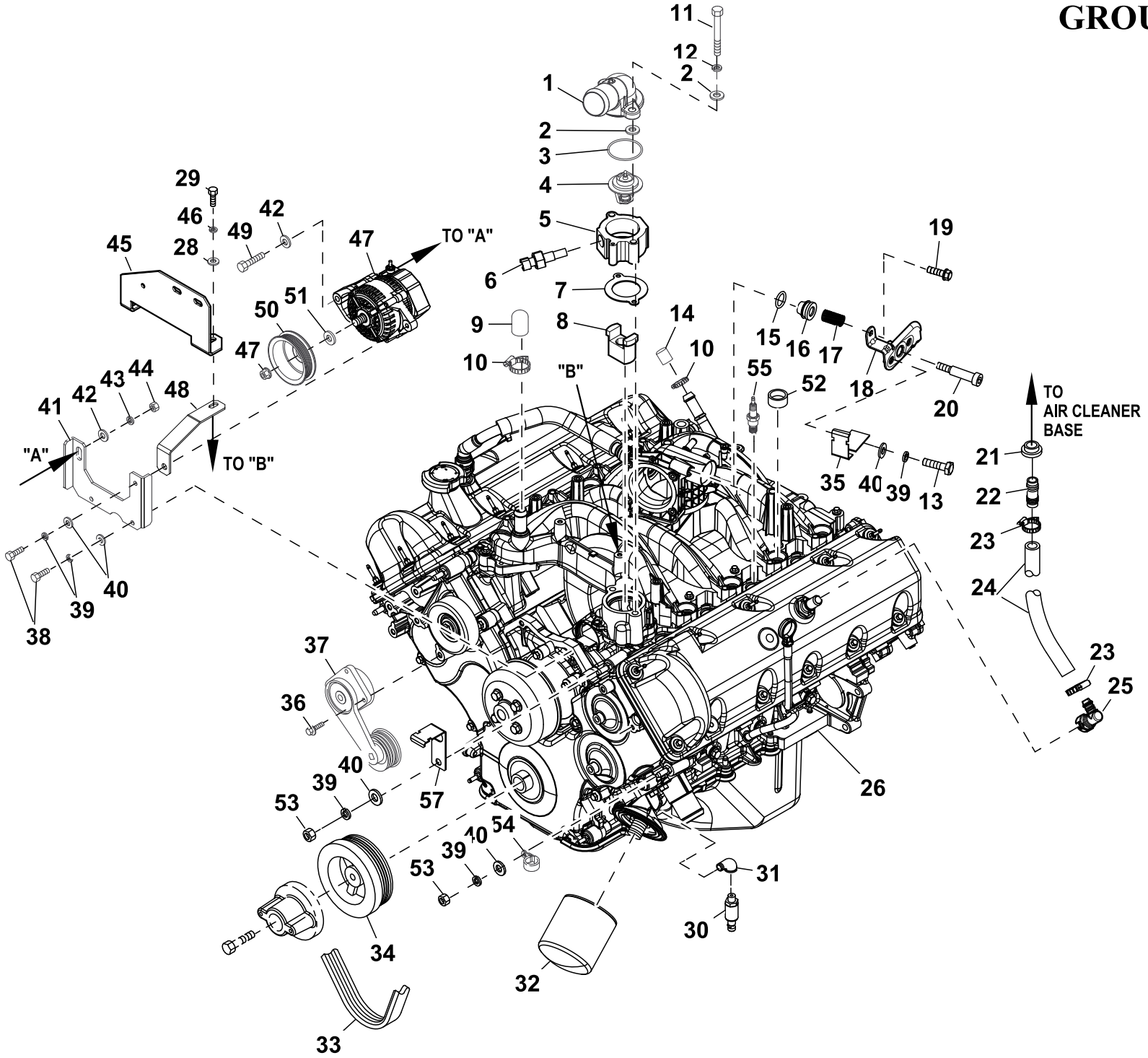
3)Sub-assemble the heat shield panels (0F4367, I/N 5) and the heat shield cap (0F4368, I/N 6) using the screws provided (0C2454, I/N 4). Lock nuts (077992, I/N 8) should be installed after the fastener has penetrated through the extrusions in the heat shield panels.

4)Slide the heat shield subassembly over the muffler.

5)Fasten the heat shield assembly to the enclosure using the screws provided (0C2454, I/N 4). Lock nuts (077992, I/N 8) should be installed after the fastener has penetrated through the extrusions in the enclosure. An access panel may need to be removed to complete this step.

6)Install the rain cap over the outlet of the muffler and tighten (0F4462, I/N 1).

GROUP D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"B"
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TO
AIR CLEANER
BASE
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TO "A"
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"A"
TO "B"
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EXPLODED VIEW: ENGCOMPRT LH 4.6L G3

DRAWING #: 0H3914

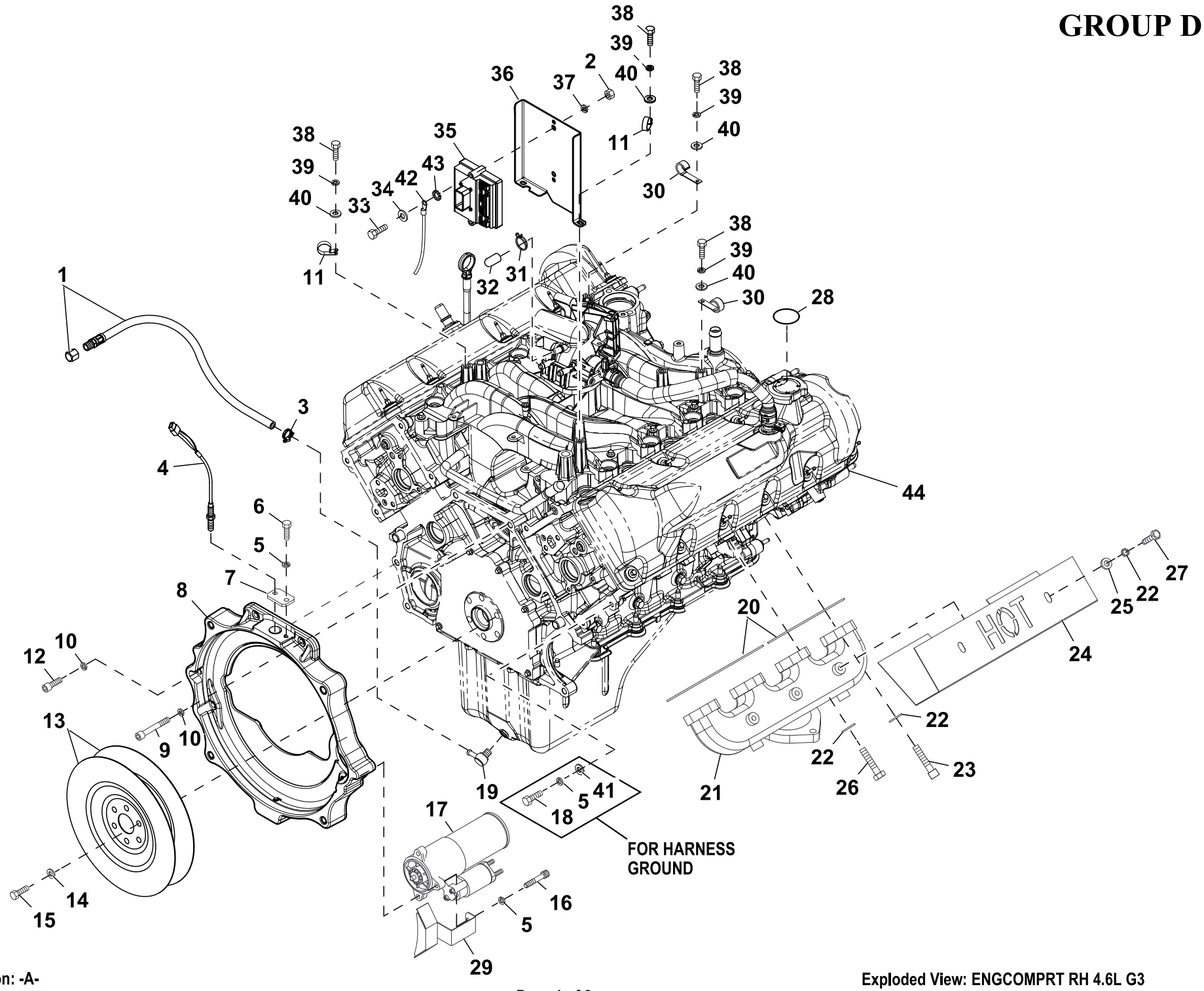
GROUP D

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	REF	1	CONNECTION WATER OUTLET
(1)2	022145	4	WASHER FLAT 5/16-M8 ZINC
3	REF	1	GASKET THERMOSTAT HOUSING G3
4	REF	1	THERMOSTAT ASSY
(1)5	0G5515B	1	ADAPTER THERMOSTAT 4.6L G3
6	0E0502	1	TEMPERATURE SENDER, DELPHI
(1)7	0G5511	1	GASKET THERMOSTAT 4.2L
(1)8	0H3920	1	SPACER COOLANT BYPASS
(1)9	0F6151	1	CAP RUBBER
(1)10	057823	2	CLAMP HOSE #10 .56-1.06
(1)11	0G5148	2	SCREW IHHC M8-1.25 X 140 G8.8
(1)12	022129	2	WASHER LOCK M8-5/16
13	042907	1	SCREW HHC M8-1.25 X 16 C8.8
(1) 14	077996	1	CAP ANTIFREEZE RUBBER
15	REF	1	O-RING 29mm I.D. X 36mm O.D. X 3.5mm
(1)16	0G6274	1	PRESSURE RELIEF VALVE
(1)17	0G6406	1	SPRING COMPRESSION .711 X 1.00
(1)18	0H3922	1	TUBE ASSY EGR OUTLET REWORK
19	REF	2	SCREW HHC M6-1.0 X 15 LONG
(1)20	0G6393	1	BOLT STRIP 3/8-16 X 1-1/4
21	0G5954	1	GROMMET 15.87 X 31.75 X 11
22	0F9505	1	BARB CONNECTOR 5/8" HOSE POLYE
23	057822	2	CLAMP HOSE #8 .53-1.00
24	065386	1	HOSE COOL 5/8 ID 100R6 (15”LG)
(1)25	0H4361	1	REWORK VENT FITTING 4.6L G3
(1)26	0F7316C	1	ENGINE 4.6L COMPLETE
	0F7316D	1	ENGINE G4.6L G3 COMPLETE
(3)(2)27	029333A	1	TIE WRAP UL 7.4"X .19" BLK
28	022473	2	WASHER FLAT 1/4 ZINC
29	042568	2	SCREW HHC M6-1.0 X 20 G8.8
30	0F4612	1	SENDER OIL PRESSURE 1/8"NPT
31	036277	1	ELBOW 90D STREET 1/8
32	0D5419	REF	OIL FILTER
33	0D3488R	1	BELT SERPENTINE 54.72"
(1)34	0G1815B	1	REWORK HARMONIC BALANCER 4.6L
35	0F2776A	1	BRACKET, SIGNAL CONDITIONER
36	0D8026	3	OLT HEX FL HD M8-1.25 X 31
37	0D8030	1	TENSIONER, ENG. AUTOMATIC BELT
38	043107	3	SCREW HHC M8-1.25 X 25 G8.8
39	022129	6	WASHER LOCK M8-5/16
40	022145	6	WASHER FLAT 5/16-M8 ZINC
41	0F9016	1	BRACKET DC ALTERNATOR 4.6L
42	022131	2	WASHER FLAT 3/8-M10 ZINC
43	046526	1	WASHER LOCK M10
44	045772	1	NUT HEX M10-1.5 G8 YEL CHR
45	0H39440ST03	1	BRACKET INTAKE MANIFOLD LOWER
46	022097	2	WASHER LOCK M6-1/4
47	0E9868A	1	ALTERNATOR DC W/OUT PULLEY
48	0F9381	1	ALTERNATOR STRAP
49	064416	1	SCREW HHC M10-1.5 X 45 G8.8 FT
50	0F3216D	1	PULLEY 160 OD DC ALTERNATOR
51	0F3217	1	SPACER DC ALTERNATOR PULLEY
(1)52	0E0992A	8	PLUG EXPANSION 14 OD
53	045771	2	NUT HEX M8-1.25 G8 CLEAR ZINC
54	055934C	1	CLAMP STL/VNL .5 X .406 Z
55	0H4787	REF	SPARK PLUG
(3)56	0H3874	1	HARN ENG G4.6L G3 H-PANEL CPL
57	0F2776	1	BRACKET, SIGNAL CONDITIONER

(1) NOTE: PART OF ENGINE MAKE (SEE I/N 26)
0F7316C = ENGINE MAKE 0H3913
0F7316D = ENGINE MAKE 0H5742
(2) NOTE: I/N 27 IS FOR HOLDING SENSOR TO I/N 35.
(3) NOTE: NOT SHOWN

GROUP D



Revision: -A-
Date: 0H3914A

Exploded View: ENGCOMPRT RH 4.6L G3
Drawing No.: 0H3914A

EXPLODED VIEW: ENG COM PRT RH 4.6L G3

DRAWING #:0H3914A

GROUP D

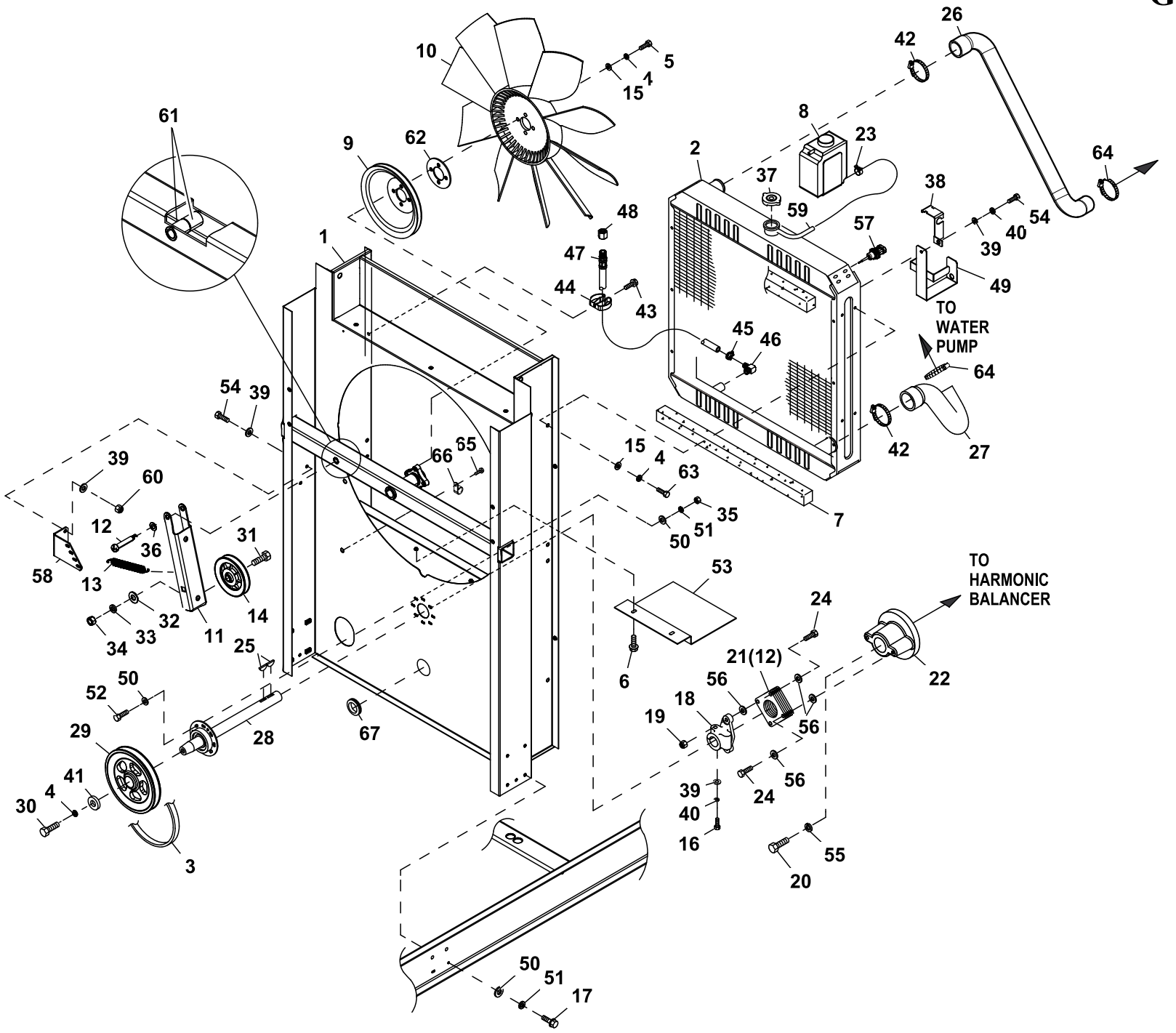
APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	069860E	1	HOSE DRAIN ASSY 28"
2	022158	2	NUT HEX #10-32 STEEL
3	0C7649	1	CLAMP HOSE .38-.87
4	0D2244M	1	ASSY MAGPICKUP(3/8-24 MALE)
5	022129	5	WASHER LOCK M8-5/16
6	039253	1	SCREW HHC M8-1.25 X 20 G8.8
7	0F5454	1	PLATE MAG PICK-UP ADAPTOR
8	0F2929	1	ENGINE ADAPTER
9	071623	2	SCREW SHC M10-1.5 X 55 G12.9
10	046526	5	WASHER LOCK M10
11	055934M	2	CLAMP STL/VNL .75 X .343 Z
12	052625	3	SCREW SHC M10-1.5 X 35 C12.9
13	0F9965D	2	FLEX PLATE 2 POLE 4.6L G3
14	0F3844	6	WASHER FLAT .43 X 1.00
15	0D5417	6	SCREW HHC M10-1.0 X 25 G10.9
16	049821	3	SCREW SHC M8-1.25 X 30 C12.9
17	0D5418	1	STARTER MOTOR V-10 G3 ENGINE
18	043107	1	SCREW HHC M8-1.25 X 25 C12.9
19	097474	1	BANJO ASSY M14-1.5
20	REF	4	GASKET, EXHAUST MANIFOLD
21	0F1820	2	MACHINED MANIFOLD,EXHAUST
22	070006	24	WASHER LOCK M8 SSTL
23	0D9913	14	SCREW SHC M8-1.25 X 35 SS
24	0F3534	2	HEAT SHLD EXHAUST MANIFOLD
25	070008	8	WASHER FLAT M8 SS
26	042909	2	SCREW HHC M8-1.25 X 30 C8.8
27	0D2608	8	SCREW HHC 5/16-18 X 1/2 SSTL
28	0F5114	1	DECAL REFER TO OWNERS MANUAL
29	0F6104	1	COVER STARTER 5.4 & 6.8 FORD CPL
30	082121A	2	CLIP-J VINYL COAT .375 ID
(1)31	048031C	3	CLAMP HOSE BAND .50
(1)32	0E9974	3	CAP VINYL 3/8"ID X 1"DP BLK
33	036943	2	SCREW PPHM #10-32 X 2
34	023897	2	WASHER FLAT #10 ZINC
35	0H4243	1	ASSY PCB 4.6L IGN MOD PRGRMMED
36	0H40910ST03	1	BRACKET IGN CONTROL 4.6L G3
37	022152	2	WASHER LOCK #10
38	042568	4	SCREW HHC M6-1.0 X 20 C8.8
39	022097	4	WASHER LOCK M6-1/4
40	022473	4	WASHER FLAT 1/4-M6 ZINC
41	022145	1	WASHER FLAT 5/16-M8 ZINC
42	0H3874	REF	HARN ENG G4.6L G3 H-PANEL CPL
43	023762	1	WASHER SHAKEPROOF EXT #10 STL
44	0F7316C	REF	ENGINE 4.6L G3 COMPLETE
	0F7316D	REF	ENGINE G4.6L G3 COMPLETE

(1) NOTE: PART OF ENGINE MAKE (SEE I/N 44)
0F7316C = ENGINE MAKE 0H3913
0F7316D = ENGINE MAKE 0H5742

1

GROUP D



EXPLODED VIEW: COOLSYS/FAN DRIVE 5.4L & 4.6L CP

DRAWING #: 0H3915

GROUP D

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	0H20530ST03	1	WELDMENT RADIATOR SUPPORT C5
2	0F2611	1	RADIATOR 680 X 680 X 70 CPL
3	0F5254	1	V-BELT 31/64" X 62-3/8"
4	046526	9	WASHER LOCK M10
(2) 5	059981	4	SCREW HHC M10-1.5 X 30 C10.9
6	0C2454	2	SCREW THF M6-1 X 16 N WA Z/JS
7	052250	2	TAPE FOAM 1 X 1 (26.75" LG)
8	076749	1	TANK COOLANT RECOVERY
9	0F2573	1	PULLEY FAN V-GROOVE 9"
10	0F2610	1	FAN 26" LH ROTATION
11	0H20620ST03	1	ARM BELT TENSIONER
(2) 12	0H2051	1	SHOULDER BOLT 1/2 X 2-1/4"
13	0F2862	1	SPRING TENSION CPL
14	0F2560	1	PULLEY V-BELT 4" FLANGED
15	022131	8	WASHER FLAT 3/8-M10 ZINC
(2) 16	039287	1	SCREW HHC M8-1.25 X 45 C8.8
17	0C8566	8	SCREW HHFC M6-1.0 X 20 G8.8
18	0F2561	1	HUB FLEX PLATE
19	0C8165	2	NUT HEX LOCK 5/16-24 NY INS
(2) 20	0D6795	1	SCREW HHC M12-1.5 X 60 G8.8
21	0C7043	12	DISK FLEX
22	0G1039	1	COUPLING FLEX HUB MACHINED
	(4) 0H5380	1	COUPLING FLEX HUB MACHINED
23	048031C	1	CLAMP HOSE BAND 1/4
(2) 24	0C8146	4	SCREW HHC 5/16-24 X 1.124
25	082774	2	KEY WOODRUFF 4 X 19D
26	0H3909	1	HOSE RADIATOR UPPER C5 CPL
	(4) 0F2686	1	HOSE, RADIATOR UPPER, CPL
27	0H3908	1	HOSE RADIATOR LOWER C5 CPL
	(4) 0F5463	1	HOSE LOWER RAD CPL C5 6.8L
28	0F8695	1	ASSY BRG/SHAFT CPL FANDRIVE
29	0F4032	1	PULLEY 5.5" DIA MACHINED
(2) 30	042911	1	SCREW HHC M10-1.5 X 30 G8.8
31	0F2872	1	SCREW HHC 1/2-13 X 2" G8
32	022304	1	WASHER FLAT 1/2 ZINC
33	022195	1	WASHER LOCK 1/2
34	022196	1	NUT HEX 1/2-13 STEEL
35	049813	8	NUT HEX M6 X 1.0 G8 YEL CHR
36	052677	1	WASHER NYLON .50 X .87 X .06
37	090283	1	CAP RADIATOR 13 PSI
38	0F2776A	1	BRACKET, SIGNAL CONDITIONER
39	022145	4	WASHER FLAT 5/16-M8 ZINC
40	022129	2	WASHER LOCK M8-5/16
41	052644	1	SPACER .5 X 1.5 X .25 STL/ZINC
42	035685	2	CLAMP HOSE #28 1.32-2.25
43	045764	1	SCREW HHTT M4-0.7 X 8 BP
44	065852	1	SPRING CLIP HOLDER .37-.62
45	0C7649	1	CLAMP HOSE .38-.87
46	043790	1	BARBED EL 90 3/8 NPT X 3/8
	(4) 055596	1	BARBED STR 3/8NPT X 3/8
47	069860E	1	HOSE DRAIN ASSY 28"
(1) 48	069811	REF	CAP HEX 1/4 NPT BRASS
49	080713	1	BRACKET COOLANT TANK
50	022473	24	WASHER FLAT 1/4-M6 ZINC
51	022097	16	WASHER LOCK M6-1/4
52	042568	8	SCREW HHC M6-1.0 X 20 G8.8
53	0F5050B	1	SHIELD RADIATOR
	(4) 0F5050	1	SHIELD RADIATOR
54	039253	3	SCREW HHC M8-1.25 X 20 G8.8
55	051769	1	WASHER LOCK M12
56	0C8145	8	WASHER FLEX (THIN)
57	0H1827	1	PROBE COOLANT LEVEL 3/8-18NPTF
58	0H23980ST03	1	BRACKET TENSIONER SPRING
59	029032	1	HOSE 9/32 ID (43"LG)
60	049820	2	NUT HEX LOCK M8-1.25 NY INS
(3) 61	0H2844	2 (REF)	BEARING SLEEVE 1/2/ X 3/4 X 1
62	0G53150AL0R	1	SPACER CPL COOLING FAN 1/8"
63	051756	4	SCREW HHC M10-1.5 X 20 C8.8
64	099502	2	CLAMP HOSE #24 B1.06-2.00

REVISION: H-5378-B
DATE: 12/16/09

EXPLODED VIEW: COOLSYS/FAN DRIVE 5.4L & 4.6L CP

DRAWING #: 0H3915

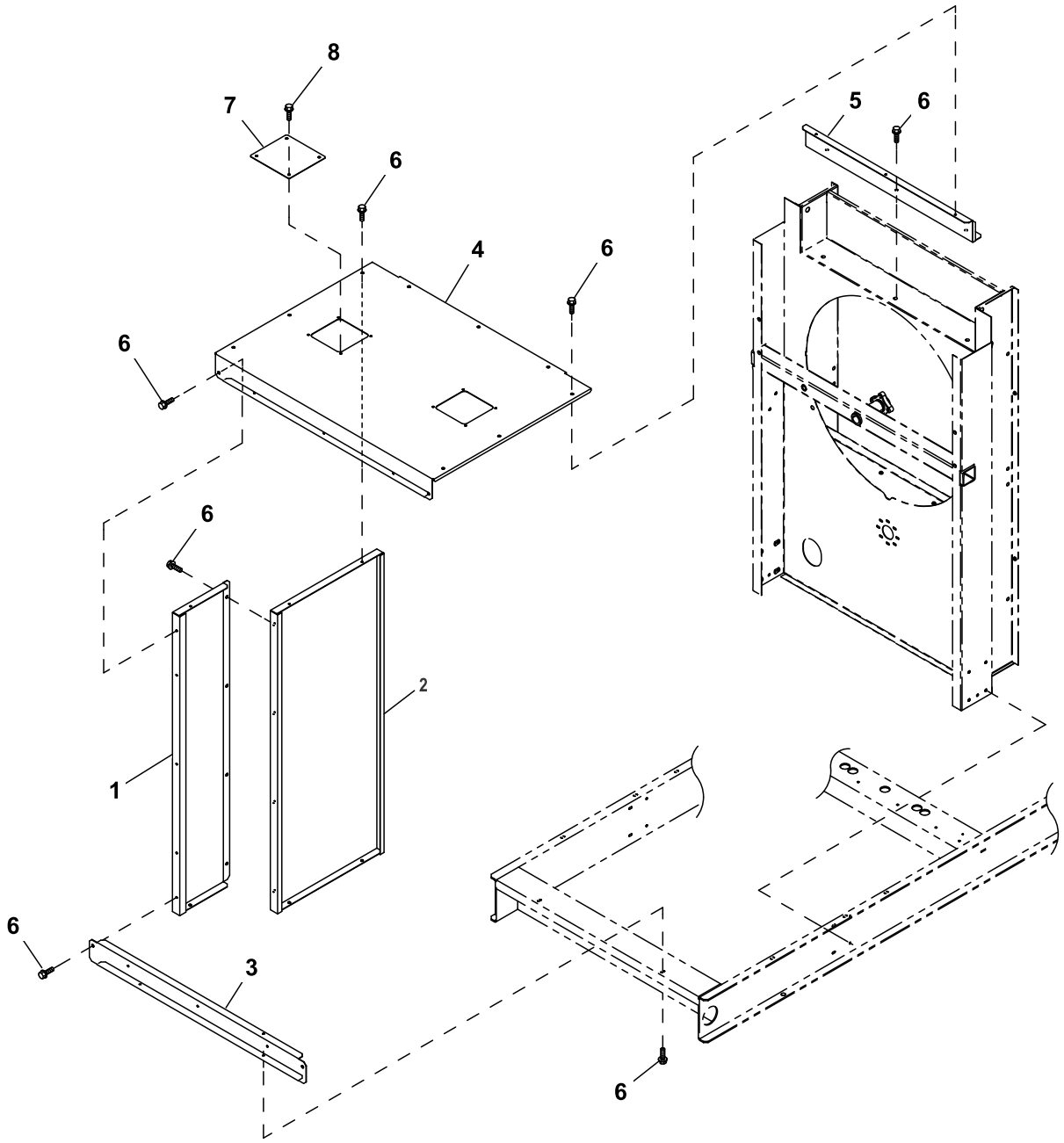
GROUP D

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
(5) 65	0D6029	1	SCREW HHTT M6-1.0 X 16 ZYC
(5) 66	055934H	1	CLAMP STL/VNL .62 X .406 Z
(5) 67	072252	1	GROMMET 1.37 X .06 X 1.00

(1) ITEM 48 IS INCLUDED WITH 47.
(2) APPLY MEDIUM STRENGTH BLUE THREAD LOCKING FLUID TO THREADS.
(3) ITEM 61 IS INCLUDED WITH ITEM 1.
(4) THESE PARTS ARE 5.4L 80KW SPECIFIC.
(5) CATALYST EQUIPPED UNITS ONLY.

REVISION: H-5378-B
DATE: 12/16/09



OPEN SETS ONLY

EXPLODED VIEW: COOLSYS/FAN DRIVE 5.4L & 4.6L CP

DRAWING #: 0H3915

GROUP D

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	0G15310GS0R	2	PANEL C5 FRONT SIDES
2	0G15320GS0R	2	PANEL C5 REAR SIDES
3	0G15300GS0R	1	PANEL LOWER FRONT
4	0G15290GS0R	1	PANEL C5 TOP
	(2) 0H30010GS0R	1	PANEL C5 TOP
5	0G15330GS0R	1	PANEL C5 TOP MOUNT
6	0C2454	20	SCREW THF M6-1 X 16 N WA Z/JS
(1) 7	0D3215B	2	ACCESS COVER 160 X 170 GALV
(1) 8	0C2454	8	SCREW THF M6-1 X 16 N WA Z/JS

(1) NOT REQUIRED FOR UNITS WITH CATALYST.
(2) CATALYST EQUIPPED UNITS ONLY

REVISION: H-5378-B
DATE: 12/16/09

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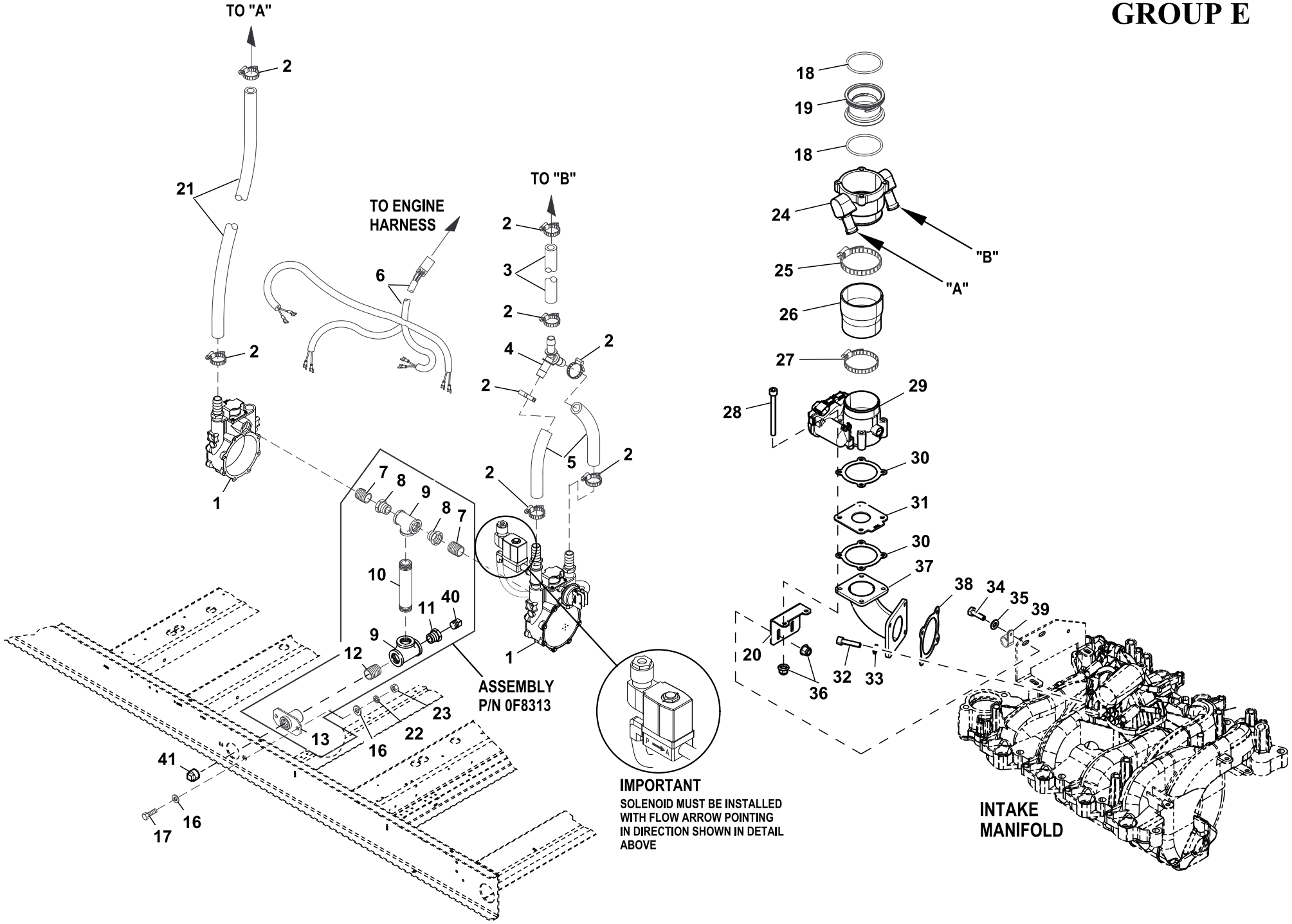
GROUP E


TO "A"
TO "B"
TO ENGINE HARNESS
ASSEMBLY P/N 0F8313
IMPORTANT
SOLENOID MUST BE INSTALLED WITH FLOW ARROW POINTING IN DIRECTION SHOWN IN DETAIL ABOVE
"A"
"B"
INTAKE MANIFOLD

EXPLODED VIEW: FUEL SYSTEM NG 4.6L 80KW

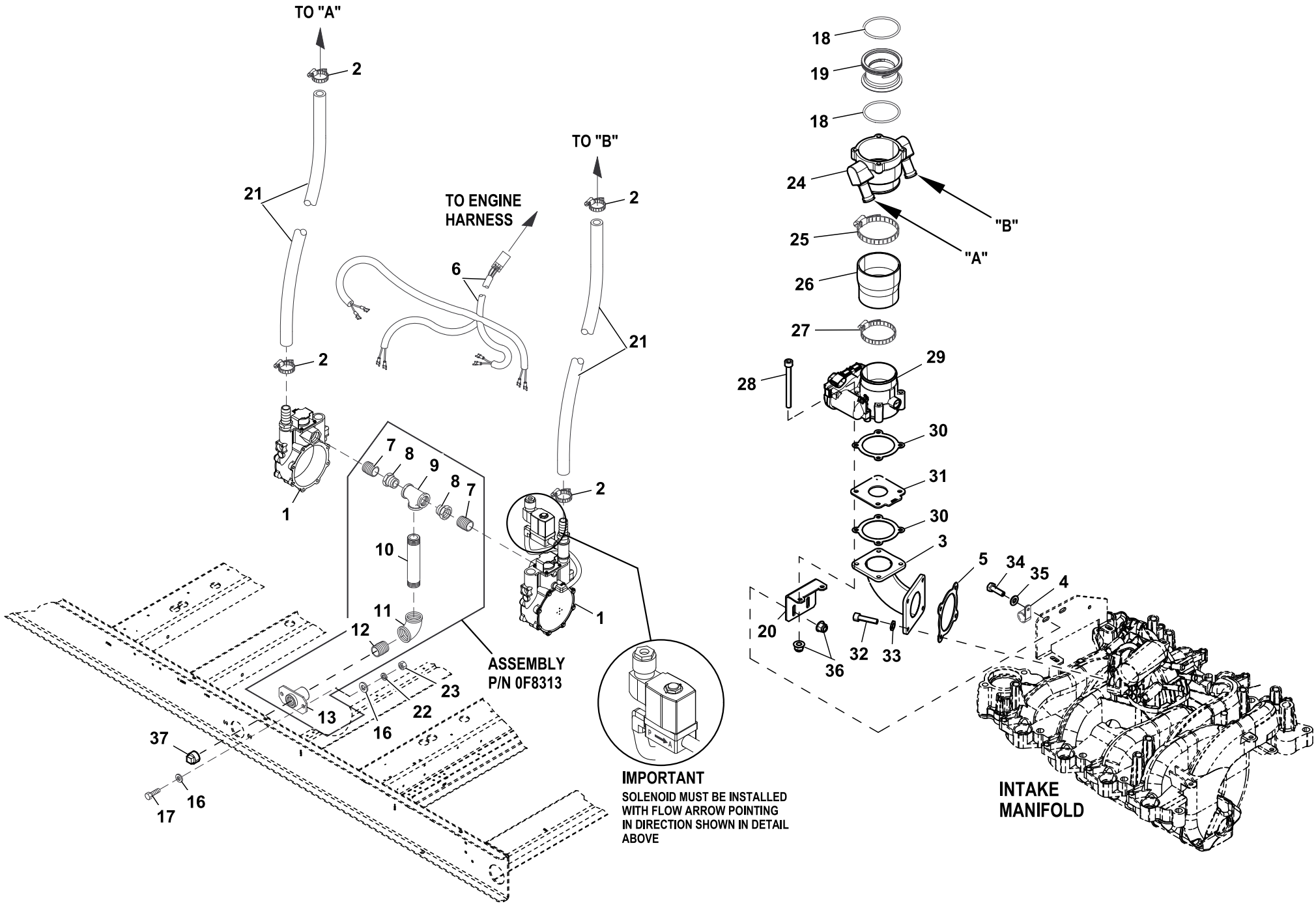
DRAWING #:0H3918

APPLICABLE TO:

GROUP E

ITEM	PART#	QTY.	DESCRIPTION
1	0G9240B	1	REG ASSY 4.6L 80KW NG CPL
2	057822	8	CLAMP HOSE #8 .53-1.00
3	059057	1	HOSE 3/4 ID SAE-30R2 (41.5" LG)
4	0F4408	1	Y CONNECTOR 500 SERIES BARBS
5	059057	2	HOSE 3/4 ID SAE-30R2 (11" LG)
6	0H4537	1	HARN FUEL JUMPER DUAL REG
7	026915	2	NIPPLE CLOSE 3/4 X 1.375
8	0A8064	2	BSHG RDCR HEX 1-1/4-3/4
9	064346	2	PIPE TEE 1-1/4 NPT
10	031015	1	NIPPLE PIPE 1-1/4 NPT X 3
11	0E7162	1	BSHG RDCR HEX 1-1/4 X 1/4FNPT
12	039130	1	NIPPLE CLOSE 1.25 NPT X 1.625
13	065908	1	SUPPORT NAT GAS SOLENOID
16	022304	4	WASHER FLAT 1/2 ZINC
17	052645	2	SCREW HHC M12-1.75 X 30 C8.8
18	0G3167	2	O-RING 2-3/4 X 3/32 X 2-15/16
19	0F3691C	1	VENTURI THROTTLE 38MM
20	0H39430ST03	1	BRACKET INTAKE MANIFOLD UPPER
21	059057	1	HOSE 3/4 ID SAE-30R2 (47.5" LG)
22	022195	2	WASHER LOCK ½
23	045773	2	NUT HEX M12-1.75 G8 YEL CHR
24	0F3885	1	MIXER 40/60MM ACTUATOR ASSY
25	086133E	1	CLAMP HI TORQUE 2.75 - 3.625
26	0F0960	1	REDUCER 3.0" TO 2.75" TURBO
27	086133D	1	CLAMP HI TORQUE 2.25 - 3.125
28	0G7104	4	SCREW SHC M6-1.0 X 60 C12.9
29	0E4392	1	ACTUATOR BOSCH 60 GOVERNOR
30	0E4390	2	GASKET GOVERNOR ACTUATOR
31	0H3766A	1	RESTRICTOR INTAKE 4.6L G3 NG
32	097962	4	SCREW SHC M6-1.0 X 25 C12.9 ZP
33	022097	4	WASHER LOCK M6-1/4
34	042568	2	SCREW HHC M6-1.0 X 20 C8.8
35	049811	2	WASHER FLAT M6
36	0D3700	6	NUT FLANGE M6-1.0 NYLOK
37	0H3894	1	INTAKE ELBOW 4.6L G3
38	0H3921	1	GASKET AIR INTAKE 4.6L G3
39	082121A	1	CLIP-J VINYL COAT .375 ID
40	026073A	1	PLUG STD PIPE 1/4 STEEL SQ HD
41	063831	1	PLUG PIPE 1.25 SQ HD ZINC

GROUP E


TO "A"
TO "B"
TO ENGINE HARNESS
ASSEMBLY P/N 0F8313
IMPORTANT
SOLENOID MUST BE INSTALLED WITH FLOW ARROW POINTING IN DIRECTION SHOWN IN DETAIL ABOVE
INTAKE MANIFOLD
"A"
"B"

EXPLODED VIEW: FUEL SYSTEM LP VAPOR 4.6L 80KW

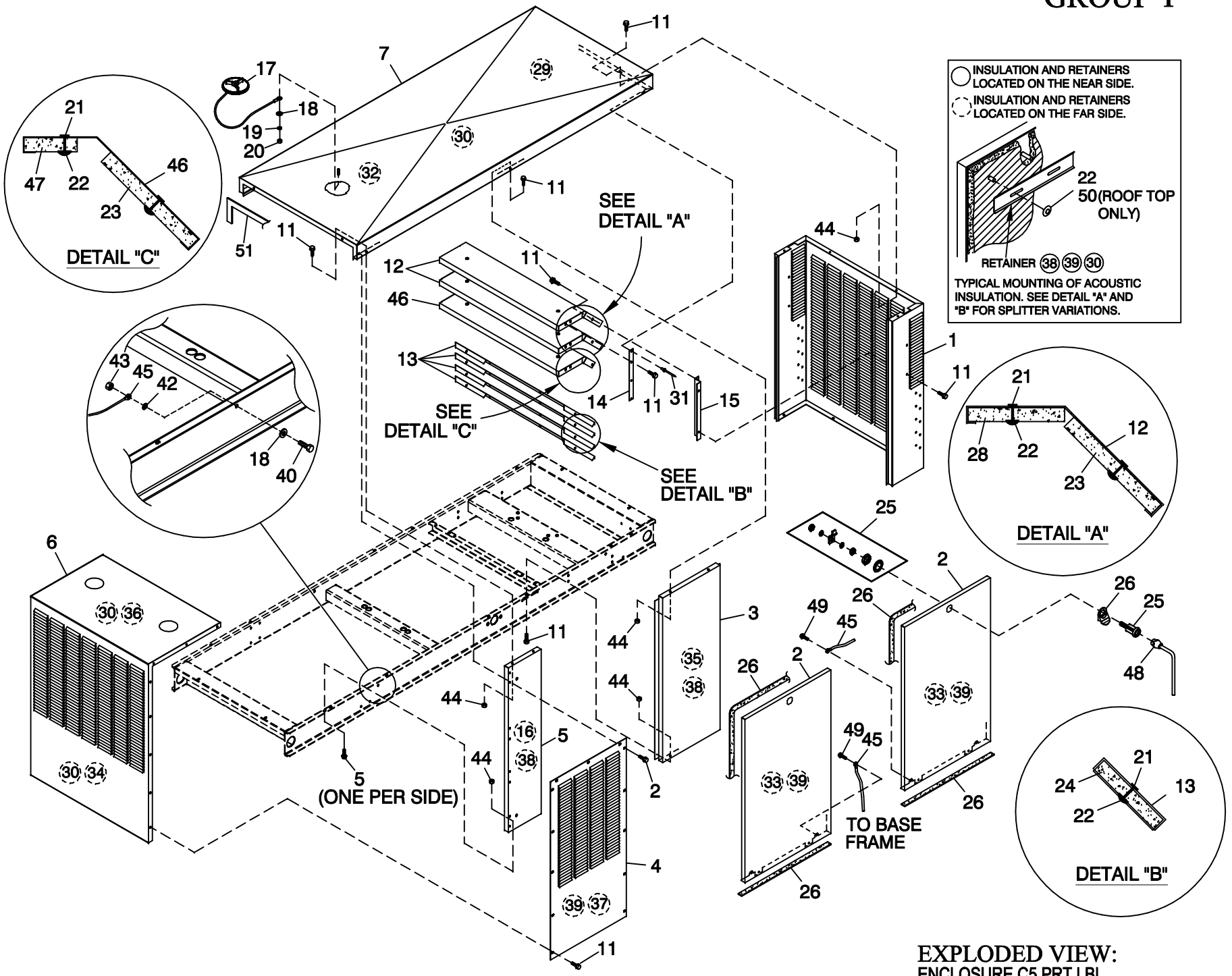
DRAWING #:0H3919

GROUP E

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	0G9239D	1	REG ASSY 4.6L 80KW LPV 2009CPL
2	057822	4	CLAMP HOSE #8 .53-1.00
3	0H3894	1	INTAKE ELBOW 4.6L G3
4	082121A	1	CLIP-J VINYL COAT .375 ID
5	0H3921	1	GASKET AIR INTAKE 4.6L G3
6	0H4537	1	HARN FUEL JUMPER DUAL REG
7	026915	2	NIPPLE CLOSE 3/4 X 1.375
8	0A8064	2	BSHG RDCR HEX 1-1/4-3/4
9	064346	1	PIPE TEE 1-1/4 NPT
10	031015	1	NIPPLE PIPE 1-1/4 NPT X 3
11	030131	1	ELBOW 90D 1-1/4 NPT
12	039130	1	NIPPLE CLOSE 1.25 NPT X 1.625
13	065908	1	SUPPORT NAT GAS SOLENOID
16	022304	4	WASHER FLAT 1/2 ZINC
17	052645	2	SCREW HHC M12-1.75 X 30 C8.8
18	0G3167	2	O-RING 2-3/4 X 3/32 X 2-15/16
19	0F3691C	1	VENTURI THROTTLE 38MM
20	0H39430ST03	1	BRACKET INTAKE MANIFOLD UPPER
21	059057	2	HOSE 3/4 ID SAE-30R2 (47.5" LG)
22	022195	2	WASHER LOCK ½
23	045773	2	NUT HEX M12-1.75 G8 YEL CHR
24	0F3885	1	MIXER 40/60MM ACTUATOR ASSY
25	086133E	1	CLAMP HI TORQUE 2.75 - 3.625
26	0F0960	1	REDUCER 3.0" TO 2.75" TURBO
27	086133D	1	CLAMP HI TORQUE 2.25 - 3.125
28	0G7104	4	SCREW SHC M6-1.0 X 60 C12.9
29	0E4392	1	ACTUATOR BOSCH 60 GOVERNOR
30	0E4390	2	GASKET GOVERNOR ACTUATOR
31	0H3766B	1	RESTRICTOR INTAKE 4.6L G3 LPV
32	097962	4	SCREW SHC M6-1.0 X 25 C12.9 ZP
33	022097	4	WASHER LOCK M6-1/4
34	042568	2	SCREW HHC M6-1.0 X 20 C8.8
35	049811	2	WASHER FLAT M6
36	0D3700	6	NUT FLANGE M6-1.0 NYLOK
37	063831	1	PLUG PIPE 1.25 SQ HD ZINC

GROUP F



EXPLODED VIEW:
ENCLOSURE C5 PRT LBL
DRAWING #: 0G2901

REVISION: H-3940-G
DATE: 2/13/09

EXPLODED VIEW: ENCLOSURE C5 PRT LBL
DRAWING #: 0G2901

APPLICABLE TO:

GROUP F

ITEM	PART #	QTY.	DESCRIPTION
(2) 1	0F58730ST01	1	REAR WRAP C5
(2) 2	0F58680ST01	4	DOOR C5
(2) 3	0F58720ST01	2	CENTER SUPPORT C5
(3) 4	0F58710AL01	2	DISCHARGE DUCT LH & RH SIDE C5
(2) 5	0F58690ST01	2	FRONT CORNERS C5
(2) 6	0F58700ST01	1	DISCHARGE CENTER DUCT C5
(3) 7	0F58670AL01	1	ROOF C5 ALUM
11	0C2454	86	SCREW THF M6-1 X 16 N WA Z/JS
12	0F2766	2	SPLITTER
13	0F3181	4	SPLITTER SHORT
14	0F3185	2	STRINGER SPLITTER C3
15	0F3416	2	SUPPORT SPLITTER C5 130KW
16	0F3949	2	INSULATION CORNER POST
17	0F4487A	1	ASSEMBLY COVER ACCESS
18	022473	5	WASHER FLAT 1/4-M6 ZINC
19	022097	1	WASHER LOCK M6-1/4
20	022127	1	NUT HEX 1/4-20 STEEL
21	0F3072	20	INSULATION RETAINMENT HANGER
22	078115	58	WASHER SELF LOCKING DOME #4-40
23	0F3949B	3	INSULATION SPLITTER
24	0F3949A	4	INSULATION SHORT LOUVER
25	0F5048D	4	VISE-ACTION LATCH SLOTTED CIR
26	0E5968	1	GASKET EXTRUDED TRIM (566” LG)
27	0F5049	4	TAB PULL
28	0F3949L	2	INSULATION SPLITTER SML
29	0F3949E	1	INSULATION ROOF TOP REAR
30	0F3890A	9	RETAINER INSULATION (740)
31	087233	2	RIVET POP .1875 X .450 SS
32	0F3949C	1	INSULATION ROOF TOP
33	0F3949D	4	INSULATION DOOR
34	0F3949G	1	INSULATION DISCHARGE DUCT
35	0F3949J	2	INSULATION CENTER SUPPORT
36	0F3949K	1	INSULATION DISCHARGE DUCT TOP
37	0F3949F	2	INSULATION INNER DUCT SIDE
38	0F3890B	4	RETAINER INSULATION (820)
39	0F3890	14	RETAINER INSULATION (450)
40	042568	4	SCREW HHC M6-1.0 X 20 G8.8
42	022447	4	WASHER SHAKEPROOF INT 1/4
43	049813	4	NUT HEX M6 X 1.0 G8 YEL CHR
(1) 44	077992	28	NUT HEX LOCK M6-1.0 SS NY INS
45	0912970094	4	ASSY WIRE 14 AWG 34.8" GRN/YEL
46	0F2766A	1	SPLITTER C5
47	0F3949M	1	INSULATION SPLITTER SHRT MPS
48	0F8869D	1	KEY VISE-ACTION LATCH SLOT CIR
49	0E3257	6	SCREW TH-FRM M6 W/CAP SHKPRF W
50	078115A	12	WASHER SELF LOCKING DOME #8-32
51	066760	1	STRIP SEALANT 1/8 X 1 (44.52”LG)

(1) ALUMINUM ENCLOSURE NOTE: ALL ENCLOSURE PANELS THAT FASTEN TO THE BASE FRAME MUST BE SECURED USING ITEM 11 & 49 THREAD FORMING FASTENER AND ITEM 44 LOCK NUT. LOCK NUT IS TO BE INSTALLED AFTER THREAD FORMING FASTENER HAS PENETRATED THROUGH EXTRUSIONS IN ENCLOSURE PANELS. ALL ROOF PANELS ARE TO BE SECURED IN THE SAME MANNER.

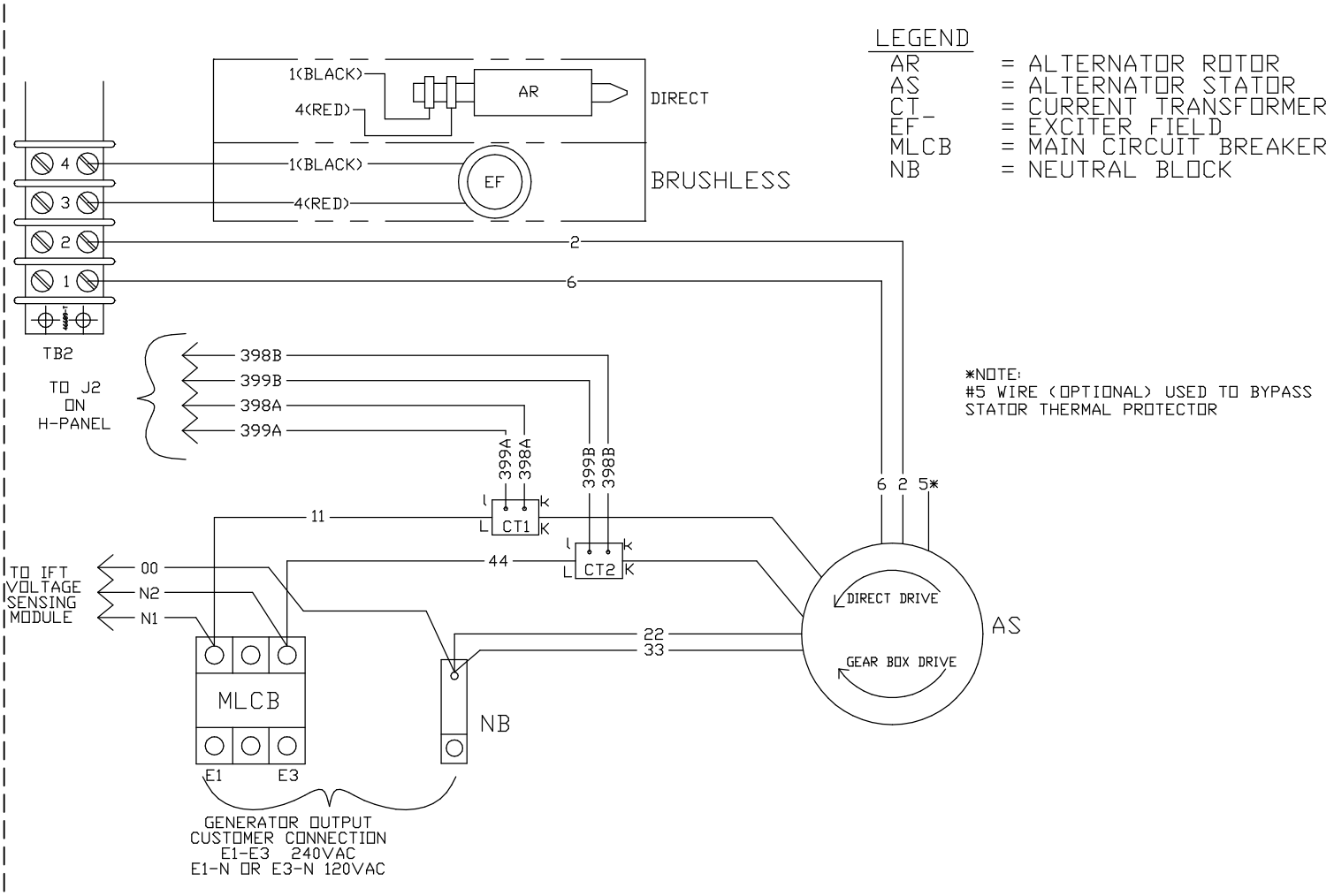
(2) NOTE: PART NUMBER SHOWN IS FOR TAN / STEEL. REFER TO THE SAMPLE GUIDE BELOW FOR AVAILABLE COLOR AND/OR ALUMINUM PART NUMBER FORMAT.

0FXXXX0ST01 = TAN / STEEL	0FXXXX0ST13 = BISQUE / STEEL
0FXXXX0AL01 = TAN / ALUMINUM	0FXXXXALT13 = BISQUE / ALUMINUM
0FXXXX0ST08 = T- GRAY / STEEL	0FXXXX0ST14 = GRAY / STEEL
0FXXXX0AL08 = T- GRAY / ALUMINUM	0FXXXXALT14 = GRAY / ALUMINUM
0FXXXX0ST05 = WHITE / STEEL	
0FXXXX0AL05 = WHITE / ALUMINUM	

(3) PART NUMBER SHOWN IS FOR TAN. SEE GUIDE BELOW FOR AVAILABLE COLOR AND PART NUMBER FORMAT.

0FXXXX0AL08 = T- GRAY / ALUMINUM	0FXXXXALT13 = BISQUE / ALUMINUM
0FXXXX0AL05 = WHITE / ALUMINUM	0FXXXXALT14 = GRAY / ALUMINUM

OPTION 1 - SINGLE PHASE, H-100 CONTROL PANEL



SCHEMATIC - DIAGRAM

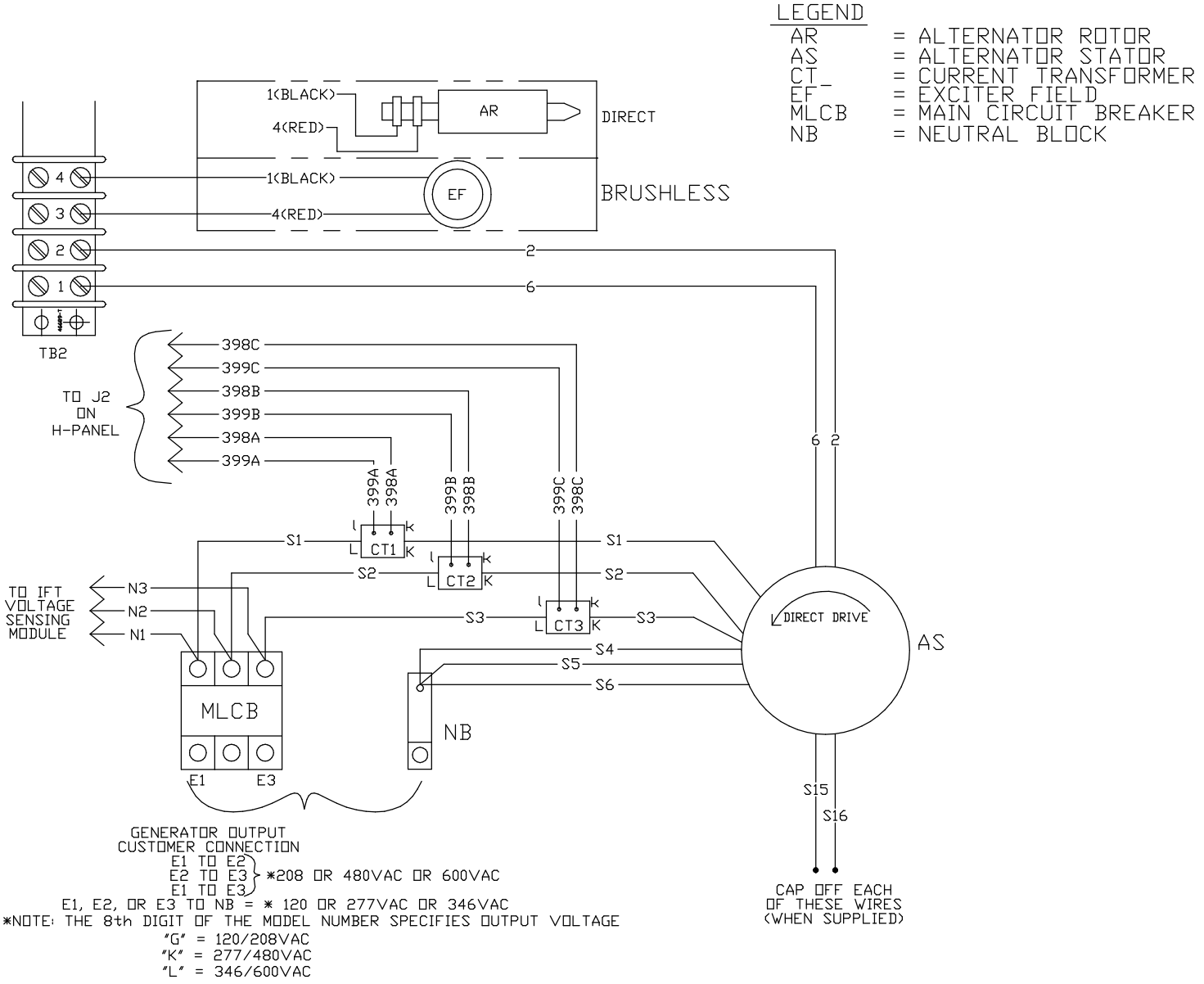
REVISION: H-0941-C

CPL H-100 ALTERNATOR

DATE: 8/15/07

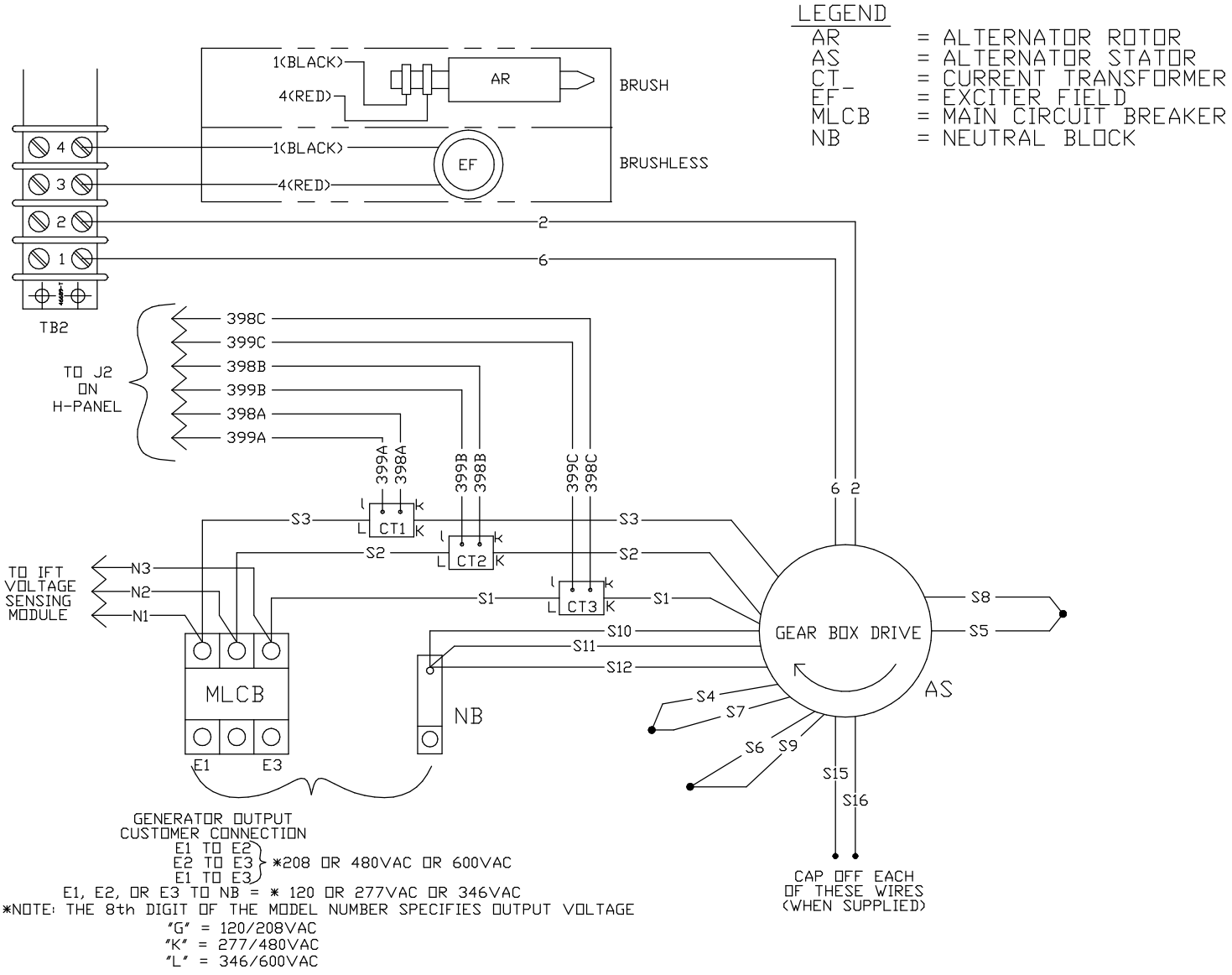
DRAWING #: 0F6587

OPTION 2 - THREE PHASE, H-100 CONTROL PANEL DIRECT DRIVE, 6 LEAD

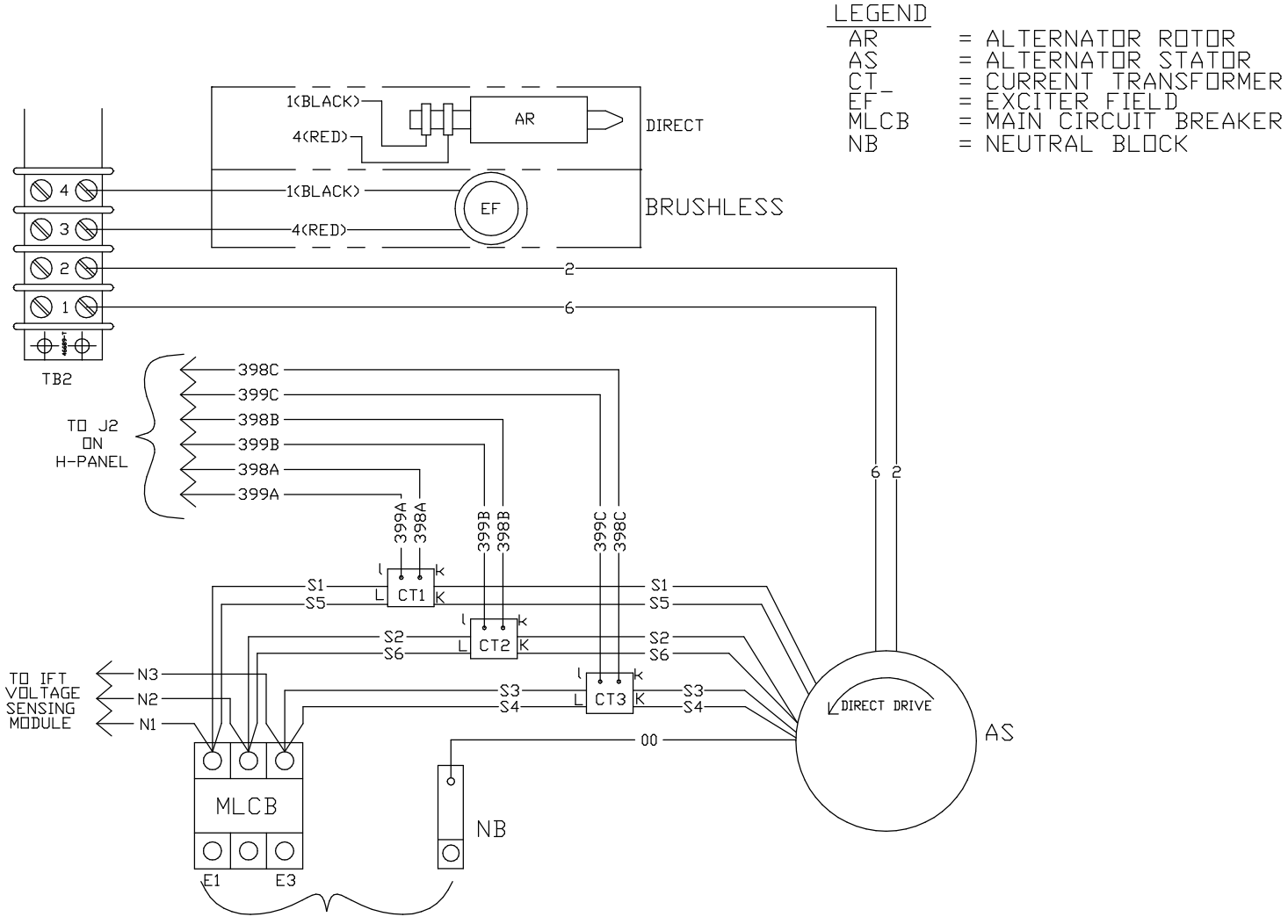


PAGE 2 OF 4

OPTION 3 - THREE PHASE, H-100 CONTROL PANEL GEAR BOX (REVERSE ROTATION)



OPTION 4 - THREE PHASE DELTA, H-100 CONTROL PANEL DIRECT DRIVE, 7 LEAD



PAGE 4 OF 4

WEIGHT DATA				
ENGINE/KW	ENCLOSURE MATERIAL	WEIGHT (GENSET ONLY) KG [LBS]	WEIGHT (WOODEN SHIPPING CRATE/SKID) KG [LBS]	SHIPPING WEIGHT (SKID AND GENSET) KG [LBS]
4.6L/80KW	STEEL	1020 [2249]	79 [175]	1100 [2424]
	ALUMINUM	941 [2075]	79 [175]	1021 [2250]

NOTES:

1) MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1241 (49") WIDE X 3231 (127.25") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES.

2) ALLOW SUFFICIENT ROOM ON ALL SIDES OF GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA37, NFPA70 STANDARDS AND ANY OTHER FEDERAL, STATE AND LOCAL CODES FOR MINIMUM DISTANCES FROM OTHER STRUCTURES.

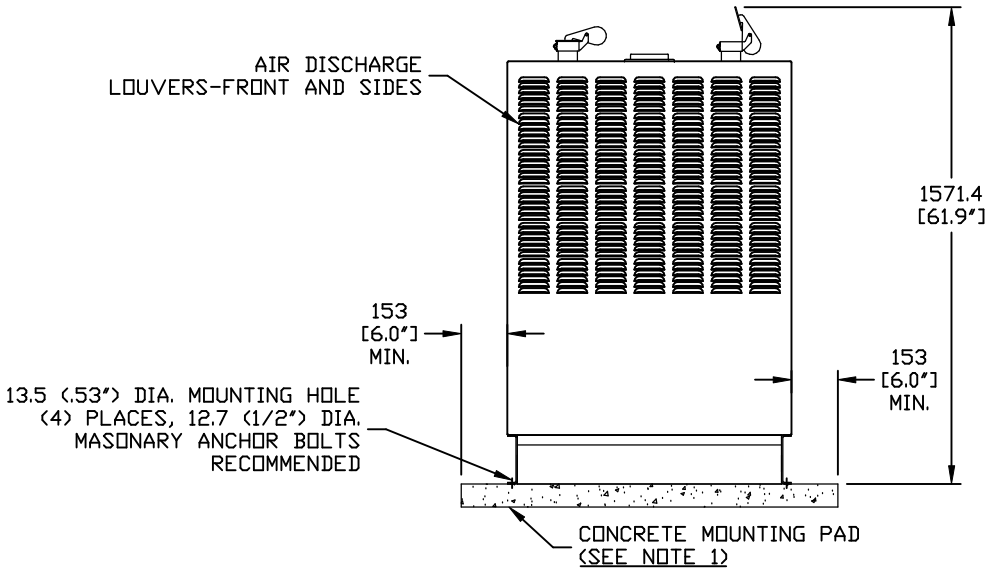
3) CIRCUIT BREAKER INFORMATION:
SEE SPECIFICATION SHEET WITHIN OWNERS MANUAL.

4) INSIDE STUB-UP AREA FOR AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (.5 AMP MAX.) CONNECTION, AND ACCESS TO TRANSFER SWITCH CONTROL WIRES. REMOVE FRONT COVER FOR ACCESS.

4A) FIELD CUT HOLE IS ONLY REQUIRED FOR MOUNTING OF GENERATOR ON AN EXISTING PAD.

5) REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.

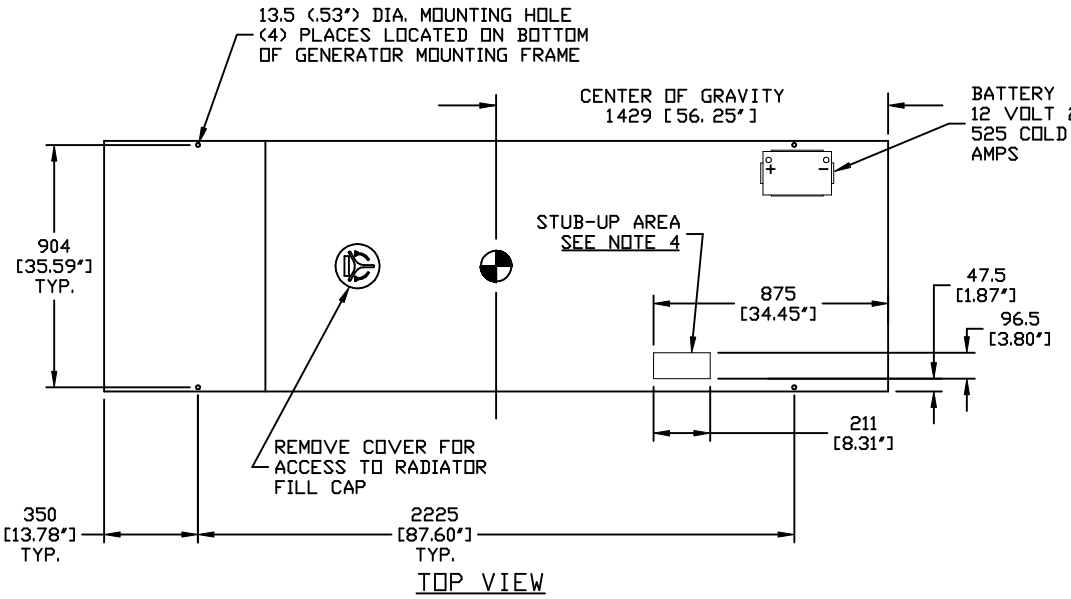
6) REMOVE EITHER LEFT OR RIGHT HAND SIDE PANEL TO ACCESS EXHAUST MUFFLERS AND FAN BELT.



EXPLODED VIEW:
INSTALLATION DRAWING 4.6L 80KW
DRAWING #: 0G1088

REVISION: H-7004-C
DATE: 7/14/10

GROUP G

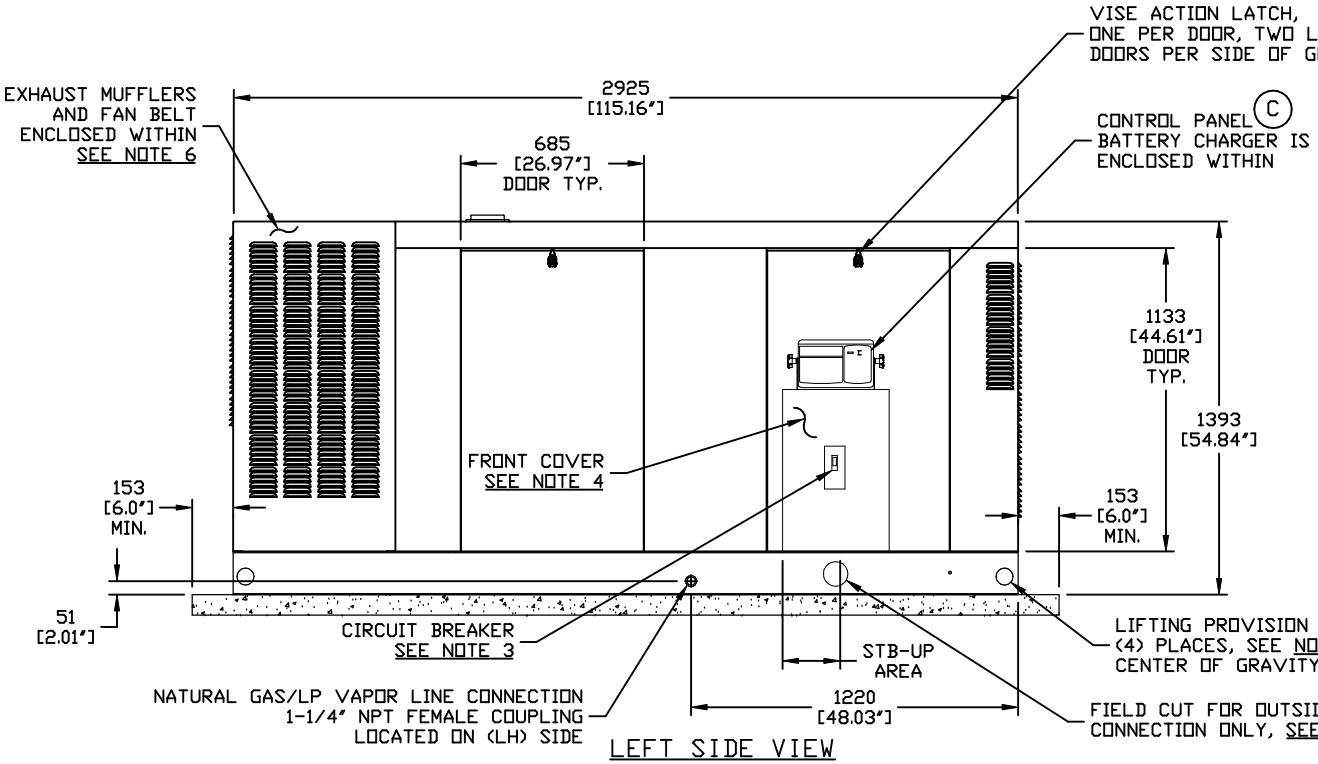


TOP VIEW

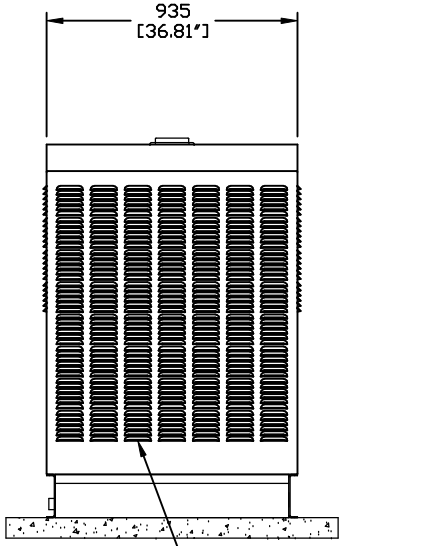
SERVICE ITEM ACCESSIBILITY CHART

SERVICE ITEM	4.6L- P/N 2G842AB	4.6L- P/N 0G804AA
OIL FILL CAP	LOCATED ON RIGHT VALVE COVER, ACCESSIBLE THRU RIGHT DOOR	LOCATED ON LEFT VALVE COVER, ACCESSIBLE THRU LEFT DOOR
OIL DIP STICK	THRU LEFT DOOR	THRU LEFT DOOR
OIL FILTER	THRU LEFT DOOR	THRU LEFT DOOR
OIL DRAIN HOSE	THRU RIGHT DOOR	THRU RIGHT DOOR
RADIATOR DRAIN HOSE	THRU LEFT DOOR	THRU LEFT DOOR
AIR CLEANER ELEMENT	EITHER DOOR	EITHER DOOR
SPARK PLUGS	BOTH DOORS	BOTH DOORS
MUFFLERS	SEE NOTE 6	SEE NOTE 6
FAN BELT	EITHER DOOR	EITHER DOOR
BATTERY	THRU RIGHT DOOR	THRU RIGHT DOOR

REFERENCE OWNERS MANUAL FOR PERIODIC
REPLACEMENT PART LISTINGS



LEFT SIDE VIEW



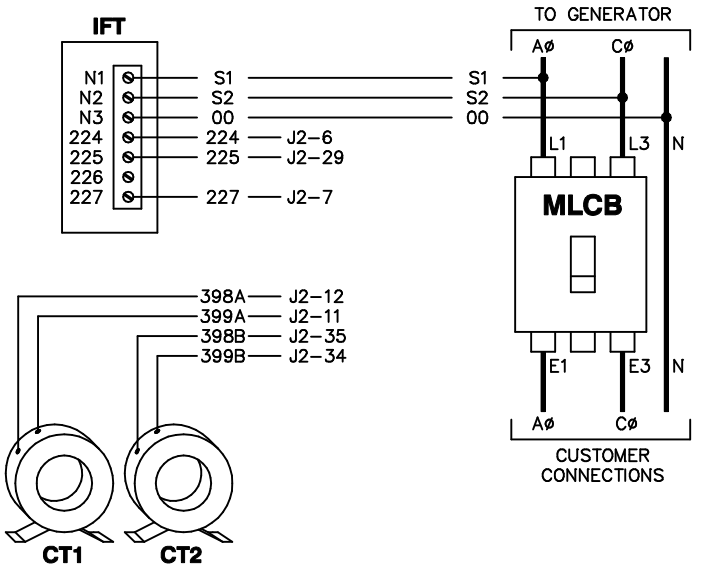
REAR VIEW

EXPLODED VIEW:
INSTALLATION DRAWING 4.6L 80KW
DRAWING #: 0G1088

REVISION: H-7004-C
DATE: 7/14/10

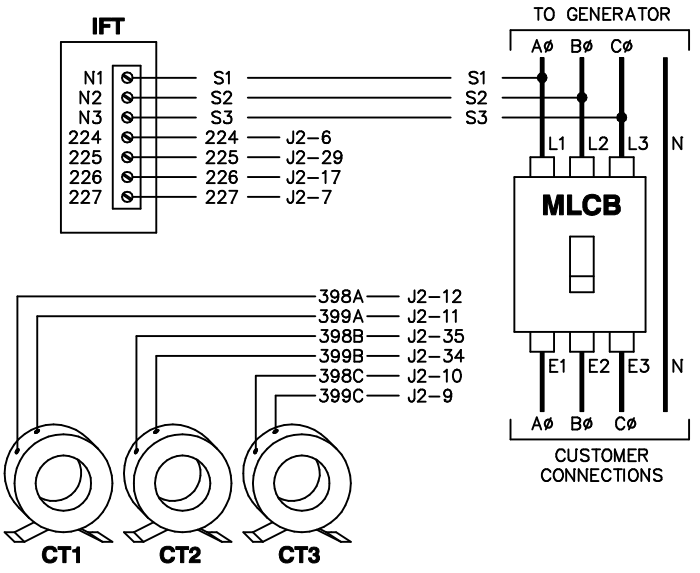
COMPONENTS LOCATED IN CIRCUIT BREAKER STAND

CONNECTIONS FOR 1Ø UNIT



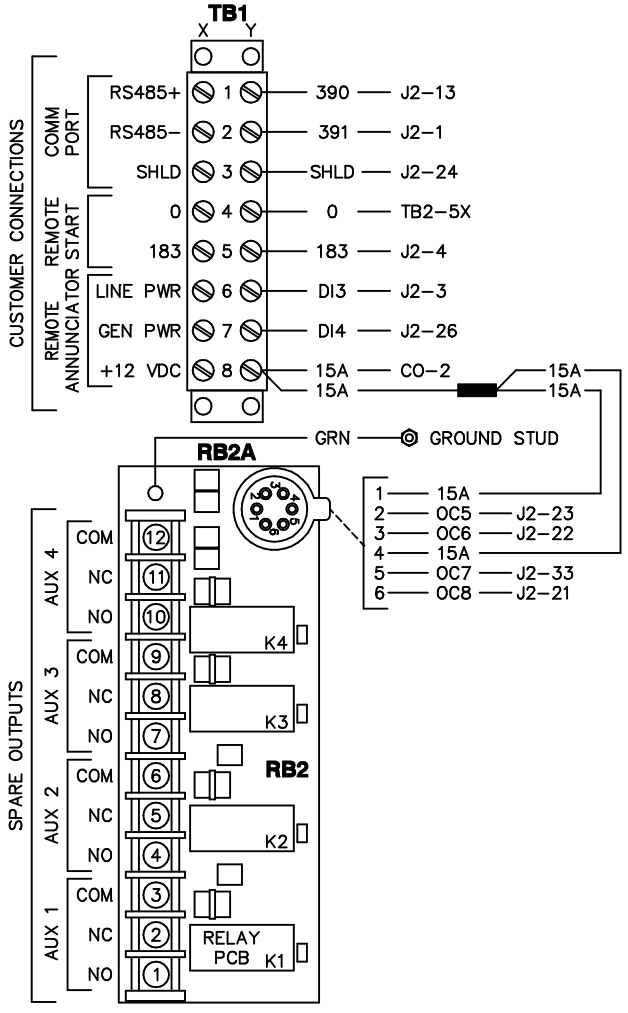
SEE DRAWING 0F8214 FOR CT WIRING.

CONNECTIONS FOR 3Ø UNIT

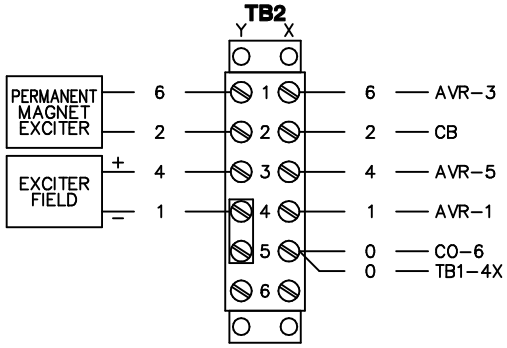


SEE DRAWING 0F8214 FOR CT WIRING.

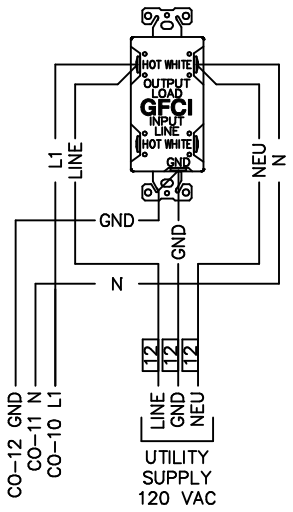
COMPONENTS LOCATED IN CIRCUIT BREAKER STAND

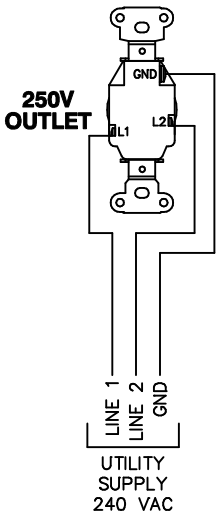


COMPONENTS LOCATED IN EXCITER SHIELD

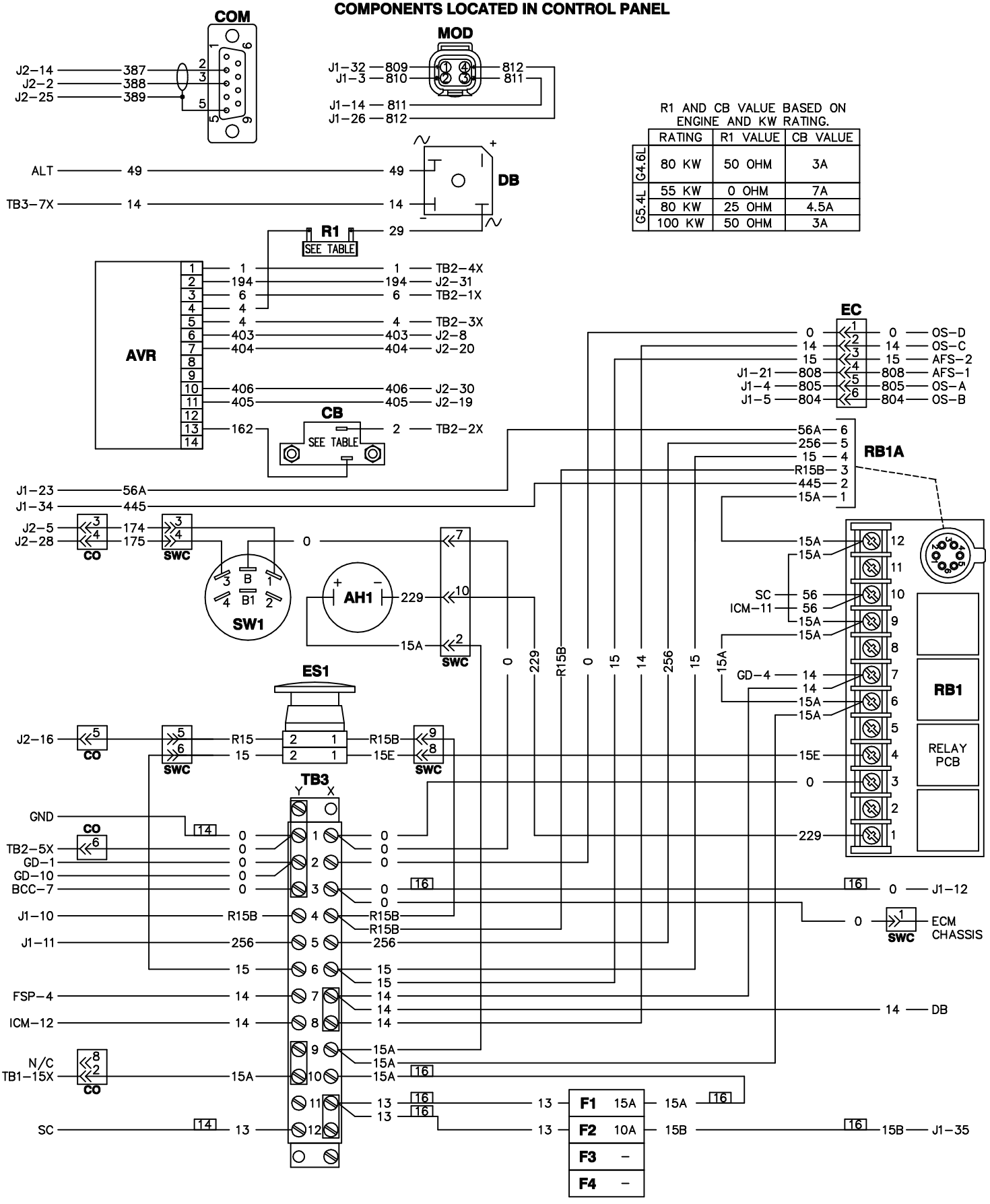


COMPONENTS LOCATED RIGHT SIDE OF ALT. CONN BOX ON THE FRAME RAIL.

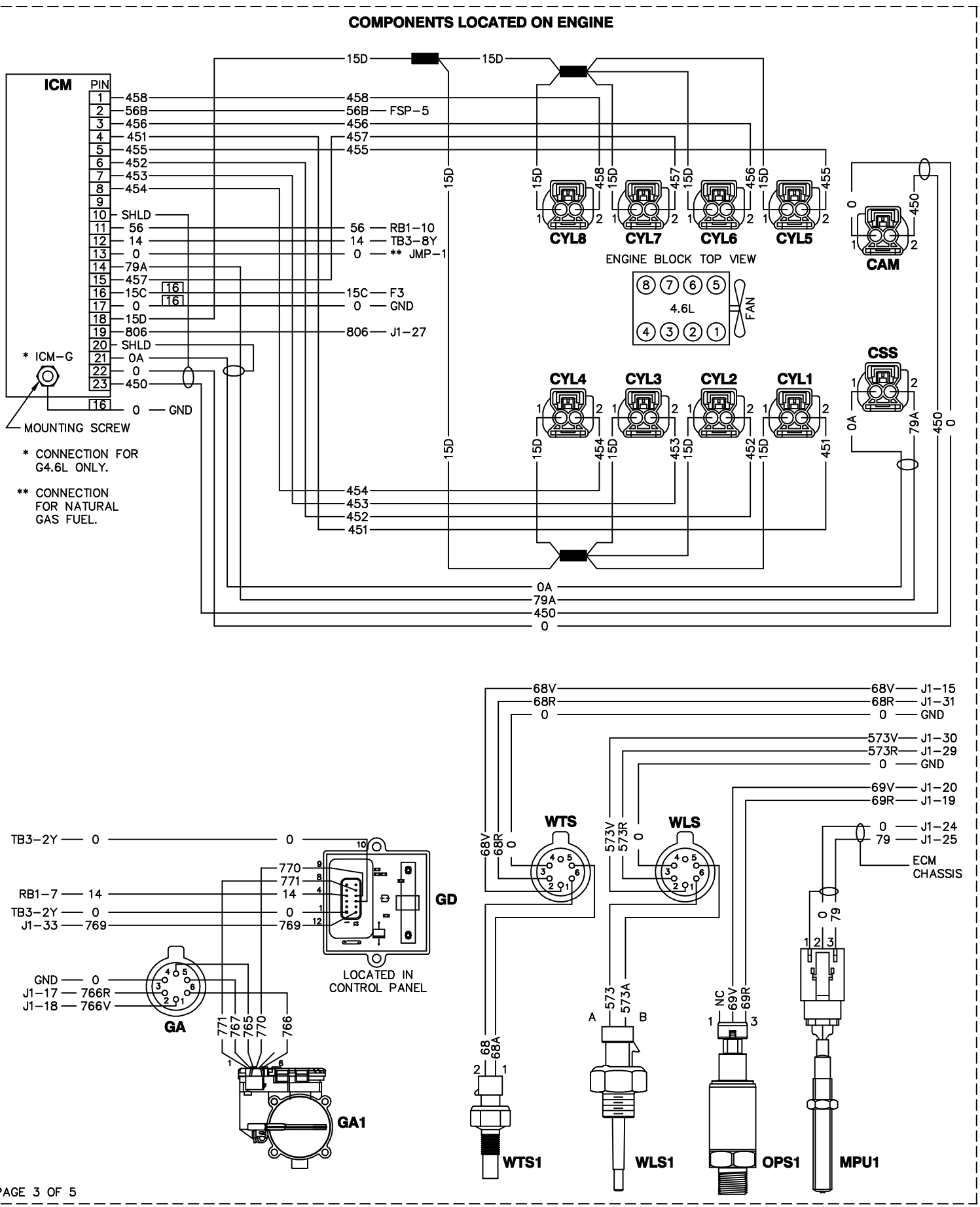




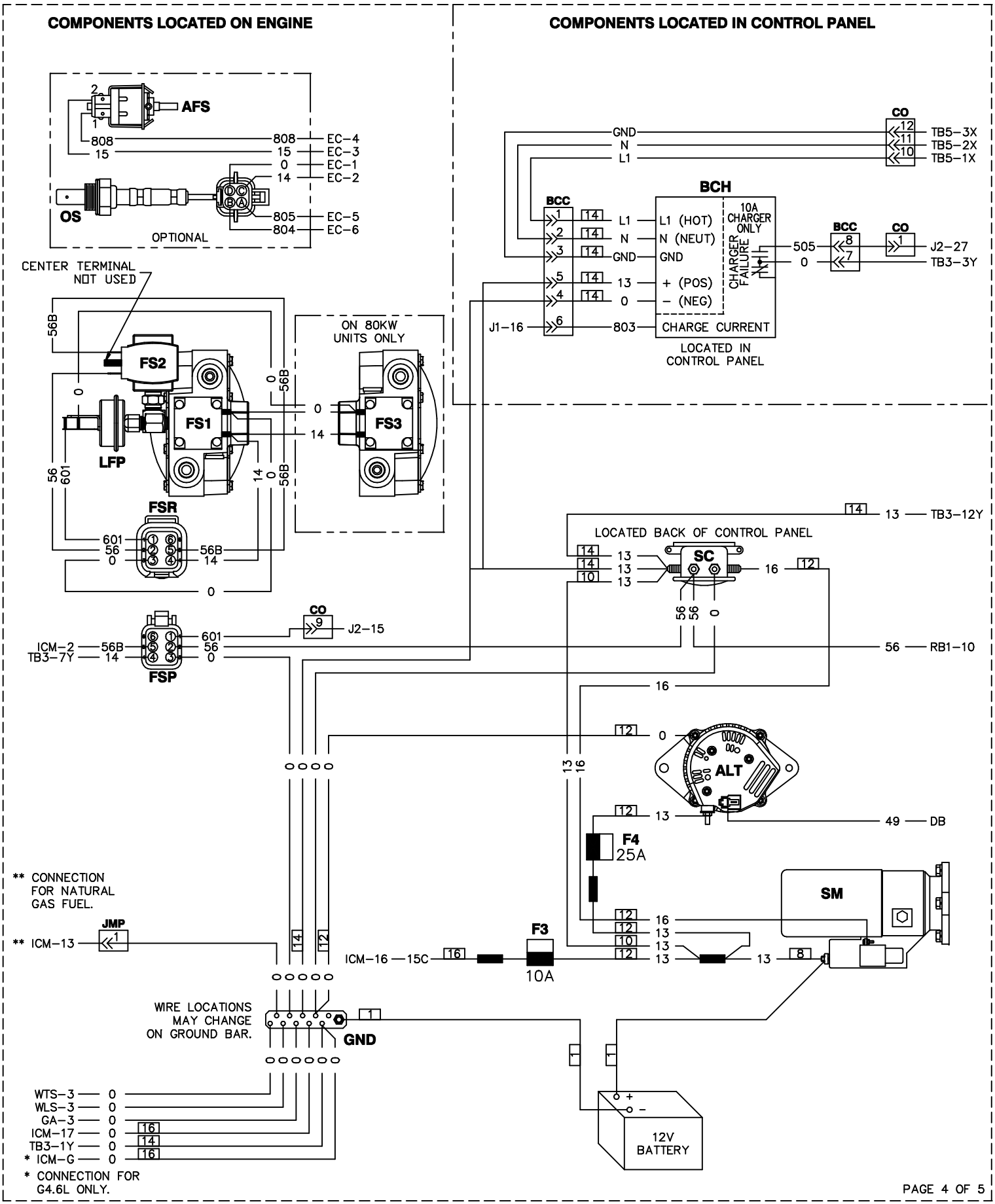
PAGE 1 OF 5


COMPONENTS LOCATED IN CONTROL PANEL
COM
MOD
DB
R1
SEE TABLE
AVR
CB
SEE TABLE
EC
RB1A
RB1
RELAY PCB
SW1
AH1
ES1
TB3
CO
SWC
F1 15A
F2 10A
F3 –
F4 –
R1 AND CB VALUE BASED ON ENGINE AND KW RATING.
G4.6L
80 KW
50 OHM
3A
G5.4L
55 KW
0 OHM
7A
80 KW
25 OHM
4.5A
100 KW
50 OHM
3A

PAGE 2 OF 5


COMPONENTS LOCATED ON ENGINE
ICM
PIN
1 458
2 56B
3 456
4 451
5 455
6 452
7 453
8 454
9
10 SHLD
11 56
12 14
13 0
14 79A
15 457
16 15C
17 0
18 15D
19 806
20 SHLD
21 0A
22 0
23 450
16 0 — GND
* ICM-G
MOUNTING SCREW
* CONNECTION FOR G4.6L ONLY.
** CONNECTION FOR NATURAL GAS FUEL.
56 — RB1-10
14 — TB3-8Y
0 — ** JMP-1
15C — F3
0 — GND
806 — J1-27
CYL8
CYL7
CYL6
CYL5
CYL4
CYL3
CYL2
CYL1
ENGINE BLOCK TOP VIEW
4.6L
FAN
CAM
CSS
0A
79A
450
0
68V — J1-15
68R — J1-31
0 — GND
573V — J1-30
573R — J1-29
0 — GND
69V — J1-20
69R — J1-19
0 — J1-24
79 — J1-25
ECM CHASSIS
WTS
WLS
WTS1
WLS1
OPS1
MPU1
TB3-2Y — 0
RB1-7 — 14
TB3-2Y — 0
J1-33 — 769
GD
LOCATED IN CONTROL PANEL
GND — 0
J1-17 — 766R
J1-18 — 766V
GA
GA1

PAGE 3 OF 5



WIRING - DIAGRAM

REVISION: H-6418-C

G4.6L/G5.4L G3 H-PANEL

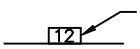
DATE: 4/6/10

DRAWING #: 0H4296

LEGEND:

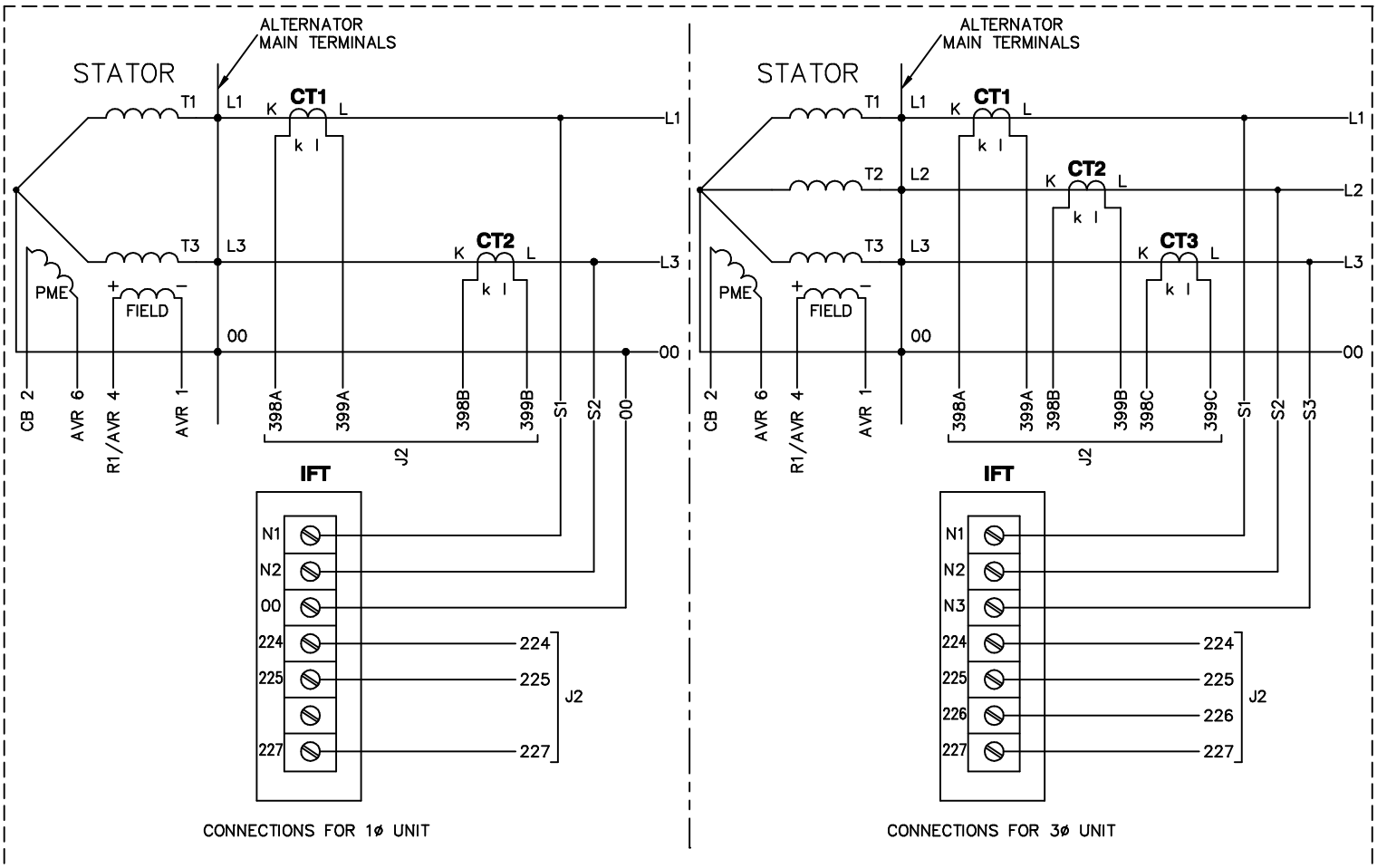
AFS	– AIR/FUEL SOLENOID	GFCI	– GROUND FAULT CIRCUIT INTERRUPTER
AH1	– ALARM HORN	GND	– GROUND BAR CONNECTION
ALT	– DC CHARGE ALTERNATOR	ICM	– IGNITION CONTROL MODULE
AVR	– AUTOMATIC VOLTAGE REGULATOR	IFT	– INTERFACE TRANSFORMER
BCC	– BATTERY CHARGER CONNECTOR	J_	– ENGINE CONTROL MODULE CONNECTIONS
BCH	– BATTERY CHARGER	JMP	– JUMPER CONNECTION FOR NATURAL GAS
CAM	– CAMSHAFT SENSOR	LFP	– LOW FUEL PRESSURE SWITCH
CB	– CIRCUIT BREAKER	MLCB	– MAIN LINE CIRCUIT BREAKER
CO	– CROSSOVER CONNECTOR	MOD	– MODEM CONNECTOR
COM	– COMMUNICATIONS PORT	MPU1	– MAGNETIC PICK UP
CSS	– CRANKSHAFT SENSOR	OPS1	– OIL PRESSURE SENDER
CT_	– CURRENT TRANSFORMER	OS	– OXYGEN SENSOR
CYL_	– CYLINDER IGNITION COIL	R1	– RESISTOR
DB	– DIODE BRIDGE	RB_	– RELAY BOARD
EC	– EMISSIONS CONNECTOR	RB_A	– RELAY BOARD CONNECTOR
ECM	– ELECTRONIC CONTROL MODULE	SC	– START CONTACTOR
ES1	– EMERGENCY STOP SWITCH	SM	– STARTER MOTOR
F_	– FUSE	SW1	– AUTO/MANUAL SELECTOR SWITCH
FS_	– FUEL SOLENOID	SWC	– OPERATOR SWITCH CONNECTOR
FSP	– FUEL SOLENOID PLUG	TB_	– TERMINAL BLOCKS
FSR	– FUEL SOLENOID RECEPTACLE	WLS_	– COOLANT LEVEL SENDER
GA_	– GOVERNOR ACTUATOR	WTS_	– COOLANT TEMPERATURE SENDER
GD	– GOVERNOR DRIVER		

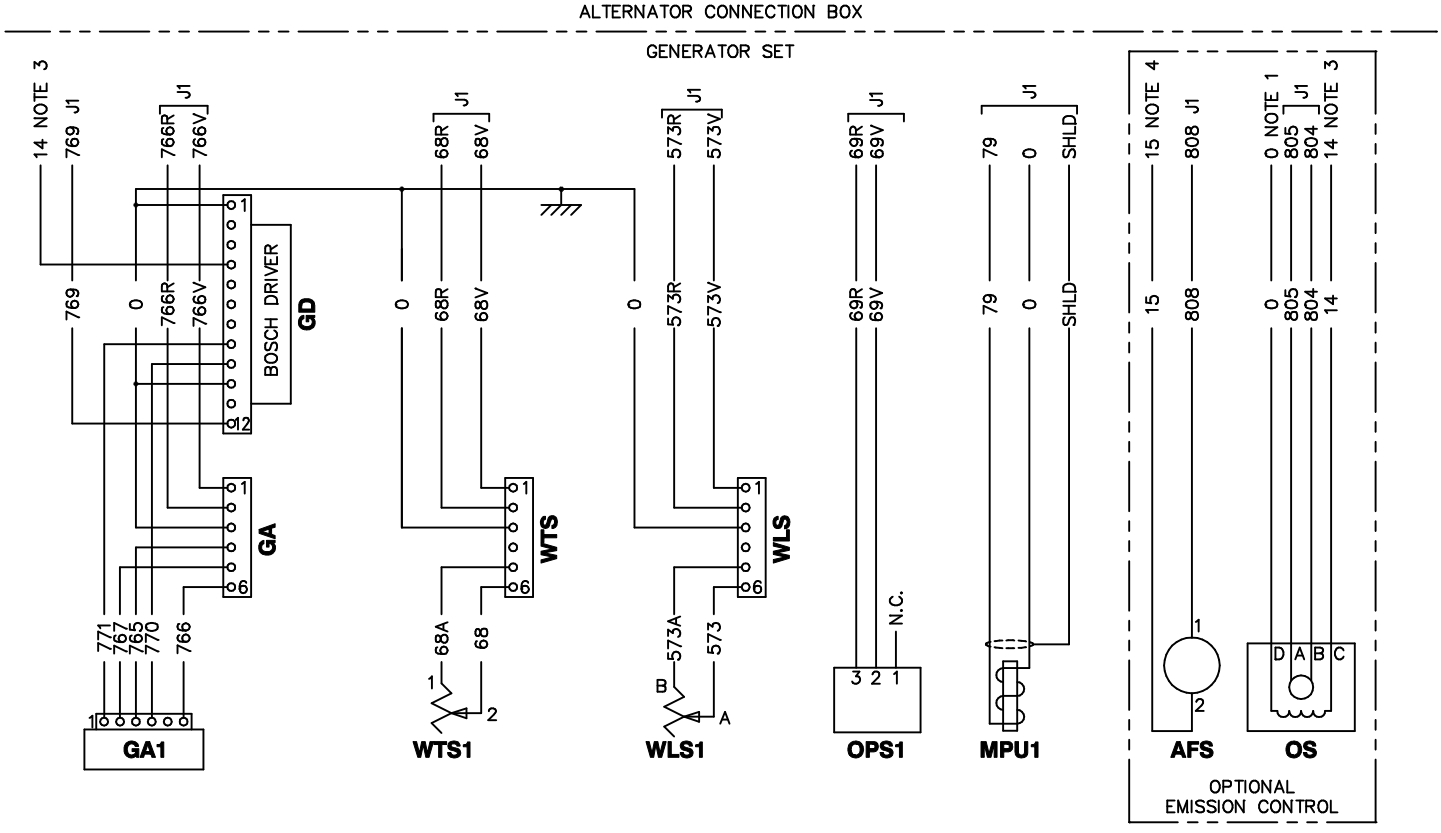
NOTE: ALL WIRES 18 AWG 300V UL LISTED UNLESS SHOWN OTHERWISE



S1, S2 & S3 ARE 600V UL LISTED

PAGE LEFT BLANK INTENTIONALLY





PAGE 1 OF 4

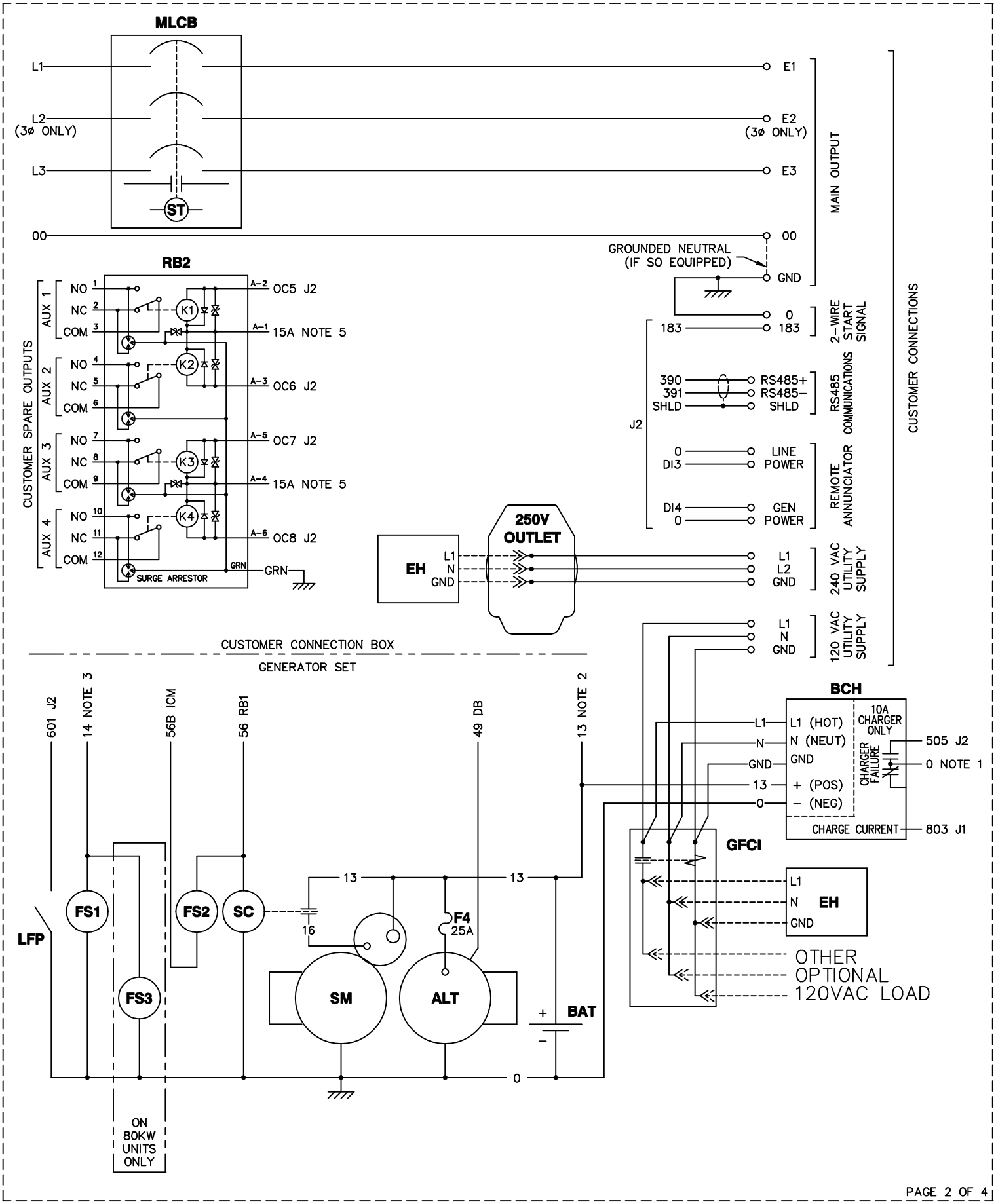
SCHEMATIC - DIAGRAM

REVISION: H-6418-C

G4.6L/G5.4L G3 H-PANEL

DATE: 4/6/10

DRAWING #: 0H4297



SCHEMATIC - DIAGRAM

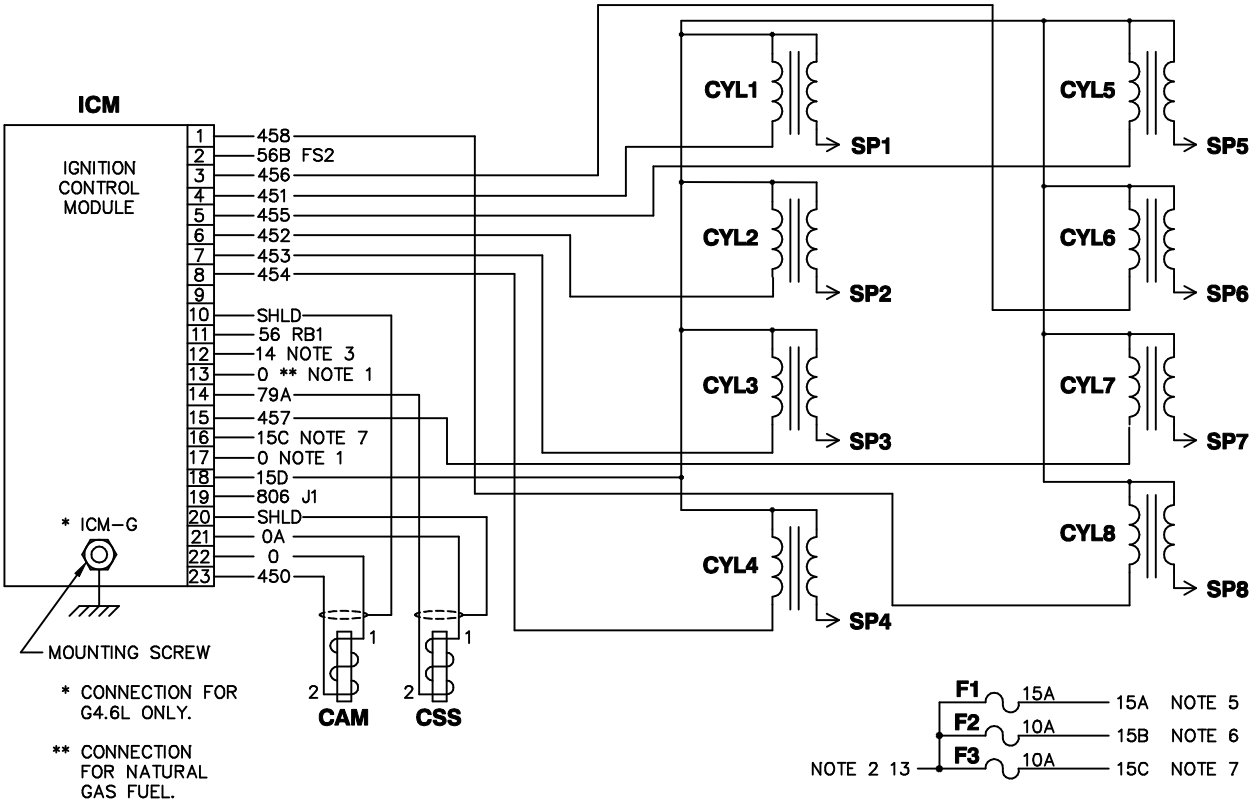
REVISION: H-6418-C

G4.6L/G5.4L G3 H-PANEL

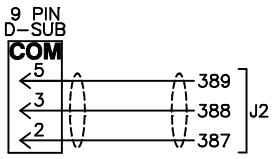
DATE: 4/6/10

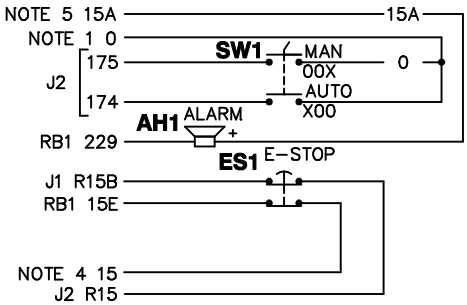
PAGE 2 OF 4

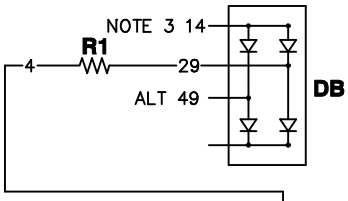
DRAWING #: 0H4297

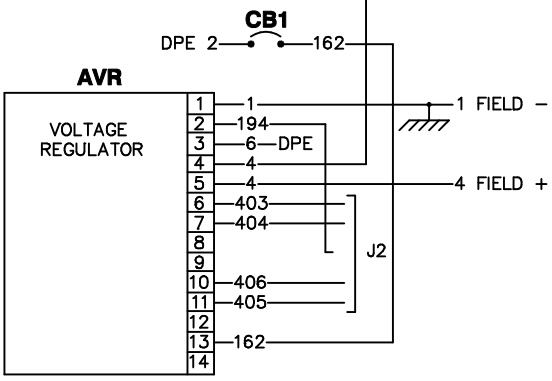

ICM
IGNITION CONTROL MODULE
1 458
2 56B FS2
3 456
4 451
5 455
6 452
7 453
8 454
9
10 SHLD
11 56 RB1
12 14 NOTE 3
13 0 ** NOTE 1
14 79A
15 457
16 15C NOTE 7
17 0 NOTE 1
18 15D
19 806 J1
20 SHLD
21 0A
22 0
23 450
* ICM-G
MOUNTING SCREW
* CONNECTION FOR G4.6L ONLY.
** CONNECTION FOR NATURAL GAS FUEL.
CAM
CSS
CYL1
CYL2
CYL3
CYL4
CYL5
CYL6
CYL7
CYL8
SP1
SP2
SP3
SP4
SP5
SP6
SP7
SP8

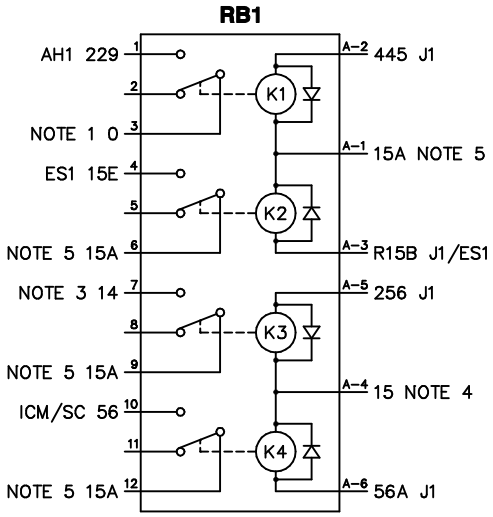
F1 15A
F2 10A
F3 10A
NOTE 2 13
15A NOTE 5
15B NOTE 6
15C NOTE 7


9 PIN D-SUB
COM
5
3
2
389
388
387
J2


NOTE 5 15A
15A
NOTE 1 0
SW1
MAN
00X
AUTO
X00
0
J2
175
174
AH1 ALARM
RB1 229
ES1 E-STOP
J1 R15B
RB1 15E
NOTE 4 15
J2 R15


NOTE 3 14
R1
4
29
ALT 49
DB


CB1
DPE 2
162
AVR
VOLTAGE REGULATOR
1 1
2 194
3 6 DPE
4 4
5 4
6 403
7 404
8
9
10 406
11 405
12
13 162
14
J2
1 FIELD -
4 FIELD +


RB1
AH1 229
NOTE 1 0
ES1 15E
NOTE 5 15A
NOTE 3 14
NOTE 5 15A
ICM/SC 56
NOTE 5 15A
K1
K2
K3
K4
A-2 445 J1
A-1 15A NOTE 5
A-3 R15B J1/ES1
A-5 256 J1
A-4 15 NOTE 4
A-6 56A J1

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NOTES:
1) WIRE# 0 IS CHASSIS GROUND (BATTERY−) UNLESS NOTED OTHERWISE.
2) WIRE# 13 IS UNFUSED +12VDC (BATTERY+).
3) WIRE# 14 IS FUSED +12VDC WHEN GENERATOR IS CRANKING OR RUNNING.
4) WIRE# 15 IS FUSED +12VDC WHEN E−STOP IS NOT ACTIVATED.
5) WIRE# 15A IS FUSED +12VDC FOR GENERAL USE.
6) WIRE# 15B IS FUSED +12VDC FOR THE ENGINE CONTROL MODULE.
7) WIRE# 15C IS FUSED +12VDC FOR THE IGNITION.

GD CONNECTOR

PIN	WIRE	TO	FUNCTION
1	0	GND	NOTE 1
4	14	RB1−7	NOTE 3
8	771	GA1−1	THROTTLE DRIVE LO
9	770	GA1−4	THROTTLE DRIVE HI
10	0	GND	NOTE 1
12	769	J1−33	THROTTLE PWM

AVR CONNECTOR

PIN	WIRE	TO	FUNCTION
1	1	FIELD	− FIELD
2	194	J2−31	+12VDC
3	6	PME	PME OUTPUT
4	4	R1	+ FIELD
5	4	FIELD	+ FIELD
6	403	J2−8	GATE TRIGGER B
7	404	J2−20	GATE TRIGGER A
10	406	J2−30	ZERO CROSSING I/P
11	405	J2−19	GROUND (ISO)
13	162	CB	PME OUTPUT (AFTER CB)

ICM CONNECTOR

PIN	WIRE	TO	FUNCTION
1	458	CYL8	IGNITION COIL DRIVE 8
2	56B	FS2	FUEL SOLENOID
3	456	CYL6	IGNITION COIL DRIVE 6
4	451	CYL1	IGNITION COIL DRIVE 1
5	455	CYL5	IGNITION COIL DRIVE 5
6	452	CYL2	IGNITION COIL DRIVE 2
7	453	CYL3	IGNITION COIL DRIVE 3
8	454	CYL4	IGNITION COIL DRIVE 4
10	SHLD	CUT	CAMSHAFT SENSOR DRAIN
11	56	RB1−10	STARTER RELAY OUT
12	14	RB1−7	NOTE 3
13	0	GND	NOTE 1
14	79A	CSS−2	CRANKSHAFT SENSOR +
15	457	CYL7	IGNITION COIL DRIVE 7
16	15C	F3	NOTE 7
17	0	GND	NOTE 1
18	15D	CYL1−CYL8	IGNITION COIL PWR
19	806	J1−27	IGNITION ALARM
20	SHLD	CUT	CRANKSHAFT SENSOR DRAIN
21	0A	CSS−1	CRANKSHAFT SENSOR −
22	0	CAM−1	CAMSHAFT SENSOR −
23	450	CAM−2	CAMSHAFT SENSOR +

ENGINE CONTROL MODULE CONNECTIONS

J1

PIN	WIRE	TO	FUNCTION
3	810	MOD−2	EXTERNAL MODEM GROUND
4	805	OS	OXYGEN SENSOR RTN (OPTION)
5	804	OS	OXYGEN SENSOR + (OPTION)
10	R15B	RB1A−3/ES1	OVERSPEED/WATCHDOG
11	256	RB1A−5	FUEL RELAY
12	0	GND	NOTE 1
14	811	MOD−3	DCD
15	68V	WTS−1	COOLANT TEMP +
16	803	BCH	BAT CHARGER CURRENT
17	766R	GA−2	THROTTLE POS RTN
18	766V	GA−1	THROTTLE POS +
19	69R	OPS−3	OIL PRESS RTN
20	69V	OPS−1	OIL PRESS +
21	808	AFS	AIR/FUEL SOLENOID (OPTION)
23	56A	RB1A−6	STARTER RELAY
24	0	MPU1−2	MPU1 SIGNAL (−)
25	79	MPU1−3	MPU1 SIGNAL (+)
26	812	MOD−4	ENABLE
27	806	ICM−19	IGNITION ALARM
29	573R	WLS−2	COOLANT LVL RTN
30	573V	WLS−1	COOLANT LVL +
31	68R	WTS−2	COOLANT TEMP RTN
32	809	MOD−1	+12
33	769	GD−12	THROTTLE PWM
34	445	RB1A−2	ALARM RELAY
35	15B	F2	NOTE 6

J2

	PIN	WIRE	TO	FUNCTION
	1	391	CUST CON	RS485− (XFER SW)
	2	388	COM−3	RS232 TX (GENLINK)
	3	DI3	CUST CON	LINE POWER SIGNAL
	4	183	CUST CON	REMOTE START
	5	174	SW1	"AUTO" START
	6	224	IFT	V SENSE GEN A PH
	7	227	IFT	V SENSE RTN
	8	403	AVR−6	AVR GATE TRIGGER B
*	9	399C	CT3	GEN C PH CURRENT −
*	10	398C	CT3	GEN C PH CURRENT +
	11	399A	CT1	GEN A PH CURRENT −
	12	398A	CT1	GEN A PH CURRENT +
	13	390	CUST CON	RS485+ (XFER SW)
	14	387	COM−2	RS232 RX (GENLINK)
	15	601	LFP	LOW FUEL PRESSURE
	16	R15	ES1	EMERGENCY STOP
*	17	226	IFT	V SENSE GEN C PH
	19	405	AVR−11	AVR GROUND
	20	404	AVR−7	AVR GATE TRIGGER A
	24	SHLD	CUST CON	RS485 DRAIN (XFER SW)
	25	389	COM−5	RS232 COM (GENLINK)
	26	DI4	CUST CON	GEN POWER SIGNAL
	27	505	BCH	BAT CHARGER FAIL
	28	175	SW1	"MANUAL" START
	29	225	IFT	V SENSE GEN B PH
	30	406	AVR−10	AVR ZERO CROSSING I/P
	31	194	AVR−2	AVR +12VDC
	34	399B	CT2	GEN B PH CURRENT−
	35	398B	CT2	GEN B PH CURRENT+

* − CONNECTIONS NOT USED IN 1ø UNITS.

LEGEND

00 − NEUTRAL
AFS − AIR/FUEL SOLENOID
AH1 − ALARM HORN
ALT − DC CHARGE ALTERNATOR
AVR − AUTOMATIC VOLTAGE REGULATOR
BAT − BATTERY (12VDC)
BCH − BATTERY CHARGER
CAM − CAMSHAFT SENSOR
CB1 − CIRCUIT BREAKER
COM − COMMUNICATION CONNECTOR
CSS − CRANKSHAFT SENSOR
CT_ − CURRENT TRANSFORMER
CUST CON − CUSTOMER CONNECTION
CYL_ − CYLINDER IGNITION COIL
DB − DIODE BRIDGE
DPE − EXCITER
EH − ENGINE BLOCK HEATER
ES1 − EMERGENCY STOP SWITCH
F_ − FUSE
FS_ − FUEL SOLENOID
GA_ − GOVERNOR ACTUATOR
GD − GOVERNOR DRIVER
GFCI − GROUND FAULT CIRCUIT INTERRUPTER
ICM − IGNITION CONTROL MODULE
IFT − INTERFACE TRANSFORMER
ISO − ISOLATED (ELECTRICALLY)
J_ − ENGINE CONTROL MODULE CONN.
LFP − LOW FUEL PRESSURE SWITCH
MLCB − MAIN LINE CIRCUIT BREAKER
MPU1 − MAGNETIC PICK UP
OPS1 − OIL PRESSURE SENDER
OS − OXYGEN SENSOR
R1 − RESISTOR
RB_ − RELAY BOARD
SC − STARTER CONTACTOR
SHLD − SHIELD
SM − STARTER MOTOR
SP_ − SPARK PLUG
ST − SHUNT TRIP
SW1 − AUTO/MANUAL SELECTOR SWITCH
WLS_ − COOLANT LEVEL SENDER
WTS_ − COOLANT TEMPERATURE SENDER

SCHEMATIC - DIAGRAM
G4.6L/G5.4L G3 H-PANEL
DRAWING #: 0H4297

REVISION: H-6418-C
DATE: 4/6/10

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