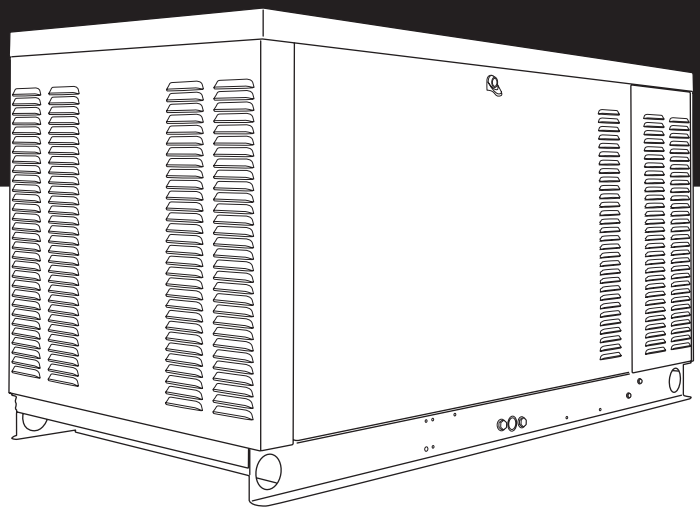
Serial Number

1.6L 20/25/30 kW Models

STANDBY 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. 0G5244

Catalog Number OMASPES025-2

Cover113 Rev. C 09/07

TABLE OF CONTENTS

Standby Generator Sets
Table of Contents

TABLE OF CONTENTS

SECTION **PAGE**

SAFETY RULES **1-1**
INTRODUCTION **1-3**
Read this Manual Thoroughly 1-3
Operation and Maintenance 1-3
How to Obtain Service 1-3
IDENTIFICATION RECORD **2-1**
Data Label 2-1
EQUIPMENT DESCRIPTION **3-1**
Equipment Description 3-1
Engine Oil Recommendations 3-1
Coolant Recommendations 3-1
ENGINE PROTECTIVE DEVICES **4-1**
High Coolant Temperature Switch 4-1
Low Coolant Level Sensor 4-1
Low Oil Pressure Switch 4-1
Overcrank Shutdown 4-1
Overspeed Shutdown 4-1
RPM Sensor Loss Shutdown 4-1
DC Fuse 4-1
FUEL SYSTEMS **5-1**
Fuel Requirements 5-1
Natural Gas Fuel System 5-1
Propane Vapor Withdrawal Fuel System 5-1
LP Fuel System 5-1
SPECIFICATIONS **6-1**
Generator 6-1
Engine 6-1
Cooling System 6-1
Fuel System 6-1
Electrical System 6-1
Cold Weather Kit 6-2
Reconfiguring the Fuel System 6-2
GENERAL INFORMATION **7-1**
Generator AC Lead Connections 7-1
Four-lead, Single-phase Stator 7-1
Alternator Power Winding Connections 7-1
3-phase Alternators 7-1
INSTALLATION **8-1**
Installation 8-1
Preparation Before Start-up 8-1
Transfer Switch 8-1
Fuel System 8-1
Generator Set Lubrication 8-1
Prior to Initial Start-up 8-1
Engine Coolant 8-1
Belt Tension 8-1
Electrical System 8-1
Initial Inspection for Genset Start-up 8-1
Start-up Checklist 8-2
Preparation for Start-up 8-2
OPERATION **9-1**
Generator Control and Operation 9-1
Operating Unit with Manual Transfer Switch 9-1
Engine Start-up and Transfer 9-1
Retransfer and Shutdown 9-1
Operating Unit with Automatic Transfer Switch 9-1
MAINTENANCE **10-1**
Maintenance Performed by Service Facilities 10-1
Every Three Months 10-1
Once Every Six Months 10-1
Once Annually 10-1
First 30 Operating Hours 10-1
First 100 Operating Hours 10-1
Every 500 Operating Hours 10-1
Every 800 Operating Hours 10-1
Cooling System 10-1
Overload Protection for Engine DC Electrical System 10-1
Checking Fluid Levels 10-1
Check Engine Oil 10-1
Battery Fluid 10-2
Engine Coolant 10-2
Maintenance Owner/Operator Can Perform 10-2
Check Engine Oil Level 10-2
Check Battery 10-2
Exercise System 10-2
Inspect Cooling System 10-2
Check Engine Coolant Level 10-2
Perform Visual Inspection 10-2
Inspect Exhaust System 10-2
Check Fan Belt 10-2
Inspect Engine Governor 10-2
Changing Engine Oil 10-3
Changing the Engine Air Cleaner 10-3
Spark Plugs 10-3
Coolant Change 10-3
Miscellaneous Maintenance 10-4
Cleaning the Generator 10-4
Battery 10-4
Battery Maintenance 10-4
Battery Replacement 10-4
Repair Parts 10-4
SERVICE SCHEDULE **11-1**
TROUBLESHOOTING **12-1**
Troubleshooting Guide 12-1
NOTES
EXPLODED VIEWS & PARTS LISTS
WIRING DIAGRAMS & SCHEMATICS

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 has a DATA LABEL that contains important information pertinent to the generator. The data label, which can be found attached to the generator's lower connection box, lists the unit's serial number and its rated voltage, amps, wattage capacity, phase, frequency, rpm, power factor, production date, etc.

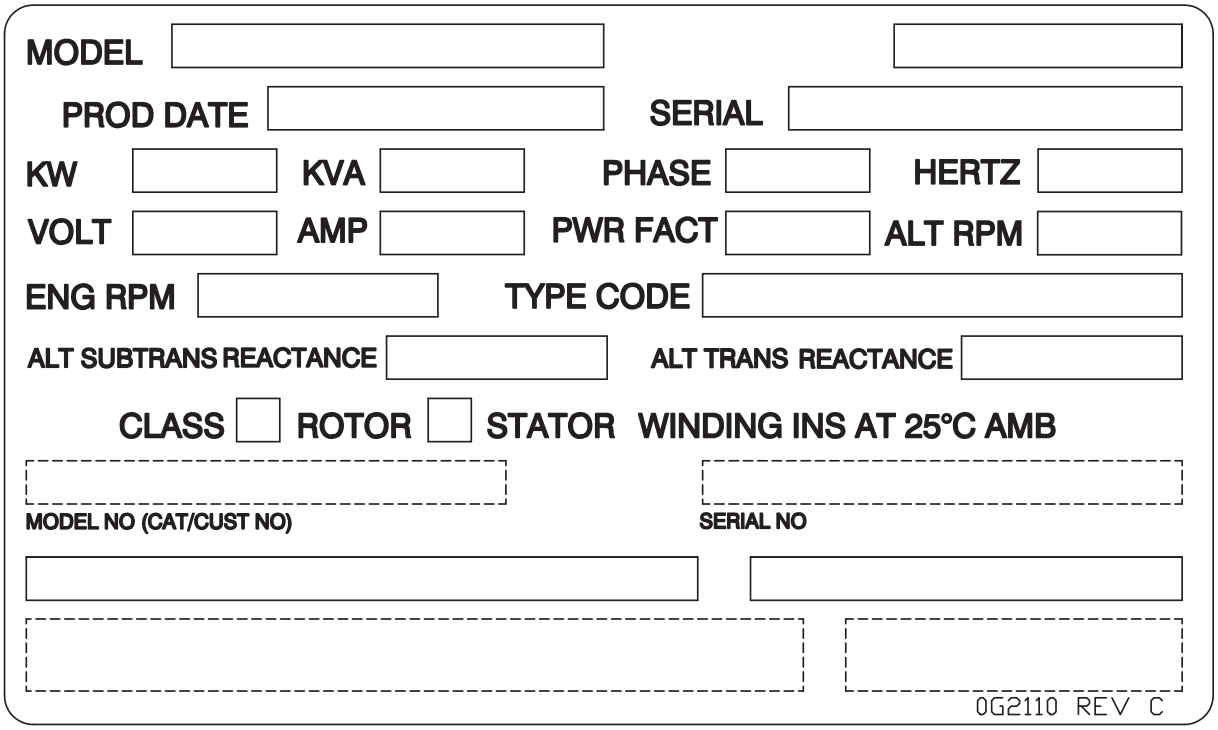
NOTE:

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



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 is Class F rated as defined by NEMA MG1-32.6, NEMA MG1-1.66. The generator is self ventilated and drip-proof constructed.
- The voltage waveform deviation, total harmonic content of the AC waveform and telephone influence factor have been evaluated and are acceptable according to NEMA MG1-32.

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 (synthetic oil is recommended).

⚠ 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:

For temperatures below 32° F, it is strongly recommended to use the optional Cold Weather Start Kit. 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.

HIGH COOLANT TEMPERATURE SWITCH

The switch will close if the temperature should exceed approximately 140° C (284° F), initiating an engine shutdown. The generator will automatically restart and the LED will reset once the temperature has returned to a safe operating level.

LOW COOLANT LEVEL SENSOR

To prevent overheating, the engine has a low coolant level sensor. If the level of engine coolant drops below the level of the low coolant level sensor, the engine automatically shuts down.

LOW OIL PRESSURE SWITCH

This switch has normally closed contacts that are held open by engine oil pressure during cranking and operating. Should oil pressure drop below the 8 psi range, switch contacts close, and the engine shuts down. The unit should not be restarted until oil is added, and the AUTO/OFF/MANUAL switch must be turned to OFF and then back to AUTO.

OVERCRANK SHUTDOWN

After a prespecified duration of cranking, this function ends the cranking if the engine has failed to start. The overcrank LED will turn ON. Turn OFF the AUTO/OFF/MANUAL switch, then turn switch back to AUTO to reset the generator control board.

NOTE:

If the fault is not corrected, the overcrank feature will continue to activate.

Approximate Crank Cycle Times

- 15 seconds ON
- 7 seconds OFF
- 7 seconds ON
- 7 seconds OFF
- Repeat for 45 seconds
  Approximately 90 seconds total.

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 overspeed 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 FUSES

Fuse F1 (15 amp) 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.

Fuse F2 (25 amp) is located in the engine wire harness adjacent to the DC alternator. It is used to prevent circuit failure due to DC alternator falure. If this fuse is blown, battery charging will not occur while the engine is running. Replace these fuses with 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 (LPV) 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.

NOTE:

The fuel consumption requirements are identified in the Specifications section of the Owner's Manual. Refer to the Installation Manual if assistance is required for the sizing of the pipe diameter for the generator. Any piping used to connect the generator to the fuel supply should be of adequate size to achieve the 100% load fuel consumption requirements identified in the Specifications section regardless of actual load.

NOTE:

The recommended fuel pressure is identified in the Specifications section this 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 must never 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:

- 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.

SPECIFICATIONS

◆ GENERATOR

Type ..... Synchronous
Rotor Insulation ..... Class F
Stator Insulation ..... Class F
Total Harmonic Distortion ..... < 5%
Alternator Output Leads 3-phase 4-wire
Bearings ..... Sealed Ball
Coupling ..... Flexible Disc
Load Capacity (Standby Rating) ..... 20/25/30 kW*

* 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 ..... Direct

Generator Output Voltage/kW - 60 Hz

	kW	Amp	CB Size
120/240V, 1-phase, 1.0 pf	20/25/30	83/104/125	100/125/150
120/208V, 3-phase, 0.8 pf	20/25/30	69/87/104	80/100/125
277/480V, 3-phase, 0.8 pf	20/25/30	30/38/45	35/45/50

Generator Locked Rotor KVA Available @ Voltage Dip of 35%

Single-phase or 208 3-phase:	20kW	25kW	30kW
	34 KVA	38 KVA	56 KVA

◆ ENGINE

Make ..... Generac
Model ..... In Line
Cylinders and Arrangement 4
Displacement ..... 1.6 Liter
Bore ..... 3.15 in.
Stroke ..... 3.13 in.
Compression Ratio 9.75-to-1
Air Intake System ..... Naturally Aspirated
Valve Seats ..... Replaceable
Lifter Type ..... Hydraulic

Engine Parameters

Rated Synchronous RPM ..... 60 Hz, 3600

HP at rated:	20kW	25kW	30kW
	35 HP	45 HP	48 HP

Exhaust System

Exhaust Flow at Rated Output 60 Hz:	20kW	25kW	30kW
	209 cfm	235 cfm	240 cfm
Exhaust Temp. at Rated Output:	910°F	1015°F	1022°F

Combustion Air Requirements (Natural Gas)

Flow at rated power, 60 Hz:	20kW	25kW	30kW
	80 cfm	90 cfm	92 cfm

Governor

Type ..... Electronic
Frequency Regulation ..... Isochronous
Steady State Regulation ..... ± .25%
Adjustments:
Speed ..... Selectable

Engine Lubrication System

Type of Oil Pump ..... Gear
Oil Filter ..... Full Flow, Cartridge
Crankcase Oil Capacity ..... 4 U.S. qts.

◆ COOLING SYSTEM

Type ..... Closed
Water Pump ..... Belt Driven
Fan Speed 2450
Fan Diameter ..... 17.7 inches
Fan Mode ..... Pusher
Air Flow (inlet air including alternator and combustion air) ..... 2490 ft^3/min.
Coolant Capacity ..... 2.0 U.S. gal.
Heat Rejection to Coolant ..... 117,000 Btu/h
Maximum Operating Air Temp. on Radiator ..... 60° C (150° F)
Maximum Ambient Temperature ..... 50° C (140° F)

◆ FUEL SYSTEM

Type of Fuel ..... Natural Gas, Propane Vapor
Carburetor ..... Down Draft
Secondary Fuel Regulator ..... Standard
Fuel Shut-off Solenoid ..... Standard
Operating Fuel Pressure ..... 5 in. - 14 in. Water Column

Fuel Consumption - ft^3/hr (Natural Gas/LPV)

	Exercise Cycle	*25% Load*	*50% Load*	*75% Load*	*100% Load*
20kW	56/24	124/49	188/75	250/99	315/125
25kW	56/24	161/64	253/101	345/138	430/175
30kW	56/24	209/82	281/117	360/147	437/185

◆ ELECTRICAL SYSTEM

Battery Charge Alternator ..... 12V, 15 Amp
Static Battery Charger ..... 2 Amp
Recommended Battery ..... Group 26, 525CCA
System Voltage ..... 12 Volts

Voltage Regulator

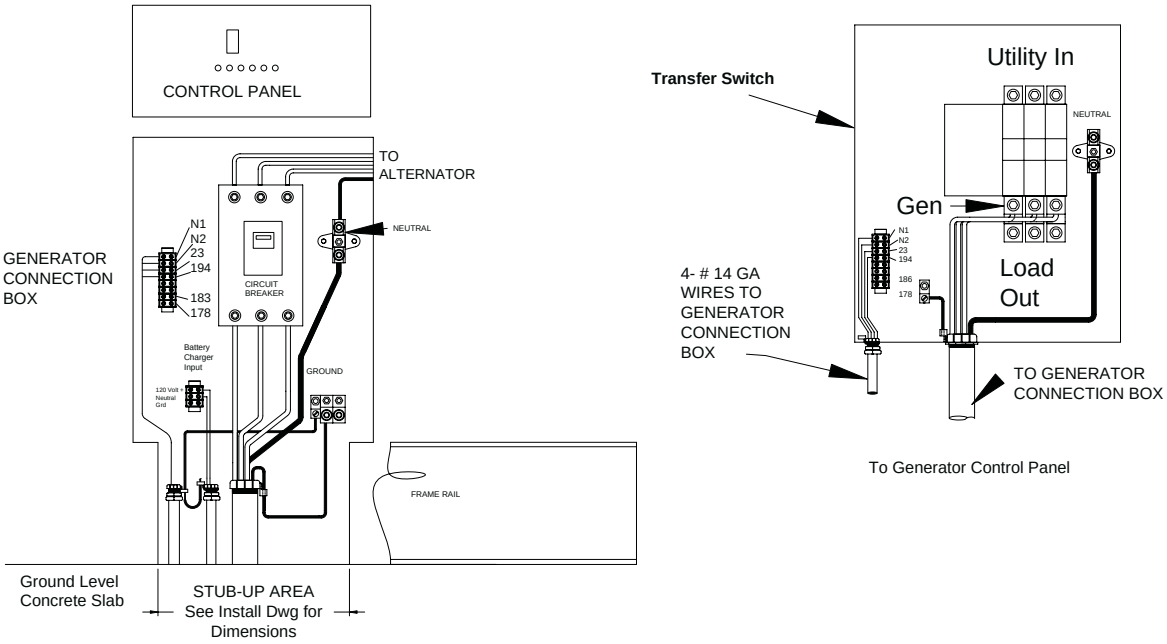
Type ..... Electronic
Sensing ..... Single-phase
Regulation ..... ± 1%
Features ..... V/F Adjustable, Adjustable Voltage and Gain LED Indicators

Power Adjustment for Ambient Conditions

Temperature Deration:			
3% for every 10° C above °C	20kW	25kW	30kW
	40	40	25
1.65% for every 10° above °F	104	104	77
Altitude Deration:			
1% for every 100 m above m	20kW	25kW	30kW
	1220	915	182
3% for every 1000 ft. above ft.	4000	3000	600

Controller R-200

Figure 6.1 — Interconnections



◆ COLD WEATHER KIT

For cold climates, optional cold weather kit (part number 0F6148) is recommended. The kit includes:

- Battery Warmer
- 4" Junction Box with hardware
- 6 qt. pack 5W-30 synthetic oil (engine)

◆ RECONFIGURING THE FUEL SYSTEM

NOTE:

All models are configured to run on natural gas from the factory.

To reconfigure the fuel system from NG to LP, follow these steps:

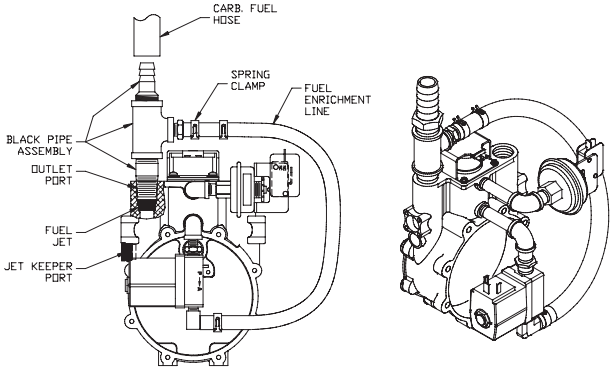
1. Turn the main gas supply off.
2. Remove the carburetor fuel hose from the outlet port of the demand regulator (see Figure 6.2).
3. Disconnect the power wires from the fuel solenoid located on top of the regulator assembly.
4. Loosen the spring clamp on the small fuel enrichment line and remove the hose from the hose barb.
5. Remove the black pipe assembly from the outlet port of the demand regulator.
6. Remove the NG fuel jet (loosen counter clockwise) from the outlet port.
7. Remove the LP fuel jet (loosen counter clockwise) from the jet keeper port on the side of the regulator housing. Install this jet into the outlet port in the regulator casting.

NOTE:

The jet sizes are stamped on the individual jets. The larger jet size is used for running on NG.

8. Install the previously removed NG jet into the jet keeper port on the side of the regulator housing.
9. Install the previously removed black pipe onto the outlet port of the demand regulator.
10. Reverse steps 1-4 in this procedure to reactivate the demand regulator.

Figure 6.2 — Reconfigure the Fuel System



⚠ DANGER ⚠

⚠ Serious injury or damage may occur if not configured properly. Please consult an Authorized Dealer with any questions.

GENERATOR AC LEAD CONNECTIONS

See “Voltage Codes”. This Stationary Emergency Generator may be rated at any one of five voltages, either single-phase or three-phase. 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. If there are any questions regarding lead connection, refer to the wiring diagrams at the back of this manual.

Voltage codes apply to the type of stator assembly installed on a particular generator.

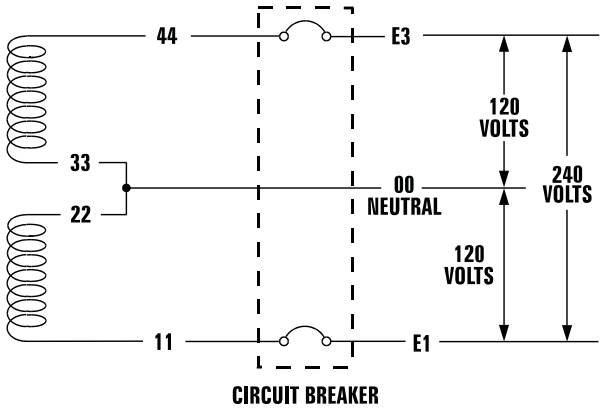
ALTERNATOR POWER WINDING CONNECTIONS

FOUR-LEAD, SINGLE-PHASE STATOR

Four-lead generators are built to supply electrical loads with voltage code "A" (240V, 1-phase, 60Hz). 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



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, 7.3, and 7.4.

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

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

Figure 7.2 — Stator Power Winding Connections - 3-phase, 120/208V (12 Lead)

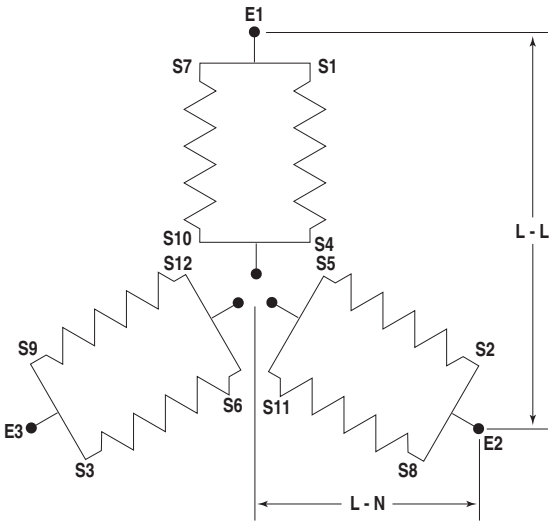


Figure 7.3 — Stator Power Winding Connections - 3-phase, 277/480V (12 Lead)

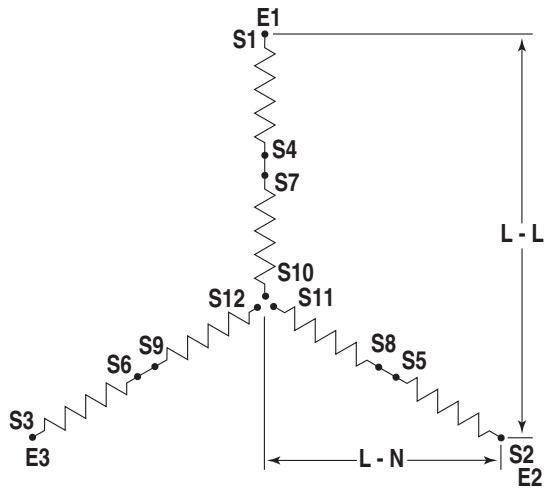
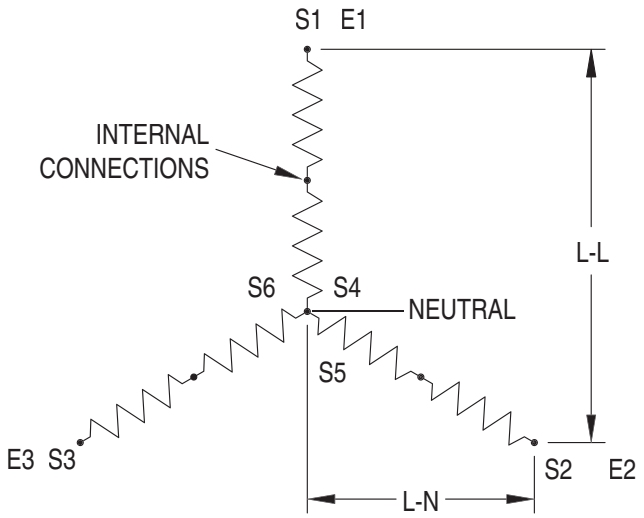


Figure 7.1 — Stator Power Winding Connections - 3-phase, 346/600V (6 Lead)



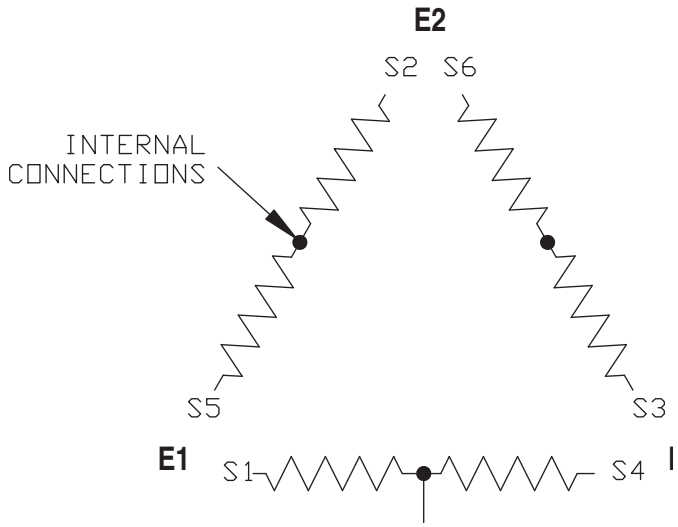
3-PHASE ALTERNATORS ("DELTA" CONFIGURATION)

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 7.5.

The rated voltage between circuit breaker terminals E1-E2, E1-E3 and E2-E3 is 208V.

The rated voltage between E1 or E3 and the neutral point 00 is 120V.

Figure 7.5 — 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 SERVICE DEALERS

⚠ 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 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 filter.

FIRST 100 OPERATING HOURS

1. Change engine oil and oil filter. After initial change, service engine oil and filter at 100 operating hours or six months, whichever comes first.
2. Retorque cylinder head.
3. Retorque intake and exhaust manifold.

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. (See the installation diagram.)

⚠ WARNING!

The exhaust system parts from this product get extremely hot and remains 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.

OVERLOAD PROTECTION FOR ENGINE DC ELECTRICAL SYSTEM

Engine cranking, start up and running are controlled by a solid state Engine Controller circuit board. Battery voltage is delivered to that circuit board via a 15 amp fuse. These overcurrent protection devices will open if the circuit is overloaded.

⚠ CAUTION!

If a circuit breaker opens or a fuse element melts, find the cause of the overload before resetting the circuit breaker or replacing the fuse.

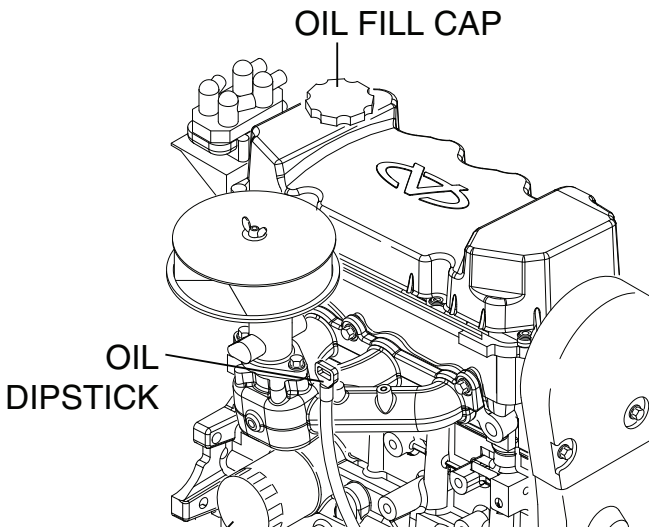
CHECKING FLUID LEVELS

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 Recommen-dations” for recommended oils.

Figure 10.1 - Oil Dipstick and Oil Fill Cap



BATTERY FLUID

Check battery electrolyte fluid based on the Maintenance Schedule. 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 Specifications.

- Add recommended coolant mixture as necessary.
- Periodically remove radiator pressure cap (only when engine has cooled down) 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 a Service Dealer. Inspect cooling system and coolant recovery system for leaks.

MAINTENANCE OWNER/OPERATOR CAN PERFORM

CHECK ENGINE OIL LEVEL

Refer to “Checking Fluid Levels”.

CHECK BATTERY

- See “Checking 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. See “Maintenance Schedule”.
- Check hoses for damage, deterioration, leaks, etc. Correct any discrepancies found.
- Check hose clamps for tightness.

CHECK ENGINE COOLANT LEVEL

See “Checking Fluid Levels”.

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 of an 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.

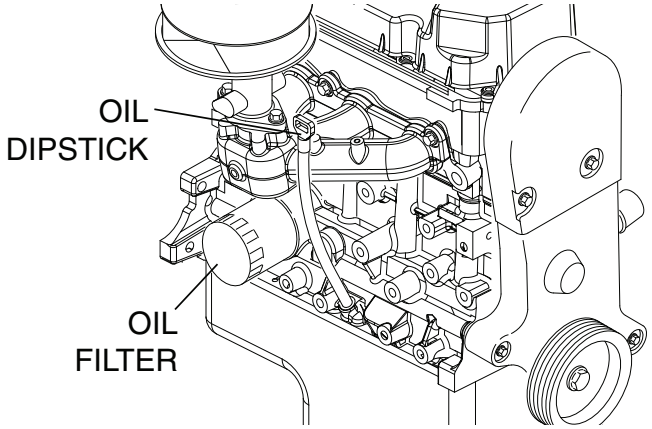
CHANGING ENGINE OIL

Refer to maintenance performed by 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. Properly dispose of old filter.

Figure 10.2 – Oil Filter



5. Apply light coating of new engine oil to seal of new oil filter.-Install FILTER and tighten by hand only. DO NOT OVER TIGHTEN.
6. Remove OIL FILL CAP. Add recommended oil (see SPECIFICATIONS). DO NOT FILL ABOVE THE DIPSTICK "FULL" MARK. Crankcase oil capacity is 4.0 U.S. quarts (3.8 liters).

⚠ CAUTION!

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

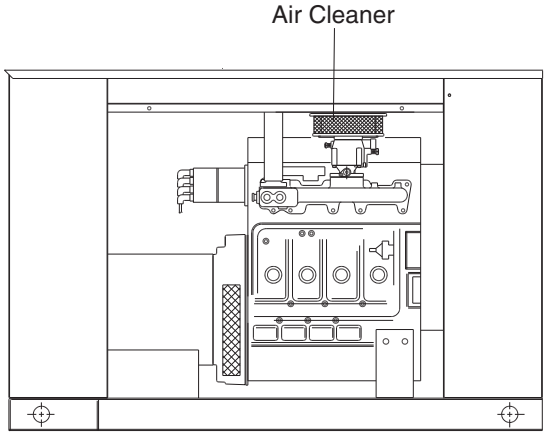
7. Start engine and check for oil leaks.

CHANGING THE ENGINE AIR CLEANER

To replace the engine air cleaner, simply remove the air cleaner cover and replace the air filter making sure it is positioned properly before reattaching the cover (Figure 10.3).

See the "Service Schedule," for air cleaner maintenance.

Figure 10.3 – Engine Air Cleaner



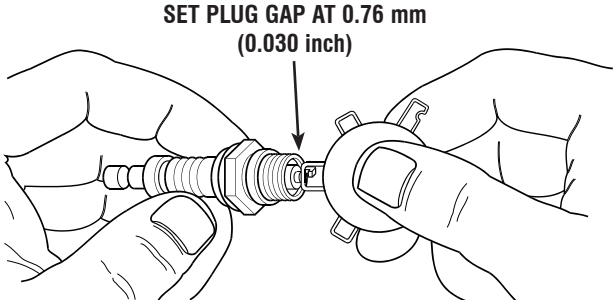
(Doors Removed for Clarity)

SPARK PLUGS

Reset the spark plug gap or replace the spark plugs as necessary (Figure 10.4).

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 to 0.76 mm (0.030 inch) by carefully bending the ground electrode (Figure 10.4).

Figure 10.4 – Setting the Spark Plug Gap



COOLANT CHANGE

Every year, have a service facility drain, flush and refill the cooling system. See "Specifications" 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 a 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 Scheduled Maintenance 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 corrosive sulfuric acid solution that can cause severe burns. Do not permit fluid to contact eyes, skin, clothing, painted surfaces, etc. Wear protective goggles, protective clothing and gloves when handling a battery. If fluid is spilled, flush the affected area immediately with clear water.

Do not 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

NOTE:

Unit DOES NOT include battery.

When supplying or replacing the battery, the recommended number and type of battery is listed in the Specifications Section.

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

The following is a recommended maintenance schedule for Stationary Emergency Generator sets. 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 or accumulated run 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.

*Performed monthly this requires approximately .**5 man-hours** per unit to complete.*

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 5 amp and 15 amp control panel fuses.**
- **Turn off the battery charger (turn OFF utility supply to ATS).**
- **Remove the negative battery cable.**

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 break-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 30 run time hours of operation after purchase of the unit and requires approximately **2.5 man-hours** per unit to complete.*

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 this requires approximately **1.5 man-hours** per unit to complete.*

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 this requires approximately **4.0 man-hours** per unit to complete.*

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)
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 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 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.							⬭	
10. Check the engine accessory drive belts for wear, weather cracking, and damage. Replace as necessary.							⬭	
11. Visually inspect the unit looking for leaks, wear or damage, loose connections or components, and corrosion. Correct as necessary.	⬭		⬭		⬭		⬭	
12. Test the engine and transfer switch safety devices. Correct and/or adjust as necessary.							⬭	

Service Schedule

Maintenance Tasks	Level 1 Recommended to be done monthly 10 Hrs.	Task Comp. (Date-In itials)	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)
13. 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.			⬭		⬭			
14. 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.							⬭	
15. Change the engine oil.			⬭				⬭	
16. Replace the engine oil filter(s).			⬭				⬭	
17. Replace the engine air filter(s).							⬭	
18. Replace the engine fuel filter(s) on diesel engine driven units and re-prime the fuel system.			⬭				⬭	
19. Check the engine spark plugs on gas engine driven units. Clean and re-gap or replace as necessary.			⬭				⬭	
20. Perform a 5 minute no-load operational run of the unit looking for any post service problems.			⬭				⬭	
21. Return the unit to standby setup for operation when required.	⬭		⬭		⬭		⬭	

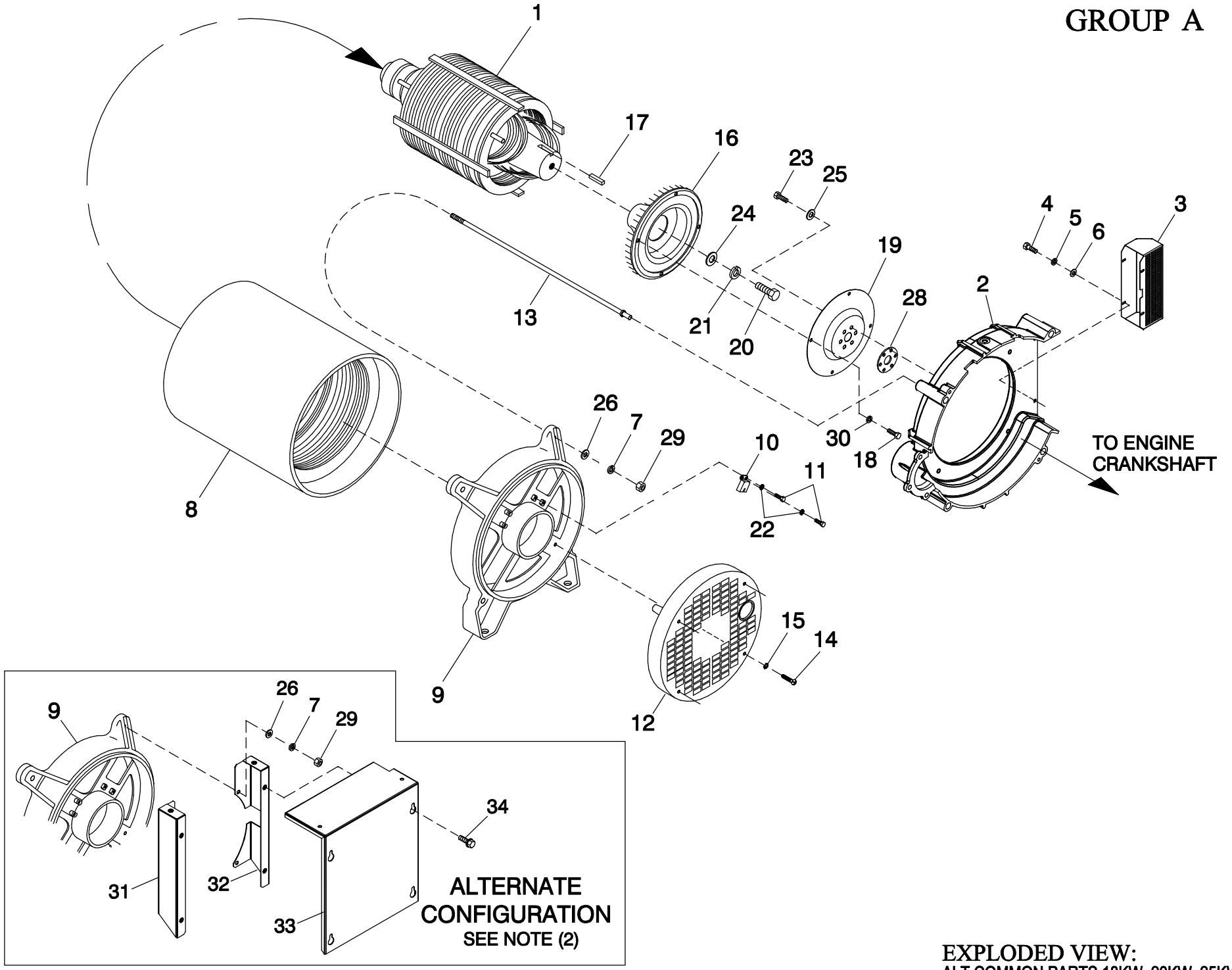
TROUBLESHOOTING GUIDE

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.**

Notes

GROUP A



EXPLODED VIEW:
ALT COMMON PARTS 18KW, 20KW, 25KW, & 30KW
DRAWING #: 0G4008

REVISION: H-9869-N
DATE: 10/28/11

EXPLODED VIEW: ALT COMMON PARTS 18KW, 20KW, 25KW, & 30KW
DRAWING #: 0G4008

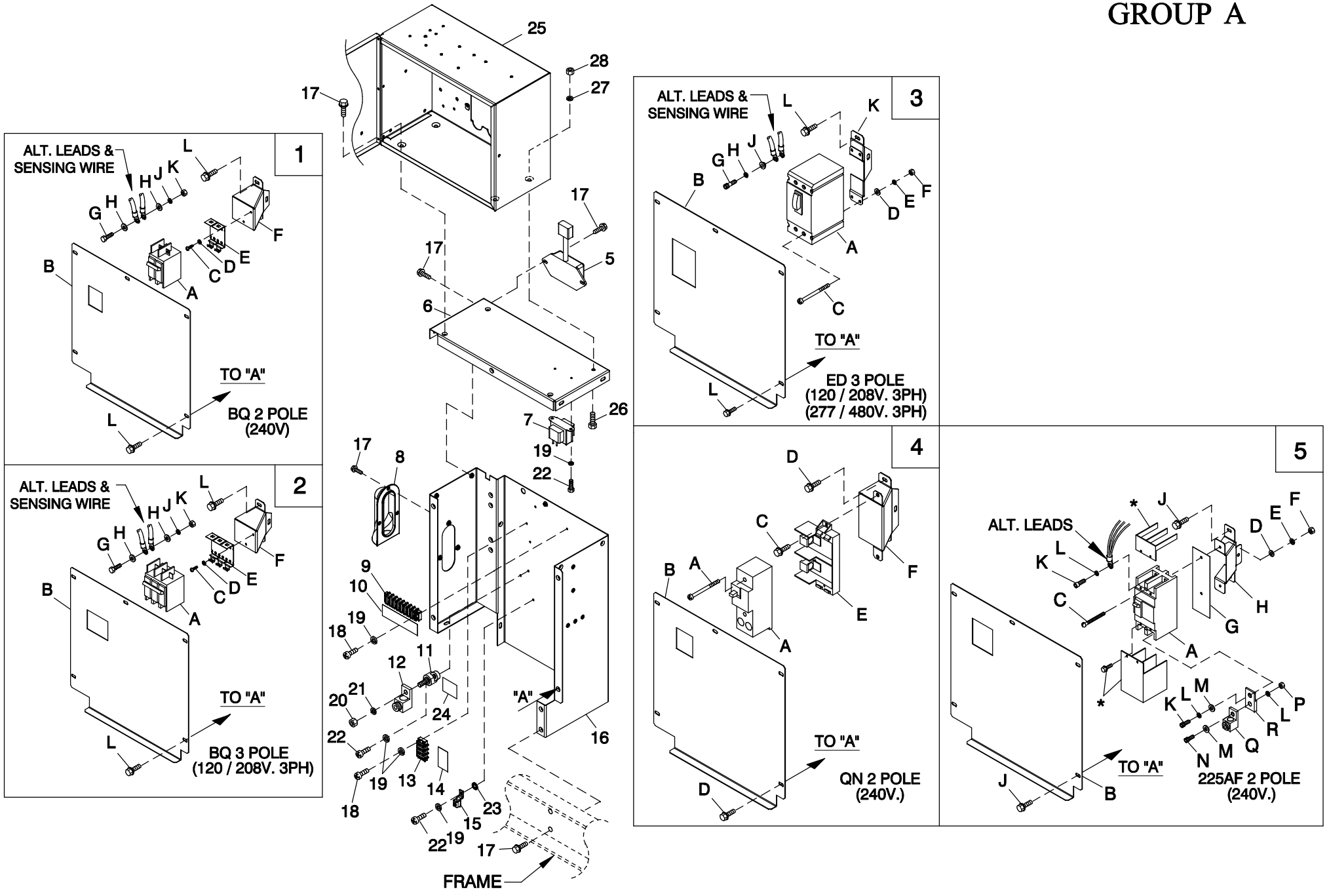
GROUP A

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0G4827	1	ASSY RTR 104 KD1 HI EFF (18KW)
	0G2927	1	RTR-102-20.0AD1 CPL (2006) (20KW)
	0G2827	1	ASSY RTR 25KW 2P (2006) (25KW)
	0G3451	1	ASSY RTR 30KW 2P 10"(2006)
2	0G0820A	1	HOUSING BLOWER LG PILOT
3	0G4452	1	BLOWER HOUSING SCREEN
4	020746	4	SCREW PPHM M5-0.8 X 8 ZINC
5	049226	4	WASHER LOCK M5
6	051713	4	WASHER FLAT M5
7	022129	4	WASHER LOCK M8-5/16
8	0G4825	1	ASSY STR 104-18AD1 HI EFF (18KW)
	0G4826	1	ASSY STR 104 18GD1 HI EFF (18KW)
	0G2926	1	STR-102-20.0AD1 CPL (2006) (20KW)
	0G3682	1	STR-102-20.0GD1 CPL (2006) (20KW)
	0G5584	1	STR-102-20.0JD1 CPL (2006) (20KW)
	0G3685	1	STR-102-20.0KD1 CPL (2006) (20KW)
	0G2826	1	ASSY STR 102 25AD1 (2006) (25KW)
	0G3683	1	STR-102-25.0GD1 CPL (2006) (25KW)
	0G6573	1	STR-102-25.0-JD1 CPL (2006) (25KW)
	0G3686	1	STR-102-25.0KD1 CPL (2006) (25KW)
	0G3684	1	STR-102-30.0GD2 CPL (30KW)
	0G3687	1	STR-102-30.0KD2 CPL (30KW)
	0G5909	1	ASSY STR 102 30AD2 10" (30KW)
	0G6103	1	STR-102-30.0JD2
9	0A5382A	1	BEARING CARRIER REAR LG PILOT
10	075591	1	ASSY HOLDER BRUSH
11	051787	4	SCREW HHC M4-0.7 X 16 G8.8
12	0A5601A	1	COVER REAR BEARING
13	0G8827	4	STUD M8-1.25 475 LONG
	0G8827A	4	STUD M8-1.25 418 LONG
14	0A9375	4	SCREW RHM #10-24 X 2
15	022152	4	WASHER LOCK #10
16	0G4196	1	FLYWHEEL & RINGGEAR ASSY 1.6L
17	042558	1	KEY SQ 3/8 X 1 STEEL
18	0J6102	4	SCREW HHFC M10-1.5 X 16 C10.9
19	0G0965B	1	PLATE FLEX 1.6L R12.7
20	053607	1	SCREW HHC M12-1.75 X 35 G8.8
21	051769	1	WASHER LOCK M12
22	023365	4	WASHER SHAKEPROOF INT #8
(1) 23	0F3353	6	SCREW HHC M10-1.0 X 20 G10.9
24	072578	1	SPACER ROTOR SHAFT
25	0G3787	6	WASHER .41 ID .94 OD .12 THK
26	0A8830	4	WASHER FLAT .34 ID X .75 OD
27	077043E	1	FLEX CONDUIT 1" BLACK (NOT SHOWN)
28	0G2070	1	PLATE SPACER 14GA 1.6L (TO BE USED WITH ENGINE PLATE P/N 0G0834.)
	0G2070A	1	PLATE SPACER 16GA 1.6L (TO BE USED WITH ENGINE PLATE P/N 0G0834A.)
29	045771	4	NUT HEX M8-1.25 G8 CLEAR ZINC
30	0D8427	4	WASHER LOCK M10 RIBBED ZINC
(2)31	0J6853A	1	SUPPORT LH ALT COVER
(2)32	0J6853B	1	SUPPORT RH ALT COVER
(2)33	0J6853C	1	COVER REAR 10" ALT
(2)34	0C2454	6	SCREW HWHT M6-1 X 16 N WA Z/JS

(1) APPLY LOCTITE 242 BEFORE THREADING SCREW INTO CRANKSHAFT.
(2) ALTERNATE CONFIGURATION REQUIRES ALL NOTED PARTS.

GROUP A



EXPLODED VIEW:
CONNECTION BOX C1 CPL
DRAWING #: 0G4980

EXPLODED VIEW: CONNECTION BOX C1 CPL
DRAWING #: 0G4980

GROUP A

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	N/A	N/A	UL BREAKER BQ2
A	0D5543	1	CB 0090A 2P 240V S BQ2 LL
	0D5544	1	CB 0100A 2P 240V S BQ2 LL
	0A2077	1	CB 0125A 2P 240V S BQ2 LL
B	0G4499	1	CB COVER 20-25K 1P (BQ2)
C	0C2265	2	SCREW PHTT M4-0.7 X 12 ZYC
D	0C2264	2	WASHER LOCK #8-M4
E	0E7890	1	BRKT CB MTG BACK
F	0G4497	1	CIRCUIT BREAKER SUPPORT (BQ)
G	052619	2	SCREW HHC M5-0.8 X 20 G8.8
H	023897	4	WASHER FLAT #10 ZINC
J	049226	2	WASHER LOCK M5
K	051716	2	NUT HEX M5-0.8 G8 CLEAR ZINC
L	0E3257	7	SCREW HWHTF M6-1.0 X 16
2	N/A	N/A	UL BREAKER BQ3
A	049135	1	CB 0070A 3P 240V S BQ3 LL
	062812	1	CB 0080A 3P 240V S BQ3 LL
	040532	1	CB 0100A 3P 240V S BQ3 LL
B	0G4500	1	CB COVER 20-25K 3P (BQ3)
C	0C2265	2	SCREW PHTT M4-0.7 X 12 ZYC
D	0C2264	2	WASHER LOCK #8-M4
E	0E6002	1	BRKT CB MTG BACK
F	0G4497	1	CIRCUIT BREAKER SUPPORT (BQ)
G	052619	3	SCREW HHC M5-0.8 X 20 G8.8
H	023897	6	WASHER FLAT #10 ZINC
J	049226	3	WASHER LOCK M5
K	051716	3	NUT HEX M5-0.8 G8 CLEAR ZINC
L	0E3257	7	SCREW HWHTF M6-1.0 X 16

ITEM	PART #	QTY.	DESCRIPTION
3	N/A	N/A	UL BREAKER ED
A	0D5548	1	CB 0030A 3P 480V S ED4 LL
	0D5549	1	CB 0035A 3P 480V S ED4 LL
	0D5551	1	CB 0045A 3P 480V S ED4 LL
	0D5552	1	CB 0050A 3P 480V S ED4 LL
	0D5556	1	CB 0090A 3P 480V S ED4 LL
	0D5557	1	CB 0100A 3P 480V S ED4 LL
	0D9693	1	CB 0125A 3P 480V S ED4 LL
B	0G4502	1	CB COVER 20-30K 3P (ED)
C	066715	4	SCREW RHM #8-32 X 4-1/2
D	038150	4	WASHER FLAT #8 ZINC
E	022264	4	WASHER LOCK #8-M4
F	022471	4	NUT HEX #8-32 STEEL
G	0A8278	3	SCREW SHC 1/4-28 X 3/4 G8.8 NZ
H	022097	3	WASHER LOCK M6-1/4
J	0D5621	3	WASHER-STEP 1/2ODX9/32ID BRASS
K	0G4498	1	CIRCUIT BREAKER SUPPORT (ED)
L	0E3257	7	SCREW HWHTF M6-1.0 X 16
4	N/A	N/A	UL BREAKER QN
A	0E7283	1	CB 0150A 2P 240V S QN2 LL
B	0G3474	1	CONBOX FRONT COVER 1.6L QN 2P
C	074908	2	SCREW HHTT M5-0.8 X 10 BP
D	0E3257	7	SCREW HWHTF M6-1.0 X 16
E	0E3664	1	BASE, QN CIRCUIT BREAKER
F	0G4112	1	BREAKER SUPPORT BRACKET 30KW
5	0A1354A	1	REGULATOR - DC ALT
6	0G3473	1	CONBOX TOP PANEL SUPPORT
7	0F6366A	1	XFMR 208 TO 16V 6VA (208V. ONLY)
	0F6366B	1	XFMR 240 TO 16V 6VA (240 / 480V.)
8	0G3524	1	COVER BELL HOUSING CONBOX
9	057701	1	BLOCK TERM 20A 8 X 6 X 1100V
10	0F3824	1	DECAL UTIL SENSE/CUST CONN
11	057073	1	JUNCTION BLOCK 3/8-16
12	057329	1	LUG SLDLSS 350-#6X13/32 AL/CU
13	0D4698	1	BLOCK TERM 20A 6 X 3 X 1100V
14	0F4464	1	DECAL CUST CONN 120V UTILITY
15	025433	1	LUG SLDLSS #6-14 X 13/64 CU
16	0G3472	1	CONBOX BACK & SIDES 1.6L
17	0E3257	22	SCREW HWHTF M6-1.0 X 16
18	0C2212	4	SCREW PHTT M4-0.7 X 16 ZYC
19	022264	9	WASHER LOCK #8-M4
20	022241	1	NUT HEX 3/8-16 STEEL
21	022237	1	WASHER LOCK 3/8
22	0C2265	5	SCREW PHTT M4-0.7 X 12 ZYC
23	023762	1	WASHER SHAKEPROOF EXT #10 STL
24	0A9457	1	DECAL NEUTRAL
25	0G4577E	REF	ASSY R-200 3600 1.6L
	0G4578E	REF	ASSY R-200 1800 1.6L
26	047411	1	SCREW HHC M6-1.0 X 16 G8.8
27	022097	1	WASHER LOCK M6-1/4
28	049813	1	NUT HEX M6 X 1.0 G8 YEL CHR
5	N/A	N/A	UL BREAKER
A	0G5249	1	CB 150A 2 POLE 240V 225AF
*	W/CB	2	TERMINAL COVER CB
B	0G5735	1	CB COVER 30K G 225AF
C	053640	2	SCREW RHM #8-32 X 3-1/4
D	038150	2	WASHER FLAT #8 ZINC
E	022264	2	WASHER LOCK #8-M4
F	022471	2	NUT HEX #8-32 STEEL
G	0F8432A	1	INSULATOR CB 2P 225AF
H	0G5734	1	CIRCUIT BREAKER SPPRT G 225AF
J	0E3257	8	SCREW HWHTF M6-1.0 X 16
K	049897	4	SCREW SHC M8-1.25 X 20 G8
L	022129	4	WASHER LOCK M8-5/16
M	022145	6	WASHER FLAT 5/16-M8 ZINC
N	058306	2	SCREW SHC M8-1.25 X 25 G12.9
P	045771	2	NUT HEX M8-1.25 G8 CLEAR ZINC
Q	0F8451	2	LUG SLDLSS 300 MCM-6 AL/CU
R	0F8843	2	BUS BAR 200A LUG ADAPTOR

GROUP B

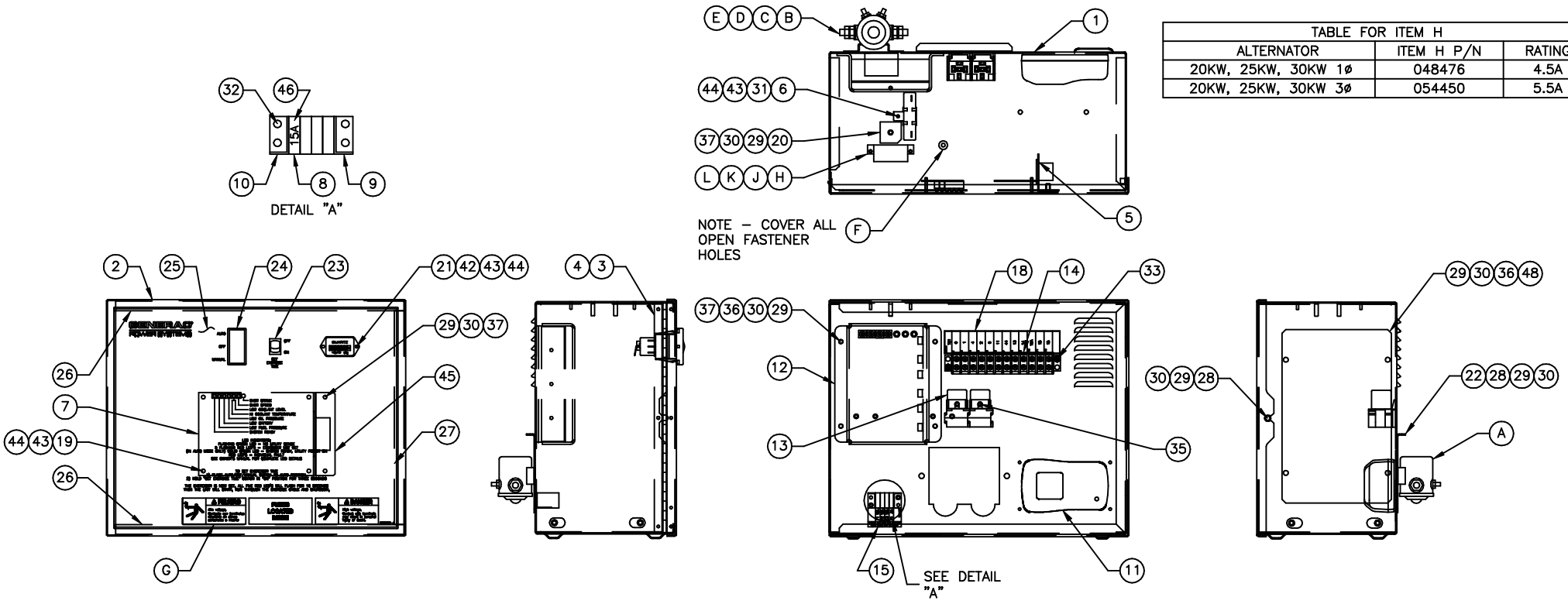


TABLE FOR ITEM H		
ALTERNATOR	ITEM H P/N	RATING
20KW, 25KW, 30KW 1ø	048476	4.5A
20KW, 25KW, 30KW 3ø	054450	5.5A

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

EXPLODED VIEW:
R-200 3600 RPM 1.6L
DRAWING #: 0G4577D

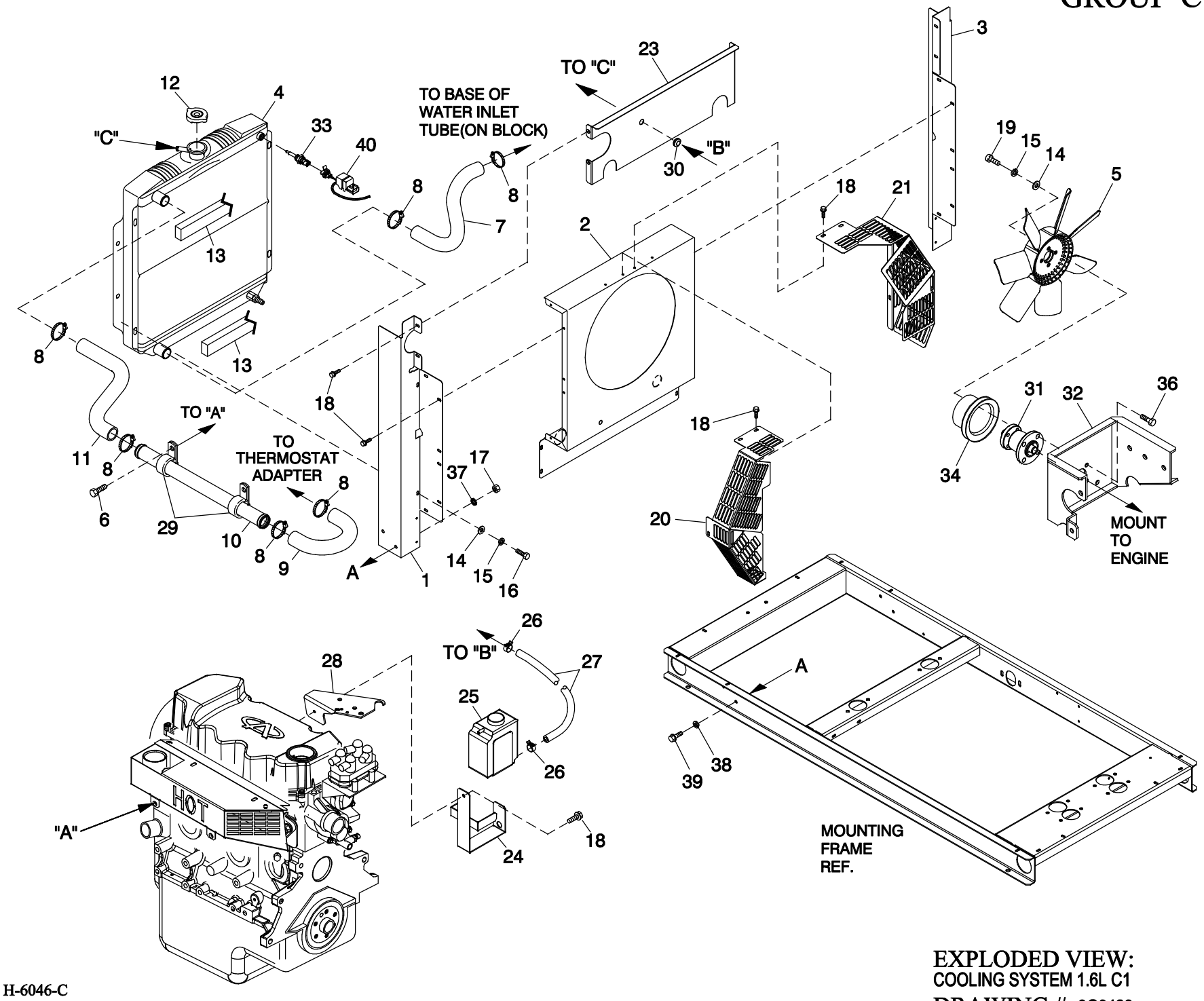
EXPLODED VIEW: R-200 3600 RPM 1.6L
DRAWING #: 0G4577D

GROUP B

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
			COMPONENTS INCLUDED IN 0G4577E
1	0F1823A	1	ENCL HSB CONTROL PANEL
2	0F3078CST03	1	COVER CONTROL PNL W/HOUR METER
3	0F2606	1	HINGE CONTINUOUS H-PANEL
4	036261	7	RIVET POP .125 X .275 SS
5	0E7358	4	SCREW PPPH HI-LO #4-24 X 3/8
6	052777	3	WASHER FLAT M3
7	0G3958D	1	ASSY PCB R-200A CNTRL 3600
8	0F1262	REF	HOLDER FUSE WICKMANN 178.6150
9	0F1263	REF	ADPTR RH SIDE WICKMAN 178.6191
10	0F1264	REF	ADPTR LH SIDE WICKMAN 178.6192
11	0G8023D	1	BATC 13.4VDC 2.5A W/8POS PLUG
12	067680	1	ASSY VOLTAGE REGULATOR 60HZ
13	0E6875A	2	RELAY 12VDC C FORM W/DIODE
14	055911	REF	BLOCK TERM 20A 12 X 6 X 1100V
15	0F5459	1	DECAL CPL CONTROL PANEL FUSES
18	0F5462	1	DECAL CPL 3.9L TB1
19	0A5062J	4	SPACER 9.5H 3.2 ID
20	029673	1	DIO BRIDGE 25A 600V
21	0C1457A	1	HOUR METER 10-80VDC
22	0F1958	1	PLATE HARNESS CLAMP
23	082573	1	SWITCH RKR DPST 125V SPD
24	0E4494	1	SWITCH RKR DPDT ON-OFF-ON
25	0G9372	1	DECAL CONTROL PNL W/HOUR METER
26	0F6305	2	SEAL COVER 3.18 X 12.7 X 382
27	0F6305A	1	SEAL COVER 3.18 X 12.7 X 283
28	0F5886	3	SCREW HHPM M5-0.8 X 12
29	051713	14	WASHER FLAT M5
30	049226	14	WASHER LOCK M5
31	0F5752F	1	RES WW 15R 5% 25W QK CONN
32	0F5884	2	SCREW PHTT M3.5-0.6 X 10
33	0F5896	2	SCREW PHTT M3.5-0.6 X 16
35	0C3990	2	SCREW PHTT M4-0.7 X 10 ZYC
36	091526	8	SCREW PPHM M5-0.8 X 12 ZNC
37	051716	7	NUT HEX M5-0.8 G8 CLEAR ZINC
42	074076	2	SCREW PHM M3-0.5 X 10 BLACK
43	043182	7	WASHER LOCK M3
44	051714	7	NUT HEX M3-0.5 G8 YEL CHR
45	0F3192	1	SUPPORT ANGLE PCB
46	0E7403C	1	FUSE ATO TYPE 15 AMP (BLUE)
47	0G4583	1	HARN CTRL PNL R-200 LOW KW (NOT SHOWN)
48	0F2627	1	PLATE COVER H PANEL
			COMPONENTS INSTALLED PER THIS DRAWING
A	056739	1	RELAY SOLENOID 12VDC PNL MNT
B	022287	2	SCREW HHC 1/4-20 X 3/4 G5
C	022473	4	WASHER FLAT 1/4-M6 ZINC
D	022097	2	WASHER LOCK M6-1/4
E	022127	2	NUT HEX 1/4-20 STEEL
F	0F6145	A/R	SEAL WEATHER .45" DIA
G	0G3545	1	DANGER HIGH VOLTAGE (SPANISH)
H	SEE TABLE	1	CIRCUIT BREAKER
J	052777	2	WASHER FLAT M3
K	043182	2	WASHER LOCK M3
L	051714	2	NUT HEX M3-0.5 G8 YEL CHR

GROUP C



EXPLODED VIEW:
COOLING SYSTEM 1.6L C1
DRAWING #: 0G3428

REVISION: H-6046-C
DATE: 2/18/10

EXPLODED VIEW: COOLING SYSTEM 1.6L C1
DRAWING #: 0G3428

GROUP C

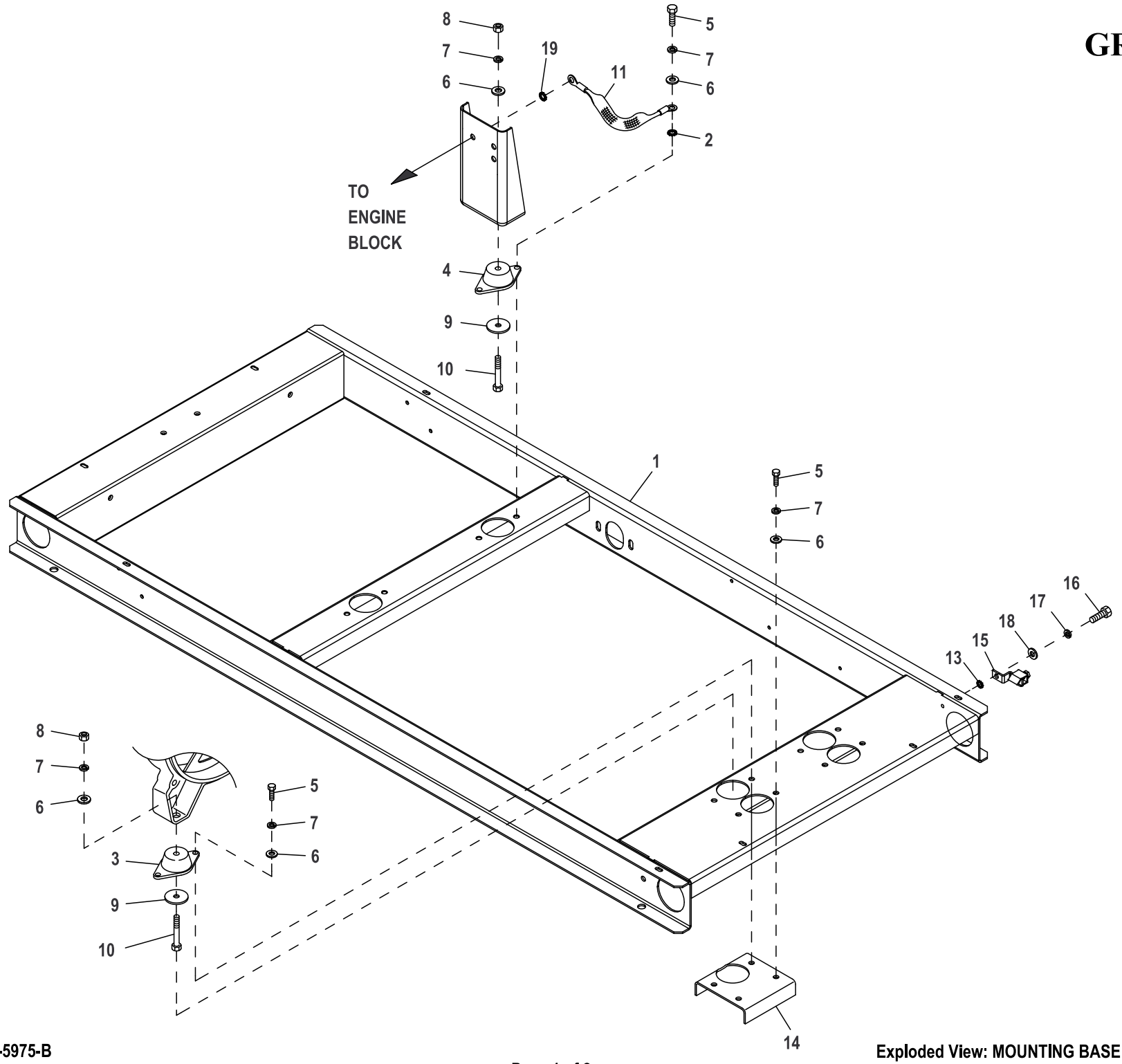
APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0G3418	1	RADIATOR SUPPORT LH SIDE 1.6L
2	0G3421	1	VENTURI 1.6L
3	0G3419	1	RADIATOR SUPPORT RH SIDE 1.6L
4	0E9837B	1	RADIATOR 1.6L CHY
5	0G3553	1	FAN COOL 450MM DIA 7 BLADE
6	0E3257	2	SCREW HWHTF M6-1.0 X 16
7	0G4080	1	HOSE LOWER RADIATOR 1.6L
8	099502	6	CLAMP HOSE #24 B1.06-2.00
9	0G4070	1	HOSE REAR COOLANT 1.6L
10	0G4072	1	TUBE ENGINE COOLANT 1.6L
11	0G4071	1	HOSE UPPER RADIATOR 1.6L
12	046627	1	CAP RADIATOR
13	052250	2	TAPE FOAM 1 X 1 (24” LG)
14	022473	8	WASHER FLAT 1/4-M6 ZINC
15	022097	8	WASHER LOCK M6-1/4
16	0C8566	4	SCREW HHFC M6-1.0 X 20 G8.8
17	045771	4	NUT HEX M8-1.25 G8 CLEAR ZINC
18	0C2454A	28	SCREW THF M6-1 X 12 N WA Z/JS
19	042568	4	SCREW HHC M6-1.0 X 20 G8.8
20	0G3573	1	GUARD FAN LH C1
21	0G3574	1	GUARD FAN RH C1
23	0G3420	1	RADIATOR BLOCK-OFF
24	080713	1	BRACKET COOLANT TANK
25	076749	1	TANK COOLANT RECOVERY
26	048031C	2	CLAMP HOSE BAND 1/4
27	029032	1	HOSE 9/32 ID (43” LG)
28	0G4451	REF	BRACKET STEPPER MOTOR COOLANT
29	055934N	2	CLAMP VINYL 1.31 X .281 Z
30	0F9504	1	GROMMET 5/8"X 1 1/8"X 5/16"
31	0G0568	1	ASSY FAN BEARING SUPPORT
32	0G3433	1	BRACKET FAN ALT ADAPTER 1.6L
33	0E2507	1	PROBE COOLANT LEVEL 3/8NPTF
	0H1827	1	PROBE COOLANT LEVEL 3/8-18NPTF (USE WITH I/N 40, P/N 0H1851)
34	0A2628	1	PULLEY - FAN 95 DIA
35	029333A	10	TIE WRAP UL 7.4" X .19" BLK (NOT SHOWN)
(1) 36	042907	4	SCREW HHC M8-1.25 X 16 G8.8
37	027482	4	WASHER SHAKEPROOF EXT 5/16 STL
38	022129	4	WASHER LOCK M8-5/16
39	039253	4	SCREW HHC M8-1.25 X 20 G8.8
(2) 40	0H1851	1	ASSY PCB LCL SENSOR (USE WITH I/N 33, P/N 0H1827 ONLY)

(1) APPLY LOCTITE 242 TO I/N 36 BEFORE THREADING INTO I/N 31.

(2) USE WITH R-200 CONTROL PANEL ONLY.

GROUP C



Revision: H-5975-B
Date: 2/5/10

Exploded View: MOUNTING BASE 1.6L
Drawing No.: 0G3531

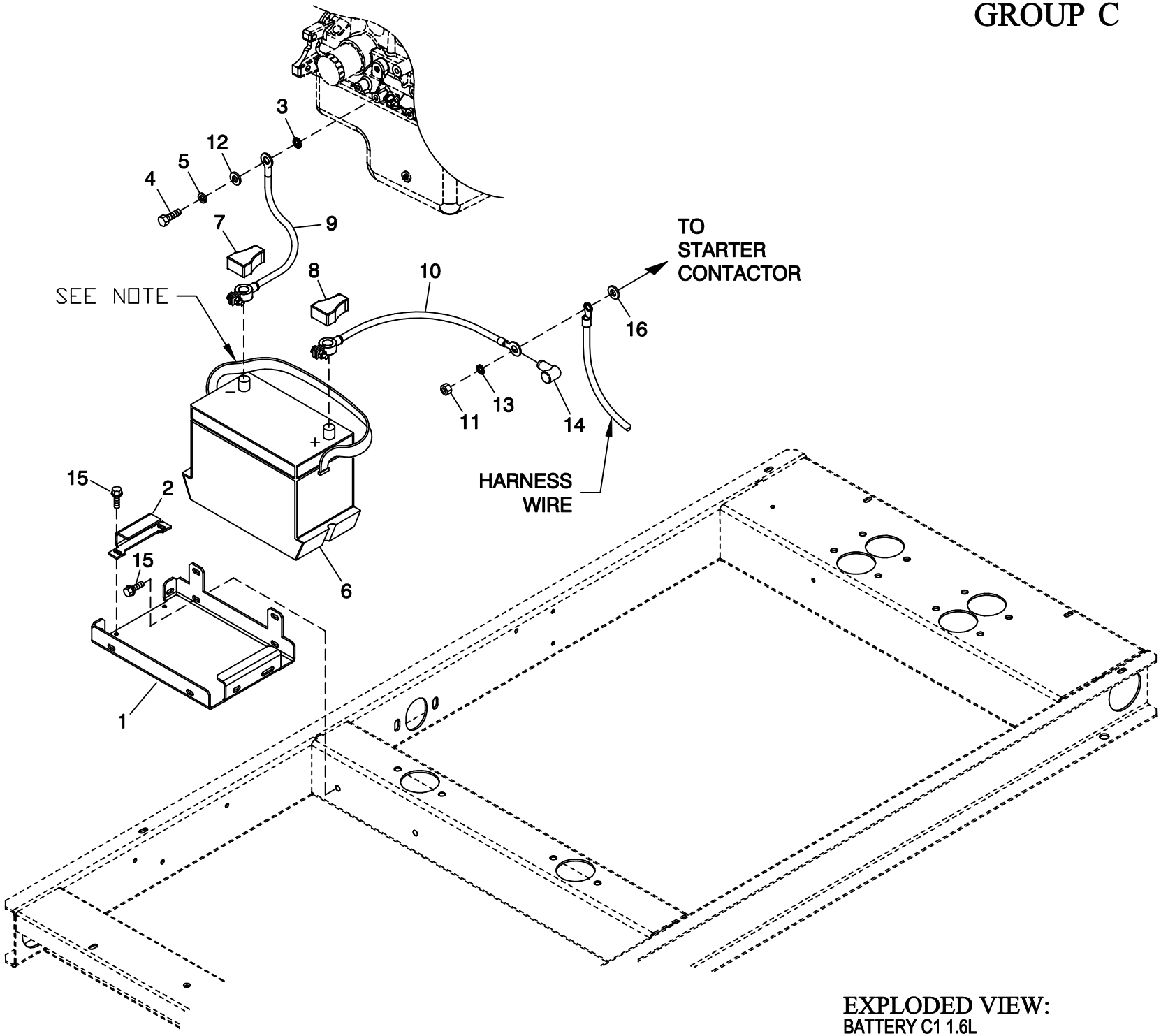
EXPLODED VIEW: MOUNTING BASE 1.6L

DRAWING #: 0G3531

GROUP C

APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	0G3343	1	MOUNTING BASE 1.6L 2007 C1
2	027482	1	WASHER SHAKEPROOF EXT 5/16 STL
3	070936	2	DAMPENER VIBRATION
4	070936C	2	VIB. ISO. 70-75 DURO
5	039253	12	SCREW HHC M8-1.25 X 20 G8.8
6	022145	16	WASHER FLAT 5/16 ZINC
7	022129	16	WASHER LOCK M8-5/16
8	045771	4	NUT HEX M8-1.25 G8 YEL CHR
9	071956	4	WASHER FLAT M8
10	051730	4	SCREW HHC M8-1.25 X 60 G8.8
11	021991	1	EARTH STRAP
13	026850	1	WASHER SHAKEPROOF EXT 1/4 STL
14	0G3461	2	ALTERNATOR SUPPORT BLOCK OFF
15	055414	1	LUG SLDLSS #2-#8 X 17/64 CU
16	047411	1	SCREW HHC M6-1.0 X 16 G8.8
17	022097	1	WASHER LOCK M6-1/4
18	022473	5	WASHER FLAT 1/4-M6 ZINC
19	025507	1	WASHER LOCK EXT 7/16 STL



EXPLODED VIEW:
BATTERY C1 1.6L
DRAWING #: 0G4067

REVISION: -A-
DATE: 10/27/06

EXPLODED VIEW: BATTERY C1 1.6L
DRAWING #: 0G4067

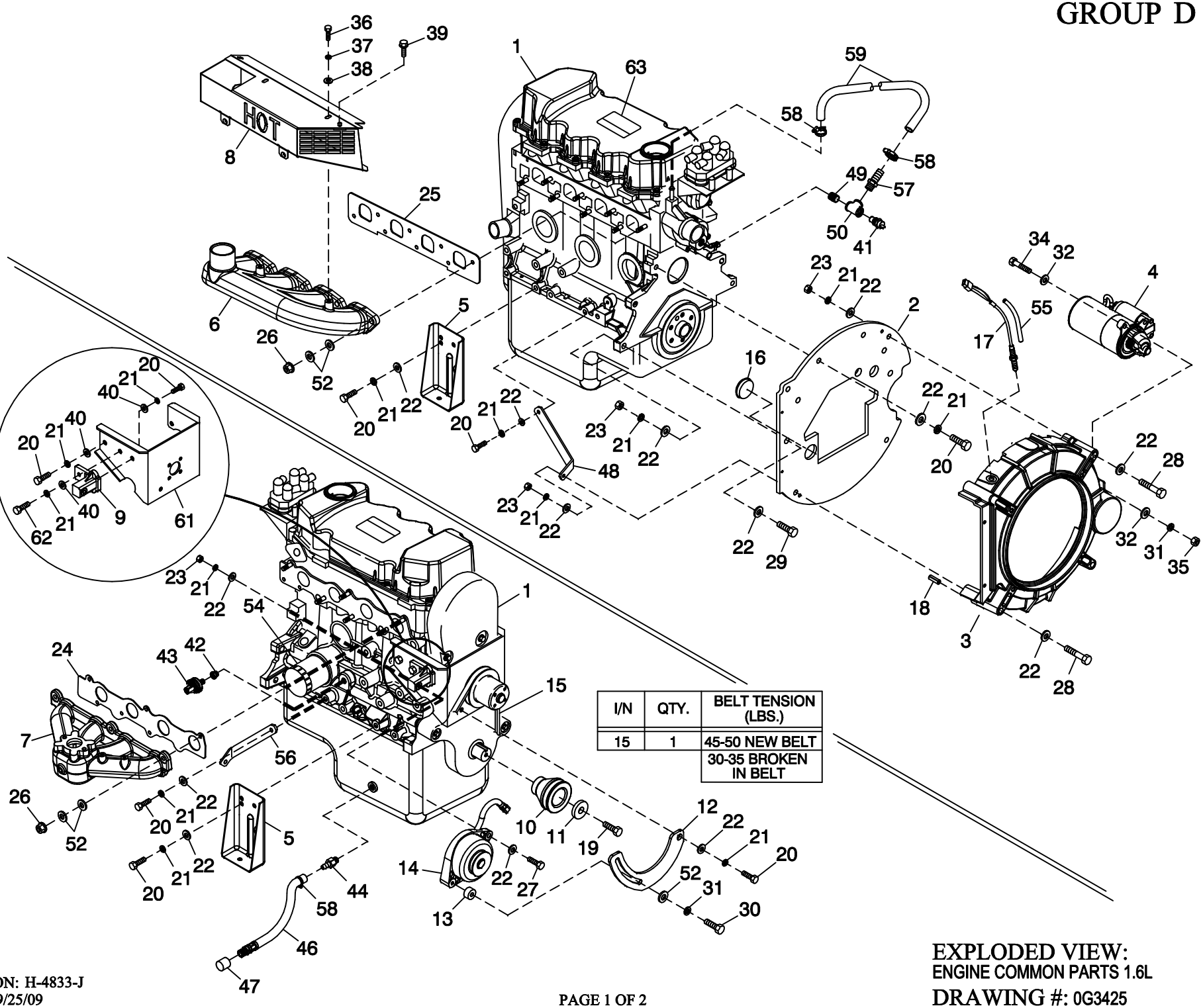
APPLICABLE TO:

GROUP C

ITEM	PART #	QTY.	DESCRIPTION
1	0F3408C	1	BATTERY TRAY, C1 & C2
2	0F3411	1	STRAP BATTERY RETAINMENT
3	025507	1	WASHER SHAKEPROOF EXT 7/16 STL
4	059980	1	SCREW HHC M10-1.5 X 25 G10.9
5	046526	1	WASHER LOCK M10
6	077483	REF	BATTERY 12VDC 75-AH 26
7	050331A	REF	BATTERY POST COVER RED +
8	050331	REF	BATTERY POST COVER BLK -
9	038805J	1	CABLE BATTERY BLACK #1 X 30.00
10	038804M	1	CABLE BATTERY RED #1 X 21.00
11	045771	REF	NUT HEX M8-1.25 G8 YEL CHR
12	022131	1	WASHER FLAT 3/8-M10 ZINC
13	027482	1	WASHER SHAKEPROOF EXT 5/16 STL
14	0F3976	1	BOOT CONTACTOR CABLES
15	0C2454	4	SCREW THF M6-1 X 16 N WA Z/JS
16	022145	REF	WASHER FLAT 5/16-M8 ZINC

NOTE: WHEN INSTALLING BATTERY, TUCK BATTERY'S LIFTING STRAP ALONG THE LEFT SIDE OF BATTERY (SIDE OPPOSITE RADIATOR) BEFORE CONNECTING THE BATTERY CABLES.

REVISION: -A-
DATE: 10/27/06



I/N	QTY.	BELT TENSION (LBS.)
15	1	45-50 NEW BELT
		30-35 BROKEN IN BELT

EXPLODED VIEW:
ENGINE COMMON PARTS 1.6L
DRAWING #: 0G3425

REVISION: H-4833-J
DATE: 9/25/09

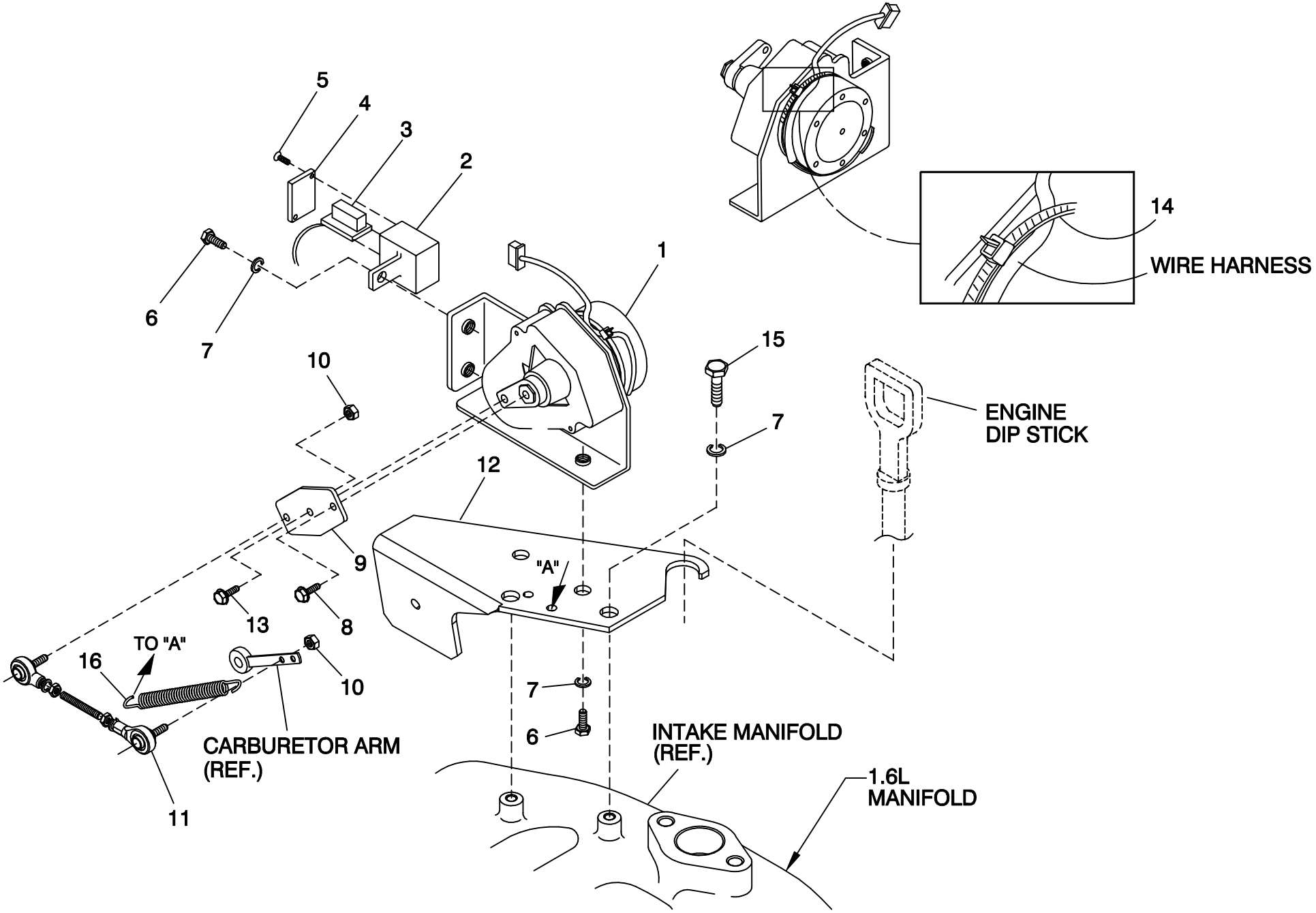
EXPLODED VIEW: ENGINE COMMON PARTS 1.6L
DRAWING #: 0G3425

GROUP D

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0H1734	REF	ENGINE GENERAC 1.6L G11 CERT
2	0G0834	1	ENGINE PLATE 1.6L (TO BE USED WITH PLATE SPACER P/N 0G2070.)
	0G0834A	1	ENGINE PLATE 1.6L 6MM (TO BE USED WITH PLATE SPACER P/N 0G2070A.)
3	0G0820	REF	HOUSING BLOWER MACHINED 1.6L
4	0G7461	1	STARTER MOTOR 12V
5	0G0839	2	ENGINE MOUNTING FOOT STAMPING
6	0G0781	1	EXHAUST MANIFOLD 1.6L MACHINED
7	0G0722	1	INTAKE MANIFOLD MACHINED 1.6L
8	0G4059	1	SHIELD 1.6L EXHAUST HEAT
9	0G4604	1	DC ALTERNATOR ADAPTER MACHINED
10	0G3424	1	PULLEY CRANKSHAFT MACHINED (3600RPM)
	0G4863	1	PULLEY CRANKSHAFT CASTING (1800RPM)
11	0G0786	1	WASHER PULLEY
12	0G4605	1	BRACKET TENSIONER DC ALT
13	0F9617A	1	SPACER ALTERNATOR
14	0A1354B	1	DC ALTERNATR HAN-KOK
15	0G0823	1	V-BELT 3/8 X 30.6 (3600RPM)
	0G4949	1	V-BELT 3/8 X 31.6 (1800RPM)
16	0G3900	1	CAP, 1.5" HOLE SHALLOW
17	0D2244M	1	ASSY MAGPICKUP (3/8-24 MALE)
18	036710	2	PIN SPRING 1/4 X 3/4
19	0C5479	1	SCREW HHC M12-1.5 X 40 G10.9
20	059980	13	SCREW HHC M10-1.5 X 25 G10.9
21	046526	22	WASHER LOCK M10
22	022131	18	WASHER FLAT 3/8-M10 ZINC
23	0G3922	9	NUT HEX M10-1.5 CLASS 10 ZINC
24	0G0464	1	GASKET INTAKE MANIFOLD 1.6L
25	0G0465	1	GASKET EXHAUST MANIFOLD 1.6L
26	052858	14	NUT TOP LOCK FL M8-1.25
27	051735	1	SCREW HHC M10-1.5 X 70 G8.8
28	0G3920	4	SCREW HHC M10-1.5 X 110 G10.9
29	0A7387	4	SCREW HHC M10-1.5 X 40 G10.9
30	039414	1	SCREW HHC M8-1.25 X 35 G8.8
31	022129	4	WASHER LOCK M8-5/16
32	022145	3	WASHER FLAT 5/16-M8 ZINC
33	029333A	1	TIE WRAP UL 7.4" X .19" BLK
34	057821	3	SCREW HHC M8-1.25 X 40 G8.8
35	045771	3	NUT HEX M8-1.25 G8 CLEAR ZINC
36	022507	2	SCREW HHC 1/4-20 X 1/2 G5
37	022097	2	WASHER LOCK M6-1/4
38	022473	5	WASHER FLAT 1/4-M6 ZINC
39	090388	3	SCREW HHTT M6-1.0 X 12 ZINC
40	0A5768	5	WASHER FLAT M10 HEAVY DUTY
41	0A6751	1	SWITCH HI-TEMP 245 D X 3/8 NPT
42	035579	1	BSHG RDCR HEX 1/4 TO 1/8
43	0A8584	1	SWITCH OIL PRESSURE 10PSI 2POL
44	0C1852	1	ADAPTER DRAIN OIL
46	069860C	1	HOSE OIL DRAIN ASSY 21"
47	069811	1	CAP HEX 1/4 NPT BRASS
48	0G38580ST03	1	STRUT LH 1.6L ENG ADAPT PLATE
49	025065	1	NIPPLE PIPE 3/8 NPT X 1-1/2
50	027738A	1	PIPE TEE 3/8 NPT
51	0E3257	3	SCREW HWHTF M6-1.0 X 16
52	0A8830	29	WASHER FLAT .34 ID X .75 OD
53	0G4582	1	HARN ENG 1.6L R200 3600RPM G11 (NOT SHOWN) (3600RPM)
	0G4581	1	HARN ENG 1.6L R200 1800RPM G11 (NOT SHOWN) (1800RPM)
54	0G02070100	1	OIL FILTER 1.6L
55	077043H	1	CONDUIT FLEX .25"ID (6" LG)
56	0G38620ST03	1	STRUT RH 1.6L ENG ADAPT PLATE
57	055596	1	BARBED STR 3/8 NPT X 3/8
58	0C7649	3	CLAMP HOSE .38-.87
59	0H2250	1	HOSE COOLANT 3/8 ID 20R3 (11" LG)
61	0G3433	REF	BRACKET FAN ALT ADAPTER 1.6L
62	049541	1	SCREW HHC M10-1.5 X 35 G8.8
63	0G7311	REF	DECAL EMISSION CTRL INFO 1.6L

GROUP D



EXPLODED VIEW:
GOVERNOR ASSEMBLY
DRAWING #: 0G4930

REVISION: -A-
DATE: 2/16/07

EXPLODED VIEW: GOVERNOR ASSEMBLY
DRAWING #: 0G4930

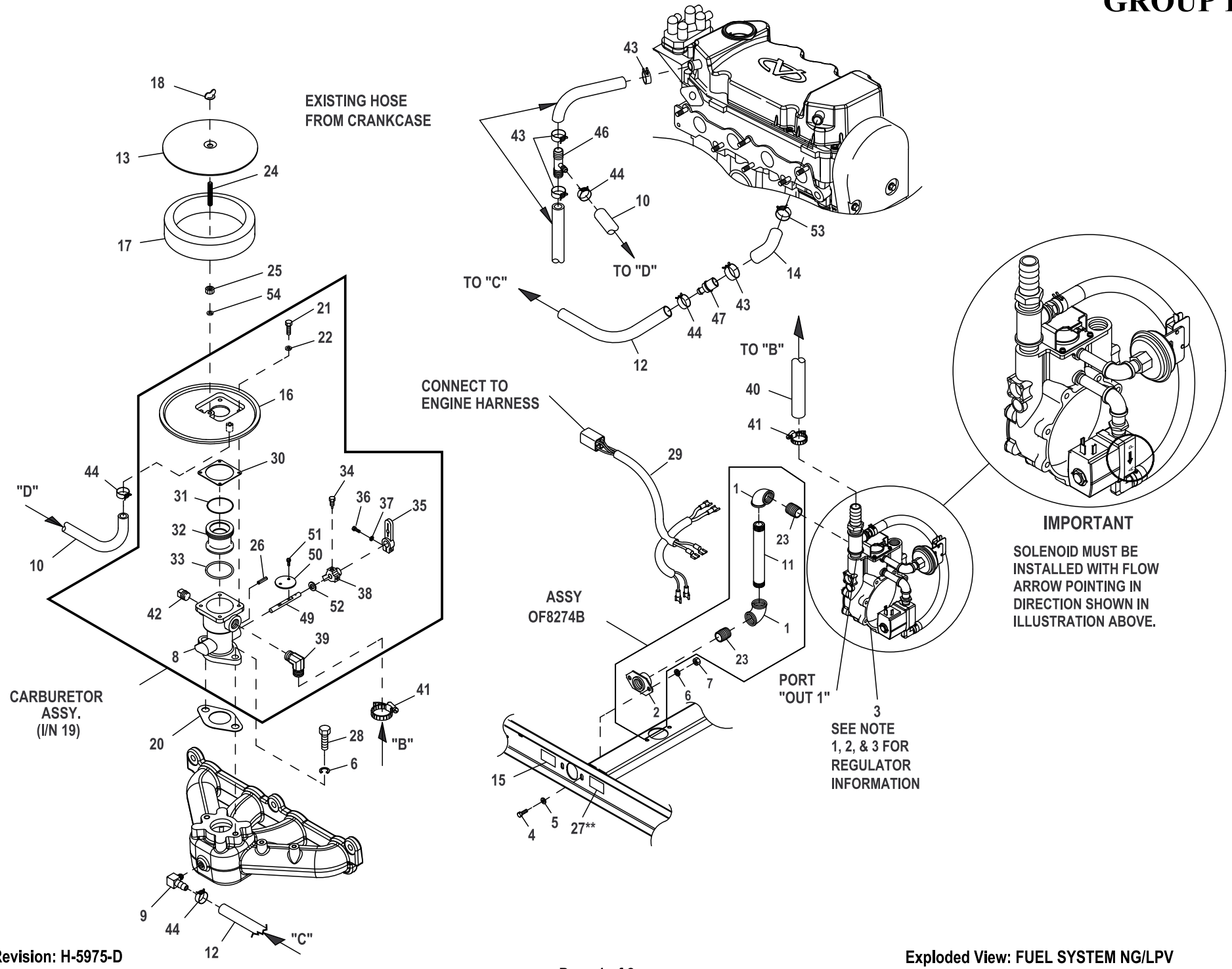
GROUP D

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	098290	1	ASM MOTOR STEPPER
2	098941A	1	HOUSING GOVERNOR CONNECTOR
3	098958A	REF	CONNECTOR INTERFACE ASSEMBLY
4	098942A	1	COVER CONNECTOR HOUSING
5	098225	2	SCREW FHM #2 X 5/8 SELF TAP
6	043146	3	SCREW HHC M6-1.0 X 10 G8.8
7	022097	5	WASHER LOCK M6-1/4
8	084543A	1	SCREW PHM M3-0.5 X 12MM
9	098783	1	LEVER STEPPER MOTOR
10	037398	2	NUT LOCK HEX #10-32 NYL INS
11	0E1326	1	ASSY. CARBURETOR LINKAGE ROD
12	0G4451	1	BRACKET STEPPER MOTOR COOLANT
13	064526	1	SCREW TAP HWH #6-25 X 3/8 ZINC
14	029333A	10	TIE WRAP 7.4"X.19" BLK UL
15	022507	2	SCREW HHC 1/4-20 X 1/2 G5
16	0E1694	1	SPRING ANTI LASH

REVISION: -A-
DATE: 2/16/07

GROUP E


EXISTING HOSE FROM CRANKCASE
CARBURETOR ASSY. (I/N 19)
TO "C"
TO "D"
TO "B"
CONNECT TO ENGINE HARNESS
ASSY OF8274B
PORT "OUT 1"
SEE NOTE 1, 2, & 3 FOR REGULATOR INFORMATION
IMPORTANT
SOLENOID MUST BE INSTALLED WITH FLOW ARROW POINTING IN DIRECTION SHOWN IN ILLUSTRATION ABOVE.

EXPLODED VIEW: FUEL SYSTEM NG/LPV

DRAWING #: 0G4970

GROUP E

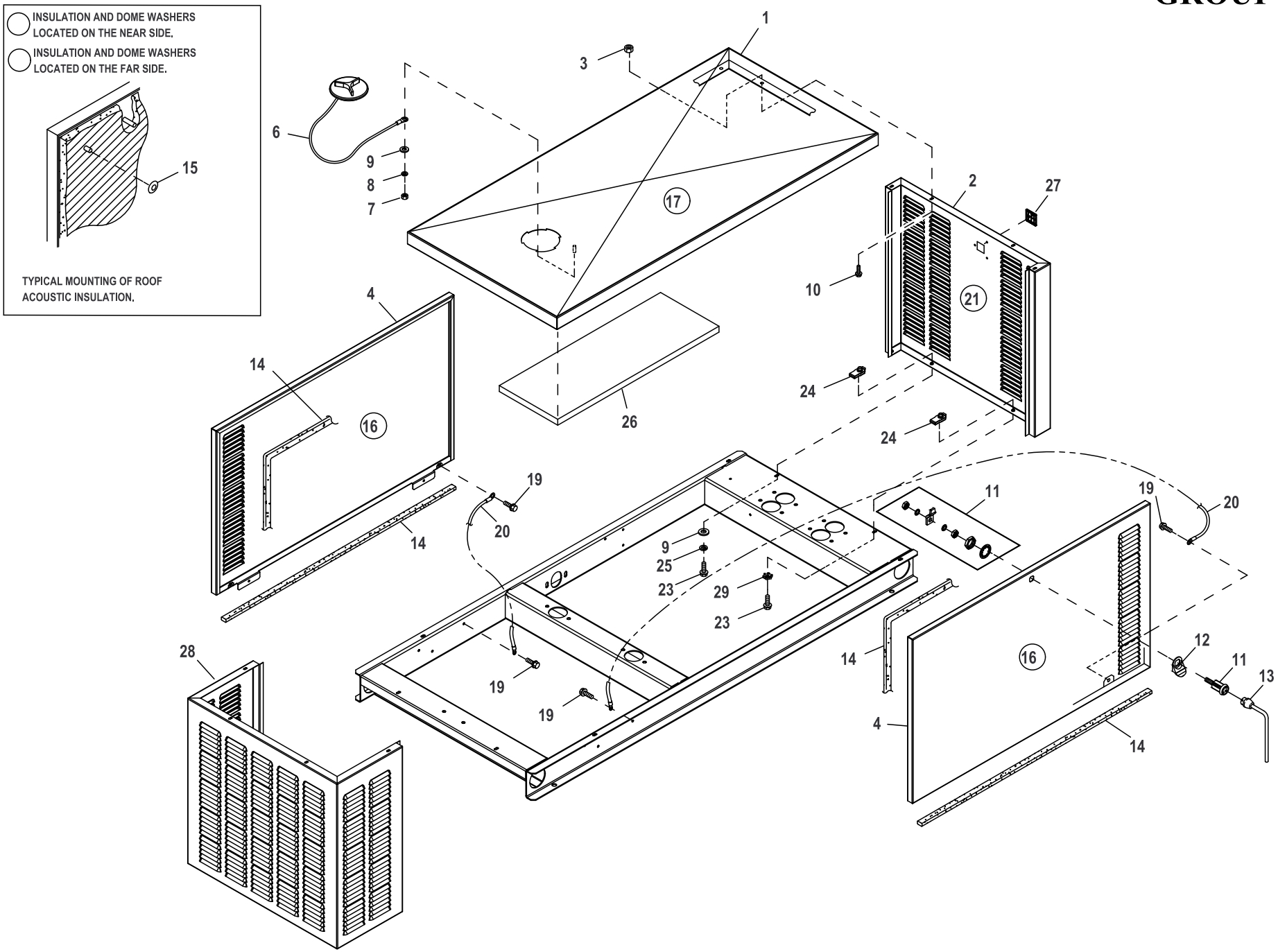
APPLICABLE TO:

ITEM	PART#	QTY.	DESCRIPTION
1	026812	2	ELBOW 90D 3/4 NPT
2	075580	1	FLANGE FUEL INLET
3	0G1397A	1	FUEL REG. REWORK 1.6L 3600 '07 (3600RPM)
	0G1397B	1	FUEL REG. REWORK 1.6L 1800 '07 (1800RPM)
4	039253	2	SCREW HHC M8-1.25 X 20 G8.8
5	022145	2	WASHER FLAT 5/16 ZINC
6	022129	4	WASHER LOCK M8-5/16
7	045771	2	NUT HEX M8-1.25 G8 YEL CHR
(1) 8	0F1570	1	BODY CARBURETOR ASSEMBLY
9	0A6344	1	BARBED EL 90 1/8 NPT X 3/8
10	047290	1	HOSE 3/8 ID SINGLE BRAID (16” LG)
11	025424	1	NIPPLE PIPE 3/4 NPT X 6
12	047290	1	HOSE 3/8 ID SINGLE BRAID (12” LG)
13	0A5547	1	COVER AIR CLEANER
14	0G3178	1	HOSE BREATHER 1.6L
15	0D1509	1	DECAL INLET PRESSUR
(1) 16	0E0591	1	ADAPTER CARB. TO AIR CLNR
17	059402	1	FILTER ELEMENT
18	037561	1	NUT WING 1/4-20 NYLK
19	0E1028F	1	ASSY CARBURETOR 1.6L 3600RPM
	0E1028E	1	ASSY CARBURETOR 1.6L 1800RPM
20	059401	1	CARBURETOR GASKET
(1) 21	091526	4	SCREW PPHM M5-0.8 X 12 ZNC
(1) 22	049226	4	WASHER LOCK M5
23	026915	2	NIPPLE CLOSE 3/4 X 1.375
24	062522	1	STUD TH 1/4-20 X 3 G2 ZNC FULL
25	022127	1	NUT HEX 1/4-20 STEEL
(1) 26	0E1339	1	PIN SPRING 3/16 X 5/8
(3) 27	050279	1	DECAL FUEL INLET NG
	050280	1	DECAL FUEL INLET LPG
28	030795	2	SCREW HHC 5/16-18 X 1 G5
29	0F6155	1	HARNESS FUEL JUMPER SINGLE REG
(1) 30	0E1104	1	GASKET AIR CLEANER ADAPTER
(1) 31	0E0668	1	O-RING 2-028 1.38 X 1.50 X .06
(1) 32	0E0590A	1	VENTURI 20MM (3600RPM)
	0E0590	1	VENTURI 18MM (1800RPM)
(1) 33	0C5133	1	O-RING 29.82 X 2.62
(1) 34	0E0665	1	SCREW THROTTLE PIN STOP
(1) 35	0E1108	1	THROTTLE ARM REWORK
(1) 36	033138	1	SCREW HHM #10-32 X 5/8
(1) 37	022152	1	WASHER LOCK #10
(1) 38	0E0645	1	LEVER THROTTLE STOP
(1) 39	034339	1	BARBED EL 90 3/8 NPT X 5/8
40	059194	1	HOSE 5/8 ID LPG & NG (12” LG)
41	057823	2	CLAMP HOSE #10 .56 - 1.06
42	026073A	1	PLUG STD PIPE 1/4 STEEL SQ HD
43	048031L	4	CLAMP HOSE BAND 1.0"
44	048031J	4	CLAMP HOSE BAND .63
46	0G1985	1	HOSE BARB REDUCR TEE 3/4"-3/8"
47	0F3994	1	PCV VALVE 2.5L FORD
(1) 49	0E0568	1	SHAFT THROTTLE 1.5L
(1) 50	0E0527	1	THROTTLE VALVE PLATE 27MM
(1)(2) 51	025105	1	SCREW RHMS 6-32 X 1/4 ZINC
(1) 52	0E0991	1	SEAL SHAFT COVER
53	048031P	1	CLAMP HOSE BAND .88"
54	022097	1	WASHER LOCK M6-1/4

(1) INCLUDED IN ITEM 19 (CARBURETOR ASSY)
(2) APPLY LOCTITE TO I/N 51 BEFORE THREADING INTO I/N 49.
(3) FOR LP VAPOR APPLICATION SUBSTITUE LPG FUEL INLET DECAL P/N 050280 FOR NG FUEL INLET DECAL P/N 050279 (ITEM 27).

NOTES:
1. REGULATOR (I/N 3) AS SHOWN IN ILLUSTRATION IS SET UP FOR NATURAL GAS APPLICATION.
2. TO CONFIGURE REGULATOR FOR LP VAPOR, REFER TO THE “RECONFIGURING THE FUEL SYSTEM” SECTION OF THIS MANUAL.

GROUP F


INSULATION AND DOME WASHERS LOCATED ON THE NEAR SIDE.
INSULATION AND DOME WASHERS LOCATED ON THE FAR SIDE.
TYPICAL MOUNTING OF ROOF ACOUSTIC INSULATION.
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EXPLODED VIEW: EV ENCLOSURE C1 CPL

DRAWING #: 0G3534

GROUP F

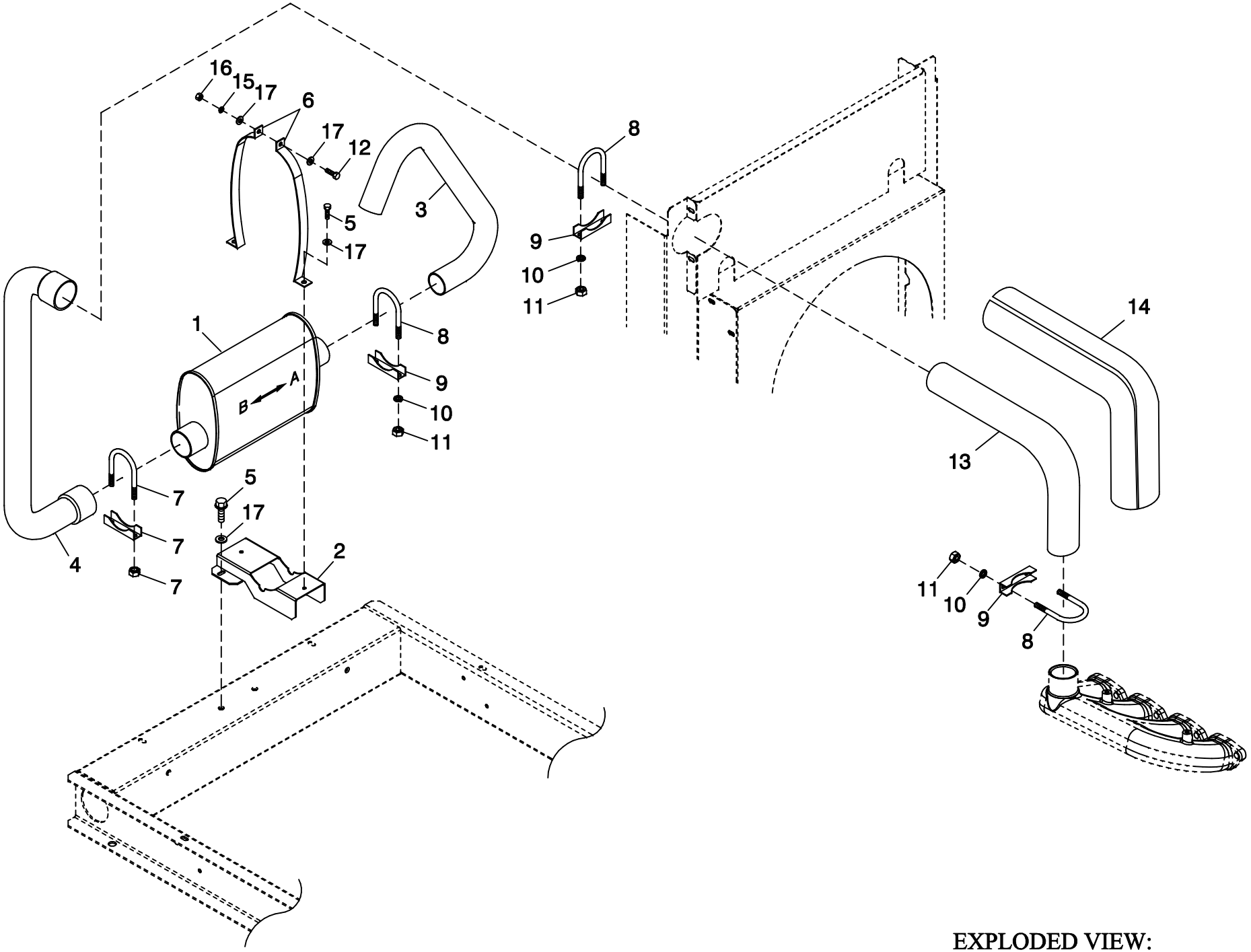
ITEM	PART#	QTY.	DESCRIPTION
(2) 1	0G33370AL0R	1	ROOF 1.6L C1
(2) 2	0J14640AL0R	1	REAR INTAKE WRAP C1
(1) 3	077992	10	NUT HEX LOCK M6-1.0 SS NY INS
(2) 4	0J14630AL0R	2	DOOR LEFT/RIGHT SIDE C1
6	0F4487A	1	ASSY ACCESS COVER
7	022127	1	NUT HEX 1/4-20 STEEL
8	022097	1	WASHER LOCK M6-1/4
9	022473	10	WASHER FLAT 1/4-M6 ZINC
(1)10	0C2454	8	SCREW THF M6-1 X 16 N WA Z/JS
11	0F5048D	2	VISE-ACTION LATCH, SLOTTED CIR
12	0F5049B	2	PULL TAB DOOR LOCK SS
13	0F8869D	1	KEY VISE-ACTION LATCH,SLOT CIR
14	089961	1	FOAM STRIP 3/4"WIDE X 3/16"THK (294"LG)
15	078115	8	WASHER SELF LOCKING DOME
16	0H7518	2	INSULATION SIDE DOOR C1
17	0H7518A	1	INSULATION ROOF C1
(1)19	0E3257	6	SCREW HWHTF M6-1.0 X 16
20	0912970090	2	ASSY WIRE 14AWG GRN/YEL (32.25"LG)
21	0H7518B	1	INSULATION REAR C1
23	0C8566	10	SCREW HHFC M6-1.0 X 20 G8.8
24	0H0412	10	NUT SPRINGCLIP M6-1.0
25	022097	8	WASHER LOCK M6-1/4
(3) 26	0H7529	1	FOIL ALUMINUM WITH ADHESIVE
27	0H1208A	1	RF COVER PLATE-PLASTIC-BISQUE
	0H1208B	1	RF COVER PLATE-PLASTIC-GREY
(2) 28	0G33350AL0R	1	FRONT DISCHARGE WRAP 1.6L C1
(1)29	0A1658	2	WASHER LOCK SPECIAL 1/4"

(1)ENCLOSURE NOTE: ALL PANELS THAT FASTEN TO THE ROOF MUST BE SECURED USING I/N 10 (THREAD FORMING FASTENER) AND I/N 3 (LOCK NUT) AND TO INCLUDE AT LEAST ONE CONNECTION POINT USING I/N 19 (THREAD FORMING FASTENER) WITH I/N 3 (LOCK NUT) TO EACH PANEL. LOCK NUT IS TO BE INSTALLED AFTER THREAD FORMING FASTENER HAS PENETRATED THROUGH EXTRUSION IN ENCLOSURE PANELS. ALL PANEL TO BASEFRAME CONNECTIONS TO INCLUDE AT LEAST ONE CONNECTION POINT USING I/N 29 (WASHER SPECIAL).

(2) SHEET METAL PARTS LISTED IN THE BOM TABLE ARE REPRESENTING GENERIC PARTS (NO COLOR)

- MANUFACTURING: FOR CORRECT MATERIAL AND COLOR REFER TO AS400 BOM.
- CUSTOMER: WHEN ORDERING REPLACEMENT PARTS ENTER BASE NUMBER (FIRST 6 DIGITS ONLY) IN THE SYSTEM FOR CORRECT MATERIAL AND COLOR (FOR REFERENCE SEE GUIDELINE 0H7169).

(3) USED ON 1.5L / 1.6L UNITS ONLY.1



EXPLODED VIEW:
EXHAUST SYSTEM 1.6L
DRAWING #: 0G3535

REVISION: -A-
DATE: 9/12/06

EXPLODED VIEW: EXHAUST SYSTEM 1.6L
DRAWING #: 0G3535

GROUP F

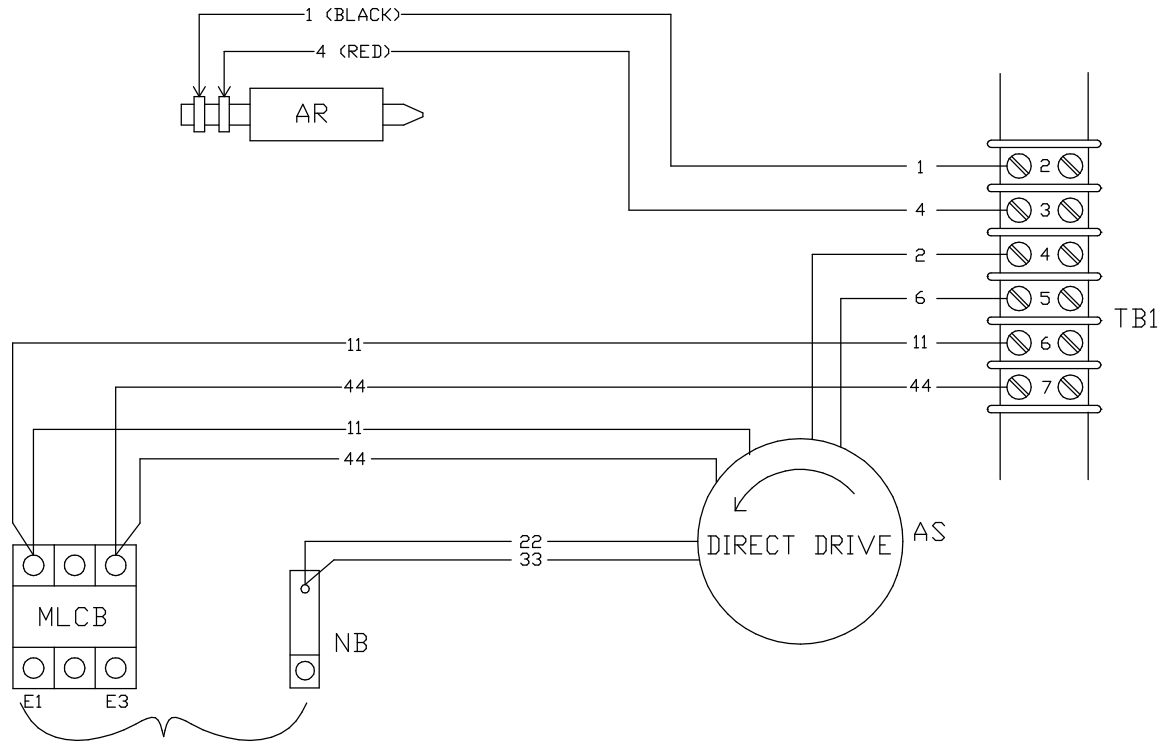
APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F7366	1	MUFFLER C1
2	0F7647	1	MUFFLER SADDLE
3	0F8095	1	PIPE EXHAUST OUTLET
4	0G3576	1	EXHAUST PIPE LOWER 1.6L
5	0E3257	4	SCREW HWHTF M6-1.0 X 16
6	0F7644	2	MUFFLER STRAP
7	0C6119	1	BOLT U 5/16-18 X 2-1/4
8	036434	3	BOLT U 5/16-18 X 2.09
9	036449	3	SADDLE 2 INCH
10	022129	6	WASHER LOCK M8-5/16
11	022259	6	NUT HEX 5/16-18 STEEL
12	038750	1	SCREW HHC M6-1.0 X 30 G8.8
13	0G3575	1	EXHAUST PIPE UPPER 1.6L SS
14	0F3794A	1	EXHAUST BLANKET 500MM LONG
15	022097	1	WASHER LOCK M6-1/4
16	049813	1	NUT HEX M6 X 1.0 G8 YEL CHR
17	022473	6	WASHER FLAT 1/4-M6 ZINC

REVISION: -A-
DATE: 9/12/06

OPTION 1 - SINGLE PHASE, R-SERIES CONTROL PANEL, 240V

LEGEND
AR = ALTERNATOR ROTOR
AS = ALTERNATOR STATOR
MLCB = MAIN CIRCUIT BREAKER
NB = NEUTRAL BLOCK

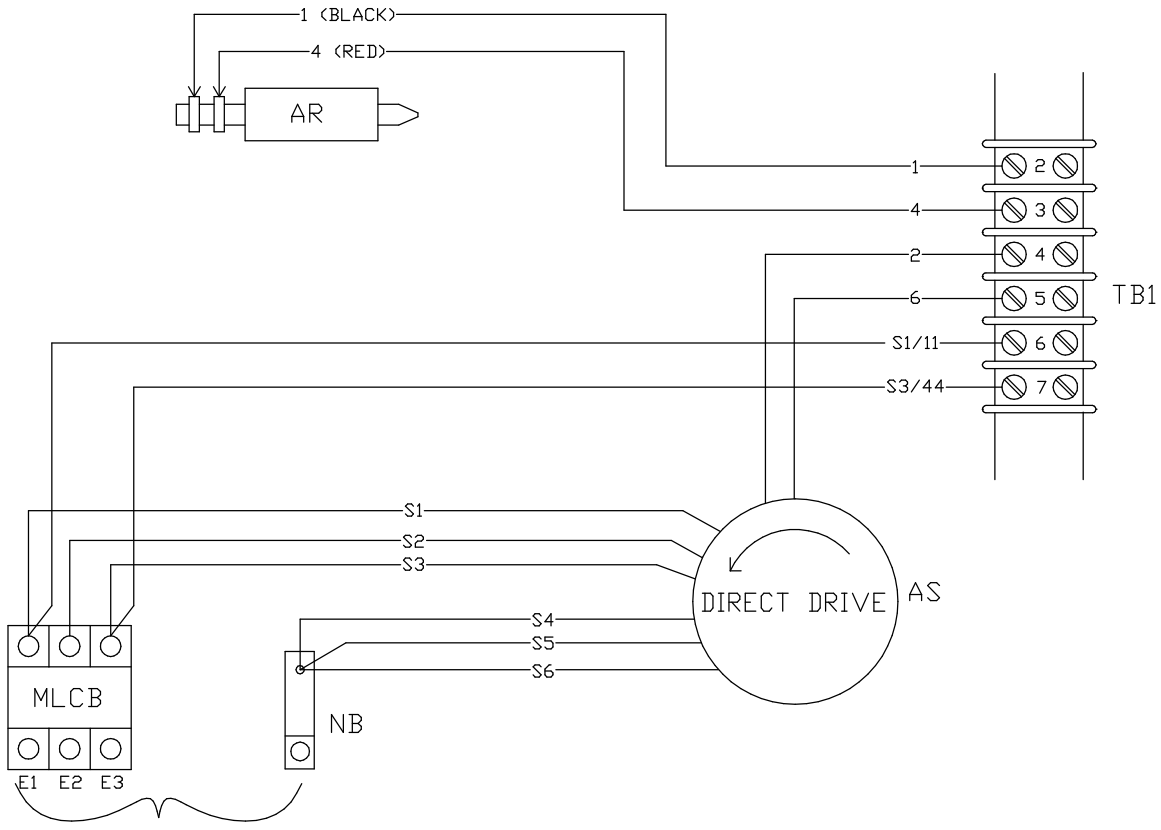


GENERATOR OUTPUT
CUSTOMER CONNECTION

E1 - E3 = 240VAC
E1 - NB = 120VAC
E3 - NB = 120VAC

OPTION 2 - THREE PHASE, R-SERIES CONTROL PANEL, 6-WIRE 120/208V

LEGEND
AR = ALTERNATOR ROTOR
AS = ALTERNATOR STATOR
MLCB = MAIN CIRCUIT BREAKER
NB = NEUTRAL BLOCK



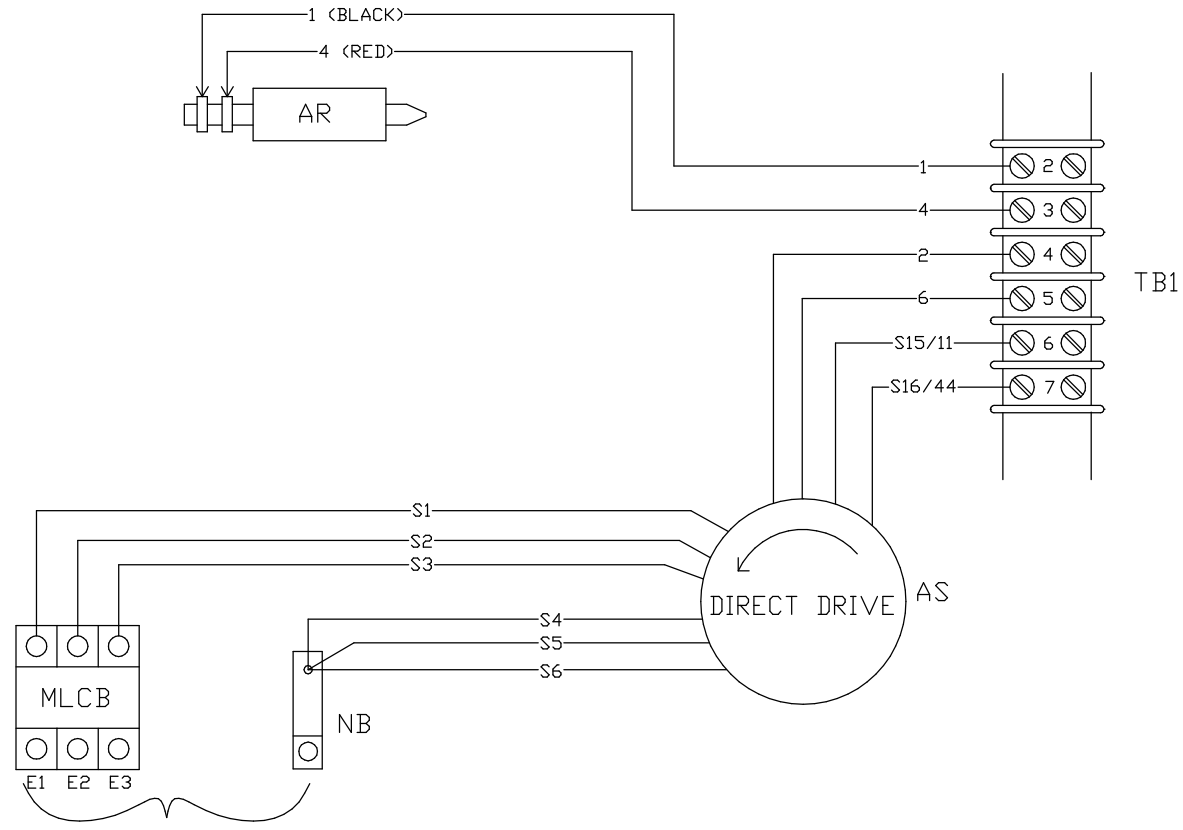
GENERATOR OUTPUT
CUSTOMER CONNECTION
E1 TO E2
E2 TO E3 } *208VAC
E1 TO E3
E1, E2, OR E3 TO NB = * 120VAC

*NOTE: THE 8th DIGIT OF THE MODEL NUMBER SPECIFIES OUTPUT VOLTAGE
"G" = 120/208VAC

PAGE 2 OF 5

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

LEGEND
AR = ALTERNATOR ROTOR
AS = ALTERNATOR STATOR
MLCB = MAIN CIRCUIT BREAKER
NB = NEUTRAL BLOCK



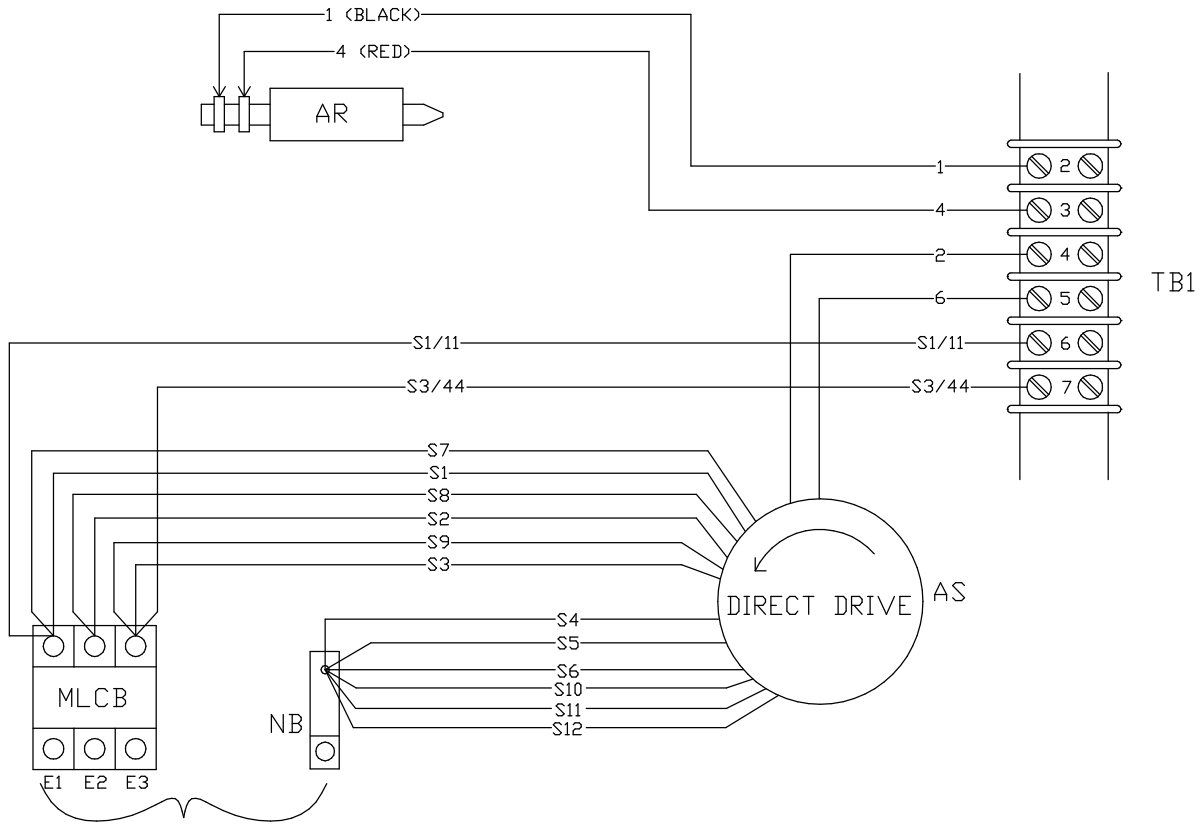
GENERATOR OUTPUT
CUSTOMER CONNECTION
E1 TO E2
E2 TO E3 } *480VAC
E1 TO E3
E1, E2, OR E3 TO NB = * 277VAC

*NOTE: THE 8th DIGIT OF THE MODEL NUMBER SPECIFIES OUTPUT VOLTAGE
"K" = 227/480VAC

PAGE 3 OF 5

OPTION 4 - THREE PHASE, R-SERIES CONTROL PANEL, 12-WIRE 120/208

LEGEND
AR = ALTERNATOR ROTOR
AS = ALTERNATOR STATOR
MLCB = MAIN CIRCUIT BREAKER
NB = NEUTRAL BLOCK



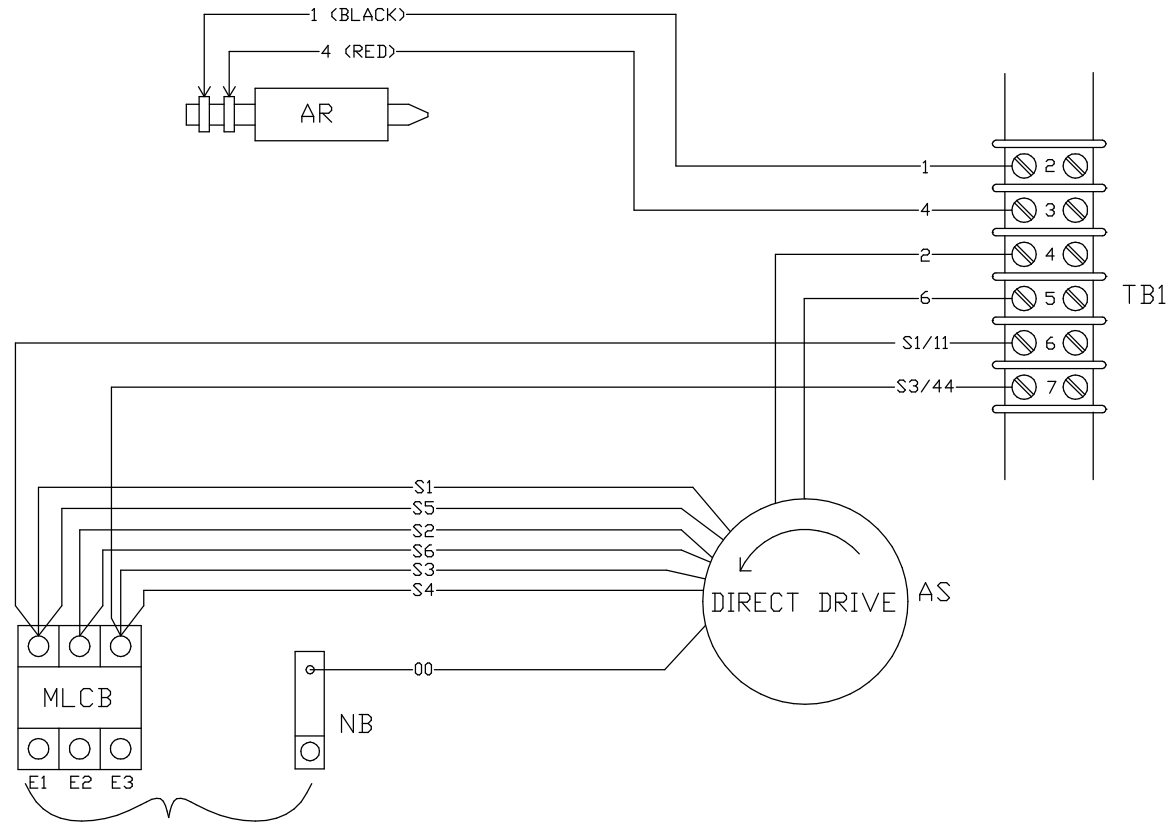
GENERATOR OUTPUT
CUSTOMER CONNECTION
E1 TO E2
E2 TO E3 } *208VAC
E1 TO E3
E1, E2, OR E3 TO NB = * 120VAC

*NOTE: THE 8th DIGIT OF THE MODEL NUMBER SPECIFIES OUTPUT VOLTAGE
"G" = 120/208VAC

PAGE 4 OF 5

OPTION 5 - THREE PHASE DELTA, R-SERIES CONTROL PANEL, 7-WIRE 120/240V

LEGEND
AR = ALTERNATOR ROTOR
AS = ALTERNATOR STATOR
MLCB = MAIN CIRCUIT BREAKER
NB = NEUTRAL BLOCK

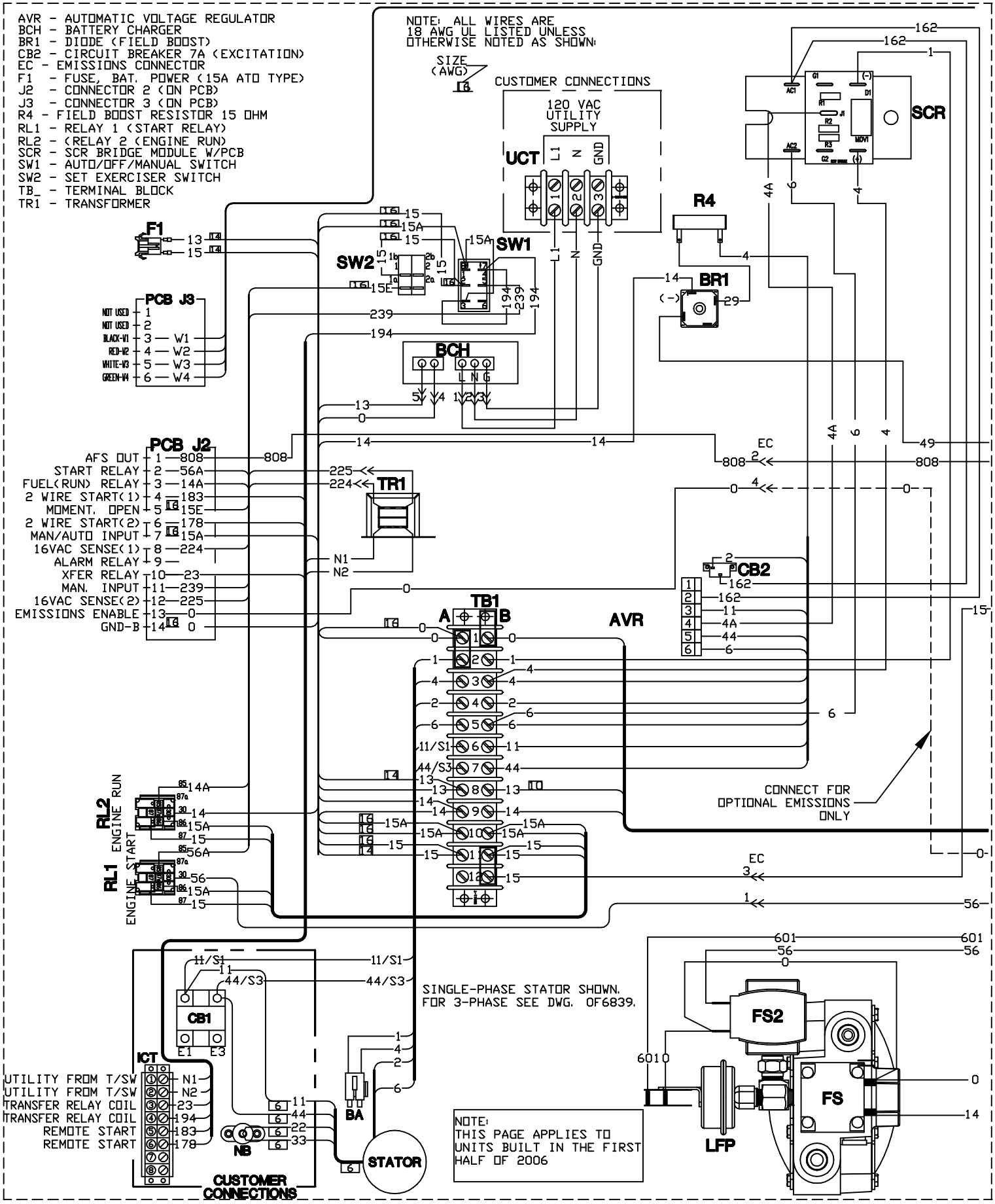


GENERATOR OUTPUT
CUSTOMER CONNECTION
E1 TO E2
E2 TO E3 } *240VAC
E1 TO E3
E1, OR E3 TO NB = * 120VAC

*NOTE: THE 8th DIGIT OF THE MODEL NUMBER SPECIFIES OUTPUT VOLTAGE
"j" = 120/240VAC

PAGE 5 OF 5

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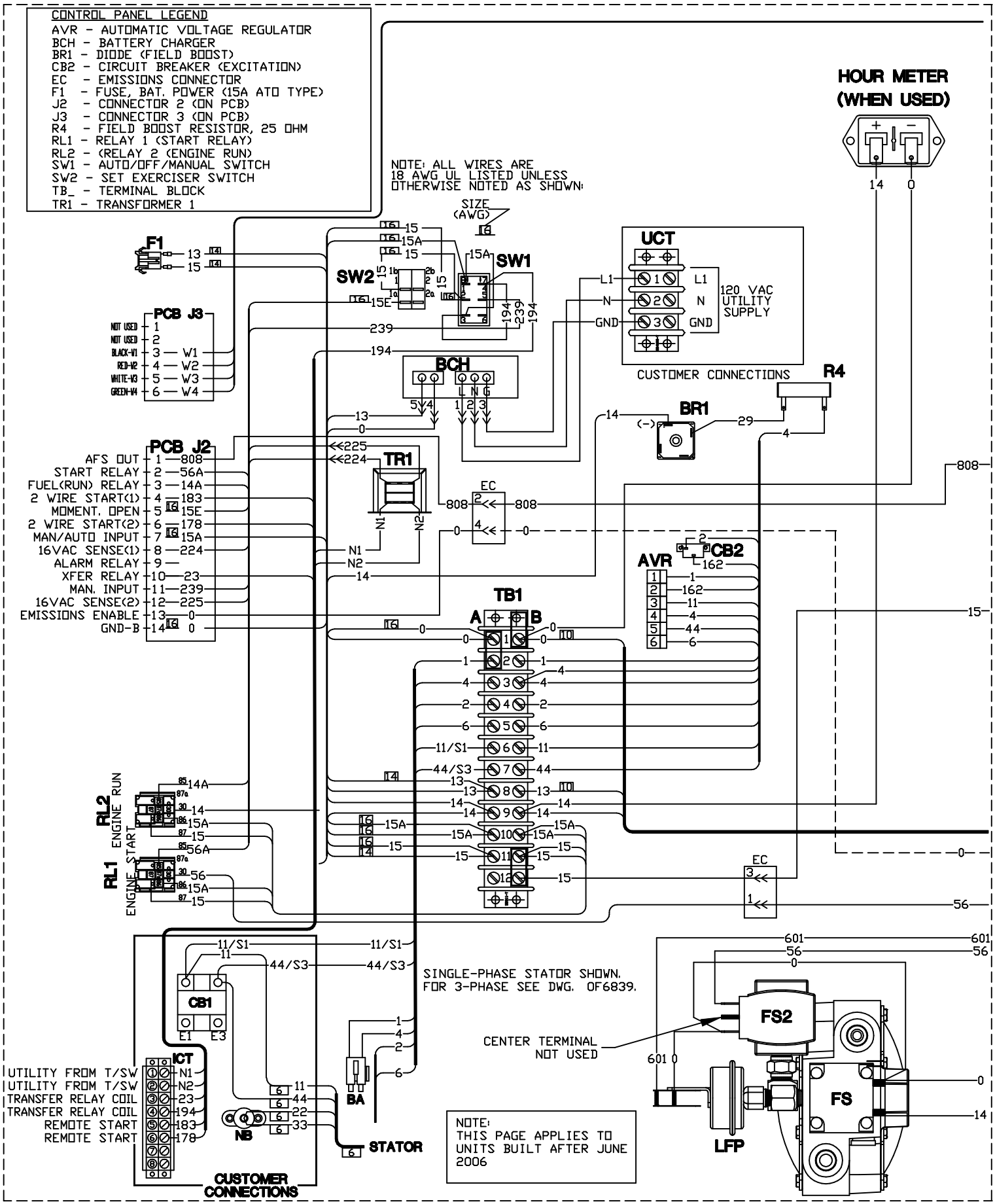
SCHEMATIC - DIAGRAM

REVISION: H-2338-B

1.6L 2-POLE

DATE: 05/02/08

DRAWING #: 0G0925



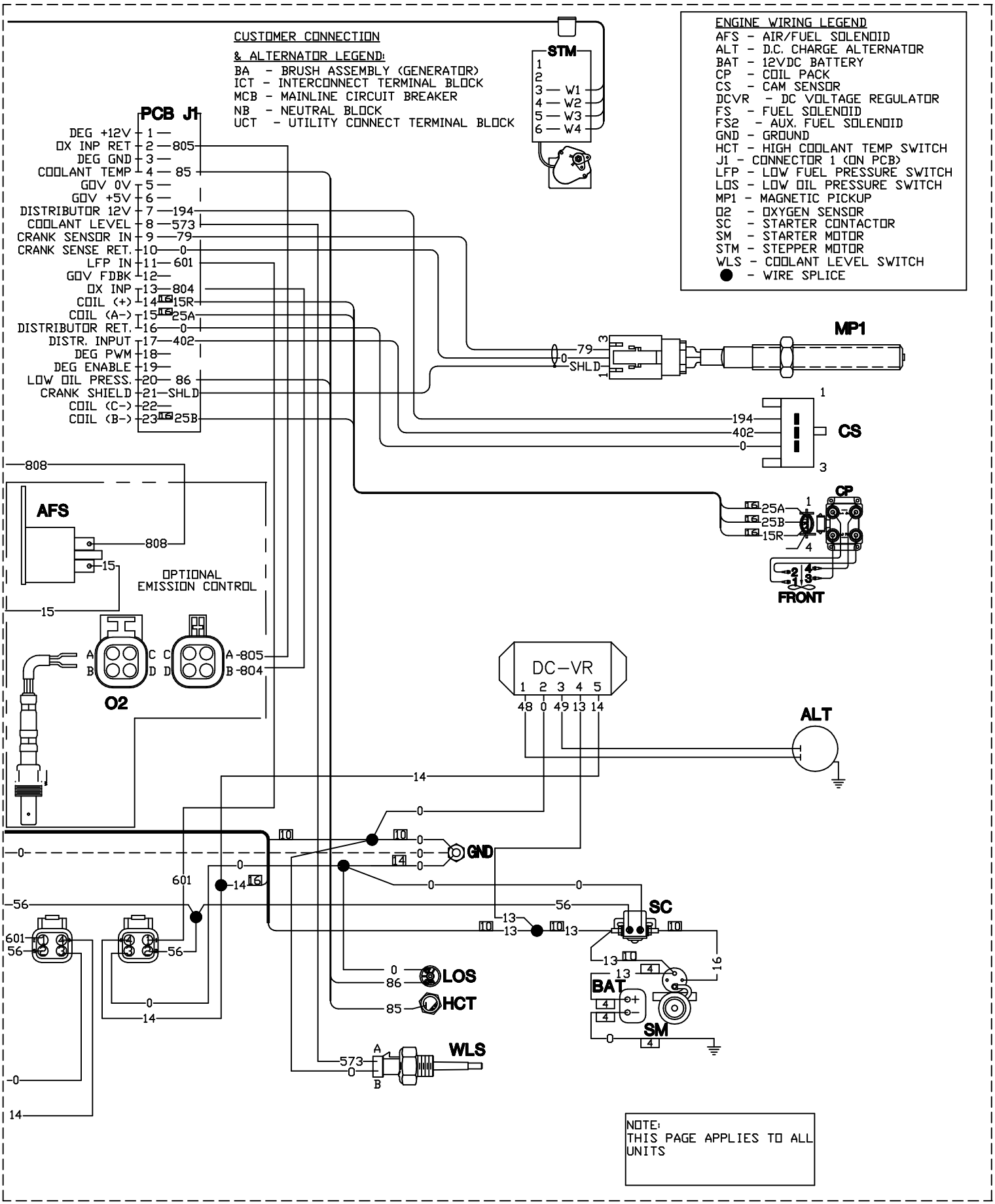
SCHEMATIC - DIAGRAM

REVISION: H-2338-B

1.6L 2-POLE

DATE: 05/02/08

DRAWING #: 0G0925

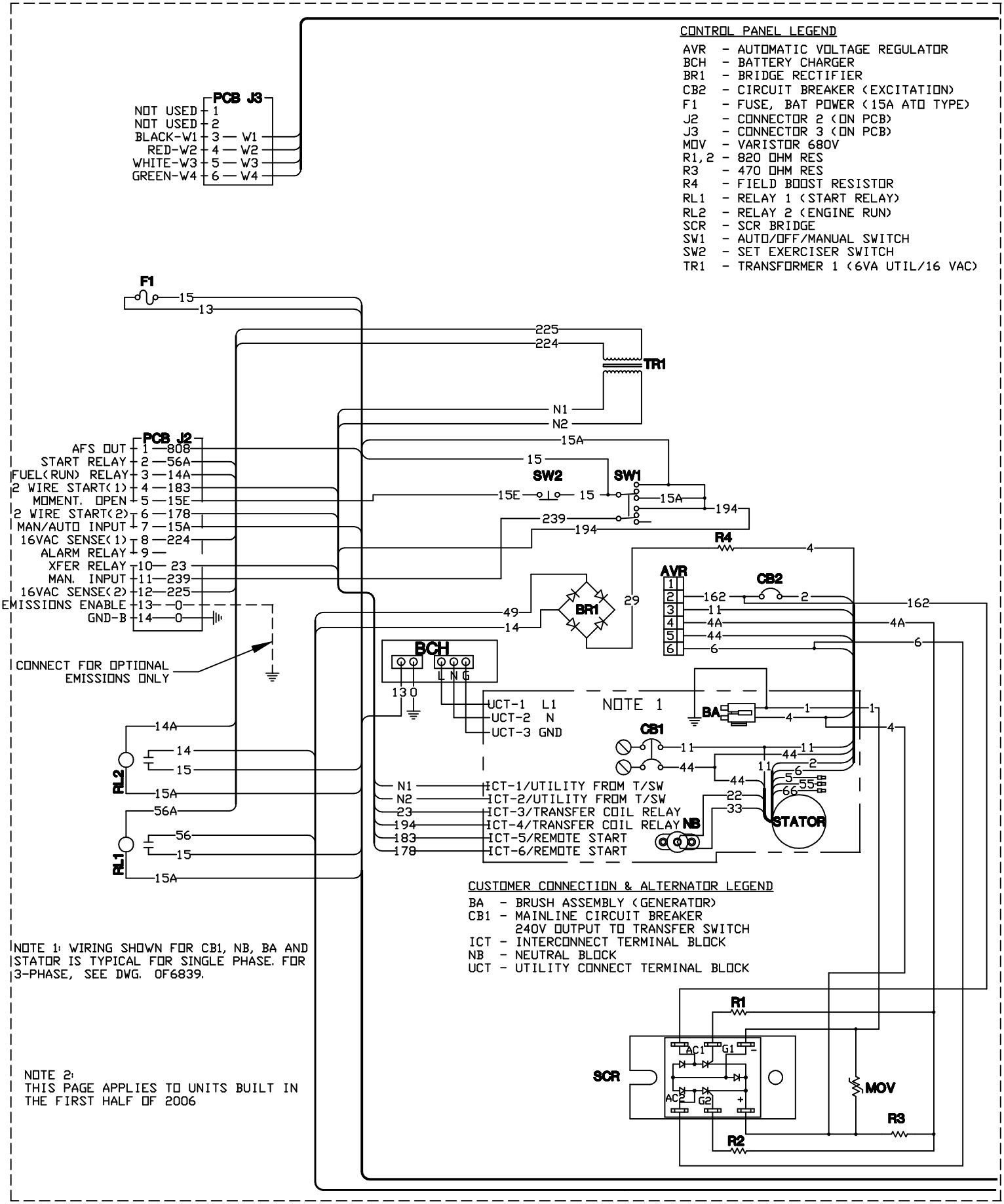


SCHEMATIC - DIAGRAM

1.6L 2-POLE

DRAWING #: 0G0925

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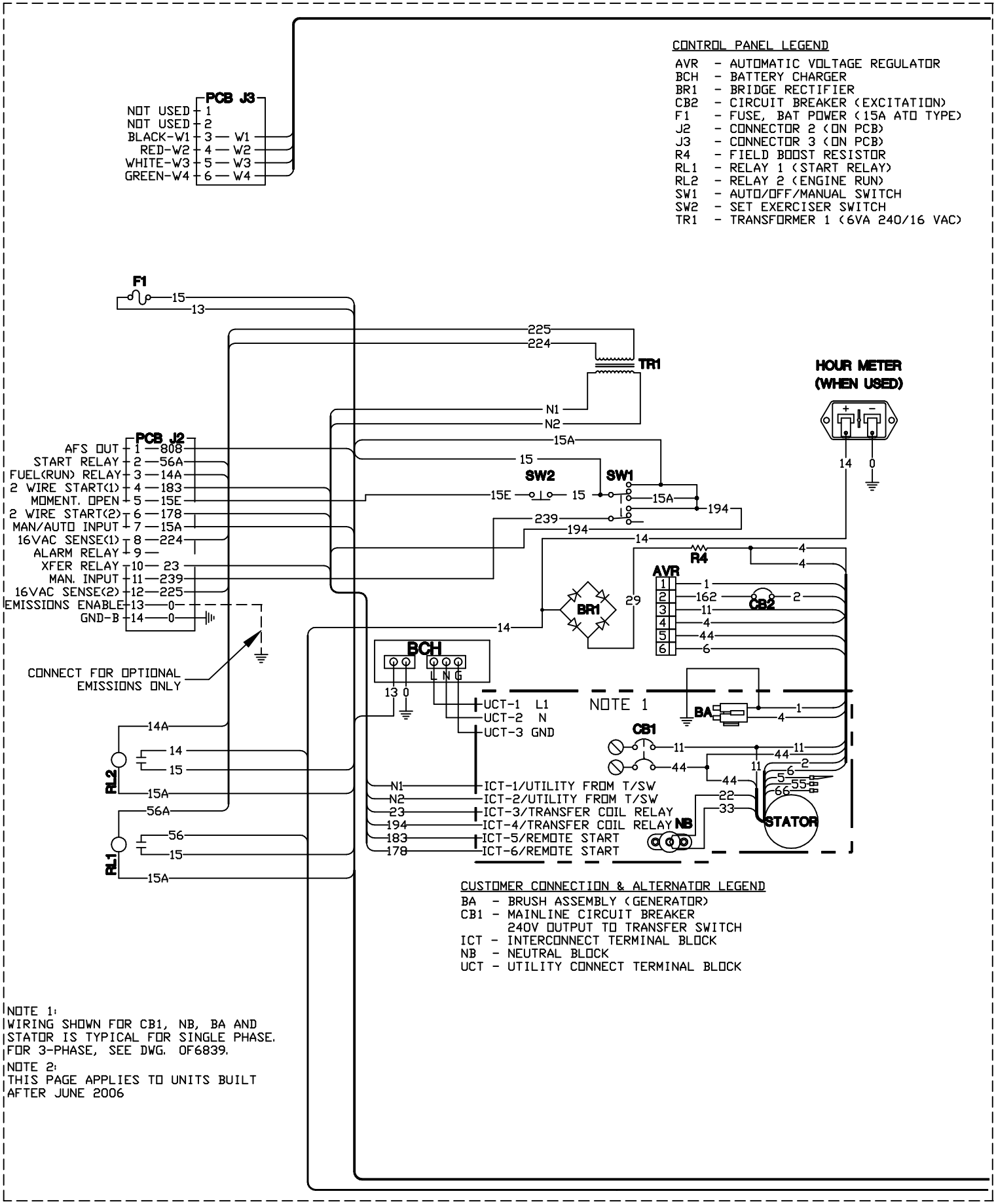
SCHEMATIC - DIAGRAM

1.6L 2-POLE

REVISION: H-2338-B

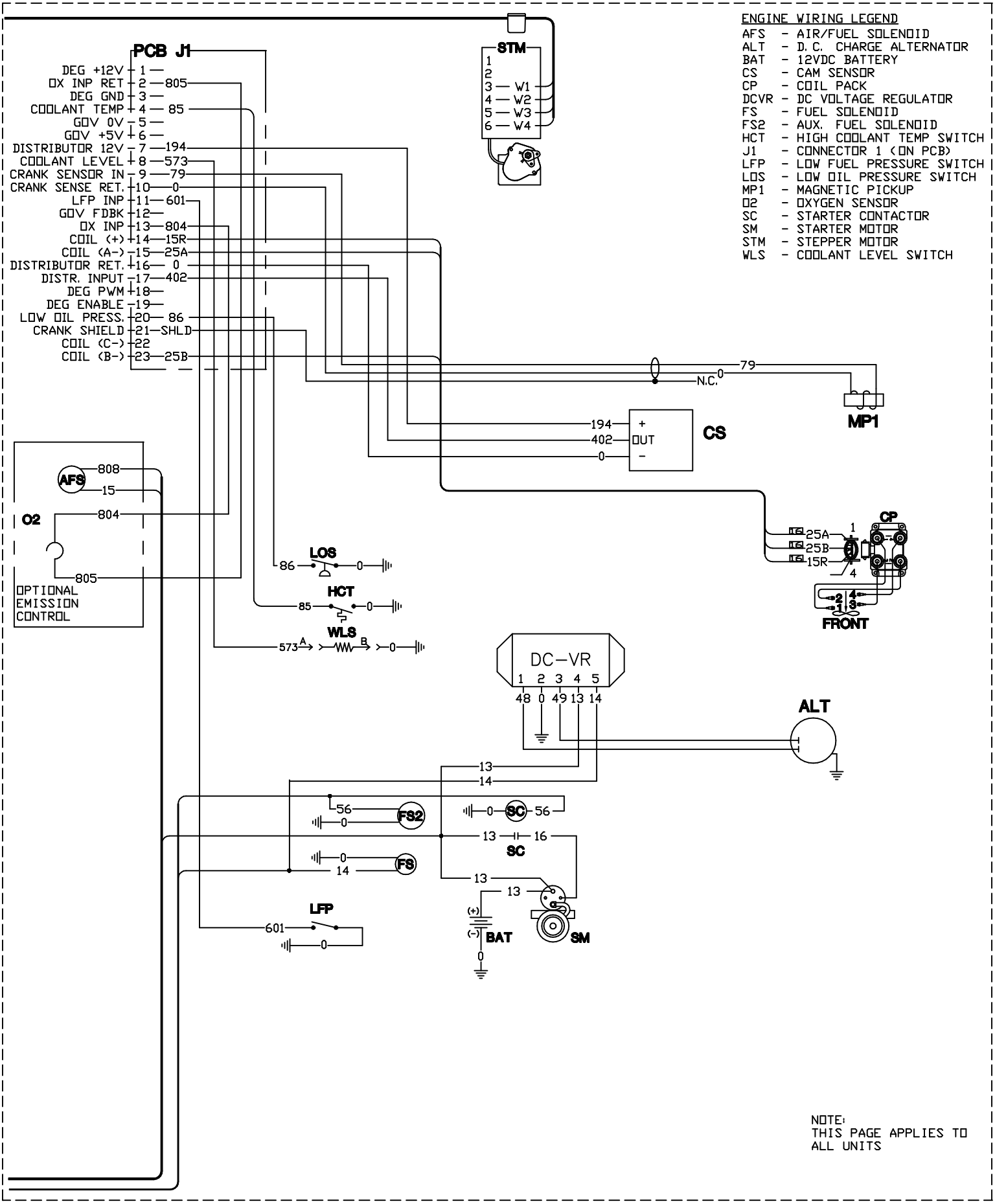
DATE: 5/02/08

DRAWING #: 0G1042



SCHEMATIC - DIAGRAM

1.6L 2-POLE



SCHEMATIC - DIAGRAM

1.6L 2-POLE

DRAWING #: 0G1042

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GROUP G

NOTES:

1) MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1041 (41.0") WIDE X 1892 (74.5") LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES.

2) ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING, THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE AND LOCAL CODES FOR MINIMUM DISTANCES FROM OTHER STRUCTURES.

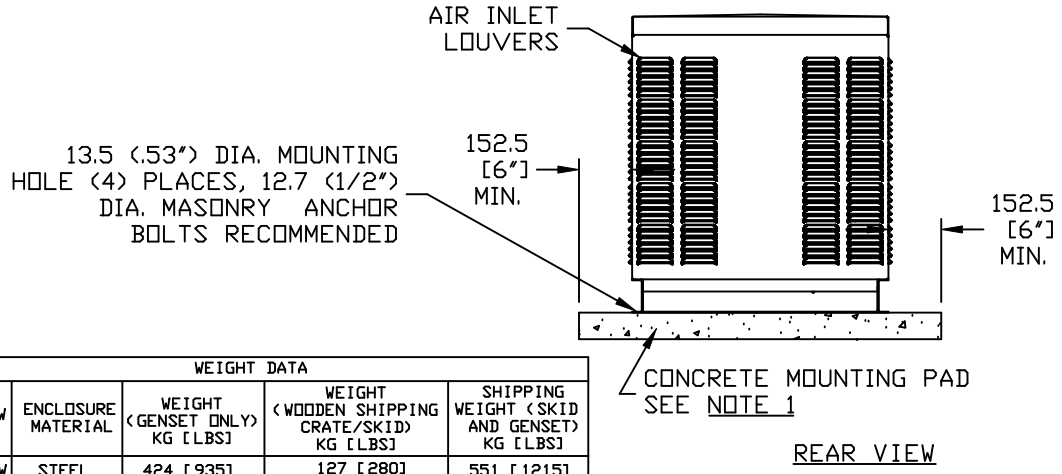
3) CIRCUIT BREAKER INFORMATION:
SEE SPECIFICATION SHEET WITHIN OWNERS MANUAL

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

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

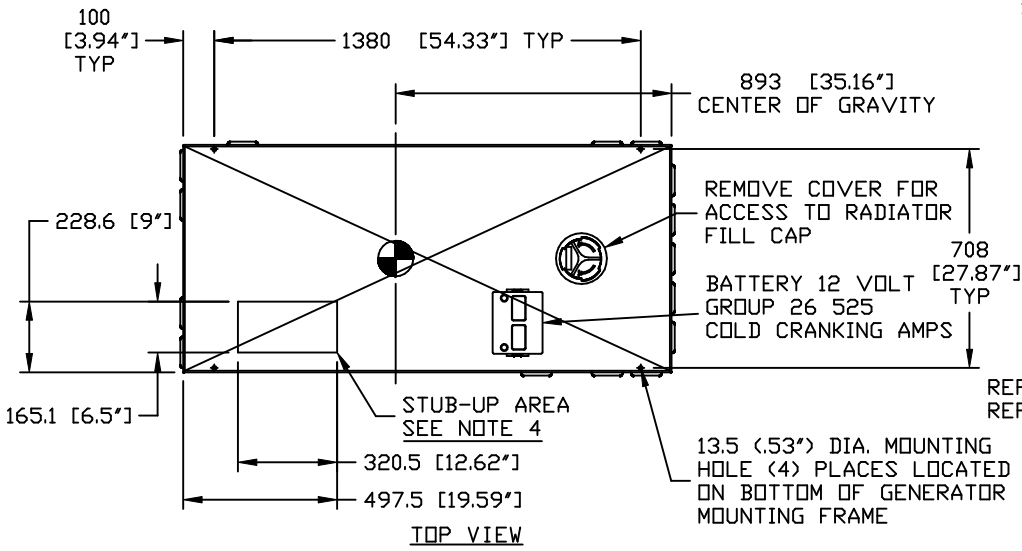
5) REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.

6) REMOVE LIFT-OFF ENCLOSURE TO ACCESS EXHAUST MUFFLER.



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]
1.6L/18KW	STEEL	424 [935]	127 [280]	551 [1215]
	ALUMINUM	383 [845]	127 [280]	510 [1125]
1.6L/20KW	STEEL	397 [875]	127 [280]	524 [1155]
	ALUMINUM	356 [785]	127 [280]	483 [1065]
1.6L/25KW	STEEL	397 [875]	127 [280]	524 [1155]
	ALUMINUM	356 [785]	127 [280]	483 [1065]
1.6L/30KW	STEEL	424 [935]	127 [280]	551 [1215]
	ALUMINUM	383 [845]	127 [280]	510 [1125]

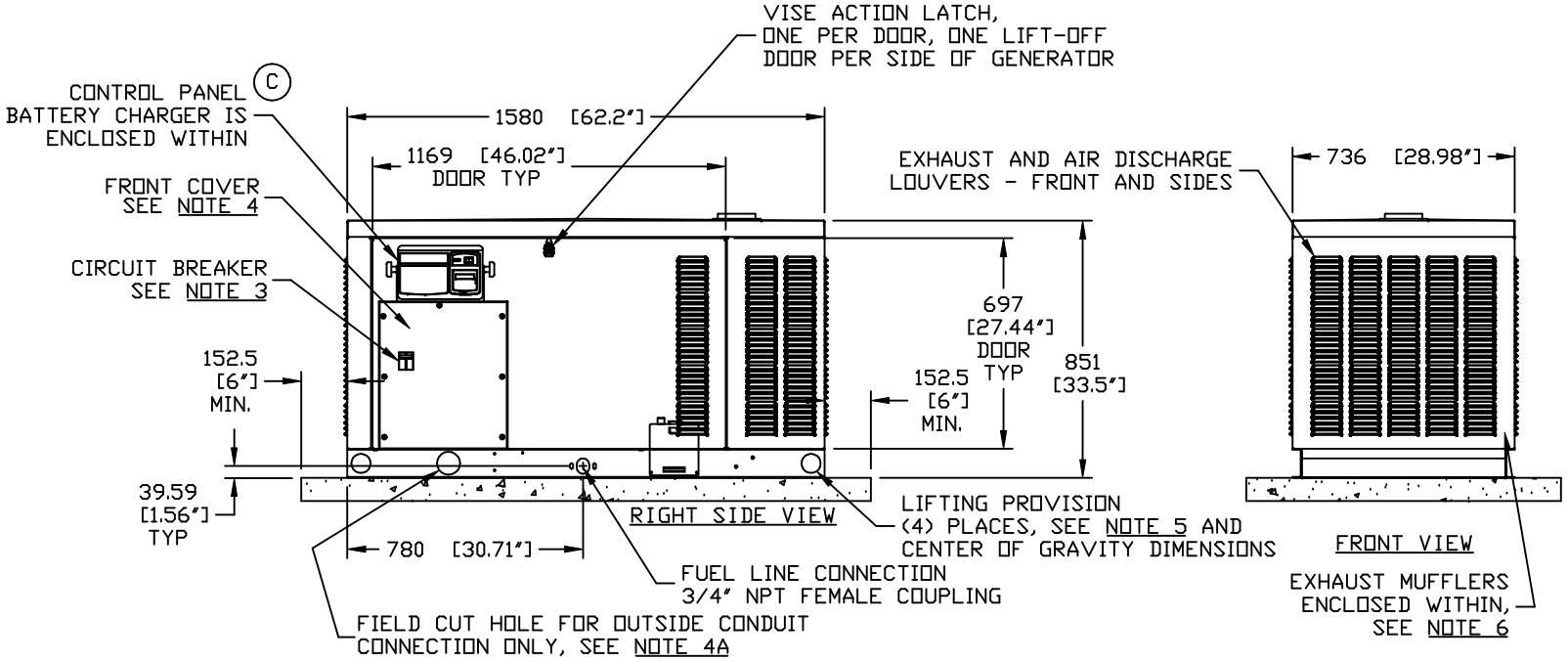
EXPLODED VIEW:
INSTALLATION DRAWING C1 CPL
DRAWING #: 0G5116



SERVICE ITEM ACCESSIBILITY CHART

SERVICE ITEM	ACCESS
OIL FILL CAP	EITHER DOOR
OIL DIP STICK	THRU RIGHT DOOR
OIL FILTER	THRU RIGHT DOOR
OIL DRAIN HOSE	THRU RIGHT DOOR
RADIATOR DRAIN HOSE	THRU RIGHT DOOR
AIR CLEANER ELEMENT	THRU RIGHT DOOR
SPARK PLUGS	THRU RIGHT DOOR
MUFFLERS	SEE NOTE 6
FAN BELT	THRU RIGHT DOOR
BATTERY	THRU RIGHT DOOR

REFERENCE OWNERS MANUAL FOR PERIODIC
REPLACEMENT PART LISTINGS



EXPLODED VIEW:
INSTALLATION DRAWING C1 CPL
DRAWING #: 0G5116