

Serial Number

005191-1

005200-1

005230-0

SG30

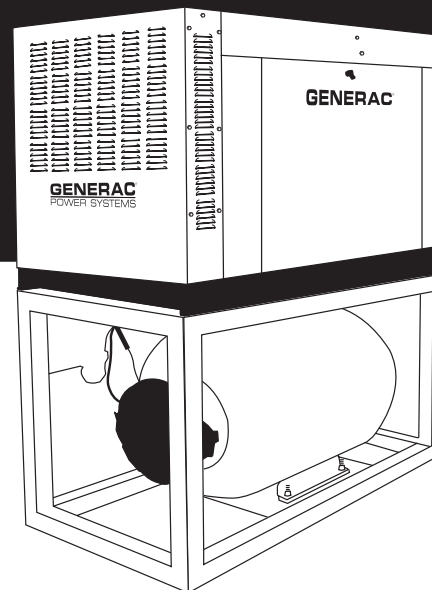
GENERATOR

TANK SET

NATURAL GAS

RISER FRAME

# STANDBY GENERATOR OWNER'S MANUAL



*A new standard of reliability*

**GENERAC®**  
POWER SYSTEMS, INC.

⚠ 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.

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## Standby Generator Sets Important 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. **⚠**



### WARNING:



The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.



### WARNING:



This product contains or emits chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

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 an Authorized 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. Exhaust gases must be piped safely away from any building or enclosure that houses the generator to an area where people, animals, etc., will not be harmed. This exhaust system must be installed properly, 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.



## Standby Generator Sets Important Safety Instructions



- 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 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 standby 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 set 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.
- 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 generator sets 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.





## Standby Generator Sets Important Safety Instructions



### INTRODUCTION

Thank you for purchasing this model of the standby generator set 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 Authorized 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:



**After this heading, read instructions that, if not strictly complied with, will result in personal injury or property damage.**



**After this heading, read instructions that, if not strictly complied with, may result in personal injury or property damage.**



**After this heading, read instructions that, if not strictly complied with, could result in damage to equipment and/or property.**


#### NOTE:

**After this heading, read explanatory statements that require special emphasis.**


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.

#### ◆ 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 an Authorized 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 an Authorized Service Dealer for service aids and accessories.

Operating instructions presented in this manual assume that the standby electric system has been installed by an Authorized 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 an Authorized Service Dealer for assistance. Service technicians are factory-trained and are capable of handling all service needs.

When contacting an Authorized Service Dealer or the factory about parts and service, always supply the complete model number of the unit as given on the front cover of this manual or on the DATA LABEL affixed to the unit.

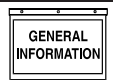
#### AUTHORIZED SERVICE DEALER LOCATION

To locate the nearest AUTHORIZED SERVICE DEALER, please call this number:

**1-800-333-1322**

or locate us on the web at:

**www.generac.com**



## Standby Generator Sets General Information



### 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, etc.

GENERATOR SET DATA		MADE IN USA					
MODEL		SERIAL					
RATED KW		RATED KVA		PHASE			
RATED VOLTAGE		RATED AMPS					
POWER FACTOR		HERTZ		ALT RPM			
ENGINE RPM		PRODUCTION DATE					
ALTERNATOR SUBTRANSIENT REACTANCE							
ALTERNATOR TRANSIENT REACTANCE							
CLASS	<input type="checkbox"/>	ROTOR	<input type="checkbox"/>	STATOR	<input type="checkbox"/>	WINDING INSULATION AT 25°C AMBIENT	
GENERAC POWER SYSTEMS, INC. WAUKESHA, WI							

#### 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.**

#### ✦ 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.

#### ✦ Identification Code

Use this code to obtain important information about the generator. For example, if the code is ...

**SD 100-- A 1 6 5.0 D 18 HB Y N C**

– identify the generator as follows:

- SD – Standby diesel generator (“SG” indicates a standby gaseous fuel unit).
- 100 – Rated output is 100,000 watts (100 kW).
- A – Voltage code (see “Voltage Codes” on this page).
- 1 – Indicates single-phase unit (3 – indicates three-phase unit).
- 6 – Indicates unit rated 60 Hertz (Hz) (5 – indicates 50 Hz).
- 5.0 – Engine is 5.0 liter (304 cubic inches).
- D – Unit has diesel fuel system (“N” indicates natural gas; “L” indicates LP Liquid Withdrawal; “V” indicates LP Vapor Withdrawal).
- 18 – Alternator rpm rating (1,800 rpm); “36” indicates 3,600 rpm.
- H – Unit has an option “H” control panel.
- B – Indicates a brushless unit (“D” indicates a direct excited unit with brushes and slip rings; “P” indicates a permanent magnet excitation).
- Y – Unit is equipped with a standard enclosure (“N” indicates no enclosure; “S” indicates unit has an acoustic enclosure).
- N – Unit does not have an exhaust muffler (“Y” indicates a muffler has been mounted; “L” indicates a muffler has been shipped loose with the unit).
- Y – Unit has a main line circuit breaker (“C” indicates unit has a UL-listed circuit breaker; “N” indicates no circuit breaker has been mounted).

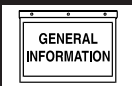
#### ✦ Groups and Assembly Numbers

The Data Label lists the groups and corresponding assembly numbers for each unit. The assembly numbers refer to exploded view drawing numbers that are applicable to the specific generator model. These drawings are located in the back half of this manual.

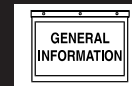
#### ✦ Voltage Codes

The identification code letter following the unit's kilowatt rating is the generator's “voltage code.” Any one of the following voltage codes may be listed.

- A – 120/240 volts, single-phase, four-lead, 60 Hz
- D – 120/240 volts, single- and three-phase, 12-lead, 60 Hz
- G – 120/208 volts, three-phase, 12-lead, 60 Hz Broad Range
- J – 120/240 volts, three-phase, 12-lead, 60 Hz Broad Range
- K – 277/480 volts, three-phase, 12-lead, 60 Hz Broad Range
- L – 346/600 volts, three-phase, six-lead, 60 Hz
- M – 110/220 volts, single-phase, four-lead, 50 Hz
- N – 115/200 volts, three-phase, 12-lead, 50 Hz Broad Range
- P – 100/200 volts, three-phase, 12-lead, 50 Hz Broad Range
- R – 231/400 volts, three-phase, 12-lead, 50 Hz Broad Range
- S – 277/480 volts, three-phase, six-lead, 50 Hz



## Standby Generator Sets Equipment Description



### EQUIPMENT DESCRIPTION

This equipment is a revolving field, alternating current generator set. It is powered by a propane vapor or natural gas fueled engine operating at 1800 rpm for 4-pole direct drive unit. The unit comes complete with a sound attenuated enclosure, internally mounted muffler, control console, mainline circuit breaker, battery charger, fuel tank set and protective alarms as explained in the following section.

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

The generator incorporates the following generator features:

- Rotor and Stator insulation is Class H 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 15W-40 engine oil at the factory. Use a high-quality detergent oil classified "For Service CC, SD, SE, SF." Detergent oils keep the engine cleaner and reduce carbon deposits. Use oil having the following SAE viscosity rating, based on the ambient temperature range anticipated before the next oil change:

Temperature	Oil Grade (Recommended)
Above 80° F (27° C)	SAE 30W or 15W-40
32° to 80° F (0° to 27° C)	SAE 20W-20 or 15W-40
Below 32° F (0° C)	See Note

#### 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 (part number listed in the Specification Section). The oil grade for temperatures below 32° F is 5W-30 synthetic oil.

### COOLANT RECOMMENDATIONS

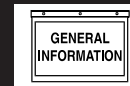
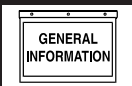
Use a mixture of propylene glycol base anti-freeze and deionized water. Cooling system capacity is about 8 U.S. quarts (7.6 liters). Use only deionized water and only propylene anti-freeze. If desired, add a high quality rust inhibitor to the recommended coolant mixture. When adding coolant, always add the recommended 50-50 mixture.

#### CAUTION

- ⚠ Do not use any chromate base rust inhibitor with propylene glycol base anti-freeze. Engines that have been operated with a chromate base rust inhibitor must be chemically cleaned before adding propylene 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 standby generator may be required to operate for long periods of time without an operator on hand to monitor such engine conditions as coolant temperature, oil pressure or rpm. For that reason, the engine has several devices designed to protect it against potentially damaging conditions by automatically shutting down the unit when the oil pressure is too low, the coolant temperature is too high, the coolant level is too low, or the engine is running too fast.

#### NOTE:

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

### ◆ COOLANT TEMPERATURE SENSING

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

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

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

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

### ◆ LOW COOLANT LEVEL

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

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

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

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

### ◆ OIL PRESSURE SENSING

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

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

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

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

### ◆ OVERCRANK SHUTDOWN

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

### ◆ OVERSPEED SHUTDOWN

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

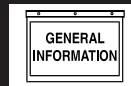
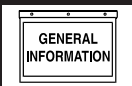
### ◆ RPM SENSOR LOSS SHUTDOWN

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

### ◆ DC FUSE

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





## FUEL SYSTEM

### ◆ FUEL REQUIREMENTS

This standby generator is equipped with one of the following fuel systems:

- Natural gas fuel system
- Propane vapor (PV) fuel system
- PV/NG dual fuel system

The Manual Drawing Listing that is affixed to the unit includes the "Identification Code", which may be used to identify the type of fuel system installed on the unit.

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

Required fuel pressure for **natural gas and liquid propane is five inches to 14 inches water column (0.18 to 0.5 psi)**.

#### NOTE:

**Any piping used to connect the generator to the fuel supply should be of adequate size to ensure the fuel pressure NEVER drops below five inches water column for natural gas or liquid propane for all load ranges.**

#### NOTE:

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

### ◆ NATURAL GAS FUEL SYSTEM

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

- Gas pressure in a building is usually regulated by national, state and local codes.
- To reduce gas pressure to a safe level before the gas enters a building, a primary regulator is needed. The natural gas supplier may or may not supply such a regulator.
- It is the responsibility of the gas supplier to make sure sufficient gas pressure is available to operate the primary regulator.
- Gas pressure at the inlet to the fuel shutoff solenoid should not exceed approximately 14 inches water column (0.5 psi). Optimum pressure at the fuel shutoff solenoid is 11 inches water column (0.4 psi).

### ◆ PROPANE VAPOR WITHDRAWAL FUEL SYSTEM

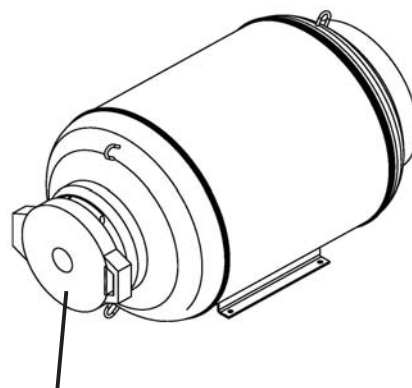
This type of system utilizes the vapors formed above the liquid fuel in the supply tank. Approximately 10 to 20 percent of the tank capacity is needed for fuel expansion from the liquid to the vapor state. The vapor withdrawal system is generally best suited for smaller engines that require less fuel.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

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

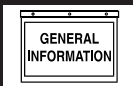
#### NOTE:

**The door on the fuel tank MUST be properly closed for generator to operate (Figure 5.1).**

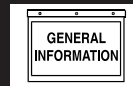
Figure 5.1



Fuel Tank Door Properly Closed



## Standby Generator Sets Fuel Systems



### ◆ NG/PV DUAL FUEL SYSTEM

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This system may be set up to run primarily on either natural gas or propane vapor. When the primary fuel pressure drops below 4 inches of water, the generator switches to run on the secondary fuel.

This unit is shipped for operation on both natural gas, and liquid propane vapor (propane) fuel. The natural gas low pressure switch is programmed as an alarm only and will not shut the unit down. The propane fuel will take over supplying the engine automatically.

If the unit is to be used solely for natural gas usage, the low pressure switch needs to be programmed as a shut down function by an Authorized Service Dealer.

### ◆ LOW FUEL LEVEL ALARM

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This standby generator is equipped with a low fuel level alarm when propane vapor is used. When the fuel level in the propane tank gets low, an alarm will sound to notify operator.

### ◆ GAS DETECTOR

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Either one or two gas detectors may be equipped on this unit. They are located on the frame and detect if there is a fuel leak. If the detector(s) senses a leak, the unit will shut down.

### ◆ FLUID SPILL ALARM

---

This alarm notifies the operator when there is a spill inside the enclosure, i.e. coolant, oil.

## SPECIFICATIONS

### ◆ GENERATOR

Type ..... Synchronous  
 Rotor Insulation ..... Class H  
 Stator Insulation ..... Class H  
 Telephone Interference Factor (TIF) ..... < 50  
 Alternator Output Leads 1-phase ..... 4-wire  
 Bearings ..... Sealed Ball  
 Coupling ..... Flexible Disc  
 Load Capacity (Standby Rating) ..... 30kW  
 Excitation System ..... Brushless  
 Generator Output Voltage/kW - 60 Hz      kW      Amp      CB Size  
 120/240V, 1-phase, 1.0 pf      30      125      150  
 Generator Locked Rotor KVA Available @ Voltage Dip of 35%  
 Single-phase ..... 60 kVA

### ◆ ENGINE

Make ..... Generac  
 Model ..... V-type  
 Cylinders and Arrangement ..... 6  
 Displacement ..... 3.9 Liter  
 Bore ..... 3.91 in.  
 Stroke ..... 3.31 in.  
 Compression Ratio ..... 9.1-to-1  
 Air Intake System ..... Naturally Aspirated  
 Valve Seats ..... Hardened  
 Lifter Type ..... Hydraulic

#### Engine Parameters

Rated Synchronous RPM ..... 60 Hz, 1800  
 HP at rated kW ..... 60 Hz, 62

#### Exhaust System

Exhaust Flow at Rated Output 60 Hz ..... 274 cfm  
 Exhaust Temperature at Rated Output ..... 1250° F

#### Combustion Air Requirements (Natural Gas)

Flow at rated power, 60 Hz ..... 105 cfm

#### Governor

Type ..... Electronic  
 Frequency Regulation ..... ± 1%  
 Steady State Regulation ..... ± 1/2%  
 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 ..... 2190  
 Fan Diameter ..... 22 inches  
 Fan Mode ..... Pusher  
 Air Flow (inlet air including alternator and  
 combustion air) ..... 2725 ft<sup>3</sup>/min.  
 Coolant Capacity ..... (3.0 U.S. gal.)  
 Heat Rejection to Coolant ..... 153,000 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<sup>3</sup>/hr (NG/PV)

Exercise Cycle	25% Load	50% Load	75% Load	100% Load
93/33	148/59.5	285/115	360/140	420/168

### ◆ ELECTRICAL SYSTEM

Battery Charge Alternator ..... 12V, 30 Amp  
 Static Battery Charger ..... 10 Amp  
 Recommended Battery ..... 24F 625CCA  
 System Voltage ..... 12 Volts

#### Voltage Regulator

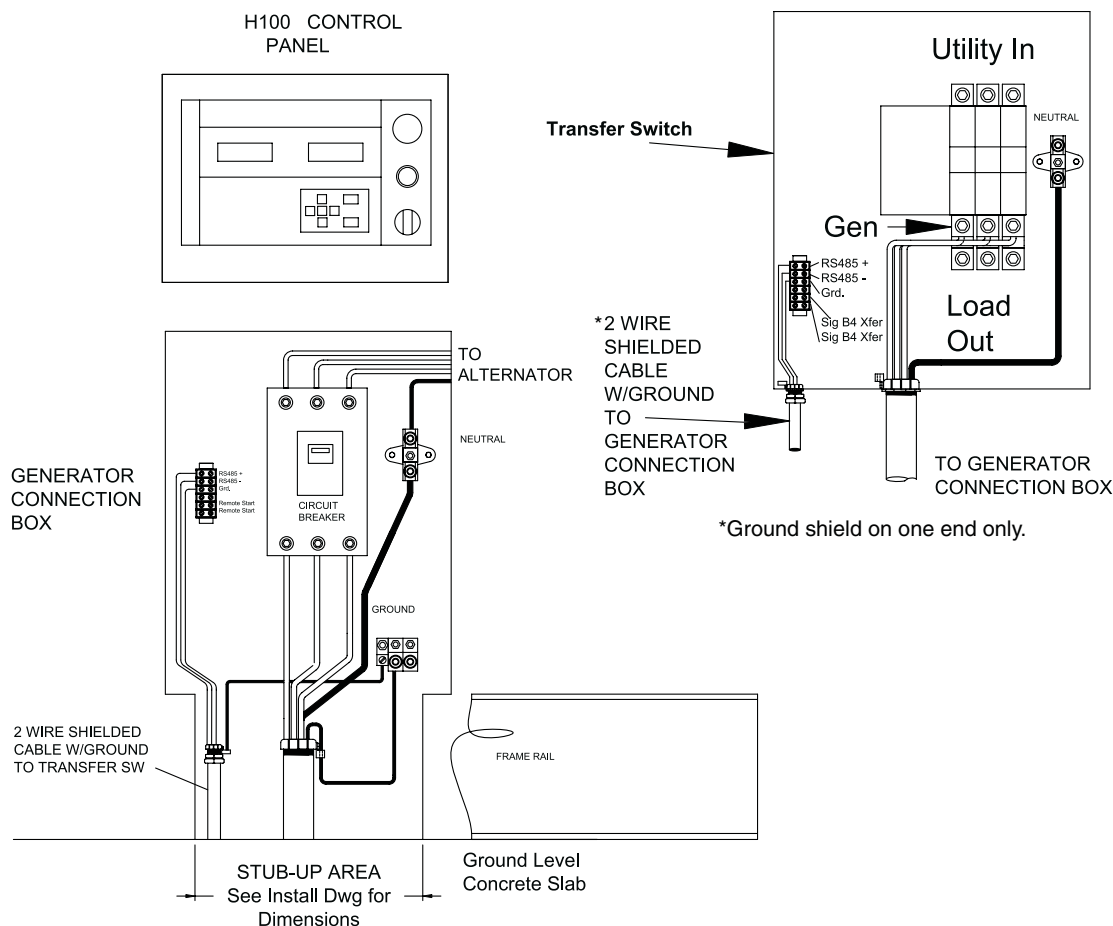
Type ..... Electronic  
 Sensing ..... Single-phase  
 Regulation ..... ± 1%  
 Features ..... V/F Adjustable, Adjustable  
 Voltage and Gain LED Indicators

#### Power Adjustment for Ambient Conditions

Temperature Deration  
 3% for every 10° C above °C ..... 25  
 1.65% for every 10° above °F ..... 77  
 Altitude Deration  
 1% for every 100 m above m ..... 182  
 3% for every 1000 ft. above ft. .... 600

Controller ..... **H-100**

**Figure 1 — Interconnections**



## IGNITION DESCRIPTION

When this ignition is used on a 3.9L engine, a mag pick-up sensor and 164 tooth flywheel are used to determine engine timing. A Hall based CAM/Distributor sensor establishes the location of flywheel tooth number one. The 3.9L engine uses one (1) coil driver together with a single-fire coil.

### Nominal Engine Timing versus Engine Speed:

RPM	LP Timing (BTDC)
1800 rpm	23 degrees

## ◆ IGNITION POWER-UP INPUT ("56 LINE" INPUT)

When battery voltage is applied to this input the ignition will power up. For the ignition to power itself down, battery voltage must be removed from this input. When flywheel and cam pulses are no longer detected by the ignition and this input is no longer connected to plus battery voltage, the ignition will power itself down.

## ◆ FUEL SELECT INPUT

When this input is not connected (i.e. left open) the ignition will operate in LP Fuel Mode.

## ◆ IGNITION SHUTDOWN ON LOSS OF FLYWHEEL OR CAM/DISTRIBUTOR SIGNALS

The ignition will stop firing the coils immediately following the loss of the flywheel signal. The ignition will stop firing the coils approximately three (3) seconds following the loss of the cam signal.

## ◆ 3.9L ENGINE SELECT INPUT

If this input is "low" when the ignition initially powers up, the ignition will be configured for operation with a 3.9L engine.



## ◆ DIAGNOSTIC BLINK PATTERNS (IGNITION RED LED)

The diagnostic LED is located on the back of the ignition control module, near one of the module mounting bases. It will be necessary to remove the module from the panel, and turn over, to view the LED.

- Normal Operation: LED flashes at a 0.5 second ON and a 0.5 second OFF rate.

LED Fault Code with Priority as shown;

- No Crank Signal: LED blinks 2 times, is OFF for 3.0 seconds and then repeats
- No CAM Signal: LED blinks 3 times, is OFF for 3.0 seconds and then repeats

Only one fault is displayed at a time. If multiple faults exist then the highest priority fault must be resolved prior to a lower priority fault being displayed.

The diagnostic blink patterns provide flywheel and CAM sensor diagnostics only during cranking following the initial power-up of the ignition. The Generator must have been in the OFF mode for 60 seconds prior to cranking for the flywheel and CAM sensor diagnostics to be valid (i.e. diagnostics are not valid during a re-crank). The LED fault code blink pattern, if present, is displayed for 60 seconds and then the ignition will power itself down.

**Table 1 — Ignition 23 Pin "BLUE" Connector**

J1 Pin #	Pin Description
1	Coil Driver A
2	Coil Driver C
3	Coil Driver B
4	N/C
5	N/C
6	2.5L Engine Select Return*
7	N/C
8	2.5L Engine Select Input (connect to Pin 6 for 2.5L operation)
9	N/C
10	12V CAM/Distributor Voltage (Hall Sensor)
11	Power-Up Input ("56 Line" is connected to this input)
12	Fuel Select Input ("14 Line" = NG Fuel, Open/Unconnected = LP Fuel)
13	3.9L Engine Select Return
14	Flywheel or Crank Sensor Input
15	3.9L Engine Select Input (connect to Pin 13 for 3.9L operation)
16	12V Battery Input (fused input, 15 Amp, ATO Type)
17	Battery GND
18	Coil + (supply voltage to engine coil pack)
19	Digital Output
20	Flywheel or Crank Sensor Screen
21	Flywheel or Crank Sensor Return
22	Distributor Return
23	Distributor Input

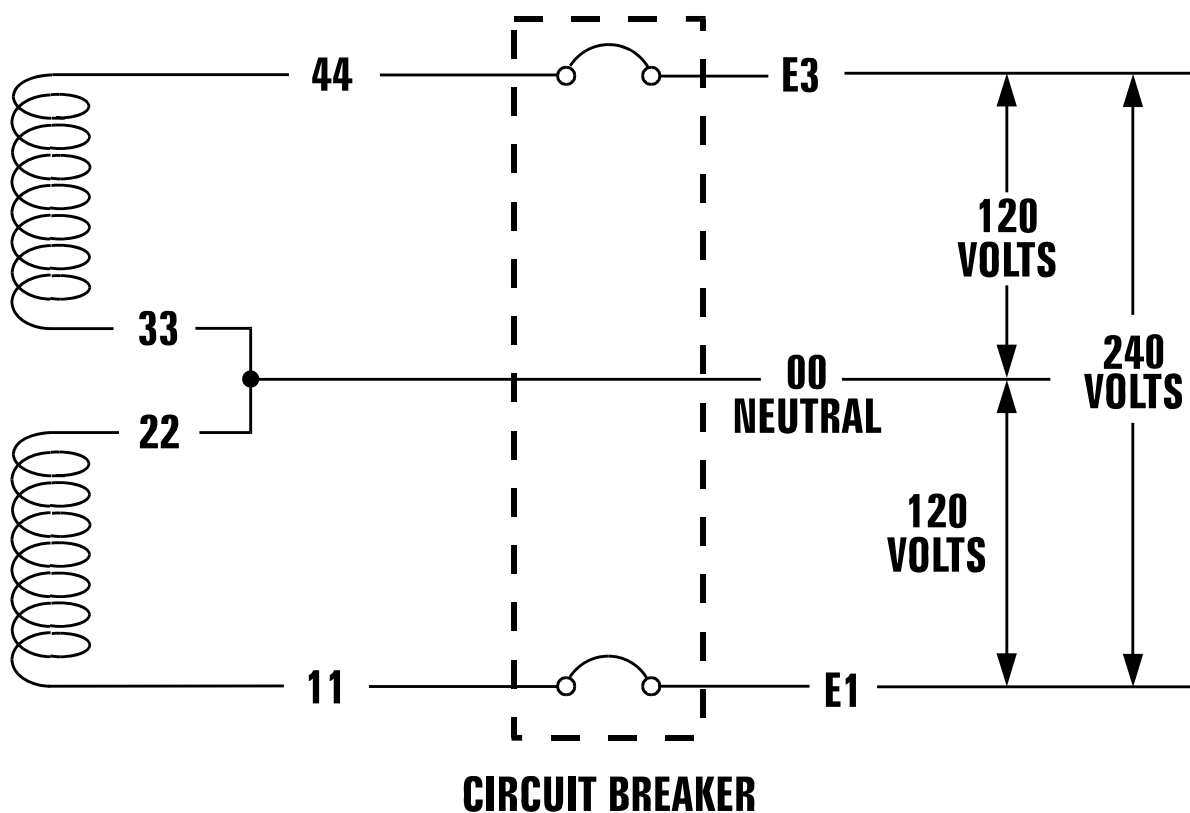
## GENERATOR AC LEAD CONNECTIONS

### ◆ FOUR-LEAD, SINGLE-PHASE STATOR

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

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

Figure 7.1 — Four-lead, Single-phase Stator





## INSTALLATION

### ◆ UNPACKING

Handle shipping cartons and crates with care. Use care to avoid damage from dropping, bumping, collision, etc. Store and unpack cartons with the proper side up, as noted on the shipping carton.

### —⚠ WARNING ⚠—

⚠ **Do not lift the fuel storage tank assembly using upper rails of tank frame. Damage to the fluid containment pan and/or wiring may result which will void warranty.**

⚠ **Fuel Storage tank must be lifted from underneath the bottom frame rails or through the lifting points as shown on the INSTALLATION DRAWING included in the back of this manual.**

### ◆ GENERATOR LOCATION

Install the generator set, in its protective enclosure outdoors, where adequate cooling and ventilating air always is available. Consider these factors:

- Install the unit where air inlet and outlet openings will not become obstructed by leaves, grass, snow, etc. If prevailing winds will cause blowing or drifting, consider using a windbreak to protect the unit.
- Install the generator on high ground where water levels will not rise and endanger it.
- This genset must be installed on a level surface. The base frame must be level within 1/2 inch all around.
- 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.
- Where strong prevailing winds blow from one direction, face the generator air inlet openings into the prevailing winds.
- Install the generator as close as possible to the transfer switch. This reduces the length of wiring and conduit.
- Install the generator as close as possible to the fuel supply, to reduce the length of piping. HOWEVER, REMEMBER THAT LAWS OR CODES MAY REGULATE THE DISTANCE.

### ◆ GENERATOR SUPPORT

Guidelines that should be followed are:

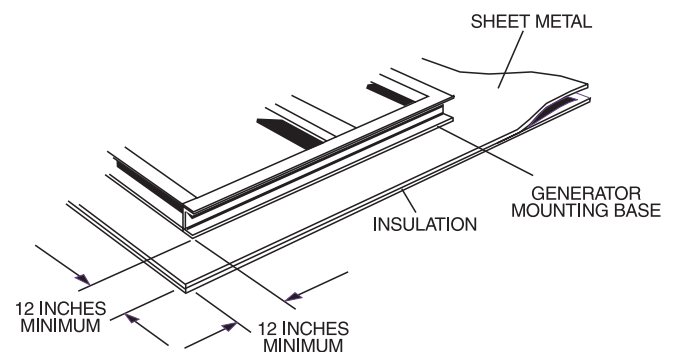
- When designing a concrete base slab, all federal, state and local codes should be followed. Special attention should be given to the concrete base slab which should exceed the length and width of the generator by a minimum of six (6) inches (0.152 meters) on all sides.
- The concrete base should be leveled to  $\pm .25$  inches horizontally.
- Retain the generator set to the concrete slab with masonry bolts.

### ✦ Combustible Floor and Roof Protection

If the generator must be installed on any combustible floor or roof, comply with the following rules:

- Place a layer of non-combustible insulation, followed by a layer of sheet metal beneath the unit's mounting base rails.
- Both the layer of insulation and the sheet metal must extend beyond the generator base to a distance of at least 12 inches (30.5 cm) on all sides.

**Figure 8.1 - Combustible Floor and Roof Protection**



### NOTE:

**Consult the local building codes, which may vary.**



## INSTALLATION RULES

This equipment is a liquid-cooled, generator set. The generator is designed to supply electrical power that operates critical electrical loads during utility power failure. The unit has been factory installed in a weather resistant, all metal enclosure and is intended for outdoor installation only.

### ⚠ WARNING ⚠

- ⚠ If this generator is used to power electrical load circuits normally powered by a utility power source, it is required by code to install a transfer switch. The transfer switch must effectively isolate the electric system from the utility distribution system when the generator is operating (NEC 701). Failure to isolate an electrical system by such means results in damage to the generator and may also result in injury or even death to utility power workers due to backfeed of electrical energy.

## BEFORE INSTALLATION

Before installing this equipment, check the ratings of both the generator and the transfer switch. Read "Emergency Isolation Method" and "Total Circuit Isolation Method" Paragraph.

The generator's rated wattage/ampere capacity must be adequate to handle all electrical loads that the unit will power. The critical (essential) loads may need to be grouped together and wired into a separate "emergency" distribution panel.

### ⚠ DANGER ⚠

- ⚠ Connecting this generator to an electrical system normally supplied by an electric utility shall be by means of a transfer switch, so as to isolate the electric system from the utility distribution system when the generator is operating. Failure to isolate the electric system by these means will result in damage to the generator and may also result in injury or death to utility workers due to backfeed of electrical energy.
- ⚠ If an open bottom is used, the generator is to be installed over non-combustible materials and should be located such that combustible materials are not capable of accumulating under the generator set.

Only qualified, competent installation contractors or electricians thoroughly familiar with applicable codes, standards and regulations should install this standby electric power system. The installation must comply strictly with all codes, standards and regulations pertaining to the installation.

### ⚠ CAUTION ⚠

- ⚠ After the system has been installed, do nothing that might render the installation in noncompliance with such codes, standards and regulations.

## ◆ NFPA STANDARDS

The following published standards booklets pertaining to standby electric systems are available from the National Fire Protection Association (NFPA). Batterymarch Park, Quincy, MA 02269:

- NFPA No. 37, STATIONARY COMBUSTION ENGINES AND GAS TURBINES.
- NFPA No. 76A, ESSENTIAL ELECTRICAL SYSTEMS FOR HEALTH CARE FACILITIES.
- NFPA No. 220, STANDARD TYPES OF BUILDING CONSTRUCTION
- NFPA No. 68, GUIDE FOR EXPLOSION VENTING
- NFPA No. 70, NATIONAL ELECTRICAL CODE.
- NFPA No. 30, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE.
- NFPA No. 10, INSTALLATION, MAINTENANCE AND USE OF PORTABLE FIRE EXTINGUISHERS.

### NOTE:

**It is essential to use the latest version of any standard to ensure correct and current information.**

## ◆ OTHER PUBLISHED STANDARDS

In addition to NFPA standards, the following information pertaining to the installation and use of standby electric systems is available:

- Article X, NATIONAL BUILDING CODE, available from the American Insurance Association, 85 John Street, New York, N.Y. 10038.
- AGRICULTURAL WIRING HANDBOOK, obtainable from the Food and Energy Council, 909 University Avenue, Columbia, MO. 65201.
- ASAE EP-364.2, INSTALLATION AND MAINTENANCE OF FARM STANDBY ELECTRIC POWER, available from the American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085.
- A52.1, AMERICAN NATIONAL STANDARD FOR CHIMNEYS, FIREPLACES AND VENTING SYSTEMS, available from the American National Standard Institute, 1430 Broadway, New York, N.Y. 10018.

### NOTE:

**It is essential to use the latest version of any standard to ensure correct and current information.**

The installer must comply with all applicable state and local codes.





## PREPARATION BEFORE START-UP

The instructions in this section assume that the standby generator has been mechanically properly installed, serviced, 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".

### ◆ INITIAL INSPECTION FOR GENERATOR STARTUP

Inspect for the following.

- Freight Damage.
- Manuals present.
- Fluid Levels ( Oil, coolant, battery).
- Correct fuel piping (if other than provided by Generac).
- 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.
- Communication wires connected between transfer switch and generator (HTS only).
- Unit secured to pad.

### ✦ 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 standby 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" and "Preparation for Start-up" 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".

#### 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



- ⚠ 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.

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



## START-UP CHECK LIST



### WARNING

Before working on the generator, ensure the following:

- The AUTO/OFF/MANUAL switch is in the OFF position.
- The 120VAC supply to the battery charger is switched OFF.
- Ensure the UTILITY supply is disconnected from the transfer switch.
- Remove the fuse from the the control panel. For the H-100 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.
- 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 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.

- 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 panel.
- Put the Owners Manual in a safe and accessible place.
- Make certain the AUTO/OFF/MANUAL switch is in the AUTO position.

## ◆ START-UP INSPECTION FORM

When a start-up is performed by an Authorized Service Dealer, a standard three form titled "Start-up Inspection for Standby Power Systems" (part no. 067377), should be completed by the installation technician or engineer. The installer should complete the form and disseminate copies as follows:

- White copy: Mail to Generac Warranty Dept, PO. Box 340. 211 Murphy Dr., Eagle, WI 53119-2062.
- Pink Copy: For service file of installing dealer.
- Yellow Copy: For the customer's records.

## ELECTRICAL CONNECTIONS

### ◆ GROUNDING THE GENERATOR

A GROUNDING LUG is provided on the generator mounting base for the purpose of grounding the frame and the external electrically conductive parts of this equipment to an approved earth ground and/or grounding rods where required by the National Electrical Code (Figure 8.2). Consult a qualified electrician for grounding requirements in the area. Grounding procedures must meet local regulations.



### DANGER

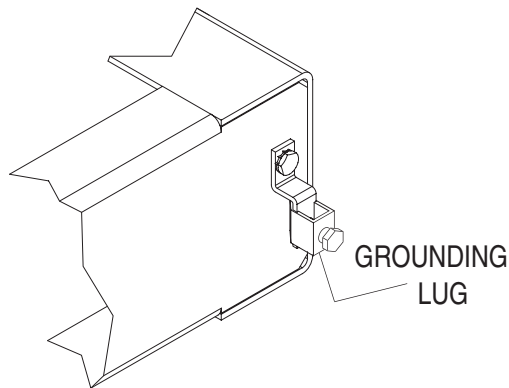


**Do not connect the ground wire to any pipe that carries a flammable or explosive substance - FIRE or an EXPLOSION may result.**

Proper grounding helps protect personnel against electrical shock in the event of a ground fault condition in the generator or in connected electrical devices. In addition, grounding helps dissipate static electricity that often builds up in ungrounded devices.



**Figure 8.2 - Generator Grounding Lug (typical)**



## ◆ BATTERY CHARGER CONNECTION

The generator has been equipped with a 10 Amp battery charger installed. This charger needs to be plugged into an appropriate 120VAC 15 amp outlet.

## ◆ BATTERY INSTALLATION

### — ⚠ DANGER ⚠ —

⚠ Standby generators installed with automatic transfer switches 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, do not connect battery cables until certain that; the AUTO/OFF/MANUAL switch is in the OFF position; the 15A fuse has been removed from the control box (see Start-up Check List); normal source voltage at the transfer switch is correct and the system is ready to be placed into operation.

⚠ Storage batteries give off explosive hydrogen gas. This gas can form an explosive mixture around the battery for several hours after charging. The slightest spark can ignite the gas and cause an explosion. Such an explosion can shatter the battery and cause blindness or other injury. Any area that houses a storage battery must be properly ventilated. Do not allow smoking, open flame, sparks or any spark producing tools or equipment near the battery.

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

### — ⚠ WARNING ⚠ —

⚠ Do not dispose of the battery in a fire. The battery is capable of exploding.

⚠ Do not open or mutilate the battery. Released electrolyte can be toxic and harmful to the skin and eyes.



◆ **TABLE 1 – VAPOR CAPACITY OF PROPANE STORAGE TANKS (FOR REFERENCE)**

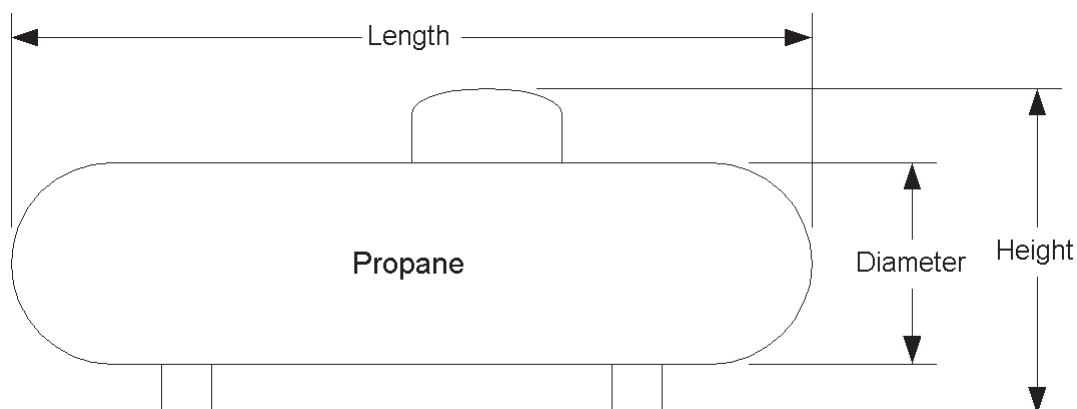
To Use: Go to the First column and pick the required kW load and then pick the minimum ambient temperature (40°, 20° or 0° F) that the generator would be operating in. The third column (tank capacity) will give the required tank size to continually produce the given fuel flow.

Max kW Vapor	Minimum Temp	Operating Hours @ Max kW	Tank Capacity (Gallons)	Length Inches	Dia Inches	Overall Ht. Inches
30 20 10	40 20 0	24 35 67	120	57	24	33
35 25 12	40 20 0	26 36 72	150	68	24	33
60 40 20	40 20 0	26 38 74	250	94	30	39
80 50 25	40 20 0	26 40 77	325	119	30	39
100 60 30	40 20 0	31 51 100	500	119	37	46
150 100 50	40 20 0	35 53 105	850	165	41	50
170 120 60	40 20 0	36 51 103	1000	192	41	50

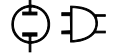
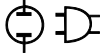
Propane storage tanks can provide either a liquid or a vapor supply to the generator. The above chart is for **vapor withdrawal only** and provides the kW output or amount of vapor that can be withdrawn at a given temperature while keeping the temperature of the liquid above the boiling point. If the withdrawal rate is too high, the LP temperature goes below the boiling point, the pressure drops to zero and no vapor can be withdrawn. A primary regulator is also required at the tank to reduce the line pressure to the generator to 5-14 inches of water column for units less than 70kW or 11-14 inches of water column for units 70kW and above.

Propane Conversions: 36.38 ft<sup>3</sup> = 90,500 btu = 1 gal • 1lb = 21,500 btu = 8.56 ft<sup>3</sup>

**Figure 1.5 — Propane Storage Tank**







## GENERATOR CONTROL AND OPERATION

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

## OPERATING UNIT WITH MANUAL TRANSFER SWITCH

If the 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.



⚠ 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 standby 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 its STANDBY (GENERATOR) position, i.e., load circuits supplied by the generator.
- Set the standby generator's main line circuit breaker to its ON (or CLOSED) position.
- Load circuits are now powered by the standby 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:

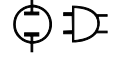
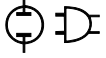
- Set the standby generator's main line circuit breaker to its OFF (or OPEN) position.
- Manually move the transfer switch handle to its UTILITY (NORMAL) position, i.e., load circuits connected to the utility.
- Turn ON the utility power supply to the transfer switch, using the means provided (such as 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 generator has been installed with an automatic transfer switch, such as an HTS or GTS-type 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."**

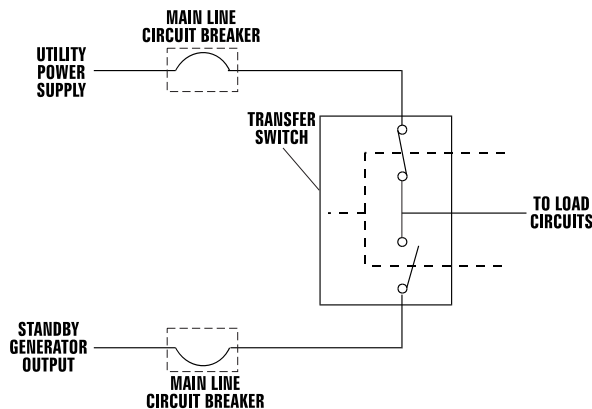


## BASIC STANDBY ELECTRIC SYSTEM

Figure 9.1 shows a schematic diagram of a basic standby electric system. Both the UTILITY power supply and the STANDBY (GENERATOR) output are connected to an approved transfer switch. The transfer switch is required by electrical code and serves the following functions:

- Allows the LOAD circuits to be connected to only one power supply at a time.
- Prevents electrical backfeed between the generator and the UTILITY power circuits.

**Figure 9.1 – Basic Standby Electric System**



Notice that both the STANDBY and the UTILITY power supplies to the transfer switch are protected against overload by a main line circuit breaker.

## STANDBY CIRCUIT ISOLATION METHOD

This prevents overloading the generator by keeping electrical loads below the wattage/amperage capacity of the generator. If the generator is powering only designated loads, within the wattage/amperage capacity, during utility power outages, consider using the emergency circuit isolation method.

Designated electrical loads are grouped together and wired into a separate “Standby Distribution Panel.” Load circuits powered by that panel are within the wattage/amperage capacity of the generator set. When this method is used, it is difficult to overload the generator. The transfer switch must meet the following requirements:

- It must have an ampere rating equal to the total amperage rating of the standby distribution panel circuit.
- Have it installed between the building’s main distribution panel and the standby distribution panel.

## TOTAL CIRCUIT ISOLATION METHOD

When a generator capable of powering all electrical loads in the circuit is to be installed, use the “Total Circuit Isolation Method.” It is possible for the generator to be overloaded when this isolation method is employed. The following apply to the transfer switch in this type of system.

- Ampere rating of the transfer switch must equal the ampere rating of the normal incoming utility service.
- The transfer switch is installed between the utility service entrance and the building distribution panel.

## CONNECTION DIAGRAMS

All wiring in the standby electric power system must be in strict compliance with applicable codes, standards and regulations. Such wiring must be properly supported, routed, and connected. In addition, wiring must be properly sized to carry the maximum load current to which it will be subjected.

The connections between the generator and transfer switch will vary depending on the equipment ordered. In each case there are two types of interconnections, load wiring and control wiring.

### NOTE:

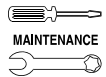
**Control wiring must always be run in a separate conduit from the load wiring.**



- ⚠ Make sure to turn OFF both the NORMAL (UTILITY) and STANDBY (EMERGENCY) power supplies before trying to connect power source and load lines to the transfer switch. Supply voltages are extremely high and dangerous. Contact with such high voltage power supply lines causes extremely hazardous, possibly lethal, electrical shock.



- ⚠ Be sure to maintain proper electrical clearances between live electrical parts and grounded metal. Allow at least one-half inch of clearance for circuits up to 400 amps.



### MAINTENANCE PERFORMED BY AUTHORIZED SERVICE FACILITIES

#### — ⚠ WARNING ⚠ —

⚠ Before working on the generator, ensure the following:

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

#### ◆ EVERY THREE MONTHS

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

#### ◆ ONCE EVERY SIX MONTHS

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

#### ◆ ONCE ANNUALLY

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

#### ◆ FIRST 100 OPERATING HOURS

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

#### ◆ EVERY 500 OPERATING HOURS

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

### COOLING SYSTEM

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

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

#### — ⚠ WARNING ⚠ —

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

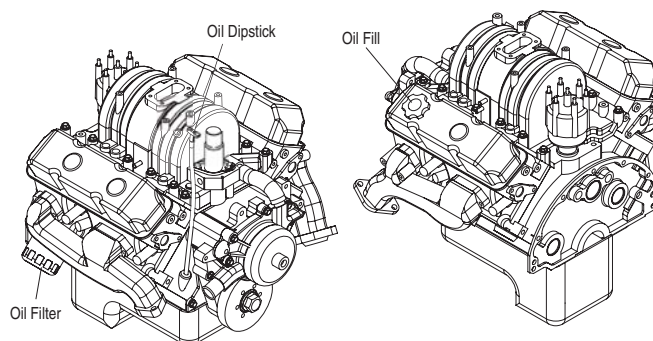
### CHECKING FLUID LEVELS

#### ◆ CHECK ENGINE OIL

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

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

*Figure 10.1 - Oil Dipstick and Oil Fill Cap*



#### ◆ BATTERY FLUID

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



## Standby Generator Sets Maintenance



### ◆ ENGINE COOLANT

Check coolant level in coolant recovery bottle. See the “Specifications” section.

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

## MAINTENANCE OWNER/ OPERATOR CAN PERFORM

### ◆ CHECK ENGINE OIL LEVEL

Refer to the “Checking Fluid Levels” section.

### ◆ CHECK BATTERY

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

### ◆ EXERCISE SYSTEM

Start the generator engine at least once every seven days and let it run at least 20 minutes. See the “Weekly Exercise Cycle” section.

### ◆ INSPECT COOLING SYSTEM

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

### ◆ CHECK ENGINE COOLANT LEVEL

See the “Checking Fluid Levels” section.

### ◆ PERFORM VISUAL INSPECTION

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

### ◆ INSPECT EXHAUST SYSTEM

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

### ◆ CHECK FAN BELT

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

### ◆ INSPECT ENGINE GOVERNOR

Visually inspect electronic governor.



- ⚠ 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 authorized service facilities for engine oil and filter change frequencies.

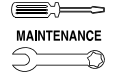
Drain the oil while the engine is still warm from running. This means warm up the engine, shut it down and drain immediately as follows:

1. Remove OIL DRAIN HOSE from its retaining clip.
2. Loosen and remove OIL DRAIN HOSE CAP. Drain oil completely into suitable container.
3. When all oil has drained, install and tighten OIL DRAIN HOSE CAP, and re-install into its retaining clip.
4. Turn OIL FILTER (Figure 10.2) counterclockwise and remove. Dispose of old filter.
5. Apply light coating of new engine oil to seal of new oil filter. Install FILTER and tighten by hand only. DO NOT OVERTIGHTEN.
6. Remove OIL FILL CAP. Add recommended oil (see SPECIFICATIONS). DO NOT FILL ABOVE THE DIPSTICK “FULL” MARK. Crankcase oil capacity is 4.0 U.S. quarts (3.8 liters).



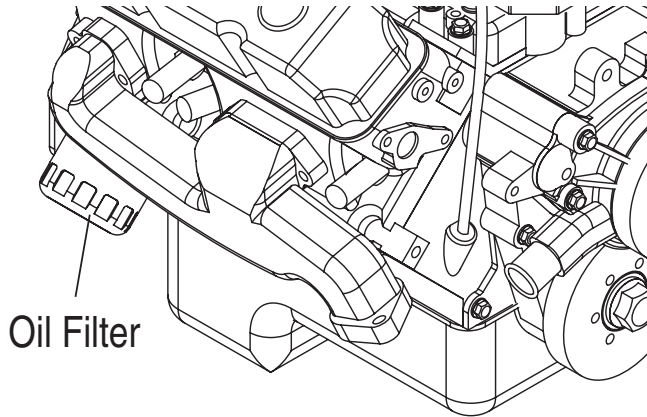
- ⚠ After refilling the crankcase with oil, always check oil level on dipstick. NEVER OPERATE ENGINE WITH OIL BELOW THE DIPSTICK “ADD” MARK.





7. Start engine and check for oil leaks.

**Figure 10.2 - Oil Filter**



### ◆ CHANGING THE ENGINE AIR CLEANER

To replace the engine air cleaner, (part number 0A4637), remove the air cleaner cover and replace the air filter making sure it is positioned properly before reattaching the cover.

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

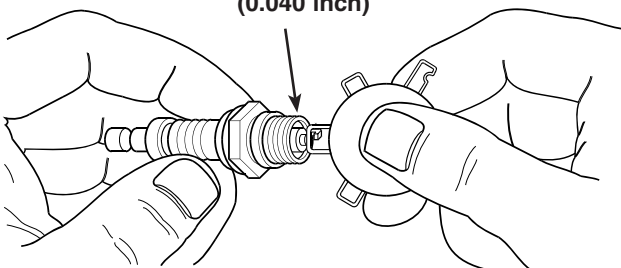
### ◆ SPARK PLUGS

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

1. Clean the area around the base of the spark plugs to keep dirt and debris out of the engine. Clean by scraping or washing using a wire brush and commercial solvent. Do not blast the spark plugs to clean.
2. Remove the spark plugs and check the condition. Replace the spark plugs if worn or if reuse is questionable. See the “Service Schedule” section for recommended inspection.
3. Check the spark plug gap using a wire feeler gauge. Adjust the gap to 1.01 mm (0.040 inch) by carefully bending the ground electrode (Figure 10.3).

**Figure 10.3 – Setting the Spark Plug Gap**

SET PLUG GAP AT 1.01 mm  
(0.040 inch)



### ◆ COOLANT CHANGE

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

## MISCELLANEOUS MAINTENANCE

### ◆ CLEANING THE GENERATOR

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

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

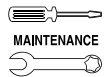
Once each year, have the generator cleaned and inspected by an Authorized Service Dealer. That dealer will use dry, low pressure air to clean internal windings. Parts inside the control console should be cleaned and inspected at this time as well.

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

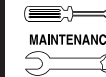
### ◆ BATTERY

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

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



## Standby Generator Sets Maintenance





### ◆ BATTERY MAINTENANCE


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

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





 Storage batteries give off explosive hydrogen gas. This gas can form an explosive mixture around the battery for several hours after charging. The slightest spark can ignite the gas and cause an explosion. Such an explosion can shatter the battery and cause blindness or other injury. Any area that houses a storage battery must be properly ventilated. Do not allow smoking, open flame, sparks or any spark producing tools or equipment near the battery.

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

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



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

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

### ◆ BATTERY REPLACEMENT

When replacing batteries, use the same number and the type of battery that follows:

BCI Group No.	CCA
24F-6	535 @ 0 deg. F

#### 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.

Periodic Replacement Parts	
Part Name	Part Number
Oil Filter	# 0E7415
Radiator Cap	# 046627
Air Cleaner	# 0A4637
Spark Plug	Champion # RC12LC4



## Standby Generator Sets Service Schedule



### SERVICE SCHEDULE

#### 30 KW - 150 KW STANDBY GAS ENGINE DRIVEN GENERATOR SETS

The following is a recommended maintenance schedule for standby gas engine driven generator sets from 30kW to 150 kW in size. The established intervals in the schedule are the maximum recommended when the unit is used in an average service application. They will need to be decreased (performed more frequently) if the unit is used in a severe application. Use calendar time, from the previous maintenance interval to determine the next required maintenance interval.

#### Service Maintenance Interval Information:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

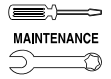
*Performed annually or following each 100 hours of operation of the unit.*

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

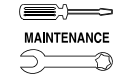
- 5 A comprehensive inspection of the generator set to insure it is properly serviced and ready to operate and carry the load when required, and to identify any potential problem areas.

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

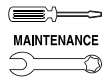
*This inspection contains some maintenance tasks which require special tools, equipment, and/or knowledge to accomplish and should be performed only by an Authorized Service Dealer.*



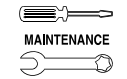
## Standby Generator Sets Service Schedule



Maintenance Tasks	Level 1		Level 2		Level 3		Level 4		Level5	
	Recom- mended to be done monthly/ 10 hrs.	Task Comp. (Date- Initials)	Required to be done 3 months/ Break-in 30 hrs.	Task Comp. (Date- Initials)	Required to be done Semi- annually/ 50 hrs.	Task Comp. (Date- Initials)	Required to be done Annually/ 100 hrs.	Task Comp. (Date- Initials)	Required to be done Bi- annually/ 250 hrs.	Task Comp. (Date- Initials)
1. Disable the unit from operating per the first page warning.										
2. Check the engine oil level. Adjust as necessary.										
3. Check the engine coolant level. Adjust as necessary.										
4. Check the engine coolant thermal protection level. Correct as necessary.										
5. Check the natural gas delivery system for leaks and correct pressure on gas engine driven units. Tighten connections as necessary.										
6. Check the air inlets and outlets for debris. Clean as necessary.										
7. Check the battery electrolyte level and specific gravity if accessible. Adjust as necessary.										
8. Check the battery posts, cables, and charger for loose connections, corrosion, and proper operation. Correct as necessary.										
9. Check the unit wiring for loose connections, corrosion, and damage. Correct as necessary.										

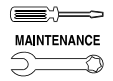


## Standby Generator Sets Service Schedule



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





## Standby Generator Sets Service Schedule



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



## Standby Generator Sets Troubleshooting



### TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	CORRECTION
Engine won't crank.	<ol style="list-style-type: none"> <li>15 amp fuse blown.</li> <li>Loose or corroded or defective battery cables.</li> <li>Defective starter contactor.</li> <li>Defective starter motor.</li> <li>Dead or Defective Battery.</li> <li>5 amp fuse blown.</li> </ol>	<ol style="list-style-type: none"> <li>Replace fuse.</li> <li>Tighten, clean or replace battery cables as necessary.</li> <li>Replace contactor.*</li> <li>Replace starter motor.*</li> <li>Remove, change or replace battery.</li> <li>Replace fuse.*</li> </ol>
Engine cranks but won't start	<ol style="list-style-type: none"> <li>Out of fuel.</li> <li>Fuel solenoid (FS) is defective</li> <li>Open Wire #14A from Engine Control circuit board.</li> <li>Spark plugs defective.</li> <li>Door on tank not closed.</li> </ol>	<ol style="list-style-type: none"> <li>Replenish fuel.</li> <li>Replace solenoid.*</li> <li>Reconnect wire.</li> <li>Clean, regap or replace plugs.</li> <li>Close door on tank.</li> </ol>
Engine starts hard, runs rough.	<ol style="list-style-type: none"> <li>Flame arrestor (air cleaner) plugged or damaged.</li> <li>Plugged fuel line.</li> <li>Defective spark plugs.</li> <li>Fuel pressure incorrect.</li> </ol>	<ol style="list-style-type: none"> <li>Clean or replace as needed.</li> <li>Unclog fuel line.</li> <li>Clean, regap or replace plugs.</li> <li>Confirm fuel pressure to regulator is as recommended in SPECIFICATIONS.</li> </ol>
Engine starts then shuts down.	<ol style="list-style-type: none"> <li>Engine oil level is low.</li> <li>Engine is overheated.</li> <li>Defective Low Oil Pressure Switch</li> <li>Defective Coolant Temperature Switch</li> <li>Defective Control Module circuit board.</li> <li>Coolant Level is Low.</li> <li>Defective Low Coolant Level Switch</li> </ol>	<ol style="list-style-type: none"> <li>Check oil and add oil as needed.</li> <li>Check cooling system for leaks.</li> <li>Replace switch.*</li> <li>Replace switch.*</li> <li>Replace board.*</li> <li>Repair leak - Add coolant.</li> <li>Replace Switch.*</li> </ol>
AUTO/OFF/MANUAL Switch at OFF, engine continues to run	<ol style="list-style-type: none"> <li>Defective AUTO/OFF/MANUAL switch</li> <li>Open/disconnected wire #15A between AUTO/OFF/MANUAL switch and Control Module circuit board.</li> <li>Defective Control Module circuit board</li> </ol>	<ol style="list-style-type: none"> <li>Replace switch.*</li> <li>Reconnect/close wire.</li> <li>Replace board.*</li> </ol>
No AC output from generator.	<ol style="list-style-type: none"> <li>Check main line circuit breaker.</li> <li>Check circuit breaker &amp; fuses.</li> <li>Transfer switch set to NORMAL position</li> <li>Generator internal failure.</li> <li>Thermal circuit breaker open.</li> </ol>	<ol style="list-style-type: none"> <li>Reset to ON or CLOSED.</li> <li>Reset and replace, if necessary.</li> <li>Set to GENERATOR position.</li> <li>*</li> <li>Auto-reset - Wait 5 min. and attempt restart.</li> </ol>

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

## Standby Generator Sets

## Standby Generator Sets

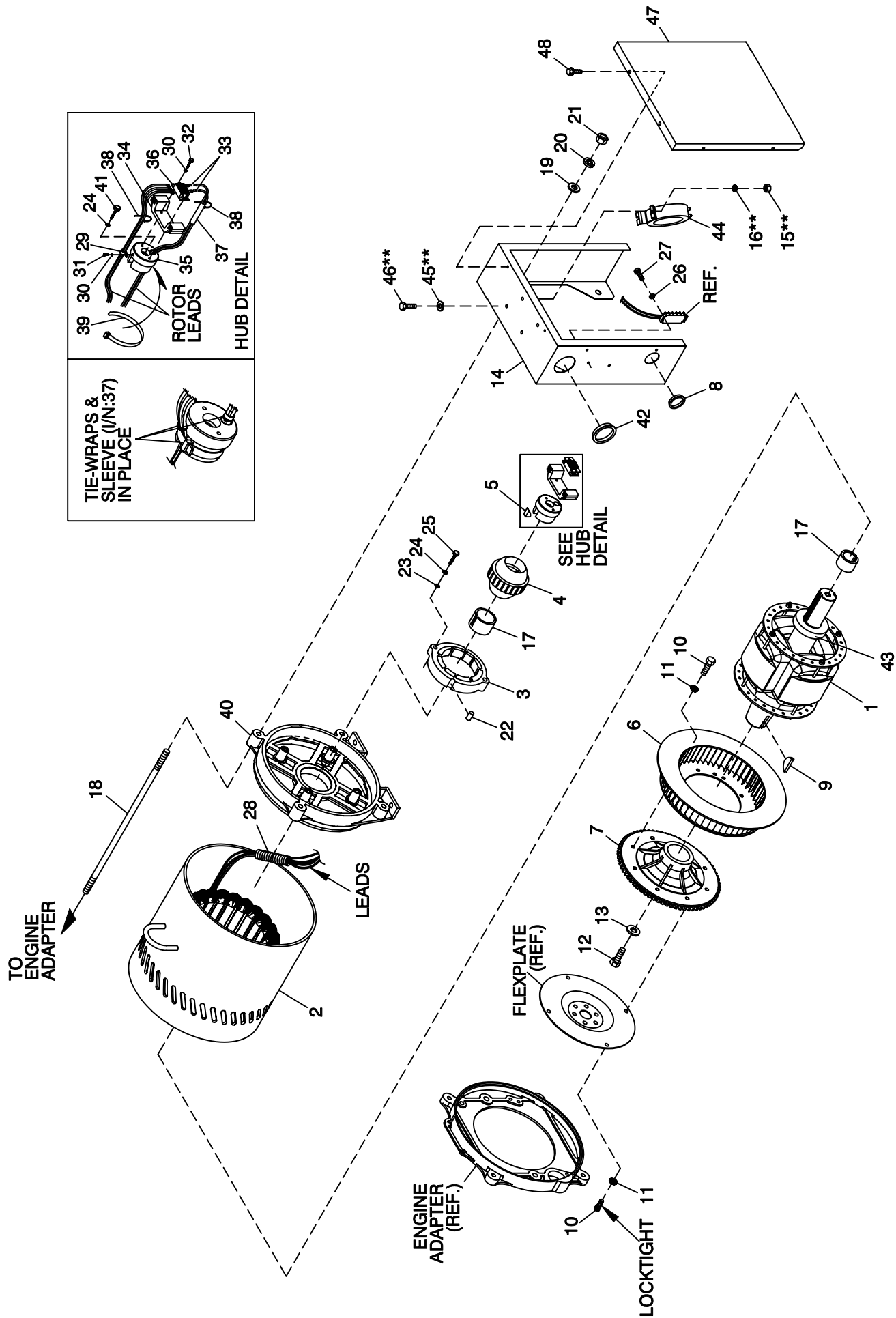
## Standby Generator Sets

## NOTES



## Standby Generator Sets

# GROUP A



EXPLODED VIEW:  
VERIZON ALTERNATOR BRUSHLESS 30KW 4-POLE  
DRAWING #: 0F6775

## EXPLODED VIEW: VERIZON ALTERNATOR BRUSHLESS 30KW 4-POLE

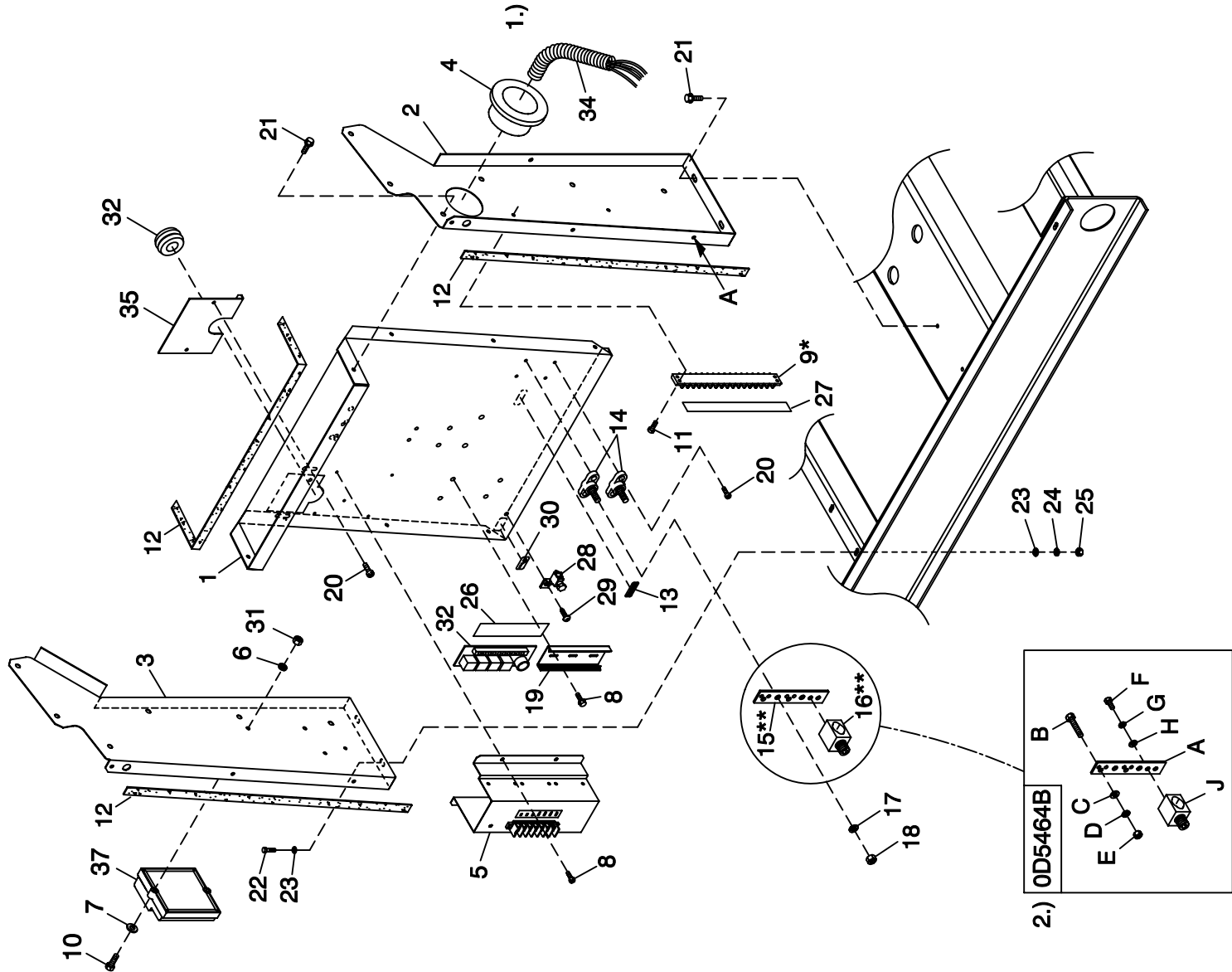
DRAWING #: 0F6775

GROUP A

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F6717	1	ASSY RTR 390 30AD2 VERIZON
2	0F6716	1	ASSY STR 390 30AD2 VERIZON
3	068405	1	EXCITER FIELD 15" 2" LG
4	087272	1	ASSY EXCITER 2.00" STK
5	072878	1	KEY SQ 3/8 X 3-1/4 STEEL
6	0E6076	1	REVCOR FAN 12.63X2 W/PRESSDISK
7	0F5536	1	ASSY FLYWHEEL C2 CPL
8	023484K	1	BUSHING SNAP SB-1750-22
9	023454	1	KEY WOODRUFF #E
10	0F3398	8	SCREW SHC M10-1.5 X 16 G10.9
11	046526	8	WASHER LOCK M10
12	0A2601	1	SCREW HHC M16-2.0 X 45 G8.8
13	0A2602	1	WASHER FLAT .688ID X 3.25OD
14	0F6811	1	COVER, EXCITER
15	045771	4	NUT HEX M8-1.25 G8 CLEAR ZINC
16	022129	4	WASHER LOCK M8-5/16
17	092950	1	COLLAR SLIP FIT 390 MM
18	04576100CH	4	STUD M14-2.0 X 600 G5 ZINC
19	052646	4	WASHER FLAT M14
20	043123	4	WASHER LOCK M14
21	051779	4	NUT HEX M14-2.0 G8 YEL CHR
22	022392	2	PIN DOWEL 1/2 X 1-1/4
23	052259	2	WASHER FLAT M12
24	051769	3	WASHER LOCK M12
25	0E7230	2	SCREW HHC M12-1.75 X 80 G10.9
26	0C2428	2	SCREW PHTT #6-32 X 1/2 ZYC
27	022155	2	WASHER LOCK #6
28	077043F	1	CONDUIT FLEX 1.25" ID (18"LG)
29	020151	1	CLAMP VINYL .312 X .203 Z
30	023365	3	WASHER SHAKEPROOF INT #8
31	033133	1	SCREW HHM #8-32 X 3/8
32	033143	2	SCREW HHM #8-32 X 7/8
33	086032	2	LUG RT-ANG #10/10-12
34	090063	1	BRIDGE SUPPORT DIODE 15"
35	090064	1	CAP END ROTOR 390MM
36	090152	1	ASSY BRIDGE RECTIFIER
37	022661L	1	SLEEVE UL #0 .330 ID (3" LONG)
38	028739A	2	TIE WRAP UL 3.9" X .10" BLK
39	085662D	1	TIE WRAP UL 17.7 X .35 BLK HT
40	068113	1	CARRIER REAR BRG 15" (BRUSHLESS)
41	068406	3	SCREW HHC M12-1.75 X 60 G10.9
42	023484N	1	BUSHING SNAP SB-2.5-31
43 *	052624	1	BEARING BALL 6212 SEALED
44	0F4281B	2	XFMR CURRENT 150A W/BRKT
45	022145	4	WASHER FLAT 5/16-M8 ZINC
46	042907	4	SCREW HHC M8-1.25 X 16 G8.8
47	0F6812	1	COVER, EXCITER
48	0C2454	6	SCREW THF M6-1X16 N WA Z/JIS

\* ROTOR REPLACEMENT PARTS.



EXPLODED VIEW:  
CONNECTION BOX & CIRCUIT BREAKER  
DRAWING #: 0F6801

## EXPLODED VIEW: CONNECTION BOX &amp; CIRCUIT BREAKER

DRAWING #: 0F6801

GROUP A

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F3137	1	PAN CB CONN BOX
2	0F7655	1	STAND, R/H CONRTOL
3	0F7656	1	STAND, L/H CONTROL
4	023484N	1	BUSHING SNAP SB-2.5-31
5	0F4677	1	ASSY PCB INTERFACE 1PH 240V
6	022152	2	WASHER LOCK #10
7	023897	2	WASHER FLAT #10 ZINC
8	0C3990	6	SCREW PHTT M4-0.7 X 10 ZYC
9 *	043365	REF.	BLOCK TERM 20A 8 X 6 X 1100V
10	036943	2	SCREW PPHM #10/32 X 2
11	0C2428	2	SCREW PHTT #6-32 X 1/2 ZYC
12	029289	1	TAPE ELEC 1/2 FOAM (65.5" LG)
13	0A9457	1	DECAL NEUTRAL
14	057073	2	JUNCTION BLOCK 3/8-16
15 **	0D5466	REF.	BUS BAR NEUTRAL BLOCK 390
16 **	0A7822	REF.	LUG SLDLSS 600/250-1/0 X 1/4-28
17	022237	2	WASHER LOCK 3/8
18	022241	2	NUT HEX 3/8-16 STEEL
19	0E9764	1	RAIL SNAPTRACK PCB HOLDER BULK (6"LG)
20	0C2266	6	SCREW PHTT M5-0.8 X 16 ZYC
21	0C2454	15	SCREW THF M6-1 X 16 N WA Z/JS
22	042568	2	SCREW HHC M6-1.0 X 20 G8.8
23	022473	4	WASHER FLAT 1/4-M6 ZINC
24	022097	2	WASHER LOCK M6-1/4
25	049813	2	NUT HEX M6 X 1.0 G8 YEL CHR
26	0F0699	1	DECAL, SPARE OUTPUT
27	0F7475	1	DECAL, T-BLOCK H-100 CUST I/O
28	025433	1	LUG SLDLSS #6-14 X 13/64 CU
29	024469	1	SCREW HHTT #10-32 X 3/8 CZ
30	067210A	1	DECAL GROUND LUG
31	022158	2	NUT HEX #10-32 STEEL
32	0E9049B	1	ASSY PCB G-PANEL RELAY 12VDC
33	081008	1	GROMMET 1.25 X .25 X .75
34	077043J	1	CONDUIT FLEX 2.0" ID (36" LG)
35	0F6156	1	PLATE WIRE SNGL GALV
36	0F7038	1	HARNESS, CONNECTION BOX (NOT SHOWN)
37	0F4475	1	ASSY PCB IGN MOD 3.9/3.0/2.5L

1)			UL CIRCUIT BREAKER (FD)
A	0F4811	1	COVER FD CB STAND C3
B	065469	1	DECAL DANGER HIGH VOLTAGE
C	0D5573	1	CB 0175A 3P 600V S FD6 LL
D	0F0199	1	INSULATOR CB FD FRAME 30MIL
E	065960	4	SCREW SHC 1/4-20 X 4 G8.8 NZ
F	022473	4	WASHER FLAT 1/4-M6 ZINC
G	022097	4	WASHER LOCK M6-1/4
H	022127	4	NUT HEX 1/4-20 STEEL
J	0C2454	7	SCREW THF M6-1 X 16 N WA Z/JS

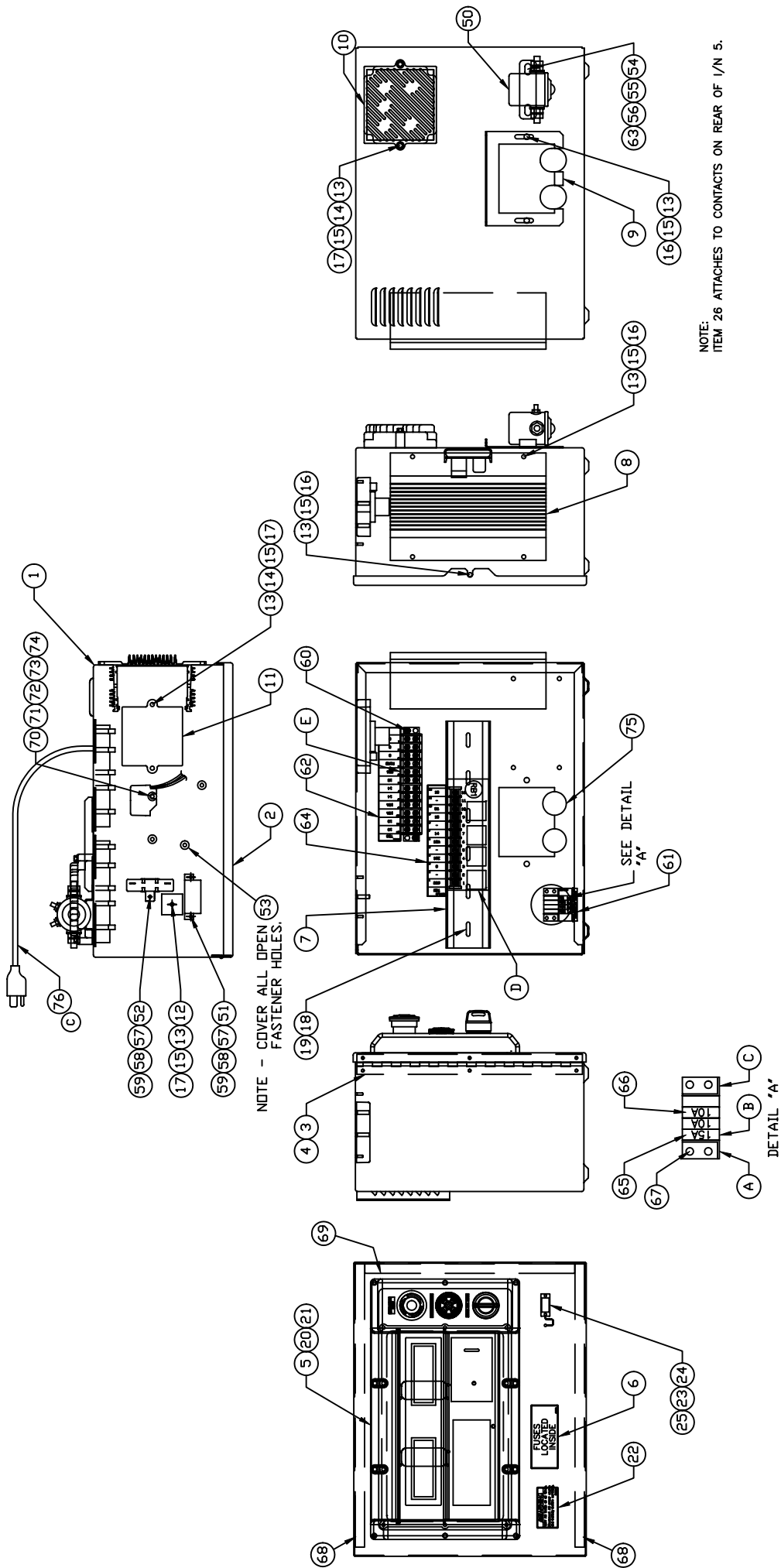
2)			
A	0D5466	1	BUS BAR NEUTRAL BLOCK 390
B	039287	1	SCREW HHC M8-1.25 X 45 G8.8 FT
C	022145	1	WASHER FLAT 5/16-M8 ZINC
D	022129	1	WASHER LOCK M8-5/16
E	045771	1	NUT HEX M8-1.25 G8 YEL CHR
F	022473	2	WASHER FLAT 1/4-M6 ZINC
G	022097	2	WASHER LOCK M6-1/4
H	0A8261	2	SCREW HHC 1/4-28 X 5/8 .625TH
J	0A7822	1	LUG SLDLSS 600/250-1/0 X 1/4-28

\* ITEM INCLUDED WITH HARNESS

\*\* ITEM INCLUDED WITH 0D5464B



# GROUP B



EXPLODED VIEW:  
H-PANEL 10A BATTIC 12V (VZW)  
DRAWING #: 0F6979D

## EXPLODED VIEW: H-PANEL 10A BATTC 12V (VZW)

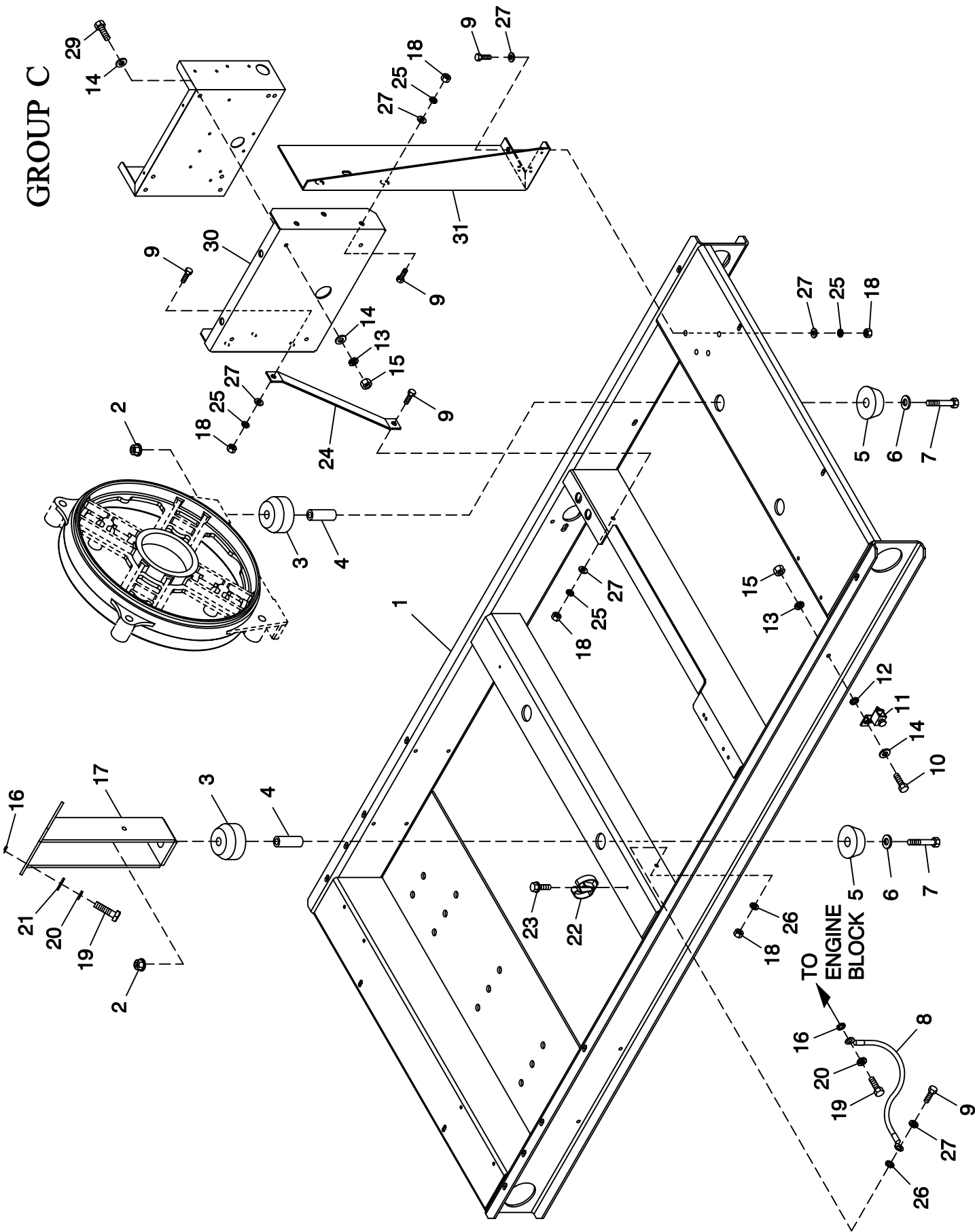
DRAWING #: 0F6979D

GROUP B

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
<u>COMPONENTS INCLUDED IN 01827E</u>			
1	0F1823	1	ENCL H CONTROL PANEL
2	0F1824	1	COVER CONTROL PANEL
3	0F2606	1	HINGE CONTINUOUS H-PANEL
4	036261	6	RIVET POP .125 X .275 SS
5	0F5763	1	ASSY PROGRAMMED PM H-100
6	0F1732	1	DECAL FUSES LOCATED INSIDE
7	0E9764	1	RAIL SNAPTRACK PCB HOLDER BULK (12")
8	0F1740C	1	ASSY PCB 10A UL BATT CHRGR 12V
9	0F1958	1	PLATE HARNESS CLAMP
10	0F2256	1	ASSY PCB PWR AVR W/AMP HEADER
11	0E3161	1	ASSY PCB BOSCH GOV DRIVER
12	029673	1	DIO BRIDGE 25A 600V
13	049226	12	WASHER LOCK M5
14	079224	4	SCREW PPHM M5-0.8 X 30 SS
15	0D3876	12	WASHER FLAT M5
16	0F5886	7	SCREW HHPM M5-0.8 X 12
17	051716	5	NUT HEX M5-0.8 G8 CLEAR ZINC
18	0C3990	3	SCREW PHTT M4-0.7 X 10 ZYC
19	043180	3	WASHER FLAT M4
20	055014	10	SCREW PPHM M4-0.7 X 8 BLK OX
21	043184	10	WASHER LOCK M4
22	0F2557	1	DECAL WARNING BATT CHRG 12/24V
23	0F5884	1	SCREW PHTT M3.5-0.6 X 10
24	0F4333	1	CONN DUST CAP W/CHAIN DB9
25	0F5883	1	WASHER FLAT M3.5
26	0F6277	1	ASSY HARNESS H-PNL SW (NOT SHOWN)
<u>COMPONENTS INCLUDED IN WIRE HARNESS</u>			
A	0F1263	1	ADAPTER RH SIDE WICKMAN 178.6191
B	0F1262	4	HOLDER FUSE WICKMANN 178.6150
C	0F1264	1	ADAPTER LH SIDE WICKMAN 178.6192
D	0E9049B	1	ASSY PCB G-PANEL RELAY 12VDC
E	055911	1	BLOCK TERM 20A 12 X 6 X 1100V
<u>COMPONENTS INCLUDED IN 0F6979D</u>			
50	056739	1	RELAY SOLENOID 12VDC PNL MNT
51	048476	1	CB 4.5 X 1 AUT30KW CNT45K
52	0F5752B	1	RES WW 25R 5% 25W QK CONN
53	0F6145	AS REQ'D	SEAL WEATHER .45"DIA
54	022287	2	SCREW HHC 1/4-20 X 3/4 G5
55	022473	4	WASHER FLAT 1/4-M6 ZINC
56	022097	2	WASHER LOCK M6-1/4
57	043182	3	WASHER LOCK M3
58	051714	3	NUT HEX M3-0.5 G8 YEL CHR
59	052777	3	WASHER FLAT M3
60	0C2323	2	SCREW PHTT #6-32 X 5/8 ZYC
61	0F5459	1	DECAL CPL CONTROL PANEL FUSES
62	0F5461	1	DECAL CPL 5.4/6.8L TB3
63	022127	2	NUT HEX 1/4-20 STEEL
64	0F5460	1	DECAL CPL 5.4/6.8L RELAY BOARD
65	0E7403C	1	FUSE ATO TYPE 15 AMP (BLUE)
66	0E7403B	2	FUSE ATO TYPE 10 AMP (RED)
67	0C2699	2	SCREW PHTT #6-32 X 3/8 ZYC
68	0F6305	2	SEAL COVER 3.18 X 12.7 X 382
69	0F6305A	1	SEAL COVER 3.18 X 12.7 X 283
70	0F5191	1	ASSY PCB FUEL PRES/FLUID BASN
71	091526	1	SCREW PPHM M5-0.8 X 12 ZNC
72	051713	1	WASHER FLAT M5
73	049226	1	WASHER LOCK M5
74	051716	1	NUT HEX M5-0.8 G8 CLEAR ZINC
75	081008B	2	GROMMET 1.25 X .25 X 1.00
76	0F7811	1	CORD POWER SUPPLY 3.9L VZW

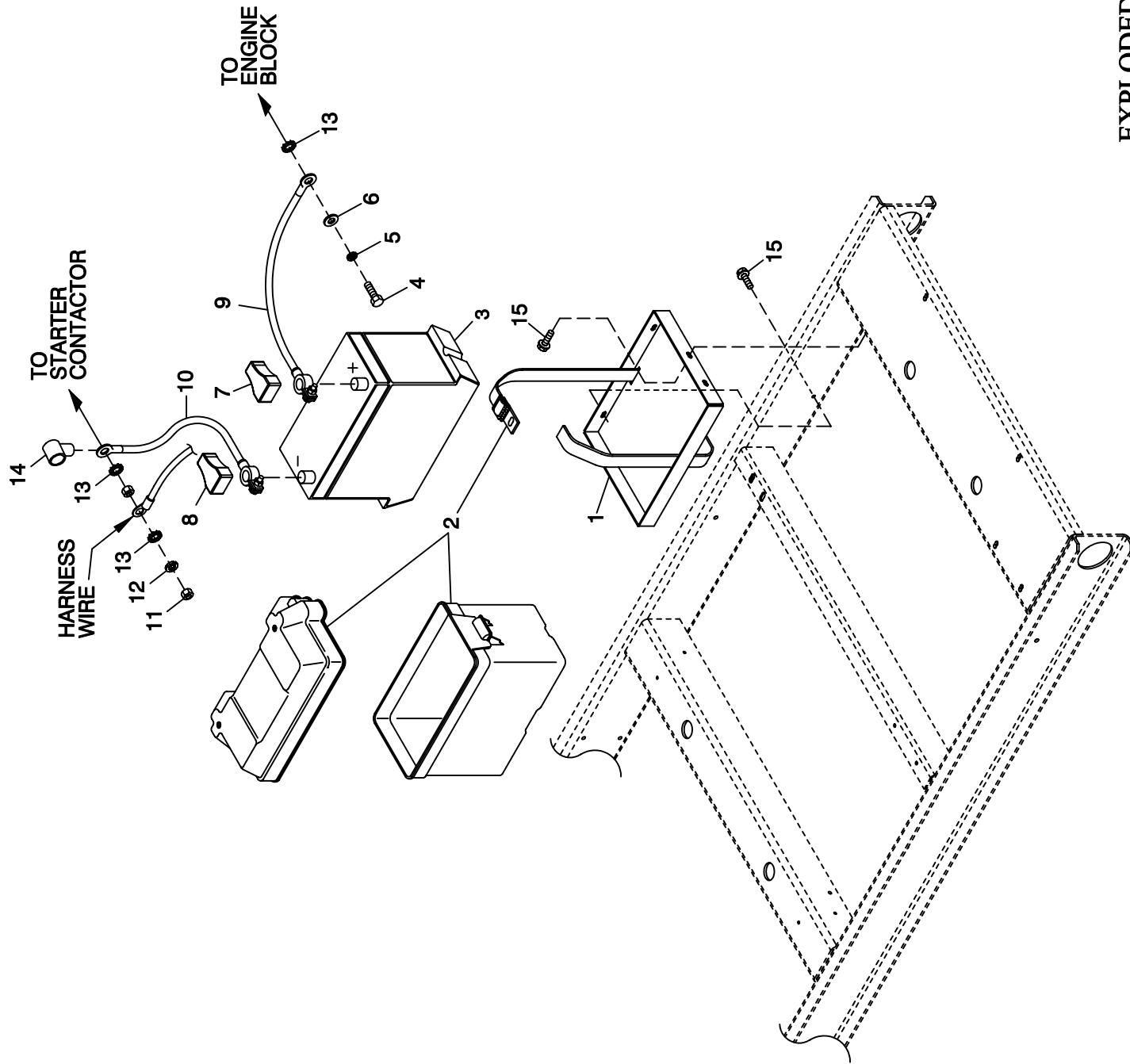
# GROUP C



EXPLODED VIEW:  
MOUNTING BASE  
DRAWING #: 0F6668

**EXPLODED VIEW: MOUNTING BASE****DRAWING #: 0F6668****GROUP C****APPLICABLE TO:**

<b>ITEM</b>	<b>PART #</b>	<b>QTY.</b>	<b>DESCRIPTION</b>
1	0F6653	1	BASE FRAME, 30KW VERIZON
2	052860	4	NUT FLANGED HEX M12-1.75
3	052251	4	DAMPENER VIBRATION 40 BLUE
4	052257	4	SPACER .49 X .62 X 1.87 PWDR/ZNC
5	052252	4	DAMPENER VIBRATION
6	052259	4	WASHER FLAT M12
7	052891	4	SCREW HHC M12-1.75 X 80 G8.8
8	0536210214	1	ASSY WIRE #0 15.00"
9	042909	10	SCREW HHC M8-1.25 X 30 G8.8
10	047411	1	SCREW HHC M6-1.0 X 16 G8.8
11	055414	1	LUG SLDLSS #2-#8 X 17/64 CU
12	026850	1	WASHER SHAKEPROOF EXT 1/4 STL
13	022097	5	WASHER LOCK M6-1/4
14	022473	9	WASHER FLAT M6-1/4 ZINC
15	049813	5	NUT HEX M6 -1.0 G8 YEL CHR
16	025507	1	WASHER SHAKEPROOF EXT 7/16 STL
17	0F2230	2	SUPPORT ENGINE 3.9L LH & RH SD
18	045771	10	NUT HEX M8-1.25 G8 CLEAR ZINC
19	036833	5	SCREW HHC 3/8-16 X 1 G8
20	022237	5	WASHER LOCK 3/8
21	022131	4	WASHER FLAT 3/8-M10 ZINC
22	065852	1	SPRING CLIP HOLDER .37-.62
23	045764	1	SCREW HHTT M4-0.7 X 8 BP
24	0F7224	1	BRACKET STIFFENER
25	022129	10	WASHER LOCK M8-5/16
26	027482	1	WASHER SHAKEPROOF EXT 5/16 STL
27	022145	14	WASHER FLAT 5/16-M8 ZINC
29	042568	4	SCREW HHC M6-1.0 X 20 G8.8
30	0F7090	1	PANEL REMOTE RELAY
31	0F7089	1	BRACKET REMOTE RELAY PANEL



EXPLODED VIEW:  
BATTERY 3.9L VERIZON  
DRAWING #: 0F6974



EXPLODED VIEW: BATTERY 3.9L VERIZON  
DRAWING #: 0F6974

GROUP C

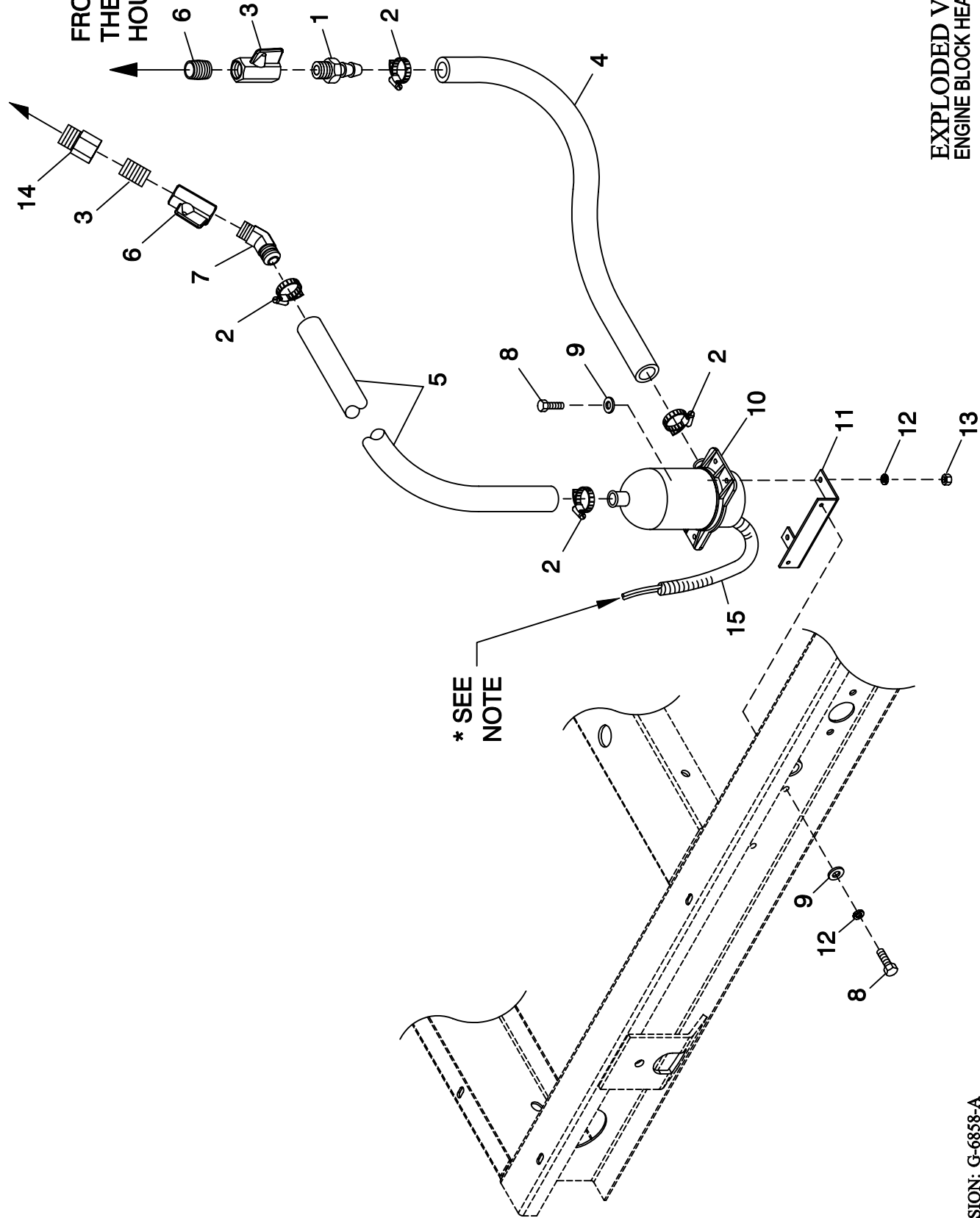
APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F7037	1	TRAY, BATTERY BOX
2	0F7036	1	BATTERY BOX (24F) VENTED
3	058208	1	BATT 12VDC 24F 625
4	036833	1	SCREW HHC 3/8-16 X 1 G8
5	022237	1	WASHER LOCK 3/8
6	022131	1	WASHER FLAT 3/8-M10 ZINC
7	050331A	1	BATT POST COVER RED +
8	050331	1	BATT POST COVER BLK -
9	038805J	1	CABLE BATT BLK #1 X 30.00
10	03880400A	1	CABLE BATT RED #1 X 44.00
11	045771	1	NUT HEX M8-1.25 G8 YEL CHR
12	022129	1	WASHER LOCK M8-5/16
13	027482	3	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

# GROUP C

TO  
ENGINE BLOCK  
L/H SIDE

FROM  
THERMOSTAT  
HOUSING



EXPLODED VIEW:  
ENGINE BLOCK HEATER (VERIZON) 3.9L CHRSLR  
DRAWING #: 0F7073

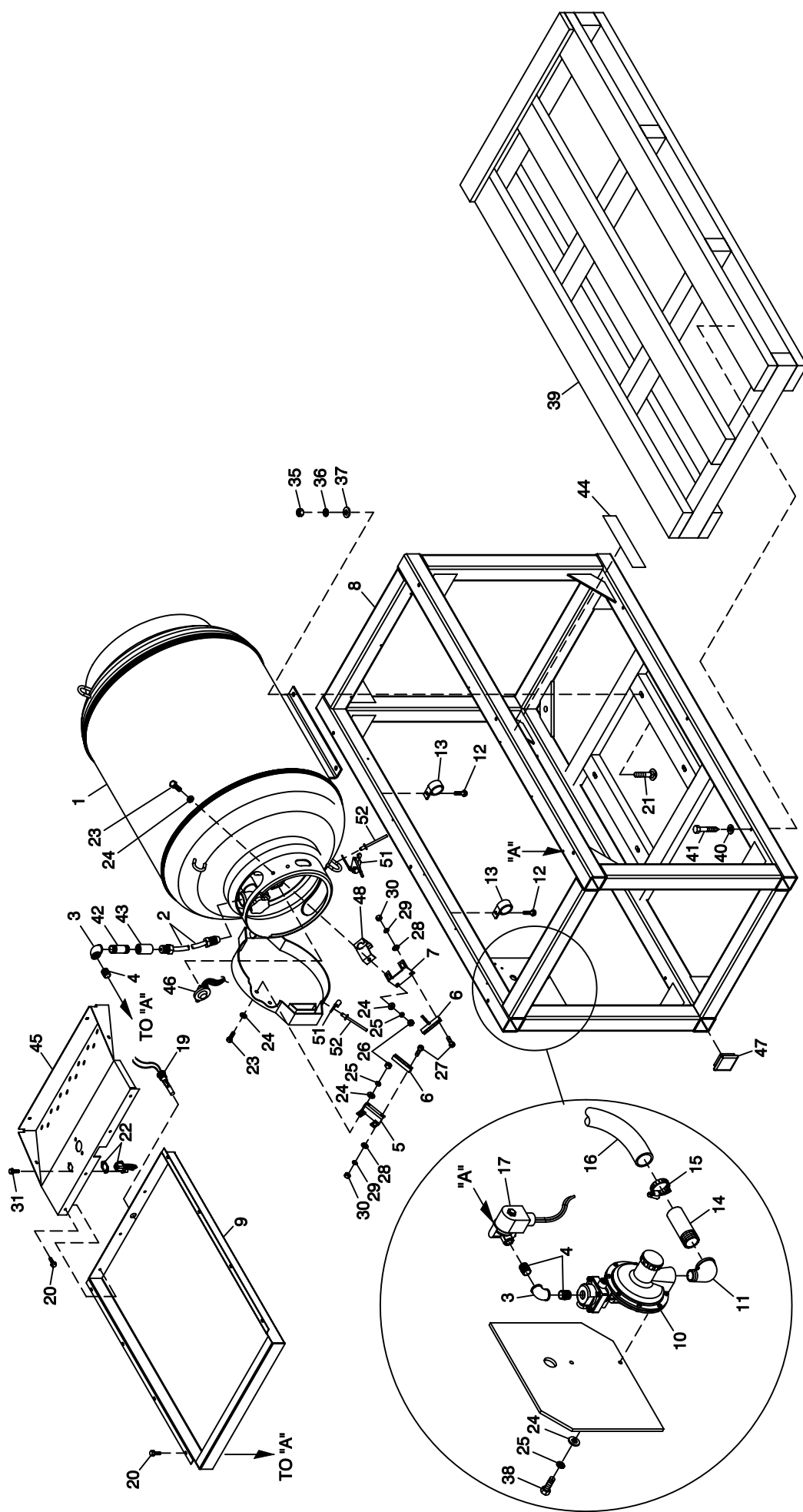
EXPLODED VIEW: ENGINE BLOCK HEATER (VERIZON) 3.9L CHRSLR  
DRAWING #: 0F7073

GROUP C

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	044117	1	BARBED STR 3/8 NPT X 5/8
2	057822	4	CLAMP HOSE #8 .53-1.00
3	035467	2	NIPPLE CLOSE 3/8 NPT X 1 VIBRA
4	050967	1	HOSE 5/8 ID RIA 250F (37" LG)
5	0A6283	1	HOSE PREFORMED BLOCK HEATER
6	099305B	2	VALVE,BALL 3/8 NPT
7	0C4905	1	BARBED EL 45 3/8 NPT X 5/8OD
8	042568	4	SCREW HHC M6-1.0 X 20 G8.8
9	022473	4	WASHER FLAT 1/4-M6 ZINC
10	084918G	1	HEATER ENG 1500W 120V
11	084427	1	BRACKET HEATER W/WELDNUTS
12	022097	4	WASHER LOCK M6-1/4
13	049813	2	NUT HEX M6 X 1.0 G8 YEL CHR
14	062303	1	ADAPTOR 1/4" NPT TO 3/8" NPT
15	077043A	1	CONDUIT FLEX .38 ID (42" LG)

\* NOTE: POWER CORD IS AN INTEGRAL PART OF THE BLOCK HEATER.



EXPLODED VIEW:  
LPL TANK AND FRAME  
DRAWING #: 0F7568

**EXPLODED VIEW: LPL TANK AND FRAME**  
**DRAWING #: 0F7568**

**GROUP C**

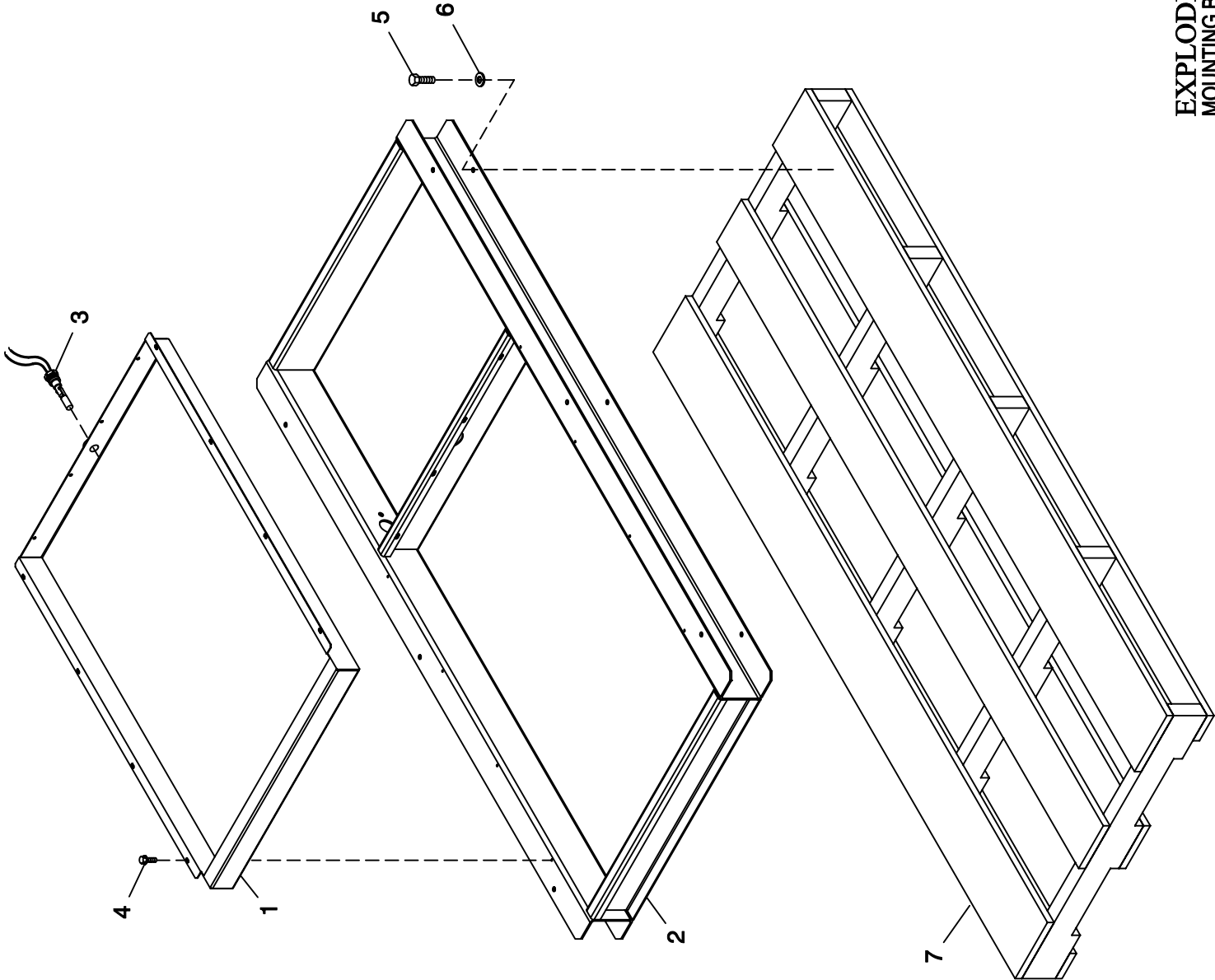
APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F6830	1	REWORK L/P TANK 120 GAL
2	0F7534	1	POL VALVE TUBE 1/4" NPT
3	033930	2	ELBOW 90D 1/4 NPT
4	026942	3	NIPPLE CLOSE 1/4 NPT X .875
5	0F7530	1	BRACKET MAGNETIC SENSOR DOOR
6	0F7643	1	SWITCH MAGNETIC REED
7	0F7531	1	BRACKET MAGNETIC SENSOR TANK
8	0F6831	1	FRAME L/P TANK
9	0F6956	1	PAN FLUID CONTAINMENT
10	0F7012	1	REGULATOR 2-STAGE
11	026739	1	ELBOW RED STREET 3/4 X 1/2
12	090388	2	SCREW HHTT M6-1.0 X 12 ZINC
13	055934N	2	CLAMP VINYL 1.31 X .281 Z
14	028641	1	NIPPLE TOE 3/4 NPT X 2
15	035473	2	CLAMP HOSE #12 .50-1.25
16	057422	1	HOSE 1IN ID LP GAS (66" LG)
17	0F9111	1	ASSEMBLY SOLENOID 12V
18 **	029333	3	TIE WRAP UL 7.4" X .19" NATL (NOT SHOWN)
19	096500V	1	ASSY FUEL LEAK DTCTR ALRMW/CON
20	074908	17	SCREW HHTT M5-0.8 X 10 BP
21	0F6832	4	BOLT CARR 9/16-12 X 2-1/4"
22	0F7035	1	HARNESS L/P TANK FRAME

ITEM	PART #	QTY.	DESCRIPTION
23	047411	4	SCREW HHC M6-1.0 X 16 G8.8
21	0F6832	4	BOLT CARR 9/16-12 X 2-1/4"
22	0F7035	1	HARNESS L/P TANK FRAME
23	047411	4	SCREW HHC M6-1.0 X 16 G8.8
24	022473	10	WASHER FLAT 1/4-M6 ZINC
25	022097	6	WASHER LOCK M6-1/4
26	049813	4	NUT HEX M6 X 1.0 G8 YEL CHR
27	036902	4	SCREW PPHM #6-32 X 1/2
28	022985	4	WASHER FLAT #6 ZINC
29	022155	4	WASHER LOCK #6
30	022188	4	NUT HEX #6-32 STEEL
31	024413	2	SCREW HHTT #10-32 X 1/2 BP
32 ***	085916	6	SCREW HHC 3/8-16 X 1 SS (NOT SHOWN)
33 ***	088775	12	WASHER FLAT 3/8 SS (NOT SHOWN)
34 ***	085917	6	WASHER LOCK 3/8 SS (NOT SHOWN)
35	0A6054	4	NUT HEX 9/16-12
36	070265	4	WASHER LOCK M16
37	0A1646	4	WASHER FLAT M16
38	022287	2	SCREW HHC 1/4-20 X 3/4 G5
39	0C4632	1	PALLET 'A' GRP OPEN
40	022131	6	WASHER FLAT 3/8-M10 ZINC
41	021442	6	SCREW HHL 3/8 X 4.0
42	035482	1	NIPPLE PIPE 1/4 IN X 6 IN
43	024268	1	COUPLING FULL 1/4-18
40	022131	6	WASHER FLAT 3/8-M10 ZINC
41	021442	6	SCREW HHL 3/8 X 4.0
42	0F7567	1	NIPPLE PIPE 1/4 NPT X 5-1/2
43	024268	1	COUPLING FULL 1/4-18
44	0F7667	2	DECAL NO FORKS
45	0F7670	1	PAN RAIN RUNNOFF
46	0D3573	1	ROCHESTER ELEC. GAUGE
47	0F7688	8	END CAP PLASTIC 3" X 3" SQUARE
48	0F2776D	1	BRACKET SIGNAL CONDITONER
49 *	029333	1	TIE WRAP UL 7.4" X .19" NATL (NOT SHOWN)
50 ***	085918	6	NUT HEX 3/8-16 SSTL (NOT SHOWN)
51	0G0050	1	DOOR LATCH, 2-PIECE STEEL
52	0F9245	4	RIVET POP .125 X .337 SS

\* TO HOLD SENSOR FROM HARNESS TO I/N 48.  
\*\* TO HOLD HARNESS TO I/N 16.  
\*\*\* MOUNTING HARDWARE FOR GENSET TO L/P TANK FRAME.  
PUT IN BAG & TIE WRAP TO FRAME.

NOTE: 1.) ADD PIPE SEALANT TO ALL NPT FITTINGS.  
2.) ADD RTV TO SEAM BETWEEN I/N 45 & I/N 9.





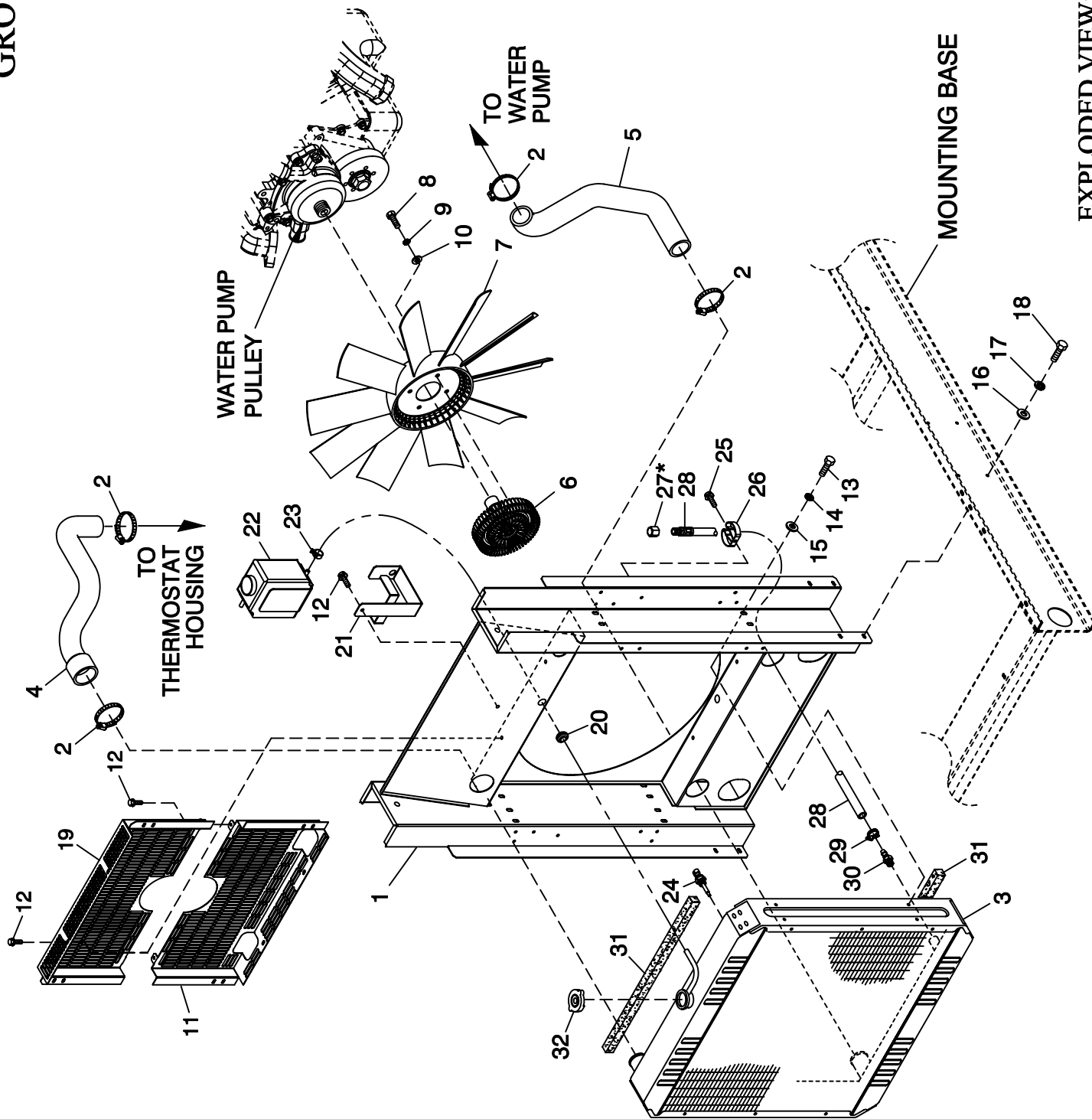
EXPLODED VIEW: MOUNTING BASE  
DRAWING #: 0F8044

GROUP C

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F6956	1	PAN, FLUID CONTAINMENT
2	0F7837	1	FRAME NATURAL GAS UNIT RISER
3	096500V	1	ASSY FUEL LEAK DET ALARM W/CON
4	074908	6	SCREW HHTT M5-0.8 X 10 BP
5	066428	6	SCREW HHL 3/8 X 2-1/2 ZINC
6	022131	6	WASHER FLAT 3/8-M10 ZINC
7	0E0767A	1	CRATE BASE 34" X 81"
8	0F8113	1	HARNESS, NAT GAS RISER FRAME (NOT SHOWN)
9*	085916	6	SCREW HHC 3/8-16 X 1 SS
10*	085917	6	WASHER LOCK 3/8 SS
11*	085918	6	NUT HEX 3/8-16 SSTL
12*	088775	12	WASHER FLAT 3/8 SS

\* MOUNTING HARDWARE FOR GENSET TO L/P TANK FRAME.  
PUT IN BAG & TIE WRAP TO FRAME.



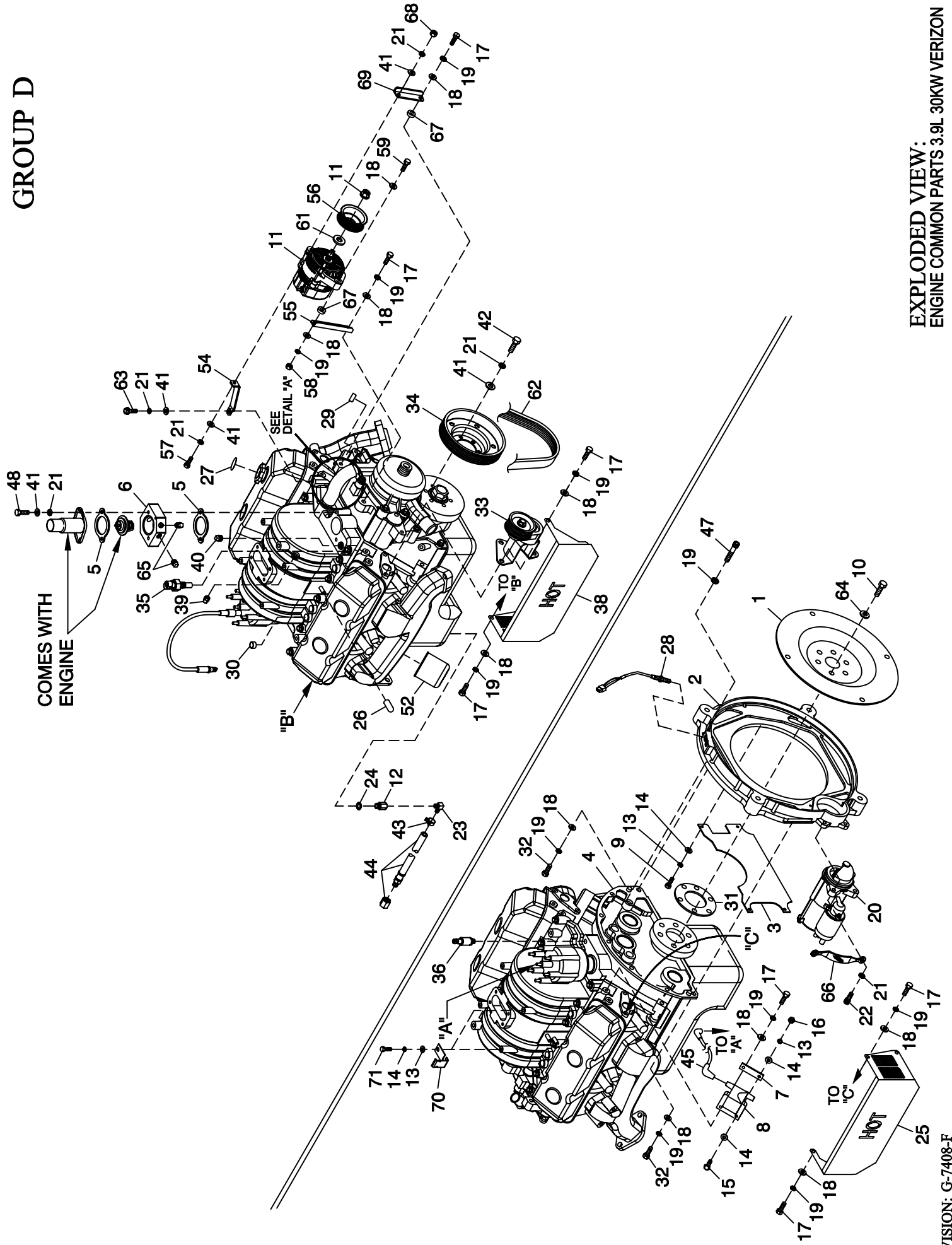
EXPLODED VIEW:  
COOLING SYSTEM & FAN DRIVE  
DRAWING #: 0F6719

**EXPLODED VIEW: COOLING SYSTEM & FAN DRIVE****DRAWING #: 0F6719****GROUP D****APPLICABLE TO:**

<b>ITEM</b>	<b>PART #</b>	<b>QTY.</b>	<b>DESCRIPTION</b>
1	0F3203	1	WELDMENT RAD SUPPORT 3.9L C2
2	035685	4	CLAMP HOSE #28 1.32-2.25
3	0F2608	1	RADIATOR 598 X 568 X 49 CPL RH
4	0F4413	1	HOSE UPPER RAD CPL C2 3.9L
5	0F4414	1	HOSE LOWER RAD CPL C2 3.9L
6	0E7854	1	CLUTCH COOLING FAN
7	0F2820	1	FAN 22" DIA 10 BLADE
8	051756	4	SCREW HHC M10-1.5 X 20 G8.8
9	046526	4	WASHER LOCK M10
10	022131	4	WASHER FLAT 3/8-M10 ZINC
11	0F8085	1	GUARD FAN C2 CPL, BOTTOM
12	0C2454	9	SCREW THF M6-1 X 16 N WA Z/JS
13	039253	8	SCREW HHC M8-1.25 X 20 G8.8
14	022129	8	WASHER LOCK M8-5/16
15	022145	8	WASHER FLAT 5/16-M8 ZINC
16	022473	8	WASHER FLAT 1/4-M6 ZINC
17	022097	8	WASHER LOCK M6-1/4
18	042568	8	SCREW HHC M6-1.0 X 20 G8.8
19	0F8085A	1	GUARD FAN C2 CPL, TOP
20	089685	1	GROMMET .75 X .12 X .50
21	080712	1	BRKT COOLANT RECOVERY TANK
22	076749	1	TANK COOLANT RECOVERY
23	048031C	1	CLAMP HOSE BAND 1/4
24	0E2507	1	PROBE COOLANT LEVEL 3/8 NPTF
25	045764	1	SCREW HHTT M4-0.7 X 8 BP
26	065852	1	SPRING CLIP HOLDER .37-.62
27 *	069811	REF.	CAP HEX 1/4 NPT BRASS
28	069860E	1	HOSE DRAIN ASSY 28"
29	0C7649	1	CLAMP HOSE .38-.87
30	055596	1	BARBED STR 3/8 NPT X 3/8
31	052250	2	TAPE FOAM 1 X 1 (22.5" LG)
32	090283	1	CAP RADIATOR 13 PSI

\* ITEM #27 IS INCLUDED WITH ITEM #28.

# GROUP D



EXPLODED VIEW:  
ENGINE COMMON PARTS 3.9L 30KW VERIZON  
DRAWING #: 0F6800

**EXPLODED VIEW: ENGINE COMMON PARTS 3.9L 30KW VERIZON**  
**DRAWING #: 0F6800**

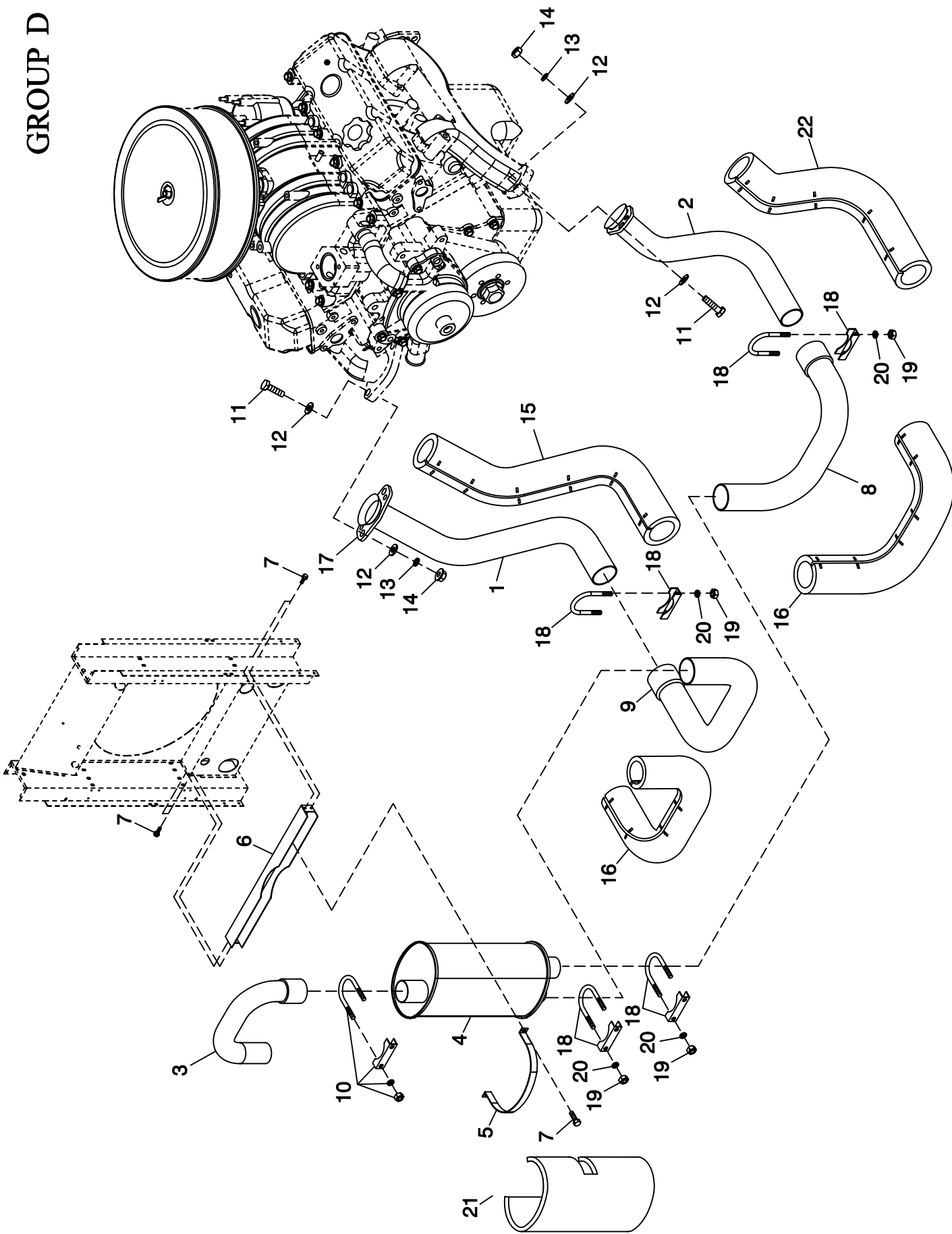
**GROUP D**

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0E5048A	1	FLEXPLATE HSB 3.9L CHRYSLER (1800RPM)
2	0E7477	1	MACHINING 3.9L ENGINE ADAPTOR
3	0E6703	1	COVER FLYWHEEL ACCESS
4	0E8336	REF	MAKE 3.9L CHRYSLER ENGINE (1800 RPM)
5	0E7841	2	GASKET THERMOSTAT ADAPTOR
6	0E7254	1	MACH THERM ADAPTOR 3.9L CHRY
7	0E7956	1	BRACKET IGNITION COIL
8	0E7953	1	COIL IGNITION 3.9L CHRYSLER
9	047411	4	SCREW HHC M6-1.0 X 16 G8.8
10	0E8615	6	BOLT 7/16-20 X 7/8
11	0E9868A	1	D.C. ALTERNATOR W/OUT PULLEY
12	054455	1	ADP OIL DRN 1/2-20
13	022097	9	WASHER LOCK M6-1/4
14	022473	12	WASHER FLAT 1/4-M6 ZINC

ITEM	PART #	QTY.	DESCRIPTION
15	049721	2	SCREW HHC M6-1.0 X 35 G8.8 BLK
16	049813	2	NUT HEX M6 X 1.0 G8 YEL CHR
17	036833	11	SCREW HHC 3/8-16 X 1 G8
18	022131	15	WASHER FLAT 3/8-M10 ZINC
19	022237	19	WASHER LOCK 3/8
20	0E6729	1	STARTER 12V
21	022129	17	WASHER LOCK M8-5/16
22	049821	3	SCREW SHC M8-1.25 X 30 G12.9
23	043790	1	BARBED EL 90 3/8 NPT X 3/8
24	0A1371	1	WASHER FLAT M14 COPPER
25	0F1444A	1	HEAT SHEILD L/H SIDE
26	0E9975	1	CAP VINYL 1/4" ID X 1" DP BLK
27	0F5114	1	DECAL REFER TO OWNERS MANUAL
28	0D2244M	2	ASSY MAGPICKUP (3/8-24 MALE)
29	0E0992B	REF	PLUG EXPANSION 21/32" OD (WATER PUMP) (QTY. 1)
30	0E0992A	REF	PLUG EXPANSION 14.1 OD (INJECTOR HOLE) (QTY. 6)
31	0E8731	1	PLATE FLEX DISK SPACER
32	057642	2	SCREW HHC M10-1.5 X 40 G8.8
33	0E7855	1	TENSIONER W/BACKET
34	0E7952	1	PULLEY CRANKSHAFT 3.9L CRYSLR (1800 RPM)
35	0E0502	1	TEMPERATURE SENDER DELPHI
36	0F4612	1	SENDER OIL PRESSURE 1/8" NPT
38	0F1444	1	HEAT SHIELD R/H SIDE
39	050873A	REF	PLUG PIPE 1/4 CSK W/ VIBRA SL
40	031919	REF	PLUG STD PIPE 3/8 COUNTERSUNK
41	022145	13	WASHER FLAT 5/16-M8 ZINC
42	030795	6	SCREW HHC 5/16-18 X 1 G5 (1800RPM)
43	048031J	REF	HOSE CLAMP BAND 5/8"
44	069860E	1	HOSE DRAIN ASSY 28"
45	0E7954	1	CABLE IGN COIL 3.9L CHRYSLER
47	023645	5	SCREW SHC 3/8-16 X 1.25 G8.8 Z
48	022403	2	SCREW HHC 5/16-18 X 2 G5
52	0E7415	1	OIL FILTER 3.9L CHRYSLER
53	042568	1	SCREW HHC M6-1.0 X 20 G8.8
54	0F3447	1	BRKT L/H SIDE D.C. ALTERNATOR
55	0F3446	1	BRKT R/H SIDE D.C. ALTERNATOR
56	0F3216	1	PULLEY 80 OD DC ALTERNATOR (1800 RPM)
57	087173	1	SCREW HHC M8-1.25 X 45 G8.8
58	022241	1	NUT HEX 3/8-16 STEEL
59	022258	1	SCREW HHC 3/8-16 X 2 G5
60	0F6804	1	HARNESS 3.9L 30KW H-PNL ENG. (NOT SHOWN)
61	0F3217	1	SPACER DC ALTERNATOR PULLEY
62	0D3488H	1	SERPENTINE BELT (60.5")
63	022532	1	SCREW HHC 5/16-18 X 2-1/2 G5
64	0F3844	6	WASHER FLAT .45 X 1.00
65	024310	2	PLUG STD PIPE 1/2 STEEL SQ HD
66	021991	1	EARTH STRAP
67	0F6715	2	SPACER .41 X .75 X .18 AL
68	045771	1	NUT HEX M8-1.25 G8 CLEAR ZINC
69	0F6480	1	BRKT L/H SIDE DC ALTERNATOR
70	0F2776	2	BRACKET SIGNAL CONDITIONER
71	022287	2	SCREW HHC 1/4-20 X 3/4 G5

# GROUP D



EXPLODED VIEW:  
MUFFLER 3.9L 30KW VERISON EXHAUST  
DRAWING #: 0F6807

EXPLODED VIEW: MUFFLER 3.9L 30KW VERIZON EXHAUST  
DRAWING #: 0F6807

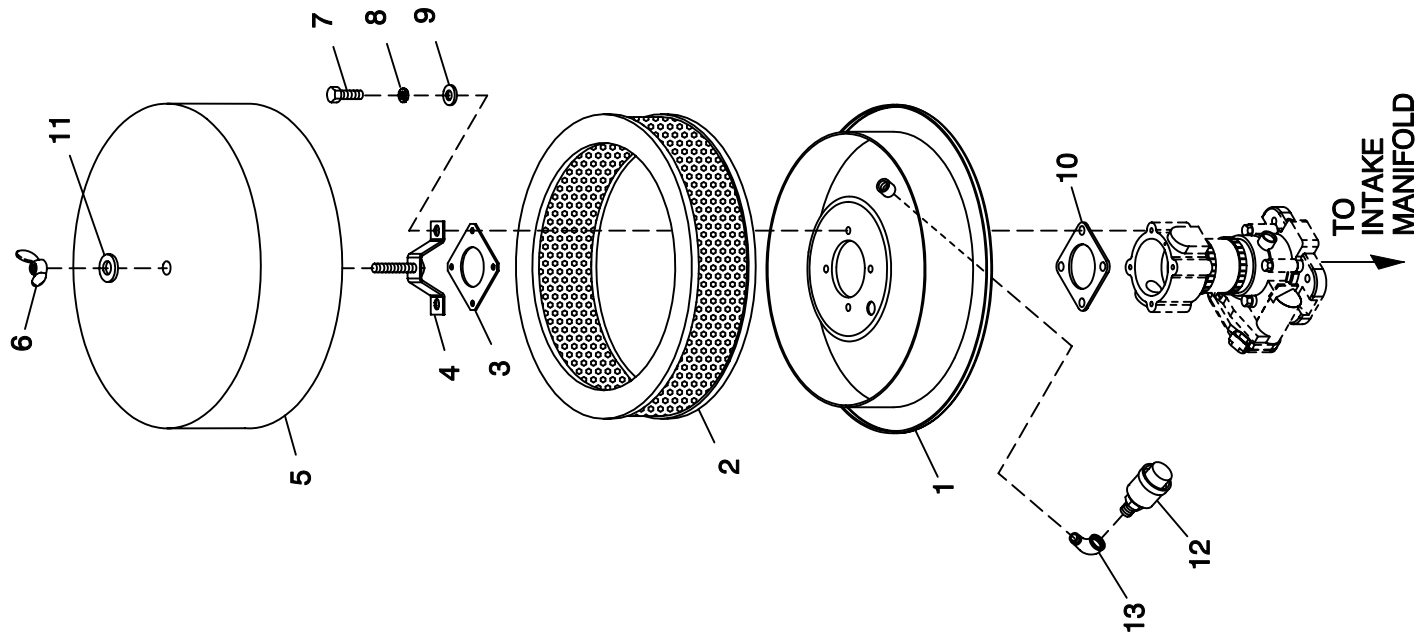
GROUP D

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F6924	1	PIPE R/H SIDE EXHAUST
2	0F7470	1	PIPE L/H SIDE EXHAUST MANIFOLD
3	0F2808B	1	PIPE EXHAUST MUFFLER OUT
4	0F0738	1	MUFFLER 7" X 9"-(2) 2" IN/2.5" OUT
5	0F2962	1	MUFFLER STRAP
6	0F6886	1	BRACKET MUFFLER
7	0C2454	6	SCREW THF M6-1 X 16 N WA Z/JS
8	0F6928	1	PIPE L/H SIDE MUFFLER
9	0F6925	1	PIPE R/H SIDE MUFFLER
10	080762	1	BOLT U 3/8-16 X 2.62
11	0D9832	4	SCREW HHC M12-1.75 X 75 SS
12	087171	8	WASHER FLAT 1/2 SS
13	083215	4	WASHER LOCK 1/2 SS
14	052860	4	NUT TOP LOCK FL M12-1.75
15	0F3794	1	EXHAUST BLANKET 600MM LONG (R/H)
16	0F3794A	2	EXHAUST BLANKET 500MM LONG (L/H)
17	0E8816	2	EXHAUST FLANGE 2" PIPE
18	036797	4	BOLT U 5/16-18 X 2.25
19	022259	8	NUT HEX 5/16-18 STEEL
20	022129	8	WASHER LOCK M8-5/16
21	0F3695	1	BLANKET EXHAUST MUFFLER 390MM
22	0E0170C	1	EXHAUST BLANKET 725MM



GROUP D



EXPLODED VIEW:  
AIR CLEANER 3.9L CHRYSLER-VERIZON  
DRAWING #: 0F6973

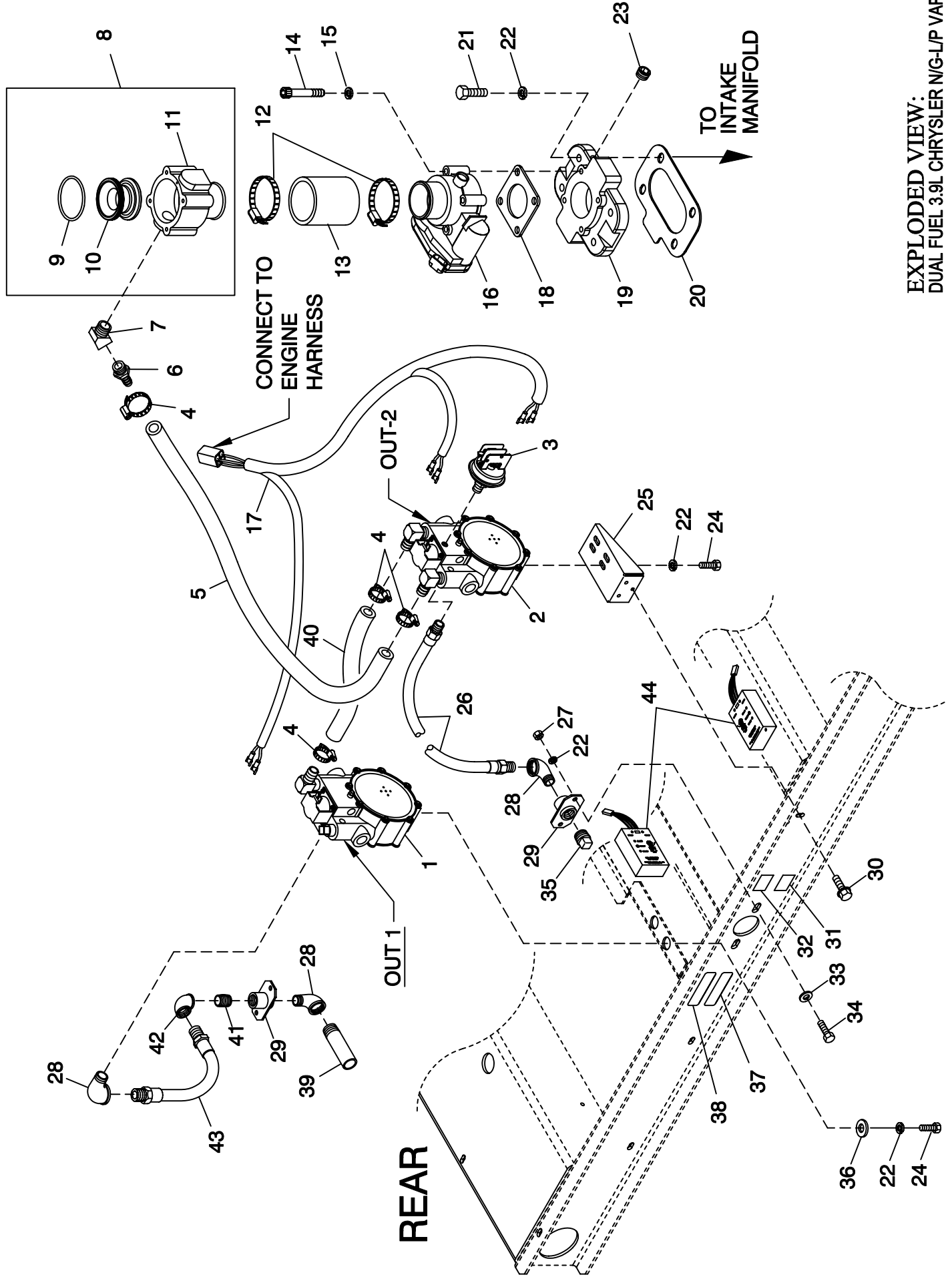
EXPLODED VIEW: AIR CLEANER 3.9L CHRYSLER-VERIZON  
DRAWING #: 0F6973

GROUP D

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F7493	1	BOTTOM PLATE AIR CLEANER
2	0F5418	1	ELEMENT AIR FILTER
3	0E6406	1	HOLDER VENTURI
4	0E7702	1	HOLD DOWN AIR CLEANER
5	0F6323	1	PLATE AIR CLEANER TOP 3.9L
6	037561	1	NUT WING 1/4-20 NYLK
7	049815	4	SCREW HHC M5-0.8 X 16 G8.8
8	049226	4	WASHER LOCK M5
9	051713	4	WASHER FLAT M5
10	0E6586	1	GASKET BOSCH 32 & 40
11	022473	1	WASHER FLAT 1/4-M6 ZINC
12	0A4256	1	INDICATOR FILTER MINDER
13	036277	1	ELBOW 90D STREET 1/8

# GROUP E



EXPLODED VIEW:  
DUAL FUEL 3.9L CHRYSLER N/G-L/P VAPOR  
DRAWING #: 0F7864

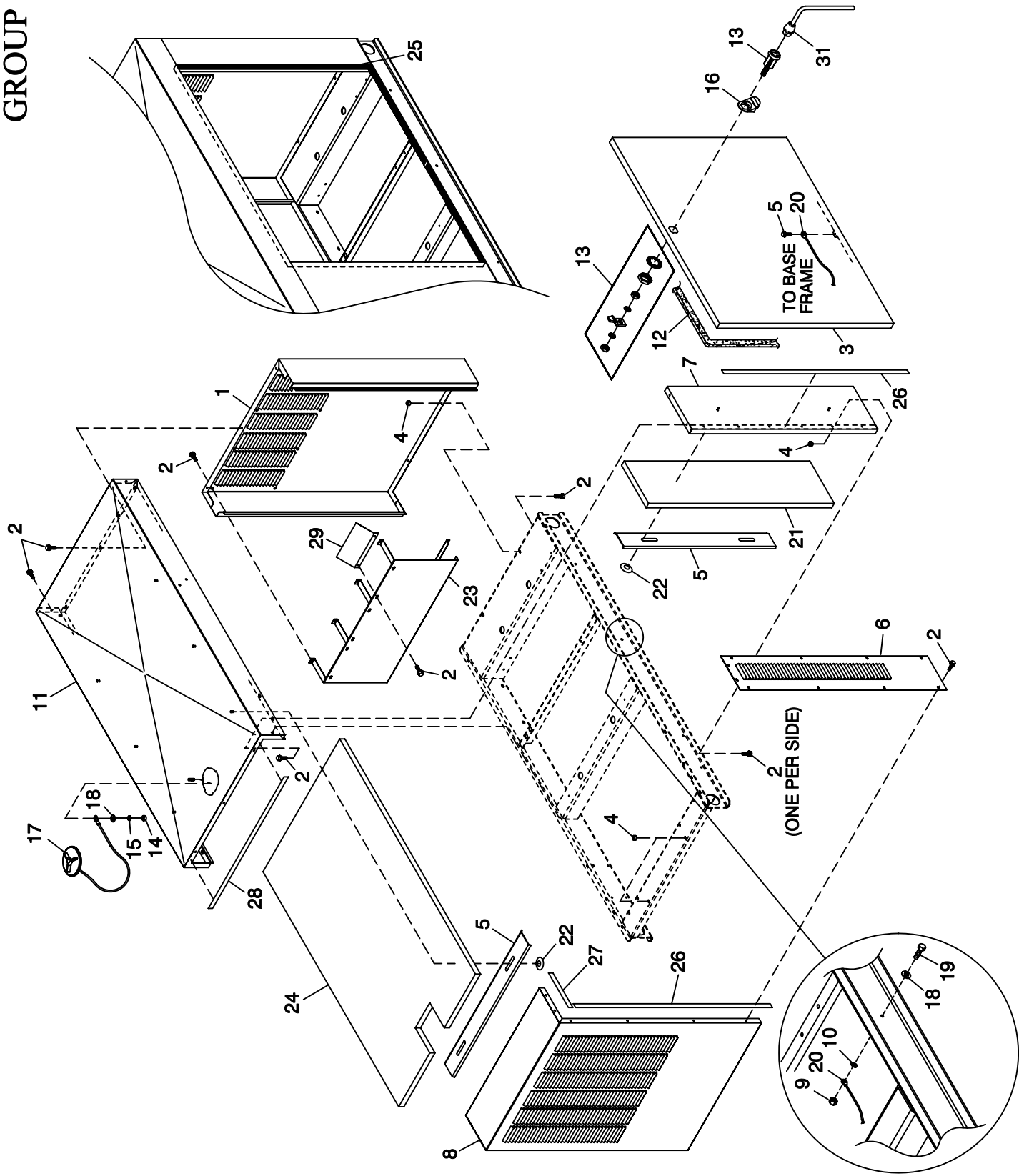
**EXPLODED VIEW: DUAL FUEL 3.9L CHRYSLER N/G-L/P VAPOR  
DRAWING #: 0F7864**

**GROUP E**

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F7884	1	ASSM,REG 3.9L NG/LPV DUAL FUEL
2	0F8004	1	ASSM,REG 3.9L DUAL FUEL,NG-LPL
3	0F3869	1 (REF.)	SWITCH PRESSURE GAS 5" RISE (INCLUDED WITH I/N 2)
4	057823	4	CLAMP HOSE #10 .56-1.06
5	057147	1	HOSE 3/4 ID LPG & NG (46.25" LG)
6	047527	1	BARBED STR 1/2 NPT X 3/4
7	0E8286	1	STREET EL 45 DEG 1/2" NPT BRASS
8	0E9295	1	ASSY THROTTLE 28MM
9	0E7121	1 (REF)	O-RING 47.625 ID X 2.38 WIDTH
10	0E6376B	1 (REF)	VENTURI 28 ID THROTTLE W/CHOKE
11	0E6382B	1 (REF)	VENTURI HOLDER W/40MM ACTUATOR
12	042561	2	CLAMP HOSE #36 1.88-2.75
13	040105	1	HOSE COOL 2 IN ID 20R4 (2" LG)
14	046580	4	SCREW SHC M6-1.0 X 45 G12.9
15	022097	4	WASHER LOCK M6-1/4
16	0E4394	1	ACTUATOR BOSCH 40, GOVERNOR
17	0F8228	1	HARNES, VERIZON FUEL JUMPER
18	0E6586	1	GASKET BOSCH 32 & 40
19	0E7839	1	MACHINING CARBURETOR ADAPTOR
20	064945	1	GASKET CARB ADAPTOR
21	033212	4	SCREW HHC 5/16-18 X 1-1/4 G5
22	022129	10	WASHER LOCK M8-5/16
23	061012	1	PLUG STD PIPE 1/8 SOCKET HEAD
24	042907	4	SCREW HHC M8-1.25 X 16 G8.8
25	0E8456	1	BRACKET FUEL REGULATOR
26	0E1056	2	FUEL HOSE ASSY NAT.GAS/L.P.V.
27	045771	2	NUT HEX M8-1.25 G8 YEL CHR
28*	026307	3	ELBOW 90D STREET 3/4
29	075580	2	FLANGE FUEL INLET
30	0C2454	3	SCREW TH-FRM M6-1 X 16 N WA Z/JS
31	0D4647	1	DECAL MAX INLET PRESSURE 250 PSI
32	050279	1	DECAL FUEL INLET NG
33	022145	2	WASHER FLAT 5/16 ZINC
34	039253	2	SCREW HHC M8-1.25 X 20 G8.8
35	025655	1	PLUG STD PIPE 3/4 STEEL SQ HD
36	0A2038	2	WASHER FLAT 3/8 ZINC
37	050280	1	DECAL FUEL INLET LPG
38	0D1509	1	DECAL INLET PRESSURE
39*	028641	1	NIPPLE TOE 3/4 NPT X 2
40	057147	1	HOSE 3/4 ID LPG & NG (11.5" LG)
41	026915	1	NIPPLE CLOSE 3/4 X 1.375
42	026812	1	ELBOW 90D 3/4 NPT
43	0E1056	1	FUEL HOSE ASSY NATGAS/LPV
44	0C8797	2	SENSOR, LP & NAT GAS
45*	039253	2	SCREW HHC M8-1.25 X 20 G8.8
46*	022145	2	WASHER FLAT 5/16-M8 ZINC
47*	022129	2	WASHER LOCK M8-5/16
48*	045771	2	NUT HEX M8-1.25 G8 CLEAR ZINC
49	028739	1	TIE WRAP UL 3.9" X .10" NATL

\* HARDWARE FOR MOUNTING I/N 29 #075580 TO SPILL CONTAINMENT PAN FOR FUEL HOOK-UP (NOT SHOWN). ALL PARTS TO BE PUT IN BAG & ZIPPED TO STATOR BOLT CLOSEST TO REGULATOR.



EXPLODED VIEW:  
ENCLOSURE C2 30KW VERIZON  
DRAWING #: 0F6652

EXPLODED VIEW: ENCLOSURE C2 30KW VERIZON  
DRAWING #: 0F6652

GROUP F

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0F6643	1	REAR WRAP
2	0C2454	64	SCREW THF M6-1 X 16 N WA Z/J5
3	0F5849AG	2	DOOR C2 ALUM GRAY
4 **	077992	5	NUT HEX LOCK M6-1.0 SS NY INS
5	0F3890A	6	RETAINER INSULATION (740)
6	0F6647	2	DISCHARGE DUCT L/H & R/H SIDE
7	0F6642	2	FRONT CORNERS
8	0F6650	1	DISCHARGE DUCT MIDDLE
9	049813	2	NUT HEX M6 X 1.0 G8 YEL CHR
10	022447	2	WASHER SHAKEPROOF INT 1/4
11	0F6644	1	ROOF
12	0E5968	1	GASKET EXTRUDED TRIM (158.50" LG)
13	0F5048D	2	WISE-ACTION LATCH SLOTTED CIR
14	022127	1	NUT HEX 1/4-20 STEEL
15	022097	1	WASHER LOCK M6-1/4
16	0F5049	2	TAB PULL
17	0C2634A	1	ASSEMBLY COVER ACCESS
18	022473	3	WASHER FLAT 1/4-M6 ZINC
19	042568	2	SCREW HHC M6-1.0 X 20 G8.8
20	0912970089	2	ASSY WIRE 14AWG 31.3" BLK
21	0F7306A	2	INSULATION SIDE SUPPORT
22	078115	12	WASHER SELF LOCKING DOME
23	0F7651	1	BAFFLE AIR
24	0F4051A	1	INSULATION ROOF TOP
25	089961	2	FOAM STRIP 3/4" WIDE X 3/16" THK (144" LG)
26	029289	4	TAPE ELEC 1/2 FOAM (40" LG)
27	029289	2	TAPE ELEC 1/2 FOAM (8" LG)
28	029289	1	TAPE ELEC 1/2 FOAM (33.187" LG)
29	0F7678	3	BRACKET AIR BAFFLE
30	0F9494	2	HEX KEY 5/16 (NOT SHOWN)
31	0F8869D	1	KEY WISE-ACTION LATCH SLOT CIR

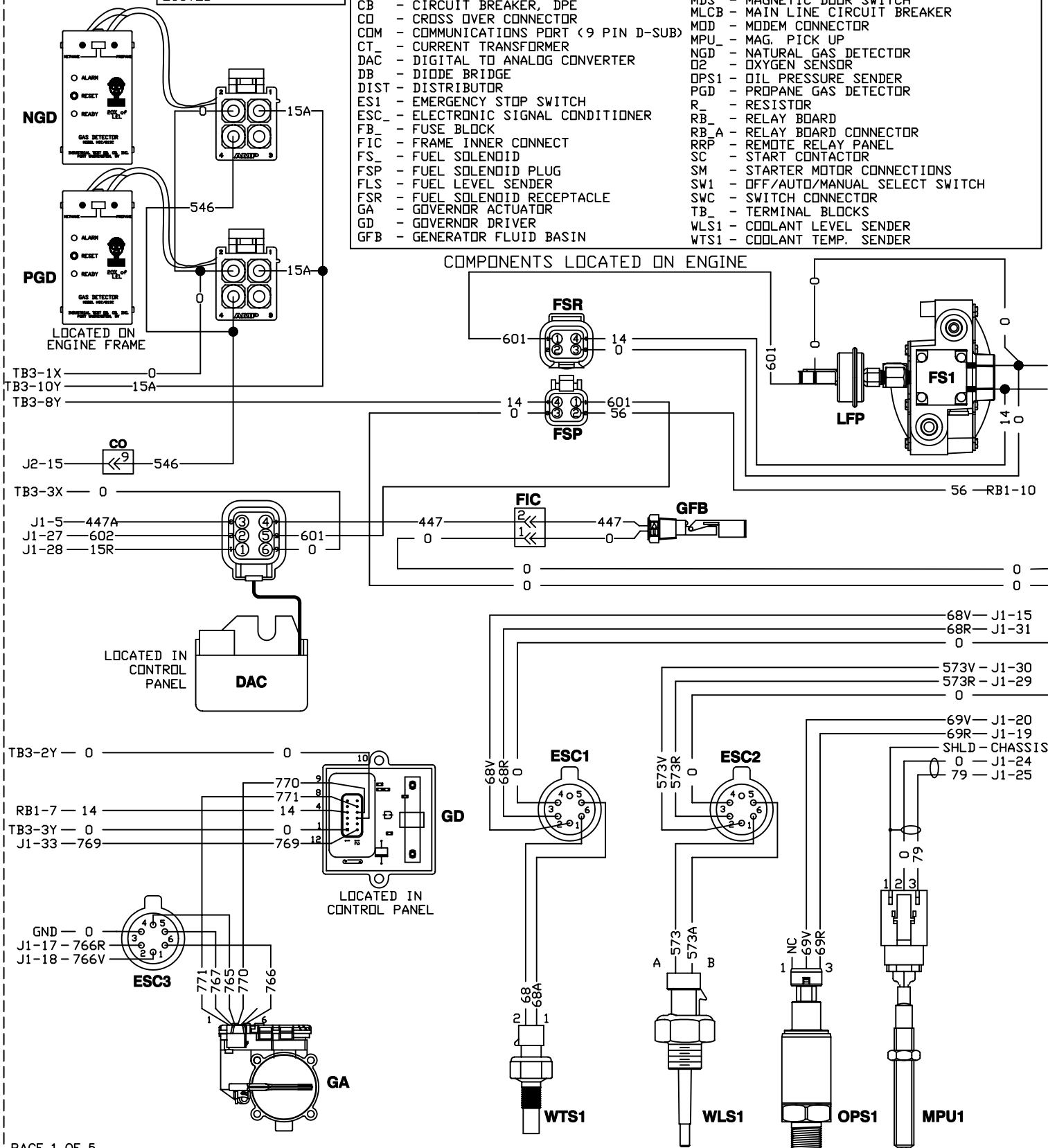
\*\* ALUMINUM ENCLOSURE NOTE: ALL ENCLOSURE PANELS THAT FASTEN TO THE BASE FRAME MUST BE SECURED USING ITEM 2 & 5 THREAD FORMING FASTENER AND ITEM 4 LOCK NUT. LOCK NUT IS TO BE INSTALLED AFTER THREAD FORMING FASTENER HAS PENETRATED THROUGH EXTRUSIONS IN ENCLOSURE PANELS.

NOTE: ALL WIRES 18 AWG  
300V UL LISTED UNLESS  
SHOWN OTHERWISE  
AWG SIZE  
S1, S2 & S3 ARE 600V UL  
LISTED

LEGEND  
AH1 - ALARM HORN  
ALT - DC CHARGE ALTERNATOR  
AFS - AIR/FUEL SOLENOID  
AVR - AUTOMATIC VOLTAGE REGULATOR  
BCC - BATTERY CHARGER CONNECTOR  
BCH - BATTERY CHARGER  
CB - CIRCUIT BREAKER, DPE  
CD - CROSS OVER CONNECTOR  
CDM - COMMUNICATIONS PORT (9 PIN D-SUB)  
CT - CURRENT TRANSFORMER  
DAC - DIGITAL TO ANALOG CONVERTER  
DB - DIODE BRIDGE  
DIST - DISTRIBUTOR  
ES1 - EMERGENCY STOP SWITCH  
ESC - ELECTRONIC SIGNAL CONDITIONER  
FB - FUSE BLOCK  
FIC - FRAME INNER CONNECT  
FS - FUEL SOLENOID  
FSP - FUEL SOLENOID PLUG  
FLS - FUEL LEVEL SENDER  
FSR - FUEL SOLENOID RECEPTACLE  
GA - GOVERNOR ACTUATOR  
GD - GOVERNOR DRIVER  
GFB - GENERATOR FLUID BASIN

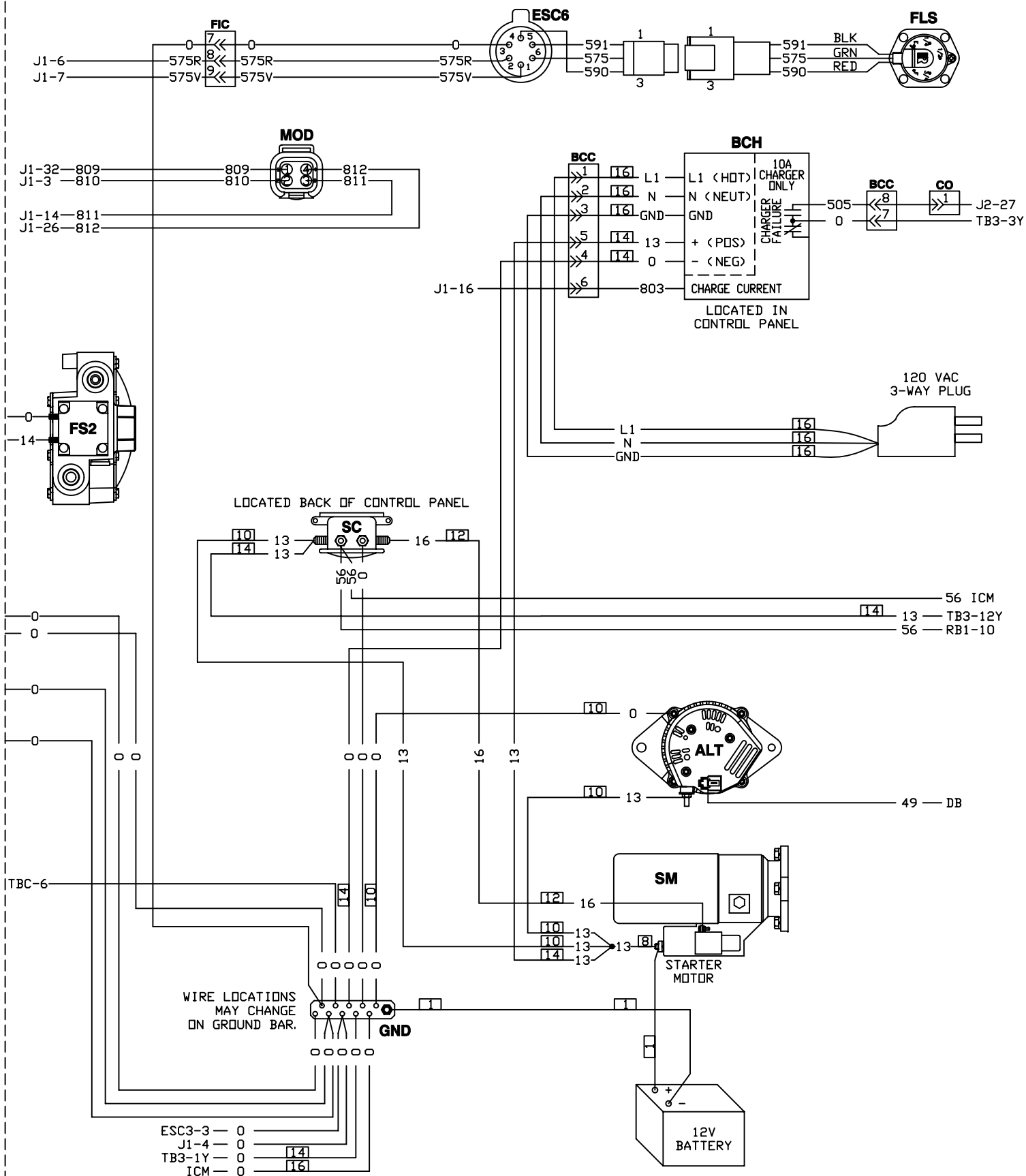
GFCI - GROUND FAULT CURRENT INTERRUPT  
GND - GROUND STUD CONNECTION  
IC - IGNITION COIL  
ICM - IGNITION CONTROL MODULE  
IFT - INTERFACE TRANSFORMER  
J - ELECTRONIC CONTROL MODULE CONN.  
LFP - LOW FUEL PRESSURE SWITCH  
MDS - MAGNETIC DOOR SWITCH  
MLCB - MAIN LINE CIRCUIT BREAKER  
MOD - MODEM CONNECTOR  
MPU - MAG. PICK UP  
NGD - NATURAL GAS DETECTOR  
O2 - OXYGEN SENSOR  
DPS1 - OIL PRESSURE SENDER  
PGD - PROPANE GAS DETECTOR  
R - RESISTOR  
RB - RELAY BOARD  
RB\_A - RELAY BOARD CONNECTOR  
RRP - REMOTE RELAY PANEL  
SC - START CONTACTOR  
SM - STARTER MOTOR CONNECTIONS  
SW1 - OFF/AUTO/MANUAL SELECT SWITCH  
SWC - SWITCH CONNECTOR  
TB - TERMINAL BLOCKS  
WLS1 - COOLANT LEVEL SENDER  
WTS1 - COOLANT TEMP. SENDER

## COMPONENTS LOCATED ON ENGINE



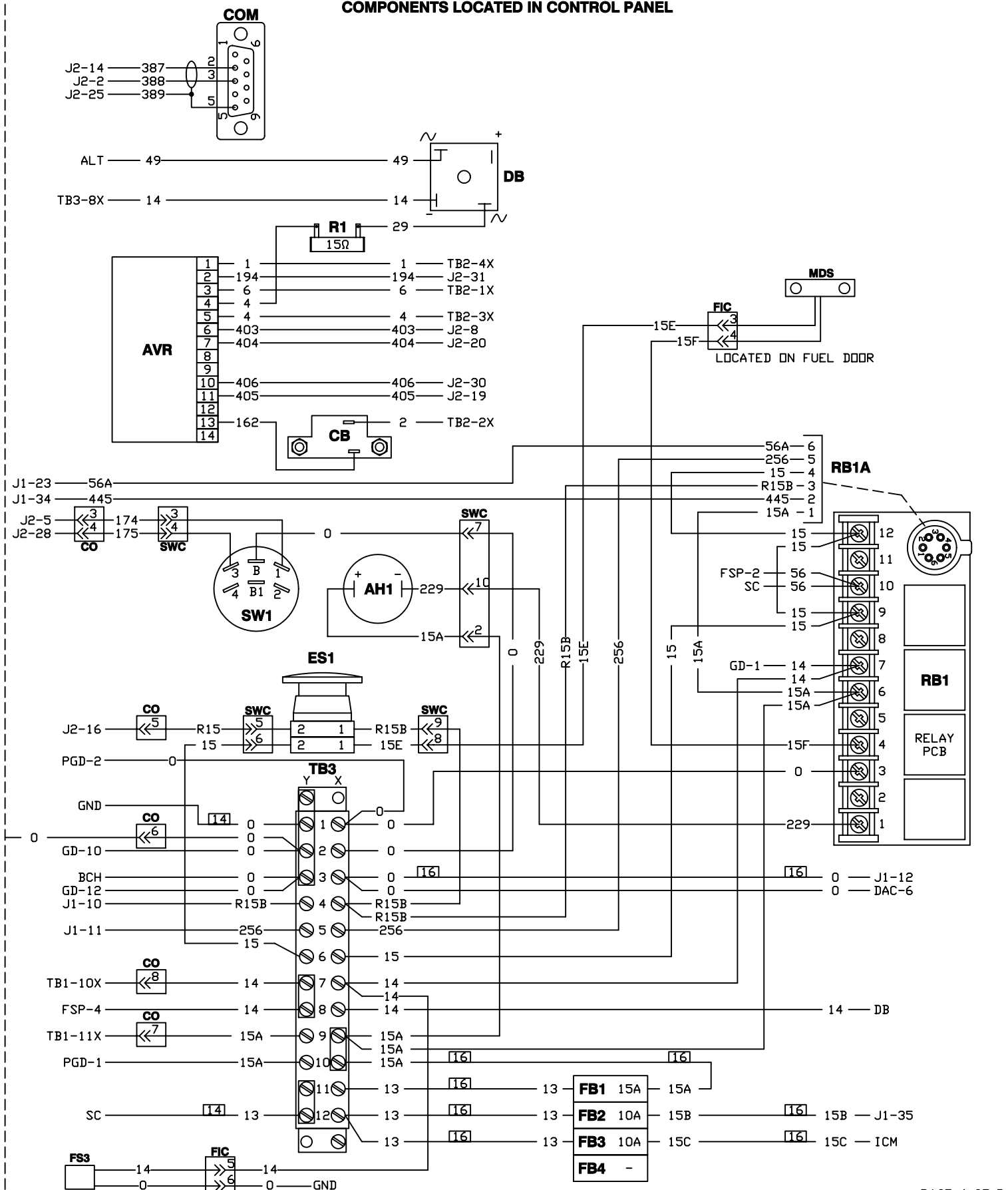


## COMPONENTS LOCATED ON ENGINE

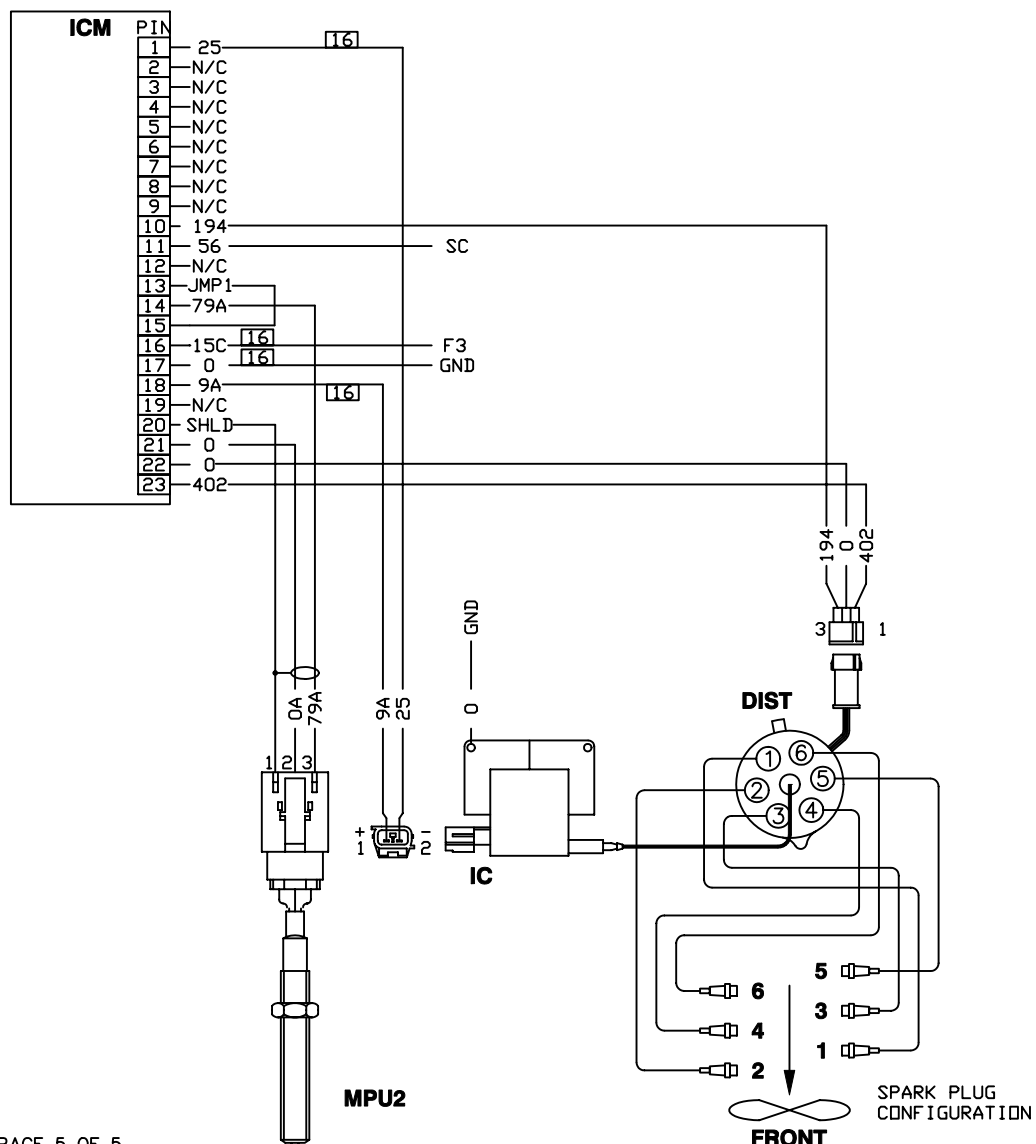




## COMPONENTS LOCATED IN CONTROL PANEL



## COMPONENTS LOCATED ON ENGINE





## GD CONNECTOR

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

## ICM - IGNITION MODULE CONNECTOR

PIN	WIRE#	TO	FUNCTION
1	25	IC	IGNITION COIL DRIVE
10	194	DIST	DIST FEEDBACK (+)
11	56	RB1-10	STARTER RELAY OUT
13	JMP1	ICM-15	3.9L ENGINE SEL RETURN
14	79A	MPU2-3	MPU2 SIGNAL (+)
15	JMP1	ICM-13	3.9L ENGINE SELECT
16	15C	F3	NOTE 7
17	0	GND	NOTE 1
18	9A	IC	IGNITION COIL PWR
20	SHLD	MPU2-1	MPU2 DRAIN
21	0A	MPU2-2	MPU2 SIGNAL (-)
22	0	DIST	DIST FEEDBACK (-)
23	402	DIST	DIST FEEDBACK

## AVR CONNECTOR

PIN	WIRE#	TO	FUNCTION
1	1	FIELD	- FIELD
2	194	J2-31	+12VDC
3	6	PMG	PME OUTPUT
4	4	R1/FIELD	+ FIELD
5	4	R1/FIELD	+ FIELD
6	403	J2-8	GATE TRIGGER B
7	404	J2-20	GATE TRIGGER A
10	406	J2-30	ZERO CROSSING I/P
11	405	J2-19	GROUND (ISD)
13	162	CB1	PME OUTPUT (AFTER CB)

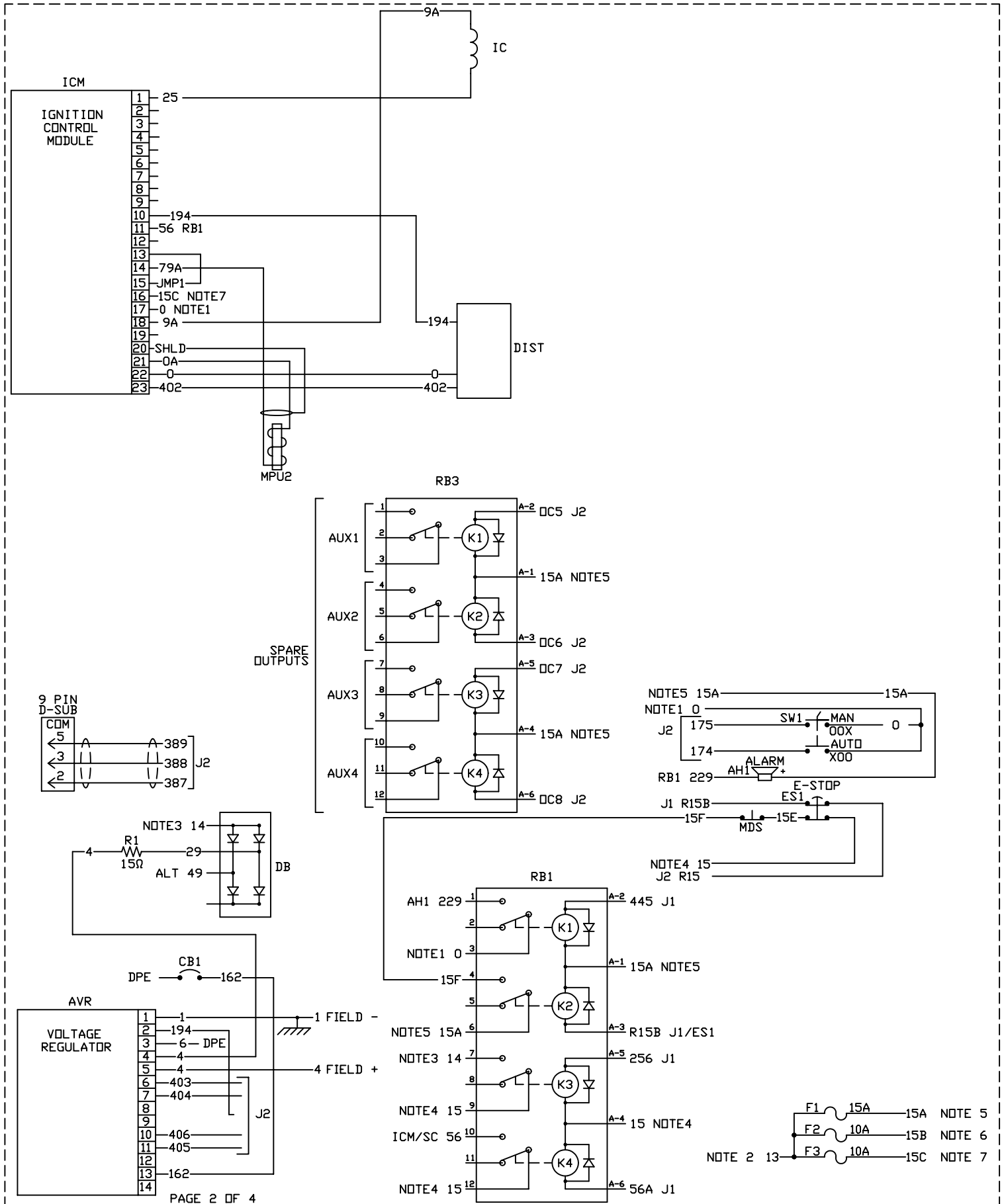
## ENGINE CONTROL MODULE CONNECTIONS

J1

PIN	WIRE	TO	FUNCTION
3	810	MODEM	OPTION
5	447A	DAC	GEN FLUID BASIN
6	575R	FLS-2	FUEL LEVEL RTN
7	575V	FLS-1	FUEL LEVEL +
10	R15B	RB1A-3/ESI	OVERSPEED/WATCHDOG
11	256	RB1A-5	FUEL RELAY
12	0	GND	NOTE 1
14	811	MODEM	OPTION
15	68V	WTS-1	COOLANT TEMP +
16	803	BCH	BAT CHARGER CURRENT
17	766R	GA-2	THROTTLE POS RTN
18	766V	GA-1	THROTTLE POS +
19	69R	DPS-3	OIL PRESS RTN
20	69V	DPS-2	OIL PRESS +
23	56A	RB1A-6	STARTER RELAY
24	0	MPU1-2	MPU1 SIGNAL (-)
25	79	MPU1-3	MPU1 SIGNAL (+)
26	812	MODEM	OPTION
27	602	DAC	LOW FUEL PRESSURE
28	15R	DAC	ANALOG +
29	573R	WLS-2	COOLANT LVL RTN
30	573V	WLS-1	COOLANT LVL +
31	68R	WTS-2	COOLANT TEMP RTN
32	809	MODEM	OPTION
33	769	GD-12	THROTTLE PWM
34	445	RB1A-2	ALARM RELAY
35	15B	F2	NOTE 6

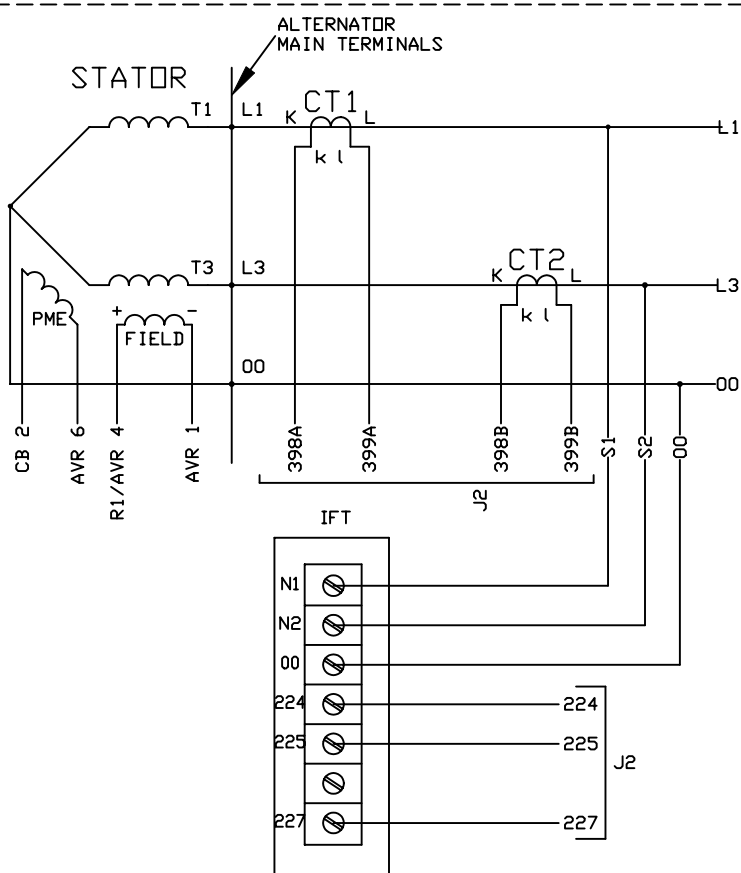
J2

PIN	WIRE	TO	FUNCTION
1	391	CUST CON	RS485- (XFER SW)
2	388	CDM-3	RS232 TX (GENLINK)
3	DI3	CUST CON	SPARE IN 3/LINE PWR
4	183	CUST CON	REMOTE START
5	174	SW1	*AUTO* START
6	224	IFT	V SENSE GEN A PH
7	227	IFT	V SENSE RTN
8	403	AVR-6	AVR GATE TRIGGER B
11	399A	CT1	GEN A PH CURRENT -
12	398A	CT1	GEN A PH CURRENT +
13	390	CUST CON	RS485+ (XFER SW)
14	387	CDM-2	RS232 RX (GENLINK)
15	546	PGD	PROPANE GAS DETECTOR
16	R15	ES1	EMERGENCY STOP
19	405	AVR-11	AVR GROUND
20	404	AVR-7	AVR GATE TRIGGER A
21	DC8	RB3A-6	SPARE OUTPUT 4
22	DC6	RB3A-3	SPARE OUTPUT 2
23	DC5	RB3A-2	SPARE OUTPUT 1
24	SHLD	CUST CON	RS485 DRAIN (XFER SW)
25	389	CDM-5	RS232 CDM (GENLINK)
26	DI4	CUST CON	SPARE IN 4/GEN PWR
27	505	BCH	BAT CHARGER FAIL
28	175	SW1	*MANUAL* START
29	225	IFT	V SENSE GEN B PH
30	406	AVR-10	AVR ZERO CROSSING I/P
31	194	AVR-2	AVR +12VDC
33	DC7	RB3A-5	SPARE OUTPUT 3
34	399B	CT2	GEN B PH CURRENT-
35	398B	CT2	GEN B PH CURRENT+

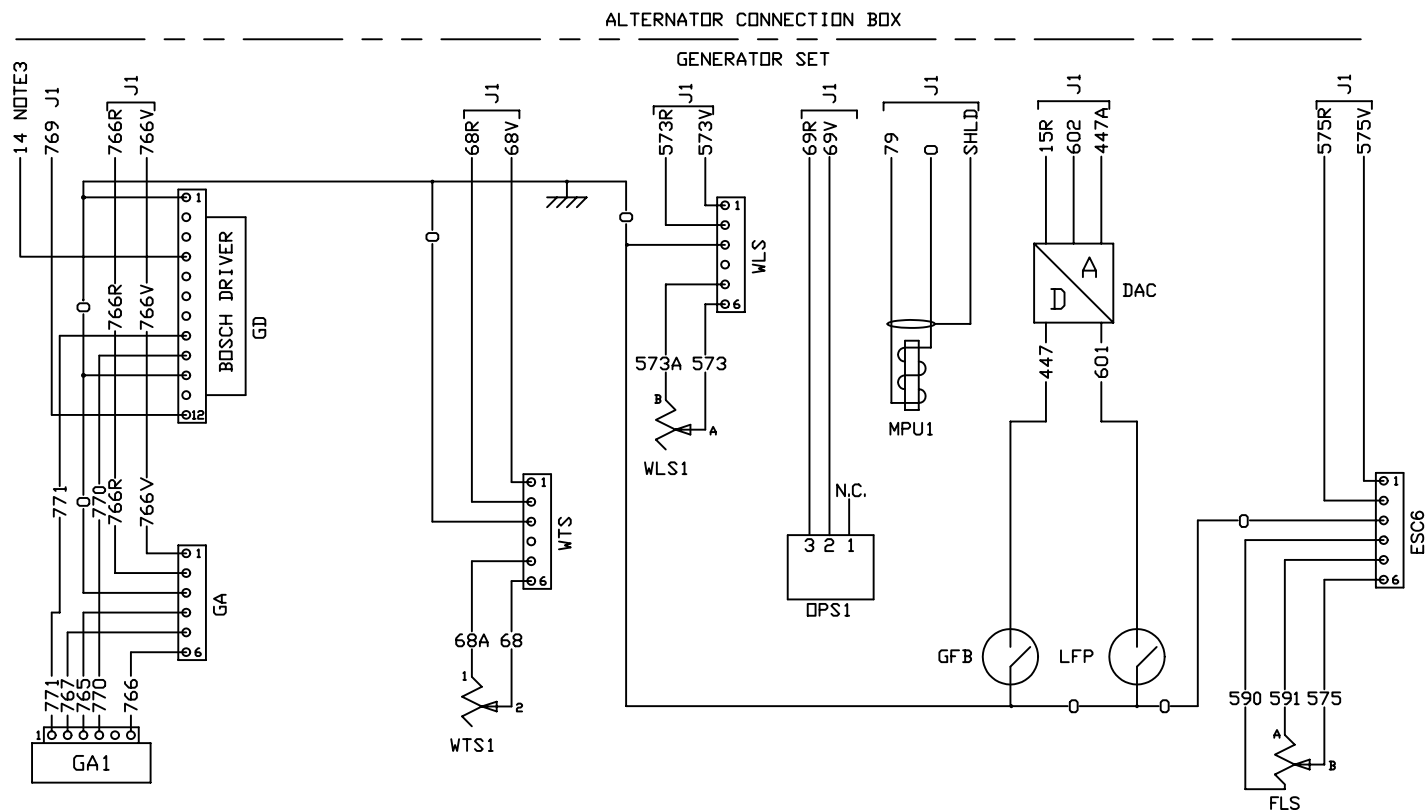




## GROUP G



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

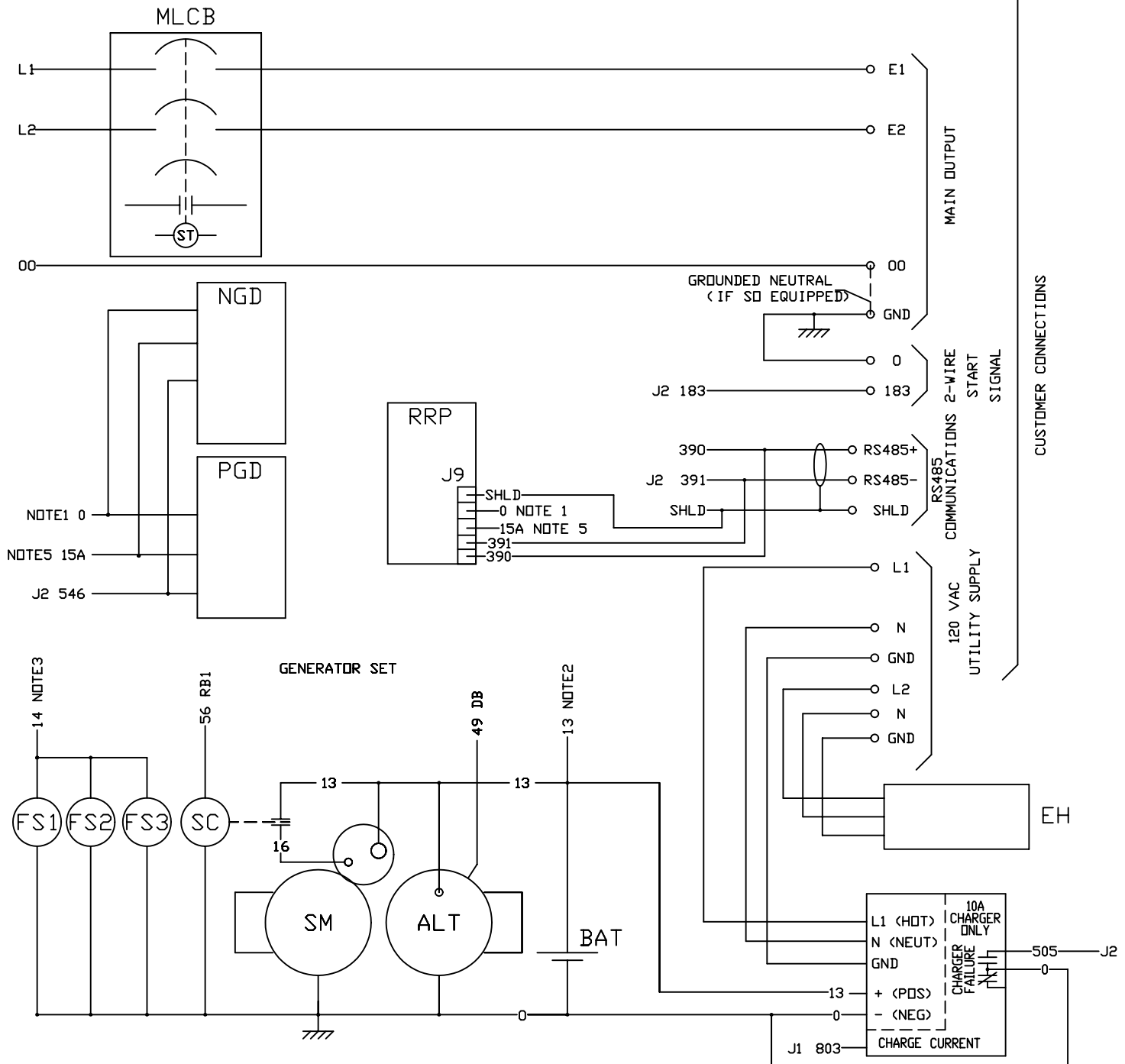


PAGE 3 OF 4

### SCHEMATIC - DIAGRAM

H-100 VERIZON

**DRAWING #: 0F6806**



## LEGEND

OO - NEUTRAL  
 AH1 - ALARM HORN  
 ALT - CHARGE ALTERNATOR  
 AVR - AUTOMATIC VOLTAGE REGULATOR  
 BAT - BATTERY (12VDC)  
 BCH - BATTERY CHARGER  
 CAM - CAMSHAFT SENSOR  
 CB - CIRCUIT BREAKER  
 COM - COMMUNICATION CONNECTOR  
 CRK - CRANKSHAFT SENSOR  
 CT - CURRENT TRANSFORMER  
 CUST CON - CUSTOMER CONNECTION  
 DAC - D/A CONVERTER

DIST - DISTRIBUTOR  
 DPE - EXCITER  
 EH - ENGINE WATER HEATER  
 ES1 - E-STOP SWITCH  
 F - FUSE  
 FLS - FUEL LEVEL SENDER  
 FS - FUEL SOLENOID  
 GA - GOVERNOR ACTUATOR  
 GD - GOVERNOR DRIVER  
 GFB - GENERATOR FLUID BASIN SWITCH  
 IC - IGNITION COIL  
 ICM - IGNITION CONTROL MODULE  
 IFT - INTERFACE TRANSFORMER  
 ISO - ISOLATED (ELECTRICALLY)

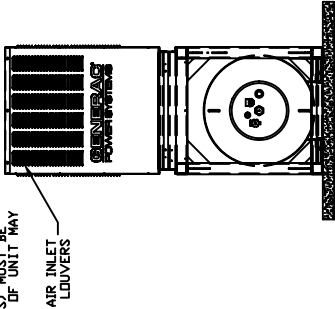
J - ENGINE CONTROLLER CONNECTIONS  
 LFP - LOW FUEL PRESSURE SWITCH  
 MDS - MAGNETIC DOOR SWITCH  
 MLCB - MAIN LINE CIRCUIT BREAKER  
 MPU - MAGNETIC PICK-UP  
 NGD - NATURAL GAS DETECTOR  
 DPS - OIL PRESSURE SENDER  
 PGD - PROPANE GAS DETECTOR  
 R - RESISTOR  
 RB - RELAY BOARD  
 SC - STARTER CONTACTOR  
 SHLD - SHIELD  
 SM - STARTER MOTOR  
 ST - SHUNT TRIP  
 SW1 - AUTO/MANUAL SELECT SWITCH  
 WLS - WATER LEVEL SENSOR  
 WTS - WATER TEMPERATURE SENDER

GROUP G

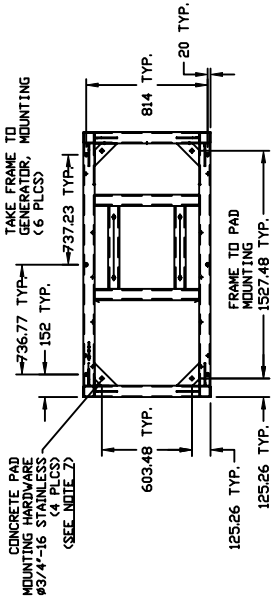
WEIGHT DATA (WITH PALLET)	
3.9L 30KW (1756 LB)	
TANK AND FRAME - 315KG (694 LB)	

NOTES:

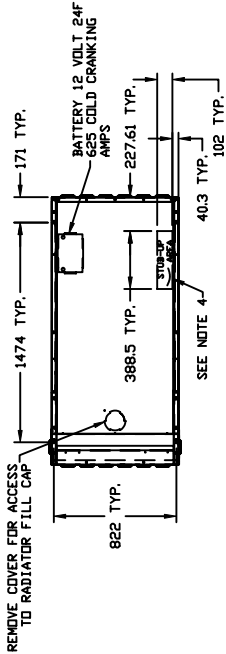
- 1) MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1460 (57.5') WIDE X 2560 (100.8') LONG. REFERENCE INSTALLATION GUIDE P/N OF6810 FOR CONCRETE PAD REINFORCEMENT AND PAD DEPTH GUIDELINES.
- 2) GENERATOR MUST BE LOCATED A MINIMUM DISTANCE OF 5 FEET FROM A WALL OR FENCE. ALLOW A 5 FOOT MINIMUM PERIMETER OF OPEN SPACE AROUND THE ENTIRE GENERATOR. REFERENCE INSTALLATION GUIDE P/N OF6810 FOR OUTDOOR ROOF MOUNTED APPLICATIONS.
- 3) CIRCUIT BREAKER INFORMATION:  
SEE SPECIFICATION SHEET WITHIN OWNERS MANUAL.
- 4) INSIDE STUB-UP AREA FOR AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (< 5 AMP MAX.) CONNECTION, AND ACCESS TO TRANSFER SWITCH CONTROL VOLT. REMOVE FRONT COVER FOR ACCESS.
- 5) REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS. HOLES ARE #63.5, AND SPACED 1665MM APART. INSTALL COVERS AFTER LIFTING INTO PLACE.
- 6) REMOVE EITHER LEFT OR RIGHT HAND SIDE PANEL TO ACCESS EXHAUST MUFFLERS.
- 7) WIND LOAD AND CALCULATIONS (AT 150mph):  
RECOMMEND A MINIMUM BOLT OF #3/4" (A307) IN CONCRETE OF STRENGTH  $\bar{F} = 3,000\text{psi}$  WITH EMBEDMENT IN CONCRETE OF 5" SMALLER DIAMETER AND BOLT LENGTH WILL RESULT IN DECREASED WIND LOAD RESISTANCE CAPABILITY.
- 8) DO NOT RUN ANY 2 WIRE START OR COMMUNICATION WIRE WITH ANY AC POWER RUNS
- 9) CONCRETE PAD (DESIGNED AND INSTALLED BY OTHERS) MUST BE CONSTRUCTED TO ADEQUATE PARAMETERS OR TIPPING OF UNIT MAY RESULT, EVEN WITH LAGGING AS INDICATED IN #7.



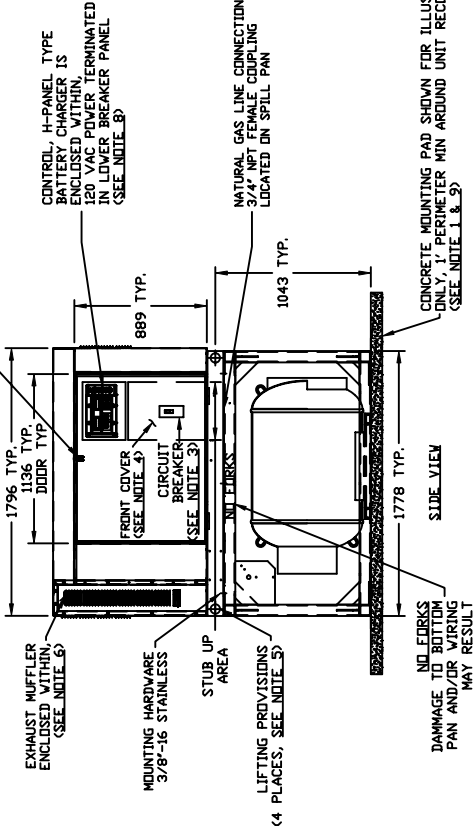
FRONT VIEW



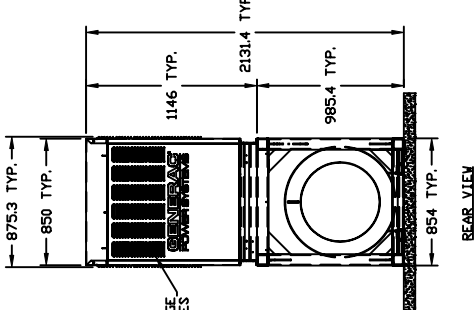
TOP VIEW DE TANK FRAME



WISE ACTION LATCH, ONE PER DOOR, ONE LIFT OFF DOOR PER SIDE OF GENERATOR



EXHAUST AND DISCHARGE LOUVERS-FRONT AND SIDES



SERVICE ITEM ACCESSIBILITY CHART	
SERVICE ITEM	3.9L 30KW
OIL FILL CAP	WIND UP LEFT ACCESSIBLE THRU DOOR
OIL DIP STICK	THRU RIGHT DOOR
OIL FILTER	THRU RIGHT DOOR
OIL DRAIN HOSE	THRU LEFT DOOR
RADIATOR DRAIN HOSE	THRU LEFT DOOR
AIR CLEANER ELEMENT	ETHER DOOR
SPARK PLUGS	BOTH DOORS
MUFFLERS	SEE NOTE 6
FAN BELT	ETHER DOOR
BATTERY	THRU RIGHT DOOR

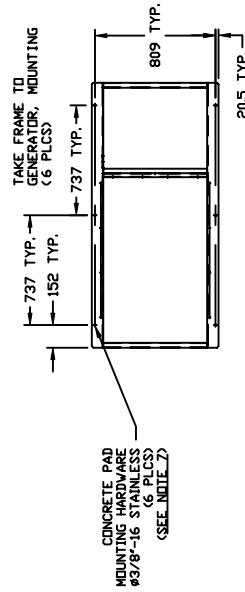
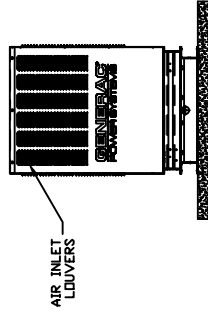
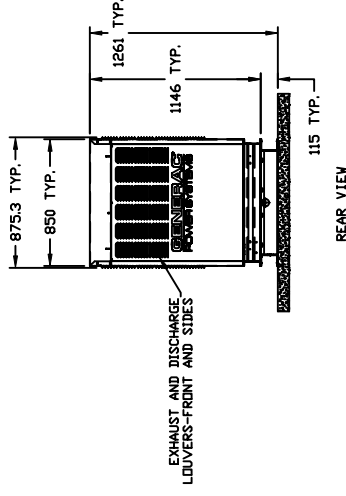
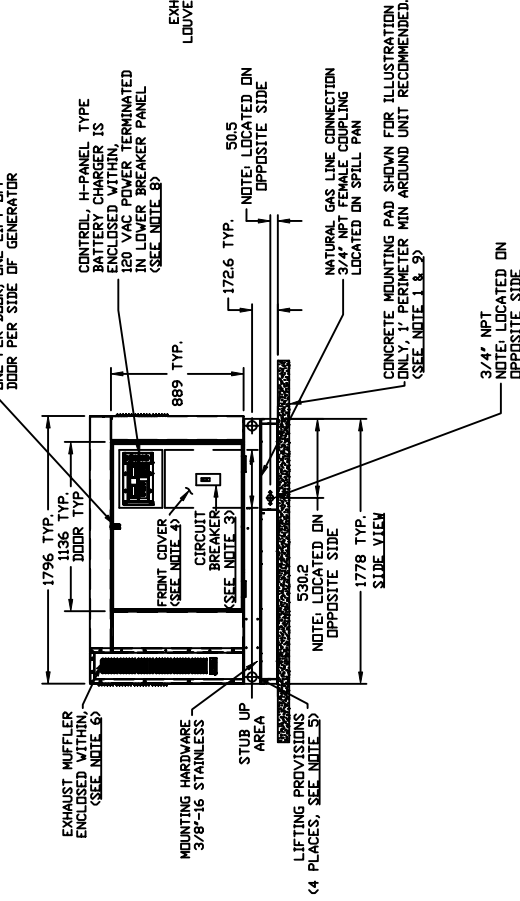
REFERENCE OWNERS MANUAL FOR PERIODIC REPLACEMENT PART LISTINGS

EXPLODED VIEW:  
INSTALL 3.9L 30KW VERIZON  
DRAWING #: 0F7583

**WEIGHT DATA (WITH PALLET)**  
**3. 9L 30KW - 799KG (1758 LB)**  
**NATURAL GAS RISER FRAME - KG ( LB )**

- 1) MINIMUM RECOMMENDED CONCRETE PAD SIZE 1460 (37' 5") WIDE X 2560 (100.8') LONG. REFERENCE INSTALLATION GUIDE P/N OF 6810 FOR CONCRETE PAD REINFORCEMENT AND PAD DEPTH GUIDELINES.
- 2) GENERATOR MUST BE LOCATED A MINIMUM DISTANCE OF 5 FEET FROM A WALL OR FENCE. ALLOW A 5 FOOT MINIMUM PERIMETER OF OPEN SPACE AROUND THE ENTIRE GENERATOR. REFERENCE INSTALLATION GUIDE P/N OF 6810 FOR OUTDOOR ROOF MOUNTED APPLICATIONS.
- 3) CIRCUIT BREAKER INFORMATION:
  - 4) INSIDE STUB-UP AREA FOR AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, BATTERY CHARGER 180 VOLT AC ( 5 AMP MAX.) CONNECTION, AND ACCESS TO TRANSFER SWITCH CONTROL WIRES. REMOVE FRONT COVER FOR ACCESS.
  - 5) SPECIFIED DIMENSIONS MANUALLY OR LIVERS AFTER LIFTING INTO PLACE, AND SPECIFIED 1600MM (63") MIN. INSTALL OVERHANG AFTER LIFTING INTO PLACE.
- 6) REMOVE EITHER LEFT OR RIGHT HAND SIDE PANEL TO ACCESS EXHAUST MUFFLERS.
- 7) WIND LOAD AND CALCULATIONS (AT 150mph):
  - 8) WEIGHING A MINIMUM BELT OF 3024" (252') IN CONCRETE OF STRENGTH F<sub>1</sub> = 3,000PSI RECOMMEND A MINIMUM BELT OF 3024" (252') CAPACITY, BUT BELT LENGTH WILL RESULT IN DECREASED WIND LOAD RESISTANCE CAPABILITY.
- 9) DO NOT RUN ANY 2 WIRE START OR COMMUNICATION WIRE WITH ANY AC POWER RUNS
- 10) CONCRETE PAD DESIGNED AND INSTALLED BY OTHERS. MUST BE CONSTRUCTED TO WITHSTAND PROPOSED WEIGHT OF UNIT MAY BE EXCEEDED, EVEN WITH LAGGING AS INDICATED IN #7.

**REFERENCE OWNERS MANUAL FOR PERIODIC  
REPLACEMENT PART LISTINGS**



**TOP VIEW OF N/G RISER FRAME**

REVISION: G-6071-A  
DATE: 8/1/05



## Standby Generator Sets Warranty



### GENERAC POWER SYSTEMS STANDARD TWO-YEAR LIMITED WARRANTY FOR STANDBY POWER SYSTEMS

NOTE: ALL UNITS MUST HAVE A START-UP INSPECTION PERFORMED BY AN AUTHORIZED GENERAC DEALER.

For a period of two (2) years or two thousand (2,000) hours of operation from the date of sale, whichever ever occurs first, Generac Power Systems, Inc. will, at its option, repair or replace any part(s) which, upon examination, inspection, and testing by Generac Power Systems or an Authorized/Certified Generac Power Systems Dealer, or branch thereof, is found to be defective under normal use and service, in accordance with the warranty schedule set forth below. Any equipment that the purchaser/owner claims to be defective must be examined by the nearest Authorized/Certified Generac Power Systems Dealer, or branch thereof. This warranty applies only to Generac Power Systems Generators used in "Standby" applications, as Generac Power Systems, Inc. has defined Standby, provided said generator has been initially installed and/or inspected on-site by an Authorized/Certified Generac Power Systems Dealer, or branch thereof. Scheduled maintenance, as outlined by the generator owner's manual, must be performed by an Authorized/Certified Generac Power Systems Dealer, or branch thereof. This will verify service has been performed on the unit throughout the warranty period. This warranty is limited to and available only on Liquid-cooled units.

#### WARRANTY SCHEDULE

YEAR ONE — One hundred percent (100%) coverage on mileage, labor, and parts listed.

• ALL COMPONENTS — ENGINE, ALTERNATOR, AND TRANSFER SWITCH

YEAR TWO — One hundred percent (100%) coverage on parts listed.

• ALL COMPONENTS — ENGINE, ALTERNATOR, AND TRANSFER SWITCH PARTS ONLY

#### Gearbox Equipped Units - Limited Gearbox Coverage

YEARS ONE THROUGH FIVE — Parts and labor coverage on gearbox and components.

YEARS SIX THROUGH TEN — Parts only coverage on gearbox and components.

#### Guidelines:

Travel allowance is limited to 300 miles maximum, and 7.5 hours maximum (per occurrence), round trip, to the nearest authorized Generac Service Facility, and only applies to permanently wired and mounted units.

- Any and all warranty repairs and/or concerns, must be performed and/or addressed by an Authorized/Certified Generac Power Systems Dealer, or branch thereof.
- A Generac Power Systems, Inc. Transfer Switch is highly recommended to be used in conjunction with the generator set. If a Non-Generac Power Systems, Inc. Transfer Switch is substituted for use and directly causes damage to the generator set, no warranty coverage shall apply.
- All warranty expense allowances are subject to the conditions defined in Generac Power Systems Warranty, Policies, Procedures and Flat Rate Manual.
- Units that have been resold are not covered under the Generac Power Systems Warranty, as this Warranty is not transferable.
- Unit enclosure is only covered during the first year of the warranty provision.
- Use of Non-Generac replacement part(s) will void the warranty in its entirety.
- Engine coolant heaters (block-heaters), heater controls and circulating pumps are only covered during the first year of the warranty provision.

#### THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

1. Any unit built/manufactured prior to July 1, 2004.
2. Costs of normal maintenance (i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up).
3. Any failure caused by contaminated fuels, oils, coolants/antifreeze or lack of proper fuels, oils or coolants/antifreeze.
4. Units sold, rated or used for "Prime Power", "Trailer Mounted" or "Rental Unit" applications as Generac Power Systems has defined Prime Power, Trailer Mounted or Rental Unit. Contact a Generac Power Systems Distributor for Prime Power, Trailer Mounted or Rental Unit definition and warranty.
5. Failures caused by any external cause or act of God such as, but not limited to, collision, fire, theft, freezing, vandalism, riot or wars, lightning, earthquake, windstorm, hail, volcanic eruption, water or flood, tornado, hurricane, terrorist acts or nuclear holocaust.
6. Products that are modified or altered in a manner not authorized by Generac Power Systems in writing.
7. Failures due, but not limited to, normal wear and tear, accident, misuse, abuse, negligence, or improper installation or sizing.
8. Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
9. Damage related to rodent and/or insect infestation.
10. Failure due to misapplication, misrepresentation, or bi-fuel conversion.
11. Telephone, facsimile, cellular phone, satellite, Internet, or any other communication expenses.
12. Rental equipment used while warranty repairs are being performed (i.e. rental generators, cranes, etc.).
13. Overtime, holiday, or emergency labor.
14. Modes of transportation deemed abnormal (refer to Generac Power Systems Warranty, Policies, Procedures and Flat Rate Manual).
15. Steel enclosures that are rusting due to improper installation, location in a harsh or saltwater environment or scratched where integrity of paint applied is compromised.
16. Any and all expenses incurred investigating performance complaints unless defective Generac materials and/or workmanship were the direct cause of the problem.
17. Starting batteries, fuses, light bulbs, engine fluids, and overnight freight cost for replacement part(s).

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, SPECIFICALLY, GENERAC POWER SYSTEMS MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to purchaser/owner.

GENERAC POWER SYSTEMS ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC POWER SYSTEMS BE LIABLE FOR ANY INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC POWER SYSTEMS, INC. NEGLIGENCE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to purchaser/owner. Purchaser/owner agrees to make no claims against Generac Power Systems, Inc. based on negligence. This warranty gives purchaser/owner specific legal rights. Purchaser/owner also may have other rights that vary from state to state.

**Generac Power Systems, Inc. • P.O. Box 8 • Waukesha, WI 53187**

**Ph: [262] 544-4811 • Fax: [262] 544-4851**

Bulletin 0166290SBY / Printed in U.S.A. 6.04

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