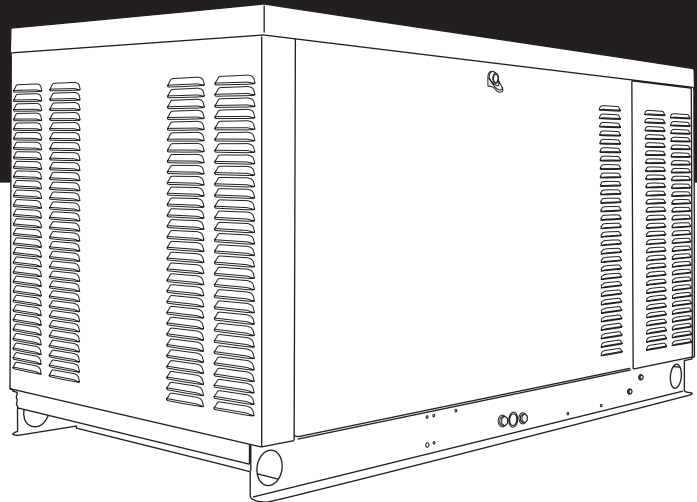


**Serial Number**

**1.6L  
20/25/30 kW  
Models**

**STANDBY GENERATOR  
OWNER'S MANUAL**



***A new standard of reliability***

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

— ⚠ **CAUTION** ⚠ —

**ONLY QUALIFIED ELECTRICIANS OR CONTRACTORS SHOULD ATTEMPT INSTALLATION!  
DEADLY EXHAUST FUMES. OUTDOOR INSTALLATION ONLY!**

This manual should remain with the unit.

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



## 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 a Service Dealer or other competent, qualified electrician or installation technician who is familiar with applicable codes, standards and regulations. The operator also must comply with all such codes, standards and regulations.
- Installation, operation, servicing and repair of this (and related) equipment must always comply with applicable codes, standards, laws and regulations. Adhere strictly to local, state and national electrical and building codes. Comply with regulations the Occupational Safety and Health Administration (OSHA) has established. Also, ensure that the generator is installed, operated and serviced in accordance with the manufacturer's instructions and recommendations. Following installation, do nothing that might render the unit unsafe or in noncompliance with the aforementioned codes, standards, laws and regulations.
- The engine exhaust fumes contain carbon monoxide gas, which can be DEADLY. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. For that reason, adequate ventilation must be provided. 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.





## 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 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 a Service Dealer. Normal maintenance service and replacement of parts are the responsibility of the owner/operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

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

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

### ◆ HOW TO OBTAIN SERVICE

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

When contacting a Service Dealer 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.



## EQUIPMENT DESCRIPTION

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

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

The generator incorporates the following generator features:

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

## ENGINE OIL RECOMMENDATIONS

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



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



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



- ▲ 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:

Protective switches and sensors are mentioned for the reader's convenience. Also see the applicable control panel manual for additional automatic engine shutdown information.

### ◆ HIGH COOLANT TEMPERATURE SWITCH

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

### ◆ LOW COOLANT LEVEL SENSOR

Should the engine coolant level drop below the level of the high coolant temperature switch, it is possible for the engine to overheat without automatic shutdown. To prevent such overheating, the engine has a low coolant level sensor. If the level of engine coolant drops below the level of the low coolant level sensor, the engine automatically shuts down.

### ◆ LOW OIL PRESSURE SWITCH

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

### ◆ OVERCRANK SHUTDOWN

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

### NOTE:

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

### Approximate Crank Cycle Times

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

### ◆ OVERSPEED SHUTDOWN

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

### ◆ RPM SENSOR LOSS SHUTDOWN

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

### ◆ DC FUSE

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



## FUEL SYSTEM

### FUEL REQUIREMENTS

The standby generator may be equipped with one of the following fuel systems:

- Natural gas fuel system
- Propane vapor (PV) 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 is 5 inches to 14 inches water column (0.18 to 0.5 psi); and for liquid propane, 5 inches to 14 inches of 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 5 inches water column for propane vapor for all load ranges.**

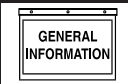
#### NOTE:

**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.**

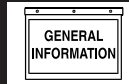
### NATURAL GAS FUEL SYSTEM

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



# Standby Generator Sets Specifications



## SPECIFICATIONS

### ◆ GENERATOR

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

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

Excitation System ..... Direct  
 Generator Output Voltage/kW - 60 Hz

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

Generator Locked Rotor KVA Available @ Voltage Dip of 35%  
 Single-phase or 208 3-phase:     20kW   25kW   30kW  
   34 KVA   38 KVA   56 KVA

### ◆ ENGINE

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

#### Engine Parameters

Rated Synchronous RPM ..... 60 Hz, 3600  
 HP at rated:     20kW     25kW     30kW  
                           35 HP       45 HP       48 HP

#### Exhaust System

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

#### Combustion Air Requirements (Natural Gas)

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

#### Governor

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

### Engine Lubrication System

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

### ◆ COOLING SYSTEM

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

### ◆ FUEL SYSTEM

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

#### Fuel Consumption - ft<sup>3</sup>/hr (Natural Gas/LPV)

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

### ◆ ELECTRICAL SYSTEM

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

#### Voltage Regulator

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

#### Power Adjustment for Ambient Conditions

Temperature Deration:

3% for every 10° C above °C	<u>20kW</u>	<u>25kW</u>	<u>30kW</u>
	40	40	25
1.65% for every 10° above °F	104	104	77

Altitude Deration:

1% for every 100 m above m	<u>20kW</u>	<u>25kW</u>	<u>30kW</u>
	1220	915	182
3% for every 1000 ft. above ft.	4000	3000	600

Controller ..... **R-200**



## GENERATOR AC LEAD CONNECTIONS

See "Voltage Codes". This generator may be rated at any one of three voltages, either single-phase or three-phase. The electrical wires in the unit's AC connection (lower) panel should be installed according to the number of leads and the voltage/phase required for the application. If there are any questions regarding lead connection, refer to the wiring diagrams at the back of this manual.

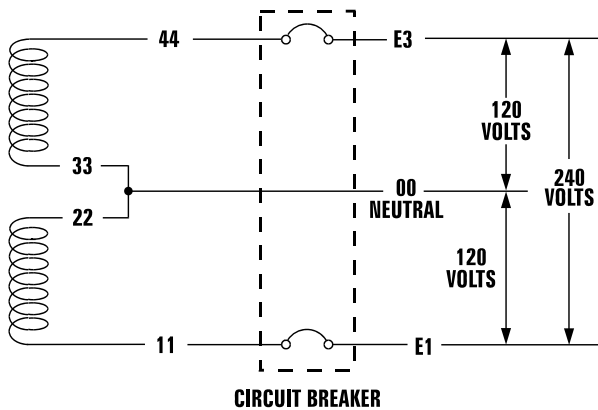
Voltage codes apply to the type of stator assembly installed on a particular generator.

### ◆ 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



## ALTERNATOR POWER WINDING CONNECTIONS

### ◆ 3-PHASE ALTERNATORS

The generator is designed to supply 3-phase electrical loads. Electric power is produced in the alternator power windings. These windings were connected at the factory to the main circuit breaker with a "Y" configuration as shown in Figures 7.2 and 7.3.

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

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

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

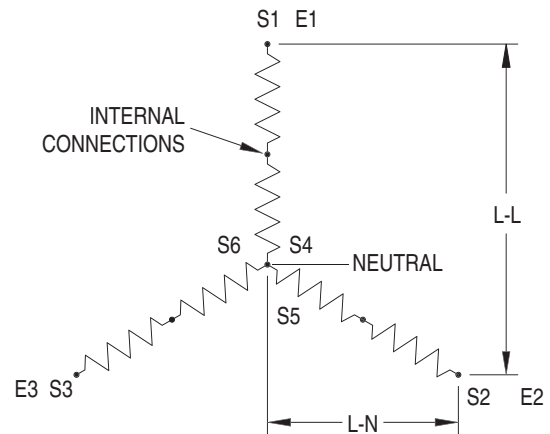
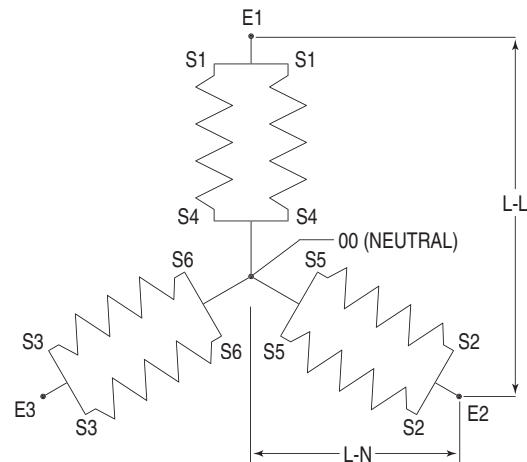


Figure 7.3 — Stator Power Winding Connections - 3-phase, 120/208V (6 Lead)





## INSTALLATION

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

## PREPARATION BEFORE START-UP

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

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

### ◆ TRANSFER SWITCH

If this generator is used to supply power to any electrical system normally powered by an electric utility, the National Electrical Code requires that a transfer switch be installed. The transfer switch prevents electrical backfeed between two different electrical systems. (For additional information, see the applicable transfer switch manual for this unit.) The transfer switch, as well as the generator and other 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” 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.

#### NOTE:

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

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

## INITIAL INSPECTION FOR GENSET STARTUP

**Inspect for the following.**

- Freight Damage.
- Manuals present.
- Fluid Levels (Oil, coolant, battery, Gear Drive).
- Correct fuel piping.
- 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.

## START-UP CHECKLIST



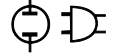
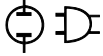
### WARNING

 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.**

### ◆ PREPARATION FOR START-UP

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



## 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.



### ◆ 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 RTS, 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."**



### MAINTENANCE PERFORMED BY 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 condition.
2. Inspect and test fuel system.
3. Check transfer switch.
4. Inspect exhaust system.
5. Check engine ignition system.
6. Check fan belts.

#### ◆ ONCE EVERY SIX MONTHS

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

#### ◆ ONCE ANNUALLY

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

#### ◆ FIRST 30 OPERATING HOURS

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

#### ◆ FIRST 100 OPERATING HOURS

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

#### ◆ EVERY 500 OPERATING HOURS

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

#### ◆ EVERY 800 OPERATING HOURS

1. Retorque cylinder head.
2. Retorque intake and exhaust manifold.
3. Check engine compression.
4. Check valve clearance.

### COOLING SYSTEM

Air intake and outlet openings in the compartment must be open and unobstructed for proper operation. This includes conditions as high grass, weeds, brush,

Without sufficient cooling and ventilation, the engine/generator quickly overheats and will shut down. (See the installation instructions.)

#### ⚠ WARNING ⚠

⚠ The exhaust system parts from the engine are extremely hot and remains hot after operation. High grass, weeds, brush, leaves, and other debris remain clear of the exhaust. Such debris can ignite and burn from the heat of the exhaust system.

### OVERLOAD PROTECTION FOR DC ELECTRICAL SYSTEM

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

#### ⚠ CAUTION ⚠

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

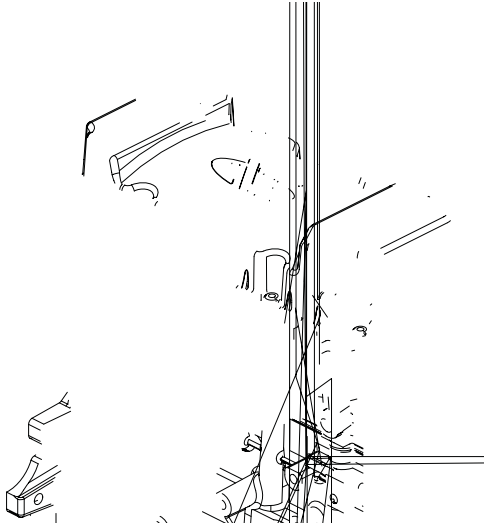
### CHECKING FLUID LEVELS

#### ◆ CHECK ENGINE OIL

Check engine crankcase oil level (Figure 1) every 20 hours of operation, or prior to

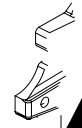
- Remove oil dipstick and wipe dry with a clean, free cloth.
- Install oil dipstick, then remove again.
- Oil should be between FULL and ADD.
- If oil level is below the dipstick ADD mark, add oil to the FULL mark. Add the recommended oil level up to the FULL mark. DO NOT EXCEED THE "FULL" MARK. See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

Figure 10.1 - Oil Dipstick and Oil Fill Cap



C  
er  
er  
in  
g.  
c  
R  
c  
L  
o  
V  
r  
c  
D  
a

FIG



SET PLUG GAP AT 0.76 mm  
(0.030 inch)

**CHANGE**

service facility drain, flush and  
system. See "Specifications" for cool-  
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 a Service Dealer. That dealer will use dry, low pressure air to clean internal windings. Parts inside the control console should be cleaned and inspected at this time as well.

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

### ◆ BATTERY

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

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

### ◆ BATTERY MAINTENANCE

The battery should be inspected per the Scheduled Maintenance section. The following procedure should be followed for inspection:

1. Inspect the battery posts and cables for tightness and corrosion. Tighten and clean as necessary.
2. Check the battery fluid level of unsealed batteries and, if necessary, fill with **DISTILLED WATER ONLY. DO NOT USE TAP WATER IN BATTERIES.**

3. Have the state of charge and condition checked. This should be done with an automotive-type battery hydrometer.

—▲ **DANGER** ▲—

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

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

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

—▲ **WARNING** ▲—

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

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

### ◆ BATTERY REPLACEMENT

**NOTE:**

**Unit DOES NOT include battery.**

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

**NOTE:**

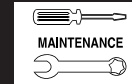
**The BCI number should be located directly on the battery.**

### ◆ REPAIR PARTS

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



## Standby Generator Sets Service Schedule



### SERVICE SCHEDULE

The following is a recommended maintenance schedule for small standby and residential generator sets. The established intervals in the schedule are the *maximum* recommended when the unit is used in an average service application. They will need to be decreased (performed more frequently) if the unit is used in a severe application. Use calendar time or accumulated run time, from the previous maintenance interval to determine the next required maintenance interval.

#### Service Maintenance Interval Information:

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

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

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

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

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

- Disable the generator set from starting and/or connecting to the load by setting the control panel AUTO/OFF/MANUAL switch to the OFF position.
- Remove the 5 amp and 15 amp control panel fuses.
- Turn off the battery charger (turn OFF utility supply to ATS).
- Remove the negative battery cable.

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

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

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

*Performed **ONLY ONCE** following the first three months, or 30 run time hours of operation after purchase of the unit and requires approximately 2.5 man-hours per unit to complete.*

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

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

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

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

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

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

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



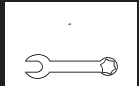
## Standby Generator Sets Service Schedule



Maintenance Tasks	Level 1	Task Comp. (Date-Initials)	Level 2	Task Comp. (Date-Initials)	Level 3	Task Comp. (Date-Initials)	Level 4	Task Comp. (Date-Initials)
	Recommended to be done monthly 10 Hrs.		Required to be done 3 months/ Break-in 30 Hrs.		Required to be done Semi-annually 50 Hrs.		Required to be done Annually 100 Hrs.	
1. Disable the unit from operating per the first page warning.	○		○		○		○	
2. Check the engine oil level. Adjust as necessary.	○		○		○		○	
3. Check the engine coolant level. Adjust as necessary.	○		○		○		○	
4. Check the engine coolant thermal protection level. Correct as necessary.							○	
5. Check the natural gas delivery system on gas engine driven units. Tighten connections as necessary.			○		○		○	
6. Check the air inlets and outlets for debris. Clean as necessary.	○		○		○		○	
7. Check the battery electrolyte level if accessible. Adjust as necessary.	○		○		○		○	
8. Check the battery posts, cables, and charger for loose connections, corrosion, and proper operation. Correct as necessary.	○		○		○		○	
9. Check the unit wiring for loose connections, corrosion, and damage. Correct as necessary.							○	
10. Check the engine accessory drive belts for wear, weather cracking, and damage. Replace as necessary.							○	
11. Visually inspect the unit looking for leaks, wear or damage, loose connections or components, and corrosion. Correct as necessary.	○		○		○		○	
12. Test the engine and transfer switch safety devices. Correct and/or adjust as necessary.							○	



## Standby Generator Sets Service Schedule



Maintenance Tasks	Level 1	Level 2	Level 3	Level 4
	Recommended 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.
13. Initiate an automatic start and transfer of the unit to site load and exercise it for at least 1 hour looking for leaks, loose connections or components, and abnormal operating conditions. Correct as necessary.				
14. Start and exercise the unit at full rated load (use a load bank if the site load is not enough) for at least 2 hours looking for leaks, loose connections or components, and abnormal operating conditions. Correct as necessary.				
15. Change the engine oil.				
16. Replace the engine oil filter(s).				
17. Replace the engine air filter(s).				
18. Replace the engine fuel filter(s) on diesel engine driven units and re-prime the fuel system.				
19. Check the engine spark plugs on gas engine driven units. Clean and re-gap or replace as necessary.				
20. Perform a 5 minute no-load operational run of the unit looking for any post service problems.				
21. Return the unit to standby setup for operation when required.				

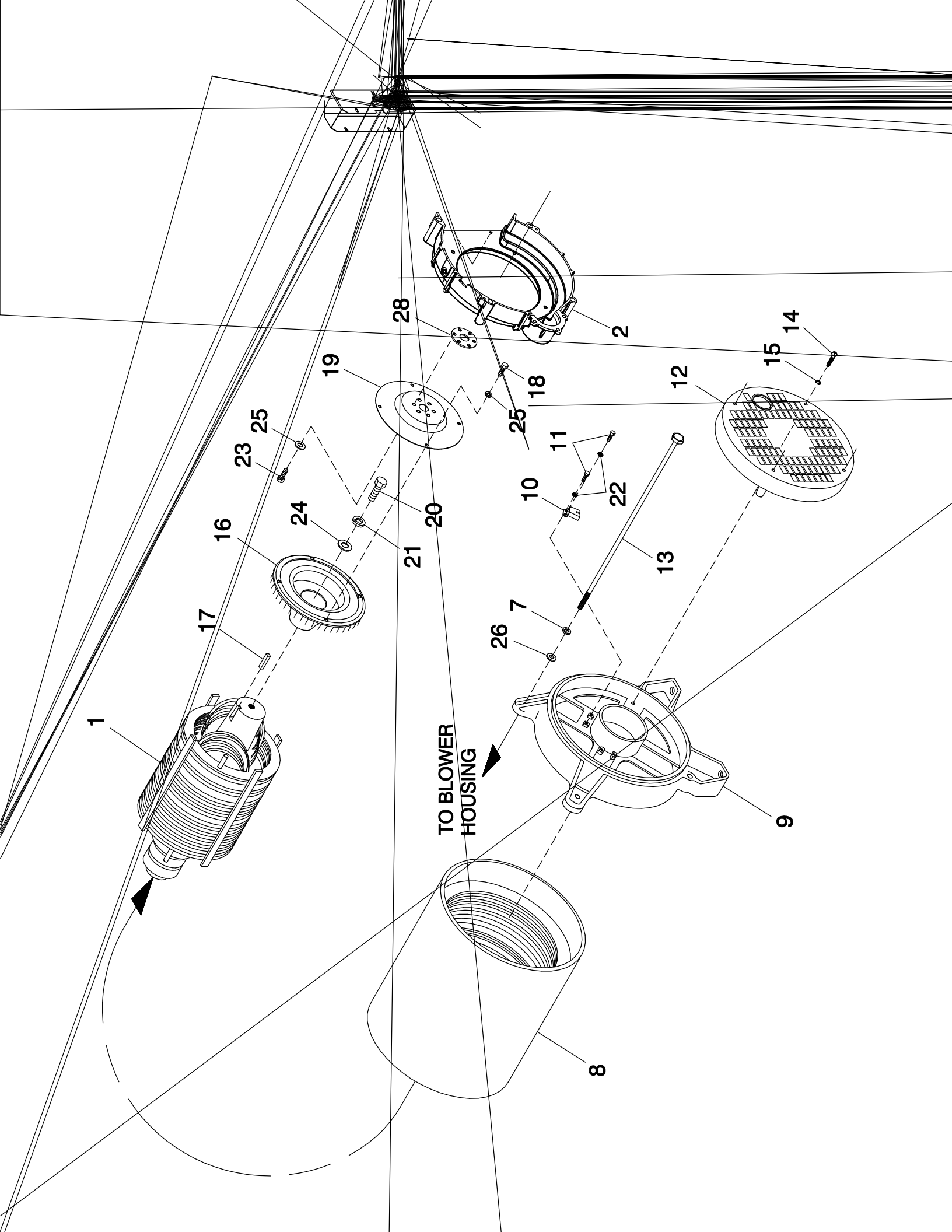


## TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	CORRECTION
Engine won't crank.	<ol style="list-style-type: none"> <li>1. 15 amp fuse blown.</li> <li>2. Loose or corroded or defective battery cables.</li> <li>3. Defective starter contactor.</li> <li>4. Defective starter motor.</li> <li>5. Dead or Defective Battery.</li> <li>6. 5 amp fuse blown.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace fuse.</li> <li>2. Tighten, clean or replace battery cables as necessary.</li> <li>3. Replace contactor.*</li> <li>4. Replace starter motor.*</li> <li>5. Remove, change or replace battery.</li> <li>6. Replace fuse.*</li> </ol>
Engine cranks but won't start	<ol style="list-style-type: none"> <li>1. Out of fuel.</li> <li>2. Fuel solenoid (FS) is defective</li> <li>3. Open Wire #14A from Engine Control circuit board.</li> <li>4. Spark plugs defective.</li> <li>5. Door on tank not closed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replenish fuel.</li> <li>2. Replace solenoid.*</li> <li>3. Reconnect wire.</li> <li>4. Clean, regap or replace plugs.</li> <li>5. Close door on tank.</li> </ol>
Engine starts hard, runs rough.	<ol style="list-style-type: none"> <li>1. Flame arrestor (air cleaner) plugged or damaged.</li> <li>2. Plugged fuel line.</li> <li>3. Defective spark plugs.</li> <li>4. Fuel pressure incorrect.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean or replace as needed.</li> <li>2. Unclog fuel line.</li> <li>3. Clean, regap or replace plugs.</li> <li>4. Confirm fuel pressure to regulator is as recommended in SPECIFICATIONS.</li> </ol>
Engine starts then shuts down.	<ol style="list-style-type: none"> <li>1. Engine oil level is low.</li> <li>2. Engine is overheated.</li> <li>3. Defective Low Oil Pressure Switch</li> <li>4. Defective Coolant Temperature Switch</li> <li>5. Defective Control Module circuit board.</li> <li>6. Coolant Level is Low.</li> <li>7. Defective Low Coolant Level Switch</li> </ol>	<ol style="list-style-type: none"> <li>1. Check oil and add oil as needed.</li> <li>2. Check cooling system for leaks.</li> <li>3. Replace switch.*</li> <li>4. Replace switch.*</li> <li>5. Replace board.*</li> <li>6. Repair leak - Add coolant.</li> <li>7. Replace Switch.*</li> </ol>
AUTO/OFF/MANUAL Switch at OFF, engine continues to run	<ol style="list-style-type: none"> <li>1. Defective AUTO/OFF/MANUAL switch</li> <li>2. Open/disconnected wire #15A between AUTO/OFF/MANUAL switch and Control Module circuit board.</li> <li>3. Defective Control Module circuit board</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace switch.*</li> <li>2. Reconnect/close wire.</li> <li>3. Replace board.*</li> </ol>
No AC output from generator.	<ol style="list-style-type: none"> <li>1. Check main line circuit breaker.</li> <li>2. Check circuit breaker &amp; fuses.</li> <li>3. Transfer switch set to NORMAL position</li> <li>4. Generator internal failure.</li> <li>5. Thermal circuit breaker open.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset to ON or CLOSED.</li> <li>2. Reset and replace, if necessary.</li> <li>3. Set to GENERATOR position.</li> <li>4. *</li> <li>5. Auto-reset - Wait 5 min. and attempt restart.</li> </ol>

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





## EXPLODED VIEW: ALT COMMON PARTS 18KW, 20KW, 25KW, &amp; 30KW

DRAWING #: 0G4008

GROUP A

APPLICABLE TO:

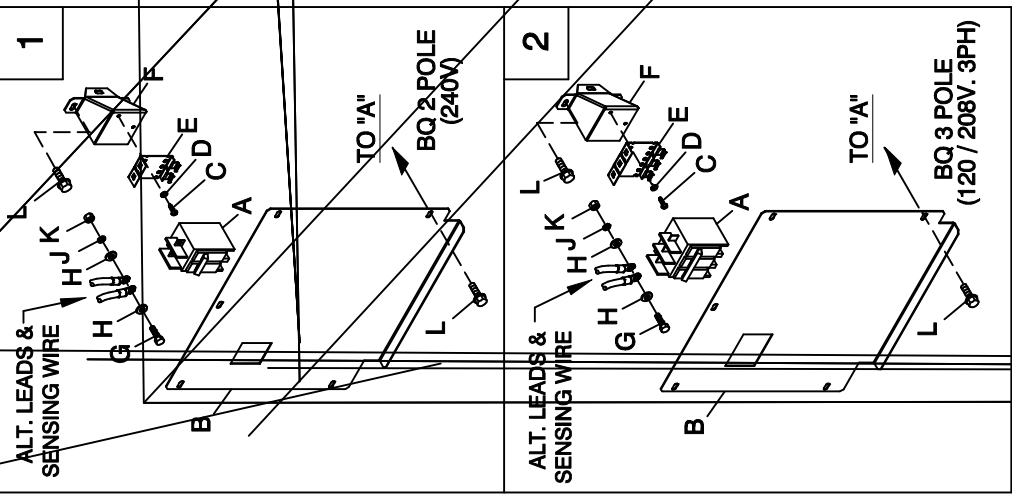
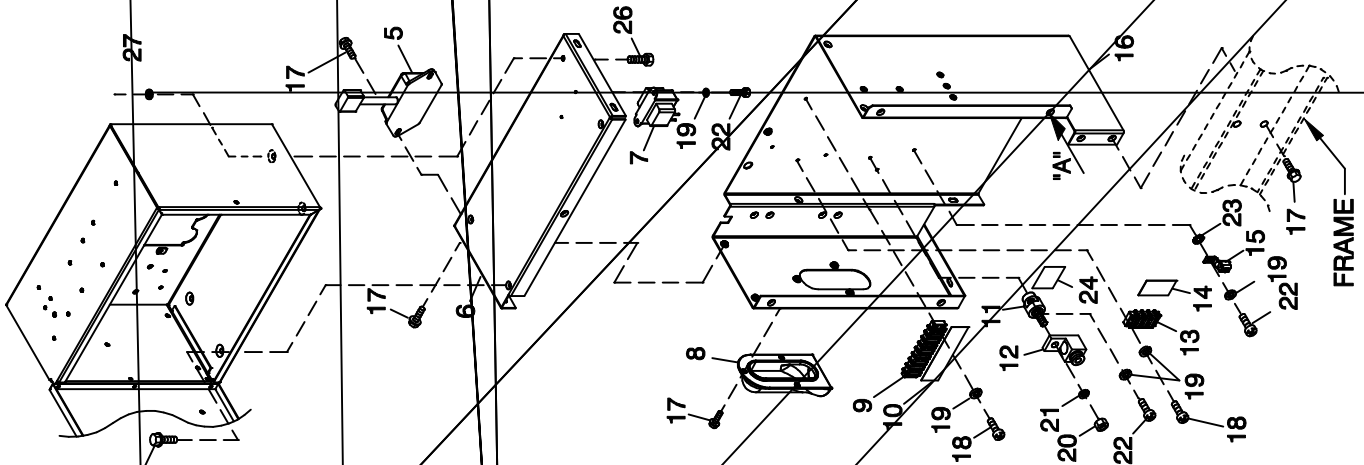
ITEM	PART #	QTY.	DESCRIPTION
1	0G4827	1	ASSY RTR 104 KD1 HI EFF (18KW)
	0G2927	1	RTR-102-20.0AD1 CPL (2006) (20KW)
	0G2827	1	ASSY RTR 25KW 2P (2006) (25KW)
	0G3451C	1	RTR 102 30KD2 (2006) CPL CHI (30KW)
2	0G0820A	1	HOUSING BLOWER LG PILOT
3	0G4452	1	BLOWER HOUSING SCREEN
4	020746	4	SCREW PPHM M5-0.8 X 8 ZINC
5	049226	4	WASHER LOCK M5
6	051713	4	WASHER FLAT M5
7	022129	4	WASHER LOCK M8-5/16
8	0G4825	1	ASSY STR 104-18AD1 HI EFF (18KW)
	0G4826	1	ASSY STR 104 18GD1 HI EFF (18KW)
	0G2926	1	STR-102-20.0AD1 CPL (2006) (20KW)
	0G3682	1	STR-102-20.0GD1 CPL (2006) (20KW)
	0G5584	1	STR-102-20.0JD1 CPL (2006) (20KW)
	0G3685	1	STR-102-20.0KD1 CPL (2006) (20KW)
	0G2826	1	ASSY STR 102 25AD1 (2006) (25KW)
	0G3683	1	STR-102-25.0GD1 CPL (2006) (25KW)
	0G6573	1	STR-102-25.0-JD1 CPL (2006) (25KW)
	0G3686	1	STR-102-25.0KD1 CPL (2006) (25KW)
	0G3452C	1	STR 102 30AD2 (2006) CPL CHI (30KW)
	0G3684	1	STR-102-30.0GD2 CPL (30KW)
	0G3687	1	STR-102-30.0KD2 CPL (30KW)
	0G5909	1	ASSY STR 102 30AD2 10" (30KW)
	0G6103	1	STR-102-30.0JD2
9	0A5382A	1	BEARING CARRIER REAR LG PILOT
10	075591	2	ASSY HOLDER BRUSH
11	051787	4	SCREW HHC M4-0.7 X 16 G8.8
12	0A5601A	1	COVER REAR BEARING
13	075554B	4	BOLT STATOR X 16" LG (20KW & 25KW)
	075554E	4	SCREW HHC M8-1.25 X 463 G5 ZP (30KW)
14	0A9375	4	SCREW RHM #10-24 X 2
15	022152	4	WASHER LOCK #10
16	0G4196	1	FLYWHEEL & RINGGEAR ASSY 1.6L
17	042558	1	KEY SQ 3/8 X 1 STEEL
18	049814	4	SCREW HHC M10-1.5 X 25 G8.8
19	0G0965B	1	PLATE FLEX 1.6L R12.7
20	053607	1	SCREW HHC M12-1.75 X 35 G8.8
21	051769	1	WASHER LOCK M12
22	023365	4	WASHER SHAKEPROOF INT #8
(1) 23	0F3353	6	SCREW HHC M10-1.0 X 20 G10.9
24	072578	1	SPACER ROTOR SHAFT
25	0G3787	10	WASHER .41 ID .94 OD .12 THK
26	0A8830	4	WASHER FLAT .34 ID X .75 OD
27	077043E	1	FLEX CONDUIT 1" BLACK (NOT SHOWN)
28	0G2070	1	PLATE SPACER 14GA 1.6L

(1) APPLY LOCTITE 242 BEFORE THREADING SCREW INTO CRANKSHAFT.

3

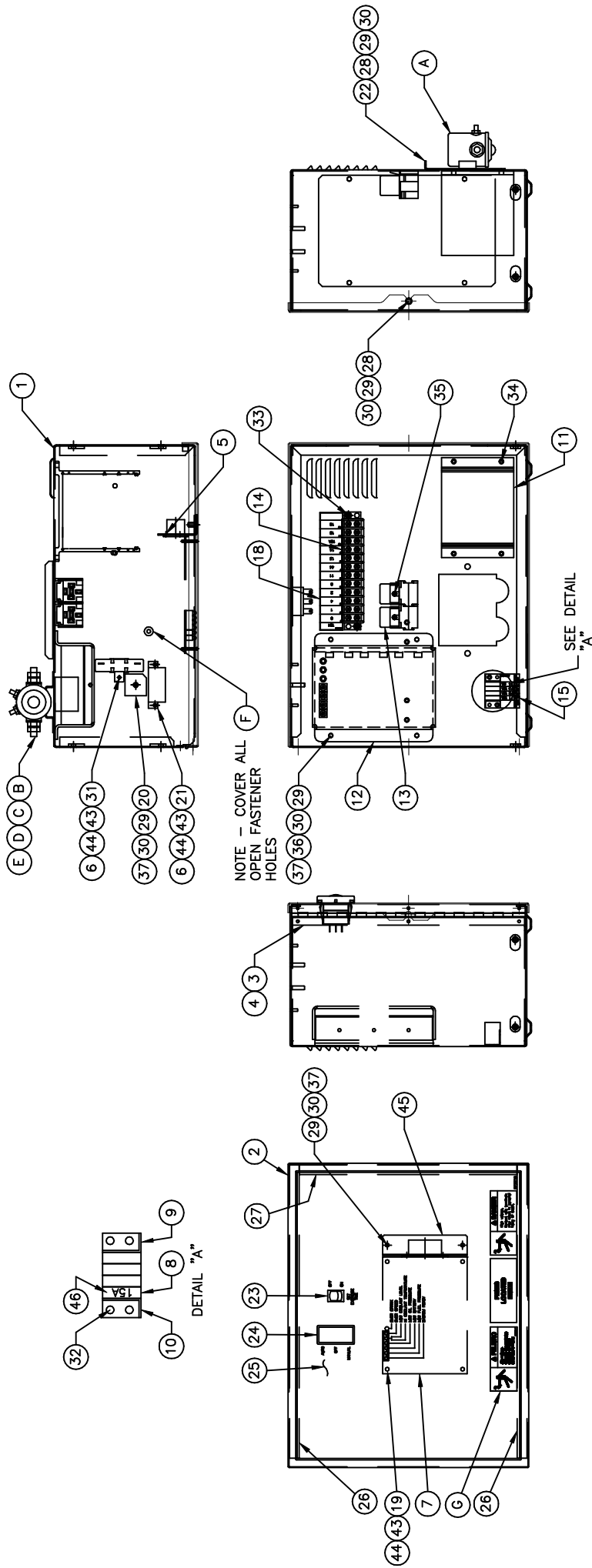
(120 / 208V. 3PH)  
(277 / 480V. 3PH)

4





# GROUP B

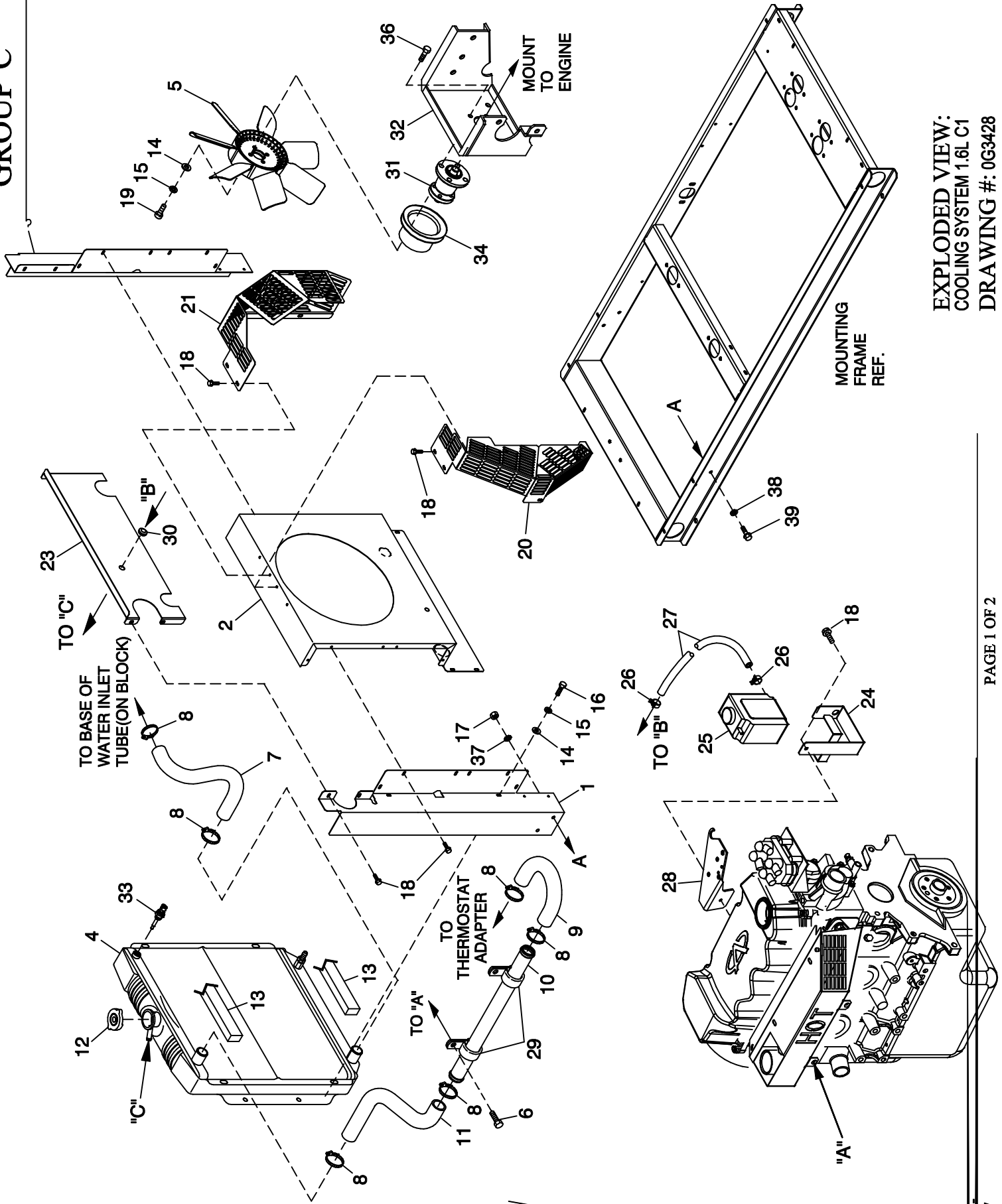


EXPLODED VIEW:  
R-200 3600 RPM 1.6L  
DRAWING #: 0G4577D





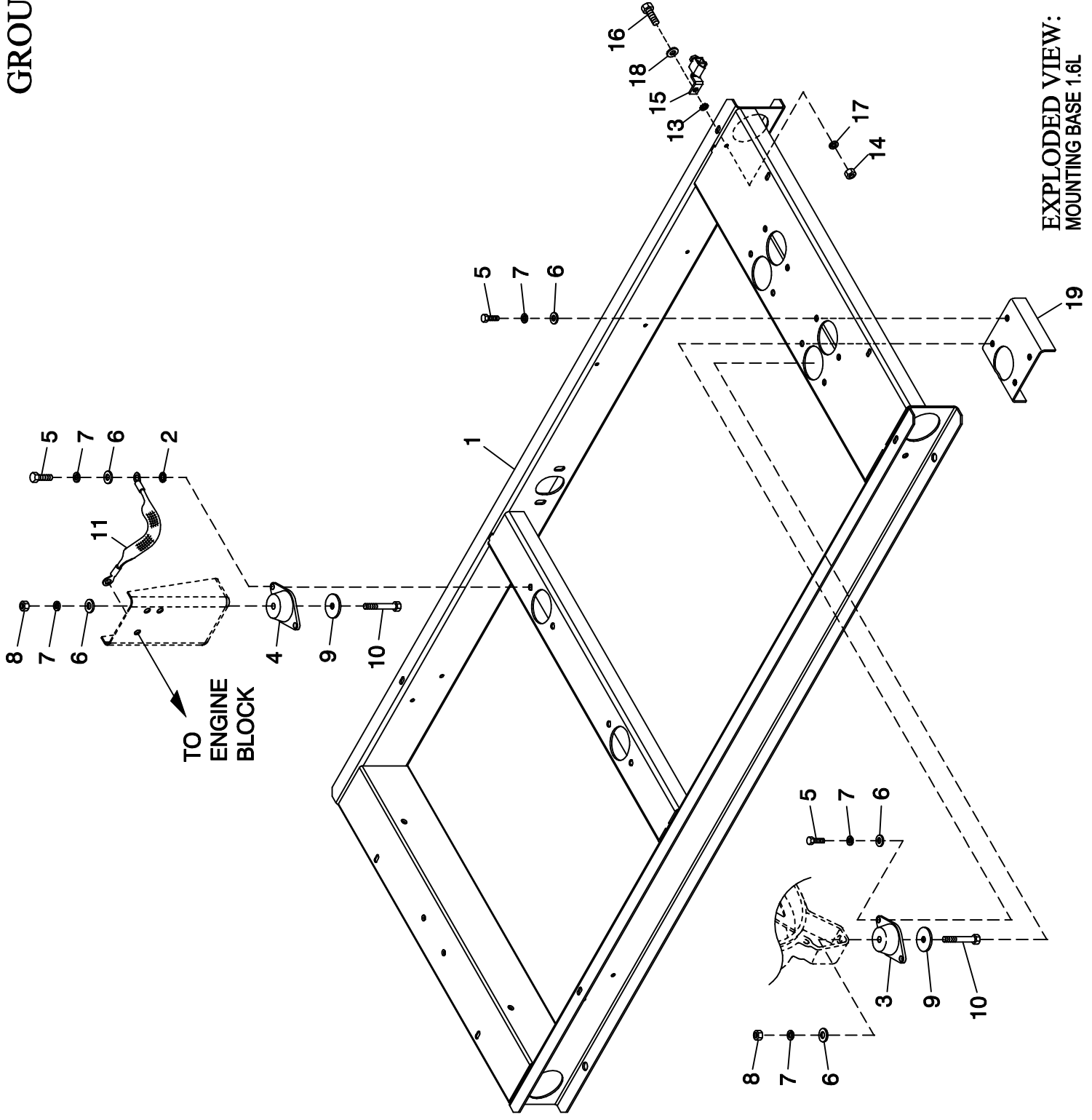
GROUP C



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



GROUP C



EXPLODED VIEW:  
MOUNTING BASE 1.6L  
DRAWING #: 0G3531

EXPLODED VIEW: MOUNTING BASE 1.6L

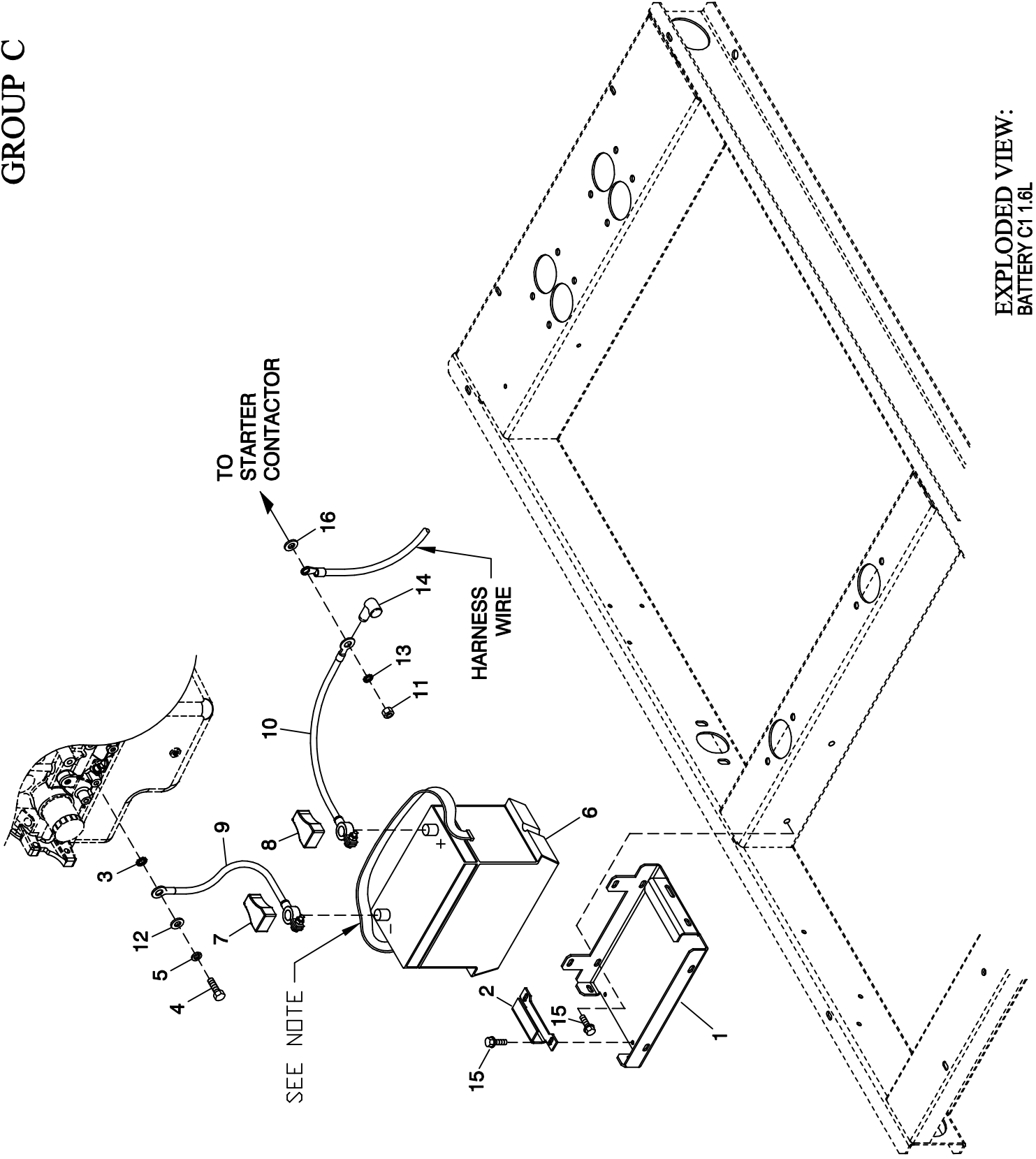
DRAWING #: 0G3531

GROUP C

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	0G3343	1	MOUNTING BASE 1.6L 2007 C1
2	027482	2	WASHER SHAKEPROOF EXT 5/16 STL
3	070936	2	DAMPENER VIBRATION
4	070936C	2	VIB. ISO. 70-75 DURO
5	039253	8	SCREW HHC M8-1.25 X 20 G8.8
6	022145	12	WASHER FLAT 5/16 ZINC
7	022129	12	WASHER LOCK M8-5/16
8	045771	4	NUT HEX M8-1.25 G8 YEL CHR
9	071956	4	WASHER FLAT M8
10	051730	4	SCREW HHC M8-1.25 X 60 G8.8
11	021991	1	EARTH STRAP
13	026850	1	WASHER SHAKEPROOF EXT 1/4 STL
14	049813	1	NUT HEX M6 X 1.0 G8 YEL CHR
15	055414	1	LUG SLDLSS #2-#8 X 17/64 CU
16	047411	1	SCREW HHC M6-1.0 X 16 G8.8
17	022097	1	WASHER LOCK M6-1/4
18	022473	5	WASHER FLAT 1/4-M6 ZINC

GROUP C



**EXPLODED VIEW: BATTERY C1 1.6L****DRAWING #: 0G4067****GROUP C**

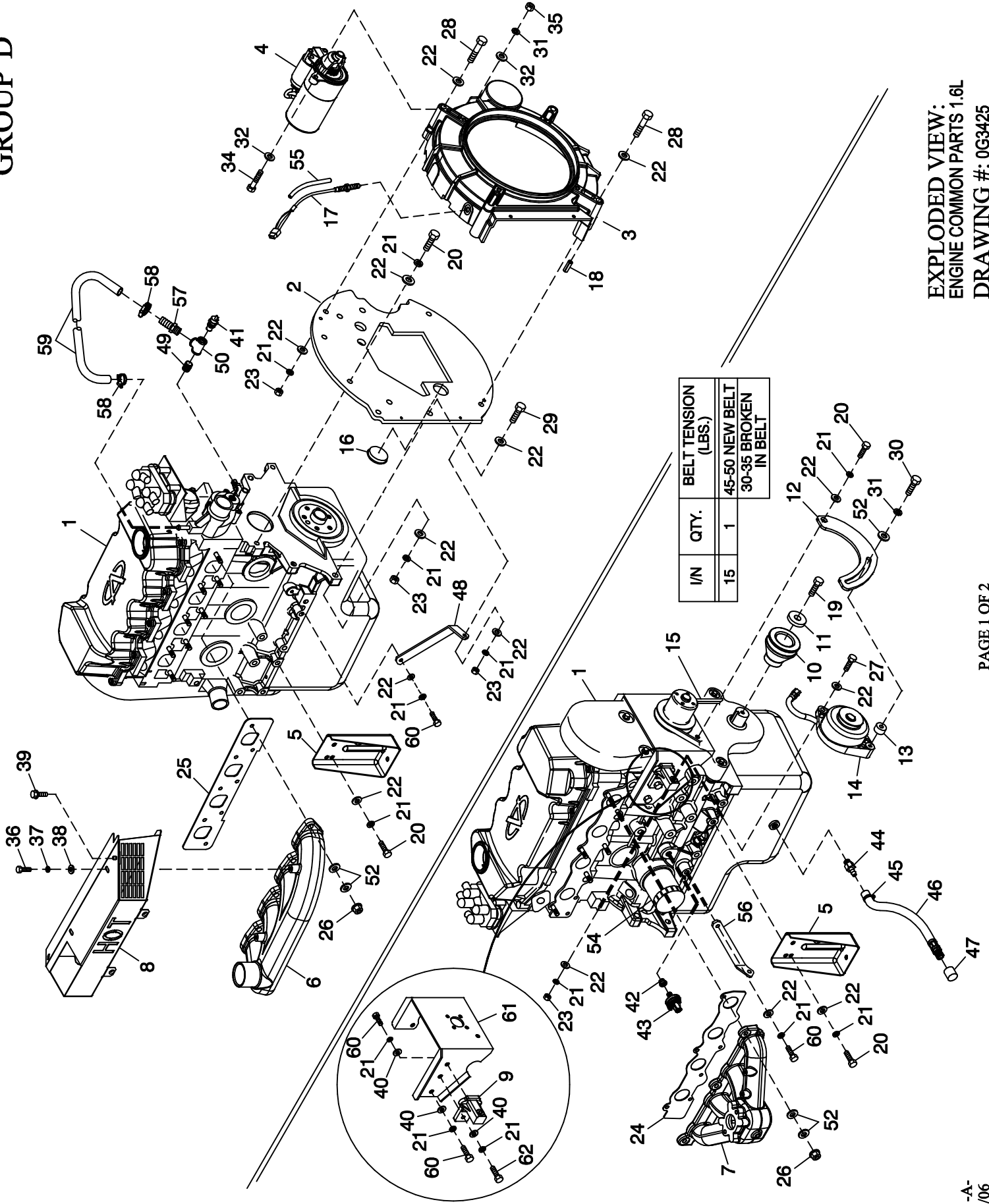
APPLICABLE TO:

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

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



# GROUP D



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

## EXPLODED VIEW: ENGINE COMMON PARTS 1.6L

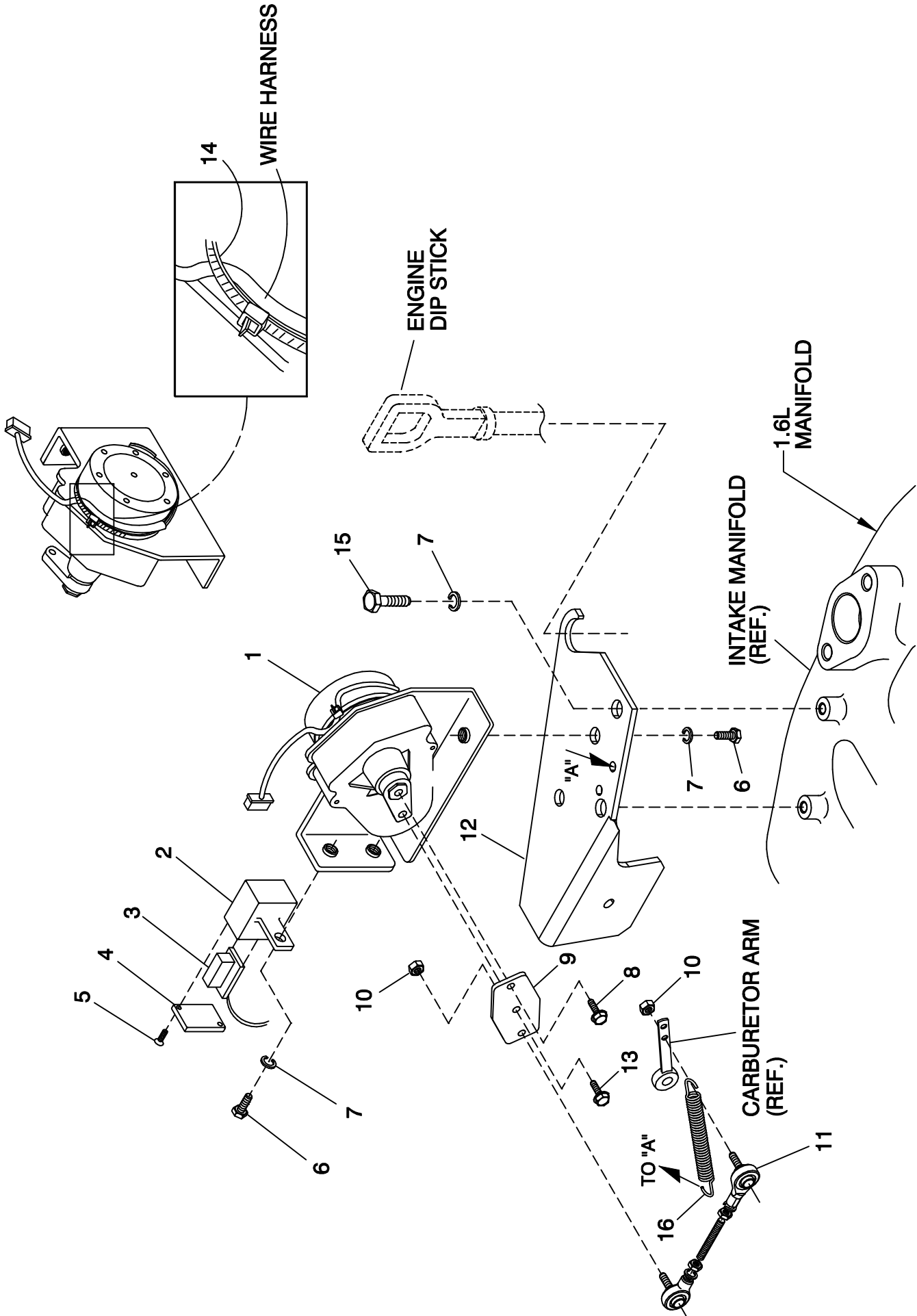
DRAWING #: 0G3425

GROUP D

APPLICABLE TO:

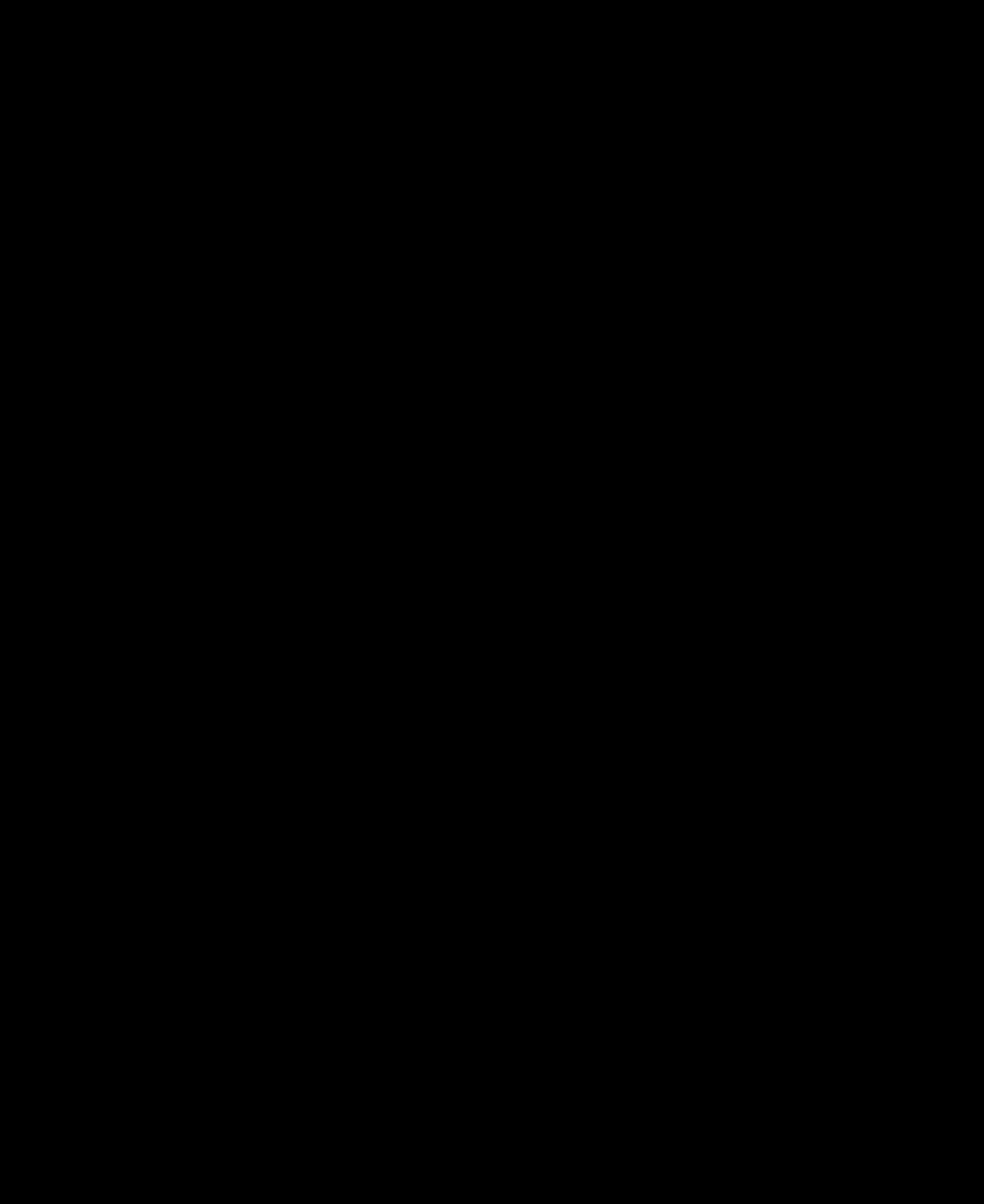
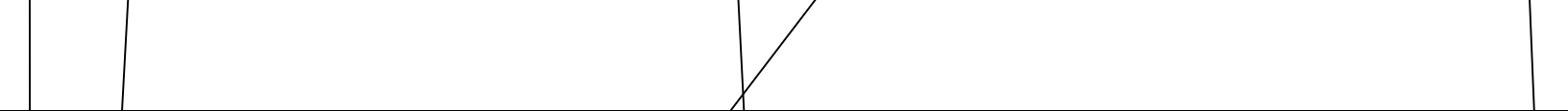
ITEM	PART #	QTY.	DESCRIPTION
1	0G0207	REF	ENGINE GENERAC 1.6L NG
2	0G0834	1	ENGINE PLATE 1.6L
3	0G0820	REF	HOUSING BLOWER MACHINED 1.6L
4	0E9747	1	STARTER 12 VOLT
5	0G0839	2	ENGINE MOUNTING FOOT STAMPING
6	0G0781	1	EXHAUST MANIFOLD 1.6L MACHINED
7	0G0722	1	INTAKE MANIFOLD MACHINED 1.6L
8	0G4059	1	SHIELD 1.6L EXHAUST HEAT
9	0G4604	1	DC ALTERNATOR ADAPTER MACHINED
10	0G3424	1	PULLEY CRANKSHAFT MACHINED (3600RPM)
	0G4863	1	PULLEY CRANKSHAFT CASTING (1800RPM)
11	0G0786	1	WASHER PULLEY
12	0G4605	1	BRACKET TENSIONER DC ALT
13	0F9617A	1	SPACER ALTERNATOR
14	0A1354B	1	DC ALTERNATR HAN-KOK
15	0G0823	1	V-BELT 3/8 X 30.6 (3600RPM)
	0G4949	1	V-BELT 3/8 X 31.6 (1800RPM)
16	0G3900	1	CAP, 1.5" HOLE SHALLOW
17	0D2244M	1	ASSY MAGPICKUP(3/8-24 MALE)
18	036710	2	PIN SPRING 1/4 X 3/4
19	0C5479	1	SCREW HHC M12-1.5 X 40 G10.9
20	059980	7	SCREW HHC M10-1.5 X 25 G10.9
21	046526	22	WASHER LOCK M10
22	022131	18	WASHER FLAT 3/8-M10 ZINC
23	0G3922	9	NUT HEX M10-1.5 CLASS 10 ZINC
24	0G0464	1	GASKET INTAKE MANIFOLD 1.6L
25	0G0465	1	GASKET EXHAUST MANIFOLD 1.6L
26	052858	14	NUT TOP LOCK FL M8-1.25
27	051735	1	SCREW HHC M10-1.5 X 70 G8.8
28	0G3920	4	SCREW HHC M10-1.5 X 110 G10.9
29	0A7387	4	SCREW HHC M10-1.5 X 40 G10.9
30	039414	1	SCREW HHC M8-1.25 X 35 G8.8
31	022129	4	WASHER LOCK M8-5/16
32	022145	3	WASHER FLAT 5/16-M8 ZINC
33	029333A	1	TIE WRAP UL 7.4" X .19" BLK
34	057821	3	SCREW HHC M8-1.25 X 40 G8.8
35	045771	3	NUT HEX M8-1.25 G8 CLEAR ZINC
36	022507	2	SCREW HHC 1/4-20 X 1/2 G5
37	022097	2	WASHER LOCK M6-1/4
38	022473	5	WASHER FLAT 1/4-M6 ZINC
39	090388	3	SCREW HHTT M6-1.0 X 12 ZINC
40	0A5768	5	WASHER FLAT M10 HEAVY DUTY
41	0A6751	1	SWITCH HI-TEMP 245 D X 3/8 NPT
42	035579	1	BSHG RDCR HEX 1/4 TO 1/8
43	0A8584	1	SWITCH OIL PRESSURE 10PSI 2POL
44	0C1852	1	ADAPTER DRAIN OIL
45	070928	1	CLAMP HOSE - OIL DRAIN
46	069860C	1	HOSE OIL DRAIN ASSY 21"
47	069811	1	CAP HEX 1/4 NPT BRASS
48	0G38580ST03	1	STRUT LH 1.6L ENG ADAPT PLATE
49	025065	1	NIPPLE PIPE 3/8 NPT X 1-1/2
50	027738A	1	PIPE TEE 3/8 NPT
51	0E3257	3	SCREW HWHTF M6-1.0 X 16
52	0A8830	29	WASHER FLAT .34 ID X .75 OD
53	0G4582	1	HARN ENG 1.6L R200 3600RPM G11 (NOT SHOWN) (3600RPM)
	0G4581	1	HARN ENG 1.6L R200 1800RPM G11 (NOT SHOWN) (1800RPM)
54	0G02070100	1	OIL FILTER 1.6L
55	077043H	1	CONDUIT FLEX .25"ID (6" LG)
56	0G38620ST03	1	STRUT RH 1.6L ENG ADAPT PLATE
57	055596	1	BARBED STR 3/8 NPT X 3/8
58	0C7649	2	CLAMP HOSE .38-.87
59	0C5210	1	HOSE 3/8 ID LOW PRES OIL/WATER (11" LG)
60	051756	6	SCREW HHC M10-1.5 X 20 G8.8
61	0G3433	REF	BRACKET FAN ALT ADAPTER 1.6L
62	049541	1	SCREW HHC M10-1.5 X 35 G8.8

GROUP D



EXPLODED VIEW:  
GOVERNOR ASSEMBLY  
DRAWING #: 0G4930





**EXPLODED VIEW: FUEL SYSTEM NG/LPV 1.6L C1 CPL  
DRAWING #: 0G4970**

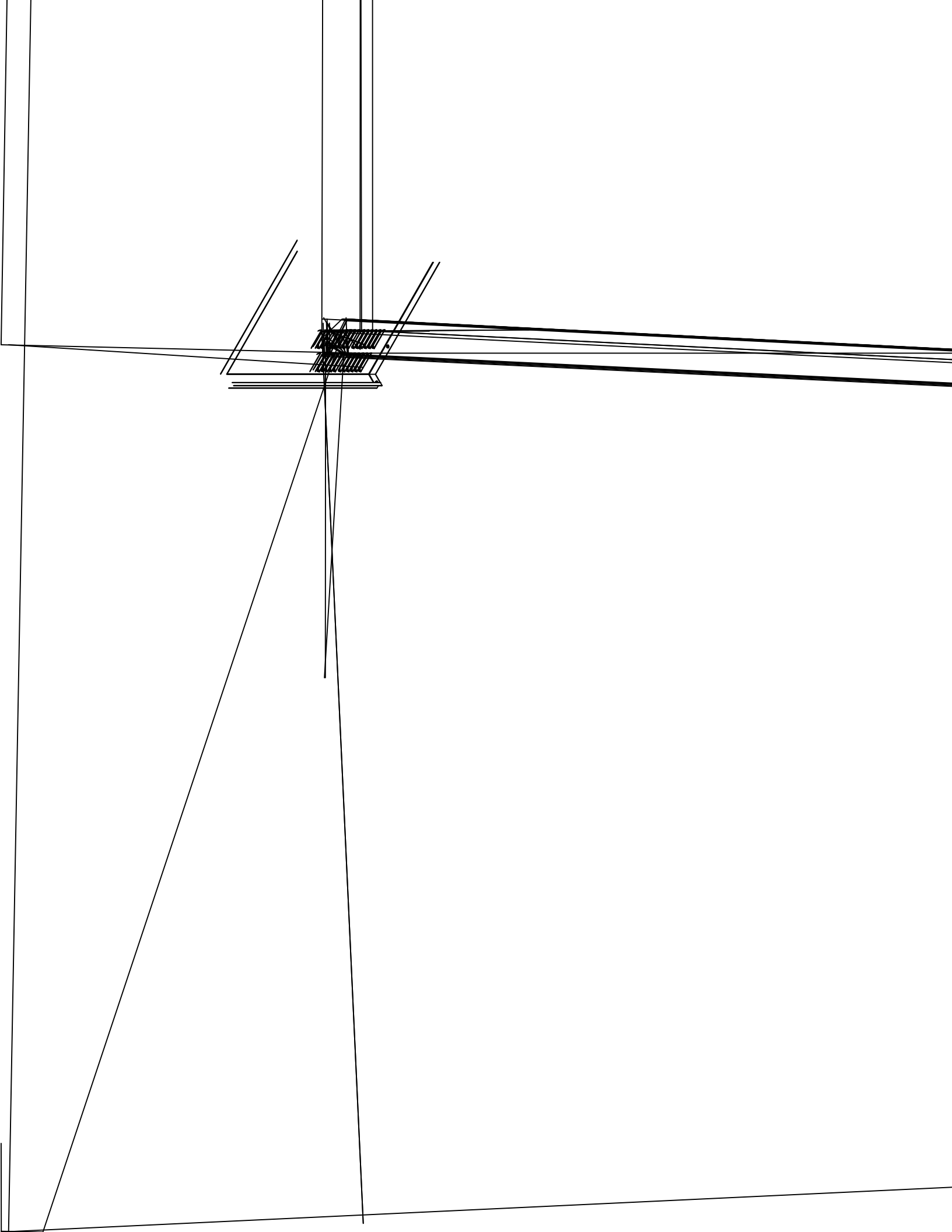
**GROUP E**

APPLICABLE TO:

ITEM	PART #	QTY.	DESCRIPTION
1	026812	2	ELBOW 90D 3/4 NPT
2	075580	1	FLANGE FUEL INLET
3	0G1397A	1	FUEL REG. REWORK 1.6L 3600 '07 (3600RPM)
	0G1397B	1	FUEL REG. REWORK 1.6L 1800 '07 (1800RPM)
4	039253	2	SCREW HHC M8-1.25 X 20 G8.8

ITEM	PART #	QTY.	DESCRIPTION
------	--------	------	-------------





APPLICABLE TO:

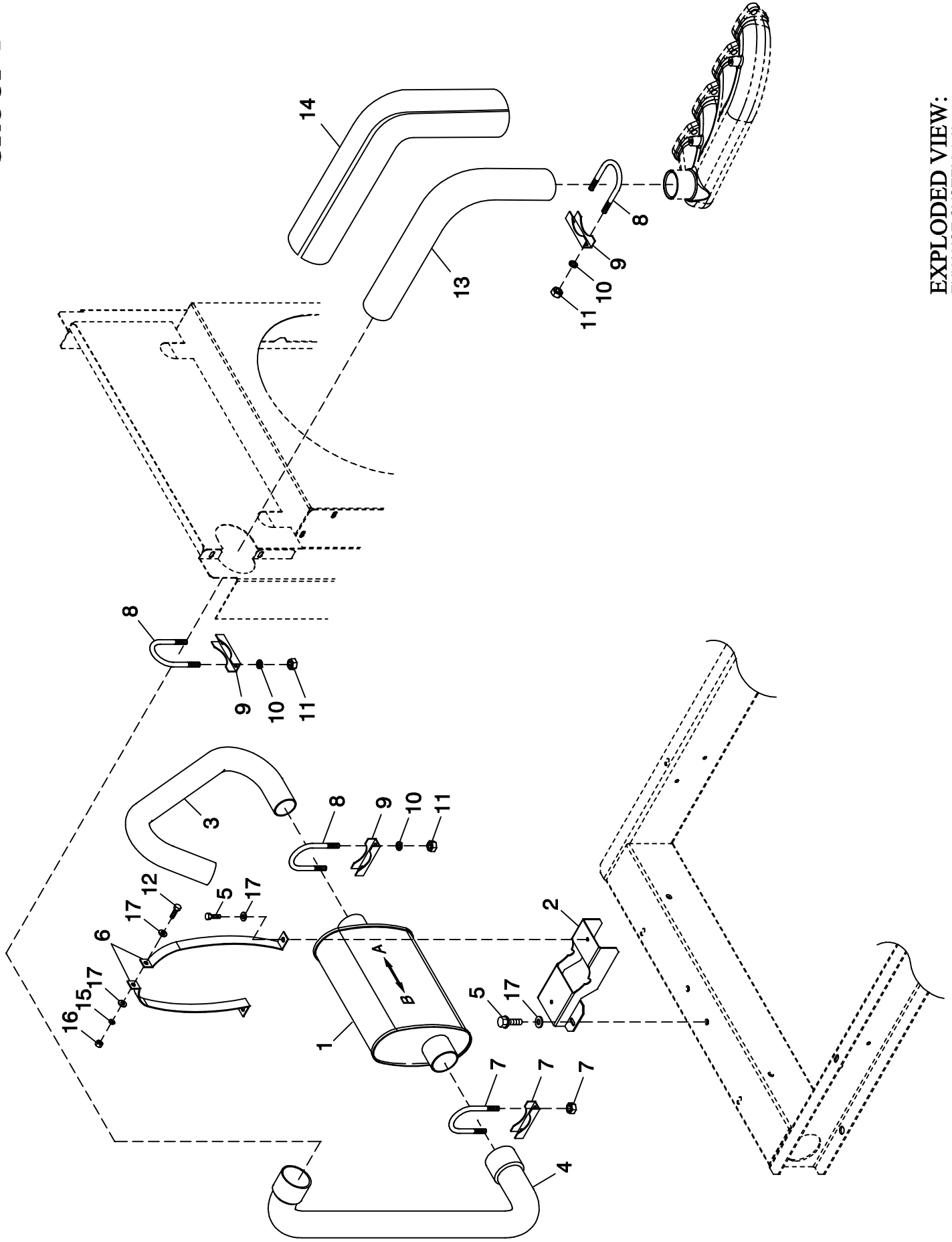
ITEM	PART #	QTY.	DESCRIPTION
(1) 1	0G3337	1	ROOF 1.6L C1
(1) 2	0G3336	1	REAR INTAKE WRAP 1.6L C1
(2) 3	077992	16	NUT HEX LOCK M6-1.0 SS NY INS
(1) 4	0G3341	2	RIGHT SIDE DOOR 1.6L C1
(1) 5	0G3335	1	FRONT DISCHARGE WRAP 1.6L C1
6	0F4487A	1	ASSY ACCESS COVER
7	022127	1	NUT HEX 1/4-20 STEEL
8	022097	1	WASHER LOCK M6-1/4
9	022473	1	WASHER FLAT 1/4-M6 ZINC
10	0C2454	16	SCREW THF M6-1 X 16 N WA Z/JS
11	0F5048D	2	WISE-ACTION LATCH, SLOTTED CIR
12	0F5049	2	TAB PULL
13	0F8869D	1	KEY VISE-ACTION LATCH, SLOT CIR
14	089961	1	FOAM STRIP 3/4"WIDE X 3/16"THK (294"LG)
15	078115	18	WASHER SELF LOCKING DOME
16	0G4029	2	INSULATION SIDE DOOR C1
17	0G4029A	1	INSULATION ROOF C1
18	0F3890	5	RETAINER INSULATION (450)
19	0E3257	4	SCREW HWHTF M6-1.0 X 16
20	0912970090	2	ASSY WIRE 14AWG GRN/YEL (32.25"LG)
21	0G4029B	1	INSULATION REAR C1
22	0F3890B	4	RETAINER INSULATION (820)

(1) REFER TO CHART BELOW FOR COLOR AND MATERIAL TYPE  
 (2) ALUMINUM ENCLOSURE NOTE: ALL ENCLOSURE PANELS THAT FASTEN TO THE BASE FRAME MUST BE SECURED USING ITEM 10 & 19 THREAD FORMING FASTENER AND ITEM 3 LOCK NUT. LOCK NUT IS TO BE INSTALLED AFTER THREAD FORMING FASTENER HAS PENETRATED THROUGH EXTRUSIONS IN ENCLOSURE PANELS. ALL ROOF PANELS ARE TO BE SECURED IN THE SAME MANNER.

SUFFIX 1 (MATL.)	SUFFIX 2 (COLOR)
AL (ALUMINUM)	01 (TAN)
ST (STEEL)	08 (GRAY)

GENERIC EXAMPLE:      SUFFIX 1      SUFFIX 2  
 OF19870AL 01

GROUP F



EXPLODED VIEW: EXHAUST SYSTEM 1.6L

DRAWING #: 0G3535

APPLICABLE TO:

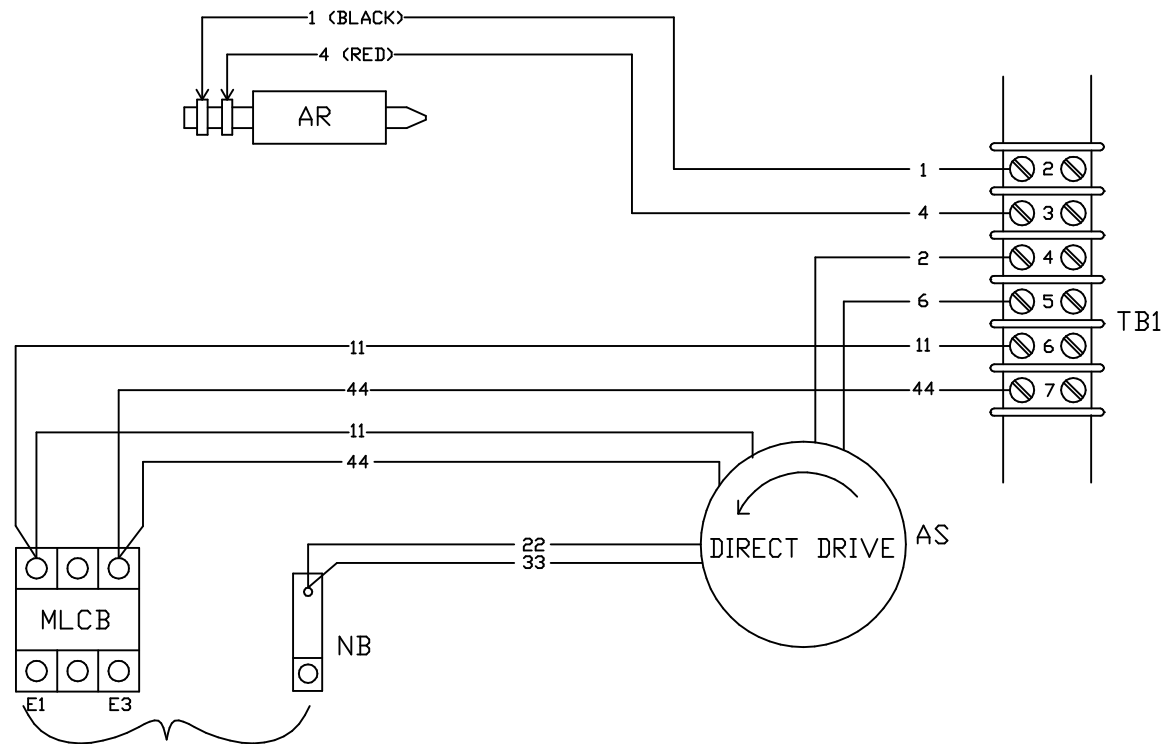
GROUP F

ITEM	PART #	QTY	DESCRIPTION
------	--------	-----	-------------

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

### LEGEND

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



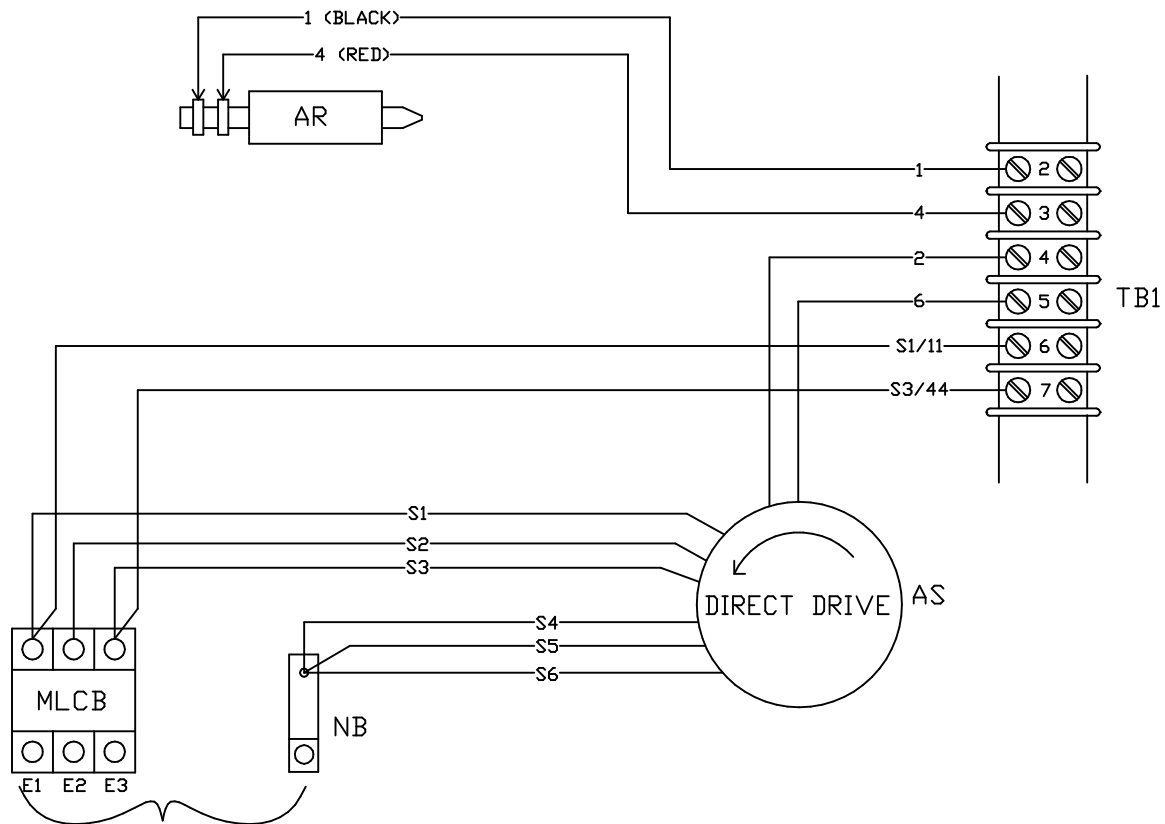
GENERATOR OUTPUT  
CUSTOMER CONNECTION

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

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

### LEGEND

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



GENERATOR OUTPUT  
CUSTOMER CONNECTION

E1 TO E2 }  
E2 TO E3 } \*208VAC  
E1 TO E3 }

E1, E2, OR E3 TO NB = \* 120VAC

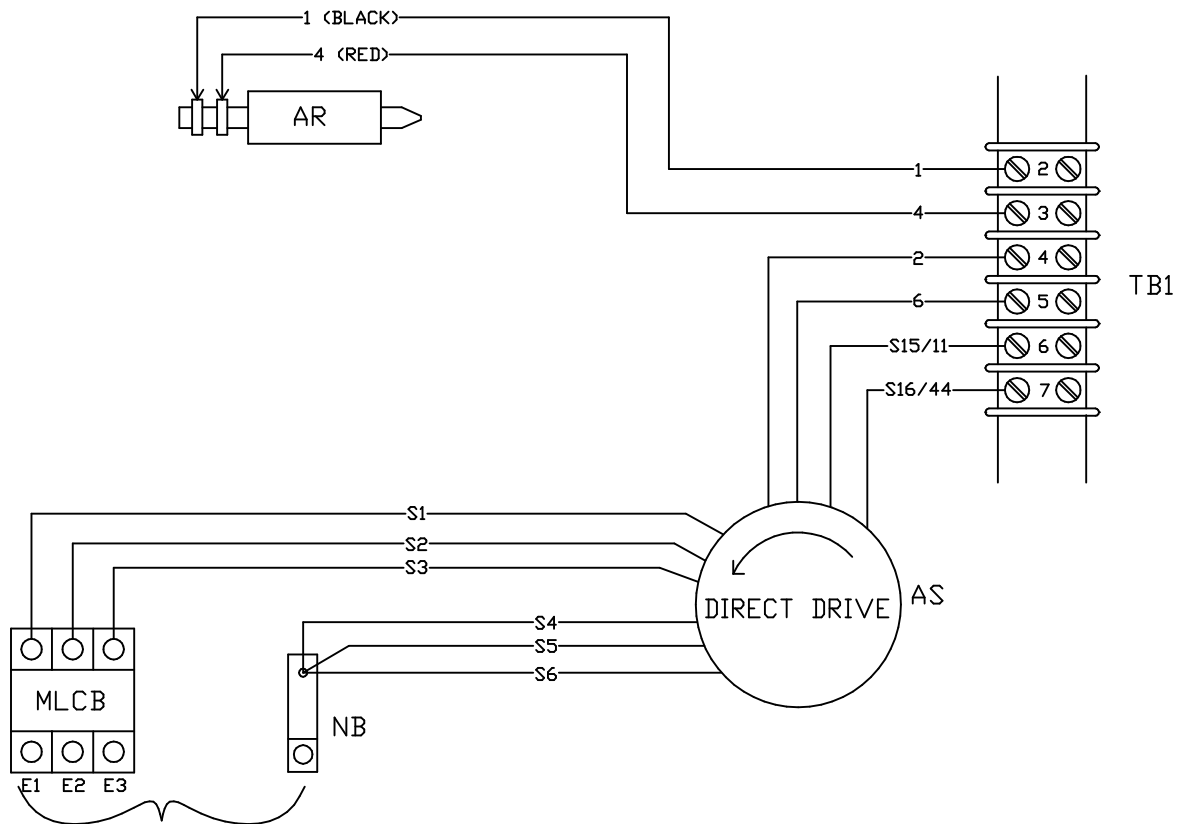
\*NOTE: THE 8th DIGIT OF THE MODEL NUMBER SPECIFIES OUTPUT VOLTAGE

"G" = 120/208VAC

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

LEGEND

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



GENERATOR OUTPUT  
CUSTOMER CONNECTION

E1 TO E2 }  
E2 TO E3 } \*480VAC  
E1 TO E3 }

E1, E2, OR E3 TO NB = \* 277VAC

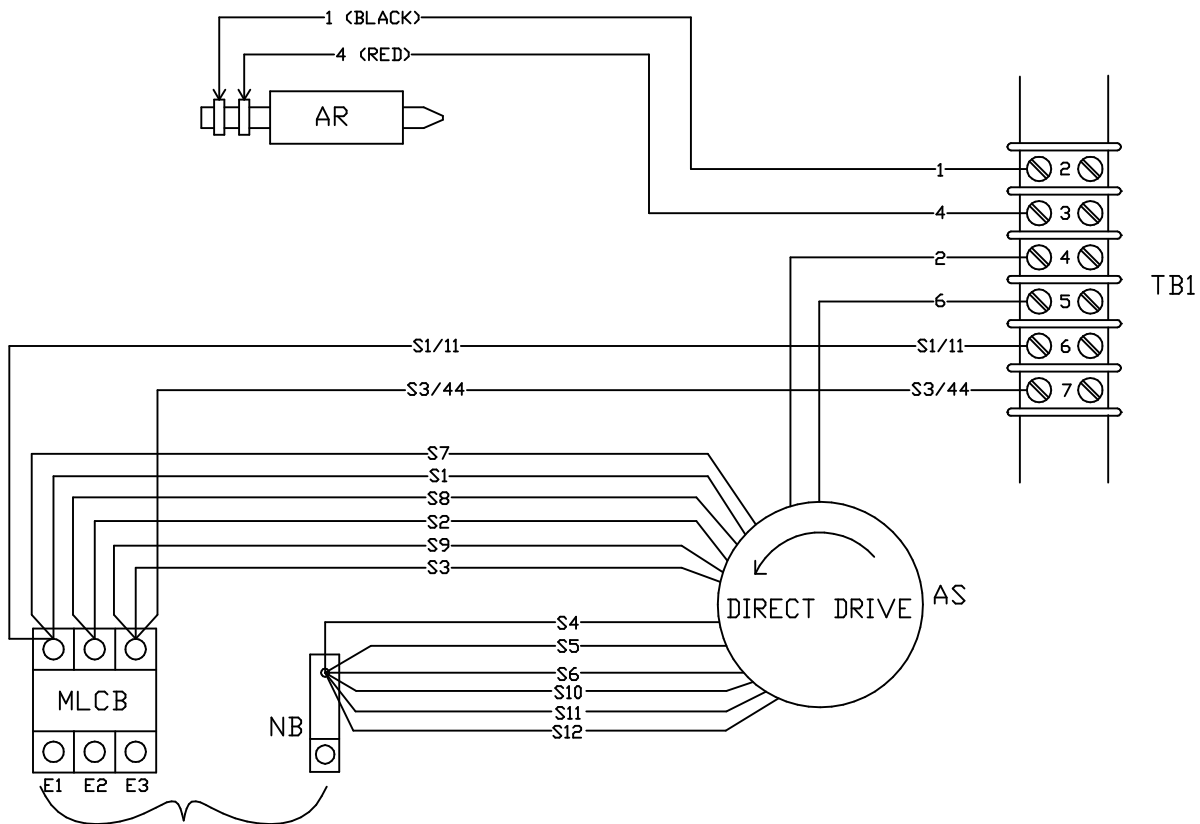
\*NOTE: THE 8th DIGIT OF THE MODEL NUMBER SPECIFIES OUTPUT VOLTAGE

"K" = 227/480VAC

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

### LEGEND

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



### GENERATOR OUTPUT CUSTOMER CONNECTION

E1 TO E2 } \*208VAC  
 E2 TO E3 }  
 E1 TO E3 }

E1, E2, OR E3 TO NB = \* 120VAC

\*NOTE: THE 8th DIGIT OF THE MODEL NUMBER SPECIFIES OUTPUT VOLTAGE

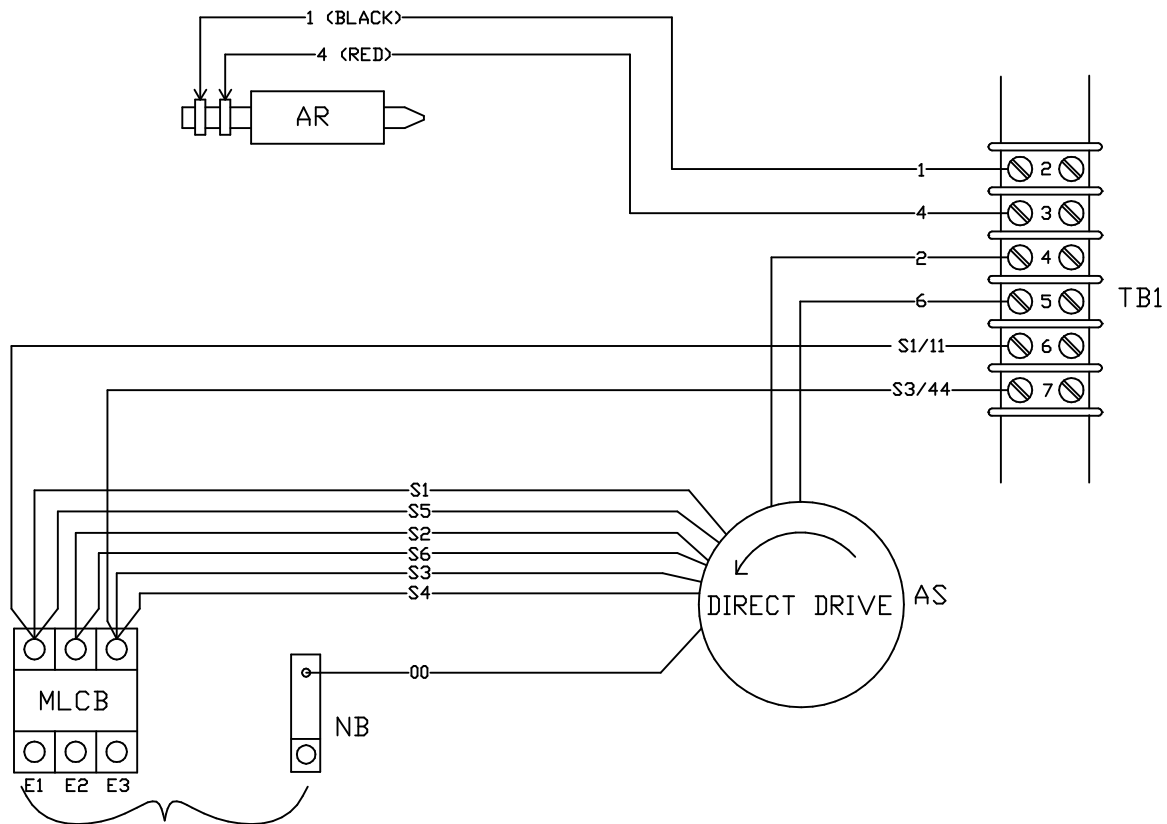
"G" = 120/208VAC



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

### LEGEND

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



GENERATOR OUTPUT  
CUSTOMER CONNECTION

E1 TO E2 } \*240VAC  
E2 TO E3 }  
E1 TO E3 }

E1, OR E3 TO NB = \* 120VAC

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

# GROUP G

NOTE: ALL WIRES ARE LISTED UNLESS OTHERWISE NOTED AS SHOWN:  
 SIZE (AWG) 18

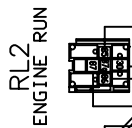
J3 - CONNECTOR 3 (ON PCB)

TERMINAL BLOCK

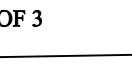
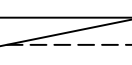
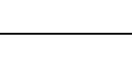
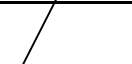
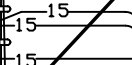
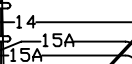
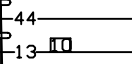
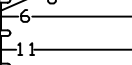
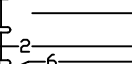
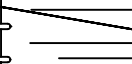
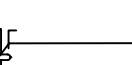
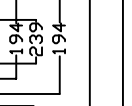
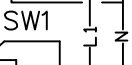
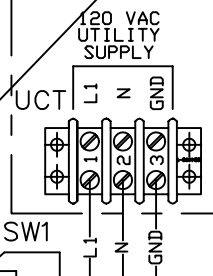


- PCB J3
- NOT USED - 1
  - NOT USED - 2
  - BLACK-W1 - 3
  - RED-W2 - 4
  - WHITE-W3 - 5
  - GREEN-W4 - 6

- PCB J2
- AFS/DWT - 1 - 808
  - START RELAY - 2 - 56A
  - FUEL(RUN) RELAY - 3 - 14A
  - 2 WIRE START(1) - 4 - 183
  - MOMENT. OPEN - 5 - 15E
  - 2 WIRE START(2) - 6 - 178
  - MAN/AUTO INPUT - 7 - 15A
  - 16VAC SENSE(1) - 8 - 224
  - ALARM RELAY - 9 -
  - XFER RELAY - 10 - 23
  - MAX. INPUT - 11 - 239
  - 16VAC SENSE(2) - 12 - 225
  - EMISSIONS ENABLE - 13 - 0
  - GND-B - 14 - 0



CUSTOMER CONNECTIONS



NOTE: THIS PAGE APPLIES TO UNITS BUILT IN THE FIRST HALF OF 2006

## SCHEMATIC - DIAGRAM

1.6L 2-POLE

DRAWING #: 0G0925

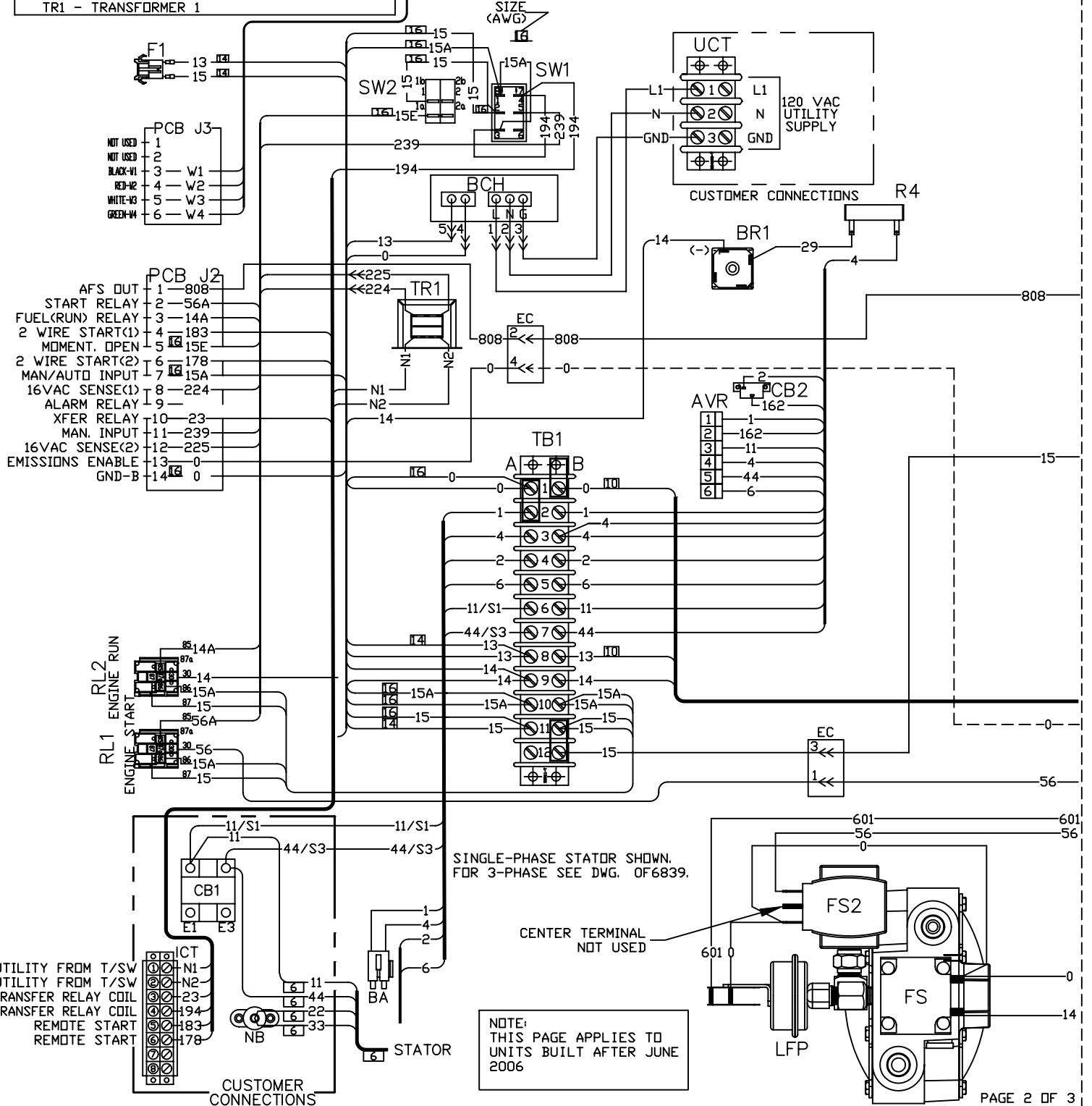
REVISION: G-7908-A

DATE: 04/20/06

CONTROL PANEL LEGEND

- AVR - AUTOMATIC VOLTAGE REGULATOR
- BCH - BATTERY CHARGER
- BR1 - DIODE (FIELD BOOST)
- CB2 - CIRCUIT BREAKER (EXCITATION)
- EC - EMISSIONS CONNECTOR
- F1 - FUSE, BATT. POWER (15A ATD TYPE)
- J2 - CONNECTOR 2 (ON PCB)
- J3 - CONNECTOR 3 (ON PCB)
- R4 - FIELD RESISTOR, 25 OHM
- RL1 - RELAY 1 (START RELAY)
- RL2 - (RELAY 2 (ENGINE RUN)
- SW1 - AUTO/OFF/MANUAL SWITCH
- SW2 - SET EXERCISER SWITCH
- TB\_ - TERMINAL BLOCK
- TR1 - TRANSFORMER 1

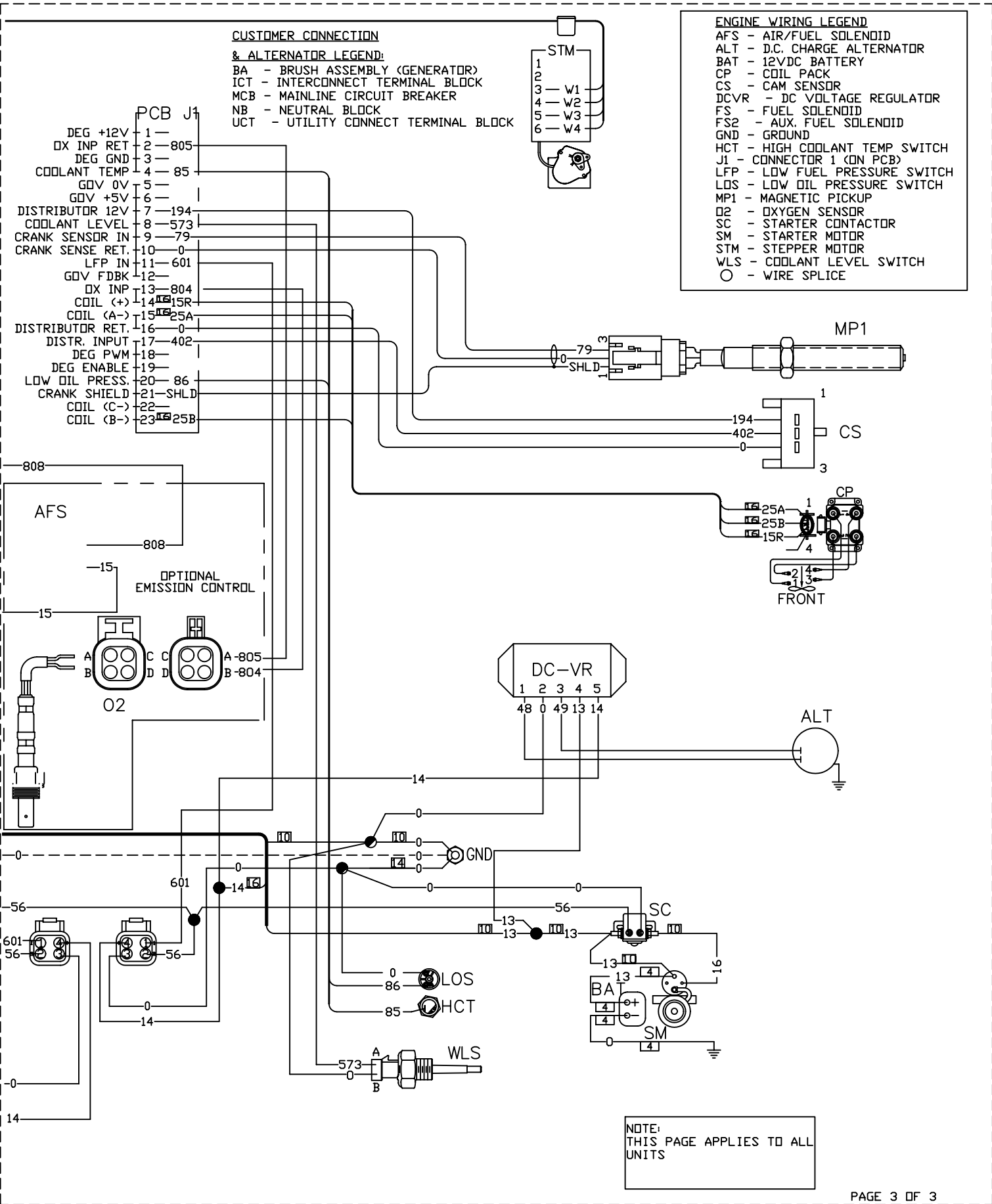
NOTE: ALL WIRES ARE 18 AWG UL LISTED UNLESS OTHERWISE NOTED AS SHOWN:



SCHMATIC - DIAGRAM

1.6L 2-POLE

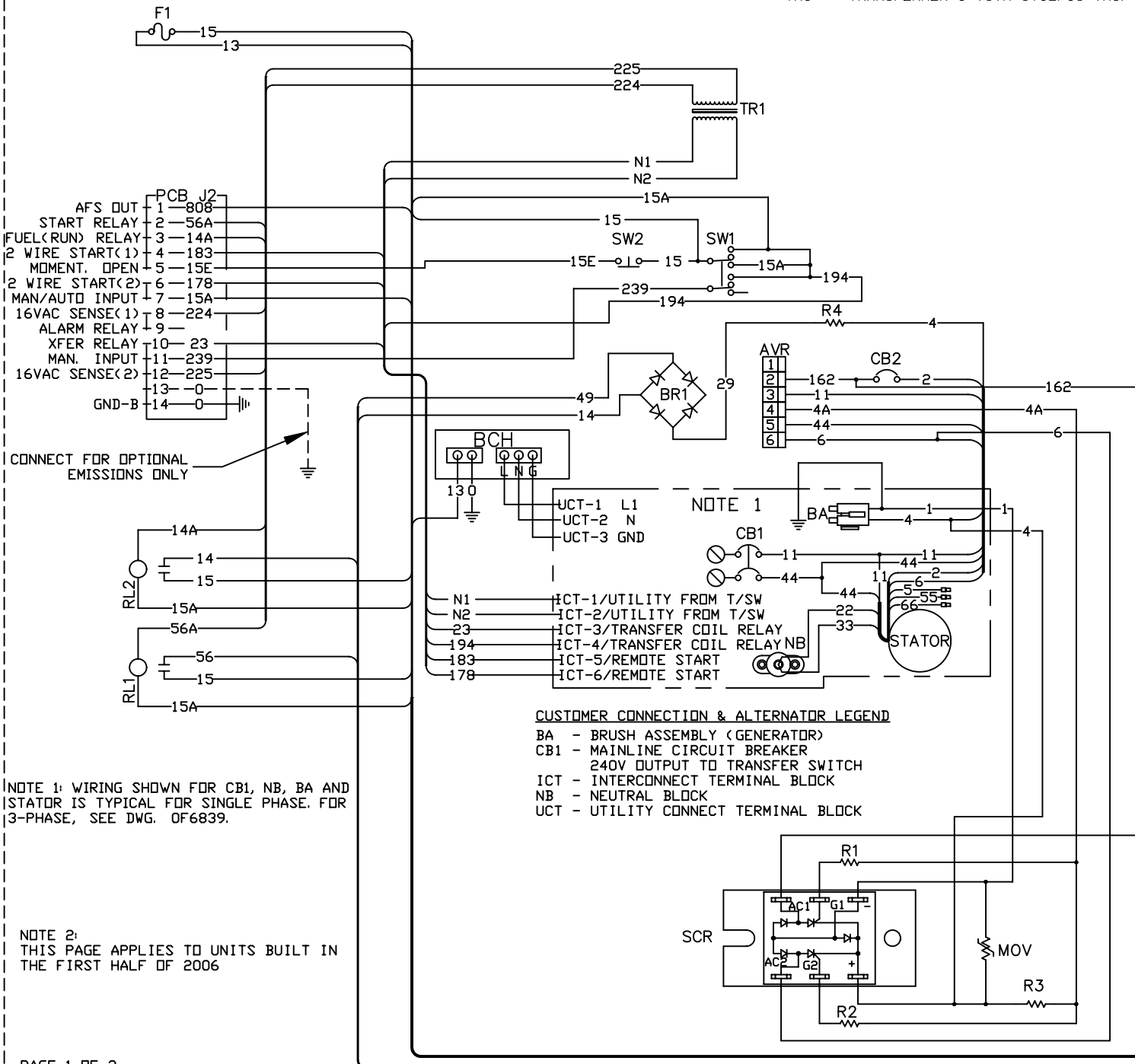
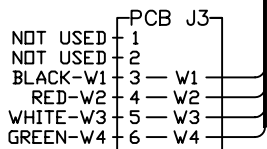
DRAWING #: 0G0925



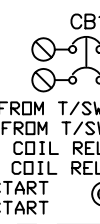
NOTE:  
THIS PAGE APPLIES TO ALL  
UNITS

## CONTROL PANEL LEGEND

- AVR - AUTOMATIC VOLTAGE REGULATOR
- BCH - BATTERY CHARGER
- BR1 - BRIDGE RECTIFIER
- CB2 - CIRCUIT BREAKER (EXCITATION)
- F1 - FUSE, BAT POWER (15A ATD TYPE)
- J2 - CONNECTOR 2 (ON PCB)
- J3 - CONNECTOR 3 (ON PCB)
- MOV - VARISTOR 680V
- R1, 2 - 820 OHM RES
- R3 - 470 OHM RES
- R4 - FIELD BOOST RESISTOR
- RL1 - RELAY 1 (START RELAY)
- RL2 - RELAY 2 (ENGINE RUN)
- SCR - SCR BRIDGE
- SW1 - AUTO/OFF/MANUAL SWITCH
- SW2 - SET EXERCISER SWITCH
- TR1 - TRANSFORMER 1 (6VA UTIL/16 VAC)



NOTE 1



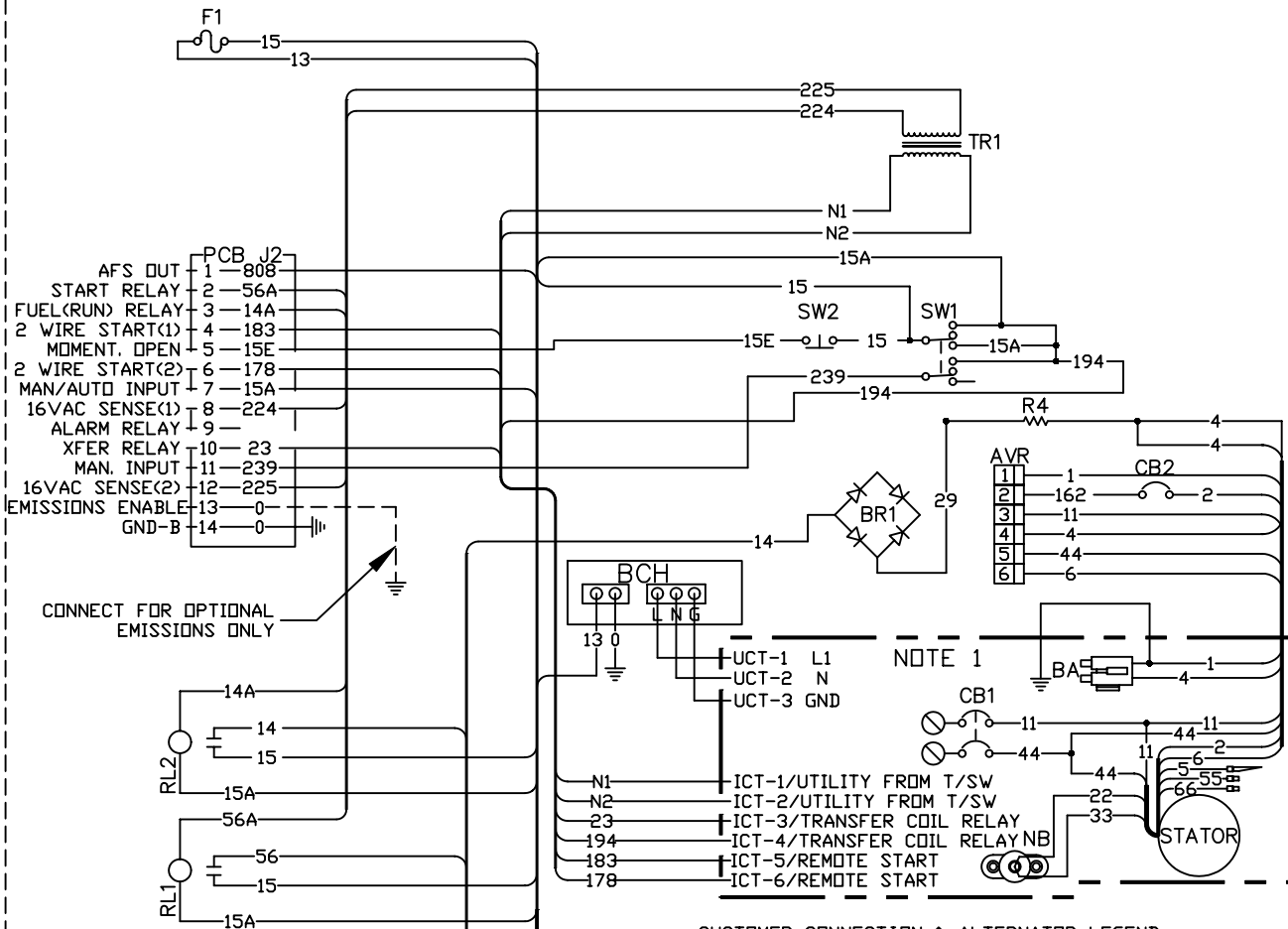
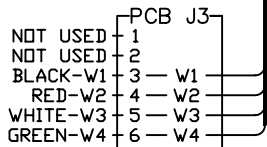
## CUSTOMER CONNECTION & ALTERNATOR LEGEND

- BA - BRUSH ASSEMBLY (GENERATOR)
- CB1 - MAINLINE CIRCUIT BREAKER  
240V OUTPUT TO TRANSFER SWITCH
- ICT - INTERCONNECT TERMINAL BLOCK
- NB - NEUTRAL BLOCK
- UCT - UTILITY CONNECT TERMINAL BLOCK

NOTE 2:  
THIS PAGE APPLIES TO UNITS BUILT IN  
THE FIRST HALF OF 2006

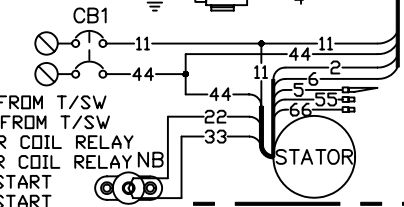
## CONTROL PANEL LEGEND

- AVR - AUTOMATIC VOLTAGE REGULATOR
- BCH - BATTERY CHARGER
- BR1 - BRIDGE RECTIFIER
- CB2 - CIRCUIT BREAKER (EXCITATION)
- F1 - FUSE, BAT POWER (15A ATO TYPE)
- J2 - CONNECTOR 2 (ON PCB)
- J3 - CONNECTOR 3 (ON PCB)
- R4 - FIELD BOOST RESISTOR
- RL1 - RELAY 1 (START RELAY)
- RL2 - RELAY 2 (ENGINE RUN)
- SW1 - AUTO/OFF/MANUAL SWITCH
- SW2 - SET EXERCISER SWITCH
- TR1 - TRANSFORMER 1 (6VA 240/16 VAC)



CONNECT FOR OPTIONAL EMISSIONS ONLY

### NOTE 1



## CUSTOMER CONNECTION & ALTERNATOR LEGEND

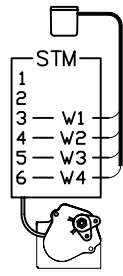
- BA - BRUSH ASSEMBLY (GENERATOR)
- CB1 - MAINLINE CIRCUIT BREAKER  
240V OUTPUT TO TRANSFER SWITCH
- ICT - INTERCONNECT TERMINAL BLOCK
- NB - NEUTRAL BLOCK
- UCT - UTILITY CONNECT TERMINAL BLOCK

NOTE 1:  
WIRING SHOWN FOR CB1, NB, BA AND STATOR IS TYPICAL FOR SINGLE PHASE. FOR 3-PHASE, SEE DWG. OF 6839.

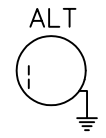
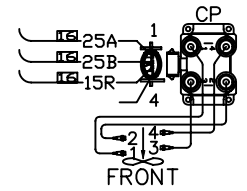
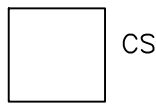
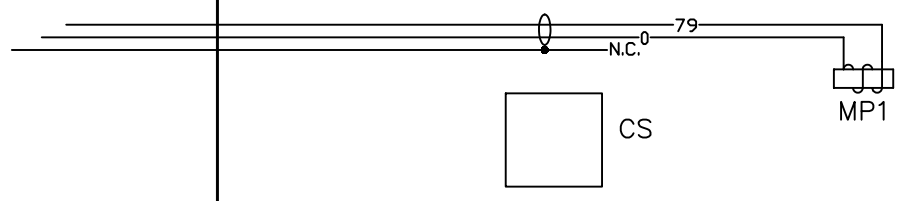
NOTE 2:  
THIS PAGE APPLIES TO UNITS BUILT AFTER JUNE 2006

# GROUP G

- PCB J1
- 1 -
  - 2 - 805
  - 3 -
  - 4 - 85
  - 5 -
  - 6 -
  - 7 - 194
  - 8 - 573
  - 9 - 79
  - 10 - 0
  - LFP INP - 11 - 601
  - GOV FDBK - 12 -
  - OX INP - 13 - 804
  - COIL (+) - 14 - 15R
  - COIL (A-) - 15 - 25A
  - DISTRIBUTOR RET. - 16 - 0
  - DISTR. INPUT - 17 - 402
  - DEG PWM - 18 -
  - IEG ENABLE - 19 -
  - 20 - 86
  - CRANK SHIELD - 21 - SHLD



- ENGINE WIRING LEGEND**
- AFS - AIR/FUEL SOLENOID
  - ALT - D. C. CHARGE ALTERNATOR
  - BAT - 12VDC BATTERY
  - CS - CAM SENSOR
  - CP - COIL PACK
  - DCVR - DC VOLTAGE REGULATOR
  - FS - FUEL SOLENOID
  - FS2 - AUX. FUEL SOLENOID
  - HCT - HIGH COOLANT TEMP SWITCH
  - J1 - CONNECTOR 1 (ON PCB)
  - LFP - LOW FUEL PRESSURE SWITCH
  - LPS - LOW OIL PRESSURE SWITCH
  - MP1 - MAGNETIC PICKUP
  - O2 - OXYGEN SENSOR
  - SC - STARTER CONTACTOR
  - SM - STARTER MOTOR
  - STM - STEPPER MOTOR
  - WLS - COOLANT LEVEL SWITCH



NOTE:  
THIS PAGE APPLIES TO  
ALL UNITS





# GROUP G

## NOTES:

- 1) MINIMUM RECOMMENDED CONCRETE PAD SIZE: 1041 (41.0') WIDE X 1892 (74.5') LONG. REFERENCE INSTALLATION GUIDE SUPPLIED WITH UNIT FOR CONCRETE PAD GUIDELINES.
- 2) ALLOW SUFFICIENT ROOM ON ALL SIDES OF THE GENERATOR FOR MAINTENANCE AND SERVICING. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE AND LOCAL CODES FOR MINIMUM DISTANCES FROM OTHER STRUCTURES.
- 3) CIRCUIT BREAKER INFORMATION SEE SPECIFICATION SHEET WITHIN OWNERS MANUAL
- 4) INSIDE STUB-UP AREA FOR AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, BATTERY CHARGER 120 VOLT AC (1.5 AMP MAX.) CONNECTION, AND ACCESS TO TRANSFER SWITCH CONTROL WIRES. REMOVE FRONT COVER FOR ACCESS.
- 4A) FIELD CUT HOLE IS ONLY REQUIRED FOR MOUNTING OF GENERATOR ON AN EXISTING PAD.
- 5) REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
- 6) REMOVE LIFT-OFF ENCLOSURE TO ACCESS EXHAUST MUFFLER.

135 (5.3') DIA MOUNTING 152.5 (6.1') MIN.

AIR INLET LOUVERS

HOLE IN PLACE (12' x 12') DIA MASONRY ANCHOR BOLTS RECOMMENDED

152.5 (6.1')

ENGINE/KW	ENCLOSURE MATERIAL	WEIGHT DATA		
		WEIGHT (GENSET ONLY) KG (LBS)	WEIGHT WOODEN SHIPPING CRATE (SKID) KG (LBS)	SHIPPING WEIGHT (SKID AND GENSET) KG (LBS)
1. 6L/18KW	STEEL	424 (935)	127 (280)	551 (1215)
	ALUMINUM	383 (845)	127 (280)	510 (1125)
1. 6L/20KW	STEEL	397 (875)	127 (280)	524 (1155)
	ALUMINUM	356 (785)	127 (280)	483 (1065)
1. 6L/25KW	STEEL	397 (875)	127 (280)	524 (1155)
	ALUMINUM	356 (785)	127 (280)	483 (1065)
1. 6L/30KW	STEEL	424 (935)	127 (280)	551 (1215)
	ALUMINUM	383 (845)	127 (280)	510 (1125)

CONCRETE MOUNTING PAD SEE NOTE 1

REAR VIEW

EXPLODED VIEW:  
INSTALLATION DRAWING C1 CRL  
DRAWING #: 0G6116





## Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>