GENERAC®

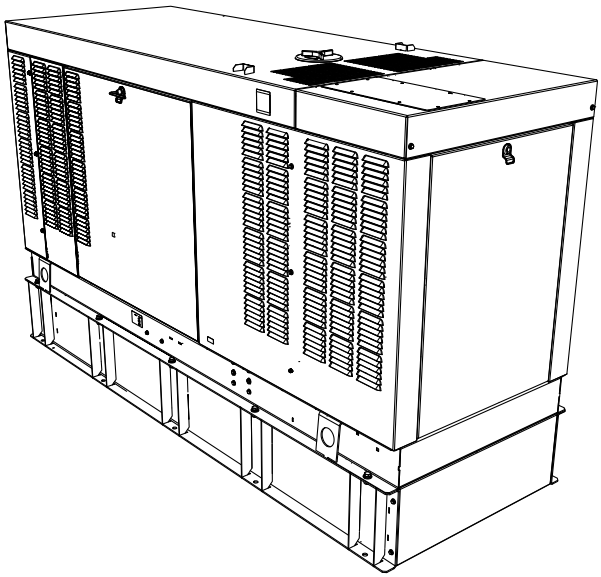
Protector™ Series

Owner's Manual

Stationary Diesel Generators

Residential and Commercial

15–30 kW, 12–24 kVA



⚠WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury. (000209b)

Register your Generac product at:

WWW.GENERAC.COM

1-888-GENERAC

(888-436-3722)

Para español , visita: http://www.generac.com/service-support/product-support-lookup

Pour le français, visiter : http://www.generac.com/service-support/product-support-lookup

SAVE THIS MANUAL FOR FUTURE REFERENCE

Use this page to record important information about the generator set.

For quick and easy reference, copy the information printed on the Unit Identification Label into the table provided below. The Unit Identification Label is located on the left engine mount on 15/20 kW (2.5L) units, and on the left side of the radiator shroud on 30 kW (2.2L) models. The label provides the following information:

Model Number	
Serial Number	
Rated KW or kVA	
Voltage Rating	
Maximum Current Rating (AMPS)	

When contacting an Independent Authorized Service Dealer (IASD) about parts and/or service, always provide the complete model number and serial number.

Operation and Maintenance: Proper maintenance and care of the generator ensures safe operation and longer service life while also keeping operating expenses to a minimum. It is the operator's responsibility to perform all safety checks, to make sure that all maintenance is performed promptly, and to have the equipment checked periodically by an IASD.

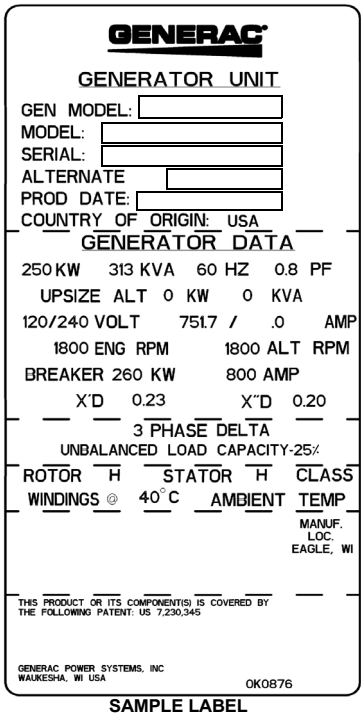
Normal maintenance, service and replacement of parts are the responsibility of the owner/operator, and are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage may contribute to the need for additional maintenance or service.

When the generator requires servicing or repairs, contact an IASD for assistance. IASDs are factory-trained and are capable of handling all service needs.

INDEPENDENT AUTHORIZED SERVICE DEALER LOCATION

To locate the nearest
INDEPENDENT AUTHORIZED
SERVICE DEALER,
please call this number:
1-800-333-1322

or visit the dealer locator at:
www.generac.com/Service/DealerLocator/



SAMPLE LABEL

006366

⚠WARNING

Operating, servicing and maintaining this equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your equipment in a well-ventilated area and wear gloves or wash your hands frequently when servicing your equipment. For more information go to www.P65Warnings.ca.gov. (000393)

⚠WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65Warnings.ca.gov/diesel. (000394)

Table of Contents

Section 5: Maintenance

Section 6: Troubleshooting

Section 1: Safety

Introduction

Thank you for purchasing this stationary automatic standby generator set. Every effort was made to ensure that the information in this manual was both accurate and complete at the time it was released. However, the manufacturer reserves the right to change, alter or otherwise improve this product at any time without prior notice.

This generator is designed to automatically supply electrical power to operate critical loads during a utility power failure. The unit is factory installed in an all-weather metal enclosure and **is intended exclusively for outdoor installation** using only diesel fuel.

When properly sized, the generator is suitable for supplying typical residential/commercial loads, such as induction motors (sump pumps, refrigerators, freezers, air conditioners, furnaces, etc.), electronic components (computers, monitors, televisions, etc.), lighting, microwaves, and other residential and business loads.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Read this Manual Thoroughly

⚠WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury.

(000100a)

The operator is responsible for proper and safe use of this equipment. Read and thoroughly understand the contents of this manual before attempting to use the equipment. If any portion of this manual is not fully understood, contact the nearest Independent Authorized Service Dealer (IASD) for assistance.

SAVE THESE INSTRUCTIONS: The manufacturer suggests that this manual and the rules for safe operation be copied and posted near the generator installation site. Safety should be stressed to all operators and potential operators of this equipment.

Safety Alerts

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

⚠DANGER

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

(000001)

⚠WARNING

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

(000002)

⚠CAUTION

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

(000003)

NOTE: Notes contain additional information important to an operation or procedure.

These “Safety Alerts” cannot eliminate the hazards that they signal. Strict compliance with these special instructions, plus common sense, are major accident prevention measures.

Safety Information

Study these safety rules carefully before 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 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 not all-inclusive. If using a procedure, work method or operating technique the manufacturer does not specifically recommend, ensure that it is safe for personnel. Also make sure the procedure, work method or operating technique used does not render the generator unsafe.

General Hazards

DANGER

Loss of life. Property damage. Installation must always comply with applicable codes, standards, laws and regulations. Failure to do so will result in death or serious injury.

(000190)

WARNING

Electric shock. Only a trained and licensed electrician should perform wiring and connections to unit. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage.

(000155a)

WARNING

Moving Parts. Keep clothing, hair, and appendages away from moving parts. Failure to do so could result in death or serious injury.

(000111)

WARNING

Moving Parts. Do not wear jewelry when starting or operating this product. Wearing jewelry while starting or operating this product could result in death or serious injury.

(000115)

WARNING

Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to service this equipment and could result in death or serious injury.

(000215)

WARNING

Accidental Start-up. Disconnect the negative battery cable, then the positive battery cable when working on unit. Failure to do so could result in death or serious injury.

(000130)

WARNING

Injury and equipment damage. Do not use generator as a step. Doing so could result in falling, damaged parts, unsafe equipment operation, and could result in death or serious injury.

(000216)

WARNING

Equipment damage. This unit is not intended for use as a prime power source. It is intended for use as an intermediate power supply in the event of temporary power outage only. Doing so could result in death, serious injury, and equipment damage.

(000247a)

WARNING

Loss of life. This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury.

(000209b)

- Inspect the generator regularly, and contact the nearest Independent Authorized Service Dealer for parts needing repair or replacement.

Exhaust Hazards

DANGER

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.

(000103)

WARNING

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury.

(000178a)

WARNING

Equipment and property damage. Do not alter construction of, installation, or block ventilation for generator. Failure to do so could result in unsafe operation or damage to the generator.

(000146)

- The generator must be installed and operated outdoors only.

Electrical Hazards

⚠DANGER

Electrocution. Contact with bare wires, terminals, and connections while generator is running will result in death or serious injury. (000144)

⚠DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury. (000104)

⚠DANGER

Electrocution. Do not wear jewelry while working on this equipment. Doing so will result in death or serious injury. (000188)

⚠DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury. (000145)

- The generator may crank and start at any time when utility power is lost. When this occurs, load circuits are transferred to the STANDBY (generator) power source. Before working on the generator, always move the Main Circuit Breaker switch on the control panel down to the OFF (Open) position, press the OFF key on the control panel keypad, remove the 7.5 amp fuse, and disconnect the negative battery cable (black) from the negative (-) battery terminal.

Fire Hazards

⚠DANGER

Explosion and fire. Fuel and vapors are extremely flammable and explosive. No leakage of fuel is permitted. Keep fire and spark away. Failure to do so will result in death or serious injury. (000192)

⚠WARNING

Fire and explosion. Installation must comply with all local, state, and national electrical building codes. Noncompliance could result in unsafe operation, equipment damage, death or serious injury. (000218)

⚠WARNING

Fire hazard. Use only fully-charged fire extinguishers rated “ABC” by the NFPA. Discharged or improperly rated fire extinguishers will not extinguish electrical fires in automatic standby generators. (000219)

- Comply with regulations of the Occupational Safety and Health Administration (OSHA). Also, ensure that the generator is installed in accordance with the manufacturer’s instructions and recommendations. Following proper installation, do nothing that might alter a safe installation and render the unit in noncompliance with the aforementioned codes, standards, laws and regulations.

Explosion Hazards

⚠DANGER

Explosion and fire. Fuel and vapors are extremely flammable and explosive. No leakage of fuel is permitted. Keep fire and spark away. Failure to do so will result in death or serious injury. (000192)

IMPORTANT NOTE: 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 electrical system from the utility distribution system when the generator is operating (NEC 702). Failure to isolate an electrical system by such means will result in damage to the generator and also may result in injury or death to utility power workers due to backfeed of electrical energy.

This page intentionally left blank.

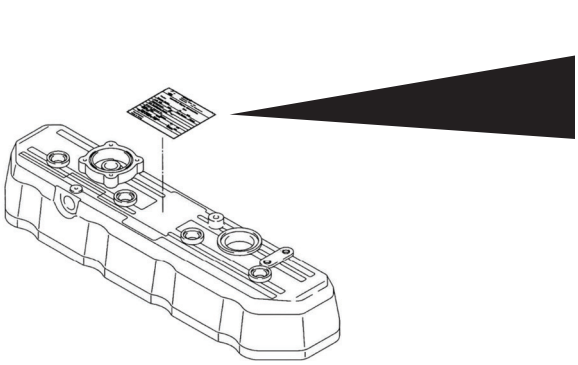
Section 2: Specifications

Emission Information

The U.S. Environmental Protection Agency (EPA) requires that the generator comply with exhaust emission standards. The generator is certified to meet the applicable EPA emission levels, and is certified for use as a stationary engine for standby power generation. Any other use may be a violation of federal and/or local laws. To ensure that the engine complies with the applicable emission standards for the duration of the engine's life, it is important to follow the maintenance specifications in Section 5. This generator is certified to operate on Ultra-Low Sulfur Diesel Fuel No. 2 (KSM2610).

Emissions Data Plate

A data plate is riveted to the cylinder head cover to verify compliance with EPA emissions regulations.



EMISSION CONTROL INFORMATION	
EMISSION CONTROL INFORMATION	
ENGINE FAMILY	HH3XL2.22TCC
POWER CATEGORY	19 ≤ kW < 37
DISPLACEMENT	2.216 Litres
EMISSION-CONTROL SYSTEM	IFI TC CAC
DATE OF MANUFACTURE : 11/2017	
THIS ENGINE CONFORMS TO 2017 U.S. EPA REGULATIONS FOR STATIONARY COMPRESSION - IGNITION ENGINES	
USE IN CONSTANT-SPEED APPLICATIONS ONLY	
LOW SULFUR FUEL OR ULTRA LOW SULFUR FUEL ONLY	
FOR STATIONARY EMERGENCY USE ONLY	
190369690	

006367

Figure 2-1. Emissions Data Plate on Cylinder Head Cover (Sample)

Specifications

Engine

General	2.5L Engine	2.2L Engine
Engine System		
Type	4 cylinder, in-line, 4 cycle	4 cylinder, in-line, 4 cycle
Fuel Type	Ultra Low Sulfur Diesel	Ultra Low Sulfur Diesel
Fuel Filtering	6 Microns	25 Microns (maximum)
Bore and Stroke	3.30 in x 3.90 in (84 mm x 100 mm)	3.30 in x 3.90 in (84 mm x 100 mm)
Displacement	152.86 cubic inches (2.505 liter)	135.2 cubic inches (2.216 liter)
Firing Order	1-3-4-2	1-3-4-2
Direction or Rotation	CCW - As Viewed From Flywheel	CCW - As Viewed From Flywheel
Dimensions L x W x H	615 mm x 492 mm x 623 mm (24.21 in x 19.37 in x 24.53 in)	662 mm x 489 mm x 698 mm (26.1 in x 19.3 in x 27.5 in)
Dry Weight	375 lb (170 kg)	507.1 lb (230 kg)
Compression Ratio	22: 1	21.3 : 1
Cooling System		
Water Pump	Pre-Lubed, Self-Sealing	Pre-Lubed, Self-Sealing
Drive	Belt	Belt
Thermostat	Full Open Temperature: 170 F (76.5° C)	Full Open Temperature: 180° F (82° C)
System Coolant Capacity	3.0 gal (11.44 liter)	2.5 gal (9.5 liter)
Coolant Flow Rate	17 gal (65 liter)/min at 1800 RPM	14.8 gal (56.2 liter)/min at 1800 RPM
Lubricating System		
Oil Pump Type	Gear	Gear
Oil Filter Type	Full Flow Spin-On Canister	Full Flow Spin-On Canister
Oil Cooler	Not Applicable	Installed
Crankcase Capacity	6.87 qt. (6.5 liter)	11.2 qt. (10.6 liter)
Lubricating Oil	15W-40	15W-40
Oil Fill Location	Filler Cap on Valve Cover and/or Front Engine Cover	Filler Cap on Valve Cover and/or Front Engine Cover
Oil Drain Location	Oil Pan, Bottom Side	Oil Pan, Bottom Side
Intake and Exhaust System		
Intake Air System	Naturally Aspirated	Turbocharged / Aftercooled
Maximum Allowable Intake Restriction	7.87 in. of Water (1.96 kPa)	20 in. of Water (5.0 kPa)
Maximum Allowable Exhaust Back Pressure	26.8 in. of Water (6.67 kPa)	41 in. of Water (10.2 kPa)
Breather	Closed Crankcase System	Open Crankcase System
Other Specifications		
Operating Temperature Range	-20° F to 120° F (-29° C to 49° C)	-20° F to 120° F (-29° C to 49° C)
POWER ADJUSTMENT FOR AMBIENT CONDITIONS Temperature Deration3% for every 5 °C above 25 °C or 1.7% for every 5 °F above 77 °F Altitude Deration (15 & 30 kW)1% for every 100 m above 915 m or 3% for every 1000 ft above 3000 ft Altitude Deration (20 kW) 1% for every 100 m above 305 m or 3% for every 1000 ft above 1000 ft		

A complete specification sheet is included in the documentation provided with the unit at the time of purchase. For additional copies, consult your local Independent Authorized Service Dealer (IASD).

Engine Oil Recommendations

To maintain the product warranty, the engine oil should be serviced in accordance with the recommendations of this manual. For your convenience, maintenance kits designed and intended for use on this product are available from the manufacturer that include engine oil, oil filter, air filter, spark plug(s), a shop towel and funnel. These kits can be obtained from an Independent Authorized Service Dealer (IASD).

All Generac maintenance kits meet minimum American Petroleum Institute (API) Service Class CD or better. Select the appropriate viscosity oil grade according to the expected operating temperature. After break-in, synthetic oil also can be used in the appropriate weight as standard. Once synthetic oil is used, it should be used for the life of the generator. It is not recommended to go back to a mineral oil. Do not use special additives.

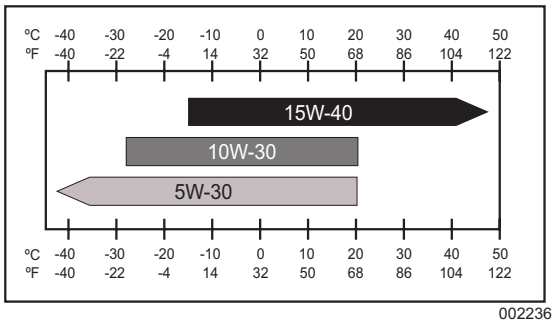


Figure 2-2. Lubricating Oil Recommendations

Coolant Water Treatment

Use of improper coolants can damage the engine cooling system. Use demineralized water or distilled water for best results. Hard water causes scale deposits, which reduces cooling efficiency and raises internal temperatures, possibly leading to engine damage. Use an anti-corrosive to prevent rot in summer and anti-freeze to prevent freezing in winter.

Dilute the anti-freeze based on a theoretical temperature that is 9-18°F (5-10°C) below the lowest temperature expected in the area. A ratio of 40-60% is most common range.

Freezing Point °F (°C)	-13 (-25)	-31 (-35)	-58 (-50)
Coolant (% Volume)	40	50	60
Water (% Volume)	60	50	40

NOTE: Use only Peak Fleet-Charge® 50/50 ethylene glycol type coolant (available from any IASD).

IMPORTANT NOTE: Do not use propylene glycol type coolant. Using the wrong coolant, mixing different types of coolant, or even mixing different brands of the correct type of coolant, can produce unsatisfactory results, possibly leading to engine damage.

Fuel Requirements

IMPORTANT NOTE: DO NOT use Home Heating Oil or Bio-Diesel Fuel.

Use **No. 2D** diesel fuel when temperatures are above freezing. When temperatures are below freezing, blend **No. 1D** diesel fuel and **No. 2D** diesel fuel together for a climate adjusted fuel ratio.

- Use only Ultra-Low Sulfur Diesel fuel (ULSD)

NOTE: Low ambient temperatures as well as engine operation at high altitudes may require the use of fuels with higher Cetane ratings.

Allow at least 5 percent of the tank capacity for fuel expansion. **DO NOT OVERFILL!**

Fuel Maintenance

Always treat diesel fuel for long term storage. Use the approved fuel additive and water abatement material. Test stored fuel every 90 days and provide additional treatment if required. Periodically check and dry abatement material as necessary.

Battery Requirements

Group 27F, 12 Volt	**2.5L & 2.2L engine:** For areas where temperatures regularly drop below 32° F (0° C).
NOTE: Battery dimensions (L x W x H) for Group 27F battery must not exceed 12-1/2" x 6-13/16" x 8-15/16" (318 mm x 173 mm x 227 mm).	
Group 31, 12 Volt	**Upgrade option for 2.2L engine:** For areas where temperatures regularly drop below 32° F (0° C).
NOTE: Battery dimensions (L x W x H) for Group 31 battery must not exceed 13" x 6-13/16" x 9-7/16" (330 mm x 173 mm x 240 mm).	

Battery Charger

The battery charger is integrated into the control panel module. It operates as a “Smart Charger” which ensures output charging levels are safe and continuously optimized to promote maximum battery life.

Battery Disposal

⚠WARNING

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death or serious injury. (000228)

Always recycle batteries in accordance with local laws and regulations. Contact your local solid waste collection site or recycling facility to obtain information on local recycling processes. For more information on battery recycling, visit the Battery Council International website at: ***http://batterycouncil.org***.

Corrosion Protection

Periodically wash and wax the enclosure using automotive type products. Frequent washing is recommended in salt water/coastal areas.

Accessories

See ***Figure 2-3***. The following product accessories are available. Contact an IASD for additional information.

1. Scheduled Maintenance Kit (Part No. G007640-0; 15/20 kW)
2. Scheduled Maintenance Kit (Part No. G007641-0; 30 kW)
3. Cold Weather Kit (Part No. G007650-0: 15/20 kW; Part No. G007651-0: 30 kW)
4. Vent Extension Support Kit (Part No. G006588-1)
5. Fuel Fill Drop Tube (Part No.G006507-0)
6. Lockable Fuel Fill Cap (Part No. G006512-0)
7. Emergency Stop Switch (Part No. G006510-0)
8. Touch-Up Paint Kit (Part No. G005703-0)
9. Five Gallon Spill Box (Part No. G006502-0)
10. Fuel Tank Risers (Part No. G006505-0: 15/20 kW; Part No. G006506-0: 30 kW)
11. 90% Fuel Fill Level Alarm (Part No. G006504-0)
12. Spill Box Drain Back (Part No. G006511-0)
13. Stainless Steel Fuel Lines (Part No. G007660-0 (15/20 kW); G007661-0 (30 kW))
14. Mobile Link™ (Part No. G006463-4) (not pictured)

Figure 2-3. Product Accessories

This page intentionally left blank.

Section 3: Activation and Startup

IMPORTANT NOTE: Before startup, the unit fuel tank may need to be inspected by the local AHJ (authority having jurisdiction) or fire marshal to meet all requirements. User must fill the fuel tank and treat the fuel according to additive specifications.

Orientation

NOTE: The 2.2L unit is depicted in most of the artwork used in this manual. The location and appearance of some components may vary between engine models.

The side of the enclosure with the viewing window (A) is identified as the rear of the generator set. The right and left sides are identified by standing at the rear and looking towards the front of the unit. The battery (B) and fuel priming pump (C) are located on the side of the unit.

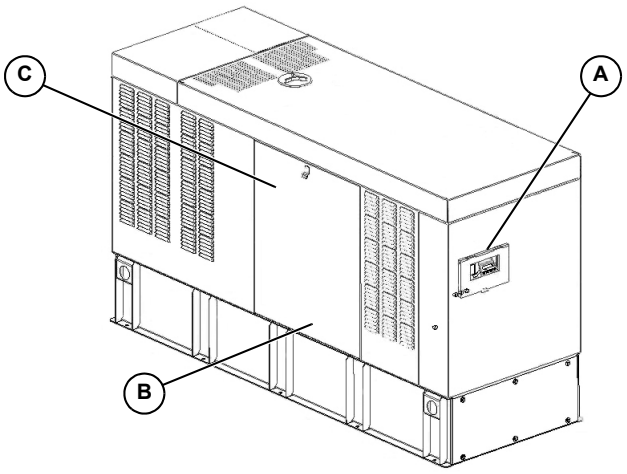


Figure 3-1. Enclosure (Rear Left View)

Remove Side Access Panels

NOTE: Access panels are located at both the front and sides of the enclosure.

1. Insert key into latch and rotate counterclockwise 1/2 turn. See ***Figure 3-2***.
2. Raise panel using thumb latch.

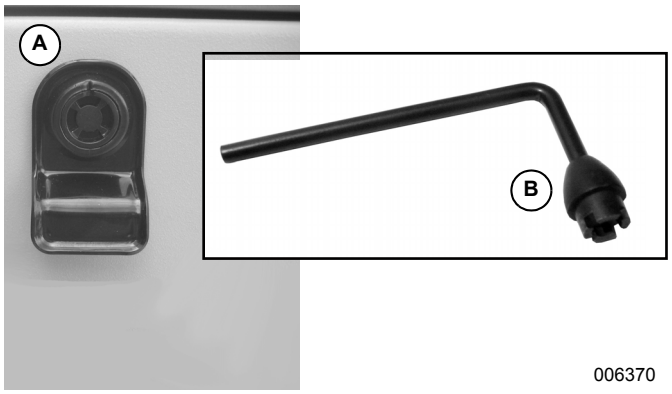


Figure 3-2. Access Panel Key

Prime Fuel System

NOTE: The 2.2L engine is equipped with a rubber hand priming bulb. Some 2.2L models may be equipped with a remote stainless steel hand primer pump with a pushbutton.

1. See ***Figure 3-3*** and, if applicable, ***Figure 3-4***. Loosen fuel filter air bleed screw (G) and work priming pump (H), or priming bulb, until bubbles are observed.

Figure 3-3. Fuel Filter Air Bleed Screw

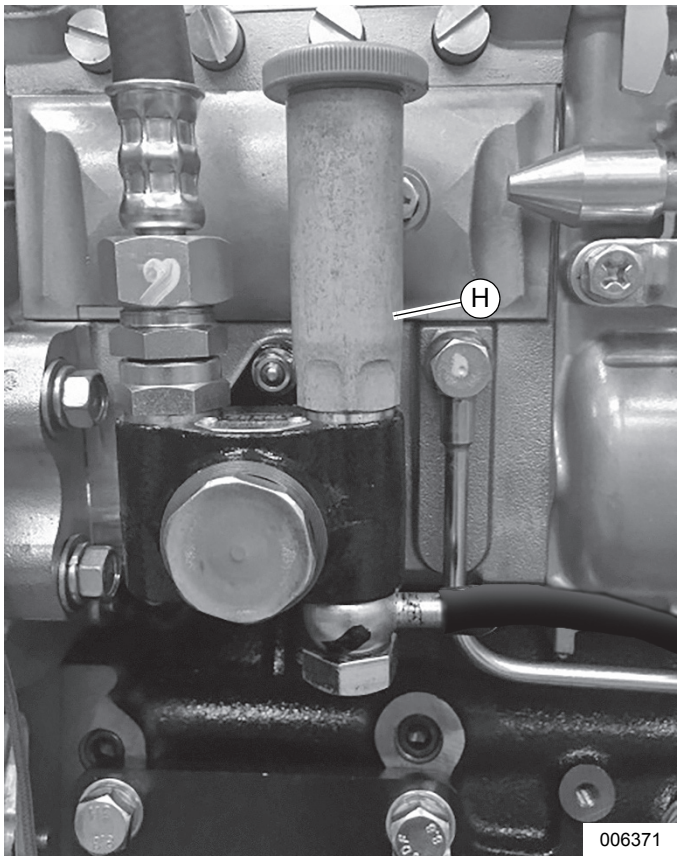


Figure 3-4. Prime Fuel System (2.5L Engines)

2. When all bubbles are purged and replaced by a solid stream of fuel, lower pump handle (or release priming bulb) and tighten the air bleed screw.

Install Battery

⚠WARNING

Explosion. Batteries emit explosive gases. Always connect positive battery cable first to avoid spark. Failure to do so could result in death or serious injury. (000133)

2.5L Models

NOTE: Remove ten screws to release louvered air intake panel on left side of enclosure.

1. Loosen two screws with nylon washers to release hold-down clamp from battery tray, or loosen strap and move away from tray.
2. See ***Figure 3-5***. Place battery (C) on tray.
3. Install two screws with nylon washers to secure hold-down clamp to battery tray, or tighten strap over top of battery.
4. Connect positive battery cable (red) (A) to positive (+) battery terminal.
5. Connect negative battery cable (black) (B) to negative (-) battery terminal.
6. Thread ten screws into louvered air intake panel. Alternately tighten screws to 90 in-lb (10 Nm) using a crosswise pattern.

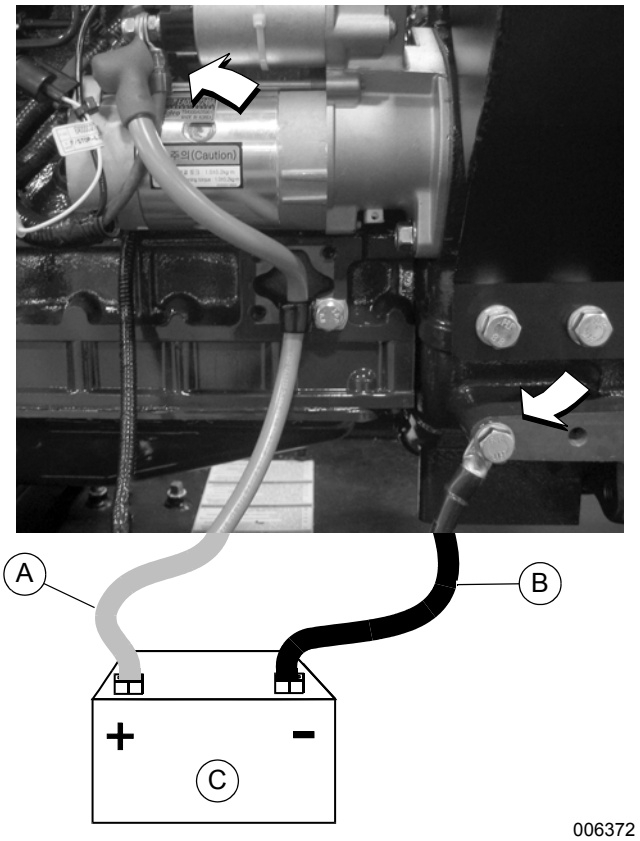


Figure 3-5. Battery Cable Connections

Open Viewing Window

1. Rotate viewing window upward to access control panel.
2. See ***Figure 3-6***. To hold viewing window in the open position, remove rod from clip at back of window and insert into hole in frame (A).

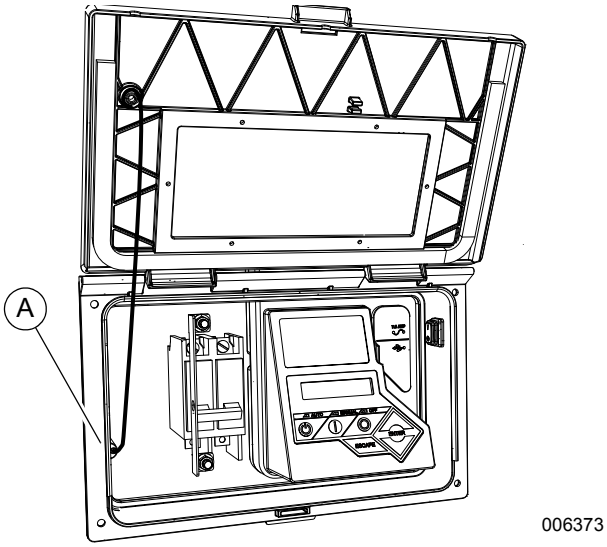


Figure 3-6. Viewing Window

Start and Run Engine

1. See ***Figure 3-7***. Pull up rubber flap covering fuse holder and verify installation of 7.5 amp fuse (A).
2. Move the Main Circuit Breaker switch down to the OFF (Open) position (B).
3. Verify both auxiliary shutdown switches are in the ON (I) position.
4. Press MANUAL (C) on the control pad to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode.
5. Allow the engine to run until it reaches normal operating temperature.
6. Press OFF on the control pad to stop the engine. A red LED illuminates to confirm that the system is in the OFF mode.

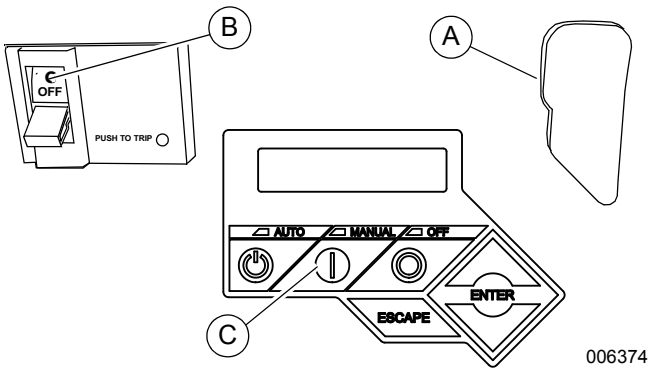


Figure 3-7. Generator Control Panel

Test Engine Shutdown Switch Operation

The generator is equipped with an independent means of shutting down the prime mover (engine) for use in emergency situations. The shutdown mechanism, when activated, requires a mechanical reset.

See ***Figure 3-8***. Generators 15 kW and larger are equipped with two engine shutdown switches. One switch (A) is located on the generator roof above and to the right of the viewing window. The second switch (B) is inside the control panel enclosure.

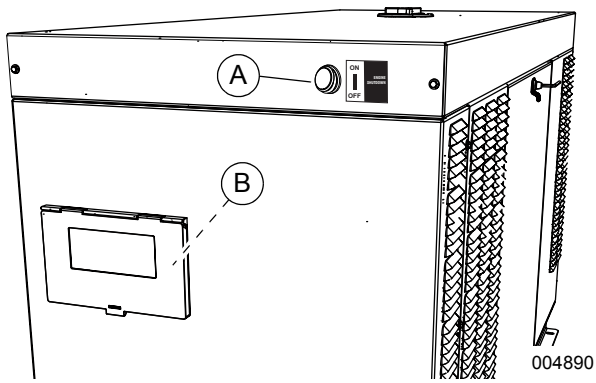


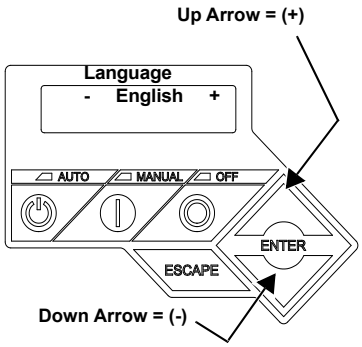
Figure 3-8. Engine Shutdown Switches

Test engine shutdown switches after installation to verify proper operation.

1. Verify rocker switches are ON (I).
2. Press MANUAL key on control panel keypad to start engine.
3. With engine running, press one of the engine shutdown switches to OFF (O). Engine should shut down immediately.
   - **If engine stops,** press engine shutdown switch to ON (I), clear alarm on controller, and restart engine to verify generator is operating normally. After verifying normal operation of first switch, verify operation of second switch.
   - **If engine does not stop,** engine shutdown switch is not functioning correctly. Contact an IASD.

NOTE: Engine shutdown switches are not intended to be the primary means to shut down the generator under normal operating conditions. Accidental activation of an engine shutdown switch will prevent the generator from operating during a power outage.

Activate Unit

Display Reads:  	**Generator Active** is displayed on the LCD screen when the unit is first powered up. After displaying firmware and hardware version codes, as well as other system information, the Installation Wizard is launched, and the Language screen is displayed. Use UP ARROW or DOWN ARROW to scroll to desired language. Press ENTER.	If the wrong language is selected, it may be changed later using the Edit menu.
Display Reads: **Activate me (ENT) or ESC to run in manual**	Press ENTER.	Press ESCAPE to abort the activation sequence. NOT ACTIVATED is displayed and the generator will run in manual mode only. Disconnect and reconnect the negative battery cable to restart the activation routine. If power is removed after a successful activation, no data is lost, but the time and date must be updated.
Display Reads: **To Activate go to www.activategen.com**	Go to ***www.activategen.com*** or call 1-888-9ACTIVATE (922-8482, US & CA only) if activation passcode is not available. If activation passcode is available, wait a few seconds for the next display.	
Display Reads: **SN 1234567890** **PASS CODE XXXXX**	Use UP ARROW or DOWN ARROW to increment or decrement the digit to correspond to the first number of the pass code. Press ENTER. Repeat step to enter remaining digits.	Press ESCAPE to return to preceding digits if a correction becomes necessary. If attempts to enter the activation code are unsuccessful, check the number against the code given on activategen.com. If it is correct, contact 1-888-9ACTIVATE (922-8482, US & CA only).
Display Reads: **Select Hour (0-23)** **- 6 +**	Use UP ARROW or DOWN ARROW to increment or decrement the hour. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the minute. Press ENTER. Use UP ARROW or DOWN ARROW to select the month. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the date. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the year. Press ENTER.	

Display Reads: **Quite Test Mode?** **Yes No**	Use UP ARROW or DOWN ARROW to select either Yes or No. Press ENTER.	Select YES to perform exercise at low speed. Select NO to perform exercise at normal operating speed.
Display Reads: **Select Hour (0-23)** **- 1 +**	Set Exercise Time. Use UP ARROW or DOWN ARROW to increment or decrement the hour. Press ENTER. Use UP ARROW or DOWN ARROW to increment or decrement the minute. Press ENTER. Use UP ARROW or DOWN ARROW to scroll to the day of the week. Press ENTER.	In the AUTO mode, the engine starts and runs once each week at the time and day specified. During the exercise cycle, the unit runs approximately 12 minutes and then shuts down. Transfer of loads to the generator does not occur unless utility power fails.

Operational Checks

NOTE: The following procedures require special tools and skills. Contact an Independent Authorized Service Dealer or an authorized service provider to perform these tasks.

Self Test

Upon power up, the controller goes through a system self test which checks for the presence of utility voltage on the DC circuits. This is done to prevent damage if the installer mistakenly connects AC utility power sense wires into the DC terminal block. If utility voltage is detected, the controller displays a warning message and locks out the generator, thereby preventing damage to the controller. Remove power to the controller to clear this warning.

Utility voltage must be turned on and present at the N1 and N2 terminals inside the generator control panel for this test to be performed and pass.

Before starting, complete the following:

1. Verify that the generator is OFF. A red LED on the control pad illuminates to confirm that the system is in the OFF mode.
2. Verify that the Main Circuit Breaker switch on the generator control panel is in the OFF (Open) position.
3. Turn off all circuit breakers/electrical loads that will be powered by the generator.
4. Verify both auxiliary shutdown switches are in the ON (I) position.
5. Check the fuel level, coolant level, and engine lubricating oil level. See ***Check Fuel Level and Fill***, ***Check Coolant Level and Hoses***, and ***Check Lubricating Oil Level***, respectively.

During initial start up only, the generator may exceed the normal number of start attempts and experience an “over crank” fault. This is due to accumulated air in the fuel system during installation. Reset the control board and restart up to two more times, if necessary. If unit fails to start, contact an IASD for assistance.

Check Manual Transfer Switch Operation

Refer to the manufacturer’s instructions.

⚠DANGER

Electrocution. Do not manually transfer under load. Disconnect transfer switch from all power sources prior to manual transfer. Failure to do so will result in death or serious injury, and equipment damage. (000132)

Electrical Checks

Complete electrical checks as follows:

1. Verify that the generator is OFF. A red LED on the control pad illuminates to confirm that the system is in the OFF mode.
2. Verify that the Main Circuit Breaker switch on the generator control panel is in the OFF (Open) position.
3. Turn OFF all circuit breakers/electrical loads that will be powered by the generator.
4. Turn on the utility power supply to the transfer switch using the means provided (such as a utility main line circuit breaker).

⚠DANGER

Electrocution. High voltage is present at transfer switch and terminals. Contact with live terminals will result in death or serious injury.

(000129)

5. Use an accurate AC voltmeter to check utility power source voltage across transfer switch terminals N1, N2, and N3 (if three phase). Normal line-to-line voltage should be equivalent to rated unit voltage.
6. Check utility power source voltage across terminals N1, N2, and N3 (if three phase) and the transfer switch neutral lug.
7. When certain that utility supply voltage is compatible with transfer switch and load circuit ratings, turn OFF the utility power supply to the transfer switch.
8. Press MANUAL on the control pad to crank and start the engine.
9. Allow the engine to warm up for about five minutes. Move the Main Circuit Breaker switch on the generator control panel up to the ON (or closed) position.
10. Connect an accurate AC voltmeter and a frequency meter across transfer switch terminal lugs E1, E2, and E3 (if three phase).
11. Successively connect the AC voltmeter test leads across terminal lugs E1, E2, and E3 (if three phase) and neutral; then across E2 and neutral. Voltage reading in each case should match utility voltage reading. If system is three phase, verify that generator phase rotation matches utility phase rotation.
12. Move the Main Circuit Breaker switch on the generator control panel down to the OFF (Open) position.
13. Press OFF on the control pad to shut the engine down.

IMPORTANT NOTE: Do not proceed unless certain that generator AC voltage and frequency are correct and within the stated limits.

Test Generator Under Load

To test the generator set with electrical loads applied, proceed as follows:

1. Verify that the generator is OFF. A red LED on the control pad illuminates to confirm that the system is in the OFF mode.
2. Turn OFF all breakers/electrical loads that will be powered by the generator.
3. Turn OFF the utility power supply to the transfer switch, using the means provided (such as a utility main line circuit breaker).

⚠DANGER

Electrocution. Do not manually transfer under load. Disconnect transfer switch from all power sources prior to manual transfer. Failure to do so will result in death or serious injury, and equipment damage.

(000132)

4. Manually set the transfer switch to the STANDBY position, i.e., load terminals connected to the generator's E1, E2, and E3 (if three phase) terminals.
5. Press MANUAL on the control pad. The engine will crank and start.
6. Allow the engine to warm up for a few minutes.
7. Move the Main Circuit Breaker switch on the generator control panel up to the ON (or closed) position. The switch is now powered by the standby generator.
8. Turn ON the circuit breaker/electrical loads powered by the generator.
9. Connect a calibrated AC voltmeter and a frequency meter across terminal lugs E1, E2, and E3 (if three phase). Voltage should be approximately unit rated voltage. Check with clamp on amp meter to ensure unit is not overloaded.
10. Let the generator run at full rated load for 20-30 minutes. Listen for unusual noises, vibration or other indications of abnormal operation. Check for oil leaks, evidence of overheating, etc.
11. When testing under load is complete, turn OFF electrical loads.
12. Move the Main Circuit Breaker switch on the generator control panel up to the OFF (or open) position.
13. Allow the engine to run at no-load for 2-5 minutes.
14. Press OFF on the control pad to shut the engine down. A red LED illuminates to confirm that the system is in the OFF mode.

Check Automatic Operation

To check the system for proper automatic operation, proceed as follows:

1. Verify that the generator is OFF. A red LED on the control pad illuminates to confirm that the system is in the OFF mode.
2. Install front cover of the transfer switch.
3. Turn ON the utility power supply to the transfer switch, using the means provided (such as a utility main line circuit breaker).

NOTE: Transfer Switch will transfer back to utility position.

4. Move the Main Circuit Breaker switch on the generator control panel up to the ON (or closed) position.
5. Press AUTO on the control pad. The system is now ready for automatic operation.
6. Turn OFF the utility power supply to the transfer switch.

With the generator ready for automatic operation, the engine will crank and start when the utility source power is turned OFF after a 10 second delay (factory default setting). After starting, the transfer switch connects load circuits to the standby side. Let the system operate through its entire automatic sequence of operation.

With the generator running and loads powered by generator AC output, turn ON the utility power supply to the transfer switch. The system transfers back to the utility position and then runs through the cool down cycle and shuts down.

Final Instructions

1. Use key to install side access panels.
2. Close viewing window.

NOTE: Obtain viewing window hasp, if not installed. See ***Figure 3-9***. With the retaining tab at the bottom, insert square end of hasp into slot below viewing window. Push on hasp until it snaps in place. Gently pull on hasp to verify that it will not come free.

3. Install customer supplied padlock into hasp.

Figure 3-9. Install Viewing Window Hasp

Shutting Generator Down While Under Load Or During A Utility Outage

⚠DANGER

Automatic start-up. Disconnect utility power and render unit inoperable before working on unit. Failure to do so will result in death or serious injury.

(000191)

IMPORTANT NOTE: To avoid equipment damage, follow these steps, in order, during utility outages. Shutdowns may be required during utility outages to perform routine maintenance or to conserve fuel.

To turn the generator OFF:

1. Set the main utility disconnect to OFF (OPEN).
2. Set the generator MLCB (generator disconnect) to OFF (OPEN).
3. Allow the generator to run for a cool-down period of approximately one minute.
4. At the controller, set the generator to OFF.
5. Remove the 7.5A fuse from the controller.

To turn the generator back ON:

1. Install 7.5A fuse in controller.
2. Confirm the generator MLCB (generator disconnect) is OFF (OPEN).
3. At the controller, set the generator to AUTO mode.
4. Generator will start and run. Allow generator to run and warm up for a few minutes.
5. Set the MLCB (generator disconnect) to ON (CLOSED).
6. Set the main utility disconnect to ON (CLOSED).

The system now operates in automatic mode.

This page intentionally left blank.

Section 4: Operation

Control Panel

NOTE: The control panel is intended for use by qualified service personnel only.

The control panel is located behind the viewing window at the rear of the unit.

IMPORTANT NOTE: With the control pad set to AUTO, the engine may crank and start at any time without warning. Such automatic starting occurs during the programmed exercise cycle or when utility power source voltage drops below the configured level. To prevent possible injury that might occur during sudden starts, always set the control pad to OFF and remove the 7.5 amp fuse before working on or around the generator or transfer switch. For added security, place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.

⚠DANGER

Automatic start-up. Disconnect utility power and render unit inoperable before working on unit. Failure to do so will result in death or serious injury.

(000191)

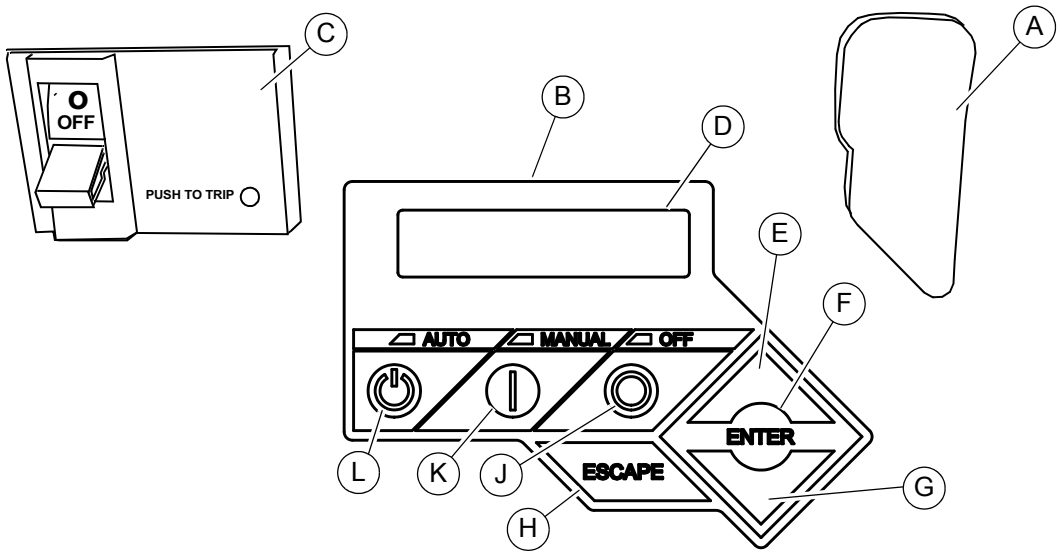


Figure 4-1. Generator Control Panel

A	7.5 Amp Fuse and USB Port Cover
B	Control pad
C	Main Circuit Breaker
D	LCD Screen
E	Up Arrow (+)
F	Enter
G	Down Arrow(-)
H	Escape
J	Off (Red LED)
K	Manual (Blue LED)
L	Auto (Green LED)

Auto/Manual/Off

Feature	Description
AUTO	Press to activate fully automatic operation. Green LED illuminates to confirm that system is in AUTO mode. Transfer to standby power occurs if utility power fails. Functionality of exercise timer is enabled, if set.
MANUAL	Press to crank and start engine. Blue LED illuminates to confirm that system is in MANUAL mode. Transfer to standby power occurs if utility power fails. Functionality of exercise timer is disabled.
OFF	Press to shut down engine, if running. Red LED illuminates to confirm that system is in OFF mode. Transfer to standby power does not occur if utility power fails.

Menu Navigation

See ***Figure 4-2***.

Feature	Description
System Menus	
HOME Screen	The system returns to the Home screen if the control pad is not used for five minutes. The screen normally displays a Status message, such as Ready to Run (Auto mode) or Switched to OFF (Off mode), and the total Hours of Protection. If an active alarm/warning condition occurs, the associated Alarm/Warning message is displayed. To clear the Alarm/Warning message, press OFF on the control pad followed by ENTER. In the event of multiple Alarms/Warnings, the next message is then displayed. The highest priority alarm is always displayed first.
MAIN MENU	Enables the operator to navigate the software using UP ARROW, DOWN ARROW, ENTER and ESCAPE. The Main Menu can be accessed from any sub menu by consecutively pressing ESCAPE. Each time ESCAPE is pressed, the preceding menu is displayed. The Main Menu is reached when the System, Date/Time, Battery, and Sub Menus are displayed.
Navigation	
ESCAPE	Used to abort a routine or back up to the preceding menu.
ENTER	Used to make a selection or save an entry.
UP ARROW **DOWN ARROW**	Used to move forward or backward from menu to menu or to scroll forward or backward (increment or decrement) through available selections.
NOTE: Pressing the control pad illuminates the backlight for 30 seconds. The backlight also illuminates for 30 seconds whenever an active Alarm/Warning message is displayed.	

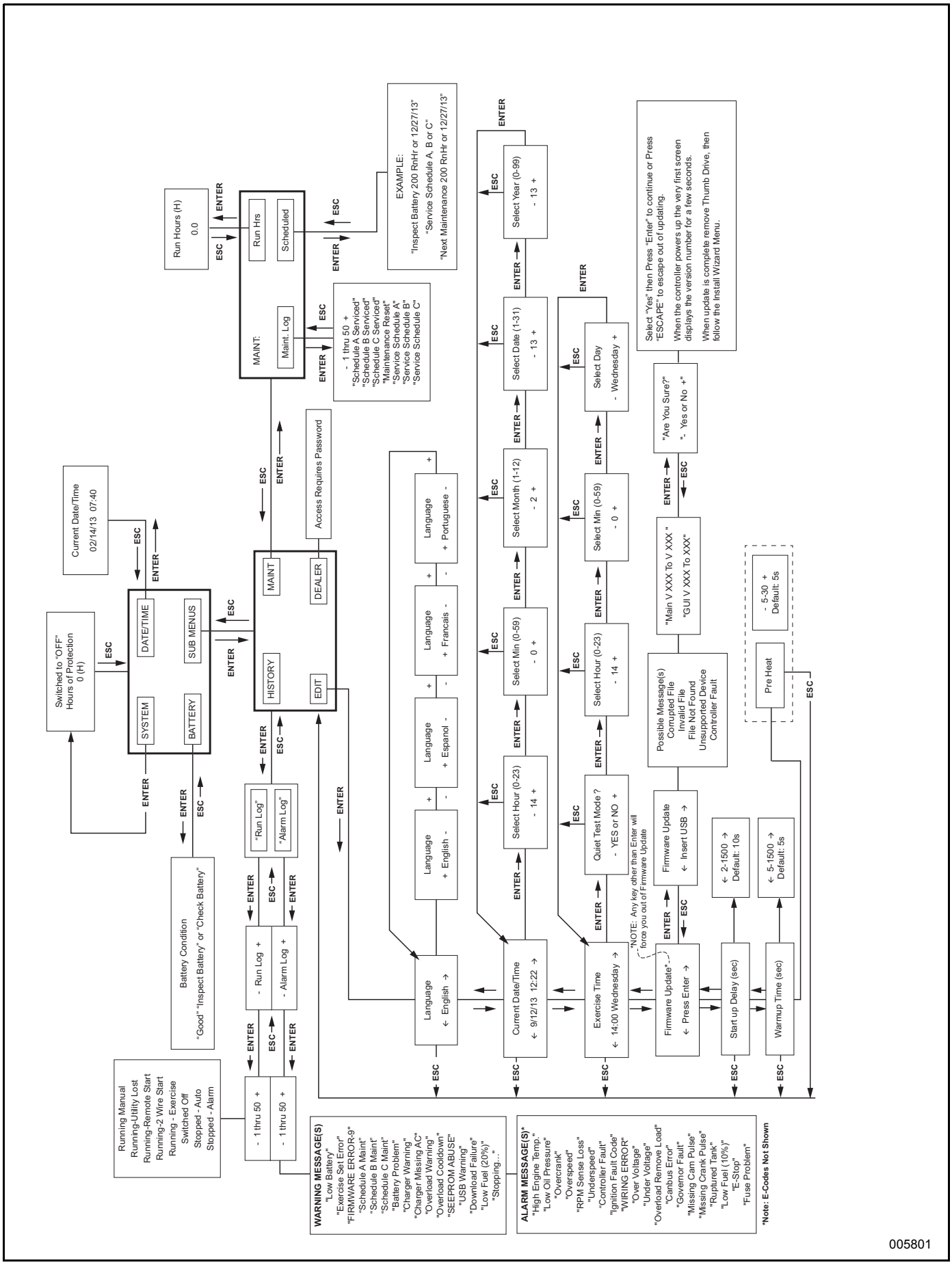


Figure 4-2. Navigation Menu

Alarm/Warning Conditions

The owner/operator is alerted to Alarm and/or Warning conditions via the control panel LCD screen. All Alarm conditions cause the generator to shut down. The Warning messages alert the operator to conditions that do not disable the unit or require immediate correction.

The possible Alarm/Warning messages are listed below.

Alarm Messages

- High Engine Temperature
- Low Coolant Level
- Low Oil Pressure
- Overcrank
- Overspeed
- RPM Sense Loss
- Underspeed
- Controller Fault
- Ignition Fault Code
- WIRING ERROR
- Over Voltage
- Under Voltage
- Overload Remove Load
- Canbus Error
- Governor Fault
- Missing Cam Pulse
- Missing Crank Pulse
- Ruptured Tank
- Low Fuel (10%)
- E-Stop
- Fuse Problem
- Auxiliary Shutdown

Warning Messages

- Low Battery
- Exercise Set Error
- FIRMWARE ERROR-9
- Schedule A Maintenance
- Schedule B Maintenance
- Schedule C Maintenance
- Battery Problem
- Charger Warning
- Charger Missing AC
- Overload Warning
- Overload Cooldown
- SEEPROM ABUSE
- USB Warning
- Download Failure
- Low Fuel (20%)
- Stopping…

NOTE: Unless properly trained to correct and clear Alarm/Warning conditions, contact an Independent Authorized Dealer or trained service technician.

Change Time and Date

To change the time and date after activation, see the Navigation Menu in ***Figure 4-2***. If power is lost (battery is disconnected/reconnected, control panel fuse is removed/installed, etc.), the display automatically prompts the user for the Time and Date. All other information is retained in memory.

Programmable Timers

Dealer Programmable

Exercise Time

A programmable exercise time is provided. In the AUTO mode, the engine starts and runs once each week at the time and day specified. During the exercise cycle, the unit runs approximately 12 minutes and then shuts down. Transfer of loads to the generator does not occur unless utility power fails.

NOTE: A Dealer password is required to change the Exercise time.

User Programmable

Start-Up Delay Timer

A programmable line interrupt delay (or Start-Up Delay) timer is provided. When utility voltage fails (falls below 65% of nominal), the start-up delay timer is started. If the voltage rises above the Utility Volts Low threshold, the timer is reset. If the utility voltage remains below the threshold during the duration of the timer, the unit cranks and starts.

NOTE: The factory default setting is five seconds, but is adjustable from 2 to 1500 seconds.

Warm-Up Delay Timer

A programmable Warm-Up Delay timer is provided. As soon as the generator starts, the warm-up timer is started. When the warm-up timer expires, the control transfers load to the generator (through the transfer switch) if the utility voltage is less than 80% of nominal. If utility voltage is greater than the threshold at expiration of the warm-up time, the load is **not** transferred to the generator and a cool-down period begins. At the end of the cool-down period, the generator stops.

NOTE: The factory default setting is five seconds, but is adjustable from 5 to 1500 seconds.

USB Port for Firmware Updates

A USB port is located beneath the rubber flap on the control panel, and is provided for firmware updates. Firmware updates must be performed by an IASD.

NOTE: The USB port is intended for use with a USB thumb drive only. The USB port is not intended for charging devices such as phones or laptops. Do not connect any consumer electronics to the USB port.

Battery Charger

NOTE: The battery charger is integrated into the control panel module.

The battery charger ensures:

- Output is continually optimized to promote maximum battery life.
- Charging levels are safe.

NOTE: A warning message is displayed on the LCD screen when the battery requires service.

Transfer Switch Automatic Operation

In AUTO, the generator starts automatically when utility source voltage drops below the preset level. Once the unit starts, loads are transferred to the standby power source.

To select automatic operation:

1. Verify that the transfer switch main contacts are set to the UTILITY position (loads connected to the utility power source).
2. Verify that normal UTILITY power source voltage is available to transfer switch terminal lugs N1, N2 and N3 (if three phase).
3. Move the Main Circuit Breaker switch on the control panel up to the ON (Closed) position.
4. Press AUTO on the control pad. A green LED illuminates to confirm that the system is in the AUTO mode.

Automatic Sequence of Operation

Utility Failure

If the control pad is set to AUTO when the utility power fails (falls below 65% of nominal, dealer programmable), a ten second Start-Up Delay timer is started (user programmable). If utility power is still absent when the time expires, the engine cranks and starts.

Once started, a **five** second engine Warm-Up Delay timer starts (user programmable). When the time has elapsed, the load is transferred to the generator. If utility power is restored (above 80% of nominal, dealer programmable) between the time the engine is first started and expiration of the warm-up time, the controller completes the start cycle and then runs through its normal cool-down cycle (while the load remains on the utility source throughout the episode).

Cranking

The cyclic cranking is controlled as follows:

Fifteen (15) seconds crank, seven (7) seconds rest, seven (7) seconds crank, seven (7) seconds rest; this sequence is repeated for a total of six (6) crank cycles.

Load Transfer

With the generator running, the transfer of load is dependent upon the operating mode as follows:

AUTO	• Starts and runs if utility power fails (falls below 65% of nominal) for **five** consecutive seconds (adjustable). • Starts a **five** second (adjustable) engine warm-up timer. • Does not execute transfer if utility power returns before expiration of warm-up timer (but finishes the warm-up and cool-down cycles). • Transfers back to utility once utility power returns (above 80% of nominal) for **fifteen** consecutive seconds. • Only shuts down if OFF is pressed or an alarm shutdown occurs. • Once utility power returns, starts a cool-down cycle before it shuts down. **NOTE:** Cool-down cycle is **five** minutes if turbocharger equipped, one minute if naturally aspirated.
	EXERCISE
	• Only works in the AUTO mode. • Does not exercise if generator is already running in AUTO. • During exercise cycle, transfers only if utility power fails for **ten** consecutive seconds.
MANUAL	• Engine cranks and runs even if utility power is present, but does not transfer to generator. • Transfers to generator if utility fails (falls below 65% of nominal) for **ten** consecutive seconds. • Transfers back to utility when utility returns for **fifteen** consecutive seconds. The engine continues to run until the AUTO or OFF key is pressed.

Transfer Switch Manual Operation

⚠DANGER

Electrocution. Do not manually transfer under load. Disconnect transfer switch from all power sources prior to manual transfer. Failure to do so will result in death or serious injury, and equipment damage. (000132)

Prior to automatic operation, manually exercise the transfer switch to verify that there is no binding or interference with proper operation of the mechanism. Manual operation of the transfer switch is required if automatic operation fails.

IMPORTANT NOTE: Always use the applicable transfer switch owner's manual for actual manual transfer switch operation instructions. The information presented here describes a typical V-style transfer switch, which is not used for three phase applications.

Transfer to Generator Power

When utility power fails, manually transfer to standby power and start the generator as follows:

1. Press OFF on the control pad. A red LED illuminates to confirm that the system is in the OFF mode.
2. Move the Main Circuit Breaker switch down to the OFF (Open) position.
3. Turn off the utility power supply to the transfer switch using the means provided (such as a utility main line circuit breaker).
4. See ***Figure 4-3***. Use the manual transfer handle (A) inside the transfer switch to move the main contacts to the STANDBY position (loads connected to the standby power source) (C).
5. Press MANUAL on the control pad. The engine cranks and starts.
6. Allow the engine to run for two minutes to bring it up to normal operating temperature.
7. Move the Main Circuit Breaker switch up to the ON (Closed) position.

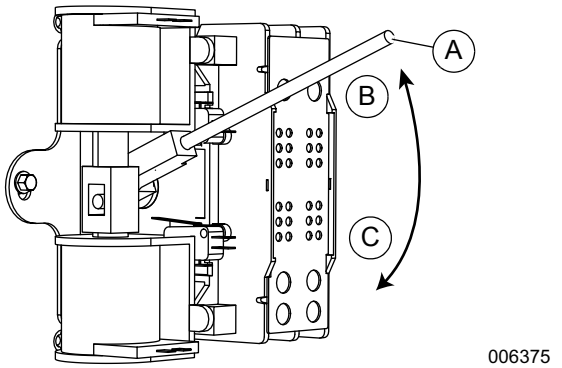


Figure 4-3. Manual Transfer Switch Operation (Typical)

NOTE: V-style transfer switch not used for three phase applications.

Transfer Back to Utility Power

When utility power is restored, manually transfer back to utility power and shut down the generator as follows:

NOTE: Verify that utility voltage has returned and is at the proper value.

1. Move the Main Circuit Breaker switch down to the OFF (Open) position.
2. Allow the engine to run for two minutes at no-load to bring it up to normal operating temperature.
3. Press OFF on the control pad to shut down the engine.
4. Verify that utility power supply to the transfer switch is turned off.
5. Use the manual transfer handle inside the transfer switch to move the main contacts to the UTILITY position (B) (loads connected to the utility power source).
6. Turn on the utility power supply to the transfer switch using the means provided.
7. Press AUTO on the control pad. A green LED illuminates to confirm that the system is in the AUTO mode.

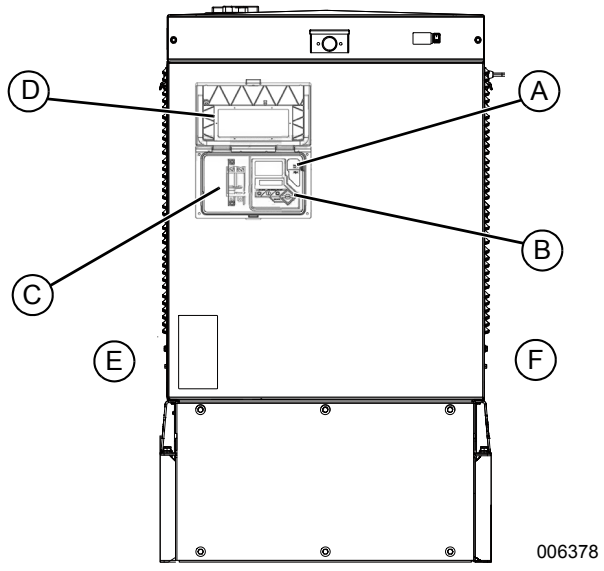
This page intentionally left blank.

Section 5: Maintenance

Component Locations

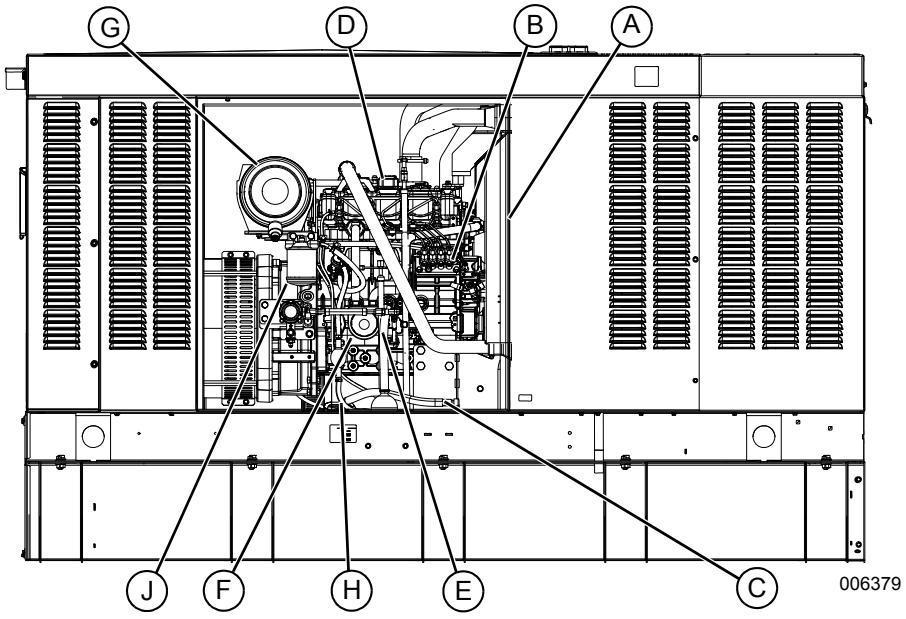
The side of the enclosure with the viewing window is identified as the rear of the generator set. The right and left sides are identified by standing at the rear and looking towards the front of the unit.

NOTE: The 2.2L engine is depicted in the artwork used in this manual. The location and appearance of some components may vary between engine models.



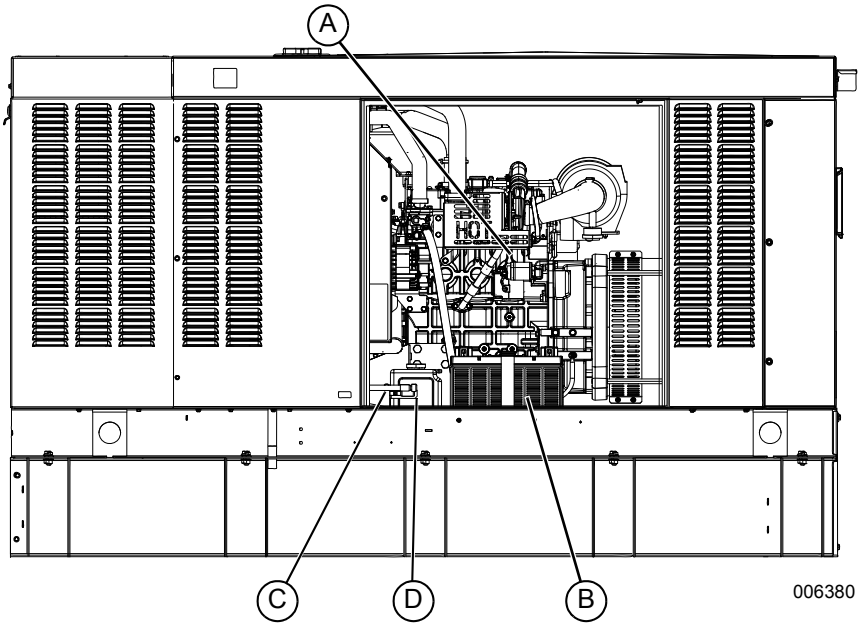
A	7.5 Amp Fuse and USB Port
B	Control Panel and LCD Screen
C	Main Circuit Breaker
D	Viewing Window
E	Left Side
F	Right Side

Figure 5-1. Rear View



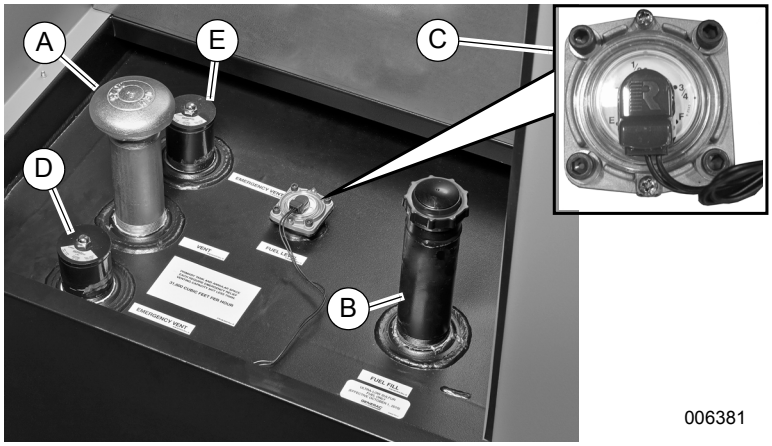
A	V-Belt (not shown)
B	Electronic Governor (2.2L engines)
C	Oil Drain Hose
D	Oil Fill Cap
E	Oil Level Dipstick
F	Oil Filter
G	Air Filter
H	Fuel Supply/Return Hoses
J	Fuel Filter/Air Bleed

Figure 5-2. Right Side View



A	Governor Linkage (2.5L engines; not shown)
B	Battery
C	Coolant Drain Hose
D	Coolant Overflow Reservoir

Figure 5-3. Left Side View



A	Fuel Tank (Primary Vent)
B	Fuel Filler Spout
C	Fuel Level Gauge
D	Emergency Vent (Secondary Tank)
E	Emergency Vent (Primary Tank)

Figure 5-4. Front View

Access Panels

Access panels are located at both the front and sides of the enclosure.

Removal

1. See ***Figure 5-5***. Insert key (B) into latch (A) and rotate counterclockwise 1/2 turn.

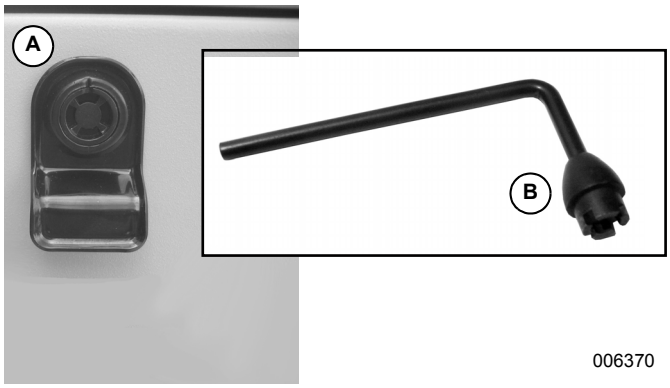


Figure 5-5. Access Panel Key

2. Raise panel using thumb latch.

Installation

1. Lower panel into position using thumb latch.
2. Insert key into latch and rotate clockwise 1/2 turn.

Service Maintenance Intervals

NOTE: Generac recommends using genuine Generac OEM parts to avoid problems that could affect your warranty coverage.

⚠WARNING

Equipment damage. Only qualified service personnel may install, operate, and maintain this equipment. Failure to follow proper installation requirements could result in death, serious injury, and equipment or property damage.

(000182a)

It is important to perform all maintenance at the interval specified in the Service Maintenance Schedule. This ensures safe and proper operation, as well as compliance with applicable emissions standards. Critical emissions maintenance must be performed for the Emissions Warranty to remain valid. Service and repairs may be performed by any qualified service technician or repair shop.

Observe the maintenance tasks and intervals shown in the table below.

Service	30 Hours Engine Break In	Daily If Running Continuously	Schedule A Every Year or 125 Hours	Schedule B Every 2 Years or 250 Hours	Schedule C Every 1000 Hours
Check Fuel Level and Fill		•	•	•	•
Drain Fuel Filter		•	•	•	•
Check Fuel Lines and Hoses		•	•	•	•
Check Coolant Level		•	•	•	•
Check Coolant Hoses		•	•	•	•
Check Radiator for Clogging		•	•	•	•
Check Lubricating Oil Level		•	•	•	•
Check Battery Condition/Fluid Level			•	•	•
Check/Adjust V-Belt Tension			•	•	•
Replace Air Filter Element			•	•	•
Drain Breather Canister and Replace Filter			•	•	•
Lubricate Governor Rod Linkage			•	•	•
Replace Lubricating Oil and Oil Filter	•			•	•
Replace Fuel Filter Element				•	•
Drain/Flush Coolant System				•	•
Inspect Fuel Tank					•
Check/Adjust Fuel Injection Valve Pressure					•
Adjust Intake/Exhaust Valve Clearance					•
Check/Adjust Fuel Injection Pump Timing					•
Tighten Critical Fasteners					•

NOTE: If the unit reaches a Schedule A or Schedule B maintenance interval with 900 to 999 total hours, have an authorized service provider perform the Schedule C maintenance tasks as well (and reset the A-B-C/Year maintenance schedule counter).

Remove From Service

To ensure safety, follow the steps below prior to inspection, maintenance or service.

IMPORTANT NOTE: If currently experiencing a utility outage, see Subsection ***Removal From Service During Utility Outages*** for special instructions.

1. Open the viewing window. See ***Open Viewing Window***.
2. Move the Main Circuit Breaker switch down to the OFF (Open) position (A). See ***Figure 5-6***.
3. Press OFF (B) on the control pad. A red LED illuminates to confirm that the system is in the OFF mode.
4. Remove T1 fuse from transfer switch.
5. Pull up rubber flap (C) covering fuse holder and remove 7.5 amp fuse.
6. Place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.
7. If the unit has been running, wait five minutes for the engine to cool.

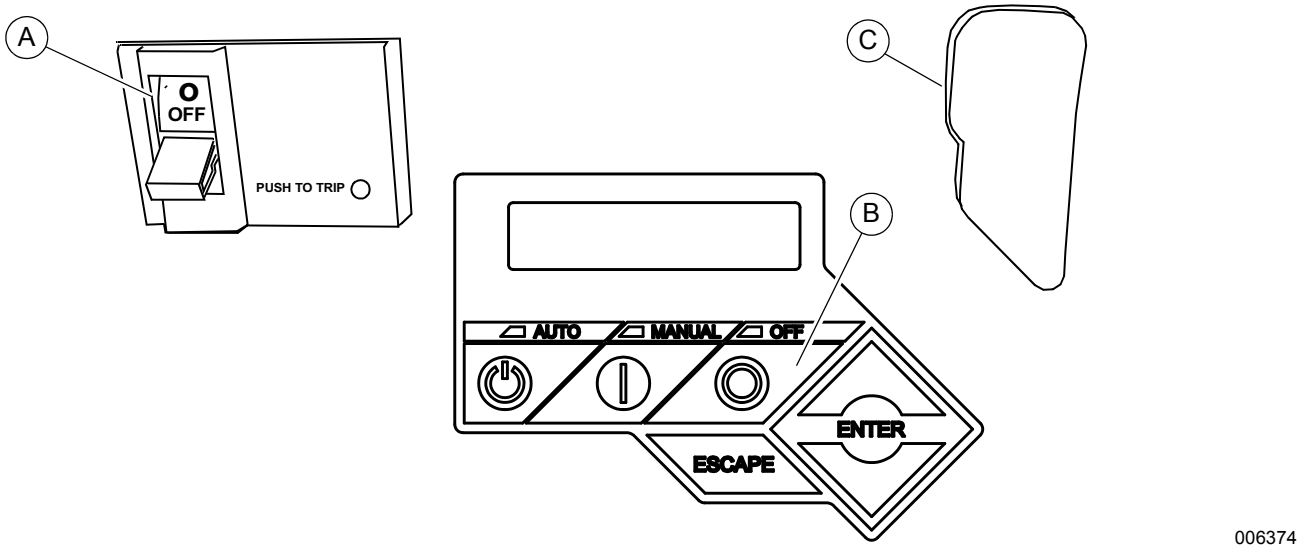


Figure 5-6. Generator Control Panel

30 Hour Break-In

Perform the following task:

- Replace Lubricating Oil and Oil Filter

NOTE: See ***Replace Lubricating Oil and Oil Filter*** under Schedule B Maintenance.

Daily Maintenance (If Running Continuously)

Perform the following tasks:

- Check Fuel Level and Fill
- Drain Fuel Filter
- Check Fuel Lines and Hoses
- Check Coolant Level
- Check Coolant Hoses
- Check Radiator for Clogging
- Check Lubricating Oil Level

NOTE: See ***Preliminary Instructions*** through ***Check Lubricating Oil Level*** under Schedule A Maintenance.

Schedule A Maintenance

NOTE: Perform Schedule A maintenance once each year or after 125 hours of service, whichever comes first.

Preliminary Instructions

1. See ***Remove From Service***.
2. Remove access panels at the front and both sides of the enclosure. See ***Access Panels***.
3. Remove negative battery cable (black) from negative (-) battery terminal.

NOTE: For general location of components, see ***Component Locations***.

Check Fuel Level and Fill

1. Observe fuel gauge to note level of fuel in tank. See ***Figure 5-7***.
2. Remove fuel fill cap from filler pipe.
3. Add fuel until needle on fuel gauge approaches the F(ull) mark.
4. Install fuel fill cap onto filler pipe.

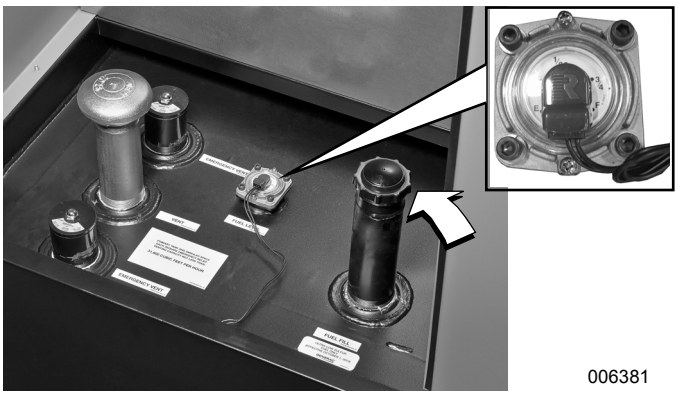


Figure 5-7. Check Fuel Level Gauge and Fill

Drain Fuel Filter and Check Fuel Lines/Hoses

1. See ***Figure 5-8***. Place a shop rag beneath the fuel filter (A) to catch water or fuel drips.

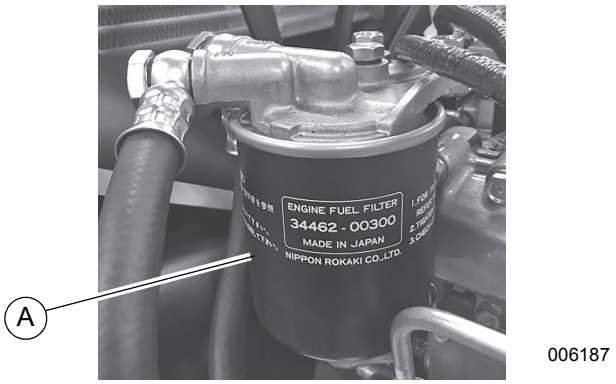


Figure 5-8. Drain Fuel Filter

2. Rotate fuel filter counterclockwise to remove from filter adapter.
3. Install **new** fuel filter by hand until gasket just contacts filter adapter. Tighten fuel filter an additional 3/4 to one full turn.

NOTE: Dispose of used filter at a proper collection center.

4. Check fuel filter and fuel lines/hoses for leaks. Tighten filter, fittings, and hose clamps if necessary.
5. Check fuel hoses for nicks, cuts, tears, or general deterioration. Replace as necessary.

Check Coolant Level and Hoses

⚠WARNING

Risk of burns. Allow engine to cool before draining oil or coolant. Failure to do so could result in death or serious injury.

(000139)

NOTE: On 2.5L models, remove ten screws to release louvered air discharge panel on left side of enclosure.

1. See ***Figure 5-9***. Verify coolant level is between the HOT and COLD marks on the overflow reservoir (B). Coolant expands when hot, so the level may be higher than the HOT mark. Do not add coolant higher than the HOT mark.
2. If the coolant level is below the COLD mark, remove fill cap from overflow reservoir and add coolant. See ***Coolant Water Treatment***.
3. Check coolant hoses (A) for leaks. Tighten hose clamps, if necessary.
4. Check hoses for nicks, cuts, tears or general deterioration. Replace as necessary.

NOTE: On 2.5L models, install louvered air discharge panel. Alternately tighten ten screws to 90 in-lb (10 Nm) using a crosswise pattern.

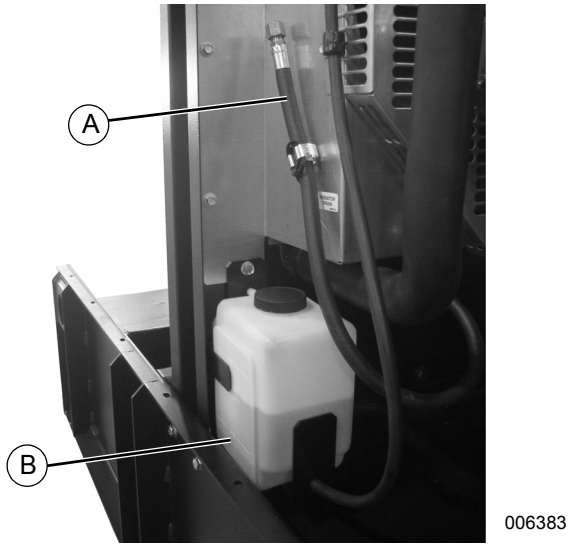


Figure 5-9. Coolant Overflow Reservoir and Drain Hose

Check Radiator for Clogging

Direct flashlight beam through openings in fan guard to inspect radiator fins. Carefully look for debris, accumulations of dirt or other deposits. If necessary, clean as follows:

1. On right side of enclosure, loosen two clamps at each end of turbocharger exhaust outlet pipe. Remove pipe, clamps and rubber couplings from engine.
2. Remove four screws with nylon washers to release fan guard from radiator shroud.
3. On left side of enclosure, loosen two clamps at each end of air intake pipe. Remove pipe, clamps and rubber couplings from engine.
4. Remove coolant hoses from holding clamps.
5. Remove four screws with nylon washers to release fan guard from radiator shroud.
6. Carefully remove any debris from radiator fins. Use warm soapy water and a soft bristled brush to remove dirt and other deposits, if necessary.
7. On left side of enclosure, install four screws with nylon washers to fasten fan guard to radiator shroud.
8. Install coolant hoses into holding clamps.

9. Install clamps and rubber couplings onto each end of air intake pipe. Install pipe to air heater and radiator shroud. Tighten clamps.
10. On right side of enclosure, install four screws with nylon washers to fasten fan guard to radiator shroud.
11. Install clamps and rubber couplings onto each end of turbocharger exhaust outlet pipe. Install pipe to turbocharger outlet and radiator shroud. Tighten clamps.

Check Lubricating Oil Level

1. Remove dipstick (A) and wipe with a clean cloth. See ***Figure 5-10***.
2. Completely insert the dipstick and then remove it.
3. Verify that the oil level is at or near the H(igh) mark.

NOTE: Each hash mark or line below the H(igh) mark represents one liter. Add oil whenever the level is one liter or more below the H(igh) mark.

4. If necessary, remove the oil fill cap and slowly add oil until the level is at the H(igh) mark (B). **DO NOT OVERFILL**.
5. Install dipstick and oil fill cap.
6. Check oil drain hose for leaks. Check hose for nicks, cuts, tears or general deterioration. Replace as necessary.

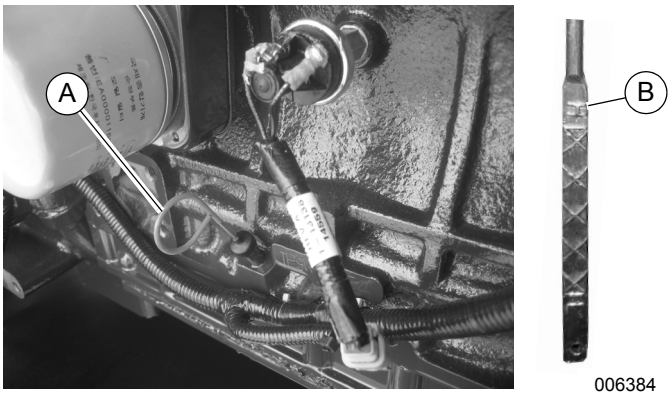


Figure 5-10. Oil Level Dipstick

Check Battery Condition/Fluid Level

Check Condition and Clean

NOTE: On 2.5L models, remove ten screws to release louvered air intake panel on left side of enclosure.

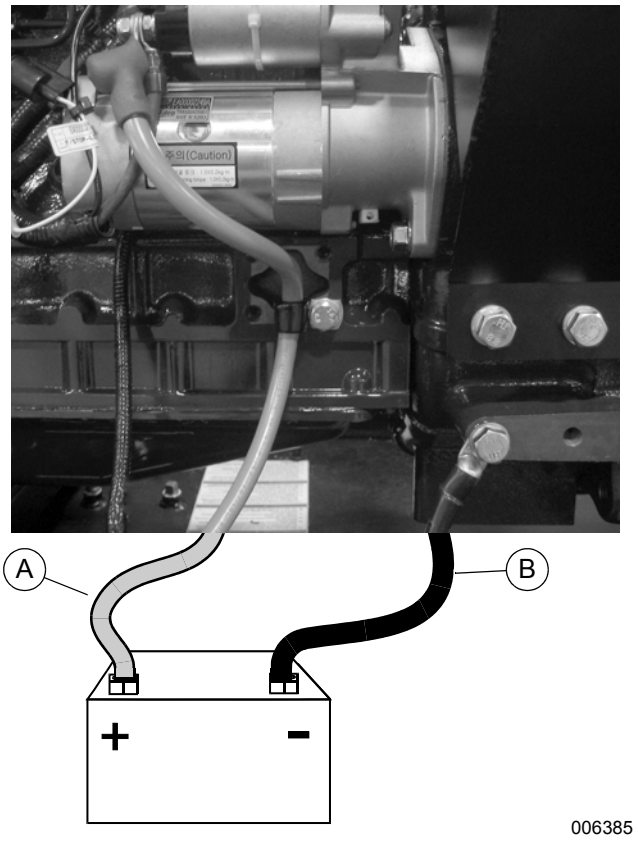


Figure 5-11. Battery Cable Connections

1. Verify top of battery is clean and dry. Dirt and electrolyte on top of the battery can cause battery to self-discharge. Clean battery top with a solution of baking soda (sodium bicarbonate) and water (5 teaspoons baking soda per quart or liter of water). When solution stops bubbling, rinse off the battery with clean water.
2. Clean cable clamps and battery terminals using a wire brush or sandpaper to remove any oxidation.
3. Inspect battery screws, clamps and cables for breakage, loose connections and corrosion. Tighten and clean as necessary.
4. Check the battery posts for melting or damage caused by over tightening.
5. Inspect battery for discoloration, raised top or a warped or distorted case, which might indicate that the battery has been frozen, overheated or overcharged.
6. Inspect the battery case for cracks or leaks.
7. Check the battery fluid level of unsealed batteries. See ***Check Fluid Level***.
8. Check the battery state of charge. See ***Check State of Charge***.
9. Replace battery if necessary. See ***Battery Replacement***.

NOTE: On 2.5L models, start ten screws to install louvered air intake panel. Alternately tighten screws to 90 in-lb (10 N-m) using a crosswise pattern.

Check Fluid Level

Check the fluid level of unsealed batteries. If necessary, fill with distilled water only. DO NOT use tap water.

Check State of Charge

Check the state of charge using a Digital Multimeter. Recharge and retest if state of charge is below manufacturer's recommendations. Replace battery if necessary.

Battery Replacement

Removal

⚠WARNING

Accidental Start-up. Disconnect the negative battery cable, then the positive battery cable when working on unit. Failure to do so could result in death or serious injury. (000130)

1. Remove negative battery cable (black) (B) from negative (-) battery terminal.
2. Remove positive battery cable (red) (A) from positive (+) battery terminal.
3. See ***Figure 5-12***. Install rubber protective cover (C) over positive (+) battery terminal.
4. Loosen two screws with nylon washers to release battery hold-down clamp from battery tray, or loosen strap and position away from tray.
5. Grasp battery strap (D) next to positive (+) battery terminal, and lift battery.
6. When battery tilts sideways, remove from opening.
7. Remove rubber protective cover from positive (+) battery terminal.

Installation

NOTE: Always connect the positive (+) battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion.

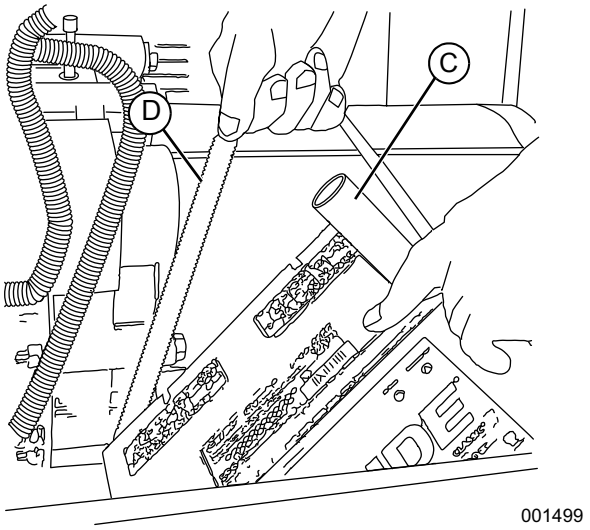


Figure 5-12. Remove/Install Battery

1. See ***Figure 5-12***. Install rubber protective cover (C) over positive (+) battery terminal.
2. Grasp battery strap (D) next to positive (+) battery terminal, and lift battery.
3. When battery tilts sideways, insert into opening.
4. Return battery to the horizontal position while sliding it onto battery tray.
5. Tighten two screws with nylon washers to secure hold-down clamp to battery tray, or tighten strap over top of battery.
6. Remove rubber protective cover from positive (+) terminal.
7. Install battery positive cable (red) to battery positive (+) battery terminal.
8. Install battery negative cable (black) to negative (-) battery terminal.

Check and Adjust V-Belt

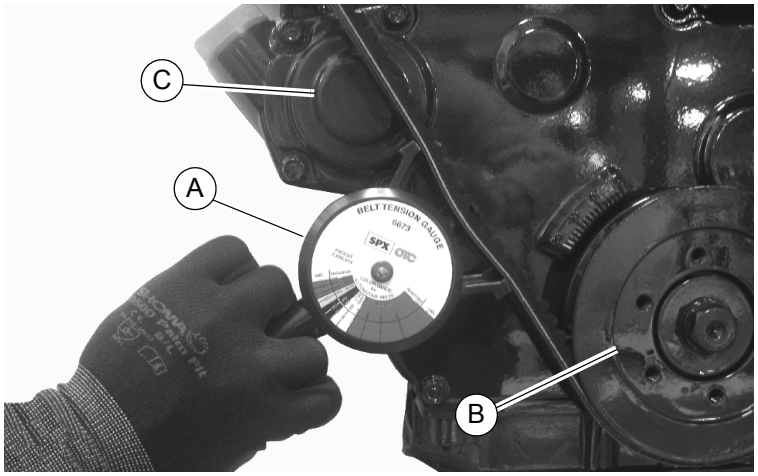
Check the V-belt deflection. Too little belt deflection accelerates belt wear, while too much deflection causes the pulley to idle, overheats the engine, and creates a no-load condition. Check and adjust belt deflection as follows:

1. On right side of enclosure, loosen two clamps at each end of turbocharger exhaust outlet pipe. Remove pipe, clamps and rubber couplings from engine.
2. Remove four screws with nylon washers to release fan guard from radiator shroud.
3. Perform visual inspection as follows:
   - Inspect belt for cracks, fraying, excessive wear or other damage.
   - Verify belt is free of grease and oil. Replace belt if contaminated.

NOTE: Use a solution of soap and warm water to clean pulleys, if necessary. Avoid use of solvents, but if used, always follow by a soap and water wash.

4. Using a suitable belt deflection gauge (A), apply 22 lbs (10 kg) force midway between the crankshaft (B) and alternator pulleys (C). See ***Figure 5-13***.
5. Take note of gauge reading. If belt deflection is not within specification, see ***Adjust V-Belt Tension***.

Belt Condition	Deflection
New	0.31–0.47 in (8–12 mm)
Used	0.39–0.59 in (10–15 mm)



006386

Figure 5-13. Check V-Belt Deflection

Adjust V-Belt Tension

1. Loosen tension adjuster screw (top). Loosen hex nut on pivot screw (bottom). Rotate alternator outward to reduce belt deflection, rotate inward to increase belt deflection.
2. Tighten tension adjuster screw (top) to 17-22 ft-lbs (23-30 Nm). Tighten hex nut on pivot screw (bottom) to 33-43 ft-lbs (45-58 Nm).
3. Recheck belt deflection and repeat steps as necessary.
6. Install four screws with nylon washers to fasten fan guard to radiator shroud.
7. Install clamps and rubber couplings onto each end of turbocharger exhaust outlet pipe. Install pipe to turbocharger outlet and radiator shroud. Tighten clamps.

Replace Air Filter Element—2.5L Engine

1. See ***Figure 5-14***. Remove wing nut (A), flat washer (B), and lock washer (C) from threaded rod to release air cleaner cover (D).

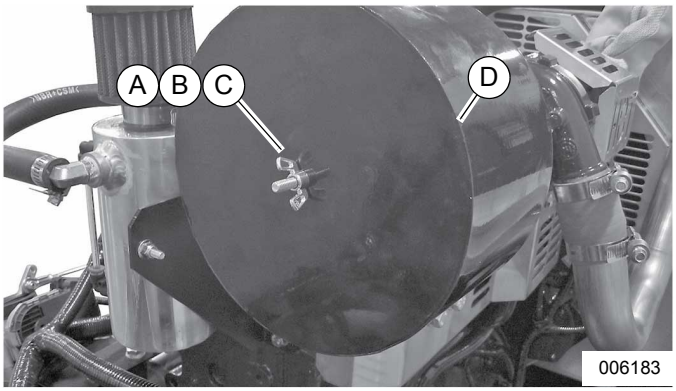


Figure 5-14. Remove Air Cleaner Cover—2.5L Engine

2. See ***Figure 5-15***. Remove air filter element (E) and discard.

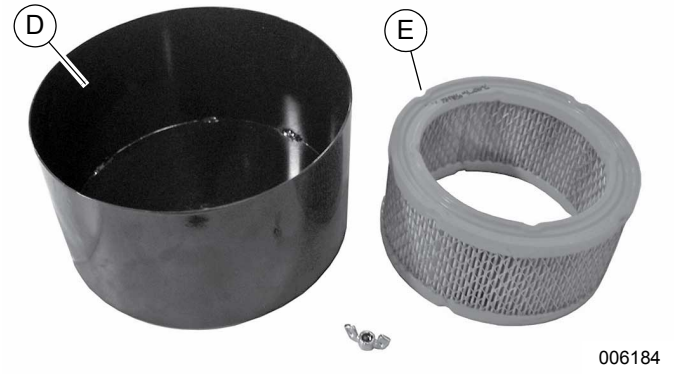


Figure 5-15. Remove Air Cleaner Element—2.5L Engine

3. Thoroughly clean air cleaner cover (D) of any dust, dirt, or debris.
4. Place **new** air filter element against adapter flange.

NOTE: The air filter element is not directional.

5. Install air cleaner cover over threaded rod, followed by flat washer, lock washer, and wing nut. Tighten wing nut until snug.

Replace Air Filter Element—2.2L Engine

NOTE: The 2.2L engine is equipped with an alternate-style air cleaner.

1. See ***Figure 5-16***. Release three buckle clasps from end cap (A) of air cleaner canister (B). Remove end cap.

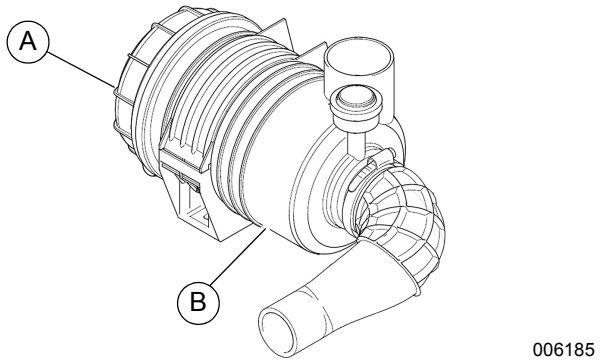


Figure 5-16. Disassemble Air Cleaner—2.2L Engine

2. See ***Figure 5-17***. Remove air filter element (C) and discard.

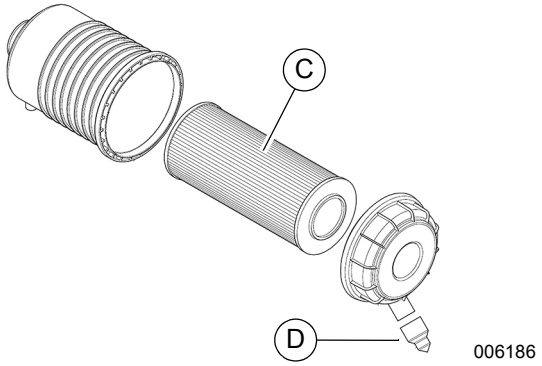


Figure 5-17. Remove Air Cleaner Element—2.2L Engine

3. Thoroughly clean air cleaner canister, end cap, and breather (D) of any dust, dirt, or debris.
4. Place **new** air filter element inside canister.

NOTE: The air filter element is not directional.

5. Install end cap on air cleaner canister and buckle three clasps.

Lubricate Governor Rod Linkage (2.5L Engine)

1. Lubricate both ends of rod (A) with a silicone spray. See ***Figure 5-18***.
2. Verify rod moves freely without binding.

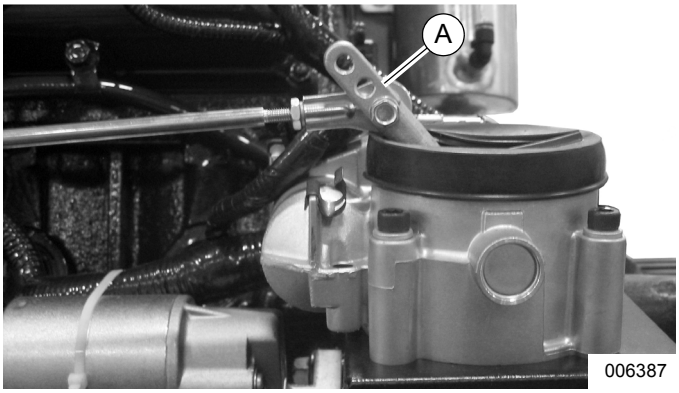


Figure 5-18. Lubricate Governor Rod Ends (2.5L Engine)

Final Instructions

1. Install negative battery cable (black) onto negative (-) battery terminal.
2. Install access panels at the front and both sides of the enclosure. See ***Access Panels***.
3. See ***Return To Service***.

Schedule B Maintenance

NOTE: Perform Schedule B maintenance every two years or after 250 hours of service, whichever comes first. Before proceeding below, first perform all tasks listed under Schedule A Maintenance.

NOTE: For general location of components, see ***Component Locations***.

Replace Lubricating Oil and Oil Filter

1. See ***Figure 5-19***. Remove oil drain hose from holding clamp (A). Use one wrench to hold hex on hose fitting (to prevent rotation), and use second wrench to remove drain plug.
2. Drain oil into a suitable container.
3. Install drain plug onto end of oil drain hose.
4. Install oil drain hose into holding clamp.
5. Rotate oil filter counterclockwise to remove from oil filter adapter.
6. Apply a light coat of clean engine oil to gasket of **new** oil filter.
7. Install oil filter by hand until gasket just contacts oil filter adapter. Tighten oil filter an additional 3/4 to one full turn.
8. Remove fill cap (B) and fill engine with the recommended oil. See ***Engine Oil Recommendations***.
9. Install fill cap.
10. Install negative battery cable (black) onto negative (-) battery terminal.
11. Pull up rubber flap covering fuse holder and install 7.5 amp fuse.
12. Press MANUAL on the control pad to start the engine.
13. Allow the engine to run for one minute. Check for leaks while the engine is running.
14. Press OFF on the control pad. A red LED illuminates to confirm that the system is in the OFF mode.
15. Wait a few minutes for the engine to cool and to allow oil to drain back to the oil pan.
16. Check oil level and add oil as necessary. **DO NOT OVERFILL**.
17. Install fill cap.

NOTE: Dispose of used oil and oil filter at a proper collection center.

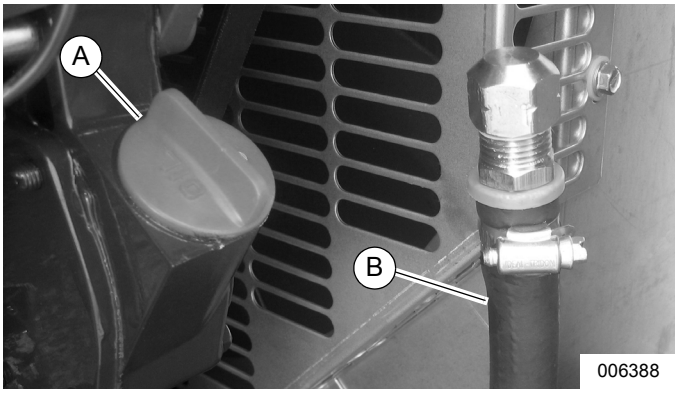


Figure 5-19. Oil Fill Cap and Drain Hose

Drain Fuel Filter and Check Fuel Lines/Hoses

1. See ***Figure 5-20***. Place a shop rag beneath the fuel filter (A) to catch water or fuel drips.

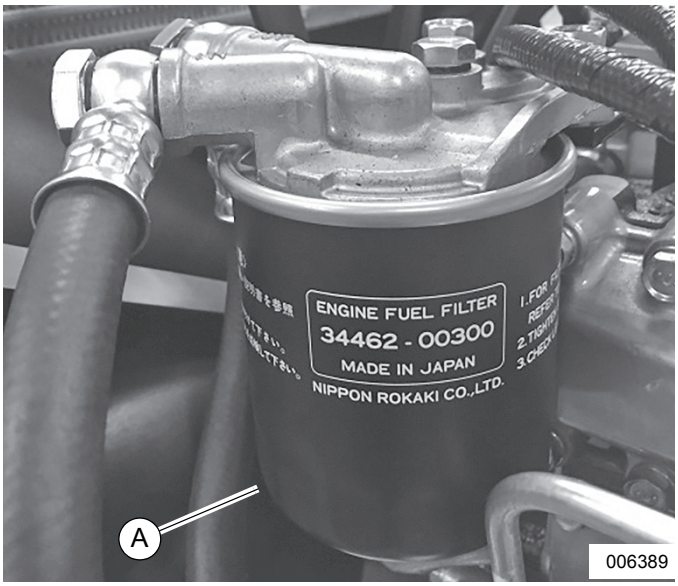


Figure 5-20. Drain Fuel Filter

2. Rotate fuel filter counterclockwise to remove from filter adapter.
3. Install **new** fuel filter by hand until gasket just contacts filter adapter. Tighten fuel filter an additional 3/4 to one full turn.

NOTE: Dispose of used filter at a proper collection center.

4. Check fuel filter and fuel lines/hoses for leaks. Tighten filter, fittings, and hose clamps if necessary.
5. Check fuel hoses for nicks, cuts, tears, or general deterioration. Replace as necessary
6. See ***Prime Fuel System*** in “Activation and Startup.”

Prime Fuel System

See ***Prime Fuel System*** in “Activation and Startup.”

Drain/Flush Coolant System

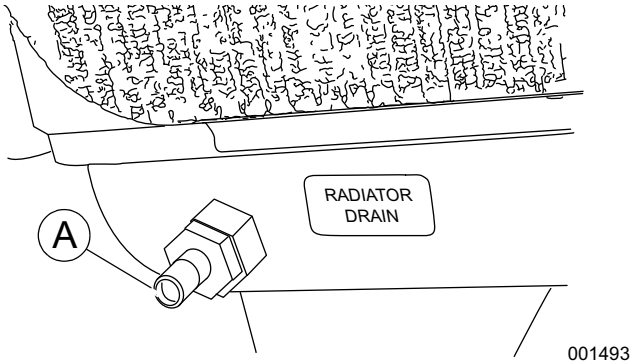
NOTE: On 2.5L models, remove ten screws to release louvered air discharge panel on left side of enclosure.

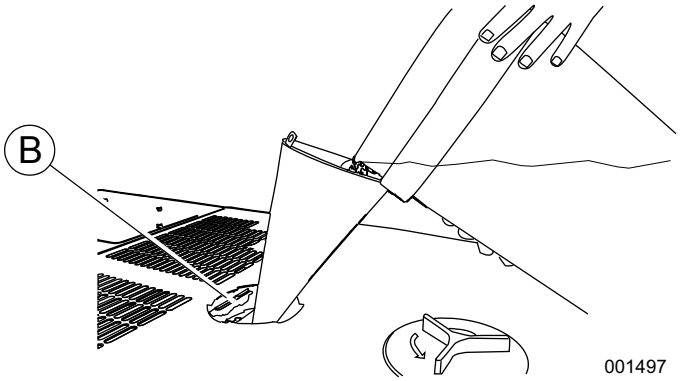
1. Disconnect and empty coolant overflow reservoir.
2. Install and connect coolant overflow reservoir.

IMPORTANT NOTE: Verify that the engine is cool before removing the radiator cap. The cooling system is under pressure, so steam and hot liquid can come out forcefully when the cap is loosened.

3. Slowly unscrew radiator cap.
4. Locate drain cock (A) at bottom left side of radiator. Rotate hex fitting to open drain cock. See ***Figure 5-21***.
5. Remove coolant drain hose from holding clamp.
6. Use wrench to hold hex on hose fitting (to prevent rotation), and use second wrench to remove drain plug.
7. Drain coolant into a suitable container.
8. Install plug at end of drain hose.
9. Install drain hose in holding clamp.
10. Rotate hex fitting to close radiator drain cock.
11. Obtain at least 3.0 gal (11.44 liters) of coolant. See ***Engine*** in “Specifications.”
12. Rotate and remove plastic cover at top of enclosure and insert funnel into filler neck (B).
13. Slowly pour coolant into filler neck until radiator is full.
14. Install radiator cap.
15. Press MANUAL on the control pad to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode.
16. Allow engine to run until the thermostat opens, as indicated by heating of the top radiator hose.
17. Check coolant hoses for leaks. Tighten clamps, if necessary.
18. Press OFF on the control pad to shut the engine down.
19. Wait five minutes for the engine to cool.
20. Repeat steps 4-20 to drain and refill cooling system.
21. Install plastic cover at top of enclosure and rotate until tight.
22. Check hoses for nicks, cuts, tears or general deterioration. Replace as necessary.

NOTE: On 2.5L models, start ten screws to install louvered air discharge panel. Alternately tighten screws to 90 in-lb (10 Nm) using a crosswise pattern.





NOTE: Drain hose removed for illustration purposes.

Figure 5-21. Drain/Fill Coolant System

Final Instructions

1. Install left and right side access panels. See ***Access Panels***.
2. See ***Return To Service***.

Schedule C Maintenance

NOTE: Perform Schedule C maintenance after 1000 hours of service. Before proceeding below, first perform all tasks listed under Schedule A Maintenance and Schedule B Maintenance.

NOTE: The following procedures require special tools and skills. Contact a Independent Authorized Service Dealer to perform these tasks.

- Inspect Fuel Tank
- Check/Adjust Fuel Injection Valve Pressure
- Check/Adjust Fuel Injection Pump Timing
- Adjust Intake/Exhaust Valve Clearance
- Tighten Critical Fasteners

NOTE: Reset the A-B-C/Year time maintenance schedule counter using the Dealer Sub Menu (password required).

Return To Service

After inspection, maintenance or service of the generator, return the unit to service following the steps below.

1. Pull up rubber flap covering fuse holder (A) and install 7.5 amp fuse. See ***Figure 5-22***.
2. Install T1 fuse in transfer switch.
3. Verify both auxiliary shutdown switches are in the ON (I) position.
4. Press AUTO (C) on the control pad. A green LED illuminates to confirm that the system is in the AUTO mode.
5. Move the Main Circuit Breaker switch up to the ON (Closed) position.
6. Close the viewing window.
7. Remove the DO NOT OPERATE tag or placard from both the control panel and transfer switch.
8. Reset the time and date.

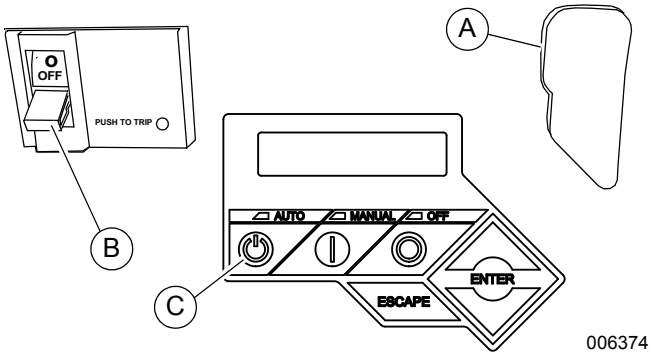


Figure 5-22. Generator Control Panel

Section 6: Troubleshooting

Engine Troubleshooting

Problem	Cause	Correction
The engine will not crank.	Fuse blown.	Replace 7.5 amp fuse in generator control panel. Correct short circuit condition if fuse blows again.
	Loose, corroded or defective battery cables.	Tighten, clean or replace as necessary.*
	Defective starter contact.	Tighten, clean or replace as necessary.*
	Defective starter motor.	Tighten, clean or replace as necessary.*
	Dead Battery.	Charge or replace battery.
The engine cranks but will not start.	Out of fuel.	Replenish fuel. Turn on fuel valve.
	Defective fuel solenoid.	*
	Open F1 5 amp fuse.	Replace F1 5 amp fuse if fuse blows again.*
	Defective fuel system.	*
	No fuel to pump.	Prime fuel system.*
The engine starts hard and runs rough.	Air cleaner plugged or damaged.	Check/replace air cleaner.
The generator is set to OFF, but the engine continues to run.	Defective keypad.	*
	Defective control board.	*
There is no AC output from the generator.	Main line circuit breaker is in the OFF (OPEN) position.	Reset circuit breaker to ON (CLOSED) position.
	Generator internal failure.	*
There is no transfer to standby after utility source failure.	Defective transfer switch coil.	*
	Defective transfer relay.	*
	Transfer relay circuit open.	*
	Defective control logic board.	*
Unit consumes large amounts of oil.	Engine over filled with oil.	Adjust oil to correct level.
	Engine breather defective.	*
	Incorrect oil type or viscosity.	See ***Engine Oil Recommendations***.
	Damaged gasket, seal or hose.	Check for oil leaks.
* Contact an Independent Authorized Service Dealer (IASD) for assistance.		

Controller Troubleshooting

Active Alarm	Problem	Solution
NOT ACTIVATED	Unit will not start in AUTO with utility loss.	Refer to activation section in Owner's Manual.
AUXILIARY SHUTDOWN	Unit will not start in AUTO with utility loss.	Verify both auxiliary shutdown switches are ON (I).
NONE	Unit running in AUTO but no power in house.	Check MLCB. Contact an IASD if MLCB is in the ON position.
NONE	Unit will not start in AUTO with utility loss.	Check screen for start delay countdown. If the start up delay is greater than expected, contact an IASD to adjust from 2 to 1500 seconds.
HIGH TEMPERATURE	Unit shuts down during operation.	Check ventilation around the intake, exhaust and rear of generator. Contact an IASD if no obstruction is found.
OVERLOAD	Unit shuts down during operation.	Clear alarm and remove household loads from the generator. Put back in AUTO and restart.
RPM SENSE LOSS	Unit was running and shuts down, attempts to restart.	Clear alarm and remove household loads from the generator. Put back in AUTO and restart. If problem returns, contact an IASD to investigate possible fuel issue.
LOW OIL PRESSURE	Unit will not start in AUTO with utility loss.	Check oil level. Add oil per Owner's Manual. Contact an IASD if oil level is correct.
RPM SENSE LOSS	Unit will not start in AUTO with utility loss.	Clear alarm. From the MAIN menu on the control panel, navigate to the BATTERY MENU. Contact an IASD if battery is GOOD. Replace battery If CHECK BATTERY is displayed.
OVERCRANK	Unit will not start in AUTO with utility loss.	Clear alarm. Attempt to start the unit in MANUAL. If it does not start or starts and runs rough, contact an IASD.
FUSE PROBLEM	Unit will not start in AUTO with utility loss.	Check ATO 7.5 amp fuse. Replace with same type fuse if bad. Contact an IASD if fuse is good.
OVERSPEED	Unit will not start in AUTO with utility loss.	Contact an IASD.
UNDER VOLTAGE	Unit will not start in AUTO with utility loss.	Contact an IASD.
UNDERSPEED	Unit will not start in AUTO with utility loss.	Contact an IASD.
MISWIRE	Unit will not start in AUTO with utility loss.	Contact an IASD.
OVERVOLTAGE	Unit will not start in AUTO with utility loss.	Contact an IASD.
LOW BATTERY	Warning active.	Clear alarm. From the MAIN menu on the control panel, navigate to the BATTERY MENU. Contact an IASD if battery is GOOD. Replace battery If CHECK BATTERY is displayed.
BATTERY PROBLEM	Warning active.	Contact an IASD.
CHARGER WARNING	Warning active.	Contact an IASD.
SERVICE SCHEDULE A	Warning active.	Perform SERVICE SCHEDULE A maintenance; press ENTER to clear.
SERVICE SCHEDULE B	Warning active.	Perform SERVICE SCHEDULE B maintenance; press ENTER to clear.
SERVICE SCHEDULE C	Warning active.	Perform SERVICE SCHEDULE C maintenance; press ENTER to clear.

Removal From Service During Utility Outages

If, during prolonged utility outages, the user wishes to remove the unit from service to conserve fuel, reduce run hours, or to perform maintenance tasks, then complete the steps listed below.

IMPORTANT NOTE: Failure to abide by this procedure can result in equipment damage.

To remove the generator from service while running in AUTO and online, proceed as follows:

1. Turn the main utility disconnect to OFF (Open).
2. Open the viewing window. See ***Open Viewing Window***.
3. Move the Main Circuit Breaker switch down to the OFF (Open) position.
4. Press OFF on the control pad. A red LED illuminates to confirm that the system is in the OFF mode.

NOTE: If inspection and/or maintenance tasks are to be performed, complete the additional steps listed below.

5. Remove T1 fuse from transfer switch.
6. Pull up rubber flap covering fuse holder and remove 7.5 amp fuse.
7. Remove negative battery cable (black) from negative (-) battery terminal.
8. Place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.

To return the generator to service, proceed as follows:

NOTE: If inspection and/or maintenance tasks were performed, start with step 1. If the unit was just shut down to conserve fuel or to reduce run hours, start at step 5.

1. Install negative battery cable (black) onto negative (-) battery terminal.
2. Pull up rubber flap covering fuse holder and install 7.5 amp fuse.
3. Install T1 fuse in transfer switch.
4. Remove the DO NOT OPERATE tag or placard from both the control panel and transfer switch.
5. Press AUTO on the control pad. A green LED illuminates to confirm that the system is in the AUTO mode. Allow the generator to start and run for a few minutes.
6. Move the Main Circuit Breaker switch up to the ON (Closed) position.
7. Turn the main utility disconnect to ON (Closed).
8. Close the viewing window.

Storage

Prepare For Storage

If the generator cannot be exercised every **seven** days and will be out of service longer than 90 days, prepare for storage as follows:

1. Open the viewing window. See ***Open Viewing Window***.
2. Press MANUAL on the control pad to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode.
3. Allow the engine to run until it reaches normal operating temperature.
4. Press OFF on the control pad. A red LED illuminates to confirm that the system is in the OFF mode.
5. Move the Main Circuit Breaker switch on the control panel down to the OFF (Open) position.
6. Pull up rubber flap covering fuse holder and remove 7.5 amp fuse.
7. Turn off utility power to the transfer switch.
8. Place a DO NOT OPERATE tag or placard on both the control panel and transfer switch.
9. Wait five minutes for the engine to cool.
10. Remove right side access panel. See ***Access Panels***.
11. Remove oil drain hose from holding clamp.
12. Use one wrench to hold hex on hose fitting (to prevent rotation), and use second wrench to remove drain plug.
13. Drain oil into a suitable container.
14. Install drain plug onto end of oil drain hose.
15. Install oil drain hose into holding clamp.
16. Rotate oil filter counterclockwise to remove from oil filter adapter.
17. Apply a light coat of clean engine oil to gasket of **new** oil filter.
18. Install oil filter by hand until gasket just contacts oil filter adapter. Tighten oil filter an additional 3/4 to one full turn.
19. Remove oil fill cap and fill engine with the recommended oil. See ***Engine Oil Recommendations***.
20. Install oil fill cap.
21. Install right side access panel. See ***Access Panels***.

NOTE: Dispose of used oil and oil filter at a proper collection center.

22. Remove left side access panel. See ***Access Panels***.

NOTE: On 2.5L models, remove ten screws to release louvered air intake panel.

⚠WARNING

Explosion. Batteries emit explosive gases. Always disconnect negative battery cable first to avoid spark. Failure to do so could result in death or serious injury. (000238)

23. Remove negative battery cable (black) from negative (-) battery terminal.
24. Remove positive battery cable (red) from positive (+) battery terminal.
25. Remove two screws to release battery hold-down clamp from platform, or loosen strap and position away from tray.
26. Remove battery and store in a cool, dry room.

⚠WARNING

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death or serious injury. (000228)

Always recycle batteries in accordance with local laws and regulations. Contact your local solid waste collection site or recycling facility to obtain information on local recycling processes. For more information on battery recycling, visit the Battery Council International website at: ***http://batterycouncil.org***.

27. Install left side access panel. See ***Access Panels***.

NOTE: On 2.5L models, start ten screws to install louvered air intake panel. Alternately tighten screws to 90 in-lb (10 Nm).

28. Thoroughly clean and wipe down the generator. See ***Corrosion Protection***.

Return From Storage

To return the unit to service after storage, proceed as follows:

1. Thoroughly clean and wipe down the generator. See ***Corrosion Protection***.
2. Remove left side access panel. See ***Access Panels***.

NOTE: On 2.5L models, remove ten screws to release louvered air intake panel.

3. Install battery onto tray oriented with the negative (–) post toward the front of the enclosure.
4. Install two screws with nylon washers to secure battery hold-down clamp to tray, or tighten strap over top of battery.
5. Check battery. See ***Check Battery Condition/ Fluid Level***.

⚠WARNING

Explosion. Batteries emit explosive gases. Always connect positive battery cable first to avoid spark. Failure to do so could result in death or serious injury. (000133)

6. Install positive battery cable (red) onto positive battery (+) terminal.
7. Install negative battery cable (black) onto negative (-) battery terminal.
8. Install left side access panel. See ***Access Panels***.

NOTE: On 2.5L models, start ten screws to install louvered air intake panel. Alternately tighten screws to 90 in-lb (10 Nm).

9. Remove right side access panel. See ***Access Panels***.
10. Check oil level and add oil as necessary. **DO NOT OVERFILL**.
11. Open the viewing window. See ***Open Viewing Window***.
12. Pull up rubber flap covering fuse holder and install 7.5 amp fuse.
13. Move the Main Circuit Breaker switch up to the ON (Closed) position.
14. Press MANUAL on the control pad to start the engine. A blue LED illuminates to confirm that the system is in the MANUAL mode.
15. Allow the engine to run until it is reaches normal operating temperature. Check for leaks while the engine is running.
16. Press OFF on the control pad. A red LED illuminates to confirm that the system is in the OFF mode.
17. Install right side access panel. See ***Access Panels***.
18. Turn on utility power to the transfer switch.
19. Press AUTO on the control pad. A green LED illuminates to confirm that the system is in the AUTO mode.
20. Reset the time and date.
21. Close the viewing window.

Attention After Submersion

Do NOT start and operate the generator if it has been submerged in water. Have an Independent Authorized Service Dealer thoroughly clean, dry, and inspect the generator following any submersion. If the structure (home) has been flooded, it should be inspected by a certified electrician to ensure there won't be any electrical problems during generator operation or when utility power is returned.

Attention After Fuel Spillage

Contact reputable local company that performs clean up and disposal services.

Contaminated Fuel Disposal

Contact reputable local company that performs purging, burnishing and disposal services.

This page intentionally left blank.

Part No. 10000019179 Rev. A 01/08/18

Generac Power Systems, Inc.
S45 W29290 Hwy. 59
Waukesha, WI 53189
1-888-GENERAC (1-888-436-3722)
www.generac.com