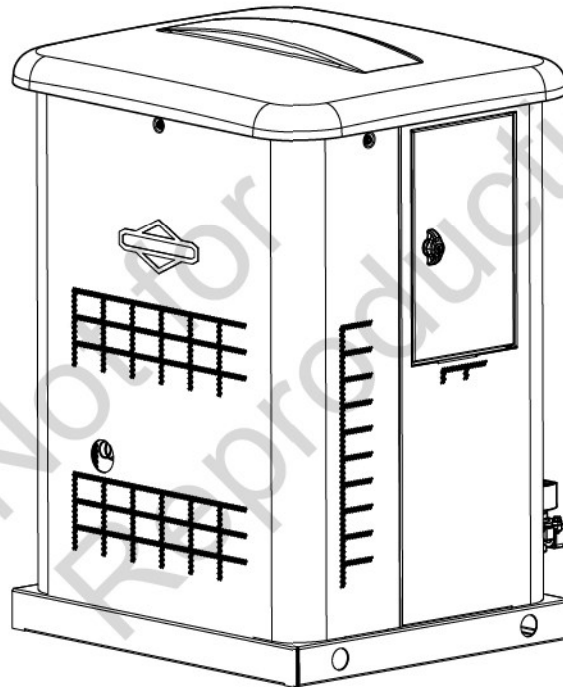




Standby Generator System 12kW  
Model 040517-00

# BRIGGS & STRATTON OPERATOR'S MANUAL STANDBY GENERATOR SYSTEM



80011758 Rev -

**Thank you** for purchasing this quality-built Briggs & Stratton® home generator. We're pleased that you've placed your confidence in the Briggs & Stratton brand. When operated and maintained according to the instructions in the operator's manual, your home generator will provide many years of dependable service.

**This manual contains** safety information to make you aware of the hazards and risks associated with standby generators and how to avoid them. This product is only for use as an optional generator system which provides an alternate source of electric power and to serve loads such as heating, refrigeration systems, and communication systems that, when stopped during any power outage, could cause discomfort or inconvenience.

**Save these original instructions for future reference.**

**This generator requires professional installation before use.** The installer should follow the instructions completely.

## **Where to Find Us**

You never have to look far to find Briggs & Stratton support and service for your generator. Consult your Yellow Pages. There are thousands of Briggs & Stratton authorized service dealers worldwide who provide quality service. You can also contact Technical Service by phone at **800 743-4115**, or click on Find a Dealer at [BRIGGSandSTRATTON.COM](http://BRIGGSandSTRATTON.COM), which provides a list of authorized dealers.

**Generator and engine model and serial numbers should be recorded in the installation manual.**

Not for  
Reproduction

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# Safety Rules

## Important Safety Instructions

**SAVE THESE INSTRUCTIONS** - This manual contains important instructions that should be followed during installation and maintenance of the generator and batteries.

### Safety Symbols and Meanings



Explosion



Fire



Electrical Shock



Toxic Fumes



Rotating Parts



Hot Surface



Auto Start



Explosive Pressure



Chemical Burn



Lift Hazard



Read Manual

⚠ The safety alert symbol indicates a potential personal injury hazard. A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to designate a degree or level of hazard seriousness. A safety symbol may be used to represent the type of hazard. The signal word NOTICE is used to address practices not related to personal injury.

⚠ **DANGER** indicates a hazard which, if not avoided, *will* result in death or serious injury.

⚠ **WARNING** indicates a hazard which, if not avoided, *could* result in death or serious injury.

⚠ **CAUTION** indicates a hazard which, if not avoided, *could* result in minor or moderate injury.

**NOTICE** addresses practices not related to personal injury.

The manufacturer cannot possibly anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and the tags and decals affixed to the unit are, therefore, not all-inclusive. If you use a procedure, work method or operating technique that the manufacturer does not specifically recommend, you must satisfy yourself that it is safe for you and others. You must also make sure that the procedure, work method or operating technique that you choose does not render the generator system unsafe.

⚠ **WARNING** Running engine gives off carbon monoxide, an odorless, colorless, poison gas.




Breathing carbon monoxide could result in death, serious injury, headache, fatigue, dizziness, vomiting, confusion, seizures, nausea or fainting.

- Operate this product **ONLY** outdoors in an area that will not accumulate deadly exhaust gas.
- Keep exhaust gas away from any windows, doors, ventilation intakes, soffit vents, crawl spaces, open garage doors or other openings that can allow exhaust gas to enter inside or be drawn into a potentially occupied building or structure.
- Carbon monoxide detector(s) **MUST** be installed and maintained indoors according to the manufacturer's instructions/ recommendations. Smoke alarms cannot detect carbon monoxide gas.

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


⚠ **WARNING** Certain components in this product and related accessories contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after handling.

 **WARNING** Storage batteries give off explosive hydrogen gas during recharging. Slightest spark will ignite hydrogen and cause explosion, resulting in death or serious injury.


Battery electrolyte fluid contains acid and is extremely caustic. Contact with battery contents could cause severe chemical burns.

A battery presents a risk of electrical shock and high short circuit current.

- DO NOT dispose of battery in a fire. Recycle battery.
- DO NOT allow any open flame, spark, heat, or lit cigarette during and for several minutes after charging a battery.
- DO NOT open or mutilate the battery.
- Wear protective goggles, rubber apron, rubber boots and rubber gloves.
- Remove watches, rings, or other metal objects.
- Use tools having insulated handles.

 **WARNING** Propane and Natural Gas are extremely flammable and explosive, which could cause burns, fire or explosion resulting in death or serious injury.


- Install the fuel supply system according to NFPA 37 and other applicable fuel-gas codes.
- Before placing the generator into service, the fuel system lines must be properly purged and leak tested.
- After the generator is installed, you should inspect the fuel system periodically.
- NO leakage is permitted.
- DO NOT operate engine if smell of fuel is present or other explosive conditions exist.
- DO NOT smoke around the generator. Wipe up any oil spills immediately. Ensure that no combustible materials are left in the generator compartment. Keep the area near the generator clean and free of debris.

 **WARNING** Generator produces hazardous voltage. Failure to properly ground generator could result in electrocution.



Failure to isolate generator from utility power could result in death or serious injury to electric utility workers due to backfeed of electrical energy.

- When using generator for backup power, notify utility company.
- DO NOT touch bare wires or bare receptacles.
- DO NOT use generator with electrical cords which are worn, frayed, bare or otherwise damaged.
- DO NOT handle generator or electrical cords while standing in water, while barefoot, or while hands or feet are wet.
- If you must work around a unit while it is operating, stand on an insulated dry surface to reduce the risk of a shock hazard.
- DO NOT allow unqualified persons or children to operate or service generator.
- In case of an accident caused by electrical shock, immediately shut down the source of electrical power and contact the local authorities. **Avoid direct contact with the victim.**
- Despite the safe design of the residential generator, operating this equipment imprudently, neglecting its maintenance or being careless could cause possible injury or death.
- Remain alert at all times while working on this equipment. Never work on the equipment when you are physically or mentally fatigued.
- Before performing any maintenance on the generator, disconnect the battery cable indicated by a **NEGATIVE, NEG** or **(-)** first. When finished, reconnect that cable last.
- After your system is installed, the generator may crank and start without warning any time there is a power failure. To prevent possible injury, always set the generator's system switch to **OFF**, remove the service disconnect from the disconnect box AND remove the 15 Amp fuse BEFORE working on the equipment.

 **WARNING** Unintentional sparking could cause fire or electric shock resulting in death or serious injury.




#### **WHEN ADJUSTING OR MAKING REPAIRS TO YOUR GENERATOR**

- Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.

#### **WHEN TESTING FOR ENGINE SPARK**


- Use approved spark plug tester.
- DO NOT check for spark with spark plug removed.

 **WARNING** Exhaust heat/gases could ignite combustibles or structures resulting in death or serious injury.




Contact with muffler area could cause burns resulting in serious injury.

- DO NOT touch hot parts and AVOID hot exhaust gases.
- Allow equipment to cool before touching.
- Exhaust outlet side of weatherproof enclosure must have at least 5 ft (1.5 m) minimum clearance from any structure, shrubs, trees or any kind of vegetation.
- Standby generator weatherproof enclosure must be at least 5 ft from windows, doors, any wall opening, shrubs or vegetation over 12 inches (30.48 cm) in height.
- Standby generator weatherproof enclosure must have a minimum of 5 ft (1.5 m) overhead clearance from any structure, overhang or trees.
- DO NOT place weatherproof enclosure under a deck or other type of structure that may confine airflow.
- USE ONLY flexible steel fuel line provided. Connect provided fuel line to generator, DO NOT use with or substitute any other flexible fuel line.
- Smoke detector(s) MUST be installed and maintained indoors according to the manufacturer's instructions/ recommendations. Carbon monoxide alarms cannot detect smoke.
- Keep at least minimum distances shown in *Generator Placement* to insure for proper generator cooling and maintenance clearances.
- It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact the original equipment manufacturer, retailer, or dealer to obtain a spark arrester designed for the exhaust system installed on this engine.
- Replacement parts must be the same and installed in the same position as the original parts.

 **WARNING** Starter and other rotating parts could entangle hands, hair, clothing, or accessories resulting in serious injury.




- NEVER operate generator without protective housings, covers, or guards in place.
- DO NOT wear loose clothing, jewelry or anything that could be caught in the starter or other rotating parts.
- Tie up long hair and remove jewelry.
- Before servicing, remove 15 Amp fuse from control panel and disconnect **Negative (NEG or -)** battery cable.

 **CAUTION** Installing the 15 Amp fuse could cause the engine to start at any time without warning resulting in minor or moderate injury.



- Observe that the 15 Amp fuse has been removed from the control panel for shipping.
- DO NOT install this fuse until all plumbing and wiring has been completed and inspected.

 **CAUTION** Excessively high operating speeds could result in minor injury.

Excessively low speeds impose a heavy load on generator.

- DO NOT tamper with governed speed. Generator supplies correct rated frequency and voltage when running at governed speed.
- DO NOT modify generator in any way.

**NOTICE** Improper treatment of generator could damage it and shorten its life.

- Use generator only for intended uses.
- If you have questions about intended use, contact your authorized dealer.
- Operate generator only on level surfaces.
- Adequate, unobstructed flow of cooling and ventilating air is critical for correct generator operation.
- The access panels/door must be installed whenever the unit is running.
- DO NOT expose generator to excessive moisture, dust, dirt, or corrosive vapors.
- Remain alert at all times while working on this equipment. Never work on the equipment when you are physically or mentally fatigued.
- DO NOT start engine with air cleaner or air cleaner cover removed.
- DO NOT insert any objects through cooling slots.
- DO NOT use the generator or any of its parts as a step. Stepping on the unit could cause stress and break parts. This may result in dangerous operating conditions from leaking exhaust gases, fuel leakage, oil leakage, etc.
- If connected devices overheat, turn them off and disconnect them from generator.
- Shut off generator if:
  - electrical output is lost;
  - equipment sparks, smokes, or emits flames;
  - unit vibrates excessively.
  - unit makes unusual noises.

# Installation

We sincerely appreciate your patronage. For this reason, we have made every effort to provide for a safe, streamlined and cost-effective installation. Because each installation is unique, it is impossible to know of and advise the trade of all conceivable procedures and methods by which installation might be achieved. Neither could we know of possible hazards and/or the results of each method or procedure. For these reasons,

**Only current licensed electrical and plumbing professionals should attempt home generator system installations. Installations must strictly comply with all applicable codes, industry standards and regulations.**

Your home generator is supplied with this “Operator’s Manual” and a separate “Installation Manual”. These are important documents and should be retained by the owner after the installation has been completed.

This product is only for use as an optional generator system which provides an alternate source of electric power and to serve loads such as heating, refrigeration systems, and communication systems that, when stopped during any power outage, could cause discomfort or inconvenience.

## For the Home Owner

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To help you make informed choices and communicate effectively with your installation contractor(s),

**Read and understand *Owner Orientation* in this manual before contracting or starting your generator installation.**

To arrange for proper installation, contact the store at which you purchased your generator, your dealer, a licensed electrician or your utility power provider.

## For the Installing Dealer/Contractor

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For most applications, the installation manual contains all the information required to properly install and start the generator. This operator’s manual describes routine operation and owner maintenance procedures.

**NOTICE** This product does NOT qualify for either an emergency standby or legally required standby system as defined by NFPA 70 (NEC).

- Emergency generator systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply. Emergency systems may also provide power for such functions as ventilation where essential to maintain life, where current interruption of the normal supply would produce serious life safety or health hazards.
- Legally Required standby generator systems are intended to automatically supply power to selected loads in the event of failure of the normal source which could create hazards or hamper rescue or fire-fighting operations.

Every effort has been made to ensure that information in this manual is accurate and current. However, we reserve the right to change, alter, or otherwise improve the product and this document at any time without prior notice.

Only current licensed electrical and plumbing professionals should attempt home generator system installations. Installations must strictly comply with all applicable codes, industry standards, laws and regulations.

**The generator warranty is VOID unless the system is installed by licensed electrical and plumbing professionals.**

Every effort has been made to ensure that information in this manual is accurate and current. However, we reserve the right to change, alter, or otherwise improve the product and this document at any time without prior notice.

The Emission Control System for this generator is warranted to standards set by the U.S. Environmental Protection Agency and by the California Air Resources Board (CARB).

*If you need more information in this matter, please call 888 575-8226 between 8:00 AM and 5:00 PM CT.*

## Owner Orientation

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This section provides generator owners with the information necessary to achieve the most satisfactory and cost effective installation possible.

The illustrations are for typical circumstances and are meant to familiarize you with the installation options available with your generator. A thorough understanding of these options will provide fundamental control over the cost of your installation, as well as ensure your final satisfaction and security.

Federal and local codes, appearance, noise levels, fuel types, and distances are the factors that must be considered when negotiating with an installation professional. Remember that as the distance from the

existing electrical service and gaseous fuel supply increases, and the number of 90 degree bends in the fuel supply increases; compensations in piping and wiring materials must be made. This is necessary to comply with local codes and overcome electrical voltage drops and gaseous fuel pressure drops.

**The factors mentioned above will have a direct affect on the overall price of your generator installation.**

In some areas you may need to acquire electrical permits for installing the home generator, building permits for installing gas lines, and permits for noise allowances. Your installer should check your local codes AND obtain the permits before installing the system.

### Power Decrease at High Altitude or High Temperature

Air density is less at high altitudes, resulting in less available engine power. Specifically, engine power will decrease 3.5% for each 1,000 feet (300 meters) above sea level and 1% for each 10° F (5.6°C) above 77°F (25°C).

Make sure you and your installer consider these factors when determining total generator load.



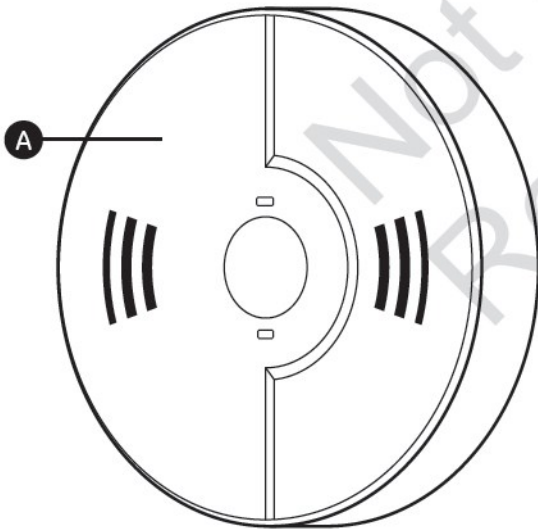
## Generator Location

The actual physical location of your home generator has a direct affect on:

1. The amount of plumbing required to fuel your generator.
2. The amount of wiring required to control and connect your generator.

Specific location guidelines are discussed in the installation manual. Acquaint yourself with that information and confer with your installer. Be sure to ask how your site might affect installation costs and compliance with local codes and standards.

- Install generator outdoors in an area that will not accumulate deadly exhaust gas.
- DO NOT install generator where exhaust gas could accumulate and enter inside or be drawn into a potentially occupied building or structure.
- By law it is required in many states to have a Carbon Monoxide (CO) detector in operating condition in your home. Carbon monoxide detector(s) **A** MUST be installed and maintained indoors according to the manufacturer's instructions/ recommendations. A CO monitor is an electronic device that detects hazardous levels of CO. When there is a buildup of CO, the monitor will alert the occupants by flashing visual indicator light and alarm. Smoke alarms cannot detect CO gas.



**⚠ WARNING** Running engine gives off carbon monoxide, an odorless, colorless, poison gas. Breathing carbon monoxide could result in death, serious injury, headache, fatigue, dizziness, vomiting, confusion, seizures, nausea or fainting.



- Operate this product ONLY outdoors in an area that will not accumulate deadly exhaust gas.
- Keep exhaust gas away from any windows, doors, ventilation intakes, soffit vents, crawl spaces, open garage doors or other openings that can allow exhaust gas to enter inside or be drawn into a potentially occupied building or structure.
- Carbon monoxide detector(s) MUST be installed and maintained indoors according to the manufacturer's instructions/ recommendations. Smoke alarms cannot detect carbon monoxide gas.

- Ensure exhaust gas is kept away from any windows, doors, ventilation intakes, soffit vents, crawl spaces, open garage doors or other openings that can allow exhaust gas to enter inside or be drawn into a potentially occupied building or structure. Your neighbor(s) home may be exposed to the engine exhaust from your standby generator and must be considered when installing your standby generator.
- Wind and air currents should be taken into consideration when positioning generator.

See the installation manual for full details on safe generator location.

**⚠ WARNING** Exhaust heat/gases could ignite combustibles or structures resulting in death or serious injury.



- Exhaust outlet side of weatherproof enclosure must have at least 5 ft (1.5 m) minimum clearance from any structure, shrubs, trees or any kind of vegetation.
- Standby generator weatherproof enclosure must be at least 5 ft (1.5 m) from windows, doors, any wall opening, shrubs or vegetation over 12 inches (30.5 cm) in height.
- Standby generator weatherproof enclosure must have a minimum of 5 ft (1.5 m) overhead clearance from any structure, overhang or trees.
- DO NOT place weatherproof enclosure under a deck or other type of structure that may confine airflow.
- USE ONLY flexible steel fuel line provided. Connect provided fuel line to generator, DO NOT use with or substitute any other flexible fuel line.
- Smoke detector(s) MUST be installed and maintained indoors according to the manufacturer's instructions/ recommendations. Carbon monoxide alarms cannot detect smoke.
- DO NOT place weatherproof enclosure in manner other than shown in illustrations.

## Delivery Inspection

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Carefully inspect the home generator for any damage that may have occurred during shipment.

If loss or damage is noted at time of delivery, have the person(s) making delivery note all damage on the freight bill and affix his signature under the consignor's memo of loss or damage. If loss or damage is noted after delivery, separate the damaged materials and contact the carrier and your installer for claim procedures. Parts damaged in shipping are not warranted.

### **The home generator system is supplied with:**

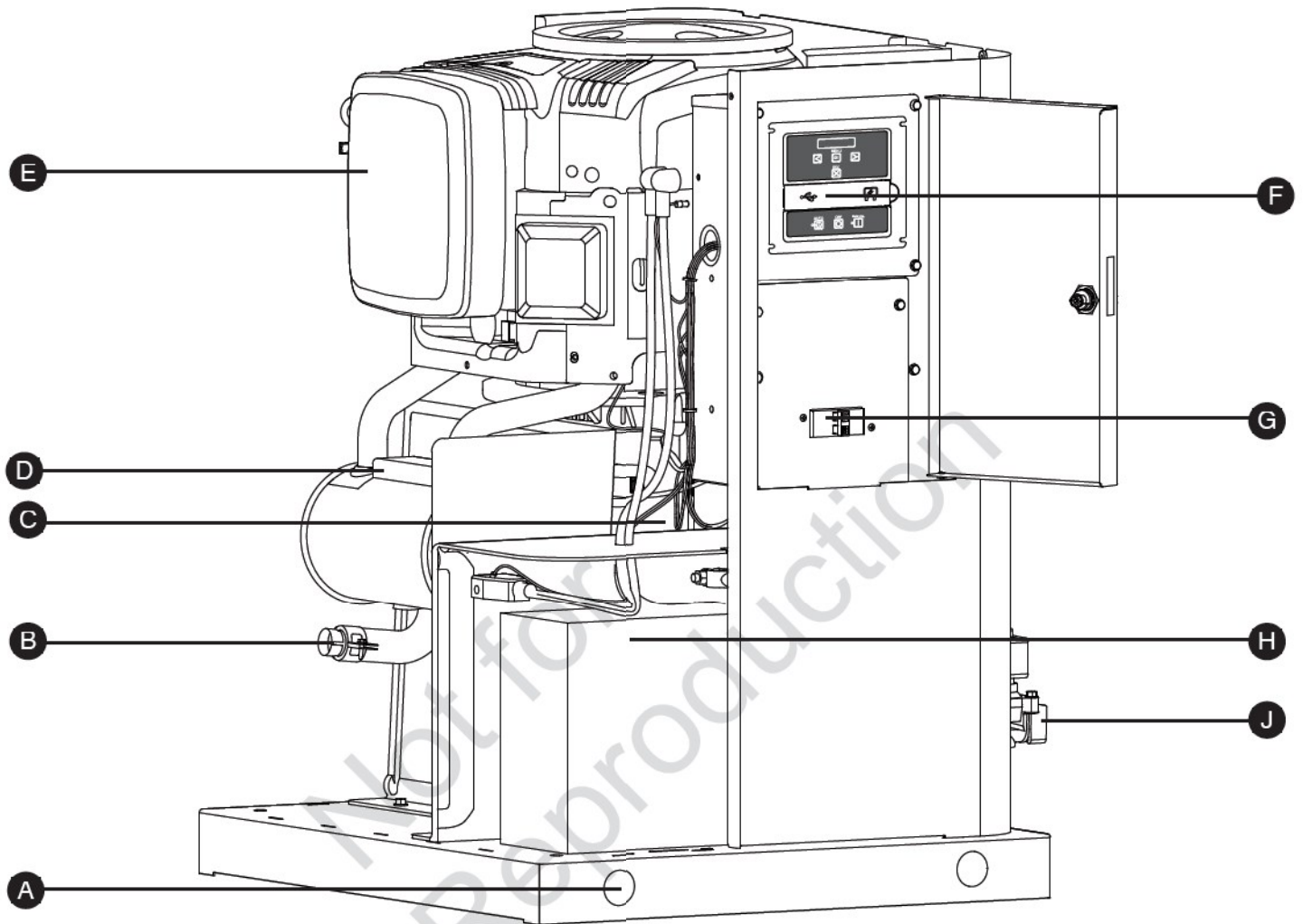
- Oil (5W30 Synthetic)
- Flexible steel fuel line
- Installation and start-up manual
- Operator's manual
- Spare access door keys
- Spare 15 Amp ATO-type fuse
- Battery tie down strap

### **Not included:**

- Carbon monoxide detector(s)
- Smoke detector(s)
- Starting battery
- Connecting wire and conduit
- Fuel supply valves/plumbing
- Crane, lifting straps, chains or cables
- Two 60" lengths of 3/4" nominal minimum scheduled 40 steel pipe (NOT conduit)
- Torque screwdriver, 5 to 70 inch-pound range
- Voltage/frequency meter
- Two (2) AA batteries for remote wireless monitor
- Remote wireless monitor (Optional)
- Antenna (Optional)

# Controls

## 12 kW Generator



Generator is shown with roof and access covers removed for clarity.

- A Lifting Holes** — Provided at each corner for lifting generator.
- B Exhaust Port** — High-performance muffler lowers engine noise to comply with most residential codes.
- C Alternator** — An electrical machine that generates an alternating current.
- D Muffler** — A device to reduce engine noise.
- E Air Cleaner** — Uses a dry type filter element to protect engine by filtering dust and debris out of intake air.
- F Control Panel** — Used for various test, operation and maintenance functions. See *System Control Panel*.
- G Circuit Breaker** — Protects the system from shorts and other over-current conditions.
- H Battery** — (installer supplied) — 12 Volt DC, sealed battery provides power to start the engine.
- J Fuel Inlet Port** — Attach appropriate fuel supply to generator here.

## Access Panels

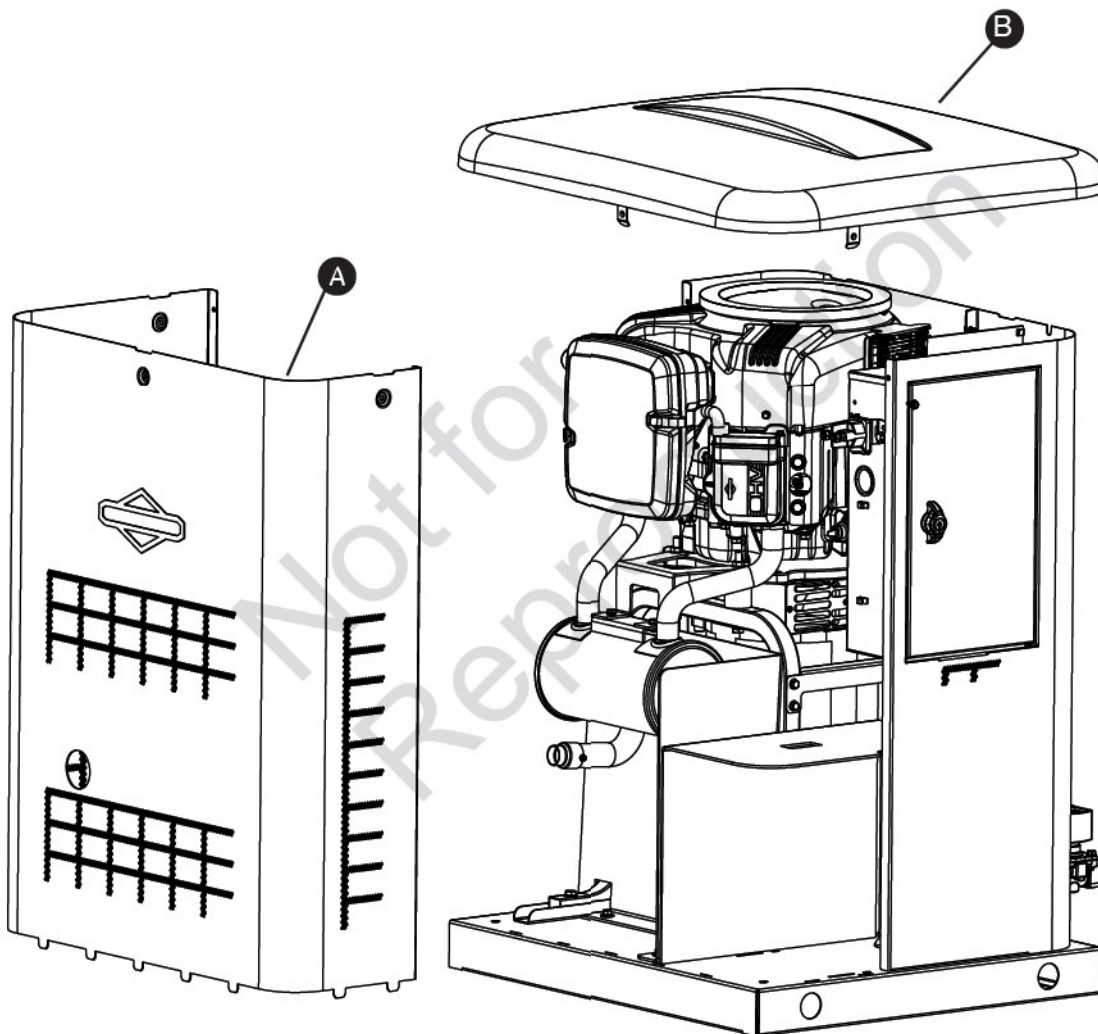
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The generator is equipped with an enclosure that has several access panels, as shown.

Front Panel **A** and roof **B** are used to access:

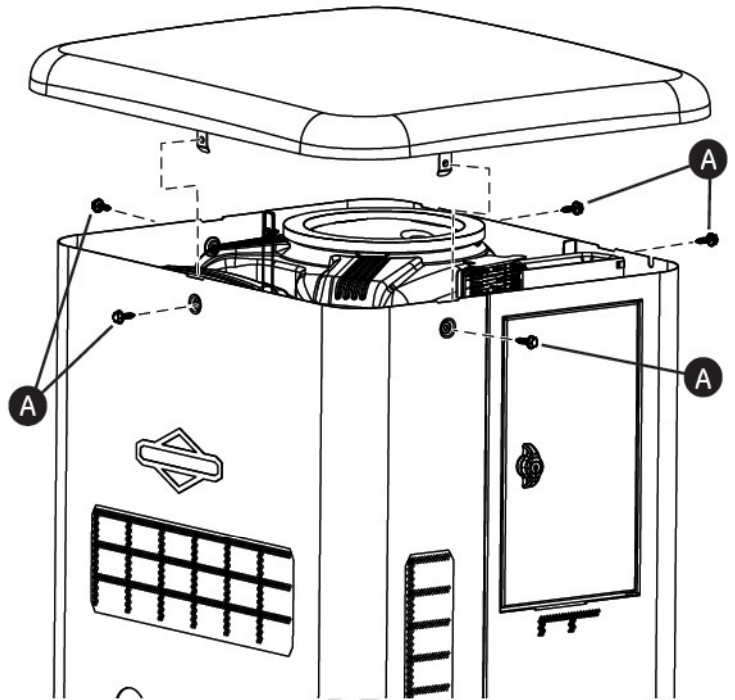
- Battery Compartment
- Engine Oil Drain Hose
- Engine Oil Filter
- Engine Valve Cover
- Spark Plugs

Each generator is shipped with a set of identical keys.



**To remove roof:**

1. Remove the five screws **A** that secure the roof to the unit.
2. Carefully lift and remove roof from unit.

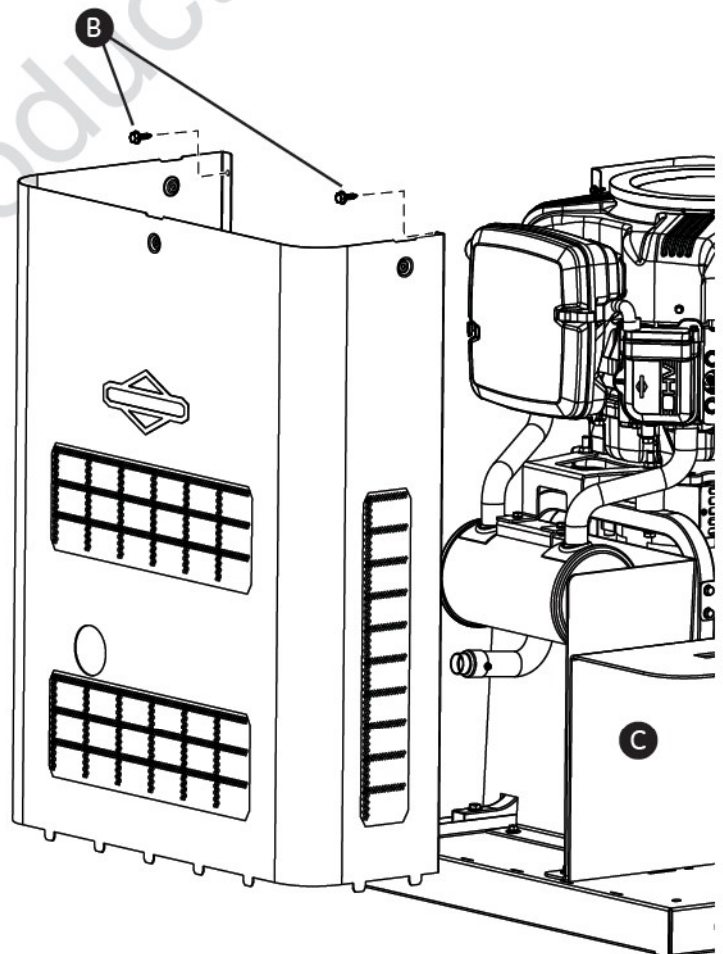


**To remove front panel:**

1. Remove the two screws **B** that secure the panel to the unit.
2. Lift and flex panel outward and off base. Use caution not to damage the battery box **C**.

**To secure front panel:**

1. Place panel in unit.
2. Secure the panel with two screws.



## System Control Panel

The generator control board, located inside the generator, under the roof, is shown below. Brief descriptions of the controls used during installation are:

**A** - **Menu/Programming Navigation Buttons** — See *Menu* section for details

**B** - **USB Port** — Authorized Dealer Service Use Only.

**C** - **Generator Operation Control Buttons** —

- **“AUTO”** Normal operating position. Press and hold button to put unit into Automatic mode. In Automatic mode, if a utility power outage is sensed, the system will start the generator. When utility power is restored, auto lets the engine stabilize internal temperatures, shuts off the generator, and waits for the next utility outage.
- **“OFF”** Turns off running generator and resets any detected service codes.

**OFF** must be pressed and held for more than 5 seconds in order to reset service code.

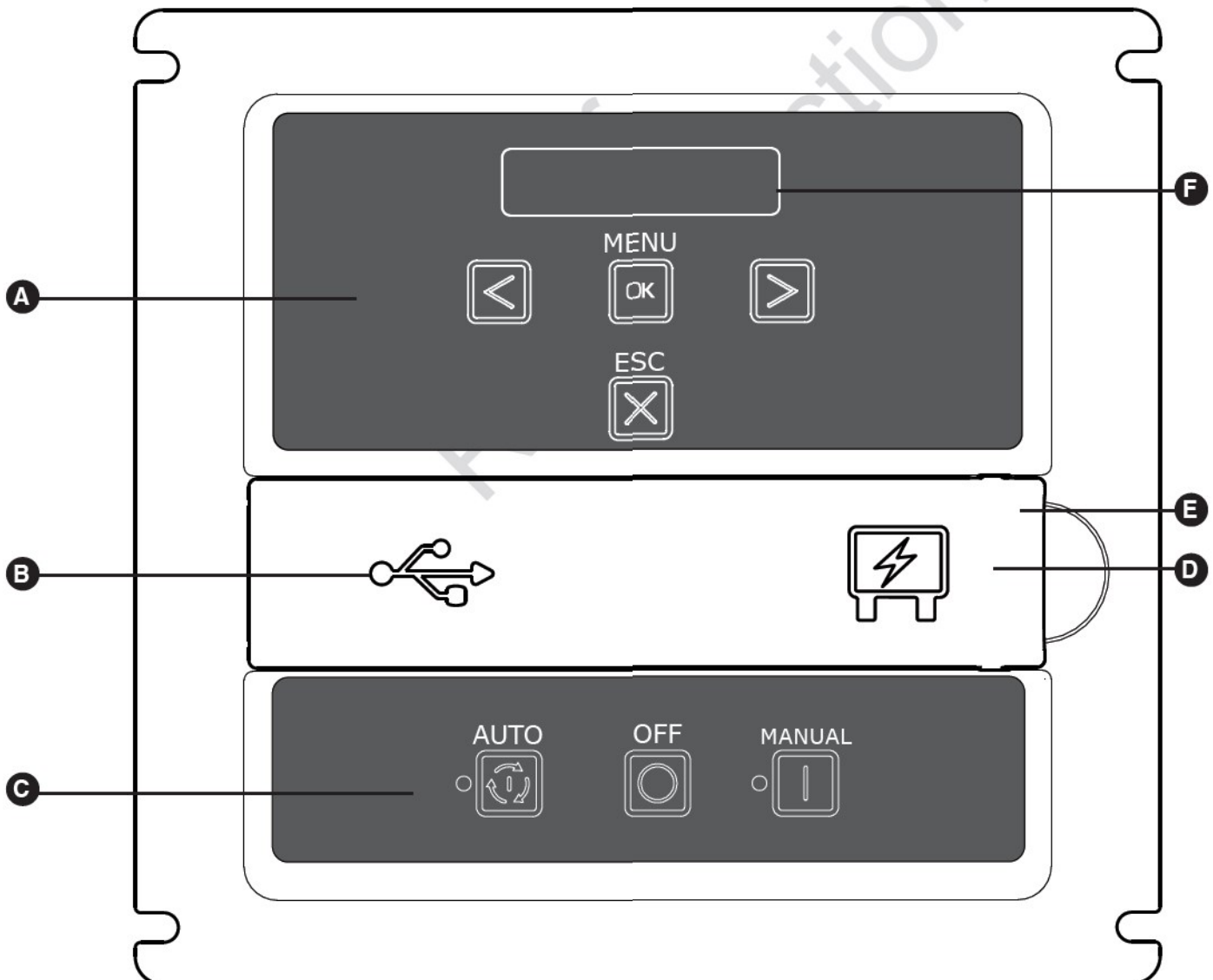
• **“MANUAL”** Used to manually start the generator.

**D** - **15 Amp Fuse** — Protects the home generator DC control circuits. If the fuse has ‘blown’ (melted open) or was removed, the engine cannot crank or start. Replace the fuse using only an identical ATO 15A fuse. One spare fuse is supplied with the unit.

**E** - **Cover** — This protective cover must be opened to access the fuse and the USB port.








**F** - **Digital Display** — Displays generator mode, menu options, service codes, and service engine indicators

More information may be found in *Controls* in the operator’s manual.





## Menu

The following chart shows the icons for the buttons that control the system control panel.

	MENU	ENTER THE MENU (VIEW SETTINGS) PRESS TO CONFIRM SELECTION WHEN PROGRAMMING.
	ESCAPE (EXIT)	RETURN TO LAST MENU ITEM
	RIGHT ARROW	TOGGLE THROUGH MENU OPTIONS SETTING SYSTEM PARAMETERS
	LEFT ARROW	TOGGLE THROUGH MENU OPTIONS SETTING SYSTEM PARAMETERS
	MANUAL MODE	USED TO MANUALLY START THE GENERATOR. PRESS AND HOLD BUT- TON TO START THE GENERATOR.
	OFF	TURNS OFF RUNNING GENERATOR, PREVENTS UNIT FROM STARTING, AND RESETS ANY DETECTED SERVICE CODES.
	AUTOMATIC MODE	NORMAL OPERATING POSITION. PRESS AND HOLD BUTTON TO PUT UNIT INTO AUTOMATIC MODE. IF A UTILITY POWER OUTAGE IS SENSED, THE SYSTEM WILL START THE GENERATOR. WHEN UTILITY POWER IS RE- STORED, AUTO LETS THE ENGINE STABILIZE INTERNAL TEMPERATURES, SHUTS OFF THE GENERATOR, AND WAITS FOR THE NEXT UTILITY POW- ER OUTAGE.

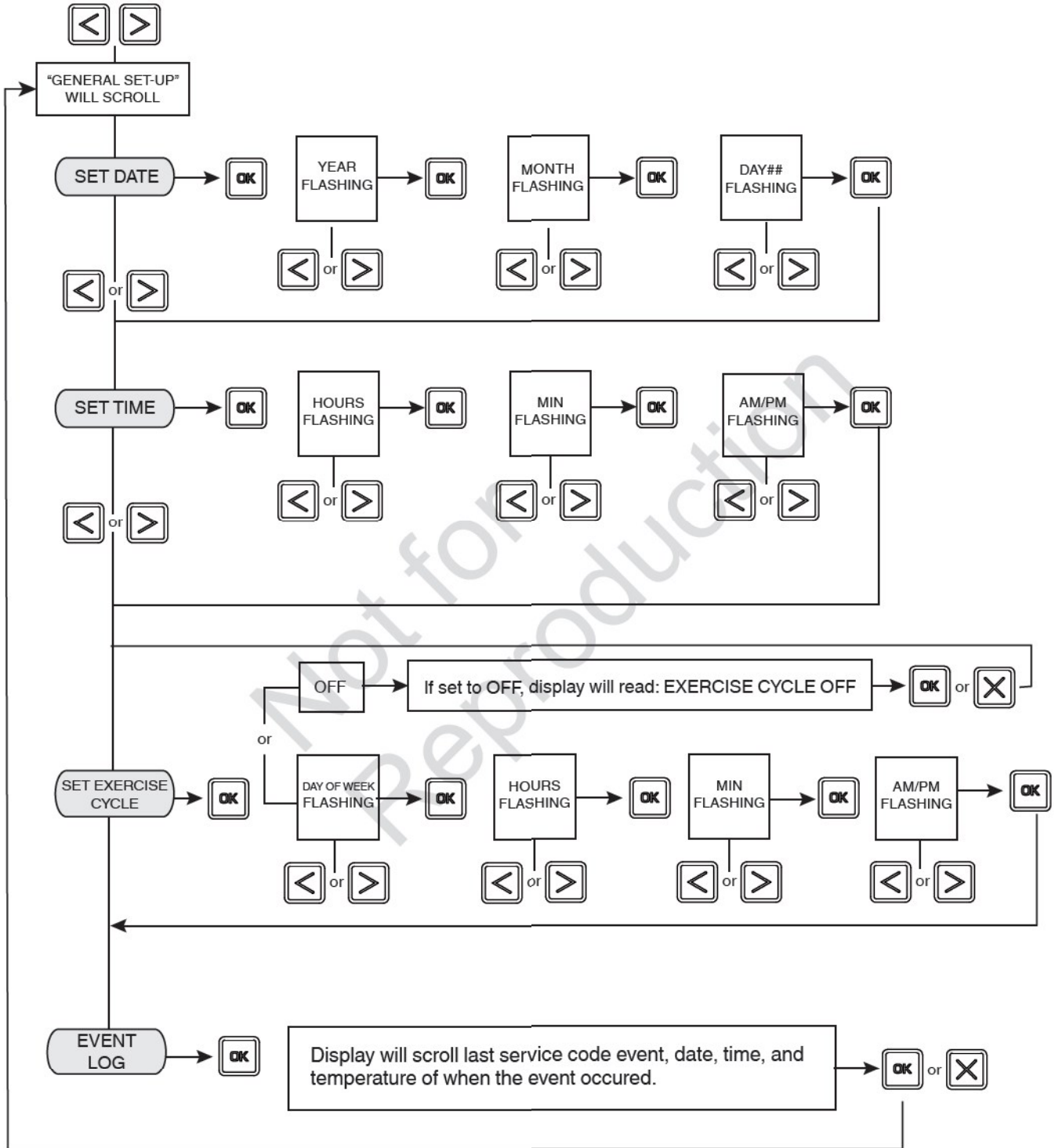
The following chart describes key sequences for accessing different programming modes;

	GENERAL SET-UP	PRESS AND HOLD [ <b>ARROW LEFT AND ARROW RIGHT</b> ] UNTIL "GENERAL SET-UP" IS DISPLAYED TO ENTER THE PROGRAM MODE.
	WIRELESS LINK MODE	PRESS AND HOLD [MENU AND ESC] FOR THREE SEC- ONDS TO ENTER THE WIRELESS LINKING MODE. (ONLY APPLICABLE ON CERTAIN MODELS).

# General Set Up Screen

For general set up, press and hold the left arrow and right arrow (◀ ▶) until "General Set-Up" is displayed. Follow the prompts as outlined below.

NOTE: Date and Time were set at the factory and stored in the control panel memory. The Exercise Cycle was also set at the factory. The default exercise cycle occurs on Tuesdays, at 2:00 P.M. Central Standard Time. To updated or change these settings, follow the steps below.



IF DURING PROGRAMMING NO BUTTONS ARE PRESSED FOR 40 SECONDS, THE CONTROL PANEL WILL AUTOMATICALLY EXIT THE PROGRAM MODE.

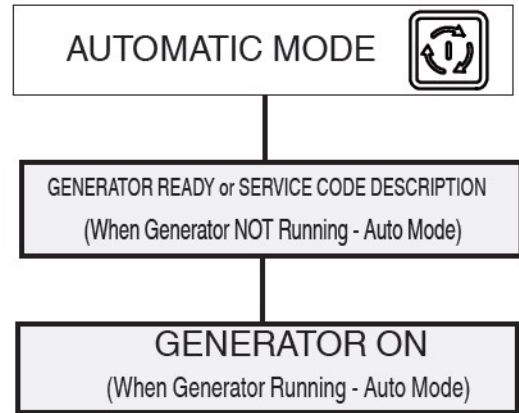


# Control Panel Prompts

## Automatic Mode

In Automatic Mode, the display screen will display via scrolling text:

- GENERATOR READY - if the unit is in standby and utility power is present.
- GENERATOR ON - if the unit is running and utility power is not on.
- SERVICE CODE - if a system service code has been detected.



## General System Parameters

To view general system parameters, press the MENU button.

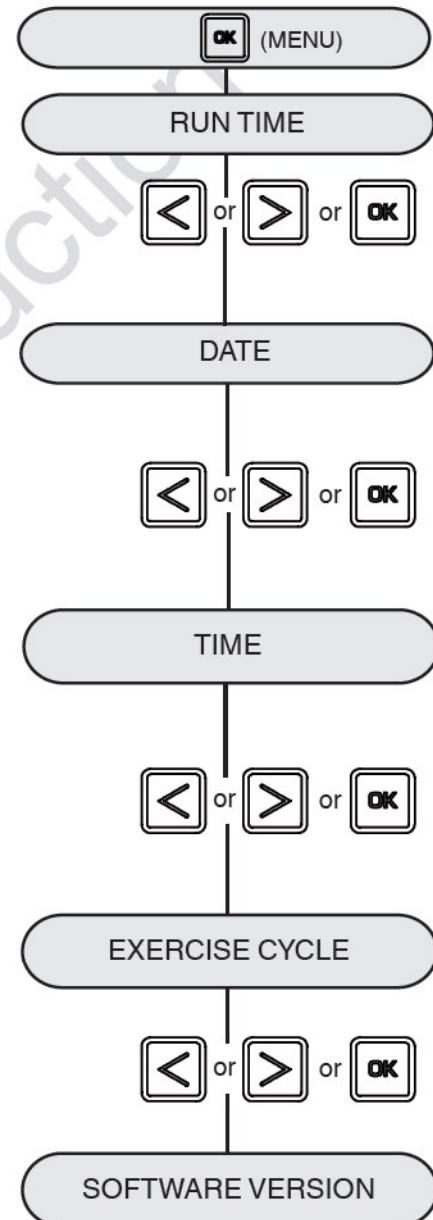
The following will scroll across the digital display and then move to the next item:

- Run time (total hours the unit has run since installation)
- Date
- Time
- Exercise Cycle date and start time

The user can press the LEFT ARROW or RIGHT ARROW at any time to move to the next item.

The user can press ESCAPE to go back to GENERATOR READY.

If no user inputs are made for 10 seconds after all the items have been displayed, the control board will reset to GENERATOR READY.



# Operation

## Important Owner's Considerations

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### Engine Oil

The engine is shipped from the factory pre-run and filled with synthetic oil (API SJ/CF 5W-30). This allows for system operation in a wide range of temperature and climate conditions. Before starting the engine, check oil level as described in *Maintenance*.

**NOTICE** Any attempt to crank or start the engine before it has been properly serviced with the recommended oil will result in equipment failure.

- Damage to equipment resulting from failure to follow this instruction will void engine and generator warranty.

### Battery

**⚠ WARNING** Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

The installer must supply a rechargeable 12 volt DC starting battery. See *Battery in Final Installation Considerations* in the installation manual.

With the battery installed, all wiring to transfer switch and home generator completed, utility power supplied to the automatic transfer switch, and the unit in **AUTO** mode, the battery receives a trickle charge while the engine is not running. The trickle charge cannot be used to recharge a battery that is completely discharged.

**NOTICE** A battery booster should never be used to quick charge a low battery.

### 15 Amp Fuse

The generator's 15 Amp fuse is critical to correct system operation. The 15 Amp fuse was removed at the factory. Your installer will ensure the fuse is properly installed upon completion of the installation.

## Automatic Operation Sequence

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The generator's control board constantly monitors utility voltage. Should utility voltage drop below a preset level, the control board will signal the engine to crank and start.

When utility voltage is restored above a preset voltage level, the engine is signaled to shut down.

The actual system operation is not adjustable and is sequenced by sensors and timers on the control board, as follows:

### Utility Voltage Dropout Sensor

- This sensor monitors utility source voltage.
- If utility source voltage drops below about 70 percent of the nominal supply voltage, the sensor energizes a 3 second timer. The timer is used to 'sense' brown-outs.
- Once the timer has expired, the engine will crank and start.

### Utility Voltage Pickup Sensor

This sensor monitors utility power voltage. When utility voltage is restored above 80 percent of the nominal source voltage, a time delay starts timing and the engine will go to engine cool-down.

### Engine Cool-down Timer

When utility power is sensed and the load transfers to the utility source, the engine will go into a cool down period as described below:

- If the generator has run for MORE than 5 minutes, once the utility transfer occurs, the engine will continue to run for about 1 minute before shutting down.
- If the generator has run for LESS than 5 minutes, once the utility transfer occurs, the engine will continue to run until 5 minutes has elapsed before shutting down.

## Setting Exercise Timer

---

The generator is equipped with an exercise timer. During the exercise period, the unit runs for approximately 20 minutes and then shuts down. Electrical load transfer DOES NOT occur during the exercise cycle (unless an utility power outage occurs).

**The generator will only enter the exercise cycle if the unit is in the AUTO mode and this exact procedure is followed.**

### To set the exercise timer:

**NOTICE** The generator is set with a default exercise cycle setting of Tuesday at 2:00 P.M, Central Time. To change the cycle setting, proceed to the following steps:

1. Choose the day and time you want your generator to exercise.
2. Press and hold the left and right arrow until "General Set-Up" scrolls. See *General Set-Up* flow chart in Menu Section.
3. Verify and/or set the time and date on the unit.
4. Go to the SET EXERCISE prompt and hit the "OK" button.

**NOTICE** Items will flash until they are selected.

**SELECT DAY:** Use the left or right arrow to toggle through the days of the week, Once the day is selected, hit the "OK" button.

**SELECT HOUR:** Use the left or right arrow to toggle through between 1 and 12. Choose the hour of day you want the generator to exercise then hit the "OK" button.

**SELECT MINUTE:** Use the left of right arrow to toggle between :00 and :59. Choose the minute of the day you want the generator to exercise then hit the "OK" button.

**SELECT AM/PM:** Use the left of right arrow to toggle between AM and PM. Once chosen, hit the "OK" button.

**NOTICE** During the weekly exercise cycle, the generator will run for 20 minutes, but it will not supply power to the home. During the exercise cycle, the in-home monitor will continue blinking the GENERATOR READY green LED.

If you want to change the day and time the unit exercises, simply perform the procedure again.

To turn off the generator exercise cycle, go to the OFF selection within the day of the week menu and press OK. The display will then scroll: EXERCISE CYCLE OFF.

## Optional Wireless Monitor (Sold Separately)

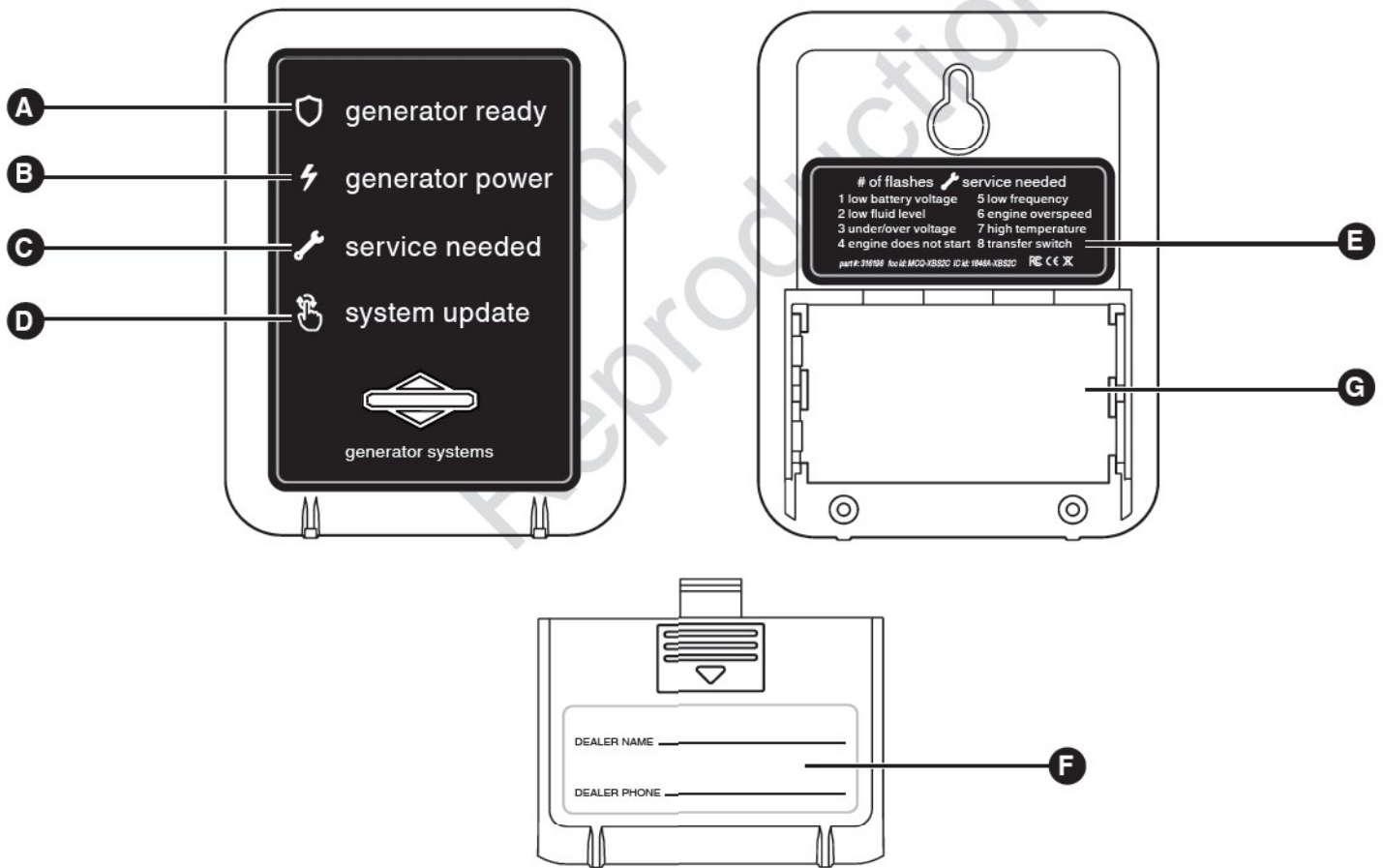
The generator is supplied with a battery-powered, wireless monitor.

The monitor communicates wirelessly with the generator control panel. The monitor may be placed in a suitable location in the home. The system has a line-of-sight range of about 200 feet, but this distance will decrease if the signal has to pass through walls or other objects.

The wireless monitor communicates with the generator, every 10 minutes and will display the status via a green or red LED light on the front of the monitor.

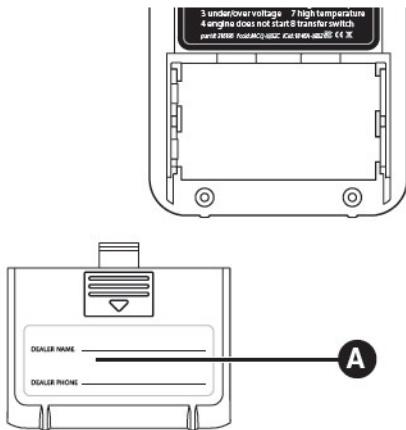
Compare the illustration below with your monitor to familiarize yourself with these important components.

- Generator Ready **A** - Green LED
- Generator Power **B** - Green LED
- Service Needed **C** - Red LED
- System Update **D** - Press for current system update with generator.
- Service code descriptions **E** - Name and number of flashes are listed on the backside of the wireless monitor.
- Battery Access Cover **F** - Record the dealer name and phone number on the label provided. Once removed, two non-rechargeable AA batteries are installed in the compartment **G**.



## Wireless Monitor Operation

1. Remove battery access cover **A** on back of monitor and install 2 AA batteries. (Observe correct battery polarity which is embossed in the bottom of



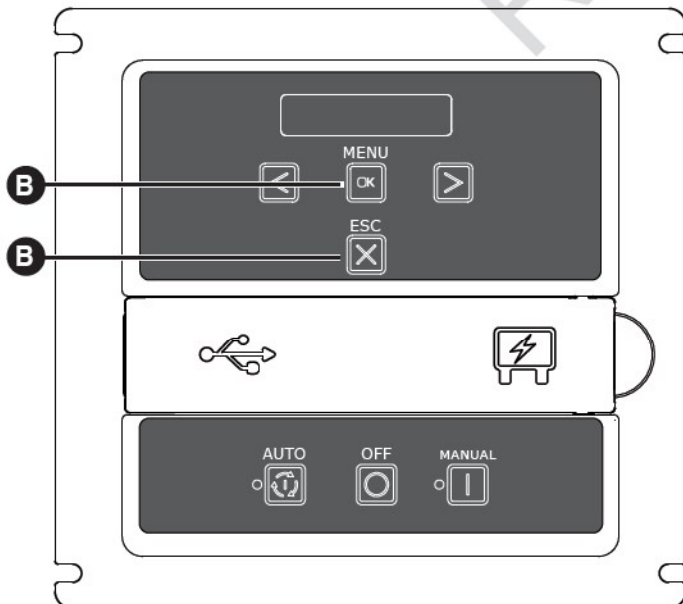
**NOTICE** The wireless monitor was linked to the generator at the factory. Communication will begin upon the installation of the batteries and the generator being placed in AUTO mode. You may need to press System Update one time.

the battery compartment). Replace battery access cover.

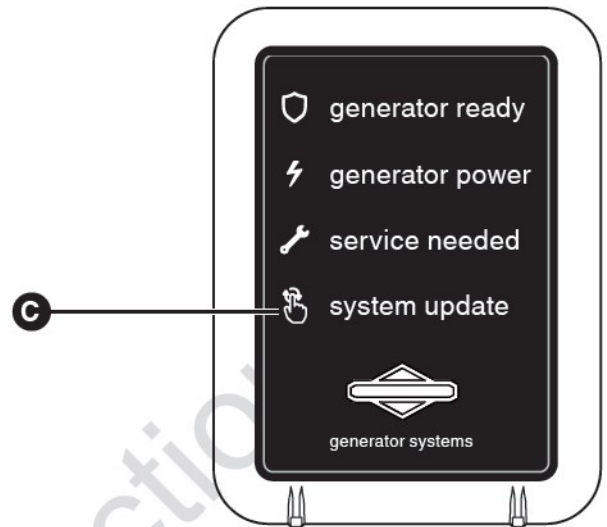
2. The wireless monitor does not have an on/off switch. When batteries are installed correctly, the GENERATOR READY green LED light will flash once every 7 seconds indicating the status of the generator.

**NOTICE** If communication does not begin upon placing the generator in AUTO, installing batteries, and pressing System Update, the monitor may need to be re-linked. To link, follow Steps 3 through 6.

3. Locate the MENU AND ESCAPE buttons on the control panel **B**. Press and hold for about 3 seconds to enter the linking mode.



4. "LINKING MODE" will scroll across the generator control panel.
5. Locate and hold the SYSTEM UPDATE button **C** on the wireless monitor while installing the batteries until all 3 LEDs turn on solid. All 3 LEDs will stay on solid until the monitor links to the generator. Once it links, the monitor will display the current state. The monitor will try to link for 1 minute. (This step can



only be completed when the generator is in Linking Mode).

6. Once the link has been confirmed, press the OK button on the generator control panel to exit or the control board will automatically turn off linking after 5 minutes. The generator will now communicate with the wireless monitor.

**NOTICE** It may take up to 1 minute for the monitor to begin displaying the generator status correctly.

## Standard Operation:

### Wireless Monitor Status LED's

- The wireless monitor receives data from the generator every 10 minutes and displays the generator status through 3 LED's.
- Pressing the SYSTEM UPDATE button will provide current generator status by flashing the status LED's. When pressed, all 3 LEDs will flash until the generator status is received.

**NOTICE** Generator control panel must be in AUTO mode or no communication with monitor will occur.

- In order to conserve power and to extend battery life, the LED's are not lit continuously; instead they are briefly flashed as indicated below.

**NOTICE** During the weekly exercise cycle, the generator will run for 20 minutes, but it will not supply power to the home. During the exercise cycle, the monitor will continue blinking the GENERATOR READY green LED.

- **GENERATOR READY** - When active, the green LED will flash once every 7 seconds. The green LED indicates that the generator is in AUTO mode and that it is ready to run in the event of a loss of utility power.
- **GENERATOR POWER** - When active, the green LED will flash every 7 seconds. The green LED indicates that the generator is supplying power.
- **SERVICE NEEDED** - When active, the red LED will flash in a sequence that corresponds to the service code. For example, when Low Frequency scrolls across the control board, the red LED will flash 5 times with a 3 second pause between series of blinks until it is reset or the condition is corrected. Contact the nearest authorized service dealer if the problem can not be fixed.

**NOTICE** Service conditions will only be displayed on the basic monitor when the control board is placed in AUTO mode.

## Other:

### LED Lighting Codes

- No status LEDs illuminated - Generator in OFF mode or check and replace batteries.

Wireless communication lost issues can typically be resolved by moving the wireless monitor closer, within the home, to the standby generator. See Optional Router Accessory Kit

- **Batteries Inserted** - the shield LED will light for 5 seconds.
- **Linking Error or Not Linked** - Each LED will light then turn off in one direction, then the other direction until a successful link is completed.
- **During the weekly exercise cycle**, the generator will run for 20 minutes, but it will not supply power to the home. During the exercise cycle, the monitor will continue blinking the green shield LED.

Service Code Descriptions - name and number of flashes are listed on the back side of the wireless monitor.



# of flashes	service needed
1	low battery voltage
2	low fluid level
3	under/over voltage
4	engine does not start
5	low frequency
6	engine overspeed
7	high temperature
8	transfer switch

part #: xxxxxx fcc id: xxxxxx IC id: xxxxxx

FC CE X

None of the service needed codes are cleared at the wireless monitor. All alerts must be cleared at the generator control panel.

# Maintenance

## Servicing the System

---

**Before performing any generator maintenance, always perform the following steps:**

1. Set generator's circuit breaker to its OFF position.
2. Press and hold the control board OFF button.
3. Remove 15 Amp fuse from control board.
4. Utility voltage is present at generator control board. Disconnect power before servicing control board by removing the fuses from the transfer switch.
5. After all servicing has been completed, replace fuses in transfer switch, replace 15 Amp fuse in control board, set circuit breaker **ON** and press and hold control board **AUTO** button.

## Service Code Detection System

---

The generator may have to run for long periods of time with no operator present. For that reason, the system is equipped with sensors that automatically shut down the generator in the event of potentially damaging conditions, such as low oil pressure, high temperature, over speed, and other conditions.

The generator's control board shows service code descriptions scrolling across the digital display. The service code descriptions are listed below:

- Low Battery Voltage
- Low Oil Pressure
- Under Voltage
- Over Voltage
- Engine Does Not Start
- Low Frequency
- Engine Overspeed
- High Oil Temperature
- Transfer Switch Service code
- No Wireless Communication
- Battery Charge Circuit

### Reset Service code Detection System

The operator must reset the service code detection system each time it activates. To do so, press the control board OFF button for 5 seconds. Once the display turns off, leave it off for at least 30 seconds. Remedy the service code condition, then return the home generator to service by pressing and holding the control board AUTO button and installing the 15 Amp fuse (if removed).

### Low Battery Voltage

This service code is indicated by *Low Battery Voltage* scrolling across the digital display and a single flash on the wireless monitor. This condition occurs if the battery voltage drops below the preset value. Causes for this problem may be a service code battery or battery charge circuit. See *Battery Charge Circuit*,

Remove the 15 Amp fuse and disconnect the battery from the generator. Test the battery voltage. If voltage meets specifications, take the battery to a local battery store for analysis. Or contact your local service center for assistance.

Reinstall the battery (replace if necessary - see *Battery* in *Final Installation Considerations* in the installation manual). Then reset the service code detection system, as described earlier.

## Low Oil Pressure

This service code is indicated by *Low Oil Pressure* scrolling across the digital display and two flashes on the wireless monitor. The unit is equipped with an oil pressure switch that uses normally closed contacts held open by engine oil pressure during operation. Should oil pressure drop below the 8 psi range, switch contacts close and the engine will shut down.

To remedy the low oil pressure condition, add the recommended oil to the FULL mark on the dipstick.

If the low oil pressure condition still exists, the engine will start, then shut down again. The service code will appear. In this case, contact an authorized dealer.

## Under Voltage

This service code is indicated by *Under Voltage* scrolling across the digital display and three flashes on the wireless monitor. This condition is caused by a restriction in the fuel flow, the electronic governing system not functioning properly, a broken or disconnected signal lead, a failed alternator winding, the control board circuit breaker is open, or the generator is overloaded.

To remedy the problem, contact your installer or an authorized dealer.

## Over Voltage

This service code is indicated by *Over Voltage* scrolling across the digital display and three flashes on the wireless monitor. This feature protects devices connected to the transfer switch by shutting the generator down if the generator output voltage happens to increase above the preset limit.

This condition is most likely caused by an alternator excitation circuit or a load imbalance. To remedy the problem, contact your installer or an authorized dealer.

## Engine Does Not Start

This service code is indicated by *Engine Does Not Start* scrolling across the digital display and four flashes on the wireless monitor. This feature prevents the generator from damaging itself if it continually attempts to start in spite of another problem, such as no fuel supply. Each time the system is directed to start, the unit will crank for 10 seconds, pause for 10 seconds, and repeat. If the system does not begin producing electricity after approximately 2 minutes, the unit will stop cranking.

The most likely cause of this problem is no fuel supply or incorrect fuel selector setting. See *Fuel Selection Switch* in the installation manual. Check the internal and external fuel shut off valves to ensure they are fully open. Other causes could be failed spark plug(s), a loose electronic governor connection, a failed engine ignition, or the engine air filter is clogged. You may need to contact your installer for assistance if you can't remedy these problems.

## Low Frequency

This service code is indicated by *Low Frequency* scrolling across the digital display and five flashes on the wireless monitor. This feature protects devices connected to the transfer switch by shutting the generator down if the engine runs slower than 55 Hz for three seconds. This condition is caused by a failed engine component, electronic governor system, or by excessive loads on the generator. To resolve the problem, contact your installer or an authorized dealer.

## Engine Overspeed

This service code is indicated by *Engine Overspeed* scrolling across the digital display and six flashes on the wireless monitor. This condition can be caused by a problem within the electronic governor system.

To resolve the problem, contact your installer or an authorized dealer.

## High Oil Temperature

This service code is indicated by *High Oil Temperature* scrolling across the digital display and seven flashes on the wireless monitor. The contacts of the temperature switch are normally open. If the engine temperature exceeds a predetermined temperature, the service code is detected and the engine shuts down.

Common causes for this condition include running the unit with an access doors removed, obstructed air inlet or exhaust port, or debris in the engine compartment or running unit with roof open.

To resolve the problem, let the engine cool down and remove any accumulated debris and obstructions. Ensure that the access doors are installed and the roof is closed whenever the unit is running. If problem persists, contact your installer or an authorized dealer.

## Transfer Switch Service code

This service code is indicated by *Transfer Switch Service code* scrolling across the digital display (if transfer switch is equipped with service code detection) and eight flashes on the wireless monitor.

The most likely cause of this service code is a blown fuse in the transfer switch. To remedy the problem, contact your installer or an authorized dealer.

## No Wireless Communication

This service code is indicated by *No Wireless Communication* scrolling across the digital display. This condition is caused by an internal error of the wireless system on the control panel. To resolve this, remove power completely from the control panel by removing the 15 Amp ATO FUSE, then remove utility power from the generator. After 1 minute, apply utility power to the generator, and then replace the 15 Amp ATO FUSE. Put the generator back into Auto mode. If the problem persists, contact your installer or authorized dealer.

## Battery Charge Circuit

This service code is indicated by *Battery Charge Circuit* scrolling across the digital display. The most likely cause is an electrical problem with the control panel. To remedy the problem, contact your installer or an authorized dealer.



## Maintenance Schedule

Follow the hourly or calendar intervals of operation, whichever occurs first.

<b>First 5 Hours</b>
Change Engine Oil
<b>Every 8 Hours or Daily</b>
Clean Debris
Check Engine Oil Level
<b>Every 100 Hours or Annually</b>
Change Air Filter
Change Engine Oil and Filter
Replace Spark Plugs
Check Valve Clearance
Check Circuit Breaker Torques
<b>Annually</b>
Clean Oil Cooler Fins

\* The emissions control system for this engine is EM (Engine Modification).

Regular maintenance will improve the performance and extend the life of the generator. See any authorized dealer for service.

### Emissions Control

**Maintenance, replacement, or repair of the emissions control devices and systems may be performed by any non-road engine repair establishment or individual.** However, to obtain "no charge" emissions control service, the work must be performed by a factory authorized dealer. See the *Emissions Warranty*.

## Generator Maintenance

The generator's warranty does not cover items that have been subjected to operator abuse or negligence. To receive full value from the warranty, the operator must maintain the generator as instructed in this manual.

Some adjustments will need to be made periodically to properly maintain your generator.

All service and adjustments should be made at least once each season. Follow the requirements in the *Maintenance Schedule* chart.

Generator maintenance consists of keeping the unit clean. Operate the unit in an environment where it will not be exposed to excessive dust, dirt, moisture or any corrosive vapors. Cooling air louvers on the enclosure must not become clogged with snow, leaves, or any other foreign material. To prevent generator damage caused by overheating, keep the enclosure cooling inlets and outlets clean and unobstructed at all times.

Check the cleanliness of the unit frequently and clean when dust, dirt, oil, moisture or other foreign substances are visible on its exterior/interior surface. Inspect the air inlet and outlet openings inside and outside the enclosure to ensure air flow is not blocked.

DO NOT use direct spray from a garden hose to clean generator. Water can enter the engine and generator and cause problems.

**NOTICE** Improper treatment of generator could damage it and shorten its life.

- DO NOT expose generator to excessive moisture, dust, dirt, or corrosive vapors.
- DO NOT insert any objects through cooling slots.

### Clean the generator as follows:

1. Press and hold the control board OFF button.
2. Remove 15 Amp fuse from control board.
3. Clean generator as desired.
  - Use a damp cloth to wipe exterior surfaces clean.
  - Use a soft, bristle brush to loosen caked on dirt, etc.
  - Use a vacuum cleaner to pick up loose dirt and debris.
  - Use low pressure air (not to exceed 25 psi) to blow away dirt. Inspect cooling air slots and openings on the generator. These openings must be kept clean and unobstructed.
4. Reinstall 15 Amp fuse in control board.
5. Press and hold the control board **AUTO** button.

# Battery

Servicing of batteries is to be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

## Servicing the Battery

If it is necessary to service the battery, proceed as follows:

1. Press and hold the control board OFF button.
2. Remove 15 Amp fuse from control panel.
3. Service or replace battery as required. See *Battery in Final Installation Considerations* in the installation manual for specific battery needed.
4. Connect red battery cable to battery positive terminal (indicated by **POSITIVE, POS**, or (+)).

**⚠ WARNING** Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

5. Connect black negative battery cable to negative battery terminal (indicated by **NEGATIVE, NEG**, or (-)).
6. Ensure hardware on both positive and negative battery terminals is secure.
7. Reinstall 15 Amp fuse in control panel.
8. Press and hold the control board **AUTO** button.



**DON'T POLLUTE. CONSERVE RESOURCES, RETURN USED BATTERY TO RECYCLING COLLECTION CENTER.**

## Charging the Battery

If it is necessary to charge the battery, proceed as follows:

1. Press and hold the control board **OFF** button.
2. Remove 15 Amp fuse from control board.
3. Disconnect negative battery cable from negative battery terminal (indicated by **NEGATIVE, NEG**, or (-)).

**NOTICE** Failure to disconnect negative battery cable could result in equipment failure.

- DO NOT attempt to jump start the generator.
- Damage to equipment resulting from failure to follow this instruction will void engine and generator warranty.

4. **Charge battery with battery charger at 2 Amps until battery holds 12 Volts. DO NOT exceed 13.7 volts when charging.**

**NOTICE** DO NOT use a battery booster to quick charge a low battery.

5. Connect negative battery cable to negative battery terminal (indicated by **NEGATIVE, NEG**, or (-)).
6. Ensure hardware on both positive and negative battery terminals is secure.
7. Reinstall 15 Amp fuse in control board.
8. Press and hold the control board **AUTO** button.

**⚠ WARNING** Storage batteries give off explosive hydrogen gas during recharging.



Slightest spark will ignite hydrogen and cause explosion, resulting in death or serious injury.

Battery electrolyte fluid contains acid and is extremely caustic. Contact with battery contents could cause severe chemical burns.

A battery presents a risk of electrical shock and high short circuit current.

- DO NOT dispose of battery in a fire. Recycle battery.
- DO NOT allow any open flame, spark, heat, or lit cigarette during and for several minutes after charging a battery.
- DO NOT open or mutilate the battery.
- Wear protective goggles, rubber apron, rubber boots and rubber gloves.
- Remove watches, rings, or other metal objects.
- Use tools having insulated handles.

**⚠ CAUTION** With the system switch set to AUTO, the engine could crank and start at any time without warning, resulting in minor or moderate injury.



- To prevent possible injury that could be caused by such sudden starts, always set the system switch to OFF if performing maintenance on the system.
- Remove the 15 Amp fuse before working on or around the generator or transfer switch.

## Engine Maintenance

**⚠ WARNING** Unintentional sparking could cause fire or electric shock resulting in death or serious injury.



### WHEN ADJUSTING OR MAKING REPAIRS TO YOUR GENERATOR

- Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.

### WHEN TESTING FOR ENGINE SPARK

- Use approved spark plug tester.
- DO NOT check for spark with spark plug removed.

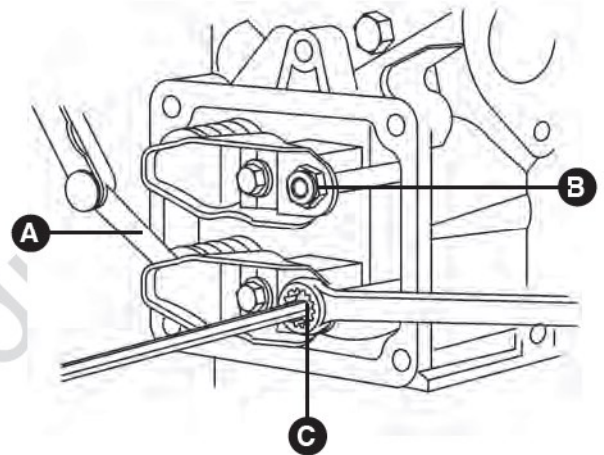
When all engine servicing is complete, replace 15 Amp fuse in control board and reset exercise timer.

## Adjust Valve Lash

The valve lash must be checked every 100 hours of operation. Measure valve clearance with the engine cold.

To adjust the valve lash, proceed as follows:

1. Gain access to valves by removing the two fasteners that secure the valve cover.
2. Remove spark plugs to ease manual rotation of engine crankshaft.
3. Turn crankshaft counterclockwise until the piston is at Top Dead Center on the compression stroke.
4. Insert a narrow screwdriver or rod into spark plug hole as a gauge, then slowly turn crankshaft counterclockwise until the piston has moved down the bore by 1/4".
5. For the Model 38 Engine:
  - Use a feeler gauge **A** to measure the valve clearance.
  - Adjust the clearance by loosening the lock nut **B** then turn the adjusting screw **C** to obtain the following measurements:  
Intake: 0.005 in. (0.13 mm)  
Exhaust: 0.008 in. (0.20 mm)
  - Once the clearance is properly set, hold the adjusting screw while torquing the lock nut to 70 in/lbs. (8 Nm).
6. Reassemble valve cover by carefully aligning cover and fastener holes. Tighten valve cover fasteners to 35 in/lbs (3.9 Nm).
7. Repeat for the other valve.



Model 38 Engine

# Electronic Governor System

The engine electronic governor system allows for improved control and increased generator performance compared to mechanically governed systems. The result is smooth steady-state operation without the “hunting” common to many mechanical governors. The system also reduces speed variations under engine loading and unloading and significantly reduces frequency fluctuation experienced when the engine is under higher loads.

The electronic governor system is composed of a stepper motor **A** , stepper motor throttle control linkages **B** . The control board contains a digital controller that processes engine speed information and sends appropriate commands to the stepper motor to control the position of the engine throttle.

Since the electronic governing system controls the engine throttle demand based upon generator load, the following service codes and/or conditions may be related to an electronic governing system issue:

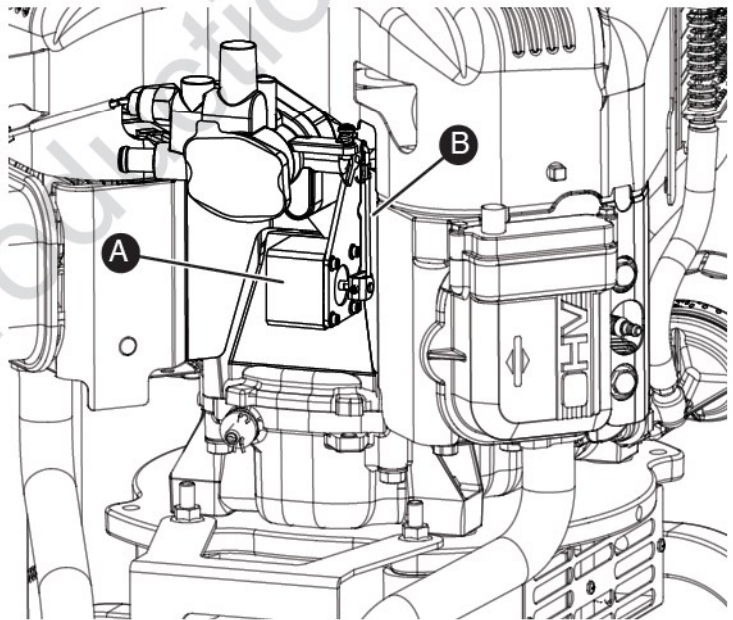
- Engine Does Not Start
- Over Speed
- Under Frequency
- Unstable No Load Engine Control

While trouble shooting any of these conditions, a verification of the electronic governor system can be initiated through the control panel – advanced menu options – Electronic Governor Check.

## Electronic Governing Check

The generator has an electronic governing check feature that will turn on the stepper motor and move the throttle linkage clockwise and counterclockwise within the throttle limits. The test will rotate the stepper motor and move the throttle arm between the wide open throttle and dead idle limits 4 times with a 2 second delay between each throttle sweep. This will allow visual verification that the stepper motor is functioning properly and the control linkages are connected. The engine will not attempt to start during this test. If the stepper motor does not move, or if a linkage binds, then service may be required.

**NOTICE** If stepper motor does not move, please make sure the stepper motor connector is attached.



# Engine Oil

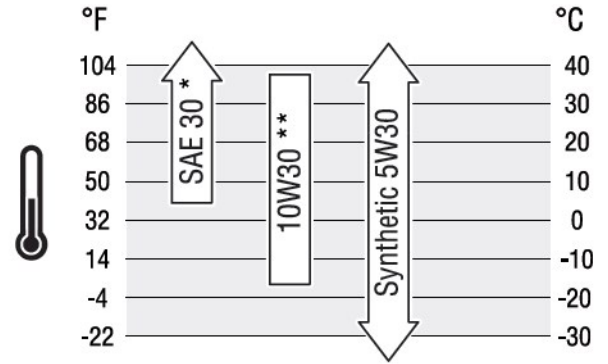
The engine is filled with synthetic oil (API SJ/CF 5W-30). This allows for system operation in the widest range of temperature and climate conditions.

We recommend the use of Briggs & Stratton Warranty Certified oils for best performance. Other high-quality detergent oils are acceptable if classified for service SJ or higher. DO NOT use special additives.

Outdoor temperatures determine the proper oil viscosity for the engine. Use the chart to select the best viscosity for the outdoor temperature range expected.



**NOTICE** Synthetic oil meeting ILSAC GF-2, API certification mark and API service symbol with “SJ/CF ENERGY CONSERVING” or higher, is an acceptable oil at all temperatures. Use of synthetic oil does not alter required oil change intervals.



\* Below 40°F (4°C) the use of SAE 30 will result in hard starting.

\*\* Above 80°F (27°C) the use of 10W30 may cause increased oil consumption. Check oil level more frequently.

## Changing Engine Oil and Oil Filter

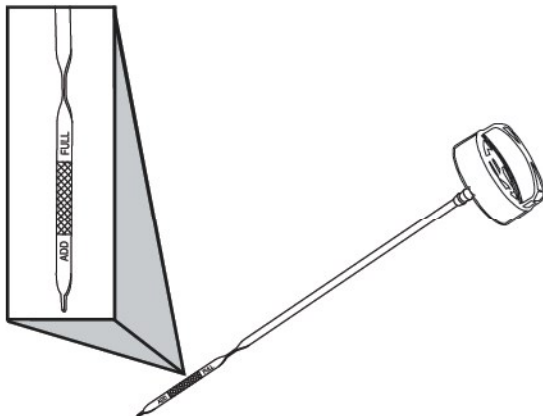
Open roof and remove front panel to access the oil filter and to add engine oil.

## Checking/Adding Engine Oil

1. Open roof to access dipstick and oil fill area.
2. Clean the oil fill area of any debris.
3. Remove the dipstick and wipe with a clean cloth.
4. Fully insert dipstick into oil fill.
5. Remove dipstick and check oil level. Verify oil is at Full mark on dipstick.
6. If needed, slowly pour recommended oil into oil fill opening. DO NOT overfill. After adding oil, wait one minute and recheck oil level.
7. Replace oil dipstick.
8. Close roof and secure.

**NOTICE** Overfilling with oil could cause the engine to not start, or hard starting.

- DO NOT overfill.
- If over the FULL mark on dipstick, drain oil to reduce oil level to FULL mark on dipstick.



## Changing Engine Oil and Oil Filter

**CAUTION** Avoid prolonged or repeated skin contact with used motor oil.

- Used motor oil has been shown to cause skin cancer in certain laboratory animals.
- Thoroughly wash exposed areas with soap and water.



KEEP OUT OF REACH OF CHILDREN. DON'T POLLUTE. CONSERVE RESOURCES. RETURN USED OIL TO COLLECTION CENTERS.

**NOTICE** Any attempt to crank or start the engine before it has been properly serviced with the recommended oil will result in equipment failure.

- DO NOT attempt to crank or start the engine before it has been properly serviced with the recommended oil. This may result in an engine failure.
- Damage to equipment resulting from failure to follow this instruction will void engine and generator warranty.

Change the oil while the engine is still warm from running, as follows:

1. Press and hold the control board **OFF** button.
2. Remove 15 Amp fuse from control board.
3. Place oil drain hose into an approved container.
4. Remove brass fitting from end of drain hose and drain oil into an approved container.
5. When oil has drained, replace brass fitting on hose.
6. Place oil absorbing towels under oil filter.
7. Remove oil filter and dispose of properly.
8. Before installing a new oil filter, lightly lubricate the oil filter gasket with fresh, clean oil.
9. Install the oil filter by hand until the gasket contacts the oil filter adapter, then tighten the oil filter 1/2 to 3/4 turn.
10. Add oil.
11. Remove container from under oil filter and clean up any spilled oil.
12. Start and run engine. As engine warms up, check for oil leaks.
13. Stop engine, wait for oil to settle, check oil level and add if necessary.

## Service Air Cleaner

---

Your engine will not run properly and may be damaged if you run it with a dirty air cleaner. Clean or replace more often if operating under dusty or dirty conditions.

To service the air cleaner, follow these steps:

1. Unclasp hooks and remove cover.
2. Remove nut and air filter.
3. To loosen debris, gently tap air cleaner on a hard surface. If air cleaner is excessively dirty, replace with a new air cleaner.
4. Install the air filter.
5. Install the cover and secure with knobs.

**NOTICE** Replacement parts must be the same and installed in the same position as the original parts.

# Fuel System Inspection and Maintenance

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## Natural Gas / Propane Fuel System

The fuel system installed on this industrial engine has been designed to various standards to ensure performance and reliability. To ensure compliance to these standards, follow

the recommended maintenance schedule contained in this section.

**NOTICE** The fuel system components have been specifically designed and calibrated to meet the fuel system requirements of the engine. If a fuel system component fails to operate or develops a leak, it should be repaired or replaced with the OEM recommended replacement parts.

## Pressure Regulator Maintenance and Inspection

If the regulator fails to operate or develops a leak, it should be repaired or replaced with the OEM recommended replacement parts.

When inspecting the regulator, check for the following items:

- Check for any fuel leaks at the inlet and outlet fittings.
- Check for any fuel leaks in the regulator body.
- Check to ensure the regulator is securely mounted and the mounting bolts are tight.
- Check the regulator for external damage.

## Venturi / Throttle Control Device Maintenance and Inspection

**NOTICE** The venturi and throttle body components have been specifically designed and calibrated to meet the fuel system requirements of the engine.

**NOTICE** A dirty air cleaner may significantly alter the venturi performance.

When inspecting the venturi and throttle body, check for the following items:

- Leaks at all fittings.
- Ensure the venturi and throttle body are securely mounted.

- Inspect air cleaner element according to the recommended maintenance schedule found in this section.
- Check fuel lines for cracking, splitting, or chaffing. Replace if any of these conditions exist.
- Check for leaks at the throttle body and intake manifold.

## Exhaust System Maintenance and Inspection

When inspecting the exhaust system, check for the following items:

- Inspect exhaust manifold at the cylinder head for leaks and that all retaining bolts and shields (if used) are in place.
- Inspect manifold to exhaust pipe fasteners to ensure they are tight and that there are not exhaust leaks. Repair as necessary.
- Inspect exhaust pipe connection for leaks. Repair as necessary.

## Engine Exterior

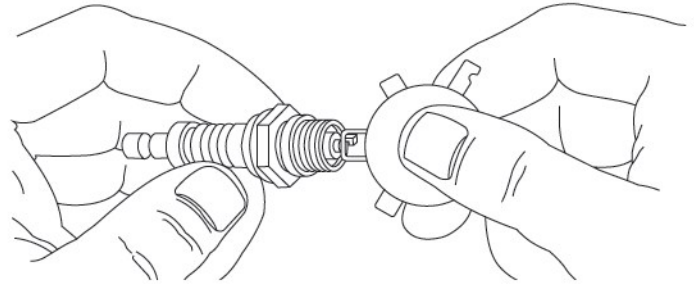
Periodically inspect the engine exterior for contamination and potential damage from dirt, leaves, rodents, spider webs, insects, etc. and remove.

## Service Spark Plugs

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Changing the spark plugs will help your engine to start easier and run better.

1. Clean area around spark plugs.
2. Remove and inspect spark plugs.
3. Check electrode gap with wire feeler gauge and reset spark plug gap to recommended gap if necessary (see *Specifications*).
4. Replace spark plugs if electrodes are pitted, burned or porcelain is cracked. Use the recommended replacement spark plugs. See *Specifications*.
5. Install spark plugs and tighten to 180 in/lbs (20 Nm).



## Clean Air Cooling System and Oil Cooler Fins

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Over time debris may accumulate in cylinder cooling fins and cannot be observed without partial engine disassembly. Unobstructed air flow is critical for correct generator operation. For this reason, we recommend you have an authorized service dealer clean the cooling system per recommended intervals (see *Maintenance Schedule* in the *Maintenance* section). Equally important is to keep top of engine free from debris. Make sure the oil cooler fins are free of dirt and debris. Also see *Cleaning*.

## When Calling for Assistance

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**You must have the following information at hand if it is necessary to contact a local service center regarding service or repair of this unit:**

1. Obtain the unit Model Number and Serial Number from the unit ID label. See *Controls* for location of the label or refer to the information recorded on the inside front cover of the installation manual.
2. Obtain the engine identification numbers from the engine label. See *Controls* for location of the label or refer to the information recorded on the inside front cover of the installation manual.

## Storage

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The home generator system is designed for long term service as a backup generator. There is no need to take any storage precautions. However, if it becomes necessary to take the system out of service for an extended period, call Technical Services at **888 575-8226**, between 8:00 AM and 5:00 PM CT for specific recommendations.



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# Troubleshooting

Problem	Cause	Correction
Engine is running, but no AC output is available.	<ol style="list-style-type: none"> <li>1. Circuit breaker open or defective.</li> <li>2. Service code in generator control board.</li> <li>3. Poor wiring connections or defective transfer switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset or replace circuit breaker.</li> <li>2. Contact local service facility.</li> <li>3. Check and repair or contact local service facility.</li> </ol>
Engine runs well at no-load but “bogs down” when loads are connected.	<ol style="list-style-type: none"> <li>1. Generator is overloaded.</li> <li>2. Short circuit in a connected load.</li> <li>3. Shorted generator circuit.</li> <li>4. Fuel pressure or mixture is incorrect.</li> <li>5. Kinked fuel line between regulator and engine.</li> <li>6. Clogged air filter.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove one or more loads.</li> <li>2. Disconnect shorted electrical load.</li> <li>3. Contact local service facility.</li> <li>4. See <i>Gaseous Fuel System</i> in the installation manual.</li> <li>5. Remove kink. Replace if necessary.</li> <li>6. Clean or replace air filter.</li> </ol>
Engine will not start; or starts and runs rough.	<ol style="list-style-type: none"> <li>1. 15 Amp fuse missing or blown.</li> <li>2. Thermal fuse(s) blown.</li> <li>3. Fuel supply turned off or depleted.</li> <li>4. Incorrect fuel selection.</li> <li>5. Failed battery.</li> <li>6. Clogged air filter.</li> <li>7. Throttle linkage binding</li> </ol>	<ol style="list-style-type: none"> <li>1. Install (new) 15 Amp fuse. See <i>System Control Board</i></li> <li>2. Replace thermal fuse(s).</li> <li>3. Open fuel valve(s); check propane tank.</li> <li>4. Check fuel selector switch and set to proper setting. (If applicable)</li> <li>5. Replace battery.</li> <li>6. Clean or replace air filter.</li> <li>7. Check linkage.</li> </ol>
Engine shuts down during operation.	<ol style="list-style-type: none"> <li>1. Fuel supply turned off or depleted.</li> <li>2. Control board digital display shows a service code.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check fuel valves, fill propane tank.</li> <li>2. Refer to <i>Service code Detection System</i>.</li> </ol>
Loss of power on circuits.	<ol style="list-style-type: none"> <li>1. Generator circuit breaker is open.</li> <li>2. Transfer switch problems.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset circuit breaker.</li> <li>2. See transfer switch manual.</li> </ol>
Unit will not exercise.	<ol style="list-style-type: none"> <li>1. Control board not set to AUTO.</li> <li>2. Exercise timer not set or set to OFF.</li> <li>3. Unit date and time not set.</li> <li>4. Failed battery.</li> <li>5. 15 Amp fuse missing or blown.</li> </ol>	<ol style="list-style-type: none"> <li>1. Press AUTO button on control board.</li> <li>2. Set exercise timer.</li> <li>3. Set unit date and time.</li> <li>4. Replace battery.</li> <li>5. Install (new) 15 Amp fuse. See <i>System Control Board</i>.</li> </ol>
Excessive Vibration	<ol style="list-style-type: none"> <li>1. Loose mechanical fastener.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and repair or contact local service facility.</li> </ol>
Odor of fuel	<ol style="list-style-type: none"> <li>1. Fuel leak.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn off manual shutoff fuel valve. Contact local service facility.</li> </ol>
Utility power returns, unit does not stop	<ol style="list-style-type: none"> <li>1. Blown fuses in transfer switch.</li> <li>2. 5 minute minimum runtime not lapsed.</li> <li>3. Poor wire connection or defective controllers.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install (new) fuses.</li> <li>2. Wait 5 minutes.</li> <li>3. Check, repair or contact local service facility.</li> </ol>



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