

Cummins **Onan**



# Operator Manual

## **Home Standby Power Generator Set**

GSBB (Spec A-D)

GSBC (Spec B-D)

**California**

**Proposition 65 Warning**

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

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# 1 IMPORTANT SAFETY INSTRUCTIONS

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## 1.1 Save These Instructions

This manual contains important instructions for the generator set that should be followed during the operation and maintenance of the generator and batteries.

Thoroughly read this manual before operating the generator set. Safe operation and top performance can only be obtained when equipment is properly operated and maintained.

The following symbols in this manual alert you to potential hazards to the operator, service person and equipment.

### **DANGER**

*Alerts you to an immediate hazard that will result in severe personal injury or death.*

### **WARNING**

*Alerts you to a hazard or unsafe practice that can result in severe personal injury or death.*

### **CAUTION**

*Alerts you to a hazard or unsafe practice that can result in personal injury or equipment damage.*

## 1.2 General Precautions

- Keep ABC fire extinguishers handy.
- Make sure all fasteners are secure and torqued properly.
- Keep the generator set and its compartment clean. Do not store any items in the genset compartment.
  - Excess oil, oily rags (etc.) can catch fire.
  - Dirt and gear stowed in the compartment will restrict cooling air flow.
- Before working on the generator set, move the Stop Switch (S2) to the Stop position, disconnect the remote harness (P7) to disable the ATS mounted charger and then remove the negative (-) battery cable to prevent starting.
- Use caution when making adjustments while the generator set is running, hot, moving or when parts are electrically live, as all situations may cause personal injury or death.
- Used engine oil has been identified by some state and federal agencies as causing cancer or reproductive toxicity. Do not ingest, inhale or come into contact with used oil or its vapors.
- Do not work on the generator set when mentally or physically fatigued or after consuming alcohol or drugs.

## 1.3 Generator Voltage is Deadly

- Generator output connections must be made by a trained and experienced electrician in accordance with all applicable codes.

- This standby generator set and the public utility may only be connected to the house circuits by means of the automatic transfer switch.
  - Improper connections can lead to electrocution of utility workers and damage to equipment.
- Use caution when working on live electrical equipment. Remove jewelry, make sure clothing and shoes are dry and stand on a dry wooden platform.

## 1.4 Engine Exhaust is Deadly

- See [What Is Carbon Monoxide Poisoning?](#) to learn the symptoms of Carbon Monoxide poisoning.
- This generator set is for outdoor installation only.
  - It must be located well away from doors, windows, other openings into the house and where the exhaust gases will disperse away from the house.

## 1.5 Fuel is Flammable and Explosive

- Keep flames, cigarettes, sparks, pilot lights, electrical arc-producing equipment, switches and all other sources of ignition well away from areas where fuel fumes are present and areas sharing ventilation.
- Fuel lines must be secured, free of leaks and separated or shielded from electrical wiring.
- Leaks can lead to explosive accumulations of gas. Prevent leaks and the accumulation of gas.
  - A "rotten egg" smell indicates a possible Natural Gas or Propane leak:
    - Natural Gas rises when released and can accumulate under hoods and inside housings and buildings.
    - Propane sinks when released and can accumulate inside housings and basements and other below-grade spaces.

## 1.6 Batteries Can Explode

Batteries can explode, causing severe skin and eye burns and can release toxic electrolytes.

- Wear safety glasses.
- Do not smoke.
- Do not dispose of the battery in a fire.
  - The battery is capable of exploding.
- Do not open or mutilate the battery.
  - Released electrolytes have been known to be harmful to the skin and eyes and to be toxic.
- Batteries present the risk to high short circuit current:
  - Remove watches, rings or other metal objects and use tools with insulated handles.
- To prevent arcing when disconnecting the battery:
  - Move the Stop Switch (S2) to the Stop position, disconnect the remote harness (P7) to disable the ATS mounted charger and then remove the negative (-) battery cable to prevent starting.
- To prevent arcing when reconnecting the battery:
  - First, reconnect the positive (+) cable, then the negative (-) cable, and finally reconnect the battery charger.



- When replacing the generator set battery, always replace it with a battery as specified in the [Model Specifications](#) section of this manual.

## 1.7 Moving Parts Can Cause Severe Personal Injury or Death

- Do not wear loose clothing or jewelry near moving parts such as fans.
- Keep hands away from moving parts.
- Keep guards in place, over fans.

## 1.8 The Hazards of Carbon Monoxide

Engine-driven generators can produce harmful levels of carbon monoxide that can injure or kill you.

### 1.8.1 What Is Carbon Monoxide Poisoning?

Carbon Monoxide (CO) is an odorless, colorless, tasteless and non-irritating gas. You cannot see it or smell it. Red blood cells, however, have a greater affinity for CO than for Oxygen. Therefore, exposure even to low levels of CO for a prolonged period can lead to asphyxiation (lack of Oxygen) resulting in death. Mild effects of CO poisoning include eye irritation, dizziness, headaches, fatigue and the inability to think clearly. More extreme symptoms include vomiting, seizures and collapse.

### 1.8.2 What Are the Special Risks of CO Near the Home?

Residents can be exposed to lethal levels of CO when the genset is running. Depending on air temperature and wind, CO can accumulate in or near the home.

To protect yourself and others from the dangers of CO poisoning, it is recommended that reliable and approved CO detector alarms be installed in the home.

#### **WARNING**

***Carbon Monoxide (CO) gas can cause nausea, fainting or death.***

### 1.8.3 Only You Can Protect Yourself From CO Poisoning!

- Locate the generator in an area where there are no windows, doors or other access points into the home.
- Make sure all CO detectors are working properly.
- Pay attention to the signs of CO poisoning.
- Check the exhaust system for corrosion, obstruction and leaks each time you start the generator set and every eight hours if you run it continuously.

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## 2 Introduction

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This generator set application is intended for stationary emergency use.

**Important note for Brazil applications:** The manufacturer warns that the installation, operation and maintenance of equipment by the user must fully comply with the Manual's guidelines and current Brazilian laws, including those of the Brazilian Agency of Petroleum, Natural Gas and Fuels (ANP) and the Brazilian Energy Agency (ANEEL).

### 2.1 About this Manual

This is the Operator Manual for the Model GSBB generator set. Each operator of this generator set should become thoroughly familiar with the information in this manual and observe all of its instructions and precautions.

Refer to the [Operation](#) chapter of this manual for instructions and guidelines for operating and monitoring the genset.

Refer to the [Maintenance](#) chapter of this manual for instructions and guidelines for performing periodic maintenance. The operator is responsible for generator set maintenance in accordance with the [Periodic Maintenance Schedule](#).

Refer to the [Troubleshooting](#) chapter for steps to be taken to diagnose and correct situations that cause a generator set to shutdown.

#### WARNING

***This generator set is not for life support. It can stop without warning. Children, persons with physical or mental limitations, and pets could suffer personal injury or death. A personal attendant, redundant power or an alarm system must be used if power system operation is critical.***

### 2.2 About the Generator Set

The model GSBB generator set is an engine-powered generator set fueled by Natural Gas or Propane.

See the Specifications section of this manual for specific information about the generator set.

The generator set is intended as a back-up to utility power. Whenever utility power is interrupted, the house electrical loads are automatically switched by the transfer switch from the utility (normal power source) to the generator set (emergency power source). When utility power is restored, the loads are automatically switched back to the utility. To do this, the generator set and transfer switch perform the following functions together:

1. Senses an interruption of utility power.
2. Starts the generator set.
3. Transfers the load to the generator set when operation has stabilized.
4. Senses the return of utility power.
5. Retransfers the load to the utility.
6. Stops the generator set.

A more in-depth illustration of the operation of the generator set and transfer switch can be found in the [Timing Charts](#), located in the Typical Operation chapter of this manual.

## 2.2.1 Generator Set Nameplate

### ⚠ WARNING

***Improper service or replacement of parts can lead to severe personal injury or death and to damage to equipment and property. Service personnel must be qualified to perform electrical and mechanical service.***

### ⚠ CAUTION

***Unauthorized modifications or replacement of fuel, exhaust, air intake or speed control system components that affect engine emissions are prohibited by law in the State of California.***

**Model, Spec and Serial Numbers:** Be ready to provide the model, spec and serial numbers on the generator set nameplate when contacting Cummins Power Generation for information, parts and service.

Record these numbers so that they are easy to find when needed. Each character in these numbers is significant for obtaining the right parts listed in the Parts Catalog. Genuine Cummins Power Generation replacement parts are recommended for best results.

| My Generator Set Information |  |
|------------------------------|--|
| Model                        |  |
| Spec                         |  |
| Serial Number                |  |

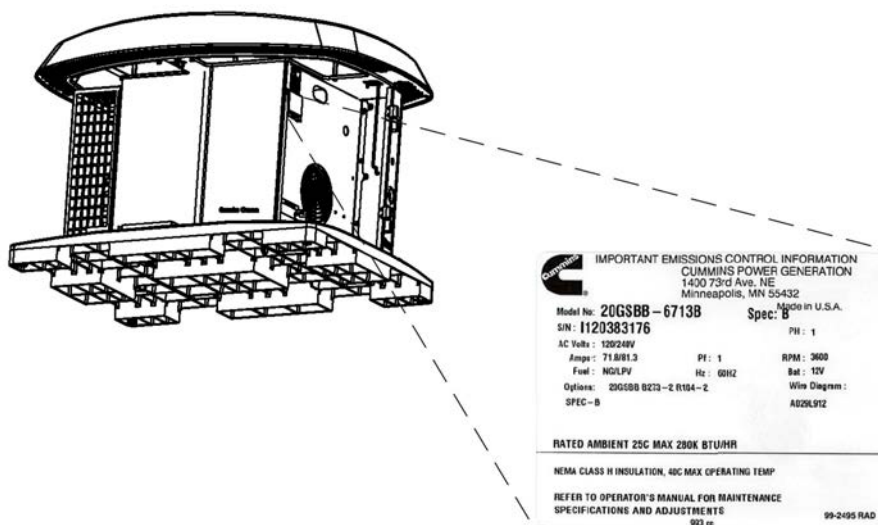


FIGURE 1. NAMEPLATE

## 2.2.2 Model Specifications

**TABLE 1. GSBB AND GSBC MODEL VARIATIONS**

| Product  | Description      |
|--|------------------|
| 20GSBB-6713A\B   | 60 Hz Warm       |
| 20GSBB-6714A\B   | 60 Hz Cold *     |
| 14GSBB-6716A\B   | 50 Hz (AU/NZ)    |
| 20GSBB-6717A\20GSBC-6927B                                      | 60 Hz CSA Cold * |
| 20GSBB-6714D   | 60 Hz Cold *     |
| 20GSBC-6727D   | 60 Hz CSA Cold * |
| * Includes an engine oil heater.                               |                  |
| <b>NOTICE</b>  |                  |
| See the Cold Weather Specifications Table for recommendations. |                  |

**TABLE 2. COLD WEATHER SPECIFICATIONS TABLE**

|                                     | 60 Hz   |             | 50 Hz         |             |
|-------------------------------------|---|-------------|---------------|-------------|
|                                     | Propane Vapor   | Natural Gas | Propane Vapor | Natural Gas |
| <b>Operating Temperature Range</b>  |   |             |               |             |
| Above 40 °F (4 °C) and low humidity | No dryers or starting aids required.  |             |               |             |
| High humidity                       | Alternator drying heater recommended.   |             |               |             |
| Below 20 °F (-7 °C)                 | Additional oil heater recommended for starting. Factory-installed model available.                            |             |               |             |
| Below 0 °F (-18 °C)                 | Additional accessory breather shield/shroud required to avoid possible engine damage. See warranty statement. |             |               |             |
| Below -10 °F (-23 °C)               | Additional accessory battery blanket recommended for starting.  |             |               |             |

**TABLE 3. GENERATOR SET SPECIFICATIONS TABLE**

|                   | 60 Hz  |             | 50 Hz         |             |
|-------------------|--|-------------|---------------|-------------|
|                   | Propane Vapor  | Natural Gas | Propane Vapor | Natural Gas |
| <b>Dimensions</b> |  |             |               |             |
| Weight (With Oil) | 540 lbs (245 kg)   |             |               |             |
| Size (L x W x H)  | 48 x 43 x 34.6 in (1219 x 864 x 880 mm)  |             |               |             |
| <b>Noise</b>      | 62 dB(A) at 23 ft (7 m) at normal load. (Normal load is equal to the typical household consumption of 3 KW.) |             |               |             |

**TABLE 4. FUEL SPECIFICATIONS TABLE (SPEC A AND CANADIAN GSBB SPEC B)**

|   | 60 Hz   |   | 50 Hz                                    |   |
|---|---|---|--|---|
|   | Propane Vapor   | Natural Gas                               | Propane Vapor                            | Natural Gas                               |
| <b>Fueling</b>  |   |   |  |   |
| 1/2 Load  | 132,500 Btu/Hr<br>53 ft <sup>3</sup> /Hr  | 135,000 Btu/Hr<br>135 ft <sup>3</sup> /Hr | 122,000 Btu/Hr<br>48 ft <sup>3</sup> /Hr | 114,000 Btu/Hr<br>111 ft <sup>3</sup> /Hr |
| Full Load   | 275,000 Btu/Hr<br>109 ft <sup>3</sup> /Hr   | 240,000 Btu/Hr<br>233 ft <sup>3</sup> /Hr | 229,000 Btu/Hr<br>91 ft <sup>3</sup> /Hr | 213,000 Btu/Hr<br>207 ft <sup>3</sup> /Hr |
| Fuel Pressure (all loads)<br>As measured at genset fuel<br>regulator service port | 7-11 inches WC  | 5-11 inches WC                            | 7-11 inches WC                           | 5-11 inches WC                            |
| Tank Size   | Contact your local gas company to verify the tank size required for your application. |   |  |   |

**TABLE 5. FUEL SPECIFICATIONS TABLE (US GSBB SPEC B AND CANADIAN GSBC SPEC B)**

|   | 60 Hz   |   | 50 Hz                                     |   |
|---|---|---|---|---|
|   | Propane Vapor   | Natural Gas                               | Propane Vapor                             | Natural Gas                               |
| <b>Fueling</b>  |   |   |   |   |
| 1/2 Load  | 195,000 Btu/Hr<br>78 ft <sup>3</sup> /Hr  | 177,000 Btu/Hr<br>172 ft <sup>3</sup> /Hr | 165,000 Btu/Hr<br>66 ft <sup>3</sup> /Hr  | 150,000 Btu/Hr<br>146 ft <sup>3</sup> /Hr |
| Full Load   | 310,000 Btu/Hr<br>123 ft <sup>3</sup> /Hr   | 255,000 Btu/Hr<br>248 ft <sup>3</sup> /Hr | 262,500 Btu/Hr<br>104 ft <sup>3</sup> /Hr | 217,000 Btu/Hr<br>211 ft <sup>3</sup> /Hr |
| Fuel Pressure (all loads)<br>As measured at genset fuel<br>regulator service port | 12-14 inches WC   | 5-7 inches WC                             | 12-14 inches WC                           | 5-7 inches WC                             |
| Tank Size   | Contact your local gas company to verify the tank size required for your application. |   |   |   |

**TABLE 6. ENGINE SPECIFICATIONS TABLE**

|  | 60 Hz   |             | 50 Hz         |             |
|--|---|-------------|---------------|-------------|
|  | Propane Vapor   | Natural Gas | Propane Vapor | Natural Gas |
| <b>Engine</b>  | 2 Cylinder-V Twin, OHV, Air-Cooled, 4-Stroke, Spark Ignited, 3600 RPM |             |               |             |
| Displacement   | 60.59 in <sup>3</sup> (993 cc)  |             |               |             |
| Spark Plug Gap   | .020 inch (.51 mm)  |             |               |             |
| Spark Plug Torque  | 15 ft-lb (20 N-m)   |             |               |             |
| Intake and Exhaust Cold Valve<br>Lash<br>(Measure at 0.25" (6.35mm)<br>past top dead center) | 0.004-0.006 inch (0.10 - 0.15 mm)                                     |             |               |             |
| Oil Capacity   | Approximately 80 oz (2.3 Liters)                                      |             |               |             |

|   | 60 Hz                      |             | 50 Hz         |             |
|---|----------------------------|-------------|---------------|-------------|
|   | Propane Vapor              | Natural Gas | Propane Vapor | Natural Gas |
| Oil Recommendation<br>(See Operator Manual) | 5W-30 Synthetic Engine Oil |             |               |             |

**TABLE 7. GENERATOR SPECIFICATIONS TABLE**

|   | 60 Hz   |             | 50 Hz         |             |
|---|---|-------------|---------------|-------------|
|   | Propane Vapor                                     | Natural Gas | Propane Vapor | Natural Gas |
| <b>Generator</b>  | Brush-Type, 2-Pole Rotating Field, Single Bearing |             |               |             |
| Power (kVA)   | ---   | ---         | 13.5          | 13.5        |
| Rated Voltage (V)   | 120/240   | 120/240     | 115/230       | 115/230     |
| Rated Current (Amps)  | 162/81.25   | 144/72      | 117.4/58.7    | 117.4/58.7  |
| Phase Type  | Single Phase                                      |             |               |             |
| Circuit Breaker (Amps)  | 100   | 100         | 60            | 60          |
| <b>De-rating Guidelines:</b> Maximum wattage or maximum current are subject to and limited by such factors as fuel Btu content, ambient temperature, altitude, engine power and condition, etc. Full rated power is available at 60 °F (15.5 °C) at sea level. De-rate 3.5% for each 1000 ft (304.8 m) above sea level and 3% for each 10 °F (5.5 °C) increase in ambient temperature above 60 °F (15.5 °C). This generator is rated in accordance with UL 2200 (Stationary Engine Generator Assemblies) or CSA C22.2 No. 100-04 (Motors and Generators). The maximum continuous current values that are listed on the generator set nameplate and specification tables occur at the lower limit of acceptable voltage. Maximum current occurs at 108 and 216 volts, 10% below nominal voltage 120/240. The voltage set point of this generator set can be adjusted from the operator panel if desired. Refer to the Operator manual procedure <a href="#">To Adjust the Output Voltage</a> . |   |             |               |             |

**TABLE 8. CONTROL SPECIFICATIONS TABLE**

|                   | 60 Hz   |             | 50 Hz         |             |
|-------------------|---|-------------|---------------|-------------|
|                   | Propane Vapor   | Natural Gas | Propane Vapor | Natural Gas |
| <b>Controller</b> | Integrated Microprocessor-Based Engine, Generator, Transfer Switch Controller |             |               |             |

**TABLE 9. DC SYSTEM SPECIFICATIONS TABLE**

|                         | 60 Hz            |             | 50 Hz         |             |
|-------------------------|------------------|-------------|---------------|-------------|
|                         | Propane Vapor    | Natural Gas | Propane Vapor | Natural Gas |
| <b>DC System</b>        |                  |             |               |             |
| Nominal Battery Voltage | 12 Volts DC      |             |               |             |
| Battery Group           | 26 R             |             |               |             |
| Battery Type            | Maintenance Free |             |               |             |
| Minimum Cold Crank Amps | 545              |             |               |             |

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## 2.3 How to Obtain Service

For parts, service, and product information (such as the Service Manual), contact the nearest authorized Cummins Power Generation distributor. You may go to Web site [www.power.cummins.com](http://www.power.cummins.com) for information on contacting our distributors worldwide.

### **In North America**

Call 1-800-888-6626 to contact the nearest Cummins Power Generation distributor in the United States or Canada. If you are unable to contact a distributor using the automated service, consult the Yellow Pages. Typically, our distributors are listed under:

GENERATORS - ELECTRIC

ENGINES - GASOLINE OR DIESEL

If you have difficulty arranging service or resolving a problem, please contact the Service Manager at the nearest Cummins Power Generation distributor for assistance.

### **Outside North America**

If you are outside North America, call Cummins Power Generation at 1-763-574-5000 from 7:30 AM to 4:00 PM, Central Standard Time, Monday through Friday.

### **Information to Have Ready**

Before calling for service, have the following information available:

1. *Complete model number and serial number*
2. *Date of purchase*
3. *Nature of problem*



# 3      Operation

## 3.1    3 Position Switch

A three-position Start/Stop switch is located at the genset control panel.

Switch positions available:

- Manual Start: Normally only the maintenance/service technician has occasion to manually start and stop the generator set. Push the switch down at the thick end to start the set immediately.
- Stop (middle position): This switch disables the set.
- Remote: For automatic operation, the Start/Stop switch must be in the Remote position and Standby On must be activated on the In-Home Display. Push the switch down at the thin end to put into the Remote position.

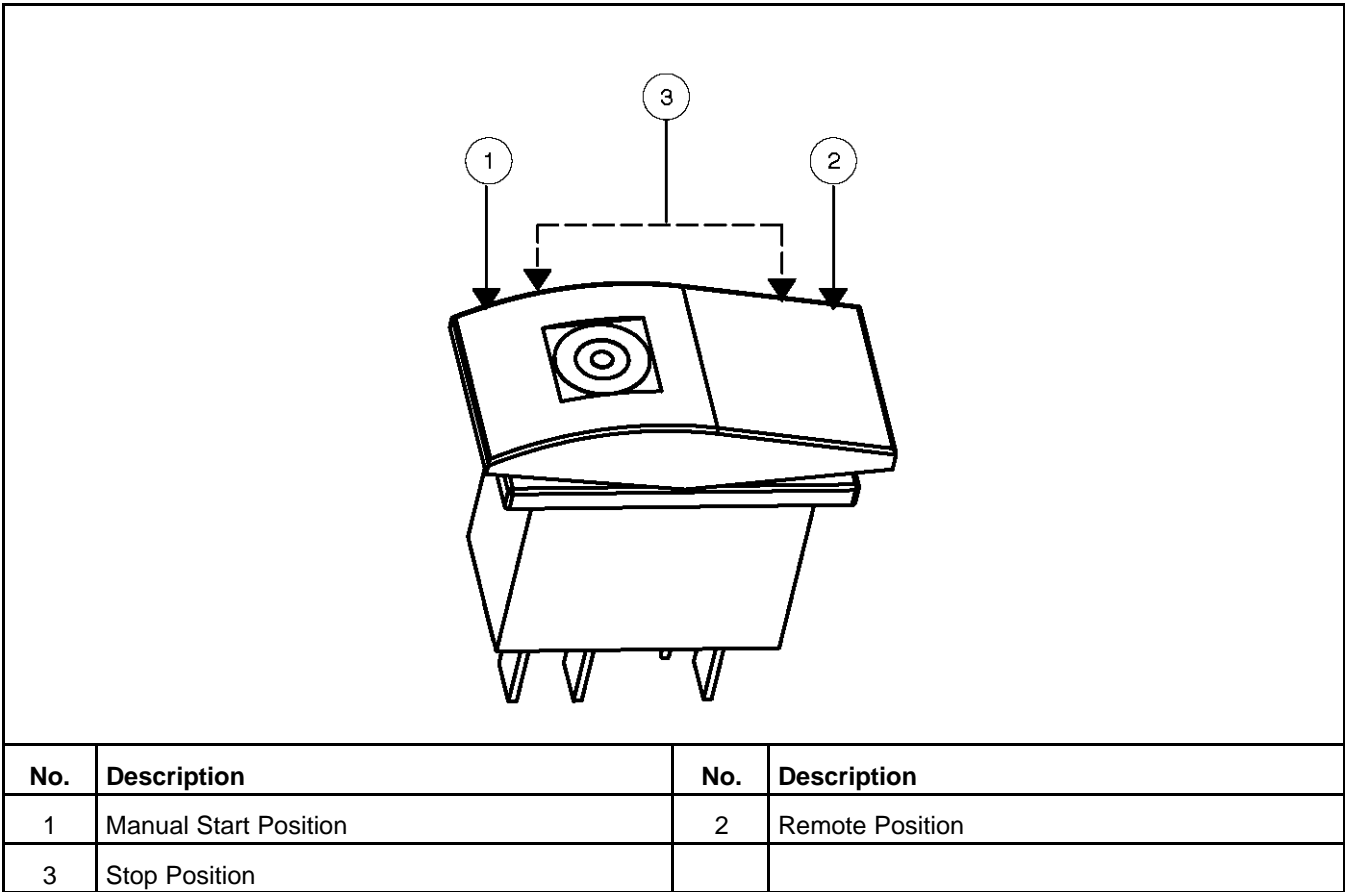


FIGURE 2. 3 POSITION SWITCH (STOP SWITCH)

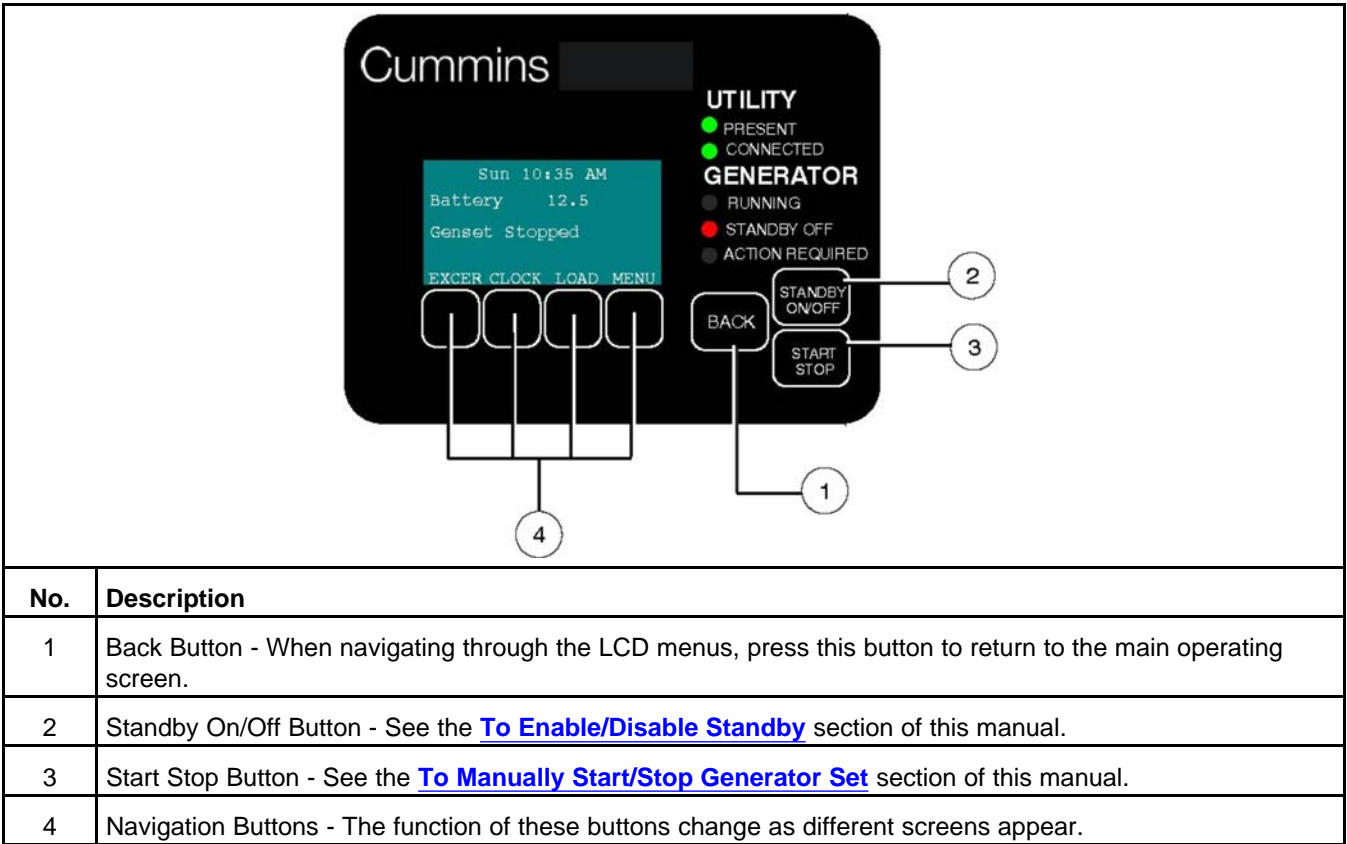
## 3.2    In-Home Operator Panel

The operator panel must be hard-wired to the generator set in order for the generator system to operate.

**NOTICE**

**The in-home operator panel and Internet/Email interface can be used simultaneously**

The operator panel consists of two UTILITY status lamps, three GENERATOR status lamps, three action buttons and an LCD display screen with four navigation buttons.



**FIGURE 3. IN-HOME OPERATOR PANEL**

### 3.2.1 BACK Button

When navigating through the LCD menus, press the **BACK** button to return to the main operating screen.

### 3.2.2 START STOP Button

See [To Manually Start/Stop Generator Set](#).

### 3.2.3 Standby ON/OFF Button

See [To Enable/Disable Standby](#).

### 3.3 Typical Operation

#### NOTICE

The following diagrams are based on an APPROXIMATE time duration. Your genset may vary slightly from the timing diagrams in this manual.

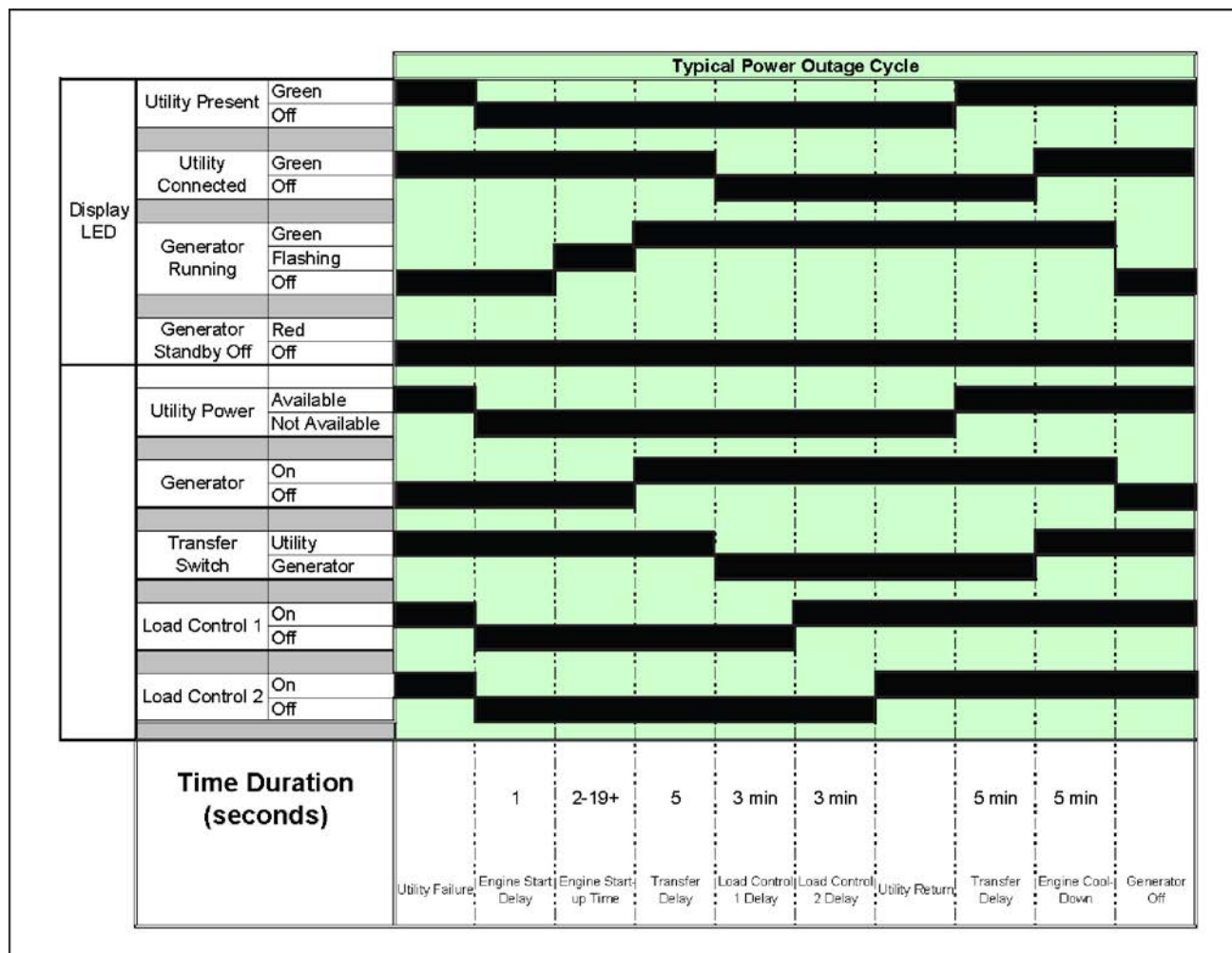


FIGURE 4. TYPICAL POWER OUTAGE CYCLE TIMING DIAGRAM

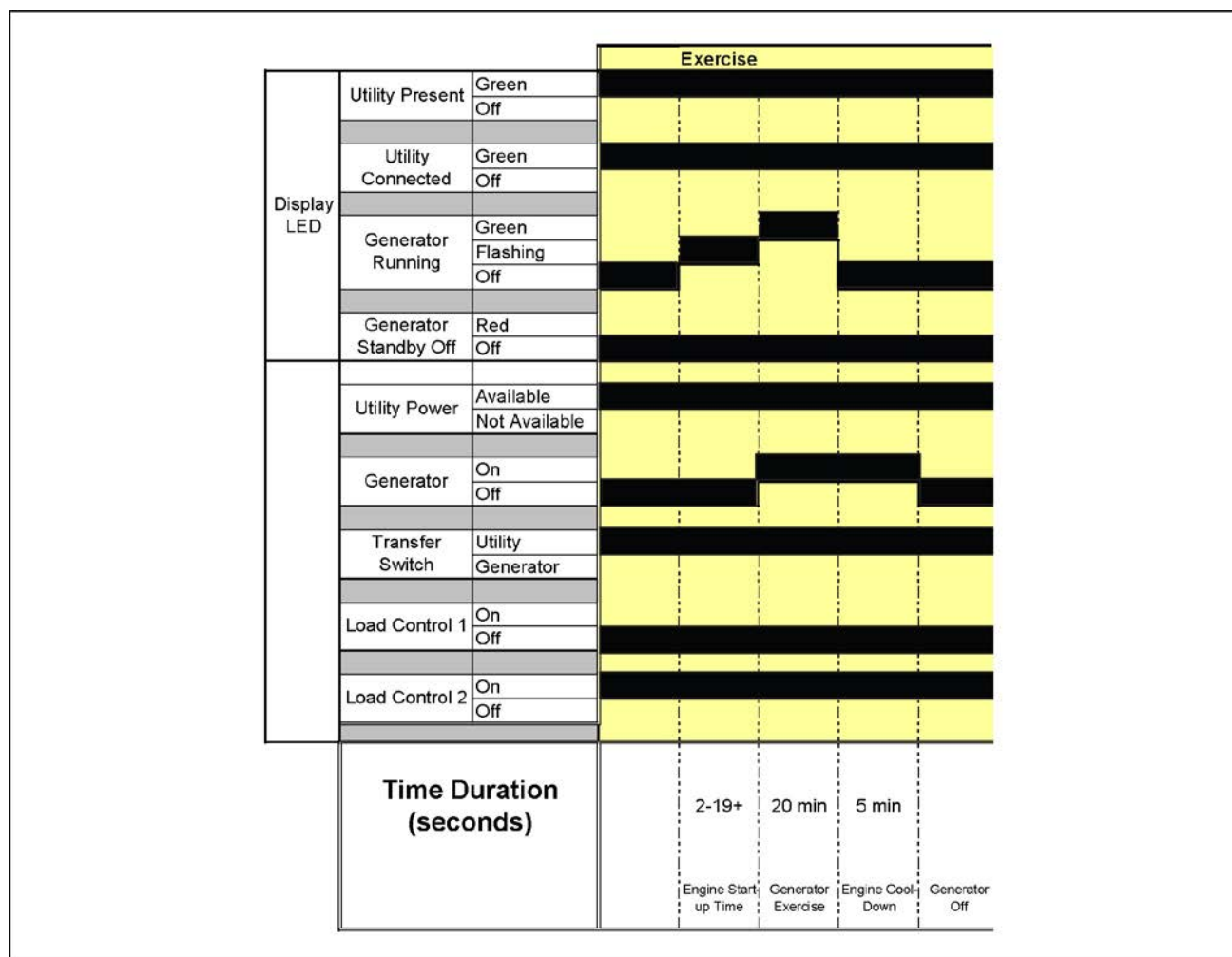


FIGURE 5. EXERCISE TIMING DIAGRAM

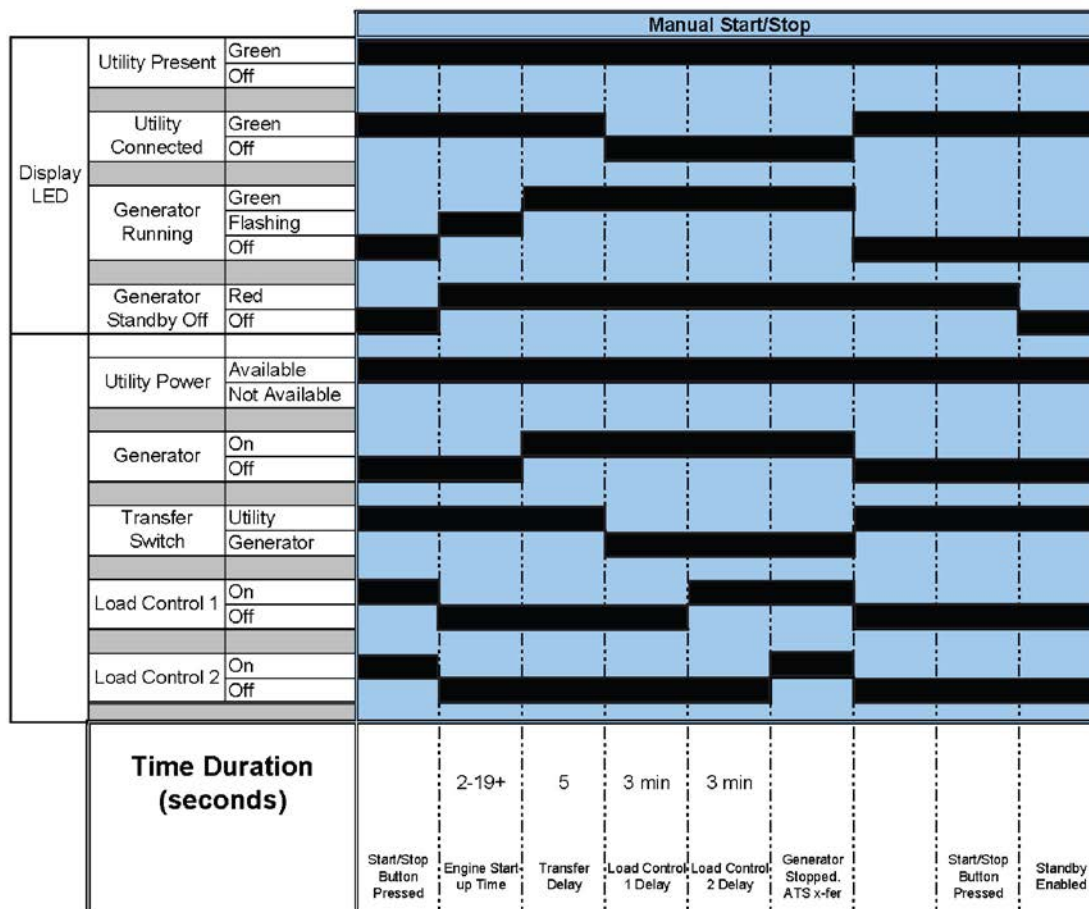


FIGURE 6. MANUAL START/STOP TIMING DIAGRAM

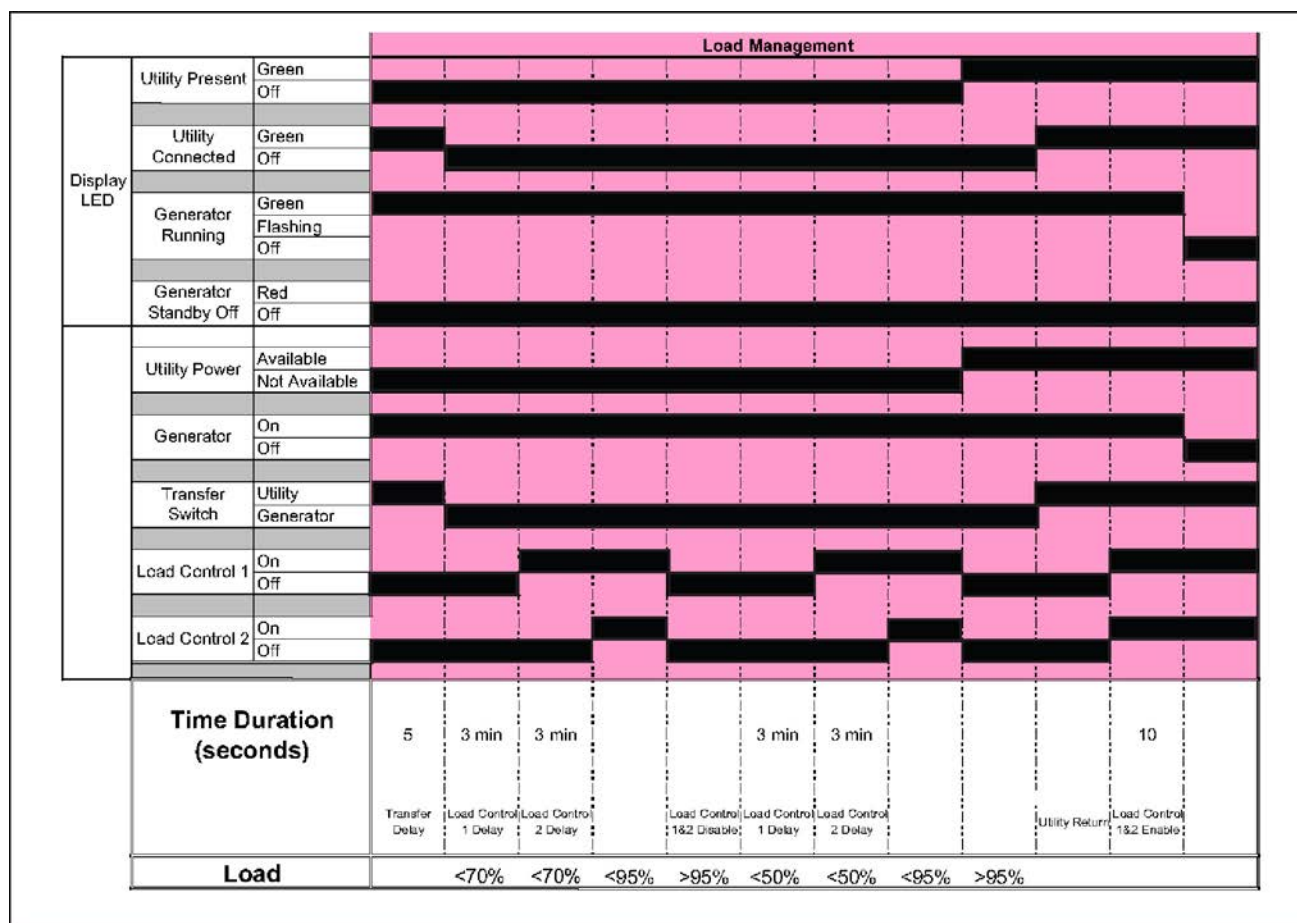


FIGURE 7. LOAD MANAGEMENT TIMING DIAGRAM

### 3.3.1 Normal Operation: Utility Power Available and Connected

As long as utility power is available and connected, both of the green UTILITY lamps (PRESENT and CONNECTED) will stay on and the LCD screen will indicate "Genset Stopped".

If the red GENERATOR STANDBY OFF light is on, the generator set will not start up automatically if utility power is interrupted. See the [To Enable/Disable Standby](#) section of this manual to enable STANDBY so that the generator set will automatically supply power if utility power is interrupted.

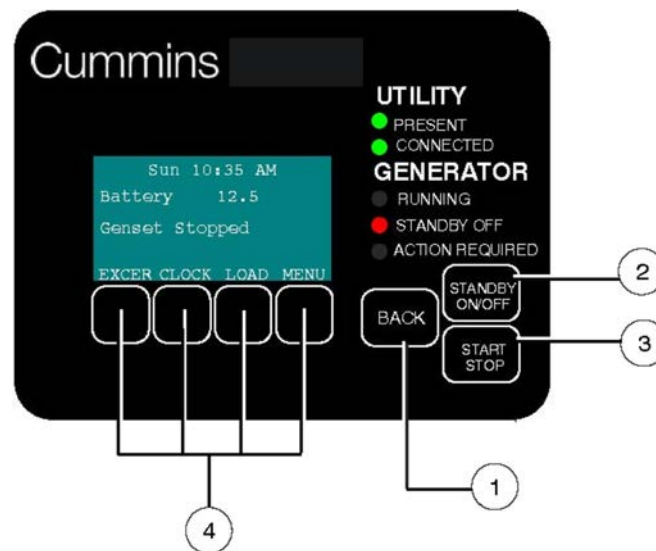


FIGURE 8. UTILITY PRESENT AND CONNECTED—STANDBY OFF LAMP ON

### 3.3.2 Emergency Operation: Utility Power Interrupted

If utility power is interrupted,

1. The green UTILITY PRESENT lamp will go out
2. The generator set will start automatically and the green GENERATOR RUNNING lamp will turn on.
3. The UTILITY CONNECTED light will go out when the generator set is connected to supply power.

The LCD screen will provide a visual indication of "Genset Load" (bar graphs). The bar graphs indicate how much of the available power is being used in each supply line (L1 and L2).

If the red ACTION REQUIRED light comes on, either the generator shut down or periodic maintenance has come due. The LCD screen will indicate what maintenance is due or which fault occurred.

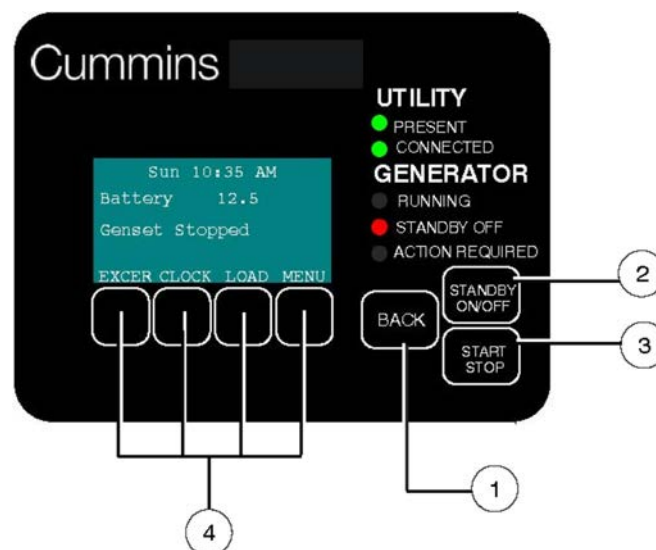


FIGURE 9. GENERATOR SET RUNNING—ACTION REQUIRED LAMP ON

### 3.3.3 To Adjust the Output Voltage

Use the following procedure:

1. Connect an accurate AC volt meter across L1 and L2 while the generator set is running.
2. With Output Volts selected on the Adjustments Menu screen, press the up or down arrow button to adjust the voltage to the desired setting
3. The control allows an adjustment of 240 VAC  $\pm$  7% (17 VAC).
4. Press the BACK button to save the settings and return to the home screen.

## 3.4 To Enable/Disable Standby

Normally, you should not have to disable generator set STANDBY.

- STANDBY should always be enabled (ON) except during maintenance/service.
- STANDBY will have to be re-enabled (STANDBY OFF light on) if the generator set is started or stopped manually (normally a maintenance/service function) or a fault shutdown has occurred.

#### CAUTION

***When STANDBY is disabled the generator set will NOT automatically start to supply power if utility power is interrupted.***

To enable or disable generator set standby:

1. Press the STANDBY ON/OFF button on the operator panel, which takes you to the Standby ON/OFF screen.
2. Press the up or down arrow button to select ON or OFF.
3. **To enable STANDBY** select ON and press the BACK button. The STANDBY OFF lamp will go out and the display will state: "Standby ready enabled by user."
4. **To disable STANDBY** select OFF and press the BACK button. The STANDBY OFF lamp will come on and the display will state: "Standby ready disabled by user."

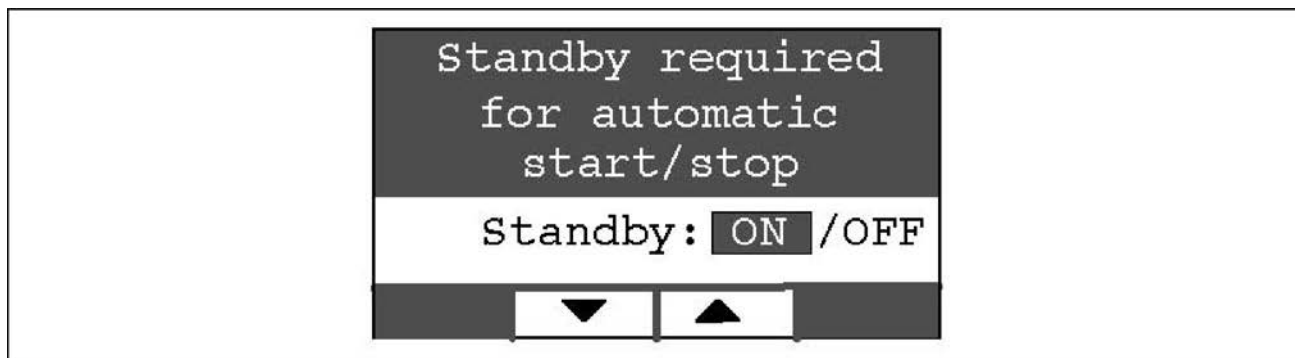


FIGURE 10. ENABLE/DISABLE STANDBY SCREEN

## 3.5 To Manually Start/Stop Generator Set

Normally, only the maintenance/service technician has to manually start and stop the generator set.

- Starting the generator set will result in the generator powering the house loads.



**⚠ CAUTION**

***Manually starting or stopping the generator set disables generator set STANDBY. The generator set will not automatically start to supply power if utility power is interrupted.***

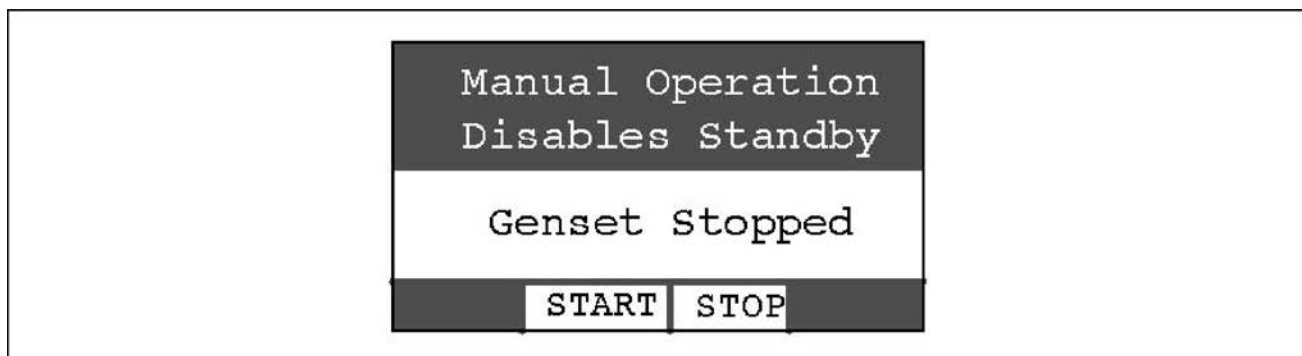
**Manually start and stop the generator set once every 3 months to test that these functions are working properly.**

To manually start or stop the generator set:

1. Press the START STOP button on the operator panel, which takes you to the Genset START/STOP screen.
  - The screen will display "Genset Stopped" or "Genset Running," as appropriate.
2. Press START to manually start the generator set and connect it to supply power to the house. The STANDBY OFF lamp will come on and the display will state: "Genset started manually (Standby Ready Disabled)."
3. Press STOP to manually stop the generator set and disconnect it. The STANDBY OFF lamp will come on and the display will state: "Genset stopped manually (Standby Ready Disabled)."

**NOTICE**

**To start the generator set without connecting loads pick Exercise Now on the Exerciser Clock screen.**



**FIGURE 11. GENSET START/STOP SCREEN**

## 3.6 Fault, Maintenance and New Event Screens

Various warning and event screens may appear on the operator panel during Normal or Emergency Operation.

### 3.6.1 Fault Screen

If a generator set shutdown fault occurs, a FAULT warning appears with the following information:

- Brief description of the warning or fault
- The two-digit Fault Code Number
- The time of occurrence of the fault

Press the BACK button to reset the fault and return to the home screen.

See the [Fault Log](#) section of this manual to review the log of the last 5 faults.

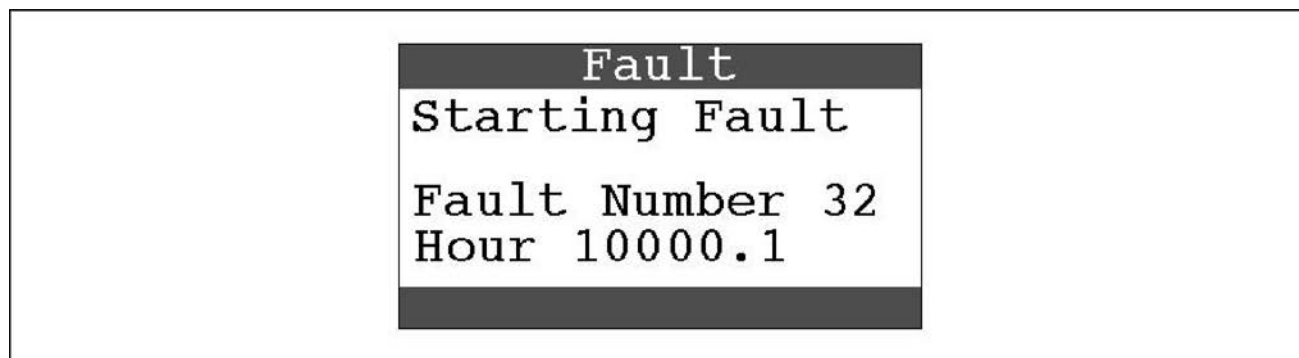


FIGURE 12. TYPICAL FAULT SCREEN

### 3.6.2 Maintenance Due Screen

A Maintenance Due screen appears when a scheduled maintenance operation is due.

- The warning does not time out.
- Perform the maintenance.

Press the BACK button to return to the home screen.

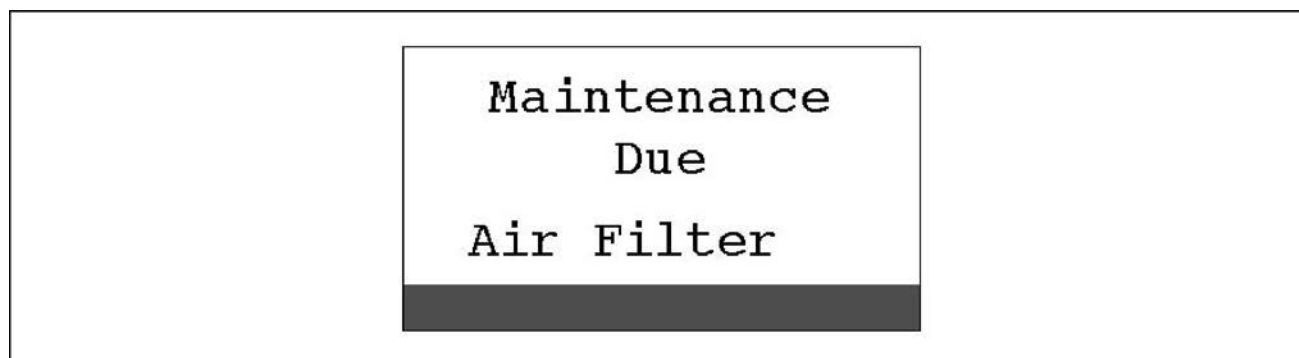


FIGURE 13. TYPICAL MAINTENANCE DUE SCREEN

### 3.6.3 New Event Screen

A New Event screen appears whenever system status changes, such as when there is an interruption of utility power. The screen provides a brief description of the event along with the time and date of the event.

- The message does not time out, unless superseded by a new event.
- Press the BACK button to return to the home screen.

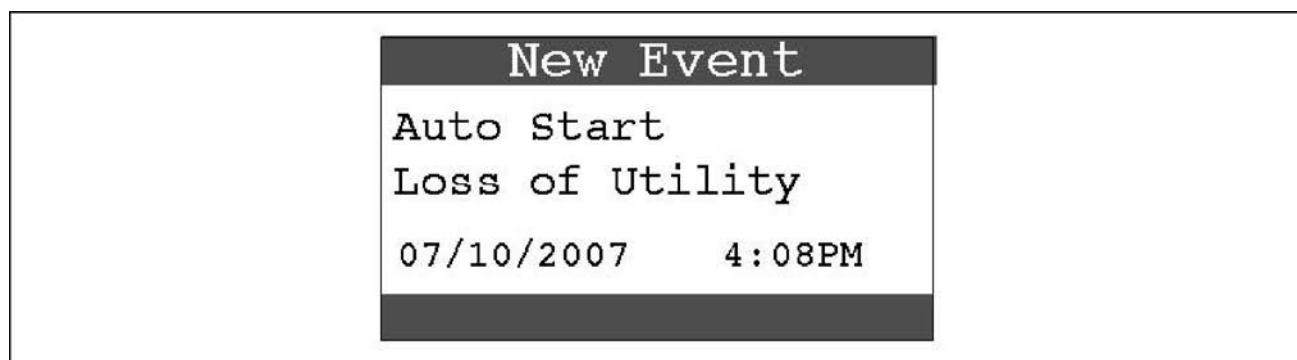


FIGURE 14. TYPICAL NEW EVENT SCREEN

## 3.7 Genset Status

To check generator set output voltage and frequency and the total numbers of hours run:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Genset Status.
3. Press the ENTER button on the menu screen and note the values displayed on the Genset Status screen.
4. Press the BACK button to return to the home screen.

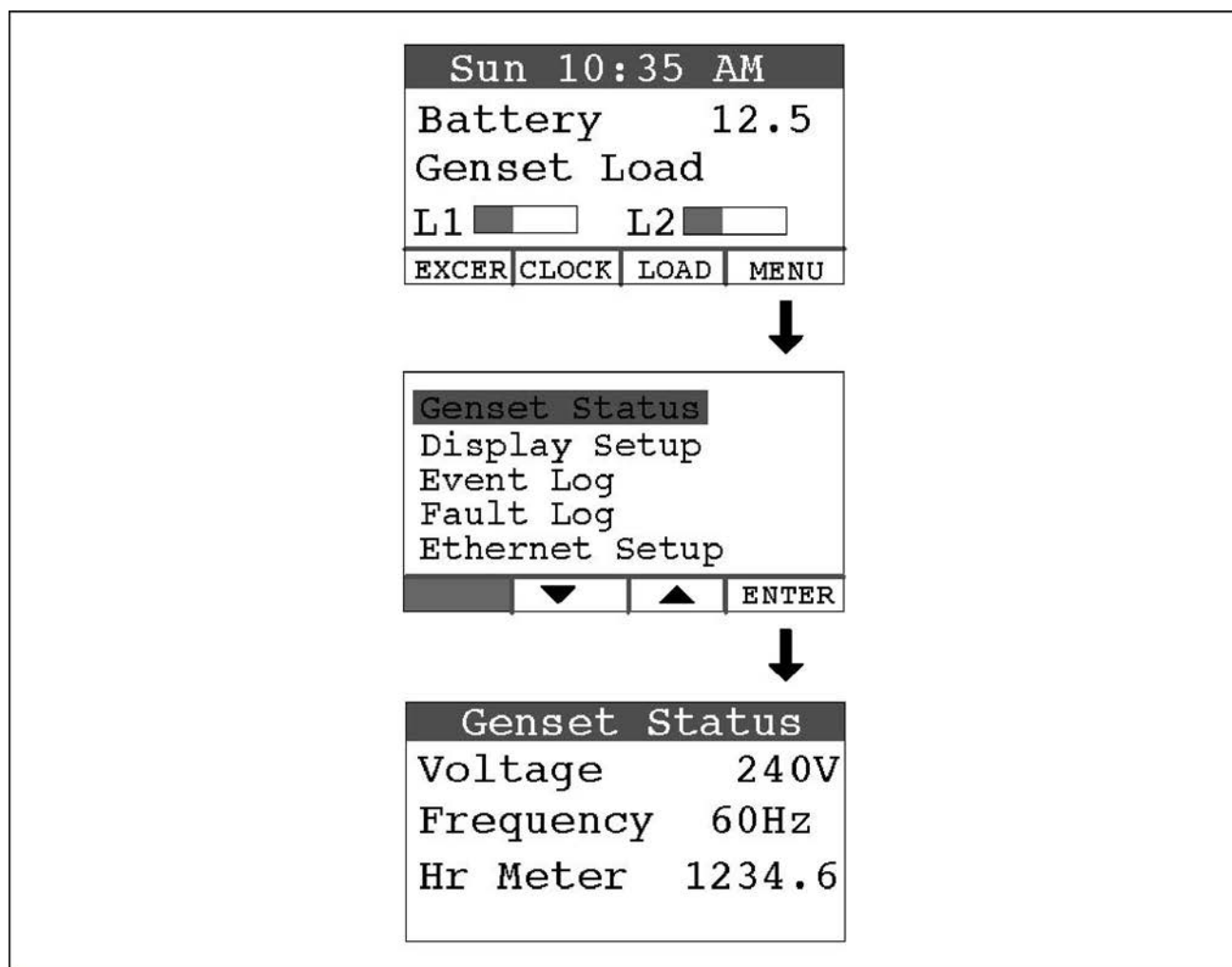


FIGURE 15. GENERATOR SET STATUS SCREEN

## 3.8 Load Management

The generator set may have been set up at installation to connect and disconnect certain large loads, such as air conditioners, to manage the total load so as not to overload the generator set. This requires the installation of relays to the load management signals which allow for the disconnection of loads. Load management can be set to operate in [automatic](#) or [manual](#) mode.

Whether in automatic or manual mode, there is a delayed start. Load 1 is enabled three minutes after the generator set is connected to the house loads, and Load 2 is enabled six minutes after the generator set is connected to the house loads.

### 3.8.1 Automatic Load Management

When set to automatic mode, the user takes no action and can only view which loads are connected. Three minutes after the generator starts, the load that is connected to genset load L1 is connected. After a delay of three more minutes, the load that is connected to genset load L2 is connected. If the connection of loads L1 and L2 exceeds 95% of the generator's load capacity, they are disconnected by the generator. Following another three minute delay, the control reconnects both loads following the same connection sequence used in the first attempt (three minutes apart). If generator load capacity is exceeded again, both loads are disconnected and no further reconnection is tried.

To select automatic load management and view whether the selected loads are connected while the generator set is running:

1. Press the LOAD button on the home screen.
2. Press the up or down arrow button to select Automatic.
3. Note which loads are connected or disconnected.
4. Press the BACK button to return to the home screen.

Adjust percent load to match the derate.

## 3.8.2 Manual Load Management

### ⚠ CAUTION

*To reduce unnecessary loss of service, it is highly recommended that manual load management be undertaken only by an authorized Cummins Power Generation dealer.*

When set to manual mode, the user is able to view, connect, and disconnect loads. If the connection of loads L1 and L2 exceeds generator capacity, the AC circuit breaker trips.

To select manual load management when the generator is running:

1. Press the LOAD button on the home screen.
2. Press the up or down arrow button to select Manual.
3. Note which loads are connected or disconnected.
4. Press the double-down arrow button to go the load connect/disconnect screen.
5. Connect or disconnect Load 1 or Load 2 as necessary by pressing either button under Load 1 or Load 2.
6. Press the BACK button to save the setting and return to the home screen.

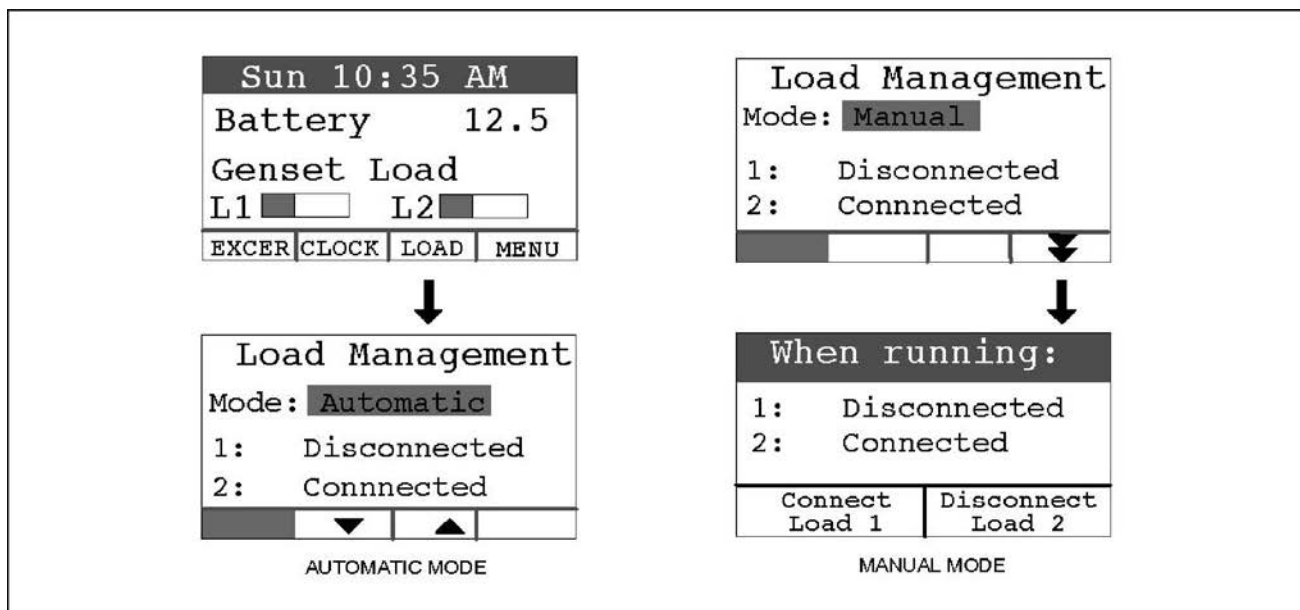


FIGURE 16. LOAD MANAGEMENT SCREEN

## **3.9 Display Setup and Software Info**

### **3.9.1 Brightness and Contrast**

To change the Brightness and Contrast of the display screen:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Display Setup.
3. Press the ENTER button on the menu screen.
4. Press the NEXT button to select Brightness or Contrast.
5. Press the increase or decrease arrow button to increase or decrease brightness.
6. Change Contrast the same way as Brightness.
7. Press the BACK button to save the settings and return to the home screen.

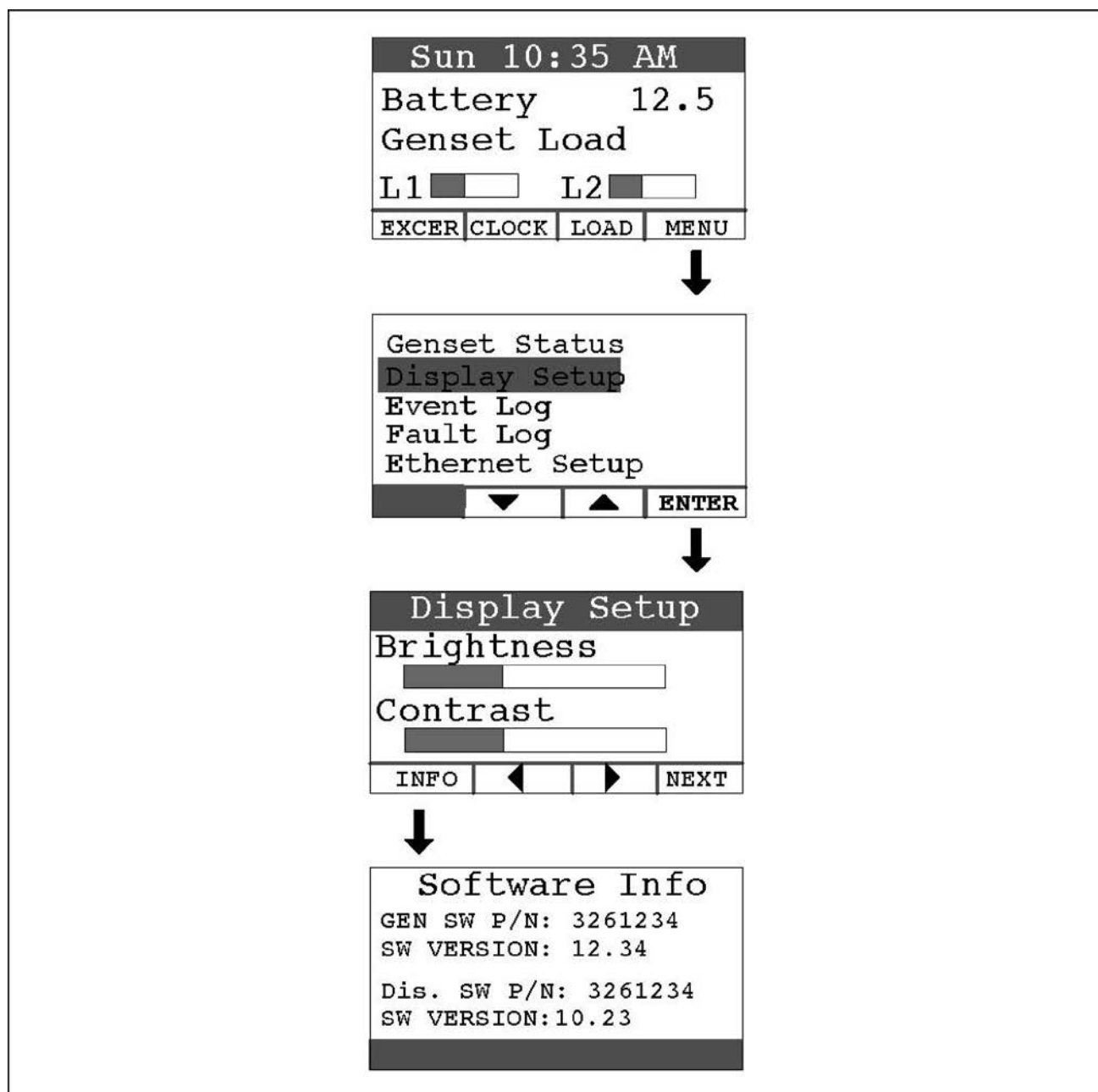


FIGURE 17. DISPLAY SETUP AND SOFTWARE INFO SCREENS

### 3.9.2 Software Info

To check on the generator set and display software:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Display Setup.
3. Press the ENTER button on the menu screen.
4. Press the INFO button on the Display Setup screen and note the values displayed on the Software Info screen.
5. Press the BACK button to return to the home screen.

## 3.10 Event Log

### 3.10.1 To Check Log of Last 20 Events

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Event Log.
3. Press the ENTER button on the menu screen.
4. Scroll through the event log with the up and down double-arrow buttons. Each screen provides a brief description of the event along with the time and date of the event.
5. Press the BACK button to return to the home screen.

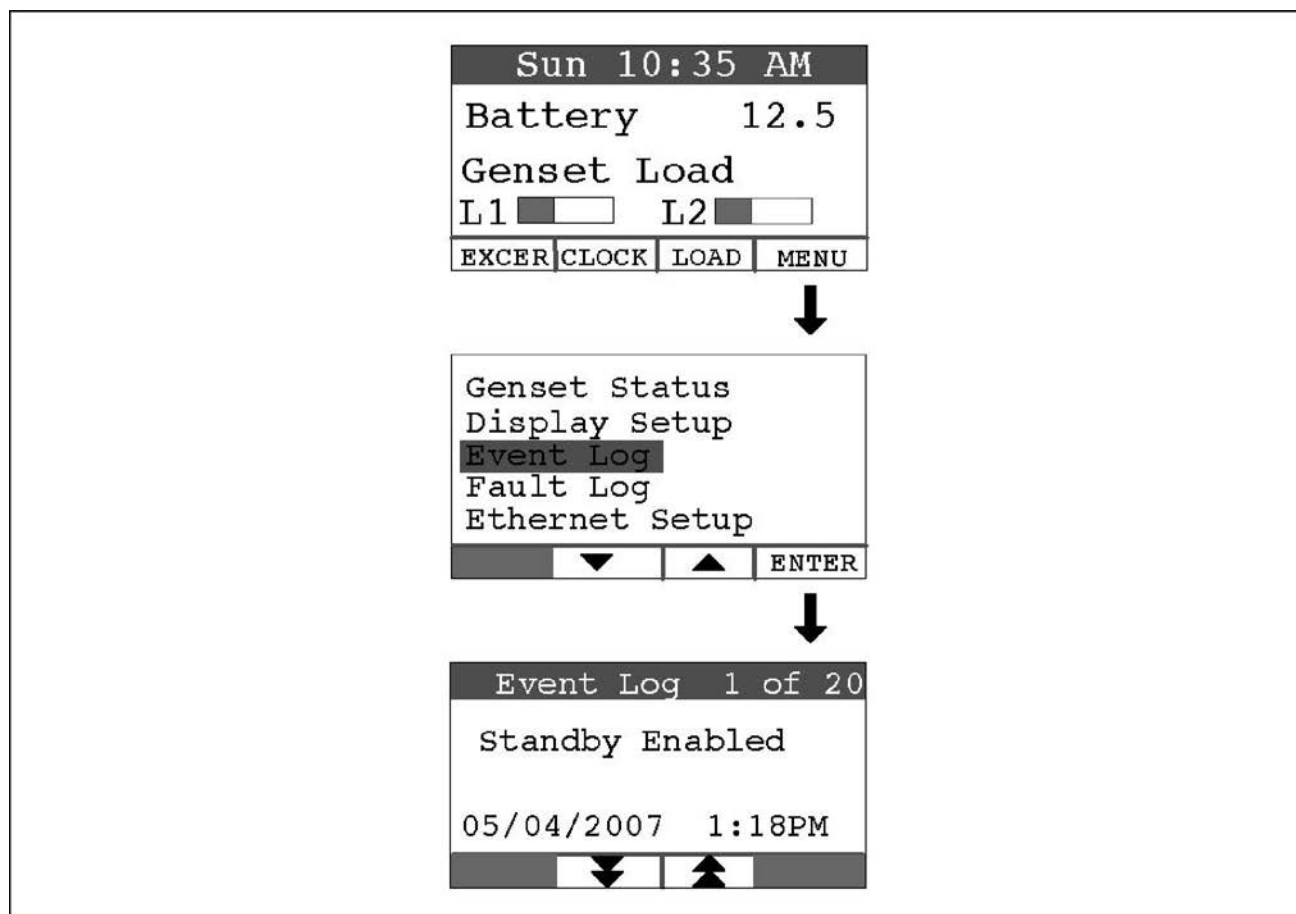


FIGURE 18. EVENT LOG SCREEN

### 3.10.2 List of Recordable Events

- "Genset started manually (Standby Ready Disabled)"
- "Genset stopped manually (Standby Ready Disabled)"
- "Genset exercise started"
- "Genset exercise completed"
- "Genset started due to loss of utility"
- "Genset stopped with return of utility"



- "Switch on genset moved to remote position"
- "Switch on genset moved to run position"
- "Switch on genset moved to off position"
- "Standby ready disabled by user"
- "Standby ready enabled by user"
- "Utility lost - not in Standby Ready"
- "Utility returned - not in Standby Ready"
- "Maintenance reminder - Change oil and check valve lash"
- "Maintenance reminder - Change oil & filter, air filter, adjust valve lash, clean and check battery & engine cooling fins"
- "Genset fault - (Fault description appended)"
- "Genset warning - Transfer Switch Signal Failure"
- "Genset warning - Transfer Switch Failed to Transfer to Utility"
- "Genset warning - Low Battery or Battery Charger Failure"

## 3.11 Fault Log

To check the log of the last 5 faults:

1. Press the MENU button on the home screen.
2. Press the up or down arrow button on the menu screen to select Fault Log.
3. Press the ENTER button on the menu screen.
4. Scroll through the fault log with the up and down double-arrow buttons. Each screen provides a brief description of the fault, the fault code number and the time and date of the fault.
5. Press the BACK button to return to the home screen

### **NOTICE**

**If there are no faults recorded, the "No Stored Faults" screen will appear.**

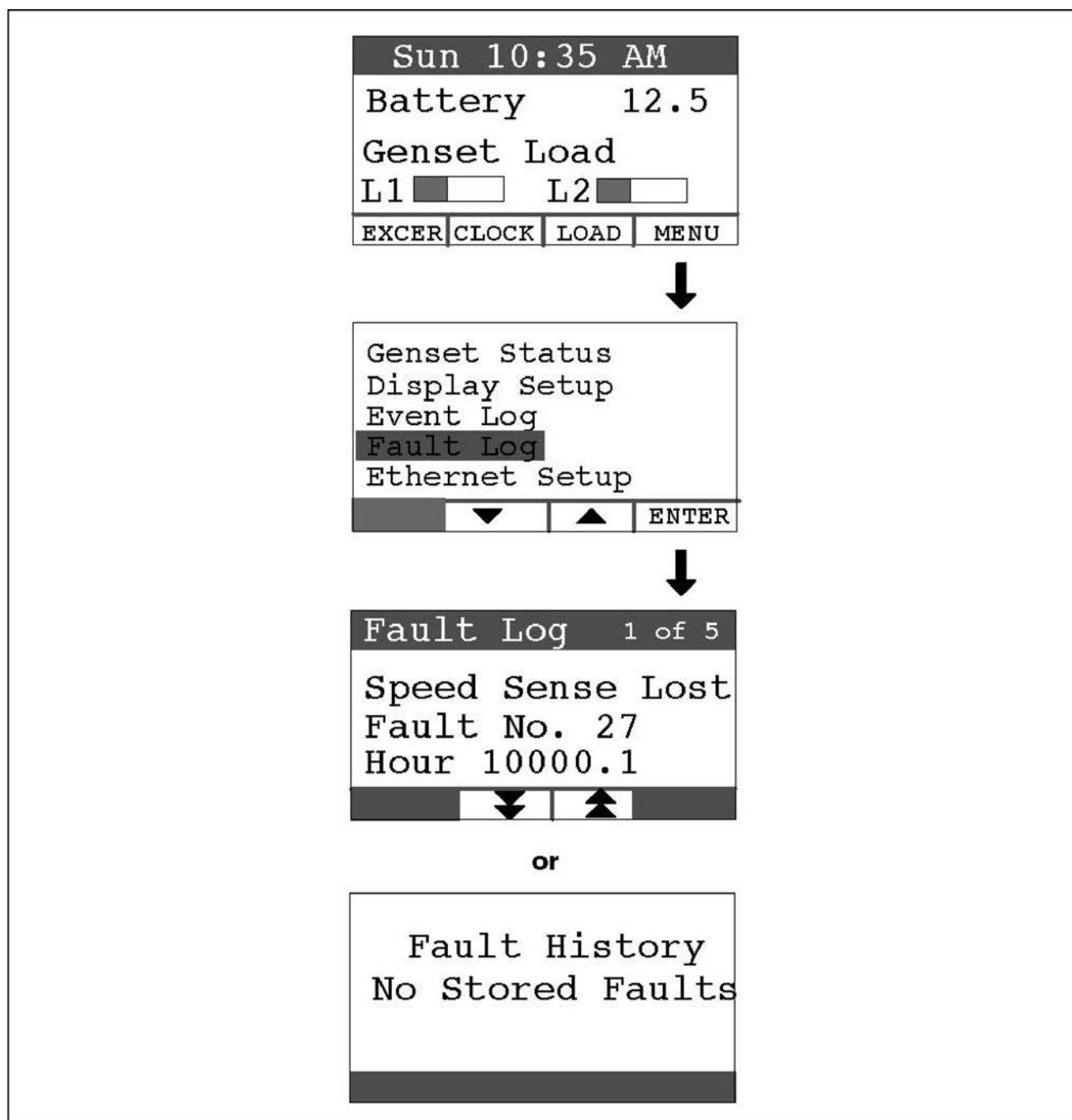


FIGURE 19. FAULT LOG SCREEN

## 3.12 Exercise Settings

To set the generator set exercise schedule:

1. Press the EXCER button on the home screen.
2. Press the NEXT button on the Exerciser Clock screen to select the field to change.
3. Press the up or down arrow button to increase or decrease the frequency of exercise and the day of the week and time of day for exercise.

Frequency selections are:

Weekly

Bimonthly

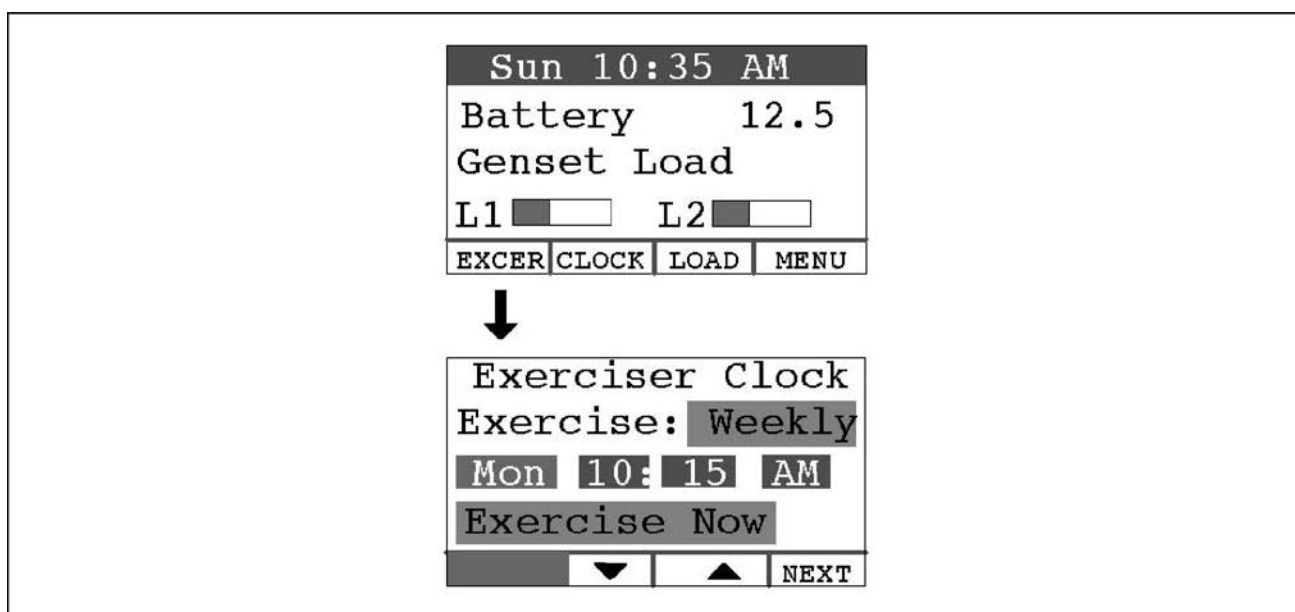
Monthly

Never

4. Press the BACK button to save the settings and return to the home screen.
5. If you want to exercise the generator set now, select Exercise Now, and press either the up or down arrow.

#### NOTICE

**Scheduled or prompted exercise does not transfer the house loads to the generator set.**



**FIGURE 20. EXERCISE CLOCK SCREEN**

## 3.13 Time Setup

To set up the generator set clock for the current date and time:

1. Press the CLOCK button on the home screen.
2. Press the NEXT button on the Time Setup screen to select the field to change.
3. Press the up or down arrow button to increase or decrease or change the date or time.
4. Press the BACK button to save the settings and return to the home screen.

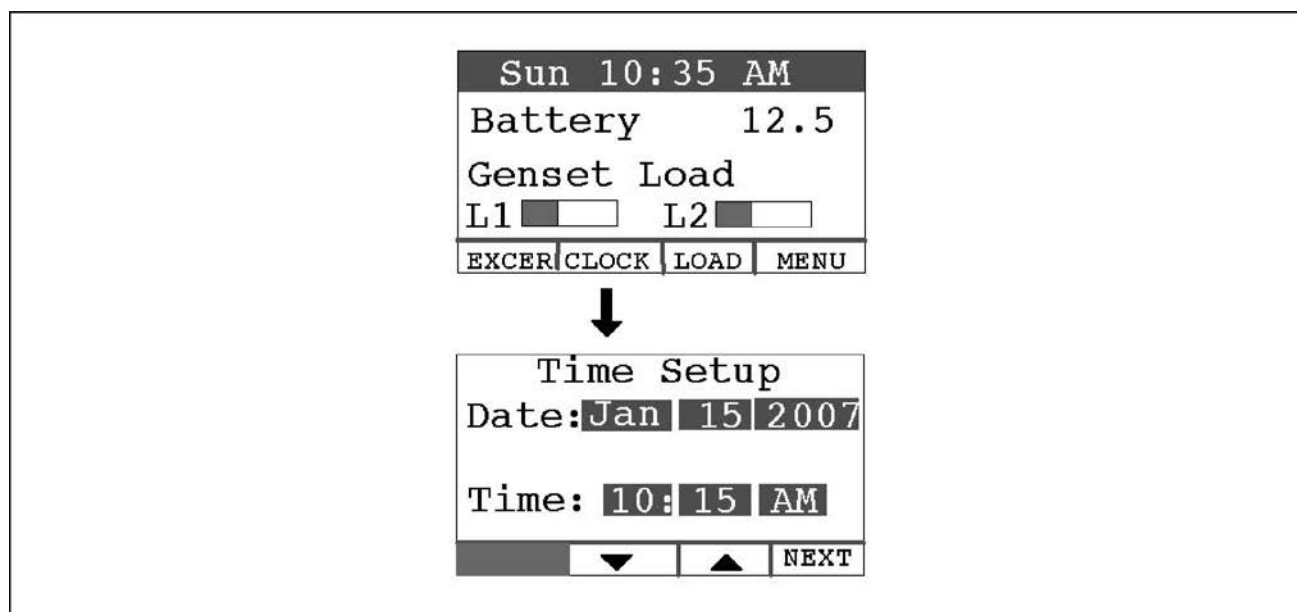


FIGURE 21. TIME SETUP SCREEN

# 4 Maintenance

## 4.1 Periodic Maintenance Schedule

Periodic maintenance is essential for top generator set performance. Use the Maintenance Frequency table as a guide for normal periodic maintenance.

- In hot and dusty environments some maintenance procedures should be performed more frequently, as indicated by the footnotes in the table.
- Maintenance, replacement or repair of emission control devices and systems may be performed by any engine repair establishment or individual.
  - Warranty work **MUST** be completed by an authorized Cummins dealer.

### WARNING

***Accidental or remote starting of the generator set can cause severe personal injury or death. Before working on the generator set, move the switch (S2) to the Stop position, disconnect the remote harness (P7) to disable the ATS mounted charger and remove the negative (-) battery cable from the battery to prevent starting.***

TABLE 10. MAINTENANCE FREQUENCY

| Maintenance Task                 | Maintenance Frequency             |                         |                             |                 |                 |                 |
|----------------------------------|-----------------------------------|-------------------------|-----------------------------|-----------------|-----------------|-----------------|
|                                  | First Startup                     | Daily or Every 24 Hours | Every 3 Months or 100 Hours | Every 100 Hours | Every 250 Hours | Every 400 Hours |
| Check Engine Oil Level           |                                   | X <sub>2, 5</sub>       |                             |                 |                 |                 |
| Change Engine Oil and Oil Filter | After first 8 hours               |                         | X <sub>1</sub>              |                 |                 |                 |
| Adjust Engine Valve Clearance*   | After first 50 hours <sub>4</sub> |                         |                             | X <sub>4</sub>  |                 |                 |
| Replace Engine Air Filter        |                                   |                         |                             |                 |                 | X <sub>1</sub>  |
| Clean and Check Starting Battery |                                   |                         |                             |                 | X               |                 |
| Replace Spark Plugs and Wires    |                                   |                         |                             |                 |                 | X <sub>3</sub>  |
| Clean Engine Cooling Fins        |                                   |                         |                             |                 |                 | X <sub>3</sub>  |
| Complete System Test             |                                   |                         | X <sub>6</sub>              |                 |                 |                 |

1. Perform more often when operating in dusty conditions.
2. Perform more often when operating in high temperature conditions.
3. Perform sooner if engine performance deteriorates.
4. Must be performed by a qualified mechanic (authorized Cummins Power Generation dealer).
5. Check daily during power outages, or monthly without power outages.
6. See automatic transfer switch manual for testing of load transfer.

**NOTICE**

**\*For the Engine Valve Clearance Adjustment procedure, please refer to the GSBB and GSBC engine service manual A030J476.**

## 4.2 Cleaning the Housing Top

The top surface of the generator set housing can be damaged by pressure washing or solvents and other cleaning agents. Only use soap and water or an "all citrus degreaser" to clean the top.

## 4.3 Exercising the Generator Set

**NOTICE**

**Audible engine RPM variation may be heard while there is no load applied. This is normal and does not affect genset performance.**

Exercising the generator set drives off moisture, re-lubricates the engine and removes oxides from electrical contacts. The result is better starting, more reliable operation and longer engine life.

The generator set exerciser is capable of automatically starting the generator set and letting it run for 20 minutes, once every 28 days, or more often, if desired.

Refer to the [Exercise Settings](#) section of this manual for more information on setting up the exerciser.

## 4.4 Engine Oil Maintenance

### 4.4.1 Recommended Engine Oil

Check the oil level prior to starting the generator set to verify that the oil level is between the FULL and ADD marks.

- The generator set is shipped with engine oil
  - 5W-30 synthetic engine oil is recommended

## 4.4.2 Checking Engine Oil Level

### WARNING

*State and federal agencies have determined that contact with used engine oil can cause cancer or reproductive toxicity. Avoid skin contact and breathing of vapors. Use rubber gloves and wash exposed skin. Accidental or remote starting of the generator set can cause severe personal injury or death. Disconnect the negative (-) battery cable and place the control switch in its OFF position before starting work.*

1. Pull out the dip stick and wipe it clean
2. Reinsert the dip stick
3. Remove the dipstick one final time and check the oil level

### NOTICE

**The engine oil level indicated on the dipstick should be between the FULL and ADD marks.**

4. Reinsert the dipstick

If the engine oil level check shows excessive or insufficient levels of oil (oil level line above the FULL mark or below the ADD mark), oil must be drained or added. Refer to the following sections ([Drain Oil](#) or [Add Oil](#) - as needed) for instructions and guidelines for draining and adding oil.

## 4.4.3 Add or Drain Oil

### CAUTION

*Too much oil can cause high oil consumption. Too little oil can cause severe engine damage. Keep the oil level between the FULL and ADD marks on the dipstick.*

### 4.4.3.1 Drain Oil

If the oil level is found to be excessive (see [Checking Engine Oil Level](#)), oil must be drained from the engine.

1. Attach one end of the drain hose (shipped loose with the genset) to the oil drain valve
2. Place the other end of the drain hose into an appropriate container.  
Refer to local/state regulations to determine the appropriate container for used oil.
3. Open the oil drain valve to release oil from the engine into the appropriate container.
4. Re-check the engine oil level ([Checking Engine Oil Level](#))

Based on the results, add or drain oil.

5. When a sufficient amount of oil has been drained from the system:
  - a. Close the oil drain valve
  - b. Remove the drain hose
  - c. Wipe the oil drain valve clean
  - d. Dispose of the used oil in accordance with local/state regulations.

### 4.4.3.2 Add Oil

If the oil level is found to be insufficient (see [Checking Engine Oil Level](#)), oil must be added.

1. Add the appropriate amount of oil, based on the engine oil level check performed beforehand.
2. Re-check the engine oil level (see [Checking Engine Oil Level](#)).

Based on the results, add or drain oil.

3. Clean up and dispose of any oil in accordance with local/state regulations.

### 4.4.4 Changing Engine Oil and Oil Filter

Refer to the [Periodic Maintenance Schedule](#) for scheduled engine oil changes and to the control panel for the oil filter part number. Change oil more often in hot and dusty environments.

1. Run the generator set until warm, shut down and place pan under the end of the oil drain hose attached to the drain valve.
2. Make sure the oil drain hose is connected to the oil drain valve and open the drain valve. Reclose the valve when oil stops draining.
3. Spin off the oil filter canister and clean the filter mounting surface on the engine block. Remove the old gasket if it remains.
4. Make sure the gasket is in place on the new filter and apply a thin film of clean oil to the gasket. Spin the new filter on until the gasket just touches the block. Turn it an additional 1/2 to 3/4 turn. Do not over tighten.
5. Refill with 67 oz (2 liters) of oil.

#### CAUTION

*Too much oil can cause high oil consumption. Too little oil can cause severe engine damage. Keep the oil level between the Full and Add marks.*

6. Start and run for 30 seconds.
7. Shut the engine off and wait 5 minutes.
8. Add more oil slowly, to bring the oil level to the FULL mark on the dipstick.
9. Dispose of the used oil and oil filter according to local environmental regulations.

## 4.5 Replacing the Air Filter Element

#### WARNING

*Before working on the generator set, move the Switch (S2) to the Stop Position, disconnect the remote harness (P7) to disable the ATS mounted charger, and remove the negative (-) battery cable from the battery to prevent starting.*

Refer to the [Periodic Maintenance Table](#) for scheduled air filter replacements. Replace it more often in dusty environments.

To change the filter element:

1. Remove the outer and inner cover and reassemble with a new air filter element.
2. Make sure the outer cover is seated before tightening its wing nut.



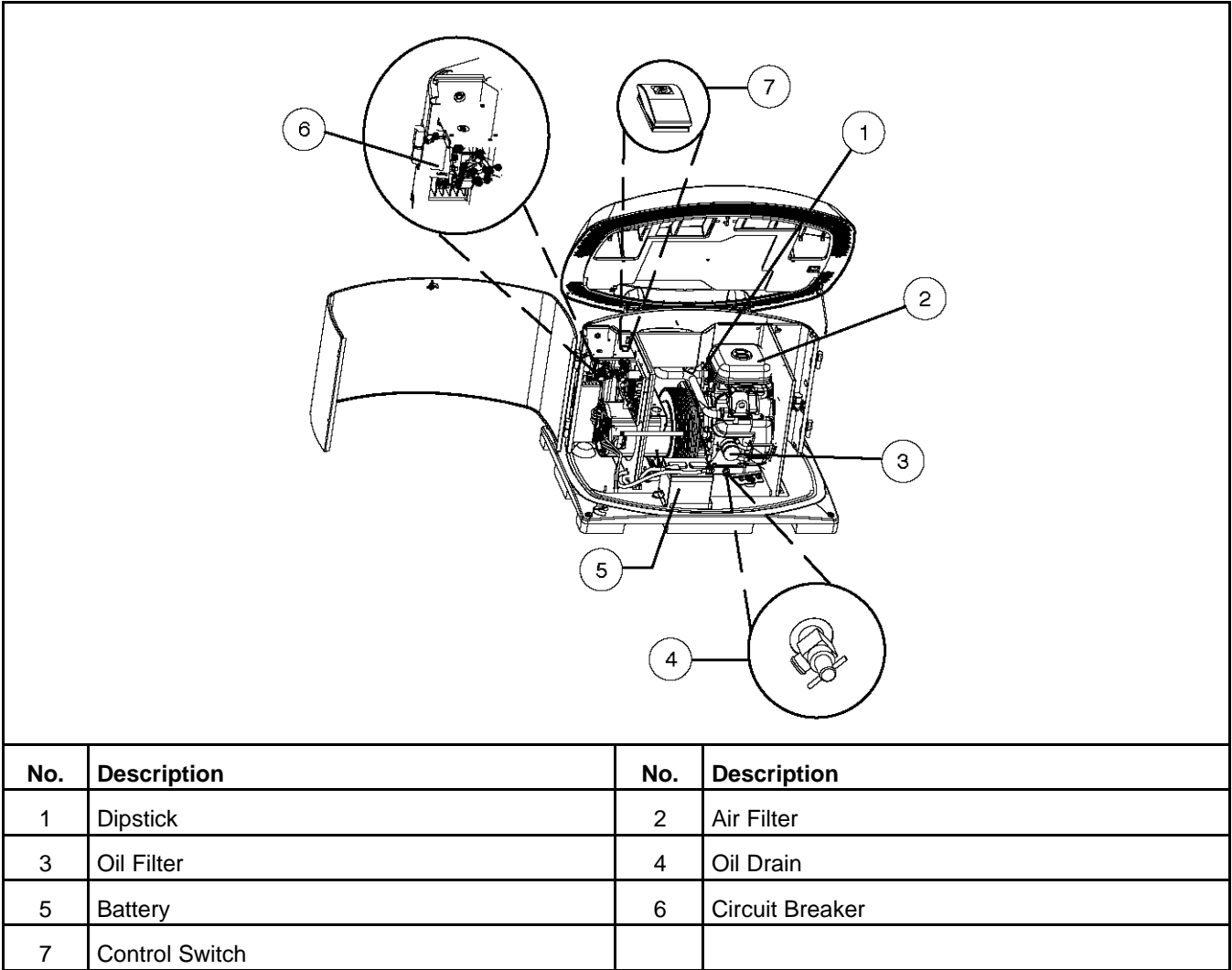




FIGURE 22. MAINTENANCE POINTS

# 4.6 Battery Maintenance

 **WARNING**

*Arcing at battery terminals or in light switches or other equipment, and flames or sparks, can ignite battery gas causing severe personal injury—Ventilate battery area before working on or near battery—Wear safety glasses—Do not smoke—Switch work light ON or OFF away from battery—Stop the generator set—Disconnect the negative (-) battery cable first and reconnect it last.*

 **WARNING**

*Before working on the generator set, move the Switch (S2) to the Stop Position, disconnect the remote harness (P7) to disable the ATS mounted charger, and remove the negative (-) battery cable from the battery to prevent starting.*

Refer to the [Periodic Maintenance Table](#) for scheduled battery maintenance, and follow the battery manufacturer's instructions. Have the battery charger in the transfer switch replaced if the battery keeps running down.

Always:

1. Keep the battery case and terminals clean and dry and the terminals tight.
2. Remove battery cables with a battery terminal puller. Torque threaded stud battery terminals as recommended by the battery manufacturer.
3. Make sure which terminal is positive (+) and which is negative (-) before making battery connections, always removing the negative (-) cable first and reconnecting it last to reduce arcing.

#### NOTICE

If the battery needs to be replaced, be sure that the replacement battery specs match those found in the [Specifications Table](#) in this manual.

## 4.7 Spark Plugs

#### ⚠ WARNING

*Before working on the generator set, move the Switch (S2) to the Stop Position, disconnect the remote harness (P7) to disable the ATS mounted charger, and remove the negative (-) battery cable from the battery to prevent starting.*

Set the genset control to the Off position before checking the spark plugs.

Refer to the [Periodic Maintenance Table](#) for scheduled spark plug replacement.

The genset has two spark plugs: one on each side of the engine. The spark plugs must be in good condition for proper engine starting and performance. A spark plug that fouls frequently or has heavy soot deposits indicates the need for engine service.

To prevent cross threading a spark plug, always thread it in by hand until it seats. Torque the spark plug to 15 ft-lb (20 Nm).

Return the genset control to Auto when finished performing maintenance.

## 4.8 Maintenance Record

Record all periodic and unscheduled maintenance and service. See the Periodic Maintenance Schedule [Section 4.1](#) for a list of scheduled maintenance frequency.

| DATE | HOUR<br>METER<br>READING | MAINTENANCE OR SERVICE PERFORMED |
|------|--------------------------|----------------------------------|
|      |                          |                                  |
|      |                          |                                  |
|      |                          |                                  |
|      |                          |                                  |
|      |                          |                                  |

| DATE | HOUR<br>METER<br>READING | MAINTENANCE OR SERVICE PERFORMED |
|------|--------------------------|----------------------------------|
|      |                          |                                  |
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Record the name, address, and phone number of your authorized Cummins Power Generation service center.

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# 5 Troubleshooting

By regularly performing the following periodic maintenance and guidelines, you greatly reduce the chances of a generator set shutdown:

- Maintain an appropriate oil level.
- Keep battery connections clean and tight.
- Do not overload the generator set.
- Keep the air inlet and outlet openings clear.

## 5.1 Troubleshooting With the In-Home Operator Panel

If a fault shutdown occurs the ACTION REQUIRED lamp on the in-home Operator Panel will come on and the LCD screen will display the a description of the Fault, the Fault Number, and the hour in total generator set running time when the Fault occurred.

The shutdown codes are listed below in numerical order along with step-by-step corrective actions.

## 5.2 Fault Code Blinking

At fault shutdown, the status indicator light will repeatedly blink sets of 1, 2, 3 or 4 blinks.

- **One blink** indicates shutdown due to high engine temperature.
- **Two blinks** indicate shutdown due to a loss of engine oil pressure.
- **Three blinks** indicate a service fault. Press **Stop** once to cause the two-digit, second-level shutdown code to blink. (Pressing **Stop** again will stop the blinking.) The two-digit code consists of 1, 2, 3, 4 or 5 blinks, a brief pause, and then 1 to 9 blinks. The first set of blinks represents the tens digit and the second set of blinks the units digit of the shutdown code number.
- **Four blinks** indicate that cranking time exceeded 35 seconds.
- *Fault Code Nos. 1, 2, 3, and 4 are first level faults. Pay close attention to the pause sequence to avoid interpreting first level faults as second-level Fault Codes Nos. 11, 22, 33 or 44.*
- *To avoid the possibility of anyone misinterpreting Code Nos. 3 and 4 as Code Nos. 33 and 44, the latter have not been assigned faults.*

## 5.3 Restoring Fault Code Blinking

The fault code stops blinking after five minutes. Press **Stop** three times within three seconds to restore fault code blinking.

### NOTICE

The last fault logged will blink even though the condition that caused the shutdown may have been corrected.

### ⚠ WARNING

*Some Generator Set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform Generator Set service.*

## 5.4 Troubleshooting with the Flashing Indicator Light

The status indicator light on the Control Switch inside the generator set flashes the diagnostic fault code when a fault shutdown occurs. For a single-digit fault code (2 or 4), the light will flash 2 or 4 times and after a short pause will repeat.

For a two-digit fault code the light will flash the tens digit, pause and flash the units digit and repeat after a longer pause. Fault 36 would be flashed as follows:

flash-flash-flash—*pause* —flash-flash-flash-flash-flash-flash—*long pause* —repeat

### NOTICE

**For fault history, go to the in-home Operator Panel.**

### 5.4.1 No Response - Status Indicator Light Dead

Possible Cause: Low/No battery voltage, poor battery connection, faulty battery, open harness connection, faulty start/stop switch, faulty LED

Corrective Actions:

1. Try generator set Start Switch if the remote display Start Switch does not respond, and vice versa
2. Clean and tighten positive (+) and negative (-) battery cable connections at the battery.
3. Recharge or replace battery. Refer to the battery manufacturer's recommendations.

### 5.4.2 Starting Battery Runs Down

Possible Cause: Marginal battery connections, battery, charging system, excessive cranking

Corrective Actions:

1. Clean and tighten positive (+) and negative (-) battery cable connections at the battery.
2. Recharge or replace battery. Refer to the battery manufacturer's recommendations.
3. Have battery charger serviced by an authorized Cummins Power Generation dealer.

### 5.4.3 Starter Engages - Disengages

Possible Causes: Cranking voltage dips below 8 VDC, battery connections, battery, charging system, start/stop switches

Corrective Actions:

1. Clean and tighten positive (+) and negative (-) battery cable connections at the battery.
2. Recharge or replace battery. Refer to the battery manufacturer's recommendations.
3. Have the battery charger serviced by an authorized Cummins Power Generation dealer.

### 5.4.4 No AC Power - generator set Running, Status LED On Steady or Flashing Rapidly

Possible Cause: Circuit breakers tripped due to short circuit or overloading.

Corrective Actions:

1. Reduce number of loads.

2. Reset or turn on generator set circuit breaker.
3. Reset or turn on circuit breaker in the distribution panel.
4. Have the circuits from the generator set and distribution panel verified by an authorized electrician.

### 5.4.5 Generator Set Cranks But Does Not Start - No Fault Code

Possible Cause: Faulty or incorrect spark plugs.

Corrective Actions:

1. Check and record last fault code.
2. Crank generator set and troubleshoot fault code and reference last fault code recorded above if necessary.

#### WARNING

*Some Generator Set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform Generator Set service.*

### 5.4.6 Genset Warning-Transfer Switch Failed to Transfer to Utility - No Fault Code

Possible Cause: Transfer switch is faulty, or wire is disconnected or broken

Corrective Actions:

1. Have the utility switch-position wire, wire connections, and transfer switch checked by an authorized electrician.

### 5.4.7 Low Oil Pressure Fault - Fault Code 2

Possible Cause: Oil Level too low/high, faulty switch, faulty oil pressure relief valve, faulty oil pump

Corrective Actions:

1. Check oil level: add or drain oil as necessary.

### 5.4.8 Overcrank - Fault Code 4

Possible Cause: Faulty switch, faulty external start command, fuel supply, air fuel mixture, exhaust system, wire connections, starter, ignition system

Corrective Actions:

1. Open any closed fuel valves.
2. Secure spark plug leads to spark plugs.
3. Check and service air filter as necessary.
4. Replace spark plugs.

#### WARNING

*Some Generator Set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform Generator Set service.*

---

### 5.4.9 Overvoltage - Fault Code 12

Possible Causes: Generator set loads, wire connections, windings

Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.10 Undervoltage - Fault Code 13

Possible Causes: Generator set loads, wire connections, windings

Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.11 Overfrequency - Fault Code 14

Possible Causes: Generator set loads, engine governor function, fuel supply, air fuel mixture, exhaust system, choke, demand regulator, carburetor, generator windings, wire connections

Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.12 Underfrequency - Fault Code 15

Possible causes: Generator set loads, engine governor function, fuel supply, air fuel mixture, exhaust system, choke, demand regulator, carburetor, generator windings, ignition, wire connections

Corrective Actions:

1. Reduce the number of connected loads especially loads that require higher starting current such as air conditioners.
2. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.13 Governor Actuator Shutdown - Fault Code 19

Possible causes: Wire connections, governor actuator

Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.14 Governor Actuator Overload - Fault Code 22

Possible causes: Generator set loads, wire connections, fuel supply, air fuel mixture, exhaust system, governor actuator, ignition system

Corrective Actions:

1. Reduce the number of connected loads especially loads that require higher starting current such as air conditioners.
2. Check and service air filter as necessary.
3. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.15 Voltage Sense Lost - Fault Code 27

Possible Causes: Generator set loads, alternator windings, ignition, wire connections



## Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

**⚠ WARNING**

***Some generator set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform generator set service.***

### 5.4.16 High Battery Voltage - Fault Code 29

Possible Causes: Incorrect battery configuration, wire damage, faulty charger, control

## Corrective Actions:

1. Have battery charger serviced by an authorized Cummins Power Generation dealer.

### 5.4.17 Low Cranking Speed Sense - Fault Code 32

Possible Causes: Starter, engine components, air intake system, exhaust system, alternator windings, wire connections, battery, battery connections, oil viscosity

## Corrective Actions:

1. Clean and tighten the positive (+) and negative (-) battery cable connections at the battery.
2. Recharge or replace the battery. Refer to the battery manufacturer's recommendations.
3. Verify that the engine oil viscosity is correct for the ambient temperature. If not, refill and replace engine oil with the correct viscosity.
4. Have the unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.18 Control Card Failure - Fault Code 35

Possible Causes: Faulty program

## Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.19 Generator Set Stopped Without Fault Condition - Fault Code 36

Possible Causes: Fuel supply, air fuel mixture, exhaust system, choke demand regulator, carburetor, generator windings, ignition, wire connections

## Diagnosis &amp; Repair:

1. Check the fuel source.
2. Open any closed fuel valves.
3. Secure spark plug leads to spark plugs.
4. Check and service air filter as necessary.
5. Replace spark plugs.
6. Check for mechanical damage.

---

### 5.4.20 Invalid Set Configuration - Fault Code 37

Possible Causes: Generator set configuration, control

Diagnosis & Repair:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.21 Processor Fault - Fault Code 43

Possible Causes: Faulty program

Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.22 Speed Sense Fault - Fault Code 45

Possible Causes: Loads, alternator windings, wire connections

Corrective Actions:

1. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.23 Generator Set Overload - Fault Code 46

Possible causes: Loads, wire connections, windings

Corrective Actions:

1. Reduce the number of connected loads especially loads that require higher starting current such as air conditioners.
2. Check and service air filter as necessary.
3. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.24 Alternator Over Temp - Fault Code 76

Possible Causes: Wire connections, faulty temperature sensor, faulty DC fan, blocked intake or exhaust openings.

Corrective Actions:

1. Verify the generator set enclosure for clear intake and exhaust openings.
2. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.25 Low Fuel Pressure - Fault Code 78

Possible Causes: Wire connections, fuel system, fuel pressure switch

Corrective Actions:

1. Open any closed fuel valves.
2. Have unit serviced by an authorized Cummins Power Generation dealer.

### 5.4.26 Failure To Transfer To Generator Set - Fault Code 79

Possible Causes: Wire connections, faulty positional switch, faulty transfer switch component(s).

Diagnosis & Solution:

1. Verify that the main AC circuit breaker on the generator set is to "On".

2. Have unit serviced by an authorized Cummins Power Generation dealer.

## 5.5 Communication Troubleshooting

### 5.5.1 In-Home Network Access to Generator Set Troubleshooting

#### WARNING

***Some generator set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform generator set service.***

**Possible Causes:** Bad connections or bad communications

**Corrective Actions:**

1. Check connections.
  - a. Verify that the Ethernet cable is plugged into the generator set control and the router.
  - b. Verify that the computer that is attempting to access the generator set is connected to the same router as the generator set via an Ethernet cable (on the same local area network).
  - c. Verify that the wireless card on the computer is turned off.
  - d. Check to see if both ends of the Ethernet cable are assembled and crimped as described in the installation instructions. If not, reassemble and crimp as described in the installation instructions.
  - e. Verify that the Ethernet cable connections between the generator set and the router are solid and correct.
  - f. Proceed to "Check communications."
2. Check communications.
  - a. If the router is also connected to an incoming connection from an ISP, check to see if you can access a standard web page with the computer connected to the same router as the generator set. If not, contact your router manufacturer for troubleshooting information.
  - b. Check to see if the green and orange lights are illuminated at the Ethernet connection port on the generator set control board. If the lights are not illuminated, this indicates that no information is being transmitted or received. Test the cable by disconnecting the Ethernet cable from the generator control board and connecting it to the computer (swap the cable with the existing Ethernet cable). With the router connected to the ISP, check to see if you can access a standard web page.
    - i. If you can access a standard web page, call Cummins Support at 1-800-888-6626 and select option 1.
    - ii. If you cannot access a standard web page, go to the "Check connections" step above.
  - c. Check to see if the correct generator IP address has been entered. If not, enter the correct IP address in the address bar of the web browser. Be sure to not enter "www" or other text prior to the IP address.
  - d. If none of the above troubleshooting techniques help, call Cummins Support at 1-800-888-6626 and select option 1.

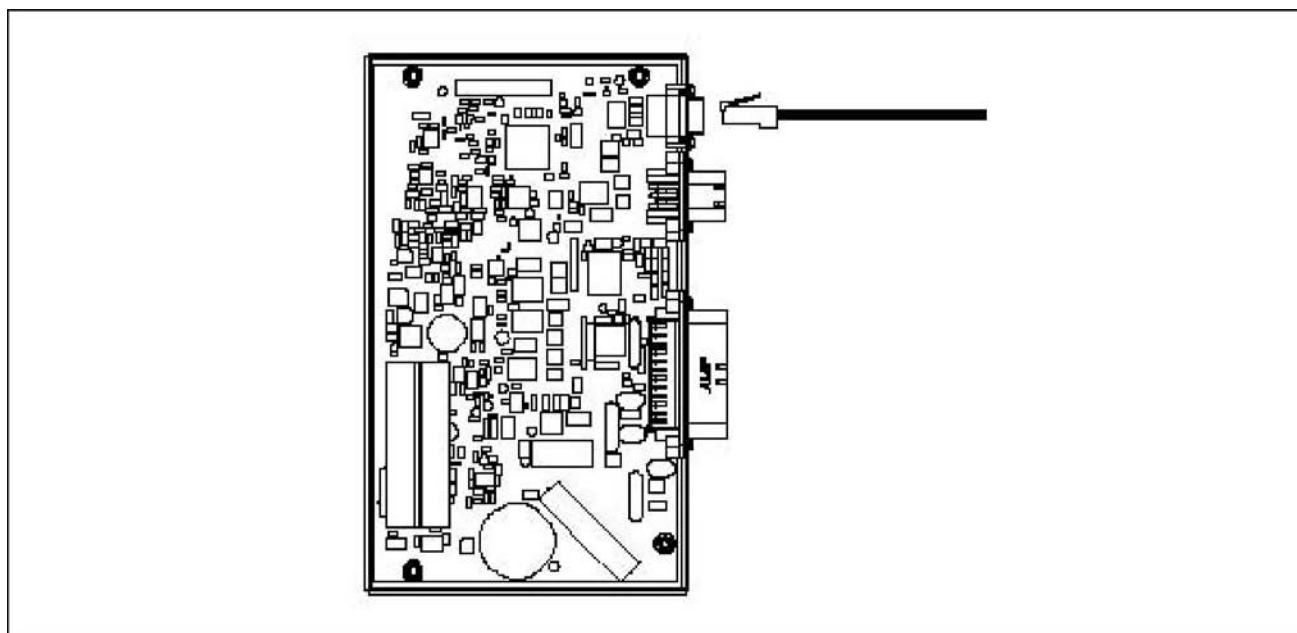


FIGURE 23. NETWORK CONNECTIONS (CONTROL BOARD AND ETHERNET CONNECTION)

## 5.5.2 Remote Internet Access to Generator Set Troubleshooting

### ⚠ WARNING

*Some generator set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform generator set service.*

**Possible Causes:** Improper setup, no high-speed internet connection, public IP address is not active or properly set up, incorrect IP address is entered, computer is connected to the same router or network as the generator set, or the internet connection is faulty.

#### Corrective Actions:

1. Check to see if you are able to access the generator set with your in-home computer.  
If not, refer to the [In-Home Network Access Troubleshooting](#) procedures.
2. Verify that you followed the network setup procedures.  
Refer to the [Network Setup Guide](#).
3. Verify that you are using a high-speed internet connection.
4. Verify that the public IP address is active and set up properly with the ISP (Internet Service Provider). If necessary, contact the ISP to verify your setup.\*
5. Verify that the correct public IP address is entered into the web browser of the computer (i.e. xxx.xxx.xxx.xxx).
6. Verify that the computer is not connected to the same router or local area network as the generator set. If it is on the same network, you will be able to access the generator set using the local network IP address configured on the generator set. The computer used for internet access must be connected to a different internet connection than the generator set.
7. Check to see if you can access a standard web page from a computer. If not, contact the ISP to troubleshoot the internet connection.

8. Verify all settings, as described in the Network Setup Guide.
9. If the previous steps do not correct the problem, contact a computer network specialist to diagnose.
  - \* To verify your IP address, access "whatismyipaddress.com" from the browser of a computer connected to the internet and on the same network as the generator set. This web page displays your current IP address which should match the IP address assigned to you by your ISP.

### 5.5.3 Email Alert Troubleshooting

#### WARNING

***Some Generator Set service procedures present hazards that can result in severe personal injury or death. Only trained and experienced service personnel with knowledge of fuels, electricity, and machinery hazards should perform Generator Set service.***

**Possible Causes:** An improper setup, the alert level is not set to "all events," emails cannot be received, the outgoing email address is not included in your contact list, the email account is not capable of using plain SMTP for the outgoing SMTP server setup, the domain name is not included in the user name filed of the Network Setup screen, or the DNS #1 and #2 values are incorrect on the Network Setup screen.

**Corrective Actions:**

1. Check to see if you are able to access the generator set with your in-home computer. If not, refer to [In-Home Computer Access Troubleshooting](#).
2. Verify that you followed the network setup instructions. Refer to the [Network Setup Guide](#).
3. Verify that the alert level is set to All Events.
  - a. To verify that your generator set can send emails, select Disable Standby and wait several minutes to verify that you did receive an email.
  - b. Select Enable Standby and wait a few more minutes to verify that you did receive a second email.
4. Send an email to the destination email address and check to see if you received this email. If not, contact your email service provider or your ISP (Internet service provider) to diagnose.
5. Check to see if the destination email accounts have spam filtering.
  - a. If spam filtering is present, add the outgoing email address to your contact list.
  - b. If spam filtering is not present, proceed to step 6.
6. Ensure that the SMTP server in use is capable of distributing non SSL certified emails. If the SMTP server is not capable of sending non SSL certified emails or the status is unknown, please contact your ISP technical support for information.
7. Verify that the domain name is included in the user name field of the Network Setup screen (i.e. username@domainname).\*\*
8. Verify with your ISP that the Static DNS (Domain Name Server) #1 and #2 are correct.
9. If the previous steps do not correct the problem, contact a computer network specialist to diagnose.

\*\* "No authentication" is possible on some systems by leaving the username and password fields blank.

**IMPORTANT NOTE:** Changes are not saved unless you navigate through all three Network Setup screens and click on "Done". The message "Settings Saved Successfully" is then displayed.

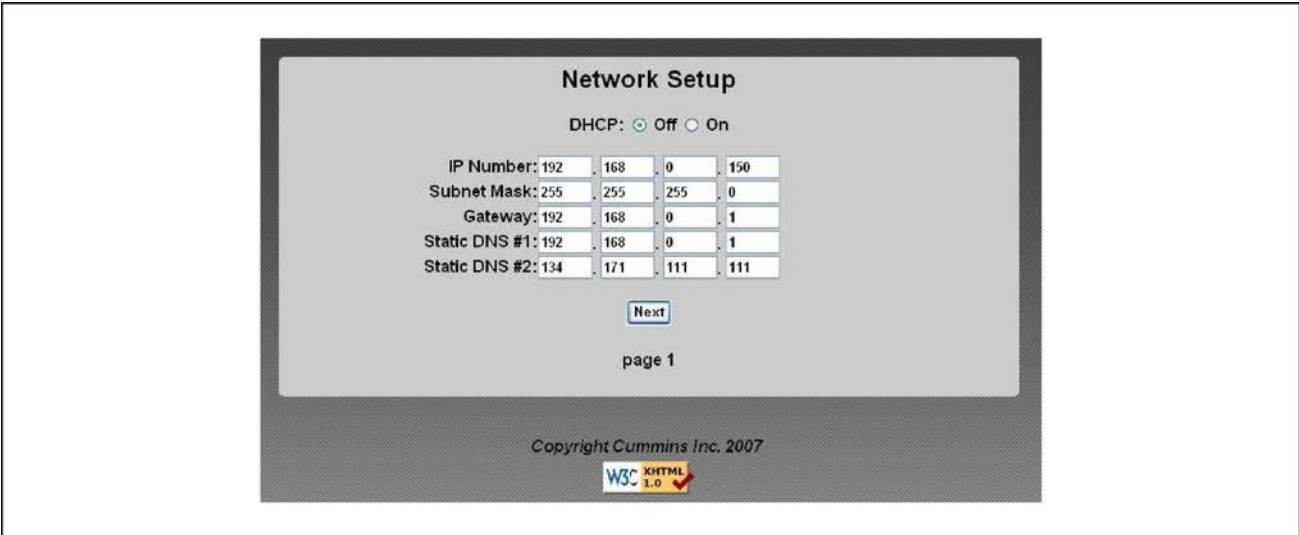


FIGURE 24. NETWORK SETUP - PAGE 1

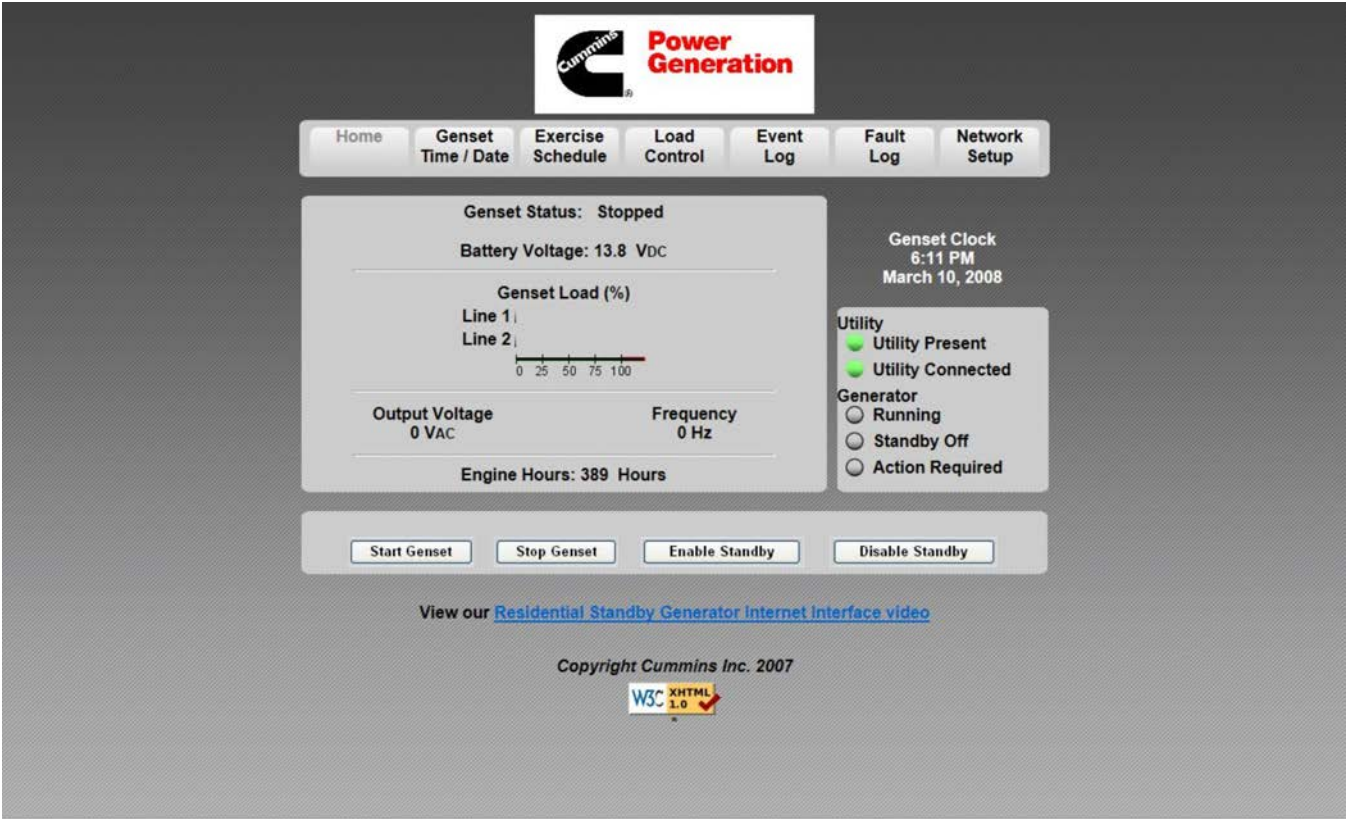
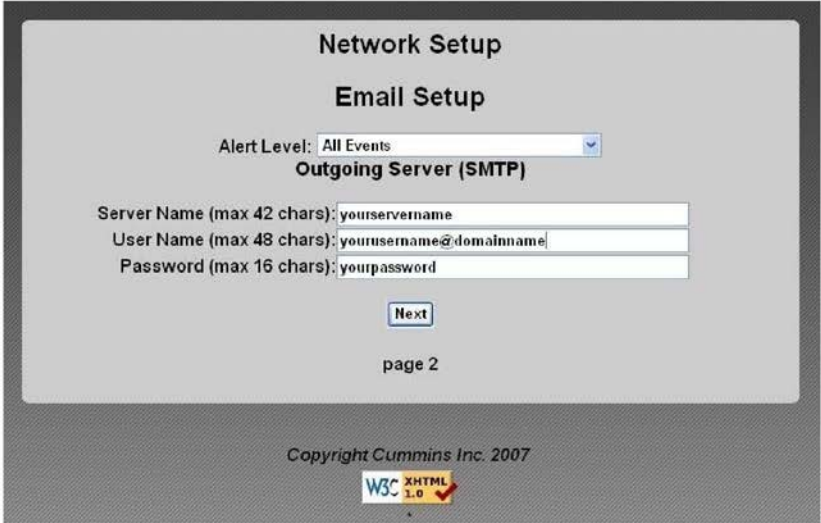
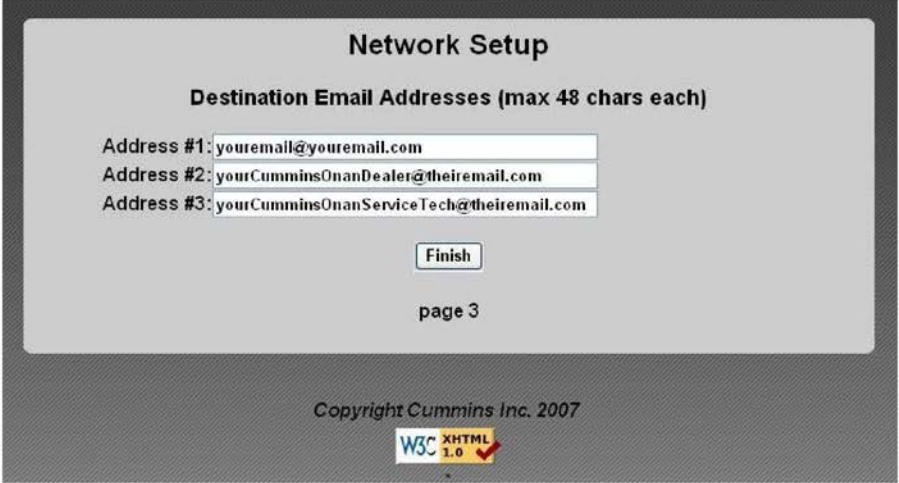


FIGURE 25. GENERATOR SET HOME PAGE



The screenshot shows a web-based configuration interface for network setup. At the top, the title "Network Setup" is centered, followed by the sub-header "Email Setup". Below this, there is a dropdown menu for "Alert Level" set to "All Events". The main section is titled "Outgoing Server (SMTP)". It contains three input fields: "Server Name (max 42 chars):" with the value "yourservname", "User Name (max 48 chars):" with the value "yourusername@domainname", and "Password (max 16 chars):" with the value "yourpassword". A "Next" button is positioned below these fields. At the bottom of the page, it says "page 2", "Copyright Cummins Inc. 2007", and a "W3C XHTML 1.0" validation logo.

FIGURE 26. NETWORK SETUP - PAGE 2



The screenshot shows the next page of the network setup interface. The title "Network Setup" is centered at the top. Below it is the sub-header "Destination Email Addresses (max 48 chars each)". There are three input fields for email addresses: "Address #1:" with the value "youremail@youremail.com", "Address #2:" with the value "yourCumminsOnanDealer@theiremail.com", and "Address #3:" with the value "yourCumminsOnanServiceTech@theiremail.com". A "Finish" button is located below these fields. At the bottom of the page, it says "page 3", "Copyright Cummins Inc. 2007", and a "W3C XHTML 1.0" validation logo.

FIGURE 27. NETWORK SETUP - PAGE 3

This page is intentionally blank.



# 6 Optional Internet/Email Interface Descriptions

---

## 6.1 Introduction

This feature allows for in-home or remote access to your generator set through a web page.

|               |
|---------------|
| <b>NOTICE</b> |
|---------------|

|   |
|---|
| <b>An Internet browser (i.e., Internet Explorer) is required for this option.</b> |
|---|

On this web page, you can start or stop the generator set, adjust the exerciser day and time, determine if utility power is available and view the last 20 events/faults on the generator set.

This feature is useful for homeowners who travel or have a second home and want to be able to remotely interface with their generator set. This feature can also help to reduce troubleshooting time and service calls when the service technician has access to the same web page.

Use of the Ethernet is not required if you do not use web access. To set up your generator set for web access, complete installation instructions are included in the Network Setup Guide instruction sheet, included with your generator set literature package.

The Internet/Email Interface can make the same fault, maintenance and event notices available to you and to your generator set service contract agency with appropriate Internet Service and email account.

|               |
|---------------|
| <b>NOTICE</b> |
|---------------|

|   |
|---|
| <b>Technical support for setup and troubleshooting of the hardware used for in-home network access to the generator set is available through the selling Cummins Power Generation dealer/distributor.</b> |
|---|

|  |
|--|
| <b>The owner may be required to contact their ISP and/or email provider for technical support of the email notification feature setup and troubleshooting.</b> |
|--|

|   |
|---|
| <b>Due to the variations in network equipment, network configurations and ISPs, the owner is responsible for acquiring the needed support/service from a qualified network specialist to properly and securely set up the owner's network for remote monitoring of the generator set.</b> |
|---|

|  |
|--|
| <b>Cummins Power Generation does not provide technical support for setup and troubleshooting of the owner's network and email service.</b> |
|--|

## 6.2 Screen Descriptions

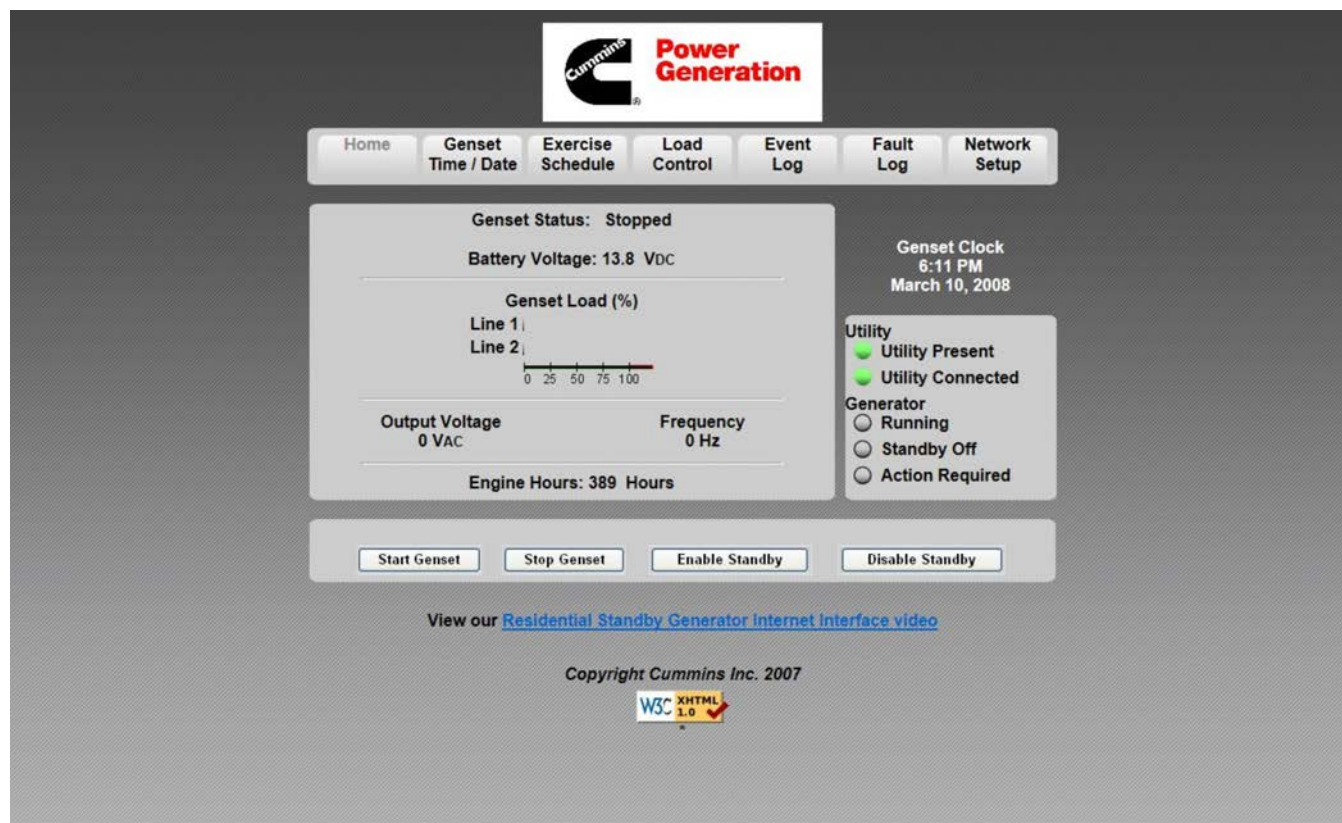


FIGURE 28. HOME PAGE

### 6.2.1 Setting Time and Date

Select the Genset Time/Date Tab on the Home Screen to set the time and date for the generator set control.

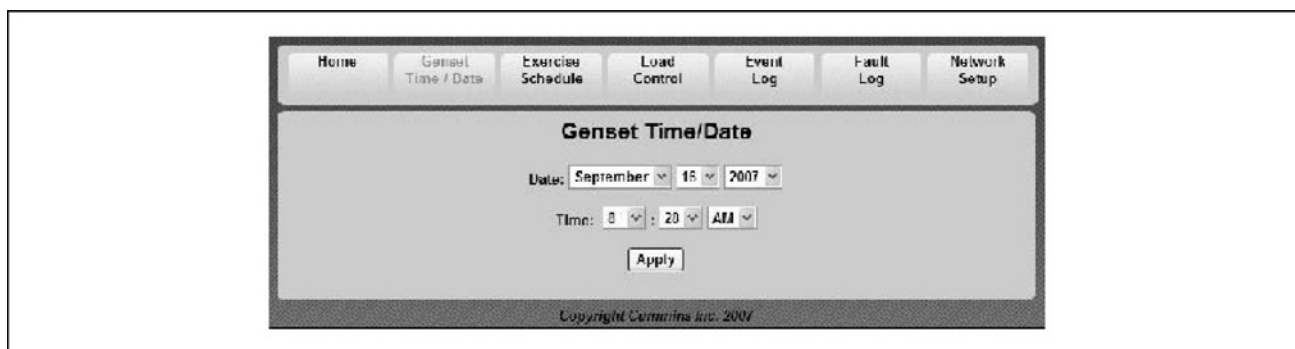


FIGURE 29. SET GENSET TIME AND DATE

### 6.2.2 Set Exercise Schedule

Select the Exercise Schedule Tab on the Home Screen to set the generator set exercise schedule.

NOTICE

The generator set will exercise on the first scheduled day for which it is programmed. After that it exercises on that day at the scheduled interval. For example, if the generator set is scheduled on a Wednesday for Saturdays with a monthly interval, the generator set starts on the next available Saturday. After that it exercises on Saturdays one month apart.



FIGURE 30. SET EXERCISE SCHEDULE

6.2.3 Load Control (Management)

Select the Load Control Tab on the Home Screen to enable Automatic or Manual Load Control. In Automatic mode, the user can only view which loads are connected. In Manual mode, the user can view loads and also connect or disconnect them. See [Load Management](#) for details.



FIGURE 31. GENSET LOAD MANAGEMENT

6.2.4 Event Log

Select the Event Log Tab on the Home Screen to review the last 20 events. See the Event Log screen capture below for a list of all of the recordable events.



FIGURE 32. EVENT LOG

6.2.5 Fault Log

Select the Fault Log Tab on the Home Screen to review the last 5 faults.



FIGURE 33. FAULT LOG

6.2.6 Network Setup Screen Descriptions

An owner-custom password can be defined in the Network Setup screen shown below. The user will be prompted to enter the User Name and Password to access this screen.

The Network Setup Parameters screen allows dynamic addresses to be changed to static addresses. This screen allows the user to configure the static address for the in-home network. See the Network Setup Parameters screen shown below.

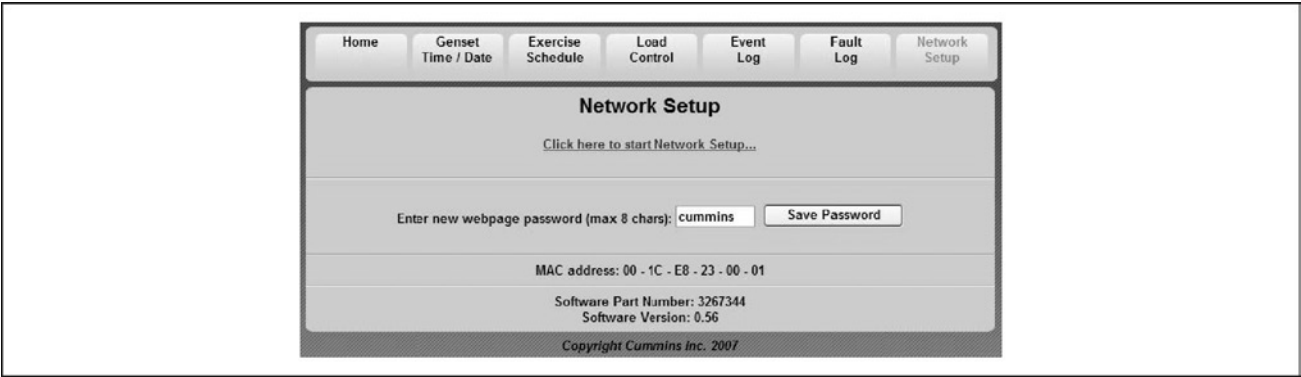


FIGURE 34. NETWORK SETUP SCREEN

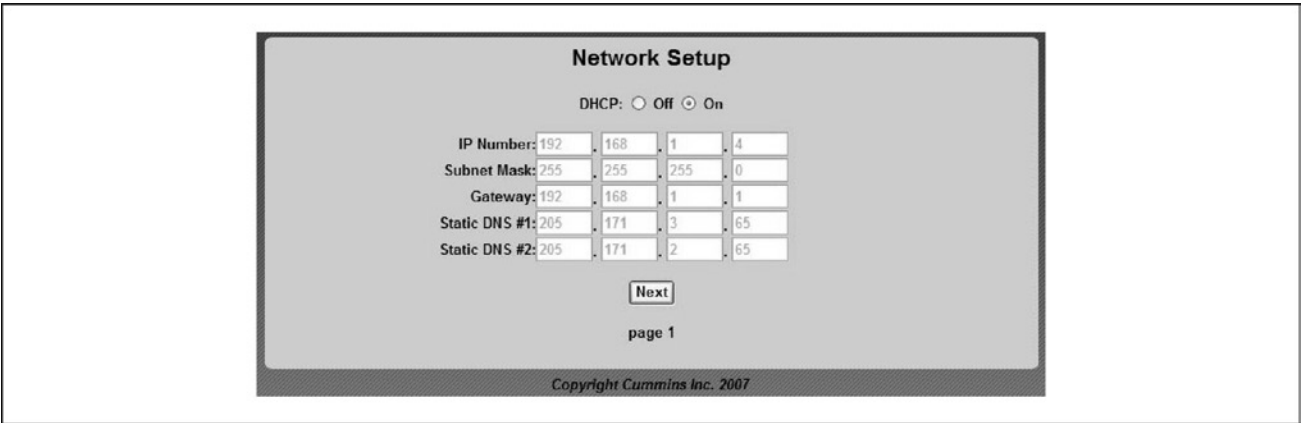


FIGURE 35. NETWORK SETUP PARAMETERS

### 6.2.7 Email Setup Screen Descriptions

The user must determine what events will trigger an email notification of the event:

- Never
- All Events
- Maintenance and Attention Required or Attention Required Only

This screen is also used to set up e-mail configuration.

The user may enter up to three email addresses for receiving notifications of the home-standby generator set status. See the Email Addresses figure below.

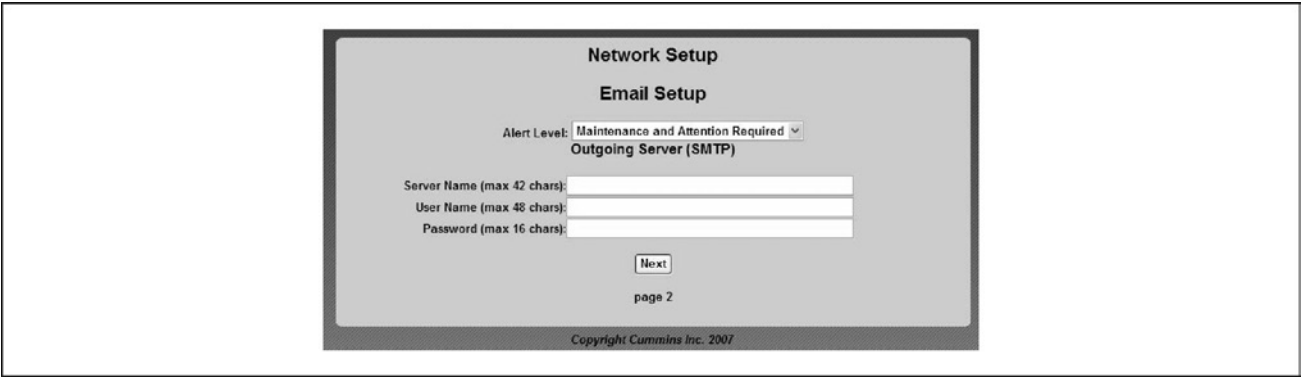


FIGURE 36. EMAIL SETUP PARAMETERS



The screenshot shows a web interface titled "Network Setup". Below the title is the heading "Destination Email Addresses (max 48 chars each)". There are three input fields labeled "Address #1:", "Address #2:", and "Address #3:". Below these fields is a "Done" button. At the bottom of the screen, it says "page 3" and "Copyright Cummins Inc. 2007".

FIGURE 37. EMAIL ADDRESSES

### 6.2.8 Saving Changes

After the email addresses are added and Done is selected, this screen will appear, verifying that all changes have been saved.

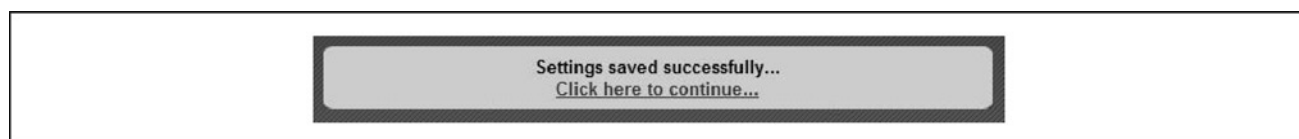


FIGURE 38. SAVE SCREEN

## 6.3 Ethernet Connections (Optional)

Wiring connections to the Ethernet RJ-45 plug are shown in the Ethernet RJ-45 Connector Wiring illustration. Utilize an appropriate Ethernet stripping and crimping tool for these connections.

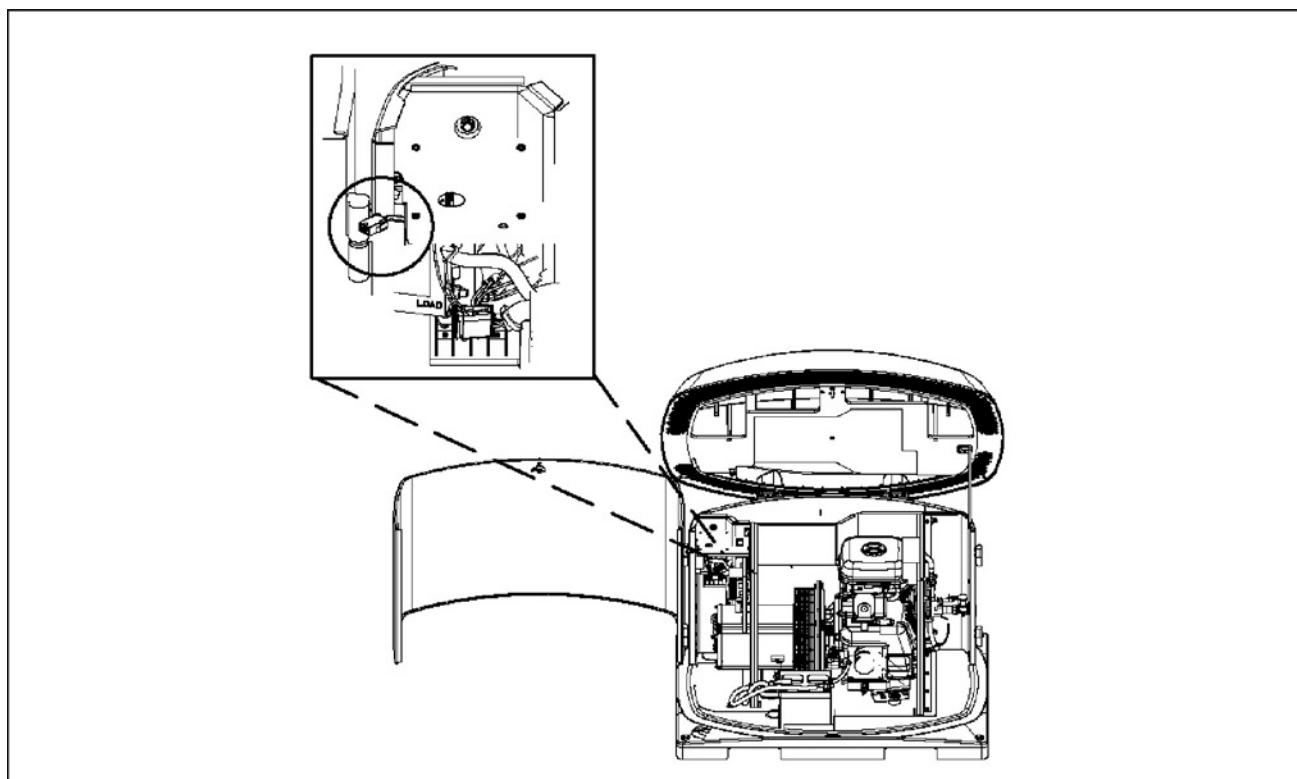


FIGURE 39. ETHERNET CONNECTOR

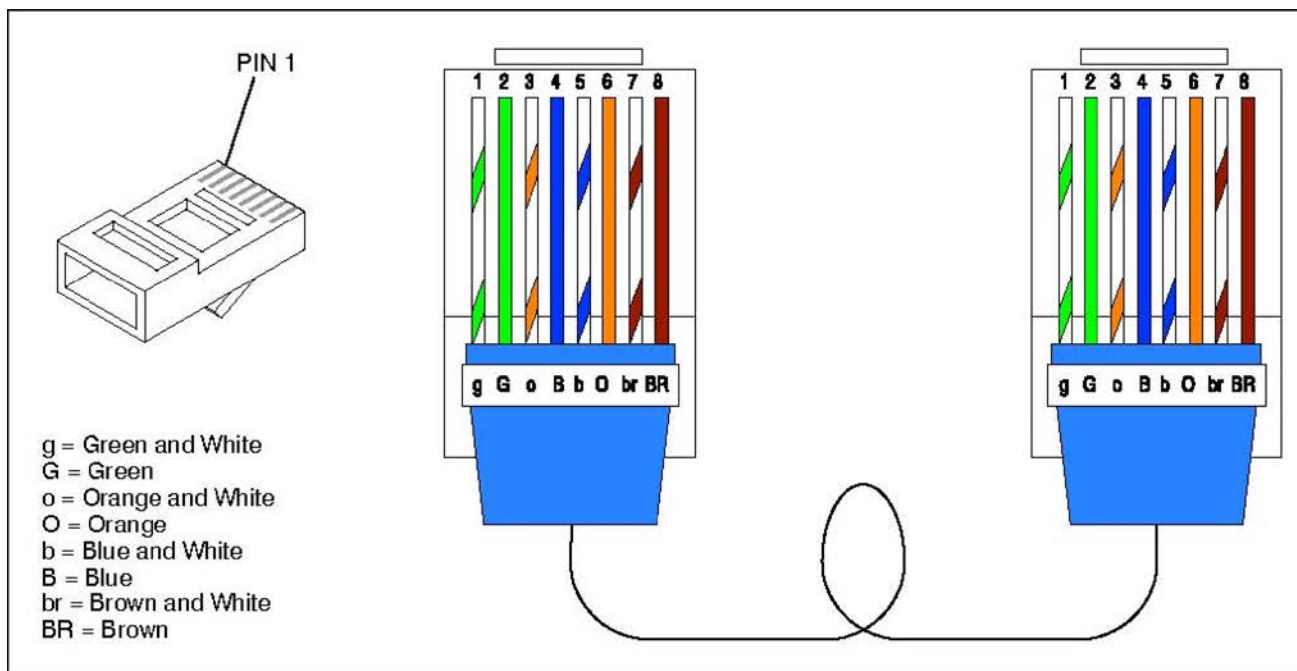
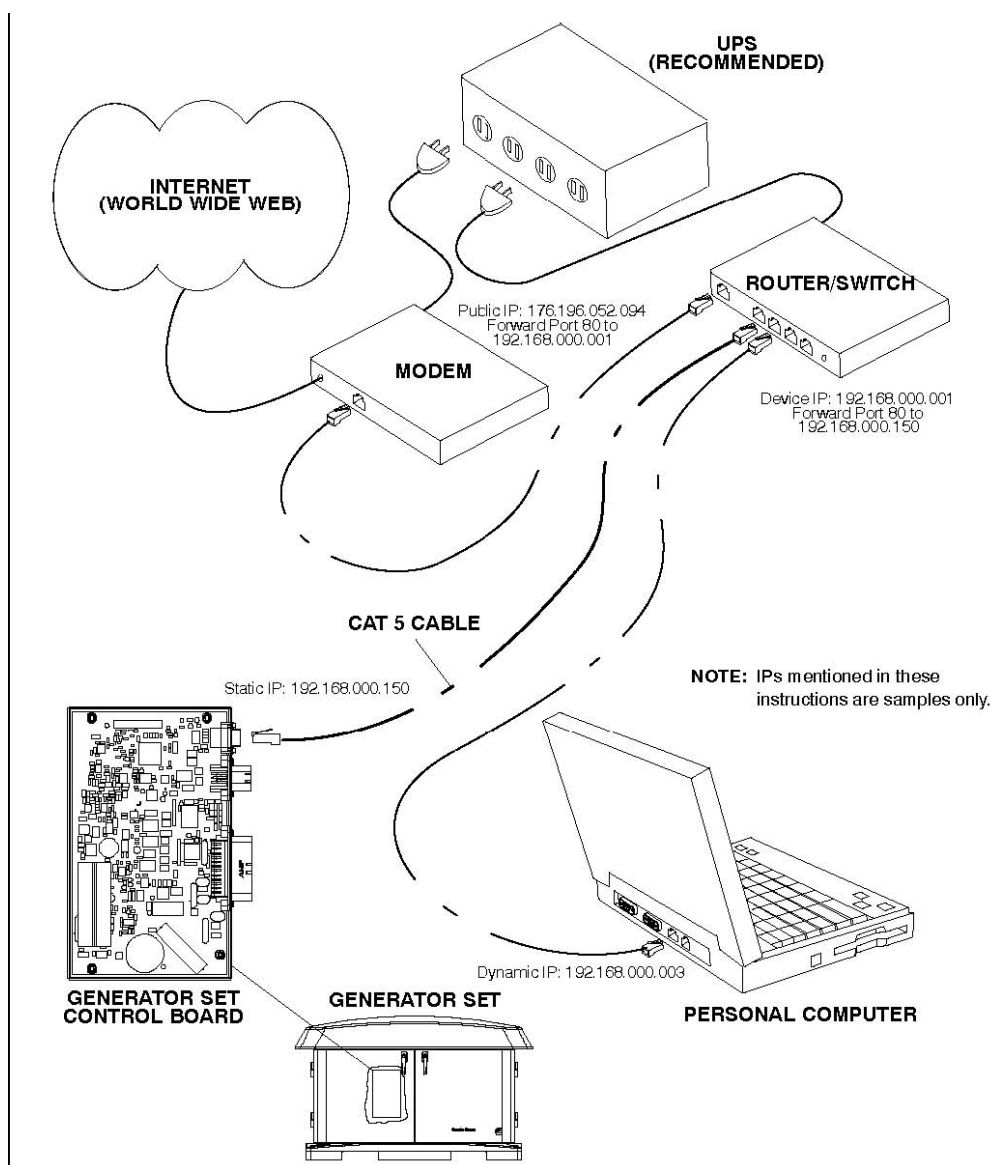


FIGURE 40. ETHERNET RJ-45 CONNECTOR WIRING

**FIGURE 41. NETWORK CONNECTIONS**





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