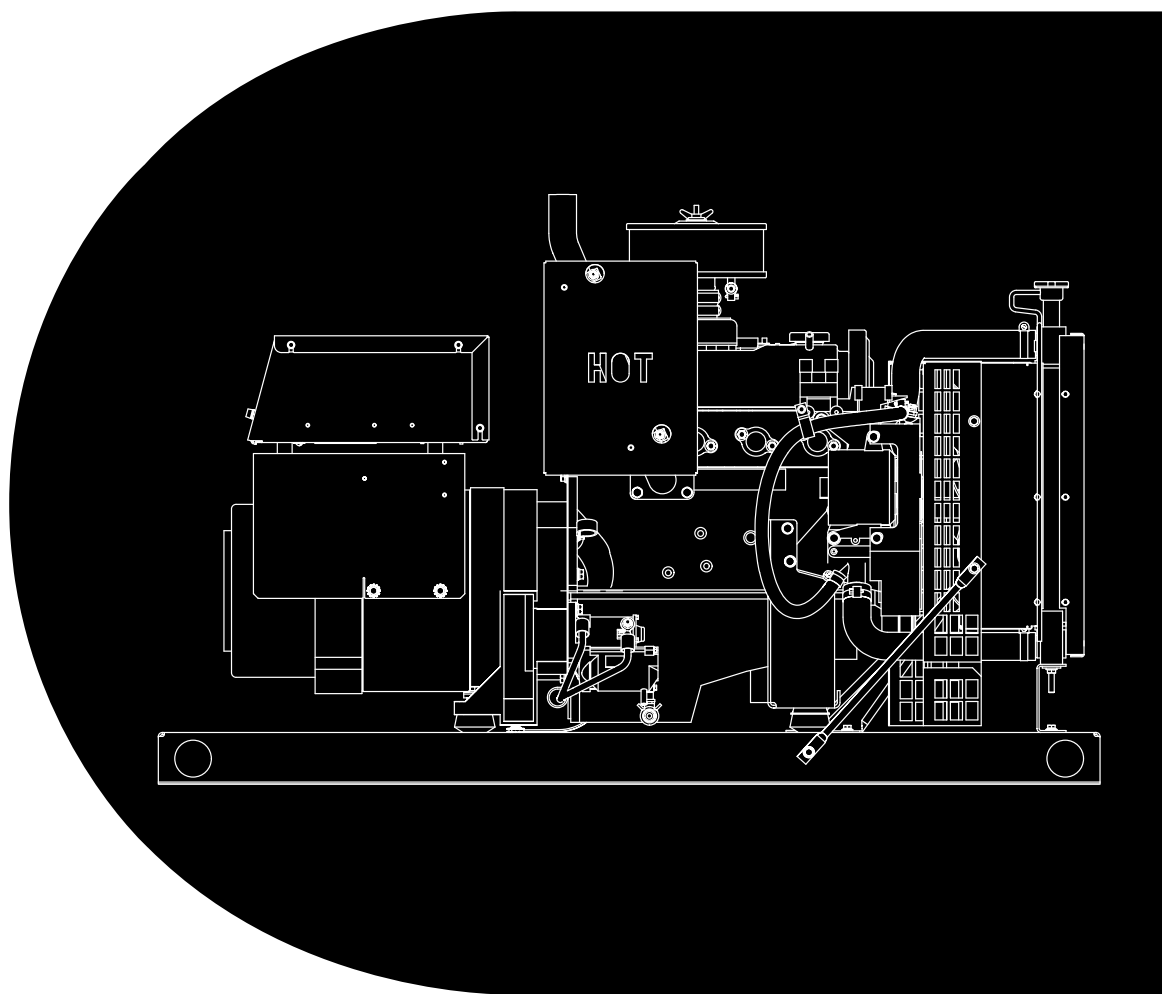


# Service Manual

## GenSet Model GGDB

with PowerCommand<sup>®</sup> Control  
PCC1301



# Table of Contents

---

| SECTION  | TITLE  | PAGE |
|----------|--|------|
|          | <b>IMPORTANT SAFETY INSTRUCTIONS</b> .....     | iii  |
| <b>1</b> | <b>INTRODUCTION</b>                            |      |
|          | About this Manual .....                        | 1-1  |
|          | Generator Set .....                            | 1-1  |
|          | System Overview .....                          | 1-2  |
|          | Test Equipment .....                           | 1-2  |
|          | How to Obtain Service .....                    | 1-2  |
| <b>2</b> | <b>CONTROL OPERATION (WITHOUT DISPLAY)</b>     |      |
|          | General .....                                  | 2-1  |
|          | Control Panel .....                            | 2-1  |
| <b>3</b> | <b>CONTROL OPERATION (WITH DISPLAY)</b>        |      |
|          | General .....                                  | 3-1  |
|          | Control Panel Power On/Off Modes .....         | 3-1  |
|          | Control Panel .....                            | 3-2  |
|          | System Messages .....                          | 3-5  |
|          | Selecting Auto, Manual Run and OFF Modes ..... | 3-7  |
|          | Operator Menus .....                           | 3-10 |
|          | Service Menus .....                            | 3-14 |
|          | History/About Menu .....                       | 3-16 |
|          | Screen Adjust Menu .....                       | 3-18 |
|          | Fault History Menu .....                       | 3-20 |
| <b>4</b> | <b>CIRCUIT BOARD</b>                           |      |
|          | General .....                                  | 4-1  |
|          | Base Board .....                               | 4-3  |
| <b>5</b> | <b>TROUBLESHOOTING</b>                         |      |
|          | General .....                                  | 5-1  |
|          | InPower Service Tool .....                     | 5-1  |
|          | Network Applications and Customer Inputs ..... | 5-1  |
|          | Safety Consideration .....                     | 5-2  |
|          | Reading Fault Codes .....                      | 5-2  |
|          | Troubleshooting Procedure .....                | 5-3  |

| <b>SECTION</b> | <b>TITLE</b>  | <b>PAGE</b> |
|----------------|---|-------------|
| <b>6</b>       | <b>CONTROL ADJUSTMENT AND SERVICE</b>               |             |
|                | General .....                                       | 6-1         |
|                | Circuit Board Removal/Replacement .....             | 6-2         |
|                | Setup Menu .....                                    | 6-3         |
|                | Genset Service Menus .....                          | 6-4         |
|                | Genset Service Submenus .....                       | 6-6         |
|                | Automatic Voltage Regulator Submenus .....          | 6-12        |
|                | Electronic Governor Submenus .....                  | 6-14        |
|                | Customer I/O Submenus .....                         | 6-16        |
|                | Metering Submenus .....                             | 6-18        |
|                | Annunciator Submenus .....                          | 6-20        |
|                | Genset Setup Submenus .....                         | 6-25        |
|                | Genset Submenus .....                               | 6-28        |
|                | Voltage Protection Submenus .....                   | 6-34        |
|                | Current Protection Submenus .....                   | 6-36        |
|                | Engine Protection Submenus .....                    | 6-38        |
|                | TB1 Base Board Customer Connections .....           | 6-44        |
|                | Engine Sensors .....                                | 6-45        |
|                | Magnetic Speed Pickup Unit (MPU) Installation ..... | 6-46        |
|                | Current Transformer (CT) Installation .....         | 6-47        |
| <b>7</b>       | <b>SERVICING THE GENERATOR</b>                      |             |
|                | General .....                                       | 7-1         |
|                | Generator/Base Board Isolation Procedure .....      | 7-2         |
|                | Testing the Generator .....                         | 7-3         |
|                | Generator Disassembly .....                         | 7-9         |
|                | Generator Reassembly .....                          | 7-11        |
| <b>8</b>       | <b>FUEL SYSTEMS</b>                                 |             |
|                | General .....                                       | 8-1         |
|                | Fuel Pressure .....                                 | 8-1         |
|                | Actuator/Fuel System Adjustment .....               | 8-1         |
|                | Initial Secondary Regulator Adjustment .....        | 8-3         |
|                | Fuel Conversion (NG to LPV or LPV to NG) .....      | 8-4         |
|                | Verify Overspeed Fault Detection .....              | 8-6         |
| <b>9</b>       | <b>WIRING DIAGRAMS</b>                              |             |
|                | General .....                                       | 9-1         |
| <b>A</b>       | <b>MENU SEQUENCE DIAGRAMS</b>                       |             |
|                | General .....                                       | A-1         |

# IMPORTANT SAFETY INSTRUCTIONS

---

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

**Before operating the generator set (genset)**, read the Operator's Manual and become familiar with it and the equipment. **Safe and efficient operation can be achieved only if the equipment is properly operated and maintained.** Many accidents are caused by failure to follow fundamental rules and precautions.

The following symbols, found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel, or the equipment.

**⚠ DANGER** *This symbol warns of immediate hazards which will result in severe personal injury or death.*

**⚠ WARNING** *This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.*

**⚠ CAUTION** *This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.*

## FUEL AND FUMES ARE FLAMMABLE

Fire, explosion, and personal injury or death can result from improper practices.

- DO NOT fill fuel tanks while engine is running, unless tanks are outside the engine compartment. Fuel contact with hot engine or exhaust is a potential fire hazard.
- DO NOT permit any flame, cigarette, pilot light, spark, arcing equipment, or other ignition source near the generator set or fuel tank.
- Fuel lines must be adequately secured and free of leaks. Fuel connection at the engine should be made with an approved flexible line. Do not use copper piping on flexible lines as copper will become brittle if continuously vibrated or repeatedly bent.
- Natural gas is lighter than air, and will tend to gather under hoods. Propane is heavier than air, and will

tend to gather in sumps or low areas. NFPA code requires all persons handling propane to be trained and qualified.

- Be sure all fuel supplies have a positive shutoff valve.
- Be sure battery area has been well-ventilated prior to servicing near it. Lead-acid batteries emit a highly explosive hydrogen gas that can be ignited by arcing, sparking, smoking, etc.

## EXHAUST GASES ARE DEADLY

- Provide an adequate exhaust system to properly expel discharged gases away from enclosed or sheltered areas and areas where individuals are likely to congregate. Visually and audibly inspect the exhaust daily for leaks per the maintenance schedule. Make sure that exhaust manifolds are secured and not warped. Do not use exhaust gases to heat a compartment.
- Be sure the unit is well ventilated.
- Engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

## MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Keep your hands, clothing, and jewelry away from moving parts.
- Before starting work on the generator set, disconnect battery charger from its AC source, then disconnect starting batteries, negative (-) cable first. This will prevent accidental starting.
- Make sure that fasteners on the generator set are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- Do not wear loose clothing or jewelry in the vicinity of moving parts, or while working on electrical equipment. Loose clothing and jewelry can become caught in moving parts. Jewelry can short out electrical contacts and cause shock or burning.
- If adjustment must be made while the unit is running, use extreme caution around hot manifolds, moving parts, etc.

## **ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH**

- Remove electric power before removing protective shields or touching electrical equipment. Use rubber insulative mats placed on dry wood platforms over floors that are metal or concrete when around electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin surface to be damp when handling electrical equipment.
- Use extreme caution when working on electrical components. High voltages can cause injury or death. **DO NOT** tamper with interlocks.
- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag and lock open switches to avoid accidental closure.
- **DO NOT CONNECT GENERATOR SET DIRECTLY TO ANY BUILDING ELECTRICAL SYSTEM.** Hazardous voltages can flow from the generator set into the utility line. This creates a potential for electrocution or property damage. Connect only through an approved isolation switch or an approved paralleling device.

## **GENERAL SAFETY PRECAUTIONS**

- Coolants under pressure have a higher boiling point than water. **DO NOT** open a radiator or heat exchanger pressure cap while the engine is running. Allow the generator set to cool and bleed the system pressure first.
- Benzene and lead, found in some gasoline, have been identified by some state and federal agencies as causing cancer or reproductive toxicity. When checking, draining or adding gasoline, take care not to ingest, breathe the fumes, or contact gasoline.
- Used engine oils have been identified by some state or federal agencies as causing cancer or reproductive toxicity. When checking or changing engine oil, take care not to ingest, breathe the fumes, or contact used oil.
- Keep multi-class ABC fire extinguishers handy. Class A fires involve ordinary combustible materials such as wood and cloth; Class B fires, combustible and flammable liquid fuels and gaseous fuels; Class C fires, live electrical equipment. (ref. NFPA No. 10).
- Make sure that rags are not left on or near the engine.
- Make sure generator set is mounted in a manner to prevent combustible materials from accumulating under the unit.
- Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and engine damage which present a potential fire hazard.
- Keep the generator set and the surrounding area clean and free from obstructions. Remove any debris from the set and keep the floor clean and dry.
- Do not work on this equipment when mentally or physically fatigued, or after consuming any alcohol or drug that makes the operation of equipment unsafe.
- Substances in exhaust gases have been identified by some state or federal agencies as causing cancer or reproductive toxicity. Take care not to breathe or ingest or come into contact with exhaust gases.
- Do not store any flammable liquids, such as fuel, cleaners, oil, etc., near the generator set. A fire or explosion could result.
- Wear hearing protection when going near an operating generator set.
- To prevent serious burns, avoid contact with hot metal parts such as radiator, turbo charger and exhaust system.

**KEEP THIS MANUAL NEAR THE GENSET FOR EASY REFERENCE**

**BUY NOW**

**Then Instant Download  
the Complete Manual  
Thank you very much!**