



# Service Manual

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## Generator Set

BGD (SPEC A-G)  
BGDL (SPEC A-G)  
NHD (SPEC A-G)

# Safety Precautions

Before operating the generator set, read the Operator's Manual and become familiar with it and the equipment. Safe and efficient operation can be achieved only if the unit 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 can result from improper practices.

- DO NOT fill fuel tanks while engine is running. Fuel contact with hot engine or exhaust is a potential fire hazard.
- DO NOT SMOKE OR USE AN OPEN FLAME 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, non-conductive line. Do not use copper piping on flexible lines as copper will work harden and become brittle.
- Be sure all fuel supplies have a positive shutoff valve.

**GASOLINE AND LPG FUEL MAY BE ACCIDENTALLY IGNITED BY ELECTRICAL SPARKS,** presenting the hazard of fire or explosion, which can result in severe personal injury or death. When installing the generator set:

- Do not tie electrical wiring to fuel lines.
- Do not run electrical lines and fuel lines through the same compartment openings.
- Keep electrical and fuel lines as far apart as possible.
- Place a physical barrier between fuel lines and electrical lines wherever possible.
- If electrical and fuel lines must pass through the same compartment opening, make certain that they are physically separated by running them through individual channels, or by passing each line through a separate piece of tubing.
- DO NOT SMOKE while servicing batteries. Lead acid batteries emit a highly explosive hydrogen gas that can be ignited by electrical arcing or by smoking.

## EXHAUST GASES ARE DEADLY

- Never sleep in the vehicle with the generator set running unless vehicle is equipped with an operating carbon monoxide detector.
- Provide an adequate exhaust system to properly expel discharged gases. Inspect exhaust system daily for leaks per the maintenance schedule. Be sure that exhaust manifolds are secure and not warped. Do not use exhaust gases to heat a compartment.
- Be sure the unit is well ventilated.

## MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Before starting work on the generator set, disconnect batteries. This will prevent accidental arcing.

- Keep your hands away from moving parts.
- 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 while working on generator sets. 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

- Disconnect starting battery 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 surfaces to be damp when handling electrical equipment.
- Use extreme caution when working on electrical components. High voltages can cause injury or death.
- Follow all state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag 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 device and after building main switch is open. Consult an electrician in regard to emergency power use.

## GENERAL SAFETY PRECAUTIONS

- Have a fire extinguisher nearby. Maintain extinguisher properly and become familiar with its use. Extinguishers rated ABC by the NFPA are appropriate for all applications. Consult the local fire department for the correct type of extinguisher for various applications.
- Hot coolants under pressure can cause severe personal injury. DO NOT open a radiator pressure cap while the engine is running. Stop the engine and carefully bleed the system pressure.
- 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.
- Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and engine damage, which presents a potential fire hazard.
- DO NOT store anything in the generator compartment such as oil or gas cans, oily rags, chains, wooden blocks, portable propane cylinders, etc. A fire could result or the generator set operation (cooling, noise and vibration) may be adversely affected. Keep the compartment 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.

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# Section 1. Introduction

## ABOUT THIS MANUAL

This manual provides service information for the Onan BGD and NHD series commercial vehicle generator sets. This manual describes troubleshooting, disassembly, repair, reassembly, and adjustments to the engine, generator, and control system. The technician must understand basic principles of electrical generation and gasoline engine operation. Basic information can be found in the following Onan publications:

- Electrical/Mechanical Fundamentals (publication 932-0408)
- Onan Generator Training Manual (publication 932-0404)
- BGD and NHD Operator's Manual (publication 985-0130)
- BGD and NHD Installation Manual (publication 965-0629)

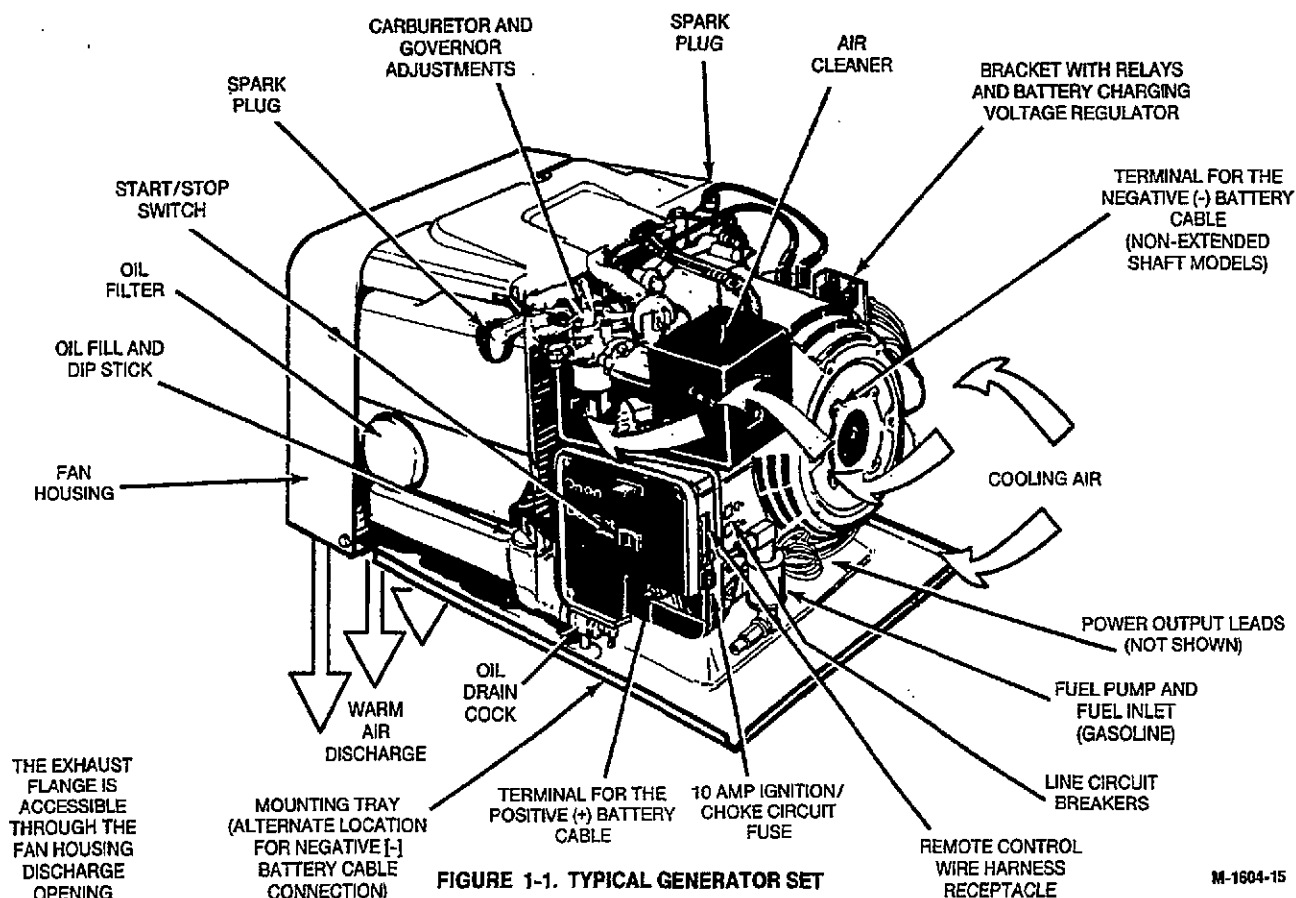
Installation must comply with the applicable codes and standards (see the installation Manual). Improper servicing may create an unsafe installation, resulting in damage to the vehicle and equipment or severe personal injury or death to the user. Read all service procedures completely before beginning any repair work, and observe all cautions and warnings.

## MODEL IDENTIFICATION

When contacting an Onan dealer or distributor, supply the complete model number and serial number from the set nameplate. This information identifies the set when ordering replacement parts.

Always use genuine Onan replacement parts, obtained from an authorized Onan dealer or distributor. Other replacement parts might not perform to Onan specifications.

**⚠ WARNING** *Incorrect service or replacement of parts can result in severe personal injury and/or equipment damage. Service personnel must be qualified to perform electrical and/or mechanical service.*



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