OWNERS MANUAL

FOR DRY FUEL MODELS

SP-250
SP-410
SP-620
SP-960
SP-1500
SP-2000
SP-2000P
SP-2500P
SP-2650
SP-3000P
SP-3000
SP-3500
SP-4000
SP-5000
SP-6500
SP-8000
SP-1M

GILLETTE GENERATORS

PRODUCT SAFETY INFORMATION
SECTION 1

SAFETY RESPONSIBILITY

Be sure that you are completely familiar with the safe operation of this equipment. Improper use can cause serious or fatal injury.

GILLETTE Generator installation and repair procedures require specialized skills. Contact GILLETTE service department for repairs or any questions you may have about the safe installation and operation of this system.

The precaution statements are general guidelines for the safe use and operation of this generator. It is not practical to list all unsafe conditions. Therefore, if you use a procedure that is not recommended or not mentioned in this manual, you must determine if it is safe for the operator and all personnel. If there is any question of safety, please contact GILLETTE before attempting installations or repairs. This generator contains high voltages. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the start-up procedure or repair of this generator.

- Only qualified personnel with knowledge of the safe installation, operation, and maintenance of this generator should attempt installation, start-up, operating, or repair procedures.

- Keep all non-qualified personnel at a safe distance from this generator.

- Always stop generator and allow generator cooldown before refueling, restoring oil level, or adding to radiator coolant.

- Always stop generator before making or removing any connections.

RESPONSIBILITY

When your generator is delivered, it becomes the responsibility of the owner and installer to prevent unsafe installation conditions and operation of the generator. Some responsibilities include (but are not limited to) the following:

- It is the responsibility of the owner/operator of this generator to ensure that this generator is correctly installed.

- It is the responsibility of the owner of this generator to ensure that any person operating this generator has access to all GILLETTE manuals and information required for the safe use and operation of this generator.

- It is the responsibility of the owner of this generator to ensure that any person operating this generator has been properly trained.

- It is the responsibility of the owner of this generator to ensure that it is properly maintained at regular service periods.

- It is the responsibility of the owner/operator of this generator to ensure that this installed generator fully complies with all federal, state, and local codes.

READ THIS MANUAL THOROUGHLY AND KEEP A COPY AT GENERATOR SITE

If you do not understand any procedure, precaution or any safety warning statement, or any part of this manual, contact GILLETTE or your nearest GILLETTE representative.

IMPORTANT SAFETY INSTRUCTIONS
Precaution Statements Used In This Manual

There are four classifications of precautionary statements used in this manual. The most critical is a "DANGER" statement, then the "WARNING" statement, followed by "CAUTION", and the least critical is the "NOTICE" statement. The usage of each statement is as follows:

DANGER: Indicates a potentially hazardous situation which, if not avoided, could result in personal injury or death.

WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in serious personal injury.

CAUTION: Indicates a hazard that if not avoided, might result in minor or moderate personal injury or damage to gen-set.

NOTICE: Indicates technical or general information.

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

This manual contains important instructions for the generator that must be followed during installation, operation, and maintenance of the generator, battery (batteries), and fuel components. For ease of reading, the following precautionary statements are summarized in the next 3 pages and are specifically mentioned again in some operation/installation paragraphs, within this manual.

DANGER: Be sure that you are completely familiar with the safe operation of this equipment. Improper

use by non-qualified operator can cause serious or fatal injury.

DANGER: Disconnect all electrical wires and load devices from generator power outlets before servicing the generator. Electrical shock can cause serious or fatal injury.

DANGER: Be sure all wiring complies with the National Electrical Code (NEC), Underwriters Laboratories (UL), and all regional and local codes. Improper wiring may cause a hazardous condition and exposure to electrical hazards can cause serious injury or death.

DANGER: Have electrical circuits and wiring installed and checked by licensed electrician or qualified technician. Electrical shock can cause serious or fatal injury.

DANGER: Inspect all wiring frequently and replace any damaged, broken, frayed wiring or wires with damaged insulation immediately. Electrical shock can cause serious or fatal injury.

DANGER: Never connect this generator to the electrical system of any building unless a licensed electrician has installed an approved automatic transfer switch. The National Electrical Code (NEC) requires that connection of a generator to any electrical circuit normally powered by means of an electric utility must be connected by means of an approved automatic transfer switch equipment to isolate the electrical circuit from the utility distribution system when the generator is operating. Failure to isolate the electrical circuits by using an automatic transfer switch may result in injury or death to utility power workers due to back-feed of electrical energy onto the utility lines.

DANGER: Be sure the system is properly grounded before applying power. Do not apply AC power before you ensure that grounds are connected. Electrical shock can cause serious or fatal injury. NEC requires that the frame, the generator housing, and exposed conductive surfaces (metal parts) be connected to an approved earth ground. Local codes may also require proper grounding of generator systems.

DANGER: High voltage may be present whenever engine is running. Electrical shock can cause serious or fatal injury. Never operate electrical equipment while safety screens and guards are removed, or while standing in water, on wet ground or with wet hands, feet or shoes, or while barefoot.

DANGER: Make sure protective covers over all rotating parts such as drive shaft, pulley, belt, etc. are in place. Rotating parts can cause extremely dangerous situations because they can catch loose clothing or extremities and cause serious of fatal injury.

DANGER: Do not put hands, feet, tools, clothing, or other objects near rotating parts such as cooling fan, drive shaft, pulley, belt, etc. Rotating parts can snag loose clothing or extremities and cause serious or fatal injury.

DANGER: Disconnect the battery's ground terminal before working in the vicinity of the battery or battery wires. Remove all rings, watches, necklaces, or any jewelry before working on batteries. Contact with the battery can result in electrical shock when a tool or other metal object accidently touches the positive battery terminal or wire. The risk of electric shock is reduced when the battery ground lead is removed during installation and maintenance.

DANGER: The positive battery cable is installed and controlled in such a manner that if accidently cut or sheared, the cable can not short out to the housing doors. DO NOT remove any ground jumper installed on generator set.

DANGER: The battery electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. The following precautions are to be followed when working on batteries: Wear protective clothing, safety glasses and gloves; for eye contamination, flush eyes with water and seek medical attention immediately; use an acid neutralizer for spilled electrolyte. Remove all jewelry (watches, rings, necklaces, etc.) and use insulated tools when working with batteries.

DANGER: Engine coolant is under pressure and is near boiling point of water when engine is hot. DO NOT open the coolant system until the engine has completely cooled. Hot coolant can cause severe burns and other injuries. When engine is cool (approximately one hour cooling time), coolant level can be checked by slowly removing the turn-lock radiator cap.

DANGER: Only a professional experienced technician should install a fuel supply system. All fuels are flammable and can cause fire, explosions, injury, or death. Read and comply with special fuel installations methods within this manual. Comply with all NFPA regulations and local codes for shut-off valves, regulators, fuel line type, connectors, etc.

DANGER: Exhaust fumes/gases are extremely dangerous and can cause severe illness or death. Never breath engine exhaust fumes. Only run the engine outdoors where ventilation is plentiful, or inside a non-inhabited room/building having specific exhaust rules. Exhaust gases contain carbon monoxide, a colorless, odorless, and extremely dangerous gas that can cause unconsciousness or

death. Symptoms of carbon monoxide poising include: dizziness, nausea, headaches, sleepiness, vomiting, or incoherence. If anyone experiences these symptoms, get out into fresh air immediately. Stop the engine and do not restart the engine until it has been inspected and if necessary repaired or generator may need an increase in cooling air input and hot air output.

DANGER: Never operate the generator set indoors in a poorly or non-ventilated area. Exhaust fumes are extremely dangerous to all personnel and livestock that are in a badly ventilated area.

DANGER: Before cleaning, inspecting, repairing, or performing any maintenance to the generator set, always be sure the engine has stopped and that all rotating parts have also stopped. After stopping, certain components are still extremely hot, so be careful not to get burned. Before servicing the generator set, **be sure to disconnect the battery terminals to prevent accidental engine rotation or starting.**

DANGER: Some parts of this generator rotate during operation. Even though safety screens are installed to protect operator and service personnel from accidental contact, it is wise to know and understand, that rotating parts are dangerous. Never touch any part of generator until it is completely stopped moving, then disconnect positive cable on battery.

DANGER: Never operate the engine when the air cleaner is removed. This removal may cause a backfire and serious burns can result.

DANGER: Do not smoke within 20 feet of generator during standstill or operation, or within same distance of fuel source. Fuels, and fuel fumes, can cause fire, explosions, injury, or death.

DANGER: Check all fuel supply piping and their connection monthly for leaks. All fuels are flammable and can cause fire, explosions, injury, or death.

DANGER: Incorrect installation of this generator set and its fuel system could result in property damage, injury, or death. Connection of the generator to its fuel source must be done by a qualified professional technician or contractor.

DANGER: Never allow the un-informed, children, or animals to be in the area where the generator is running. The generator, or the equipment being powered by the generator, may cause illness, injury, or death.

DANGER: Do not dispose of battery or batteries in a fire, or mutilate the battery. The battery is capable of exploding. If the battery explodes, electrolyte solution will be released in all directions. Battery electrsolution is caustic and can cause sever burns and blindness. If electrolyte contacts skin or eyes, immediately flush the area with water and seek medical attention quickly.

WARNING: Never permit anyone to operate the generator without proper instructions. Be sure to keep a copy of this manual with the generator so that all users can read these precautions and be properly informed of its safe operation.

WARNING: Never operate this generator in a manner other than as described in this manual. Operation in any manner not described in this manual should be considered unsafe and should not be attempted. Never start the engine unless you first have verified that the installation and operation of the generator is as described in this manual.

WARNING: When operating this generator keep alert. Never operate machinery when physically or mentally fatigued, or while under the influence of alcohol, drugs, or medication.

WARNING: Always wear safety glasses and hearing protection when working near the running generator.

WARNING: Never operate the generator unless all guards, covers, shields, and other safety items are properly installed.

WARNING: Positive and negative battery cables should be insulated from "touch" (use battery connection boots) on all battery connections.

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

WARNING: Keep a fire extinguisher near the generator while generator is in use, and know how to use the extinguisher. Use an extinguisher rated "ABC" by the National Fire Protection Association.

WARNING: Installation and repair procedures requires specialized skills with electrical generating equipment. Any person that installs or performs repairs must have these specialized skills to ensure that the generator set is safe to operate. Contact GILLETTE for installation or repairs, when questions arise.

WARNING: Never connect or disconnect loads during operation. Always connect load circuits before starting the engine.

WARNING: Circuit overload protection (automatic circuit breakers) must be provided in accordance

with the National Electrical Code and local regulations.

WARNING: Parts of this generator are extremely hot during and after operation. To prevent severe burns, do not touch any part of the generator until you have first determined it has cooled down to a safe point to touch.

WARNING: Be sure that you understand how to stop the engine quickly in case of an emergency situation. Become familiar with the engine controller and safety systems provided with this generator set.

WARNING: Engine coolant is under pressure and is near the boiling point of water when engine is hot. Do not open the coolant system (turn cap on engine radiator) until the engine has completely cooled. Hot coolant can cause severe burns and other injuries. When engine is cool, radiator coolant level can be checked.

WARNING: Keep outdoor style generator at least five feet away from buildings and other structures.

WARNING: An open bottom stationary engine generator set must be installed over noncombustible materials and shall be located such that it prevents combustible materials (leaves, paper, rags, etc.) from accumulating under the generator set.

WARNING: Keep generator away from flammable or hazardous material (trash, rags, lubricants, explosives, paints, etc.) and grass or leaf build-up.

WARNING: Hot exhaust gasses must never be directed toward anything that may catch fire or explode.

WARNING: Unauthorized modification of a generator set may make the unit unsafe for operation. Be sure that the unit is safe before starting the engine. If you are unsure, contact GILLETTE before starting the engine.

CAUTION: Do not apply high voltage to wet windings. Do not start the generator when the generator has been saturated with moisture.

CAUTION: Never install a generator with prevailing high winds, towards the engine radiator (heated air discharge) or the muffler rain cap (wind keeping rain cap open after shut down). Inspect rain cap often to ensure rain cap closure upon shutdown.

CAUTION: Avoid installing the generator set beside heat generating equipment, water or steam discharge systems, or in the vicinity of corrosive substances or vapors, metal particles, and dust. Heat can cause engine problems to develop and unwanted substances can cause rust or generator failure over time. Steam or water penetration will destroy generator windings.

CAUTION: Do not operate generator in tropical ambient conditions without a special protected insulating varnish on generator windings and insulation system. Copper windings absorb moisture and soon cause a generator malfunction.

CAUTION: Never operate the engine without a muffler, or with a rusted muffler. Dangerous exhaust components can present a fire hazard, cause excessive exhaust gases and cause damage to engine. Inspect muffler periodically and replace if necessary.

CAUTION: Use only original equipment or authorized replacement parts.

CAUTION: Engine speed is factory set to produce the correct voltage and output frequency. Do not change the engine speed, as damage will occur.

NOTICE: When moving the generator, use reasonable caution. Be careful where you place fingers and toes to prevent injury "Pinch Points". Never try to lift a heavy generator without a hoist or lift means because bodily injury may result.

NOTICE: This generator must not be used on or near any forest covered, brush covered, or grass covered land unless the engine's exhaust system is equipped with a USDA spark arrestor screen. The spark arrestor screen must be maintained in effective working order by the operator.

SAVE THESE INSTRUCTIONS

THIS MANUAL CONTAINS IMPORTANT INSTRUCTIONS THAT MUST BE FOLLOWED DURING INSTALLATION, OPERATION, AND MAINTENANCE OF THIS GENERATOR SET AND ALL ASSOCIATED EQUIPMENT.

Thoroughly read this operators manual before installing, operating, or servicing your generator set. Safe operation and best performance can be achieved only when this generator is operated and maintained properly.

INTRODUCTION

Thank you for your purchase of this standby generator set by GILLETTE GENERATORS, LLC. This generator set is intended for use as an alternative source of electric power to operate normally required electric loads, during a utility power failure.

This gen-set may have an all weather protected metal enclosure, **MADE EXCLUSIVELY FOR OUTDOOR INSTALLATION**, and will operate on its specific fuel.

GILLETTE GENERATORS has made every effort to present a modern, safe generator set that will give you a safe, clean supply of an alternative electrical source. However, because each installation is different, it is impossible for this manual and GILLETTE to know and advise against all possible hazards. The listings of dangers, warnings, cautions, and notices in this manual and on tags and decals affixed to the generator set, are therefore, **NOT ALL INCLUSIVE**. If a certain procedure, work method, test method, or operating procedure is used, and is not recommended by GILLETTE, the person or company responsible for the generator modification, must assume all responsibility for safety and correct operation for the operator, service technician, and all others within generator area.

READ YOUR GENERATOR SET MANUAL, PLUS SEPARATE ENGINE OPERATORS MANUAL AND AUTOMATIC TRANSFER SWITCH MANUAL CAREFULLY. KNOW YOUR EQUIPMENT BEFORE YOU USE IT. CONSIDER ANY POSSIBLE, POTENTIAL HAZARDS, BEFORE OPERATING YOUR GENERATOR SET.

CAUTION: Only current licensed electrical and plumbing contractors should install your standby generator. All phase of installation must comply with all applicable local and national codes, industry standards, and regulations.

THE GILLETTE WARRANTY IS AUTOMATICALLY NULL AND VOID WITHOUT THE USE OF LICENSED ELECTRICIANS AND PLUMBERS, AND SO NOTED ON THE REGISTRATION FORM THAT IS TO BE RETURNED TO GILLETTE GENERATORS, INC.

IMPORTANT SAFETY RULES

The safety alert symbol  is used as a signal for possible danger, caution warning, or general hazard.

DANGER: Indicating a hazard that, if not avoided, will result in death or serious injury.

WARNING: Indicating a hazard that, if not avoided, could result in a serious injury.

CAUTION: Indicating a hazard that, if not avoided, might result in minor or moderate injury.

NOTICE: Indicating a hazard that, if not avoided, could result in general damage.

Read and understand the above listed safety alert symbols, plus the following symbols that are used through out this manual.

A LIST OF HAZARD SYMBOLS

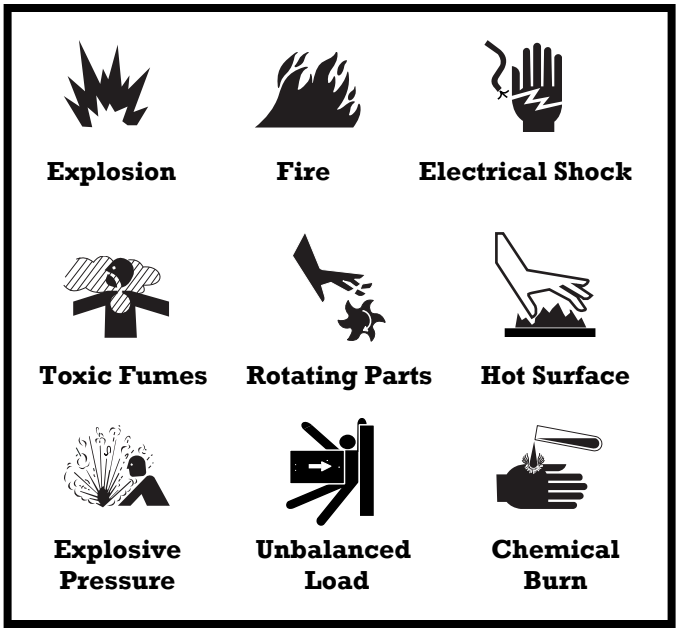


Figure 1

WARNING

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

WARNING

California Proposition 65 warning battery posts, terminals, and related equipment are known to the State of California to cause cancer, birth defects, and other reproductive harm.

AND THEIR MEANINGS

NOTICE

- For all safety reasons to the equipment, GILLETTE recommends installation, start-up and service be performed by experienced personnel.

- Sufficient, un-obstructed flow of cooling air is critical for correct generator operation.

- The generator must be installed outdoors, away from an over-hang roof where ice and snow could avalanche onto generator and away from sprinklers that could throw water up into cooling vents of generator.

• Generator should not be exposed to excessive and constant moisture, dust, dirt, or corrosive environments.

• If connected loads cause over heating or excessive vibration, an overload condition exists. Remove loads until condition stabilizes.

• Do not sit, step, or load heavy items on generator roof. Added stress can cause breakage.

• Do not start generator with air cleaner, air cleaner cover, or oil dipstick removed, nor with oil drain hose in open drain position.

• Keep a fire extinguisher rated "ABC" close by your generator and be familiar on how to use it. Consult your local fire department, for additional fire prevention ideas.

• Be sure that a positive manual, on/off fuel valve be installed in fuel line feeding generator.

• Do not tamper with engine controls, generator is factory adjusted to supply rated voltage and speed.

• Never operate generator when ambient temperature is over 105° F (40°C), as electrical insulation system may fail.

• Never install generator closer than 10 feet to residence where windows can be opened, vents in an overhung roof, or anywhere engine exhaust could possibly find its way into inhabited dwellings.

• Engine coolant is under pressure and is near boiling point when operating. Do not open coolant system until engine has completely cooled. Doing so, will cause severe coolant burns and other injuries.

• An open bottom stationary gen-set must be installed over a noncombustible material and shall be located that prevention of such materials from accumulating under gen-set.

• Only experienced technician should install a fuel supply system. Always comply with all NFPA regulations and local codes.

WARNING

STARTING BATTERY PRECAUTIONS

Starting batteries are not furnished with your generator set, but they are available through your qualified installing contractor. The home or commercial standby generator requires a 12 VDC or 24 VDC fully charged battery.

• Released battery electrolyte can burn your skin and eyes and is toxic.

• When electrolyte touches skin, wash it off immediately with water and seek medical attention. When electrolyte contacts eyes, flush thoroughly with water and seek medical attention.

• Spilled electrolyte must be washed away with an acid neutral agent. Use a solution of one pound bicarbonate of soda to one gallon of water, and wash down acid effected areas until evidence of acid foaming reaction has ended.

• A battery provides risk of electric shock. Remove watches, rings, or other metal items when working with batteries. Use tools with insulated handles.

• When disconnecting battery cables, always disconnect the battery charger first, the positive battery cable second, and negative battery cable last. When reconnecting cables, always reconnect the positive battery cable first, then negative cable, and reconnect battery charger last, to reduce possible arching.

• Discharge body static electricity by touching a grounded metal surface on generator before touching battery.

• Do not dispose of batteries in a fire and do not open or mutilate a battery, as the battery is capable of exploding.

• Lead acid batteries present a risk of fire or explosion because they generate hydrogen gas, within. Do not smoke, nor have flame or spark in a battery area.

ELECTRICAL HAZARDS

DANGER

A generator produces dangerous electric voltages and can cause a fatal electric shock and will cause sudden illness, dizziness, and incoherent actions.

• Despite the safe design of this GILLETTE generator, operating it carelessly, neglecting its normal maintenance, or being ill informed of proper operations can cause possible serious injury or death.

• Avoid contact with bare wires, connection points, etc., while generator is running.

• Do not touch any kind of electrical circuit while standing in water, while barefooted, or while hands or feet are wet or moist.

• Never wear any type of jewelry while working on a

generator. Jewelry will conduct electricity, causing electric shock.

• If generator must be serviced while it is running, stand on a dry, insulated surface from ground to reduce shock hazard. Never service a generator in the rain or snow.

• Do not allow unqualified or ill-experienced persons to operate or service generator.

• Remain alert at all times. Never work on a generator when you are physically or mentally fatigued.

• This generator is equipped with a ground terminal. Always complete the grounding path from generator to an external grounding source to prevent possible electric shock.

• In case of electric shock, shut the generator down at once. If this cannot be done, free the victim from source of live electric power. **AVOID ANY DIRECT CONTACT WITH VICTIM OR THE LIVE ELECTRIC POWER**. Use a dry piece of wood, a dry rope, or any other such non-conductive item, to free the victim from source of power. If victim is semi or totally unconscious, apply CPR (cardio-pulmonary resuscitation) and call for medical help immediately.

• Inspect all wiring frequently and replace any damaged, broken, or frayed wiring with damaged insulation. Electric shock can cause serious or fatal injuries.

CARBON MONOXIDE POISON

DANGER

A running engine produces a poisonous gas from its muffler exhaust pipe. This is an odorless, invisible, and colorless poison that cannot easily be detected. Breathing carbon monoxide will cause fatigue, headache, dizziness, vomiting, fainting, and in prolong conditions, even death.

• Operate generator only outdoors, where adequate ventilation is available. Avoid generator installations under decks, inside garages or carports, in basement, along side home exterior less than 10 feet of home vent, roof overhang vent, a window that can be opened, or other such home invasion points. Use same precautions when installing generator at property line, close to a neighbor's home, or any buildings that house animals.

POTENTIAL BURN OR FIRE

WARNING

CONDITIONS

Contact with exhaust muffler and exhaust pipe can result in serious burns.

Exhaust heat may ignite combustibles such as leaves or other such debris that is allowed to accumulate around base or interior of generator where exhaust exits.

• Do not touch hot exhaust or engine parts, and avoid hot exhaust gases.

• Keep at least a three foot clearance on all sides of generator, for normal service work.

• Do not install generator any closer than ten feet from any combustibles or buildings with walls having less than one hour, fire rating.

• Code of Federal Regulation (CFR), Title 36, states that generators must have a spark arrestor attached to muffler outlet pipe, to eliminate sparks from engine operation. USDA Forest Service standard #5100-C requires spark arrestor protection when generator is operated within federal parks and forests.

• Generator installation must always comply with local codes, standards, laws, and regulations. Check with your local fire department to learn of these precautions. Keep a fire extinguisher (rated "ABC" by NFPA as appropriate use on generator fires) nearby, at all times. Keep the extinguisher properly charged and become familiar with its use.

• Install fuel system in accordance to NFPA 37 and other applicable fuel codes.

• Do not operate gen-set if fuel odor is present or if other explosive conditions exist.

• No fuel or oil leakage is allowed.

DANGER

FIRE OR EXPLOSION CONDITIONS

All fuels are extremely explosive. Make sure the fuel supply system is installed in compliance with local and state fuel codes and regulations. Fuel leaks when ignited, can cause fire and explosion, resulting in harm or possible death.

• Before initial generator start-up, all fuel system lines must be purged and leak tested according to applicable codes by experienced service personnel. No fuel leaks are permitted.

• Do not smoke or allow open flame near generator while servicing fuel system or battery. Lead acid bat-

can be ignited. Leaks in fuel system can be ignited. Both are conditions that can cause fire and/or explosion, leading to possible death.

- Do not operate generator if smell of fuel is detected.

- Wipe up any oil spills immediately. Remove any debris that has accumulated inside or around generator base and housing.

- Always maintain a scheduled inspection of entire fuel system and starting battery, looking for leaks or other negative conditions.

CAUTION

Following is a list of potential events that might result in minor or moderate injury or damage to the generator.

- Never operate generator with oil dipstick partially seated or completely missing.

- Never operate generator without air cleaner and cover in place.

- Always check oil drain hose or radiator drain hose for leaks.

- Generator operating speeds over or under 1800 RPM increase risk of operator injury and engine damage.

- Never insert any objects through generator cooling slots.

- The control panel and wiring access area doors must be installed at time of operation.

- If connected electrical items overheat, disconnect them immediately.

- Immediately shut down generator if it looses electrical output, shows sparks, smokes, emits flames, vibrates, or shows any other abnormal operation.

- Do not modify generator design.

- Do not modify carburetion system, as it is factory set for C.A.R.B./EPA emissions certification.

This concludes the limited hazard listing. However, GILLETTE cannot possibly anticipate every possible hazard. Therefore, the warnings in this manual, plus the warning tags and decals attached to the generator are not all inclusive. If the generator operator has a different operating method, other than described in this manual, then operator becomes responsible to make sure that different procedure, work method, or operating method is totally safe, against harm and hazards to operators, buildings or environments.

UNPACKING AND INSPECTION

After receiving the generator, note that it is mounted on a heavy wood skid base and protected by clear plastic wrap. While the transportation carrier is still present, note the condition of skid and generator set. If damage occurs, make a note of damage on carrier's freight bill and have truck driver sign his name on the freight bill, under "Consignor's Memo of Loss or Damage".

If shipping container is used for shipping protection and it shows damage of any kind, and time does not permit container removal for actual generator inspection, while transportation carrier is still available, be sure to:

- Make note of container damage "with possible interior product damage" on carrier's freight bill.

- Have truck driver sign his name on freight bill under "Consignor's Memo of Loss or Damage".

This action will help prove your case against shipper. Always save shipping materials in the event that genset must be sent back to factory due to need of extensive repairs.

If damage is noticed after carrier leaves, contact the carrier for "concealed damage" form. **NOTE:** Missing or damaged parts on generator, is not a warranty claim.

GENERATOR CONTENTS

The GILLETTE generator set is supplied with the following components:

- Generator system will be supplied in (3) different forms: An "Open" (no enclosure) gen-set, a gen-set with standard weather/sound enclosure, or a gen-set with Super-Silent weather/sound enclosure having special silencing foam and "critical" grade muffler.

- Residential muffler system is standard equipment for quiet operation. An upgrade to "critical" or "hospital" grade is available and may be installed on gen-set, as an option. **NOTE**: Any style muffler for any "open" (no weather enclosure) may be chosen and shipped loose, for installation at job-site, by others.

- Heavy duty steel skid base with (4) lifting holes having plastic knock-out cover plugs.

- Two universal locking keys that fit all door locks.

• Starting battery is not included. See page 17 for battery supply information.

• All gen-sets have the required vibration isolators between generator and steel mounting skid base. No further vibration isolation is required.

• Dry fuel input pipe is supplied for fuel connection. Installer must supply fuel line and a **Stainless Steel Flexible Exhaust Hose** at the point of muffler connection for pipe vibration damping.

• One owner/operator panel.

NOTE: All accessory items will be pre-mounted and wired to generator. If separate automatic transfer switch (ATS) is ordered, it is shipped loose in cardboard shipping box, separate from standby gen-set.

PRE-INSTALLATION PLANNING

The beginning installation requires some thought and planning. The following illustrations are meant to familiarize reader with typical installation circumstances and to plan the best installation possible.

First, Federal, State, and local codes may be a factor. The local fire department can be of help on learning these codes. As with all generators, your generator must be installed in accordance with current NFPA-37 and NFPA-70 standards. Contact your local electrical inspector or city hall to insure you are aware of all codes and regulations. Contact your natural gas supplier to verify that increased BTU gas demand can be handled with existing NG gas meter. The same is true for LPV fueled generators.

The most common dry fuel mistakes are:

A) Not having a dedicated fuel line from fuel source to generator, on either LP or Natural Gas fuel.

B) Not having a dedicated LP primary fuel regulator mounted on the LPG vapor withdrawal fuel tank.

C) Wrong fuel pressures.

D) Not understanding that fuel pipe diameter must increase in direct proportion to fuel line length.

E) Wrong primary regulator. This is a common problem, using an existing regulator on a LPV Tank is typically too small for the supply needed to run a generator.

GENERATOR LOCATION GUIDELINES

Locate the generator site. It should be as close as possible to the natural gas meter, and as close as possible to the electrical distribution panel.

A) Install self housed generator only in outside area.

B) Place generator on level cement slab that has provisions for water drainage around perimeter.

C) Install generator where sump pump output, roof run-off from water, snow, or ice, rain down spots, steam discharge, water sprinklers, or any other such actions will not flood the generators.

WARNING

A running engine gives off toxic exhaust fumes, which cause headache, fatigue, dizziness, nausea, vomiting, seizures, fainting, or death.

OPERATE HOUSED GENERATOR ONLY OUTDOORS
OR
OPEN GEN-SETS IN SPECIAL VENTED, UNINHABITED BUILDING

DRY FUEL GAS REQUIREMENTS

Refer to the generator model specific spec-sheet for the fuel consumption, fuel pressure and inlet gas pipe sizes.

Gillette recommends working with your local utility to correctly size the gas meter base and regulators to ensure proper gas pressure and volume is being delivered to the generator for an un-interrupted operation.

All Generator spec sheets can be found online at www.gillettegenerators.com

RECEIVING AND INSTALLATION TIPS

When you receive your weather/sound housed generator, there are several items that require immediate attention.

A) If gen-set is shipped open with protective wrap, remove wrap and carefully inspect gen-set for any shipping damage or missing optional equipment, before shipper leaves your premise. Note damage or missing parts on shipper's Bill of Lading.

B) If gen-set is shipped in wooden crate, and crate appears damaged, note this crate damage on shippers Bill of Lading, indicating product damage may be possible due to crate damage.

C) If gen-set is to stored for a long period before use, the storage area should conform to published storage temperature and humidity specifications.

When lift or hoist equipment is used, to lift the gen-set, be careful not to contact overhead power lines or any other obstacles.

Hoist equipment should have appropriate tires for rough terrain to avoid becoming stuck or overturning. If shipping pallet or wood structure is intact, use a forklift to move gen-set. If shipping material is removed, use (2) steel pipes thru the lift point, to lift gen-set. This mounting location of gen-set is important. It must be installed in an area that is protected from harmful gases, liquids, dust, metallic particles, shock, or vibrations. It should be installed in an outdoor location, so that exhaust fumes are vented to the atmosphere. The factory installed weather and sound protected enclosure is designed to keep out undesirable weather elements.

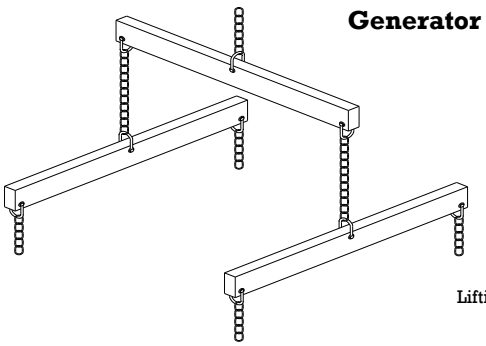
WARNING

Unbalanced Weight
Improper lifting can cause severe injury or death and equipment damage

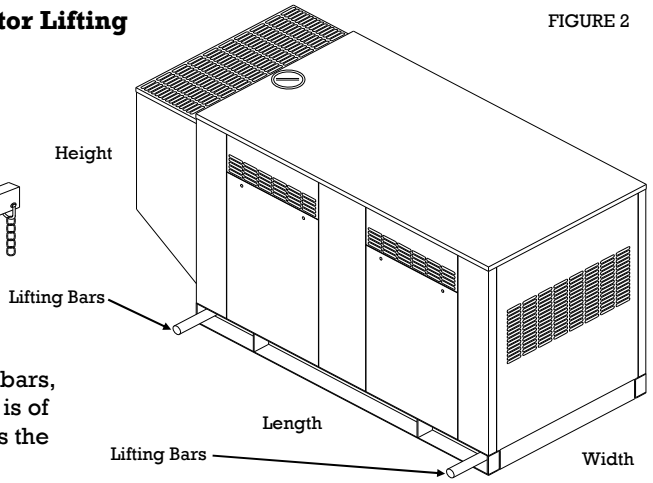
Do not use lifting eyes.
Lift the generator set using lifting bars inserted through the lifting holes on the skid.

Generator Lifting

FIGURE 2



To lift the generator, always use spreader bars, chains, eyehooks and other hardware that is of sufficient strength to lift at least three times the weight of the generators



SUGGESTIONS FOR GENERATOR LOCATIONS

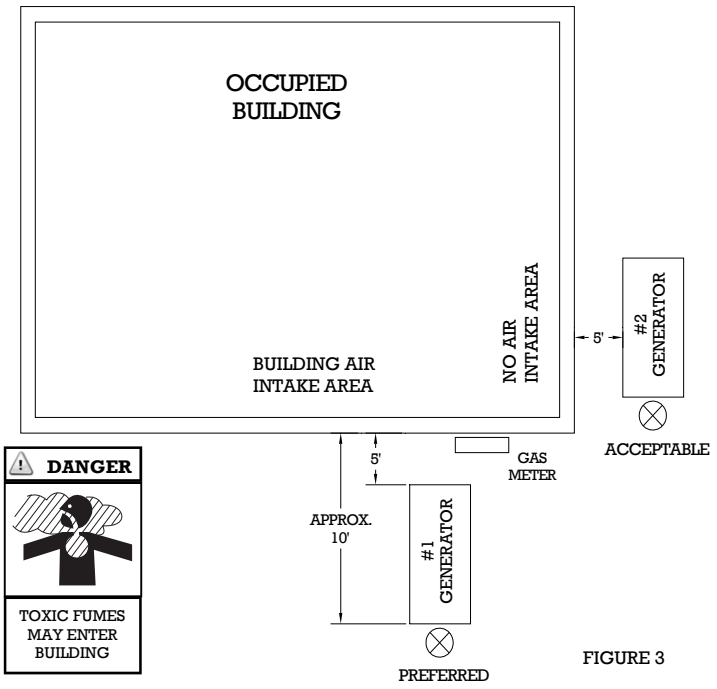


FIGURE 3

1) Always install your generator within 20 feet from natural gas meter or LPV vapor withdrawal tank. Further distances may cause "starving" of fuel from generator engine.

2) Exhaust end must always be turned away or parallel with building ⊗ and minimum 5 feet away.

3) Exhaust end is not to be directed towards play areas, patios, under ⊗ canopies or overhangs, or where people or animals congregate.

4) Do not install generator under deck of house.

5) Furnace and other habited building air intakes should be minimum 15 feet from gen-set exhaust end.

6) Windows and doors on adjacent walls, ⊗ to be closed at all times, during generator operation.

7) Nearest roof overhang vent or window locations should be minimum 15 feet from exhaust end.

8) If electrical distribution center panel ⊗ is far away from gas meter or LPV tank, locate generator close to gas meter or LPV tank. Installation costs are lower, if electric wiring is oversized for long distances, to utility point rather than oversized fuel lines to gas meter.

TYPICAL EMERGENCY GENERATOR INSTALLATION PRACTICES FOR "OPEN" (NON-SELF ENCLOSED) GENERATOR

A standby emergency power systems will give years of dependable service when installed properly. Incorrect installations can cause continuing service problems and may result in harm to humans. It is the responsibility of the owner or operator to know and understand the correct installation methods. It is of particular importance to know safe methods especially, when installing an open generator inside a building. Following is a partial list of recommendations:

1) The generator building must not be inhabited by humans or animals.

2) The building floor must be cement and capable of supporting generator weight, the running vibration, and any generator associated equipment. If in doubt, have the floor load carrying capacity tested by specialist. A heavy equipment lifting contractor should be consulted for this task.

3) The generator engine requires a certain amount of cooling air, which changes with different generator KW sizes. The CFM cooling air requirement, if insufficient, will cause over heating of generator set.

4) Generator operating noise is high, so quieting devices may be desirable: double walled room, sound deadening materials on wall, hospital grade muffler, etc.

5) Building code and safety requirements for open gen-set operation within a building are important to know and compliance to the codes, are essential: National Electric Code, Articles: 230, 250, 245, 517, and 700.

National Fire Protection Association (NFPA)

- #37—Stationary Combustion Engines and Gas Turbines.
- #99—Essential Electrical Systems for Health Care Facilities.
- #101-Life Safety Code Number Systems.
- #110-1985 Emergency and Standby Power Systems.

Local applicable codes (consult local building inspector or fire department).

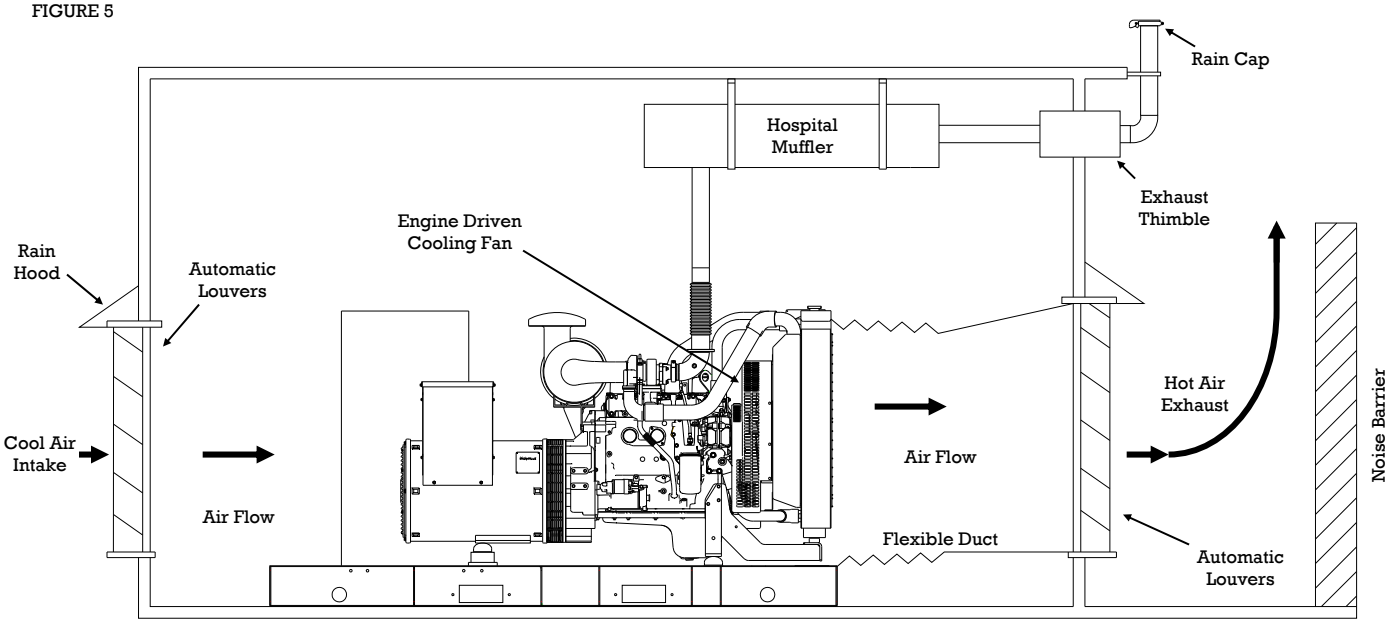
6) Generator room size: Room should be dedicated for only generator use, not for miscellaneous storage, work area, or any type of habitation.

7) Specialized controls, transfer switches, and other generator required equipment may be installed in generator room, depending on local codes.

A drawing showing a typical indoor generator installation is shown at bottom of page.

MUFFLERS: There are (4) types of mufflers: Industrial, Residential, Critical, and Hospital grade. GILLETTE does not furnish the muffler as standard equipment due to varying demand for the different grades and type of required mounting of each application.

FIGURE 5



COOLING THE GENERATOR AND ENGINE THAT IS MOUNTED IN A GENERATOR ROOM

Whenever an open (no housing) generator set is installed inside a room, in a building the radiator should be ducted outside the room. See Figure 5, page 14.

The most common method of generator set cooling, is that of a generator mounted radiator. The major components are:

A) Engine driven blower fan.
B) Circulating coolant pump
C) Cooling radiator.
D) Thermostat.

The blower fan pulls cooling air across the radiator coils. The coolant pump circulates coolant through the engine until it reaches operating temperature. The engine thermostat open and allows coolant to circulate into the radiator core. Thermostat can also close, restricting the coolant flow, as necessary to prevent over cooling. The engine fan blows air, from the engine side, through the fins of the radiator.

When a generator set is installed inside a building room, the radiator air discharge should be ducted outside the building, into the atmosphere. A typical installation is shown on page 14, Figure 5.

Install a set of louvers, 1½ times the size of engine radiator perimeter. Galvanized metal duct must fit tightly around louver perimeter and taper down to be the same size as radiator perimeter, and end at least 24"-30" from radiator. The connection from engine radiator to duct work (12" space) should be heavy canvas, silicone material, or other such flexible material, to prevent noise and vibration transmission. Sheet metal duct work should be self supporting, firmly attached to the hot air discharge louvers.

The cool air inlet opening, should be a second set of louvers that is (2) times the size of radiator perimeter. Over-sizing both air inlet and air outlet, allows for fine screens across the entire louver area to keep birds or flying insects, from entering generator room.

The ideal assembly is to install motorized louvers, so that when generator is started, the louver motors are energized by generator power, and become fully open. Like wise, when generator shuts down, louvers automatically close.

Rain hoods should be installed over top of each louver, mounted on outside wall, so that rain won't enter into open louvers.