# TABLE OF CONTENTS

WELCOME ................................................................. 2
SAFETY PRECAUTIONS .................................................. 2
ABOUT YOUR GENERATOR ................................................ 3
  1.1 UNPACKING ........................................................... 3
    1.1.1 ACCESSORIES (IF EQUIPPED) .............................. 3
  1.2 ASSEMBLY (IF EQUIPPED) .......................................... 3
    1.2.1 ASSEMBLING THE WHEEL KIT AND HANDLES ............ 3
  1.3 KNOW YOUR GENERATOR ........................................... 4
    1.3.1 MAJOR COMPONENT ........................................... 4
    1.3.2 ENGINE ASSEMBLY ........................................... 4
    1.3.3 CONTROL PANEL ............................................. 4
    1.3.4 PRODUCT SPECIFICATIONS .................................... 5
  1.4 HOW TO USE THE GENERATOR ..................................... 5
    1.4.1 SYSTEM GROUND .............................................. 5
    1.4.2 GROUNDING THE GENERATOR ................................. 5
    1.4.3 CONNECTING ELECTRICAL LOADS ............................. 5
    1.4.4 CONNECTING DC CURRENT (FOR WELDER) ................... 6
  1.5 DON'T OVERLOAD THE GENERATOR ................................. 6

OPERATION ............................................................... 6
  2.1 BEFORE STARTING THE GENERATOR ............................... 6
    2.1.1 ADDING ENGINE OIL .......................................... 6
    2.1.2 ADDING GASOLINE ............................................ 6
    2.1.3 PROVIDING FUEL GAS (FOR FUEL GAS) ..................... 7
    2.1.4 ADDING WATER ............................................... 7
  2.2 TO START THE ENGINE .............................................. 7
    2.2.1 ELECTRIC STARTING .......................................... 7
  2.3 STOPPING THE ENGINE ............................................. 7
  2.4 LOW OIL PRESSURE SHUTDOWN SYSTEM ............................ 7
    2.4.1 RESTARTING .................................................. 8
  2.5 CHARGING THE BATTERY ............................................ 8

MAINTENANCE ............................................................ 8
  3.1 MAINTENANCE SCHEDULE .......................................... 8
  3.2 GENERAL RECOMMENDATIONS .................................... 8
    3.2.1 GENERATOR MAINTENANCE .................................... 9
    3.2.2 ENGINE MAINTENANCE ....................................... 9
    3.2.3 CHECKING OIL LEVEL ....................................... 9
    3.2.4 CHANGING THE OIL AND OIL FILTER ........................ 9
    3.2.5 REPLACING THE SPARK PLUG ................................. 9
  3.3 SERVICE AIR CLEANER ............................................ 9
  3.4 GENERAL ........................................................... 9
  3.5 LONG TERM STORAGE ............................................. 10
  3.6 OTHER STORAGE TIPS ............................................ 10

TROUBLESHOOTING ....................................................... 11
  4.1 TROUBLESHOOTING GUIDE ....................................... 11
WELCOME

Thank you for your purchase. We wish you years of success using your new generator.

This manual contains general warnings about the inherent risks of operating generators and specific warnings about the operation and maintenance of this particular generator. In addition, it outlines important maintenance and storage procedures.

Please read this manual carefully before operating, maintaining, repairing, and storing your new generator.

THE INFORMATION CONTAINED HEREIN WAS BASED ON MACHINES IN PRODUCTION AT THE TIME OF PUBLICATION. MANUFACTURER RESERVES THE RIGHT TO MODIFY THIS MANUAL AT ANY TIME.

SAFETY PRECAUTIONS

Throughout this manual, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE blocks are used to alert users to special instructions about a particular operation that may be hazardous if performed incorrectly. Observe them carefully.

Their definitions are as follows:

⚠️ DANGER Indicates a hazardous situation or action which, if Not avoided, will result in death or serious injury.

⚠️ WARNING Indicates a hazardous situation or action which, if Not avoided, could result in death or serious injury.

⚠️ CAUTION Indicates a hazardous situation or action which, if Not avoided, could result in minor or moderate injury.

**NOTE:**

Notes contain additional information important to a procedure and will be found within the regular text body of this manual.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

Four commonly used safety symbols accompany the DANGER, WARNING and CAUTION blocks. The type of information each indicates:

⚠️ This symbol points out an important safety information that, if not followed, could endanger personal safety and/or property.

⚠️ This symbol points out potential explosion hazard.

⚠️ This symbol points out potential fire hazard.

⚠️ This symbol points out potential electrical shock hazard.

GENERAL HAZARDS

- Never operate in an enclosed area or indoors.
- For safety reasons, the manufacturer recommends that the maintenance of this equipment is carried out by an Authorized Dealer. Inspect the generator regularly, and contact the nearest Authorized Dealer for parts needing repair or replacement.
- Operate generator only on level surfaces and where it will not be exposed to excessive moisture, dirt, dust or corrosive vapors.
- Keep hands, feet, etc., away from drive belts, fans, and other moving parts. Never remove any fan guard while the unit is operating.
- Certain parts of the generator get extremely hot during operation. Keep clear of the generator until it has cooled to avoid severe burns.
- Do NOT operate generator in the rain.
- Do not alter the construction of the generator or change controls which might create an unsafe operating condition.
- Never start or stop the unit with electrical loads connected to receptacles and with connected devices turned ON. Start the engine and let it stabilize before connecting electrical loads. Disconnect all electrical loads before shutting down the generator.
- Do not insert objects through unit's cooling slots.
- When working on this equipment, remain alert at all times. Never work on the equipment when physically or mentally fatigued.
- Never use the generator or any of its parts as a step. Stepping on the unit can stress and break parts, and may result in dangerous operating conditions from leaking exhaust gases, fuel leakage, oil leakage, etc.
- On electric start models, disconnect the POSITIVE (+) battery cable from the engine starter or the NEGATIVE (-) battery cable from the battery terminal, whichever is easier, before transporting the generator.

EXHAUST & LOCATION HAZARDS

- Never operate in an enclosed area or indoors! NEVER use in in partly enclosed areas such as garages, even if doors and windows are open! ONLY use outdoors and far from open windows, doors, vents, and in an area that will not accumulate deadly exhaust.
• The engine exhaust fumes contain carbon monoxide, which you cannot see or smell. This poisonous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death.

• Adequate, unobstructed flow of cooling and ventilating air is critical to correct generator operation. Do not allow the installation or permit even partial blockage of ventilation provisions, as this can seriously affect safety operation of the generator. The generator MUST be operated outdoors.

• This exhaust system must be properly maintained. Do nothing that might render the exhaust system unsafe or in noncompliance with any local codes and/or standards.

• Always use a battery operated carbon monoxide alarm indoors, installed according to the manufacturer instructions.

• If you start to feel sick, dizzy, or weak after the generator has been running, move to fresh air IMMEDIATELY. See a doctor, as you could have carbon monoxide poisoning.

ELECTRICAL HAZARDS

• The generator produces dangerously high voltage when in operation. Avoid contact with bare wires, terminals, etc., while the unit is running, even on equipment connected to the generator.

• Never handle any kind of electrical cord or device while standing in water, while barefoot or hands or feet are wet. DANGEROUS ELECTRICAL SHOCK MAY RESULT.

• If the generator has full power of single phase and three phase, the power outlet of single phase and three phase are not allowed to be used at the same time. You can only use single phase or three phase alternatively.

• The National Electric Code (NEC) requires the frame and external electrically conductive parts of the generator be properly connected to an approved earth ground. Consult with a local electrician for grounding requirements in the area.

• Use a ground fault circuit interrupter in any damp or highly conductive area (such as metal decking or steel work).

• Do not use worn, bare, frayed or damaged electrical cord sets with the generator.

• Before performing any maintenance on the generator, disconnect the engine starting battery to prevent accidental start up. Disconnect the cable from the battery post indicated by a NEGATIVE. NEG or (−) first. Reconnect that cable last.

• In case of accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. AVOID DIRECT CONTACT WITH THE VICTIM. Use a non-conducting implement, such as a rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.

FIRE HAZARDS

• Gasoline or fuel gas is highly flammable and its vapor is explosive. Do not permit open flames, sparks or heat nearby while handling the fuel.

• Never add fuel while unit is running or hot. Allow engine to cool completely before adding fuel.

• Never fill fuel tank indoors. Comply with all laws regulating storage and handling of fuel.

• Do not over fill the fuel tank. Always allow room for fuel expansion. If tank is over-filled, fuel can overflow onto a hot engine and cause FIRE or an EXPLOSION. Never store generator with fuel in tank where fuel vapors might reach an open flame, spark or pilot light (as on a furnace, water heater or clothes dryer). FIRE or EXPLOSION may result. Allow unit to cool entirely before storage.

• Wipe up any fuel or oil spills immediately. Ensure that no combustible materials left on or near the generator. Keep the area surrounding the generator clean and free from debris and keep a clearance of five (5) feet on all sides to allow for proper ventilation of the generator.

• Do not insert objects through unit’s cooling slots.

• Do not operate the generator if connected electrical devices overheat, if electrical output is lost, if engine or generator sparks or if flames or smoke are observed while unit is running.

• Keep a fire extinguisher near the generator at all times.

• Be sure to lock the clamp of air tube tightly to prevent the gas leakage.

ABOUT YOUR GENERATOR

1.1 UNPACKING

• Remove all packaging material.

• Remove separate accessories.

1.1.1 ACCESSORIES (IF EQUIPPED)

Check all contents. If any parts are missing or damaged locate an authorized dealer.

<table>
<thead>
<tr>
<th>2 - Fixed Wheels</th>
<th>2 - AXLES</th>
<th>2 - Large Flange Nuts</th>
<th>4 - Large Washers</th>
<th>2(1) - Handle Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - Flange Bolts</td>
<td>6 - Small Flange Nuts</td>
<td>1 - Footing</td>
<td>1 - Wrench Set</td>
<td>1 - Hook (Silent)</td>
</tr>
</tbody>
</table>

1.2 ASSEMBLY (IF EQUIPPED)

The generator requires some assembly prior to using it. If problems arise when assembling the generator, please contact the dealer.

1.2.1 ASSEMBLING THE WHEEL KIT AND HANDLES

The wheel kit is designed to greatly improve the portability of the generator. You will need the wrench and sleeve to install the wheel kit.
NOTE:
The wheel kit is not intended for over-the-road use.

- Refer to the following photos and install the wheel kit and handles as follows:
  - Slide the Axle through the Large Washer and insert it from the inside of the frame and Fixed Wheel and Large Washer. Then secure the wheel with nut and then repeat the steps on another wheel. Note orientation of wheel.
  - Attach the footling. On the handle side of the generator, lift or support the bottom of the frame to enable the assembly of the footing by using bolts and nuts.
  - Attaching the handle. Start by installing the upper bolt and nut to hold the handle in place. Partially remove the handle pivot bolt as shown to allow the insertion of the lower bolt. Next secure the upper and lower bolts by tightening them with the wrenches or sockets. (Install the bolts and nuts to hold the handle in place. Then secure the bolts by tightening them with the wrenches or sockets.)

1.3 KNOW YOUR GENERATOR

Read the entire Owner's Manual and Safety Rules before operating this generator.

Compare the generator as below to become familiarized with controls and adjustments.

NOTE:
This generator has been equipped with patented air & water cooled system.

1.3.1 MAJOR COMPONENT

2. 12 Volt (Sealed Battery) – Used to start engine.
3. Fuel Shut Off – Between fuel tank and start grip.
5. Water Tank – Tank holds water for cooling.
7. Grounding Lug – Ground the generator to an approved earth ground. See “Grounding the Generator”.

NOTE:
The battery shipped with the generator has been fully charged. A battery may lose its charge when not in use for prolonged periods of time. If the battery is unable to ignite the engine, plug in the 12V charger (see the Charging the Battery section). RUNNING THE GENERATOR WILL CHARGE THE BATTERY.

The positive battery wire was deliberately left detached for shipping. To operate the unit, attach this wire to the terminal on the battery. Do not over-tighten. Slide the attached rubber boot over the battery post.

1.3.2 ENGINE ASSEMBLY

1. Choke Lever – Used when starting a cold engine.
2. Start Grip – Controls the Start of generator if manual start.
3. Oil Fill – Check oil level and add oil here.
4. Air Cleaner – Filters intake air as it is drawn into the engine.
5. Spark Plug Location – The spark plugs ignite the Air/Fuel Mixture.
6. Oil Drain – Drain valve to remove used oil from the engine crankcase.

1.3.3 CONTROL PANEL

1. Heat Protectors – Each receptacle is provided with a push-to-reset circuit breaker to protect the socket against electrical overload.
2. Circuit Breaker – The generators are protected with a main circuit breaker to protect the generator against AC electrical overload.
4. 3-in-1 Meter – Provides value of voltage, frequency and run time for Service Intervals.
5. 5-in-1 Meter – Provides value of voltage, frequency, current, power and run time for Service Intervals.
6. Smart Controller – Provides value for Service Intervals and control the generator.
7. Receptacle – Use each socket to power electrical loads as required. Use only high quality, well-insulated, grounded cord set.
8. Binding Posts – Connect the posts to power electrical loads as required. Use only high quality, well-insulated, grounded cord set.
9. Voltage Converter – Switch to choose the required voltage. (For dual voltage)
10. 12 VDC Receptacle – Use DC plug with this receptacle to charge the battery or operate 12 Volt DC loads.
11. Grounding Post – Connect the post to earth prior to operating the generator.
12. Welding Quick Connector – Connect both of adaptors with cable and clamps to be welding. (For welder)
13. Current Regulator – Screw the knob to turn up and turn down the welding current as required. (For welder)
14. Mode select – Press the button to choose ATS control or not. (For ATS)
15. ATS connector – Use a specified signal cable to connect the ATS. (For ATS)

1.3.4 PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>7000 (SILENT)</th>
<th>8000 (SILENT)</th>
<th>8500 (SILENT)</th>
<th>9000 (SILENT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERATOR SPECIFICATIONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated / Surge Power (60Hz)</td>
<td>4.5 / 5.5 KVA</td>
<td>5.5 / 6.5 KVA</td>
<td>6.0 / 7.0 KVA</td>
<td>6.5 / 7.5 KVA</td>
</tr>
<tr>
<td>Rated / Surge Power (60Hz)</td>
<td>5.5 / 6.5 KVA</td>
<td>6.5 / 7.5 KVA</td>
<td>7.0 / 8.0 KVA</td>
<td>7.5 / 8.5 KVA</td>
</tr>
<tr>
<td>Rated AC Voltage (Single Phase)</td>
<td>110V, 120V, 220V, 230V, 240V, 110/220V, 120/240V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated AC Voltage (Three Phase)</td>
<td>127/220V, 220/380V, 230/400V, 240/415V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated Frequency</td>
<td>50 Hz @ 3000 RPM, 60 Hz @ 3000 RPM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated Welding Current (Welder)</td>
<td>60-220 Amp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Welding Voltage (Welder)</td>
<td>25-32 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty Cycle (Welder)</td>
<td>1.6-4.0mm Electrode, 100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Capacity</td>
<td>15 L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Capacity (With Fuel Tank)</td>
<td>21 L (33 L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Capacity (Without Fuel Tank)</td>
<td>33 L (48 L)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ENGINE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Rated Horsepower@ 3600 RPM</th>
<th>13 HP</th>
<th>14 HP</th>
<th>15 HP</th>
<th>16 HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>389 cc</td>
<td>420 cc</td>
<td>440 cc</td>
<td>480 cc</td>
</tr>
<tr>
<td>Oil Type</td>
<td>See Chart in &quot;Adding Engine Oil&quot; Section</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Capacity</td>
<td>1.1 L</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* * Maximum wattage and current are subject to, and limited by, such factors as fuel Blu content, ambient temperature, altitude, engine condition, etc. Maximum power decreases about 3.5% for each 310 meters above sea level, and will also decrease about 1% for each 6°C above 16°C ambient temperature.

1.4 HOW TO USE THE GENERATOR

If there are any problems operating the generator, please contact the nearest dealer. PAY SPECIAL ATTENTION TO “SAFETY PRECAUTIONS”.

1.4.1 SYSTEM GROUND

The generator has a system ground that connects the generator frame components to the ground terminals on the AC output receptacles. The system ground is bonded to the AC neutral wire in the generator control panel via a jumper wire.

Special Requirements

There may be some regulations, local codes, or ordinances that apply to the intended use of the generator.

Please consult a qualified electrician, electrical inspector, or the local agency having jurisdiction:

- In some areas, generators are required to be registered with local utility companies.
- If the generator is used at a construction site, there may be additional regulations which must be observed.

Connecting to a Building’s Electrical System

Connections for standby power to a building’s electrical system must be made by a qualified electrician. The connection must isolate the generator power from utility power or other alternative power sources and must comply with all applicable laws and electrical codes.

1.4.2 GROUNDING THE GENERATOR

The local Code requires that the frame and external electrically conductive parts of this generator be properly connected to an approved earth ground.

Local electrical codes may also require proper grounding of the unit. For that purpose, connecting a stranded copper wire to the grounding lug and to an earth-driven copper or brass grounding rod (electrode) provides adequate protection against electrical shock. However, local codes may vary widely. Consult with a local electrician for grounding requirements in the area.

Proper grounding of the generator will help prevent electrical shock in the event of a ground fault condition in the generator or in connected electrical devices. Proper grounding also helps dissipate static electricity, which often builds up in ungrounded devices.

1.4.3 CONNECTING ELECTRICAL LOADS

DO NOT connect High Volt loads to Low Volt receptacles. DO NOT connect wrong phase or frequency of load to generator.

- Let engine stabilize and warm up for a few minutes after starting.
- Plug in and turn on the desired Volt AC, phase, Hz electrical loads.
Add up the rated watts (or amps) of all loads to be connected at one time. The total should not be greater than (a) the rated wattage/amperage capacity of the generator or (b) circuit breaker rating of the receptacle supplying the power. See “Don’t Overload the Generator”.

1.4.4 CONNECTING DC CURRENT (FOR WELDER)
DO NOT connect else cable except for our supply. DO NOT connect adapter to wrong female receptacle but follow red to positive and black to negative. DO NOT use electrode greater than 4.0mm.
- Let engine stabilize and warm up for a few minutes after starting.
- Put in and turn the knob to the desired Current while welding.
- Turn down the current properly while generating.

1.5 DON’T OVERLOAD THE GENERATOR
Overloading a generator in excess of its rated wattage capacity can result in damage to the generator and to connected electrical devices. Observe the following to prevent overloading the unit:
- Add up the total wattage of all devices to be connected at one time. This total should NOT be greater than the generator’s wattage rating.
- The rated wattage of lights can be taken from light bulbs. The rated wattage of tools, appliances and motors can usually be found on a data label or decal affixed to the device.
- If the appliance, tool or motor does not give wattage, multiply volts times amperes rating to determine watts (volts x amps = watts).
- Some electric motors, such as induction types, require about three times more watts of power for starting than for running. This surge of power lasts only a few seconds when starting such motors. Make sure to allow for high starting wattage when selecting electrical devices to connect to the generator.
1. Figure the watts needed to start the largest motor.
2. Add to that figure the running watts of all other connected loads.

OPERATION

2.1 BEFORE STARTING THE GENERATOR
Prior to operating the generator, engine oil and fuel will need to be added, as follows:

2.1.1 ADDING ENGINE OIL
All oil should meet minimum American Petroleum Institute (API) Service Class SJ, SL or better. Use no special additives. Select the oil’s viscosity grade according to the expected operating temperature (see chart as below).

Any attempt to crank or start the engine before it has been properly serviced with the recommended oil may result in an engine failure.
- Place generator on a level surface.
- Clean area around oil fill and remove dipstick.
- Slowly fill engine with oil through the oil fill until it reaches the full mark on the dipstick. Stop filling occasionally to check oil level.
- Install dipstick. Check engine oil level before starting each time thereafter.

2.1.2 ADDING GASOLINE
Do not light a cigarette or smoke when filling the fuel tank.

Never fill fuel tank indoors. Never fill fuel tank when engine is running or hot. Avoid spilling fuel on a hot engine. Allow engine to cool entirely before filling fuel tank.

Do not overflow the fuel tank. Always leave room for fuel expansion. If the fuel tank is overfilled, fuel can overflow onto a hot engine and cause FIRE or EXPLOSION. Wipe up any spilled fuel immediately.
- Use regular UNLEADED gasoline with the gasoline engine. Do not mix oil with gasoline.
- Do not use gasoline with more than 10% alcohol such as E85 or Methanol.
- Clean area around fuel fill cap, remove cap.
- Slowly add fuel to fuel tank. Fill to bottom of screen filter. Be careful not to overfill.
- Install fuel cap and wipe up any spilled gasoline.

IMPORTANT: It is important to prevent gum deposits from forming in fuel system parts such as the carburetor, fuel hose or tank during storage. Alcohol-blended fuels (called gasohol, ethanol or methanol) can attract moisture, which leads to separation and formation of acids during storage. Acidic gas can damage the fuel system of an engine while in storage. To avoid engine problems, the fuel system should be emptied before storage of 30 days or longer. See the "Storage" section. Never use engine or carburetor cleaner products in the fuel tank as permanent damage may occur.
2.1.3 PROVIDING FUEL GAS (FOR FUEL GAS)

- The concentration of LPG and NG must be higher than 90%.
- The requirement of biogas is as below:

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Pressure (change rate)</th>
<th>Calorific Value</th>
<th>Consumption rate of biogas (Calorific value)</th>
<th>Inlet pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤40°C</td>
<td>3-6KPa (≤ 1KPa/min)</td>
<td>≥5000Kcal/Nm³</td>
<td>0.6-0.8m³/KW × h (≥ 21MJ/m³)</td>
<td>≥2KPa</td>
</tr>
</tbody>
</table>

**The generator output will be affected if the calorific value of biogas fails to meet the requirement.**

2.1.4 ADDING WATER

- Please fill the tank with water slowly to the bottom of screen filter. Be careful do not overfill.
- If the ambient temperature is lower than 0°C, please add some antifreeze in the water to prevent the water freeze up.

*Always* checking the water level with the water gauge. **DO NOT** higher than the upper limit or lower than the lower limit.

2.2 TO START THE ENGINE

#### Never start or stop engine with electrical devices plugged into the receptacles and devices turned on.

- Unplug all electrical loads from the unit's receptacles before starting the engine.
- Make sure the unit is in a level position.
- Make sure the pressure of fuel gas is between 3 to 6KPa. When the pressure outside the scope, adjust the pressure regulator to be easy started or loaded on engine. (For fuel gas)
- Open the fuel shut-off valve. The fuel valve locates above the engine.
- For fuel gas type, switch the valve to required gas on the engine. (Figure 1)
- If the engine is cold, move the Choke Lever to ON position. If the engine is warm, move the Choke Lever to the CLOSED/OFF position.
- If the generator is electric start with automatic choke valve. Press the electromagnet and release until the engine starts. The choke valve will open automatically.

![Figure 1 - Gas Valve](image)

**NOTE:**

*If engine fires, but does not continue to run, pull choke level to “Full Choke” and repeat starting instructions.*

**IMPORTANT:** Do not overload the generator. Also, do not overload individual panel receptacles. These outlets are protected against overload with circuit breaker. See “Don’t Overload the Generator” carefully.

2.2.1 ELECTRIC STARTING

- Turn the key to the START position and hold for 2 seconds until the generator started. If the unit fails to started, please wait 15 seconds before restart.

**NOTE:**

For manual starting: Push the switch in panel to the ON position. Pull the Starter Grip gently until you feel slight resistance, then pull briskly. Don’t let the Starter Grip snap back.

- As the engine warms up, move the Choke Lever to CLOSED/OFF position.
- Confirm that each electrical device has been turned off before plugging it into your generator.

2.3 STOPPING THE ENGINE

- Shut off and unplug all electrical loads from generator panel receptacles. Never start or stop the engine with electrical devices plugged in.
- Let engine run at no-load for several minutes to stabilize the internal temperatures of engine and generator.
- Move Start/Run/Stop or On/Off switch to the “Stop/Off” position. For *remote shutoff:* Push the OFF button on the remote controller.
- Close fuel valve.

2.4 LOW OIL PRESSURE SHUTDOWN SYSTEM

The engine is equipped with a low oil pressure sensor that shuts down the engine automatically when the oil pressure drops much. A delay built into the low oil shutdown system allows oil pressure to build during starting. The delay allows the engine to run for about 10 seconds before sensing oil pressure. If the engine shuts down by itself and the fuel tank has enough fuel, check engine oil level.
2.4.1 RESTARTING
If trying to restart the engine within 10 seconds after it shuts down, the engine may NOT start. The system needs 5 to 10 seconds to reset. If the engine is restarted after such a shutdown and the low oil pressure has not been corrected, the engine will run for about 10 seconds as described above and then stop.

2.5 CHARGING THE BATTERY
\[\text{Do not permit open flame, sparks or heat around a battery. Wear protective goggles, rubber apron and rubber gloves when working around a battery. Battery electrolyte fluid is an extremely corrosive sulfuric acid solution that can cause severe burns. If spill occurs, flush area with clear water immediately.}\]
\[\text{Storage batteries give off explosive hydrogen gas while charging. An explosive mixture will remain around the battery for a long time after it has been charged. The slightest spark can ignite the hydrogen and cause an explosion. Such an explosion can shatter the battery and cause blindness or other serious injury.}\]
Use battery charger plug to keep the battery charged and ready for use. Battery charging should be done in a dry location.

1. Connect charger to "Battery Charger Input" plate. Plug wall receptacle end of the battery charger into a Low Volt AC wall outlet.
2. Unplug battery charger from wall outlet and control panel jack when generator is going to be in use.

NOTE: Do not use the battery charger for more than 48 hours at one charge.

3.1 MAINTENANCE SCHEDULE
Follow the calendar intervals. More frequent service is required when operating in adverse conditions noted below.

<table>
<thead>
<tr>
<th>Perform at indicated intervals</th>
<th>Everyday</th>
<th>1st month or 20 hours</th>
<th>3rd month or 100 hours</th>
<th>6th month or 500 hours</th>
<th>Every year or 1000 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check and fill enough fuel</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge fuel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check and fill enough engine oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check whether it leaks oil</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check and screw each fastened part</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange engine oil</td>
<td>○ (1st time)</td>
<td>○ (2nd time)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean filter of engine oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange air filter element</td>
<td>(If operated at dusty region, the period of maintenance should be shortened)</td>
<td>○ (Exchange)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean filter of fuel</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check high pressure oil pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check nozzle</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check fuel pipe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjust the gaps of air gate</td>
<td>● (1st time)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grind air intake and exhausted gate</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange piston ring</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check automatic transfer system</td>
<td>● (1st time)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check insulation resistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(The time of stop is over 10 days.)</td>
</tr>
</tbody>
</table>

*Change oil and oil filter every month when operating under heavy load or in high temperatures. Clean more often under dirty or dusty operating conditions. Replace air cleaner parts if very dirty.

3.2 GENERAL RECOMMENDATIONS
The operator must maintain the generator as instructed in this manual. Some adjustments will need to be made periodically to properly maintain the generator.

All adjustments in the Maintenance section of this manual should be made at least once each season. Follow the "Maintenance Schedule".

NOTE: Once a year replace the air filter. New clean air filter assure proper fuel-air mixture and help the engine run better and longer.
3.2.1 GENERATOR MAINTENANCE

Keeping the unit clean and dry. Operate and store the unit in a clean dry environment where it will not be exposed to excessive dust, moisture or corrosive vapors. Cooling air slots in the generator must not become clogged with snow, leaves, or any other foreign material. Check the cleanliness of the generator often and clean when dust, oil, moisture or other foreign substances are visible on its exterior surface.

Never insert any object or tool through the air cooling slots, even if the engine is not running.

NOTE:
DO NOT use garden hose to clean generator. In addition, if water enters the generator through cooling air slots, some water will be retained in voids and crevices of the rotor and stator winding insulation. Water and dirt buildup on the generator internal windings will eventually decrease the insulation resistance of these windings.

3.2.2 ENGINE MAINTENANCE

When working on the generator, always disconnect negative cable from battery. Also, disconnect spark plug wires from the spark plugs and keep the wires away from spark plugs.

3.2.3 CHECKING OIL LEVEL

See the “BEFORE STARTING THE GENERATOR” section for information on checking the oil level. The oil level should be checked before each use, or at least every eight hours of operation. Keep the oil level maintained.

3.2.4 CHANGING THE OIL AND OIL FILTER

Change the oil and filter after the first 30 hours of operation. Change the oil every 100 hours or every season thereafter. If running this unit under dirty or dusty conditions, or in extremely hot weather, change the oil more often.

Hot oil may cause burns. Allow engine to cool before draining oil. Avoid prolonged or repeated skin exposure with used oil. Thoroughly wash exposed areas with soap. Use the following instructions to change the oil:

- Clean area around oil drain cap.
- Remove oil drain cap from the drain hose and dipstick to drain oil completely into a suitable container.
- When oil has completely drained, install oil drain cap and tighten securely.
- Place a suitable container beneath the oil filter and turn filter counterclockwise to remove. Discard according to local regulations.
- Coat gasket of new filter with oil. Turn filter clockwise until gasket contacts tightly with filter. Then tighten an additional 3/4 turn.
- Fill engine with recommended oil and replace dipstick. (See “Before Starting The Generator” for oil recommendations).
- Wipe up any spilled oil.
- Dispose of used oil at a proper collection center.

3.2.5 REPLACING THE SPARK PLUG

Replace the plugs once each year. This will help the engine start easier and run better.

1. Stop the engine and pull the spark plug wires off of the spark plugs.
2. Clean the area around the spark plugs and remove them from the cylinder heads.
3. Set the spark plug gap to .025 mm (0.001 in.). Install the correctly gapped spark plug into each cylinder head (Figure 2).
4. Push the boots firmly on the spark plugs.

3.3 SERVICE AIR CLEANER

The engine will not run properly and may be damaged if using a dirty air cleaner. Clean or replace the air cleaner paper filter every 500 hours or half a year. Clean or replace more often if operating under dusty conditions. To clean or replace paper air filter:

- Remove air cleaner cover and remove filter element.
- Clean filter element by tapping it gently on a solid surface. If the filter is too dirty, replace it with a new one. Dispose of the old filter properly.
- Clean air cleaner cover. Next insert new paper filter into the base of the air cleaner. Re-install air cleaner cover.

NOTE:
Please contact the nearest authorized dealer to order a new air filter.

3.4 GENERAL

The generator should be started at least once every seven days and be allowed to run at least 30 minutes. If this cannot be done and the unit must be stored for more than 30 days, use the following information as a guide to prepare it for storage.

NEVER store engine with fuel in tank indoors or in enclosed, poorly ventilated areas where fumes may reach an open flame,
spare or pilot light as on a furnace, water heater, clothes dryer or other gas appliance.

⚠ Allow unit to cool entirely before storage.

### 3.5 LONG TERM STORAGE

It is important to prevent gum deposits from forming in essential fuel system parts such as the carburetor, fuel hose or tank during storage. To avoid engine problems, the fuel system should be emptied before storage of 30 days or longer, as follows:

- Remove all gasoline from the fuel tank.
- Drain fuel into approved container outdoors, away from open flame. Be sure engine is cool. Do not light a cigarette in the vicinity.
- Start and run engine until engine stops from lack of fuel.
- Allow the engine to cool, then drain oil from crankcase. Refill with recommended grade.
- Remove spark plugs.
- Pour about 1/2 ounce (15 ml) of engine oil into each cylinder.
- Install and tighten spark plugs. Do not connect the spark plug wires.
- Clean the generator outer surfaces. Check that cooling air slots and openings on generator are open and unobstructed.
- Store the unit in a clean, dry place.

### 3.6 OTHER STORAGE TIPS

- Do not store gasoline from one season to another.
- Replace any fuel can that starts to rust. Rust and/or dirt in the fuel will cause problems with the fuel system.
- If possible, store the unit indoors and cover it to give protection from dust and dirt. Cover the unit with a suitable protective cover that does not retain moisture.
- **BE SURE TO EMPTY THE FUEL TANK.** If it is not practical to empty the fuel tank and the unit is to be stored for some time, use a commercially available fuel stabilizer added to the gasoline to increase the life of the gasoline.

⚠ NEVER cover the generator while engine and exhaust area are warm.
# Troubleshooting

## 4.1 Troubleshooting Guide

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Collection</th>
</tr>
</thead>
</table>
| **Engine is running, but no AC output is available.** | 1. Circuit breaker is open.  
2. Poor connection or defective cord set.  
3. Connected device is bad.  
2. Check and repair.  
3. Connect another device that is in good condition.  
4. Contact Authorized Facility. |
| **Engine runs good but bogs down when loads are connected.** | 1. Short circuit in a connected load.  
2. Generator is overloaded.  
3. Engine speed is too slow.  
2. See 'Don’t Overload the Generator'.  
3. Contact Authorized Facility.  
4. Contact Authorized Facility. |
| **Engine will not crank.** | 1. Battery weak or dead. | 1. Recharge or replace battery (see ‘No Battery Charger DC Output’ at bottom of guide). |
| **Engine will not start, or starts and runs rough.** | 1. Fuel shut-off is off.  
2. Dirty air cleaner.  
3. Out of fuel.  
4. Stale fuel.  
5. Spark plug wire not connected to spark plug.  
7. Over-choking.  
8. Low oil level.  
9. Excessive rich fuel mixture.  
10. Intake valve stuck open or closed.  
11. Engine has lost compression. | 1. Fuel shut-off is on.  
2. Clean or replace air cleaner.  
3. Fill fuel tank.  
4. Drain fuel tank and fill with fresh fuel.  
5. Connect wire to spark plug.  
6. Replace spark plug.  
7. Put choke knob to No Choke position.  
8. Fill crankcase to proper level.  
9. Contact Authorized Facility.  
10. Contact Authorized Facility.  
11. Contact Authorized Facility. |
| **Engine shuts down during operation.** | 1. Out of fuel.  
2. Low oil level.  
2. Fill crankcase to proper level.  
3. Contact Authorized Facility. |
| **Engine lacks power.** | 1. Load is too high.  
2. Dirty air filter.  
3. Engine needs to be serviced. | 1. See 'Don’t Overload the Generator'.  
2. Replace air filter.  
3. Contact Authorized Facility. |
| **Engine ‘hunts’ or falters.** | 1. Choke is opened too soon.  
2. Carburetor is running too rich or too lean. | 1. Move choke to halfway position until engine runs smoothly.  
2. Contact Authorized Facility. |
| **No battery charger DC output.** | 1. Battery posts are corroded.  
2. Battery cable is bad.  
3. Battery is defective.  
4. Receptacle is bad.  
5. Battery charger in-line fuse (1.5A) melted open. | 1. Clean battery posts.  
2. Replace cable.  
3. Check battery condition, replace if defective.  
4. Contact Authorized Facility.  
5. Replace fuse with identical 1.5A replacement fuse only (located inside control panel). |