

# FIRMAN<sup>®</sup>

## OWNER'S MANUAL PORTABLE INVERTER GENERATOR



MODEL NUMBER  
**W01781**

Rev Level:02

**IMPORTANT:** Read all safety precautions and instructions carefully before operating equipment.



Ensure engine is stopped and level before performing any maintenance or service.

Record product information to reference when ordering parts or obtaining warranty coverage.



**DO NOT RETURN TO  
STORE!**



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# INTRODUCTION

Thank you for purchasing a FIRMAN generator.

**This manual contains** safety information to make you aware of the hazards and risks associated with generator products and how to avoid them. This generator is designed and intended only for supplying electrical power for operating compatible electrical lighting, appliances, tools and motor loads, and is not intended for any other purpose. It is important that you read and understand these instructions thoroughly before attempting to start or operate this equipment.

**Save these original instructions for future reference.**

This manual covers operation and maintenance of the FIRMAN generators. All information in this publication is based on the latest production information available at the time of approval for printing. The manufacturer reserves the right to change, alter or other wise improve the generator and this documentation at any time without prior change.

## Important Safety Information

The manufacturer cannot possibly anticipate every possible circumstance that might involve a hazard. The warnings in this manual and the tags and decals affixed to the unit are therefore not all-inclusive. If you use a procedure, work method or operating technique that the manufacturer does not specifically recommend you must satisfy yourself that it is safe for you and others. You must also make sure that the procedure work method or operating technique that you choose does not render the generator unsafe.

### SAFETY INFORMATION



#### DANGER

DANGER indicates a potentially hazardous situation which, if not avoided, WILL result in death or serious injury.



#### WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



#### CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate personal injury, or property damage.



Toxic Fumes



Risk of Electric Shock



Fire Hazard



Explosion Hazard



Hot Surface.  
Do Not Touch the Surface.



Rotating Parts Entanglement  
Hazard





Kickback



Operator's Manual

## SAFETY PRECAUTIONS

<b>⚠ DANGER</b>	
Using a generator indoors <b>CAN KILL YOU IN MINUTES</b> . Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.	
 NEVER use inside a home or garage, <b>EVEN IF</b> doors and windows are open.	 Only use <b>OUTSIDE</b> and far away from windows, doors, and vents.
Avoid other generator hazards. <b>READ MANUAL BEFORE USE.</b>	

### **⚠ WARNING** POISONOUS GAS HAZARD.



Engine exhaust contains carbon monoxide, a poisonous gas that could kill you in minutes. You **CANNOT** smell it, see it, or taste it. Even if you do not smell exhaust fumes, you could still be exposed to carbon monoxide gas.

- Operate this product **ONLY** outside far away from windows, doors and vents to reduce the risk of carbon monoxide gas from accumulating and potentially being drawn towards occupied spaces.
- Install battery-operated carbon monoxide alarms or plug-in carbon monoxide alarms with battery back-up according to the manufacturer's instructions. Smoke alarms cannot detect carbon monoxide gas.
- **DO NOT** run this product inside homes, garages, basements, crawlspaces, sheds, or other partially-enclosed spaces even if using fans or opening doors and windows for ventilation. Carbon monoxide can quickly build up in these spaces and can linger for hours, even after this product has shut off.
- **ALWAYS** place this product downwind and point the engine exhaust away from occupied spaces. If you start to feel sick, dizzy, or weak while using this product, shut it off and get to fresh air **RIGHT AWAY**. See a doctor. You may have carbon monoxide poisoning.

### **⚠ 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**

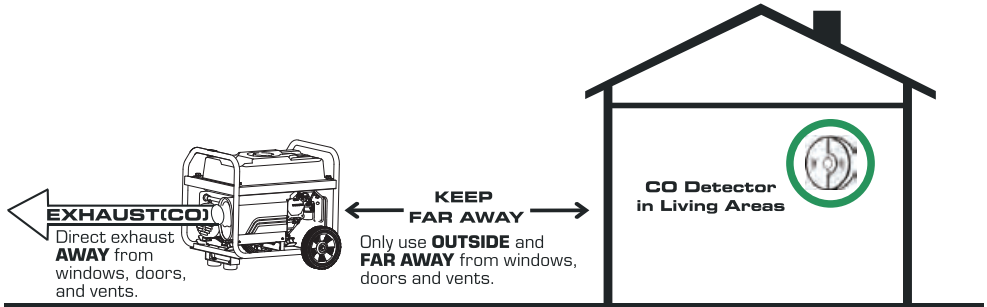
Certain components in this product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Wash hands after handling.

- If you start to feel sick, dizzy or weak while using the portable generator, you may have carbon monoxide poisoning. Get out side to fresh air immediately and call 911 for emergency medical attention. Very high levels of CO can rapidly cause victims to lose consciousness before they can rescue themselves. **DO NOT** attempt to shut off the generator before moving to fresh air. Entering an enclosed space where a generator is or has been running may put you at greater risk of CO poisoning.

## CORRECT USAGE

### Example location to reduce risk of carbon monoxide poisoning

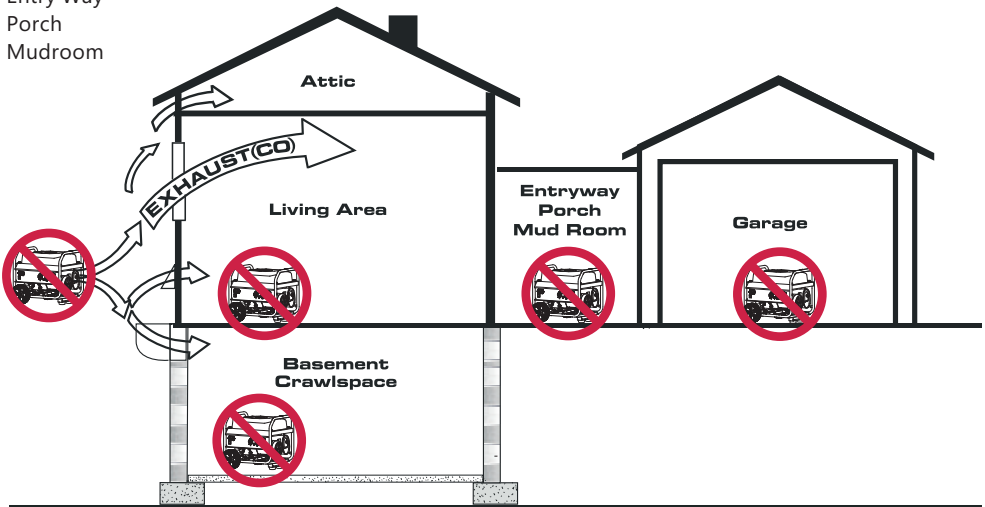
- ONLY use outside and downwind, far away from windows, doors and vents.
- Direct exhaust **AWAY** from windows, doors, and vents.



## INCORRECT USAGE

### Do not operate in any of the following locations:

- Near any door, window or vent
- Garage
- Basement
- Crawl Space
- Living Area
- Attic
- Entry Way
- Porch
- Mudroom



## **WARNING**



Starter cord kickback (rapid retraction) will pull hand and arm toward engine faster than you can let go which could cause broken bones, fractures, bruises, or sprains resulting in serious injury.

- When starting engine, pull cord slowly until resistance is felt and then pull rapidly to avoid kickback.
- **NEVER** start or stop engine with electrical devices plugged in and turned on.

## **WARNING**



Fuel and its vapors are extremely flammable and explosive which could cause burns, fire, or explosion resulting in death or serious injury and/or property damage.

## **WHEN ADDING OR DRAINING FUEL**

- Turn generator engine OFF and let it cool at least 2 minutes before removing fuel cap. Loosen cap slowly to relieve pressure in tank.
- Fill or drain fuel tank outdoors.
- **DO NOT** overfill tank. Allow space for fuel expansion.
- If fuel spills, wait until it evaporates before starting engine.
- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- Check fuel lines, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.
- **DO NOT** light a cigarette or smoke.

## **WHEN STARTING EQUIPMENT**

- Ensure spark plug, muffler, fuel cap, and air cleaner are in place.
- **DO NOT** crank engine with spark plug removed.

## **WHEN OPERATING EQUIPMENT**

- **DO NOT** operate this product inside any building, carport, porch, mobile equipment, marine applications, or enclosure.
- **DO NOT** tip engine or equipment at angle which causes fuel to spill.
- **DO NOT** stop engine by moving choke control to "Start" position.

## **WHEN TRANSPORTING, MOVING OR REPAIRING EQUIPMENT**

- Transport/move/repair with fuel tank EMPTY or with fuel shutoff valve OFF.
- **DO NOT** tip engine or equipment at angle which causes fuel to spill.
- Disconnect spark plug wire.

## **WHEN STORING FUEL OR EQUIPMENT WITH FUEL IN TANK**

- Store away from furnaces, stoves, water heaters, clothes dryers, or other appliances that have pilot light or other ignition source because they could ignite fuel vapors.

## **WARNING**

- This generator does not meet U. S. Coast Guard Regulation 33CFR-183 and should not be used on marine applications.
- Failure to use the appropriate U. S. Coast Guard approved generator could result in death or serious injury and/or property damage.

## **WARNING**



Generator voltage could cause electrical shock or burn resulting in death or serious injury.

- Use approved transfer equipment, suitable for the intended use, to prevent backfeed by isolating generator from electric utility workers.

- When using generator for backup power, notify utility company.
- Use a ground fault circuit interrupter (GFCI) in any damp or highly conductive area, such as metal decking or steel work.
- **DO NOT** touch bare wires or receptacles.
- **DO NOT** use generator with electrical cords which are worn, frayed, bare or otherwise damaged.
- **DO NOT** operate generator in the rain or wet weather.
- **DO NOT** handle generator or electrical cords while standing in water, while barefoot, or while hands or feet are wet.
- **DO NOT** allow unqualified persons or children to operate or service generator.

### **WARNING**



Exhaust heat/gases could ignite combustibles, structures or damage fuel tank causing a fire, resulting in death or serious injury and/or property damage.

Contact with muffler area could cause burns resulting in serious injury.

- **DO NOT** touch hot parts and **AVOID** hot exhaust gases.
- Allow equipment to cool before touching.
- It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact the original equipment manufacturer, retailer, or dealer to obtain a spark arrester designed for the exhaust system installed on this engine.
- Replacement parts must be the same and installed in the same position as the original parts.

### **WARNING**



Unintentional sparking could cause fire or electric shock resulting in death or serious injury.

### **WHEN ADJUSTING OR MAKING REPAIRS TO YOUR GENERATOR**

- Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.

### **WHEN TESTING FOR ENGINE SPARK**

- Use approved spark plug tester.
- **DO NOT** check for spark with spark plug removed.

### **WARNING**



Starter and other rotating parts could entangle hands, hair, clothing, or accessories resulting in serious injury.

- **NEVER** operate generator without protective housing or covers.
- **DO NOT** wear loose clothing, jewelry or anything that could be caught in the starter or other rotating parts.
- Tie up long hair and remove jewelry.

### **CAUTION**

Excessively high operating speeds could result in minor injury. Excessively low operating speeds impose a heavy load.

- **DO NOT** tamper with governor spring, links or other parts to increase engine speed. Generator supplies correct rated frequency and voltage when running at governed speed.
- **DO NOT** modify generator in any way.

### **NOTE:**

Exceeding generators wattage/amperage capacity could damage generator and/or electrical devices connected to it.

- **DO NOT** exceed the generator's wattage amperage capacity.
- Start generator and let engine stabilize before connecting electrical loads.
- Connect electrical loads in OFF position, then turn ON for operation.
- Turn electrical loads OFF and disconnect from generator before stopping generator.

**NOTE:**

Improper treatment of generator could damage it and shorten its life.

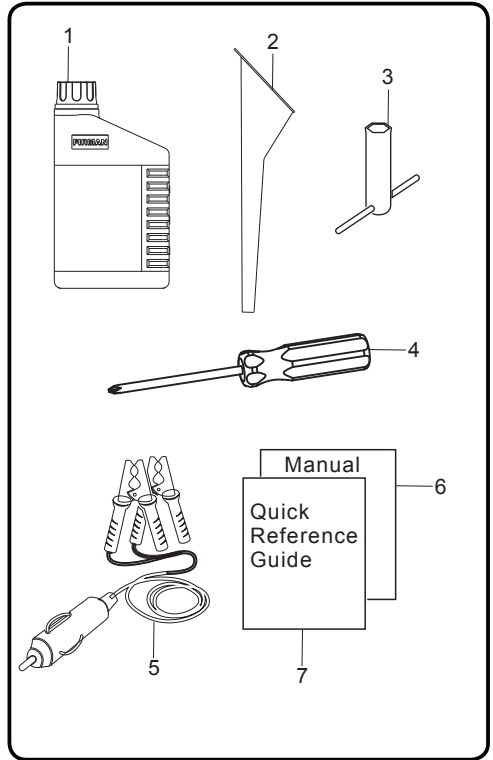
- Use generator only for intended uses.
- If you have questions about intended use, ask dealer or contact local service center.
- Operate generator only on level surfaces.
- DO NOT expose generator to excessive moisture, dust, dirt, or corrosive vapors.
- DO NOT insert any objects through cooling slots.
- If connected devices overheat, turn them off and disconnect them from generator.
- Shut off generator if:
  - Electrical output is lost.
  - Equipment sparks, smokes, or emits flames.
  - Unit vibrates excessively.

1. Engine Oil(Bottle) . . . . .	1
2. Oil Funnel . . . . .	1
3. Wrench for Spark Plug . . . . .	1
4. Screw Drive . . . . .	1
5. Battery Charge Cable . . . . .	1
6. Manual . . . . .	1
7. Quick Reference Guide . . . . .	1

**⚠ WARNING**

**Medical and Life Support Uses.**

- In case of emergency, call 911 immediately.
- NEVER use this product to power life support devices or life support appliances.
- NEVER use this product to power medical devices or medical appliances.
- Inform your electricity provider immediately if you or anyone in your household depends on electrical equipment to live.
- Inform your electrical provider immediately if a loss of power would cause you or anyone in your household to experience a medical emergency.



**UNPACKING THE GENERATOR**

- Open carton and Remove packaging materials.
- Remove generator, accessories boxes, and literature from carton.

**Parts Included**

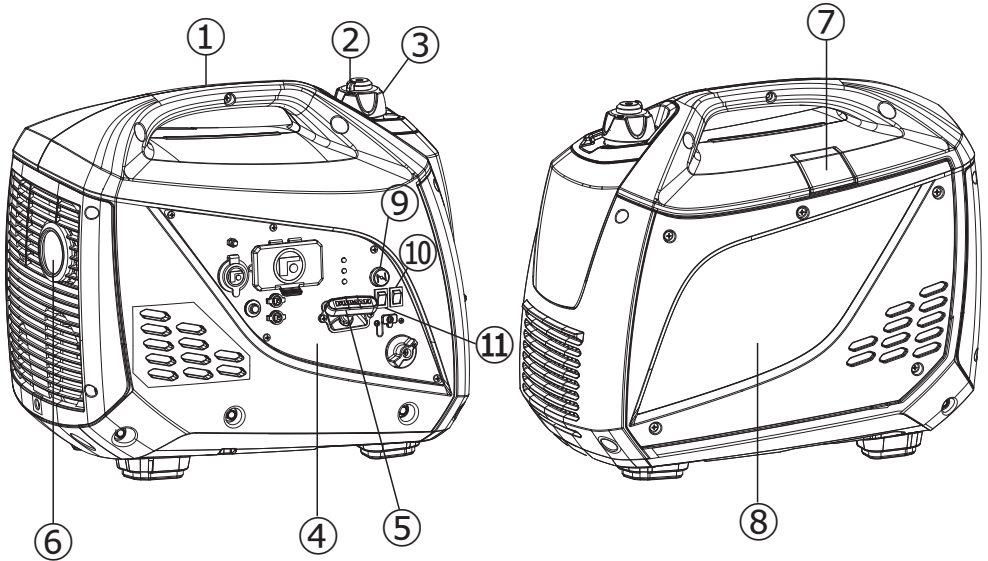
Your gasoline powered inverter generator ships with the following parts:



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## CONTROLS AND FEATURES

### Generator



**1- Carrying Handle**

**2- Fuel Lever Vent** – Turn this valve to the “On” position to supply air to the tank.

**3- Fuel Cap**

**4- Control Panel**

**5- Recoil Starter**

**6- Muffler/Spark Arrester**

**7- Spark Plug Access Cover**

**8- Maintenance Cover** – Oil filler and air filter access.

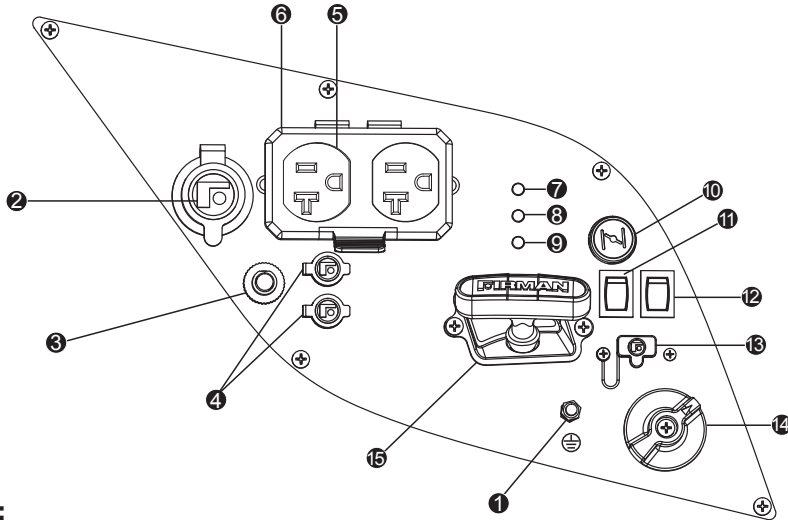
**9- Choke Knob**

**10- Engine ON/OFF Switch**

**11- Economy Control Switch**

\*We are always working to improve our products. Therefore, the enclosed product may differ slightly from the image on this page.

## Control Panel



### NOTE:

**Total power drawn from all receptacles must not exceed the name plate rating.**

- 1 Ground Terminal** – Consult an electrician for local grounding regulations.
- 2 12V DC outlet** – 5 Amp of DC current may be drawn from this receptacle.  
Use this outlet to charge 12V automotive type batteries **ONLY**. See 12V DC outlet (Battery Charger) section.
- 3 DC Circuit Breaker** - The circuit protector may be reset by pushing the button of the protector.
- 4 Parallel Operation Outlets** - These outlets are used for connecting two FIRMAN inverter generators for parallel operation. A FIRMAN parallel kit(optional equipment) is required for parallel operation.
- 5 120V, 20A Duplex** – (NEMA 5-20R) 20 Amp of current may be drawn from this 120 Volt receptacle.
- 6 Outlet Cover** - Protect the receptacles from dust and debris.
- 7 Output Ready Indicator Light** – Remains “ON” during normal operating conditions. Shuts “OFF” when generator is overloaded.  
The green AC Power Indicator Light comes on when the engine starts and generates power.
- 8 Overload Indicator Light** – This light turns “ON” when the generator is overloaded and will cut power to the receptacles.  
If the engine overload indicator light comes on, the generator’s wattage / amperage capacity has been exceeded by connected electrical devices or by a power surge. When this occurs, the green AC Power
- Indicator Light(Item 7) will go off. The engine will continue to run, but the red Engine Overload Indicator Light will stay on and power will no longer be supplied to connected electronic devices.
- 9 Oil Warning Indicator Light** – Check oil level when this light turns “ON”. Engine will not run when indicator is lit.  
When the oil falls below the minimum level, the oil warning indicator light comes on and the engine stops automatically. The engine will not start until the proper amount of oil is in the crank case.
- 10 Choke Knob**
- 11 Economy Control Switch**  
The Economy Control switch can be activated in order to minimize fuel consumption and noise while operating the unit during times of reduced electrical output, allowing the engine speed to idle during periods of non-use. The engine speed returns to normal when an electrical load is connected. When the economy switch is off, the engine runs at normal speed continuously.
- 12 Engine Switch** – Flip the switch to the “ON” position and pull the recoil starter to start the generator. Turn to the “OFF” position to turn off the generator.
- 13 5V USB Outlet**
- 14 Fuel Valve Knob**
- 15 Recoil Starter**

## SPECIFICATIONS

Model	W01781
Starting Watts	2100
Running Watts	1700
Rated AC Voltage	120V
Rated Frequency	60Hz
Phase	Single Phase
Voltage regulator	Digital
Power Factor	1
Alternator Type	Magneto Inductor
Engine	FIRMAN
Engine Type	Single Cylinder, 4-Stroke OHV Air Cooled
Displacement	80 cc
Low Oil Shutdown	YES
Ignition System	Breakless Ignition Type, Flywheel Magneto
Starting System	Recoil
Fuel	Unleaded Automotive Gasoline
Capacity Fuel Tank	0.9 Gallon
Lubricating Oil Capacity	12.9 oz(0.38L)
Carburetor Type	Float
Air Cleaner	Polyurethane Type
P.T.O. shaft rotation	Counter Clockwise (Facing P.T.O.)
Oil Type	See "Add Engine Oil" Section

### AN IMPORTANT MESSAGE ABOUT TEMPERATURE:

Your Firman Power Equipment product is designed and rated for continuous operation at ambient temperatures up to 40°C (104°F). When your product is needed, your product may be operated at temperatures ranging from -15°C (5°F) to 50°C (122°F) for short periods. If the product is exposed to temperatures outside this range during storage, it should be brought back within this range before operation. In any event, the product must always be operated outdoors, in a well-ventilated area and away from doors, windows and other vents.

- When operated above 77°F(25°C) there may be a decrease in power.
- Maximum wattage and current are subject to and limited by such factors as fuel BTU content ambient temperature, altitude, engine condition and etc. Maximum power decreases about 3.5% for each 1,000 feet above sea level; and will also decrease about 1% for each 10°F(6°C) above 60°F(16°C) ambient temperature.

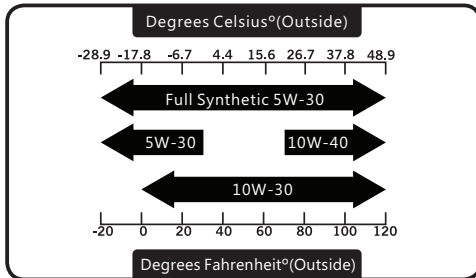
## Add Engine Oil

### ⚠ CAUTION

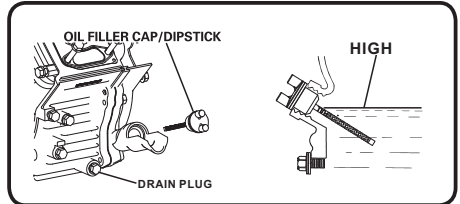
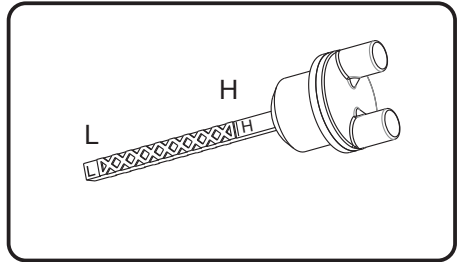
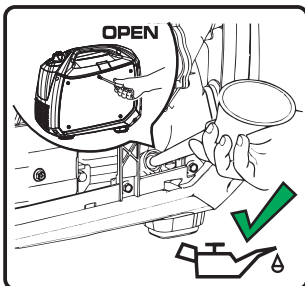
DO NOT attempt to crank or start the engine before it has been properly filled with the recommended type and amount of oil. Damage to the generator as a result of failure to follow these instructions will void your warranty.

### NOTE:

The recommended oil type is 10W-30 automotive oil. However outdoor temperatures will determine the space proper oil viscosity for the engine. Use the chart to select the best for the outdoor temperature range expected.



1. Place generator on a flat and level surface.
2. Loosen the cover screw and remove the maintenance cover.
3. Remove oil fill cap/dipstick.
4. Using oil funnel, slowly pour contents of provided oil bottle into oil fill opening to the "H" mark on dipstick. Be careful do not overfill. Overfilling with oil could cause the engine to not start or hard starting.



5. Replace oil fill cap/dipstick and fully tighten.
6. Reinstall maintenance cover and tighten screws.
7. Oil Level should be checked prior to each use or at least 8 hours of operation. Keep oil level maintained.

### ⚠ CAUTION

The engine is equipped with a low oil shut-off and will stop when the oil level in the crankcase falls below the threshold level.

### NOTE:

We consider the first 5 hours of run time to be the break-in period for the unit. During the break in period stay at or below 50% of the running watt rating and vary the load occasionally to allow stator windings to heat and cool. Adjusting the load will also cause engine speed to vary and help seat piston rings.

### Low oil shutdown

The unit is equipped with a low oil shutdown. If the oil level becomes lower than required, the sensor will activate a warning device or stop the engine.

If generator shuts off and the oil level is within specifications, check to see if generator is sitting at an angle that forces oil to shift. Place on an even surface to correct this. If engine fails to start, the oil level may not be sufficient to deactivate low oil level switch. Make sure the sump is completely full of oil.

## Add Fuel

Fuel must meet these requirements:

- Clean, fresh, unleaded gasoline.
- Use regular UNLEADED gasoline with the generator engine with a minimum 87 octane / 87 AKI (91 RON).

For high altitude use, see "Operation at High Altitude".

- Do not use gasoline with more than 10% alcohol such as E85 or ethanol.

**NOTE:** Avoid generator damage.

Failure to follow Operator's Manual for fuel recommendations voids warranty.

- DO NOT use unapproved gasoline such as E85.
- DO NOT mix oil in gasoline.
- DO NOT modify engine to run on alternate fuels.

### WARNING



Fuel and its vapors are extremely flammable and explosive which could cause burns, fire or explosion resulting in death, serious injury and/or property damage.

### WHEN ADDING FUEL

- Fill fuel tank outdoors.



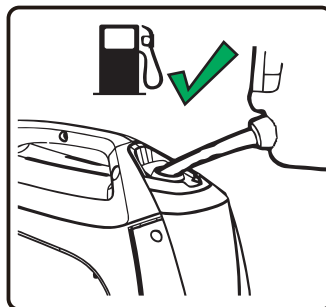
DO NOT overfill tank. Allow space for fuel expansion. If the tank is overfilled, fuel can overflow onto a hot engine and cause fire or explosion. Wipe up any spilled fuel immediately.

- If fuel spills, wait until it evaporates before starting engine.
- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- Check fuel lines, tank, cap and fittings frequently for cracks or leaks. Replace if necessary.



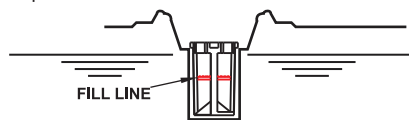
DO NOT light a cigarette or smoke when filling the fuel tank.

1. Clean area around fuel fill cap, remove cap.
2. Slowly add unleaded fuel to fuel tank. Be careful not to fill above the red fuel level indicator. This allows adequate space for fuel expansion.
3. Install fuel cap and let any spilled fuel evaporate before starting engine or wipe up any spilled gasoline.



### CAUTION

- Slowly add unleaded gasoline to fuel tank.
- Do not overfill tank.
- Do not fill above top of fuel screen. This will allow expansion in hot weather and prevent overflow.



## Grounding

The National Electric Code requires your generator must be properly connected to an appropriate ground to help prevent electric shock.

### WARNING



Failure to properly ground the generator can result in electric shock.

A ground terminal connected to the frame of the generator has been provided on the control panel. For remote grounding, connect a length of heavy gauge (12 AWG minimum) copper wire between the generator ground terminal and a copper rod driven into the ground. We strongly recommend that you consult with a qualified electrician to ensure compliance with local electrical codes.

**THERE IS A PERMANENT CONDUCTOR BETWEEN THE GENERATOR (STATOR WINDING) AND THE FRAME.**

## Connecting to a Building's Electrical System **OPERATION**

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.

### **WARNING**



Generator voltage could cause electrical shock or burn resulting in death or serious injury.

- Use approved transfer equipment to prevent backfeed by isolating generator from electric utility workers.
- When using generator for backup power, notify utility company.
- Use a ground fault circuit interrupter (GFCI) in any damp or highly conductive area, such as metal decking or steel work.
- DO NOT touch bare wires or receptacles.
- DO NOT use generator with electrical cords which are worn, frayed, bare or otherwise damaged.
- DO NOT operate generator in the rain or wet weather.
- DO NOT handle generator or electrical cords while standing in water, while barefoot, or while hands or feet are wet.
- DO NOT allow unqualified persons or children to operate or service generator.

## **Generator Location**

### **WARNING**

Make sure you review each warning in order to prevent fire hazard.

- Keep area clear of inflammables or other hazardous materials.
- Select a site that is dry, well ventilated and protected from the weather.
- Keep exhaust pipe clear of foreign objects.
- Keep generator away from open flame.
- Keep generator on a stable and level surface.

### **CAUTION**




Tilting can cause fuel spillage.



- Do not block generator air vents with paper or other material.

### **DANGER**

**Using a generator indoors CAN KILL YOU IN MINUTES.**  
Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.

 <b>NEVER</b> use inside a home or garage, <b>EVEN IF</b> doors and windows are open.		 <b>Only use OUTSIDE</b> and far away from windows, doors, and vents.
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**Avoid other generator hazards.**  
**READ MANUAL BEFORE USE.**

### **WARNING**

## **POISONOUS GAS HAZARD.**



Engine exhaust contains carbon monoxide, a poisonous gas that could kill you in minutes. You **CANNOT** smell it, see it, or taste it. Even if you do not smell exhaust fumes, you could still be exposed to carbon monoxide gas.

- Operate this product **ONLY** outside far away from windows, doors and vents to reduce the risk of carbon monoxide gas from accumulating and potentially being drawn towards occupied spaces.
- Install battery-operated carbon monoxide alarms or plug-in carbon monoxide alarms with battery back-up according to the manufacturer's instructions. Smoke alarms cannot detect carbon monoxide gas.
- **DO NOT** run this product inside homes, garages, basements, crawlspaces, sheds, or other partially-enclosed spaces even if using fans or opening doors and windows for ventilation. Carbon monoxide can quickly build up in these spaces and can linger for hours, even after this product has shut off.
- **ALWAYS** place this product downwind and point the engine exhaust away from occupied spaces. If you start to feel sick, dizzy, or weak while using this product, shut it off and get to fresh air **RIGHT AWAY**. See a doctor. You may have carbon monoxide poisoning.

## Surge Protection

### CAUTION

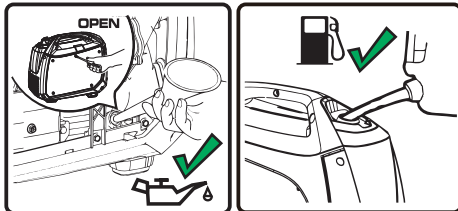
Voltage fluctuation may impair the proper functioning of sensitive electronic equipment.

Electronic devices, including computers and many programmable appliances use components that are designed to operate within a narrow voltage range and may be affected by momentary voltage fluctuations. While there is no way to prevent voltage fluctuations, you can take steps to protect sensitive electronic equipment.

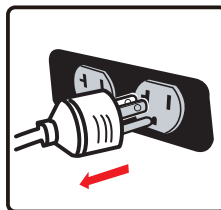
Install UL1449, CSA-listed, plug-in surge suppressors on the outlets feeding your sensitive equipment. Surge suppressors come in single- or multi-outlet styles. They're designed to protect against virtually all short-duration voltage fluctuations.

## Starting the Generator

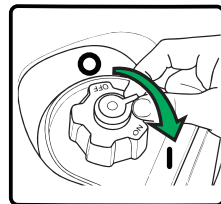
1. Before starting the generator, check for loose or missing parts and for any damage which may have occurred during shipment.
2. Check oil level and fuel.



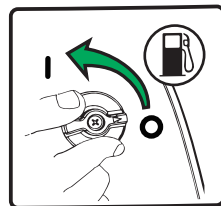
3. Disconnect all electrical loads from the generator. Never start or stop the generator with electrical devices plugged in or turned on.



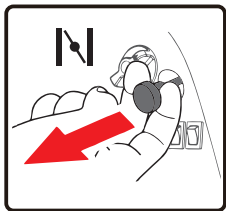
4. Turn the fuel cap vent lever to the "ON" (I) position.



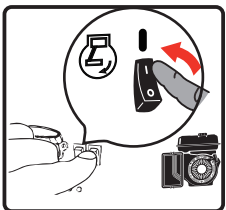
5. Turn the fuel valve to the "ON" (I) position.



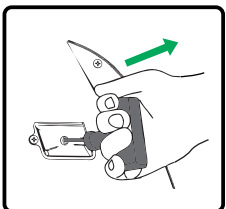
6. Pull the choke lever out to the "START" position.



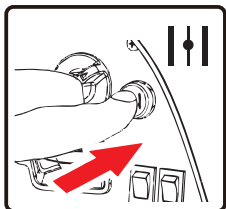
7. Flip the engine switch to the "ON" (I) position.



8. Pull the starter cord slowly until resistance is felt and then pull rapidly.



9. Do not over-choke. As soon as engine starts and warm up, push the choke lever in to the "RUN" position.



10. Allow generator to run at no load for few minutes upon each initial start-up to permit engine and generator to stabilize.

**⚠ WARNING**



Starter cord kickback (rapid retraction) will pull hand and arm toward engine faster than you can let go which could cause broken

bones, fractures, bruises, or sprains resulting in serious injury.

When starting engine, pull cord slowly until resistance is felt and then pull rapidly to avoid kickback.

**NOTE:**

Keep choke lever in "START" position for only 1 pull of the recoil starter. After first pull, move choke lever to the "RUN" position for up to the next 3 pulls of the recoil starter. Too much choke leads to sparkplug fouling/engine flooding due to the lack of incoming air. This will cause the engine not to start.

**NOTE:**

If engine starts after 3 pulls but fails to run, or if unit shuts down during operation, make sure unit is on a level surface and check for proper oil level in crankcase. This unit may be equipped with a low oil protection device. If so, oil must be at proper level for engine to start.

### Connecting Electrical Loads

This unit has been pretested and adjusted to handle its full capacity. Before starting the generator, disconnect all load. Apply load only after generator is running. Voltage is regulated via the engine speed adjusted at the factory for correct output. Readjusting will void warranty.

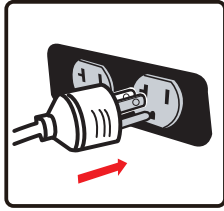
**⚠ CAUTION**

When applying a load, do not exceed the maximum wattage rating of the generator when using one or more receptacles. Also, do not exceed the amperage rating of any one receptacle.

Do not apply heavy electrical load during break-in period (the first five hours of operations).

1. Let engine stabilize and warm up for a few minutes after starting.
2. Ensure circuit breaker on control panel is in on position.
3. Plug in and turn on the desired 120 Volt AC, single phase, 60Hz electrical loads. It is better to attach the item with largest load first.



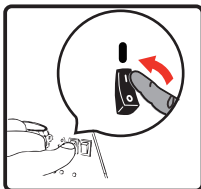


### NOTE:

Connecting a generator to your electric utility company's power lines or to another power source may be against the law. In addition this action, if done incorrectly, could damage your generator and appliances and could cause serious injury or even death to you or a utility worker who may be working on nearby power lines. If you plan to run a portable electric generator during an outage, please notify your electric utility company immediately and remember to plug your appliances directly into the generator. Do not plug the generator into any electric outlet in your home. Doing so could create a connection to the utility company power lines. You are responsible for ensuring that your generator's electricity does not feed back into the electric utility power lines. If the generator will be connected to a building electrical system, consult your local utility company or a qualified electrician. Connections must isolate generator power from utility power and must comply with all applicable laws and codes.

### Economy Control Switch

The Economy Control switch can be activated in order to minimize fuel consumption and noise while operating the unit during times of reduced electrical output, allowing the engine speed to idle during periods of non-use. The engine speed returns to normal when an electrical load is connected. When the economy switch is off, the engine runs at normal speed continuously.



### ⚠ WARNING

For periods of high electrical load or momentary fluctuations, the Economy Control Switch should be turned OFF.

### 12V DC Outlet (Battery Charger)

The 12V DC outlet is ONLY to be used with the supplied 12V battery charging cable. The DC output is unregulated and will damage other 12V DC products.

The amount of current flowing will depend on the charging voltage and battery's state of charge. As the battery becomes more fully charged, the output current to the battery decreases and nearly becomes constant. Taper chargers are intended to be used with the provision that they will be disconnected from the battery after a maximum time on charge. Normally a period of 30 to 120 minutes is sufficient to recharge a weak battery. The charge level of the battery should be checked periodically.

### ⚠ CAUTION

Do not start the vehicle while the battery charging Cable is connected and the generator is running. It will not give the battery a boost of power. The Vehicle or the generator may be damaged. Charge only vented wet lead acid batteries. Other types of batteries may burst, causing personal injury or damage.

### ⚠ WARNING

Storage batteries give off EXPLOSIVE hydrogen gas while charging. Do not allow smoking, open flames, sparks, or spark producing equipment in the area while charging.

### ⚠ WARNING

Battery electrolyte fluid is comprised of sulfuric acid that can be very dangerous and cause severe burns. Do not allow this fluid to contact eyes, skin, clothing, etc. If contact or spillage does occur, flush the area with water immediately.

Do not continue to charge a battery that becomes hot or is fully charged.

1. Before connecting the battery charging cable to a battery that is installed in a vehicle, disconnect the vehicle battery ground cable from the negative (-) battery terminal.

2. Plug the battery charging cable into the DC receptacle of the generator.
3. Connect the red (+) battery charger lead to the red (+) battery terminal.
4. Connect the black (-) battery charger lead to the black (-) battery terminal.
5. Start the generator.

**NOTE:**

When the battery circuit is in use the AC capacity is reduced by 60 watts. Make sure the combined load is within the rated limits.

**⚠ WARNING**

Do not continue to charge a battery that becomes hot or is fully charged.

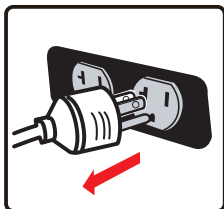
**DC CIRCUIT PROTECTOR**

A DC circuit protector has been provided to protect the circuit from overloads. If an overload occurs, the circuit protector will trip. The circuit protector may be reset by pushing the button of the protector.

Charging a large capacity battery or a totally discharged battery may cause the DC breaker to turn off. In these cases, a separate battery charger unit connected to an AC power source is recommended instead of the DC receptacle on the generator.

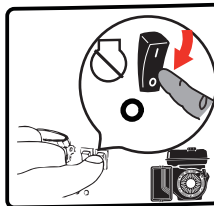
**Stopping the Engine**

1. Turn off and remove entire electrical loads. Never start or stop the generator with electrical devices plugged in or turned on.



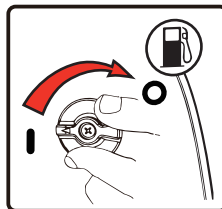
Let the generator run at no-load for two minutes to stabilize internal temperatures of the engine and generator.

2. Press the engine switch to the "OFF" (O) position.

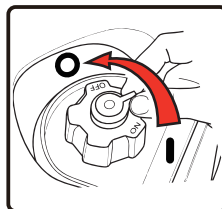


Do not leave the generator until it has completely stopped.

3. Turn the fuel valve to the "OFF" (O) position.



4. Turn the fuel cap vent lever to the "OFF" (O) position.



If a cover is used, do not install until unit has cooled.

**⚠ WARNING**



Fuel and its vapors are extremely flammable and explosive which could cause burns, fire or explosion resulting in death, serious injury and/or property damage.

DO NOT stop engine by moving choke control to "START" position.

**Important:** Always ensure that the Fuel Valve and the Engine Switch are in the "OFF" position when the engine is not in use.

**NOTE:**

If the engine will not be used for a period of two weeks or longer, please see the Storage section for proper engine and fuel storage.

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## Low Oil Shutdown

If the engine oil drops below a preset level, an oil switch will stop the engine. Check oil level with dipstick.

If oil level is between the **LOW** and **HIGH** mark on dipstick:

1. DO NOT try to restart the engine.
2. Contact an Authorized FIRMEN Service Dealer.
3. DO NOT operate engine until oil level is corrected.

If oil level is below the **LOW** mark on dipstick:

1. Add oil to bring level to **HIGH** mark.
2. Restart engine and if the engine stops again a low oil condition may still exist. DO NOT try to restart the engine.
3. Contact an Authorized FIRMEN Service Dealer.
4. DO NOT operate engine until oil level is corrected.

## Do Not Overload Generator

Overloading a generator in excess of its rated wattage capacity can result in damage to the generator and to connected electrical devices.

To prolong the life of your generator and attached devices, follow these steps to add electrical load:

1. Start the generator with no electrical load attached.
2. Allow the engine to run for several minutes to stabilize.
3. Plug in and turn on the first item. It is best to attach the item with the largest load first.
4. Allow the engine to stabilize.
5. Plug in and turn on the next item.
6. Allow the engine to stabilize.
7. Repeat steps 5-6 for each additional item.

## Overload Operation

The overload indicator light will turn on when the load exceeds 1764W (approximately). If the load exceeds 1860W (approximately), the light will blink and cut power to the receptacles in 30 seconds.

## How to Correct

1. Disconnect any electronic devices, and then stop the engine.
2. Reduce the total wattage of connected electronic devices until it is within the generator's rated output.
3. Inspect the Air Inlet and Control Panel for any blockage. Remove blockage if found.
4. Restart Engine.

## Parallel Operation

Two FIRMEN model W01781 generators can be operated in parallel to increase the total available electrical power to 3100 watts.

# MAINTENANCE AND STORAGE

## MAINTENANCE SCHEDULE

ITEM	NOTES	Daily(Before operation)	Initial 25 hours	Every 50 hours	Every 100 hours (or annual)
Spark Plug	Check condition. Adjust gap and clean. Replace if necessary.				✓
Engine Oil	Check oil level.	✓			
	Replace.		✓		✓
Air Filter	Clean, replace if necessary.			✓	
Fuel Filter	Clean fuel filter and fuel tank strainer. Replace if necessary.				✓
Fuel Line	Check fuel hose for cracks or other damage. Replace if necessary.	✓			
Exhaust System	Check for leakage. Retighten or replace gasket if necessary.	✓			
	Check spark arrester screen. Clean/Replace if necessary.				✓
Carburetor	Check choke operation.	✓			
Starting System	Check recoil starter operation.	✓			
Fittings/ Fasteners	Check. Replace if necessary.				✓

### General Recommendations

Regular maintenance will improve the performance and extend the life of the generator. See any authorized dealer for service.

The generator's warranty does not cover items that have been subjected to operator abuse or negligence. To receive full value from the warranty, the operator must maintain the generator as instructed in this manual.

Some adjustments will need to be made periodically to properly maintain your generator.

All service and adjustments should be made at least once each season. Follow the requirements in the Maintenance Schedule chart above.

**Notice** Once a year you should clean or replace the spark plug and replace the air filter. New spark plugs and clean air filter assure proper fuel-air mixture and help your engine run better and last longer.

## ENGINE MAINTENANCE

To prevent accidental starting, remove and ground spark plug wire before performing any service.

### Change Engine Oil

Change engine oil every 100 hours.  
(for a new engine, change oil after 25 hours.)

If you are using your generator under extremely dirty or dusty conditions, or in extremely hot weather, change the oil more often.

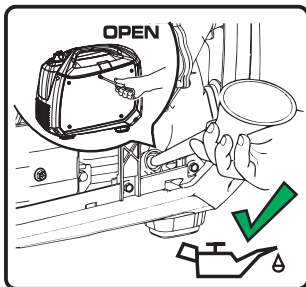
### CAUTION

Avoid prolonged or repeated skin contact with used motor oil.

- Used motor oil has been shown to cause skin cancer in certain laboratory animals.
  - Thoroughly wash exposed areas with soap and water.
- (a) Loosen the cover screws and remove the maintenance cover.
  - (b) Remove the oil filler cap/dipstick.
  - (c) Tilt the generator on its side and allow the oil to drain completely.
  - (d) Fill the engine with oil until it reaches the **HIGH (H)** level on the oil filler cap. **DO NOT OVERFILL.**
  - (e) Reinstall the maintenance cover and tighten the cover screws.
  - (f) Dispose of used oil at an approved waste management facility.

### NOTE:

Please use a container to dump the used oil for protecting the environment.

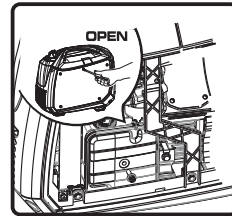


- Use fresh and high quality lubricating oil to the specified quantity.  
If contaminated or deteriorated oil is used or the quantity of the engine oil is not sufficient, the engine damage will result and its life will be greatly shortened.

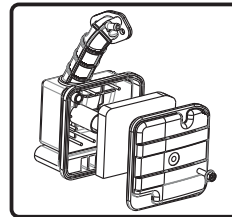
### Air Filter Maintenance

Maintaining an air filter in proper condition is very important. Dirt induced through improperly installed, improperly serviced, or inadequate elements damages and wears out engines. Always keep the element clean.

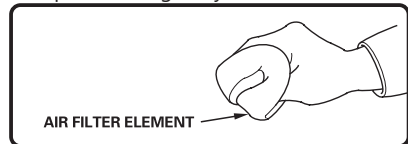
- (a) Remove the maintenance cover and locate the air filter plastic cover.



- (b) Remove the foam element.



- (c) After wetting the element by clean engine oil squeeze it tight by hand.

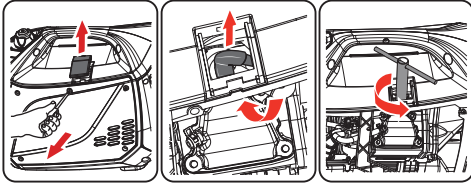


- (d) Put the element in the case and install it securely.
- (e) Reattach the air filter cover.
- (f) Reinstall the maintenance cover and tighten the cover screw securely.

## Spark Plug Maintenance

Changing the spark plug will help your engine to start easier and run better.

(a) Remove the spark plug cover.



(b) Remove the spark plug cable from the spark plug.

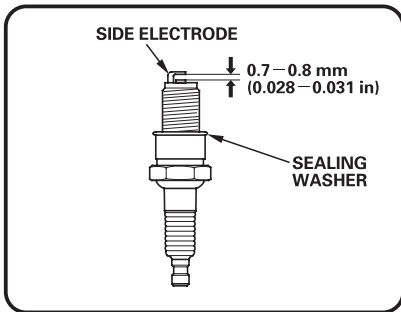
(c) Remove spark plug using provided wrench.

(d) Inspect spark plug for damage and clean with a wire brush before reinstalling.

(e) Adjust the electrode gap to 0.7 to 0.8 mm (0.028" to 0.031").

(f) Seat spark plug in position and thread by hand to prevent cross threading.

(g) Tighten plug with provided wrench and put the cap back on spark plug.



SPARK PLUG: NGK BPR6HS  
Champion RL87YC  
Torch E6RTC or equivalent

## Inspect Muffler and Spark Arrester

Inspect the muffler for cracks, corrosion, or other damage. Remove the spark arrester, if equipped, and inspect for damage or carbon blockage. If replacement parts are required, make sure to use only original equipment replacement parts.

### WARNING



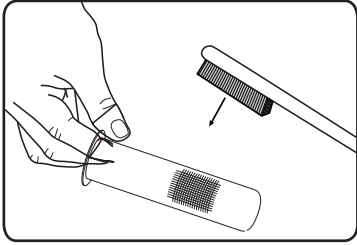
Exhaust heat/gases could ignite combustibles, structures or damage fuel tank causing a fire, resulting in death or serious injury and/or property. Contact with muffler area could cause burns resulting in serious injury.

- **DO NOT** touch hot parts and **AVOID** hot exhaust gases.
- Allow equipment to cool before touching.
- Keep at least 5 feet (1.5 m) of clearance on all sides of generator including overhead.
- Replacement parts must be the same and installed in the same position as the original parts.

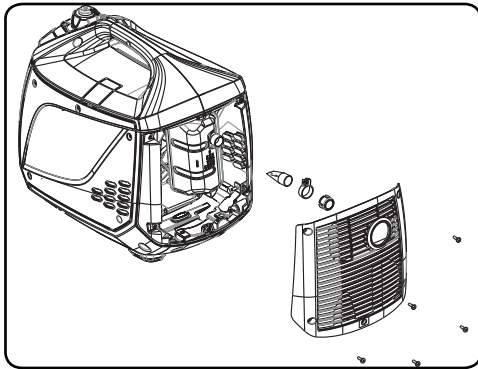
## Clean or replace spark arrester as follows:

Depending on the type fuel used, the type and amount of lubricant used, and/or your operating conditions, the exhaust part and muffler may become blocked with carbon deposits. If you notice power loss, you may need to remove these deposits to restore performance.

1. Allow the engine to cool completely before servicing the spark arrester.
2. Remove 5 screws to remove the muffler cover assembly.
3. Loosen the spark arrester clamp, remove the spark arrester cover, and with a thin blade screwdriver remove the spark arrester.
4. Carefully remove the carbon deposits from the spark arrester screen with a wire brush.



5. Replace the spark arrester if it is damaged.
6. Position the spark arrester in the muffler and attach with the screws.



**⚠ CAUTION**

Failure to clean the spark arrester will result in degraded engine performance.

## GENERATOR MAINTENANCE

Make certain that the generator is kept clean and stored properly. Only operate the unit on a flat, level surface in a clean, dry operating environment. **DO NOT** expose the unit to extreme conditions, excessive dust, dirt, moisture or corrosive vapours.

**⚠ CAUTION**

**DO NOT** use a garden hose to clean the generator. Water can enter the generator through the cooling slots and damage the generator windings.

Use a damp cloth to clean exterior surfaces of the generator.

Use a soft bristle brush to remove dirt and oil.

Use an air compressor (25 PSI) to clear dirt and debris from the generator.

Inspect all air vents and cooling slots to ensure that they are clean and unobstructed.

## SERVICE AND STORAGE

### Infrequent Service

If the unit is used infrequently, difficult starting may result. To eliminate hard starting, follow these instructions:

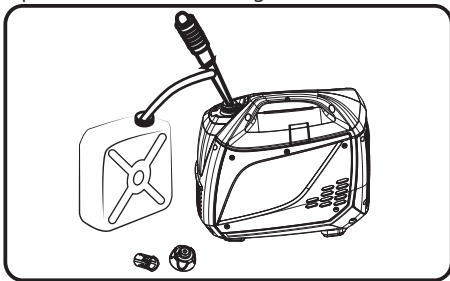
1. Run the generator at least 30 minutes every month.
2. Run the generator, then close the fuel shut-off valve and allow the unit to run until the engine stops.
3. Move the engine switch to the "OFF" position.

### Long Term Storage

When the generator set is not being operated or is being stored more than one month, follow these instructions:

1. Replenish engine oil to upper level.
2. Run the generator, then close the fuel shut-off valve and allow the unit to run until the engine stops.
3. Move the engine switch to the "OFF" position.
4. After the unit has cooled, drain gasoline from fuel tank, fuel line and carburetor.

- Turn the fuel valve to the "OFF"(O) position.
- Remove fuel cap and fuel tank filter.
- Use a siphon to transfer gasoline from generator into a gasoline approved container. Wipe up any spilled fuel with a clean rag.



- Start generator engine and let it run until it stops and all remaining fuel is consumed. Do not connect electronic devices to generator during this process.
- Remove maintains cover screws, then remove maintains cover.
- Drain fuel from carburetor by loosening the drain screw on the carburetor float chamber.

- Turn the fuel valve to the "OFF"(O) position.
  - Tighten the drain screw. Install the maintains cover and tighten screws.
  - When the engine has completely cooled down turn the Fuel Cap Air Vent to the "OFF" position.
5. Pour about one teaspoon of engine oil through the spark plug hole, pull the recoil starter several times and replace the plug. Then pull the starter until you feel the piston is on its compression stroke and leave it in that position. This closes both the intake and exhaust valves to prevent the inside of the cylinder from rusting.
  6. Cover the unit and store in a clean, dry place that is well ventilated away from open flame or sparks.

**NOTE:** We recommend always using a fuel stabilizer. A fuel stabilizer will minimize the formulation of fuel gum deposits during storage. The fuel stabilizer can be added to the gasoline in the fuel tank, or into the gasoline in a storage container.

### NEVER USE WATER TO CLEAN GENERATOR.

- Pull starter handle until resistance is felt, leaving handle in that position.
- Store generator in a well ventilated, low humidity area.

### WARNING

Generator exhaust contains odourless and colourless carbon monoxide gas.

To avoid accidental or unintended ignition of your generator during periods of storage, the following precautions should be followed: When storing the generator for short or extended periods of time make sure that the Engine Switch and the Fuel Valve are set in the OFF position.

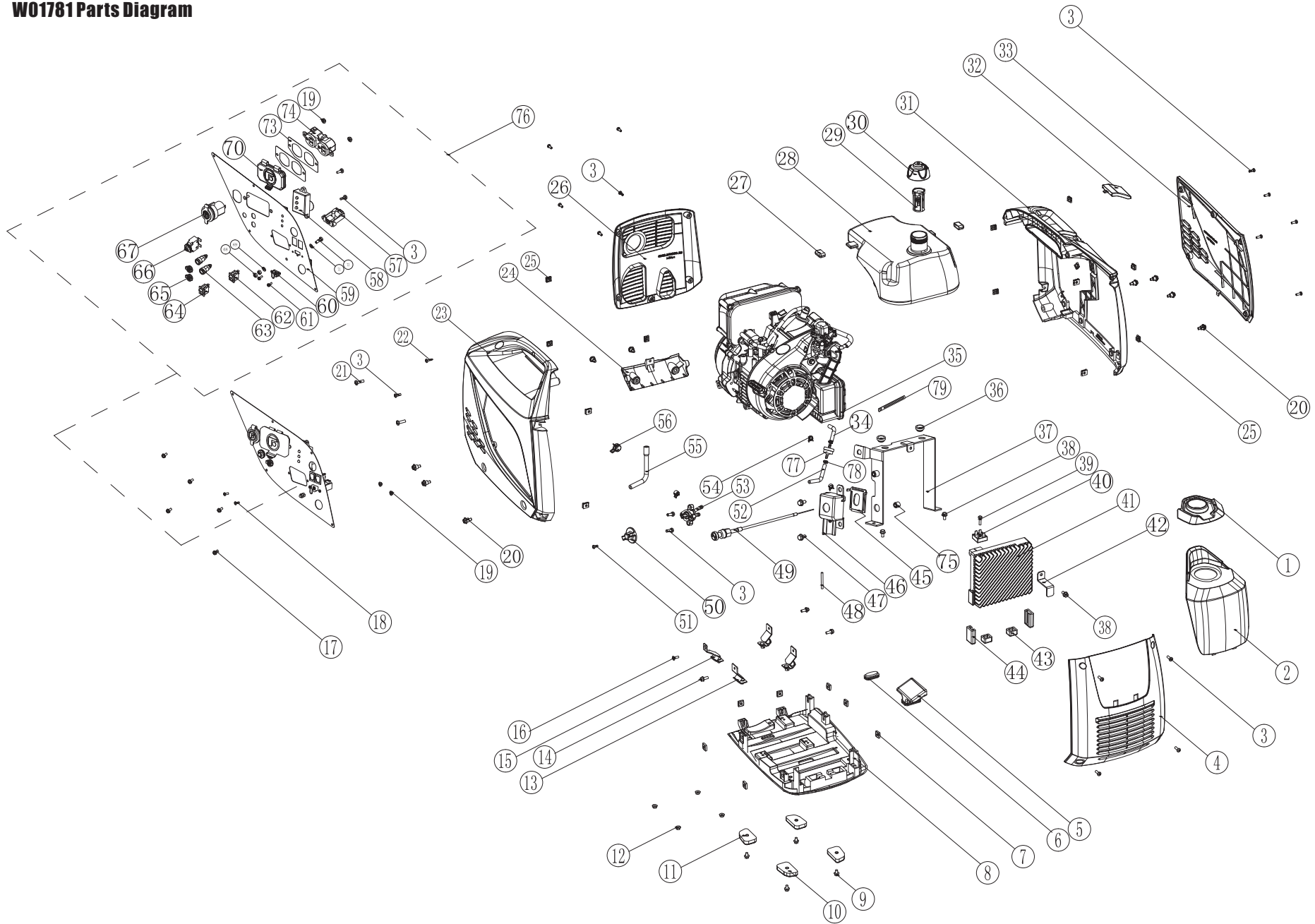


## TROUBLE SHOOTING

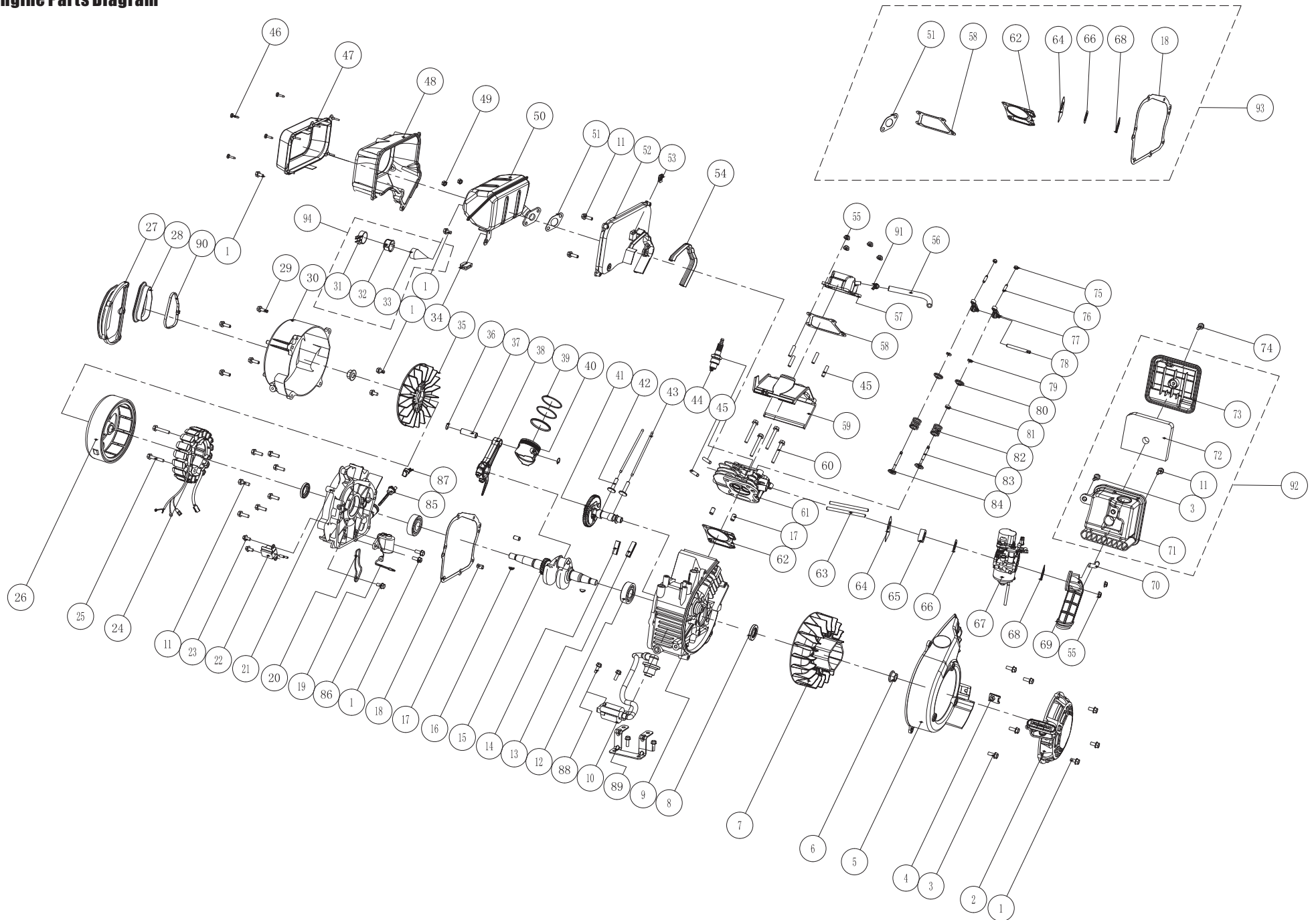
Problem	Cause	Correction
<b>Engine is running, but no AC output is available.</b>	<ol style="list-style-type: none"> <li>1. Circuit breaker is open.</li> <li>2. Fault in generator.</li> <li>3. Poor connection or defective cord set.</li> <li>4. Connected device is bad.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reset circuit breaker.</li> <li>2. Contact authorized service facility.</li> <li>3. Check and repair.</li> <li>4. Connect another device that is in good condition.</li> </ol>
<b>Engine runs good at no-load but "bogs down" when loads are connected.</b>	<ol style="list-style-type: none"> <li>1. Short circuit in a connected load.</li> <li>2. Engine speed is too slow.</li> <li>3. Generator is overloaded.</li> <li>4. Shorted generator circuit.</li> <li>5. Clogged or dirty fuel filter.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disconnect shorted electrical load.</li> <li>2. Contact authorized service facility.</li> <li>3. See Don't Overload Generator</li> <li>4. Contact authorized service facility.</li> <li>5. Clean or replace fuel filter.</li> </ol>
<b>Engine will not start; starts and runs rough or shuts down when running.</b>	<ol style="list-style-type: none"> <li>1. Engine switch set to OFF (O) position.</li> <li>2. Fuel shutoff lever is in OFF (O) position.</li> <li>3. Low oil level.</li> <li>4. Dirty air cleaner.</li> <li>5. Out of fuel.</li> <li>6. Stale fuel.</li> <li>7. Spark plug wire not connected to spark plug.</li> <li>8. Bad spark plug.</li> <li>9. Water in fuel.</li> <li>10. Flooded.</li> <li>11. Excessively rich fuel mixture.</li> <li>12. Intake valve stuck open or closed.</li> <li>13. Engine has lost compression.</li> <li>14. Clogged or dirty fuel filter.</li> </ol>	<ol style="list-style-type: none"> <li>1. Set engine switch to ON (I) position.</li> <li>2. Move fuel shutoff lever to ON (I) position.</li> <li>3. Fill crankcase to proper level or place generator on level surface.</li> <li>4. Clean or replace air cleaner.</li> <li>5. Fill fuel tank.</li> <li>6. Drain fuel tank and carburetor; fill with fresh fuel.</li> <li>7. Connect wire to spark plug.</li> <li>8. Replace spark plug.</li> <li>9. Drain gas tank and carburetor; fill with fresh fuel.</li> <li>10. Wait 5 minutes and re-crank engine.</li> <li>11. Contact authorized service facility.</li> <li>12. Contact authorized service facility.</li> <li>13. Contact authorized service facility.</li> <li>14. Clean or replace fuel filter.</li> </ol>
<b>Engine lacks power.</b>	<ol style="list-style-type: none"> <li>1. Load is too high.</li> <li>2. Dirty air filter.</li> <li>3. Clogged or dirty fuel filter.</li> <li>4. Clogged spark arrester.</li> </ol>	<ol style="list-style-type: none"> <li>1. Don't Overload Generator</li> <li>2. Replace air filter.</li> <li>3. Clean or replace fuel filter.</li> <li>4. Clean or replace spark arrester.</li> </ol>
<b>Engine "hunts" or falters.</b>	<ol style="list-style-type: none"> <li>1. Carburetor is running too rich or too lean.</li> <li>2. Clogged or dirty fuel filter.</li> </ol>	<ol style="list-style-type: none"> <li>1. Contact authorized service facility.</li> <li>2. Clean or replace fuel filter.</li> </ol>
<b>Engine shuts down when running.</b>	<ol style="list-style-type: none"> <li>1. Out of fuel.</li> <li>2. Dirty air cleaner.</li> <li>3. Low oil level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill fuel tank.</li> <li>2. Clean or replace air cleaner.</li> <li>3. Fill crankcase to proper level or place generator on level surface.</li> </ol>

# PARTS DIAGRAM AND PARTS LIST

## W01781 Parts Diagram



# 80cc Engine Parts Diagram



## W01781 Parts List

NO.	Part Number	Description	Qty.	NO.	Part Number	Description	Qty.
1	317713500	Fuel Guide	1	51	317713550	Screw M4×10	1
2	317713501	Cover, Top	1	52	317713574	Fuel Hose 2	1
3	317713502	Screw M5×14	17	53	317713552	Fuel Valve	1
4	317713503	Right Side Cover Assy	1	54	317713553	Clamp 1	3
5	317713504	Passage way,Air Cleaner	1	55	317713554	Fuel Hose 4	1
6	317713505	Passageway,Electric Machinery	1	56	317713555	Clamp 2	1
7	317713506	Nut M6	9	57	317713556	USB 5V 2.1A	2
8	317713507	Base Assy	1	58	317713557	LED Indicator Assy.	1
9	317713508	Bolt M6×12	4	59	317718301	Control Panel	1
10	317713509	Base Mounting A	2	60	317713559	Outlet Cover(USB)	1
11	317713510	Base Mounting B	2	61	317713560	Screw M3×10	2
12	317713511	Nut M6	4	62	317718303	Engine Switch	1
13	317713512	Isolator A	3	63	317713562	Parallel Ports	2
14	317713513	Bolt M6×15	3	64	317718305	Economic Switch	1
15	317713514	Isolator B	1	65	317713563	Parallel Ports Cover	2
16	317713515	Screw M6×15	1	66	317713564	DC Circuit Breaker 5A	1
17	317713516	Screw M4×14	7	67	317713565	DC Outlet	1
18	317713517	Screw M4×10	2	68	317713566	Nut M5	2
19	317713518	Nut M4	4	69	317713567	Flat Washer Φ5	1
20	317713519	Bolt M6	9	70	317713568	Outlet Cover 5-20R	1
21	317713520	Screw M6×20	2	71	317713569	Serrated Lock Washers Internal Teeth 5	1
22	317713521	Screw St4.8×17	1	72	317713570	Bolt M5×14	1
23	317713522	Front Cover Assy	1	73	317713571	Insulating Paper	2
24	317713523	Left Side Bridge	1	74	317713572	Receptacle 5-20R Duplex	1
25	317713524	Nut M5	13	75	317718302	Spacer	1
26	317713525	Left Side Cover Assy	1	76	317418300	Control Panel Assy	1
27	317713526	Mounting, Fuel Tank	2	77	317713575	Fuel Filter	1
28	317713527	Fuel Tank Assy	1	78	317713576	Clamp 3	2
29	317713528	Fuel Filter	1	79	317713577	Clip	1
30	317713529	Fuel Tank Cap Comp	1				
31	317713530	Maintenance Cover Holder	1				
32	317713531	Spark Plug Access Cover	1				
33	317713532	Maintenance Cover	1				
34	317713573	Fuel Hose 1	1				
35	317713534	Engine	1				
36	317713535	Buffer	2				
37	317713536	Bracket, Fuel Tank	1				
38	317713537	Bolt M6×12	3				
39	317713538	Bolt M5×20	1				
40	317713539	Diode Bridge	1				
41	317713540	Control Module	1				
42	317713541	Clip Control Module	1				
43	317713542	Mounting Control Module	2				
44	317713543	Rubber Control Module	2				
45	317713544	Fuel Valve Cap	1				
46	317713545	Fuel Valve Box	1				
47	317718304	Flange Bolt M6×20	2				
48	317713547	Fuel Hose 3	1				
49	317713548	Chock Cable Assy.	1				
50	317718300	Fuel Valve Knob	1				

