

# OPERATION MANUAL



## **MODEL GA-9.7HEA PORTABLE GENERATOR (HONDA GX630RVD GASOLINE ENGINE)**

Revision #2 (03/03/22)



**THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.**

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**PROPOSITION 65 WARNING**

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**GA-9.7HEA  
60 Hz Portable Generator**

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**NOTICE**

Specifications and part numbers are subject to change without notice.

# NAMEPLATE/SAFETY INFORMATION

## NAMEPLATE AND SAFETY LABELS

Safety labels are attached to the generator as shown in Figure 1. Keep these safety labels clean at all times. When the safety labels become worn or damaged, contact Discount-equipment.

### NOTICE

For safety label part numbers, reference the parts section of this manual.

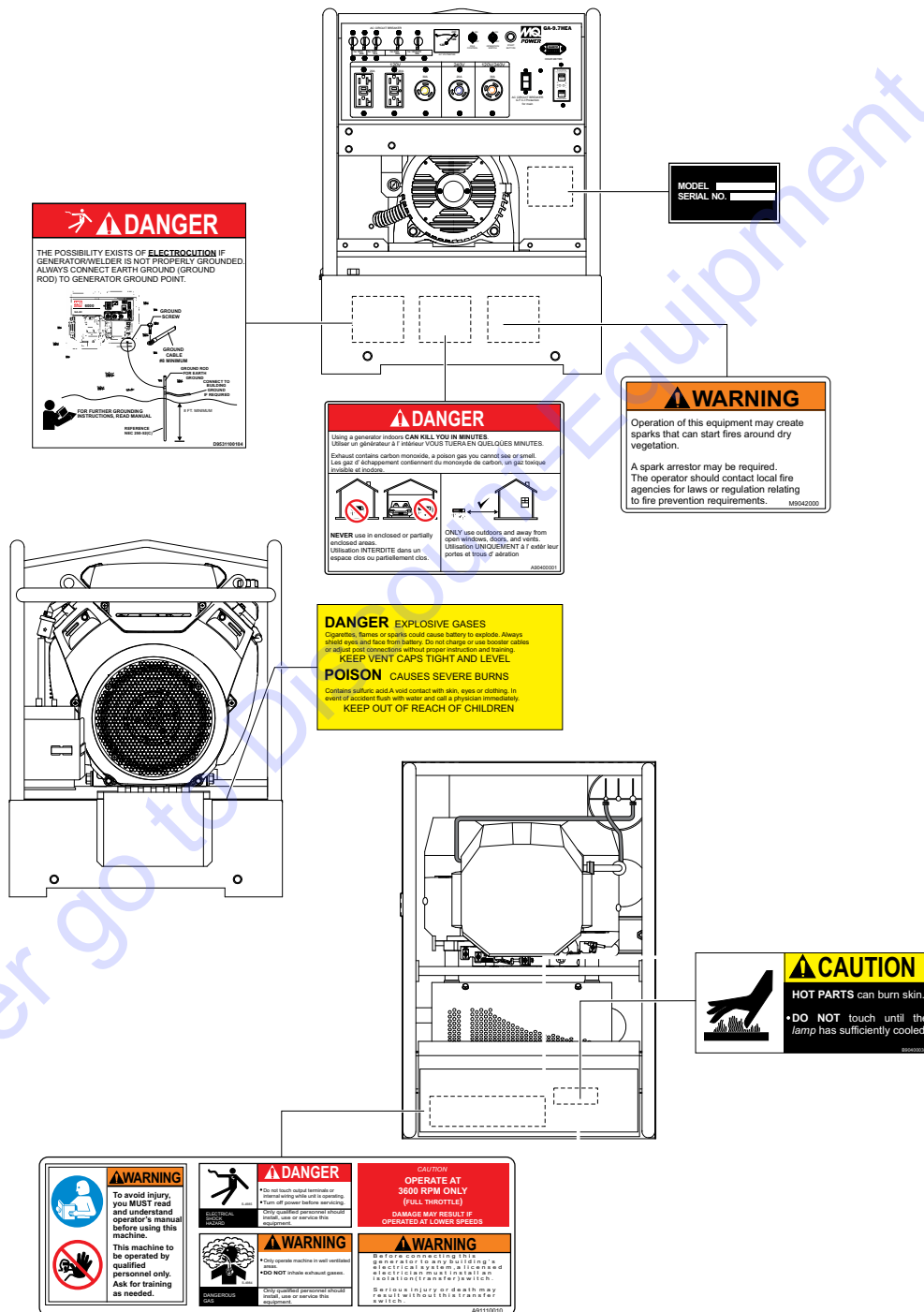


Figure 1. Nameplate And Safety Decals

# SAFETY INFORMATION

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.

## SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER**, **WARNING**, **CAUTION** or **NOTICE**.

## SAFETY SYMBOLS

**⚠ DANGER**

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY**.

**⚠ WARNING**

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY**.






**⚠ CAUTION**

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY**.

**NOTICE**

Addresses practices not related to personal injury.

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Overspeed hazards
	Electric shock hazards

# SAFETY INFORMATION

## GENERAL SAFETY

### CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.
- **NEVER** operate this equipment under the influence of drugs or alcohol.



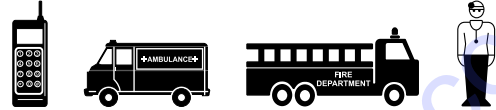
- **ALWAYS** check the equipment for loosened threads or bolts before starting.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

### NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- **ALWAYS** know the location of the nearest fire extinguisher.
- **ALWAYS** know the location of the nearest first aid kit.



- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance, doctor** and **fire department**. This information will be invaluable in the case of an emergency.



## GENERATOR SAFETY

### DANGER

- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death**.



### WARNING

- **NEVER** disconnect any **emergency or safety devices**. These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.

### CAUTION

- **NEVER** lubricate components or attempt service on a running machine.

### NOTICE

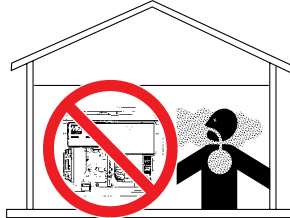
- **ALWAYS** ensure generator is on level ground before use.
- **ALWAYS** keep the machine in proper running condition.
- Fix damage to machine and replace any broken parts immediately.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel

# SAFETY INFORMATION

## ENGINE SAFETY

### DANGER

- The engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled.
- The engine of this equipment requires an adequate free flow of cooling air. **NEVER** operate this equipment in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.



### WARNING

- **NEVER** operate the engine with heat shields or guards removed.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the engine crankcase and severely scald any persons in the general area of the generator.

### CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.



### NOTICE

- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable.
- State Health Safety Codes and Public Resources Codes specify that in certain locations, spark arresters must be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed

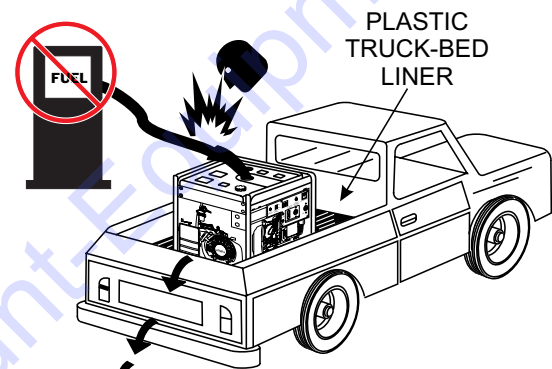


to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose. In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

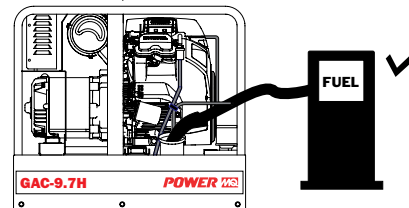
## FUEL SAFETY

### DANGER

- **DO NOT** add fuel to equipment if it is placed inside truck bed with plastic liner. Possibility exists of explosion or fire due to static electricity.



PLASTIC TRUCK-BED LINER



- **DO NOT** start the engine near spilled fuel or combustible fluids. Diesel fuel is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with **flammable** liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.



# SAFETY INFORMATION

- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.



## ELECTRICAL SAFETY

### DANGER

- Turn generator and all circuit breakers **OFF** before performing maintenance on the generator or making contact with output receptacles.

- **NEVER** insert any objects into the output receptacles during operation. This is extremely dangerous. The possibility exists of **electrical shock, electrocution or death.**



- Backfeed to a utility system can cause **electrocution** and/or property damage. **NEVER** connect the generator to a building's electrical system without a transfer switch or other approved device. All installations should be performed by a **licensed electrician** in accordance with all applicable laws and electrical codes. Failure to do so could result in electrical shock or burn, causing **serious injury or even death.**



## Power Cord/Cable Safety

### DANGER

- **NEVER** let power cords or cables **lay in water.**
- **NEVER stand in water** while AC power from the generator is being transferred to a load.
- **NEVER** use **damaged** or **worn** cables or cords when connecting equipment to generator. Inspect for cuts in the insulation.
- **NEVER** grab or touch a live power cord or cable with wet hands. The possibility exists of **electrical shock, electrocution or death.**



- Make sure power cables are securely connected to the generator's output receptacles. Incorrect connections may cause electrical shock and damage to the generator.

### NOTICE

- **ALWAYS** make certain that proper power or extension cord has been selected for the job. See Cable Selection Chart in this manual.

## Grounding Safety

### DANGER

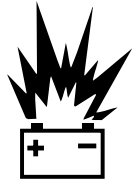
- **ALWAYS** make sure that electrical circuits are properly grounded to a suitable earth ground (ground rod) per the National Electrical Code (NEC) and local codes before operating generator. **Severe injury or death by electrocution** can result from operating an ungrounded generator.

- **NEVER** use gas piping as an electrical ground.

## BATTERY SAFETY (ELECTRIC START ONLY)

### DANGER

- **DO NOT** drop the battery. There is a possibility that the battery will explode.
- **DO NOT** expose the battery to open flames, sparks, cigarettes, etc. The battery contains combustible gases and liquids. If these gases and liquids come into contact with a flame or spark, an explosion could occur.
- **DO NOT** charge battery if frozen. Battery can explode. When frozen, warm the battery to at least 61°F (16°C).



### WARNING

- **ALWAYS** wear safety glasses when handling the battery to avoid eye irritation. The battery contains acids that can cause injury to the eyes and skin.
- Use well-insulated gloves when picking up the battery.
- **ALWAYS** keep the battery charged. If the battery is not charged, combustible gas will build up.
- **ALWAYS** recharge the battery in a well-ventilated environment to avoid the risk of a dangerous concentration of combustible gasses.



# SAFETY INFORMATION

- If the battery liquid (dilute sulfuric acid) comes into contact with **clothing or skin**, rinse skin or clothing immediately with plenty of water.
- If the battery liquid (dilute sulfuric acid) comes into contact with **eyes**, rinse eyes immediately with plenty of water and contact the nearest doctor or hospital to seek medical attention.

## CAUTION

- **ALWAYS** disconnect the **NEGATIVE** battery terminal before performing service on the generator.
- **ALWAYS** keep battery cables in good working condition. Repair or replace all worn cables.

## TRANSPORTING SAFETY

### CAUTION

- **NEVER** allow any person or animal to stand underneath the equipment while lifting.

### NOTICE

- Before lifting, make sure that the equipment parts (lifting bail if equipped) are not damaged and screws are not loose or missing.
- Always make sure crane or lifting device has been properly secured to the lifting bail (hook) of the equipment.
- **ALWAYS** shutdown engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- Use adequate lifting cable (wire or rope) of sufficient strength.
- Use one point suspension hook and lift straight upwards.
- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** tie down equipment during transport by securing the equipment with rope.

## ENVIRONMENTAL SAFETY/DECOMMISSIONING

### NOTICE

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement), be sure to follow rules below.

- **DO NOT** pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.



- When the life cycle of this equipment is over, remove battery (if equipped) and bring to appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- When the life cycle of this equipment is over, it is recommended that the unit frame and all other metal parts be sent to a recycling center.

Metal recycling involves the collection of metal from discarded products and its transformation into raw materials to use in manufacturing a new product.

Recyclers and manufacturers alike promote the process of recycling metal. Using a metal recycling center promotes energy cost savings.

## EMISSIONS INFORMATION

### NOTICE

The gasoline engine used in this equipment has been designed to reduce harmful levels of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx) contained in gasoline exhaust emissions.

This engine has been certified to meet US EPA Evaporative emissions requirements in the installed configuration.

Attempting to modify or make adjustments to the engine emission system by unauthorized personnel without proper training could damage the equipment or create an unsafe condition.

Additionally, modifying the fuel system may adversely affect evaporative emissions, resulting in fines or other penalties.

### Emission Control Label

The emission control label is an integral part of the emission system and is strictly controlled by regulation(s).

The label must remain with the engine for its entire life.

If a replacement emission label is needed, please contact Discount-equipment.

## SPECIFICATIONS (GENERATOR)

Table 1. Specifications (Generator)		
<b>AC Generator 60 Hz AC Power Source</b>	Model	GA9.7HEA
	Type	Brushless Revolving Field Type
	Excitation	Solid State, Statically Excited System
	Speed	3,600 RPM
	Cooling System	Self-Ventilation
	Max Power Output	9.7 kW
	Continuous Power Output	8.4 kW
	Rated Voltage	120/240V
	Current Max/Continuous (120V)	80.8/70 amps
	Current Max/Continuous (240V)	40.4/35 amps
	Phase	Single Phase (3 wire)
	Frequency	60 Hz
	Power Factor	1
Fuel Capacity	10 gallons (38 liters)	
<b>Battery</b>	12V (28 Amp), CCA 280	
<b>Battery Dimensions (L x W x H)</b>	7.50 X 5.0 X 7.25 in. (190 X 127 X 184 mm)	
<b>Generator Dimensions (L x W x H)</b>	31.50 X 21.25 X 27.5 in. (800 X 540 X 700 mm)	
<b>Dry Net Weight</b>	342 lbs. (155 kg.)	
<b>Weight with Fuel</b>	408 lbs. (185 kg.)	

### NOTICE

In keeping with Multiquip's policy of constantly improving its products, the specifications quoted herein are subject to change without prior notice.

## SPECIFICATIONS (ENGINE)

<b>Table 2. Specifications (Engine)</b>		
<b>Engine</b>	<b>Model</b>	<b>HONDA GX630RVD</b>
	Type	Air-cooled 4 stroke, OHV 90° V-Twin, Horizontal Shaft Gasoline Engine
	Bore X Stroke	3.07 in. X 2.83 in. (78 mm X 72 mm.)
	Displacement	42.0 cu-in (688 cm <sup>3</sup> )
	Max Output	20.8 H.P./3600 R.P.M.
	Fuel	Unleaded Automobile Gasoline
	Lube Oil Capacity	2.00 quarts (1.9 liters)
	Oil Alert System	Yes
	Speed Control Method	Centrifugal Fly-weight Type
	Starting Method	Electric Start/Recoil
<b>Dimensions (L x W x H)</b>	15.94 X 16.14 X 17.24 in. (405 X 410 X 438 mm)	
<b>Dry Net Weight</b>	98 lbs. (44.4 kg.)	

### Effects of Altitude and Heat

The maximum output of the engines listed above are applicable to supplying electrical power for continuous service at ambient conditions in accordance with SAE Test cord J607. The above ambient conditions are at standard sea level, with a barometric reading of 29.92 inches and a temperature of 60° F (15.5° C).

Generally, the engine's output power will decrease 3-1/2% for each 1000 feet (305 meters) of altitude above sea level, and 1% for each 10° F (-12.2° C) above the standard temperature of 60° F (15.5° C).

# DIMENSIONS

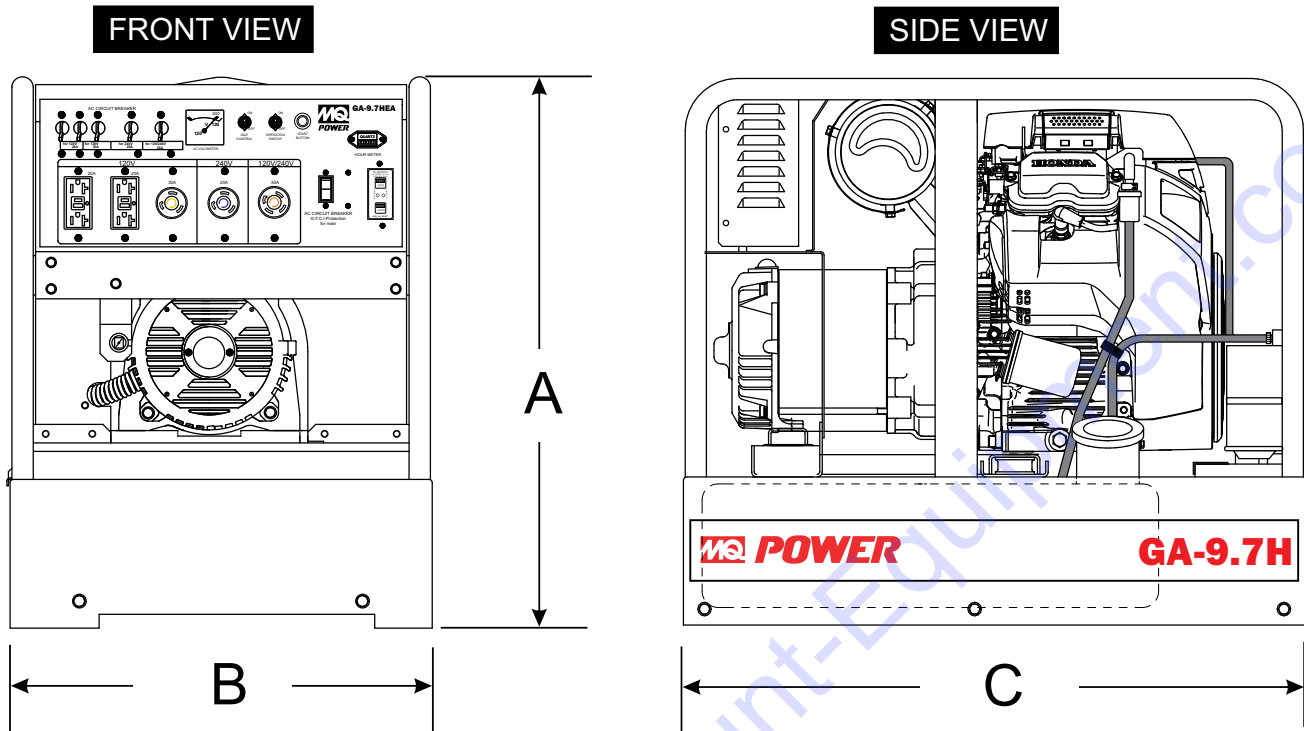


Figure 2. Dimensions

Table 3. Generator Dimensions		
REFERENCE LETTER	DESCRIPTION	DIMENSIONS: IN. (MM)
A	HEIGHT	27.50 (700)
B	WIDTH	21.25 (540)
C	LENGTH	31.50 (800)

# INSTALLATION

## CONNECTING THE GROUND

Consult with local Electrical and Safety Codes for proper connection based on condition of use.

### EXAMPLE of how to ground the unit if the condition of use requires such a device:

The ground terminal on the generator should always be used to connect the generator to a suitable ground when required.

The ground cable should be #8 size wire (aluminum) minimum. If copper wire is used, #10 size wire minimum should be used.

Connect one end of the ground cable terminal to the generator ground point (Figure 3). Connect the other end of the ground cable to a suitable earth ground (ground rod).

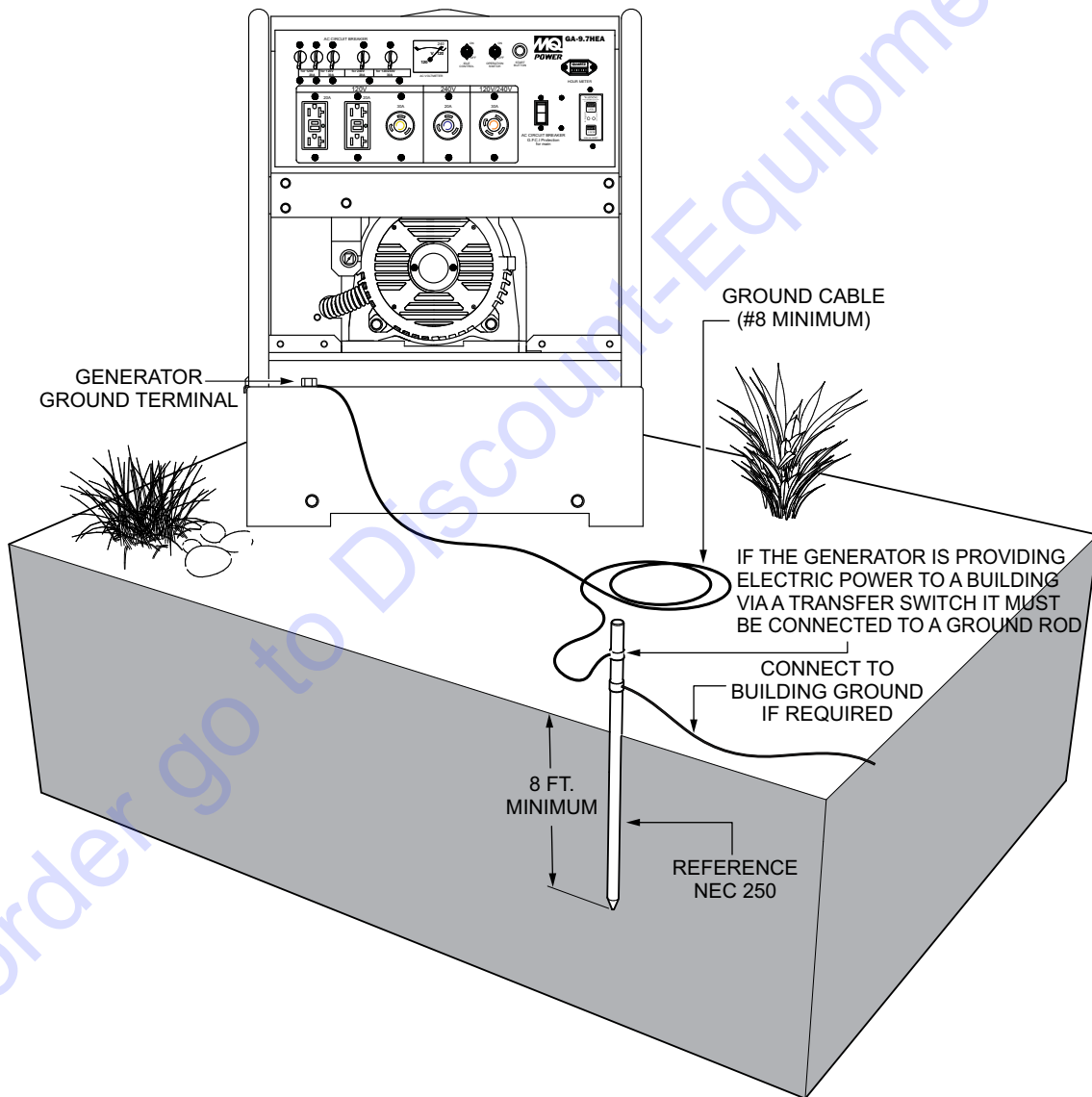


Figure 3. Generator Grounding



## OUTDOOR INSTALLATION

If possible install the generator in a area that is free of debris, bystanders, and overhead obstructions. Make sure the generator is on secure level ground so that it cannot slide or shift around.

The installation site must be relatively free from moisture and dust. All electrical equipment should be protected from excessive moisture. Failure to do so will result in deterioration of the insulation and will result in short circuits and grounding.

Foreign materials such as dust, sand, lint and abrasive materials have a tendency to cause excessive wear to engine and alternator parts.

### WARNING



Pay close attention to ventilation when operating the generator inside tunnels and caves. The engine exhaust contains noxious elements. Engine exhaust must be routed to a ventilated area.

## INDOOR INSTALLATION

Exhaust gases from gas engines are extremely poisonous. Whenever an engine is installed indoors the exhaust fumes must be vented to the outside. The engine should be installed at least two feet from any outside wall. Using an exhaust pipe which is too long or too small can cause excessive back pressure which will cause the engine to heat excessively and possibly burn the valves.

## PLACEMENT

The generator should always be placed on a flat level surface when it is running. **DO NOT** place the generator on slopes, the possibility exists that the generator could slide.

### DANGER



An electric shock is apt to happen when vibrators are used. Pay close attention to handling when operating vibrators and always use rubber boots and gloves to insulate the body from a short circuit.

## GENERATOR GROUNDING

### NOTICE

The Occupational Safety and Health Administration (OSHA) and the National Electrical Code (NEC) recommend that if the generator is providing electrical power to a structure, (home, office shop, trailer or similar) it **must** be connected to a grounding electrode system, such as a driven ground rod (Figure 3).

If applicable, to guard against electrical shock and possible damage to the generator, it is important to provide a good **EARTH** ground (Figure 3).

### NOTICE

**ALWAYS** check with State, Province, District and Municipalities for electrical grounding requirements before using generator.

Article 250 (Grounding) of the NEC handbook provides guidelines for proper grounding and specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

NEC article 250 specifies the following grounding requirements:

1. Use one of the following wire types to connect the generator to earth ground.
  - a. Copper 10 AWG (5.3 mm<sup>2</sup>) or larger.
  - b. Aluminum 8 AWG (8.4 mm<sup>2</sup>) or larger.
2. When grounding of the generator (Figure 3) is required, connect one end of the ground cable to the ground lug on the generator. Connect the other end of the ground cable to the ground rod (earth ground).
3. NEC article 250 specifies that the earth ground rod should be buried a minimum of 8 ft. into the ground.

### NOTICE

When connecting the generator to any building's electrical system **ALWAYS** consult with a licensed electrician.



## FAMILIARIZATION

### Generator

The Multiquip GA9.7HEA generator is designed as a portable dual purpose power source for 60 Hz (single phase) lighting facilities, power tools, submersible pumps and other industrial and construction machinery.

The generator is mounted on rubber vibration isolators that have a steel base backplate which is attached to the protective steel pipe carrying frame. The protective carrying frame is made of steel tubing and fully wraps around the generator to protect against damage. See Figures 3, and 4 for the basic controls and indicators for the GA9.7HEA generator.

This portable generator is supplied with a electrical control box. To reduce vibration caused by the engine, the control box is also placed on rubber isolators.

### Control Box

The control box is provided with the following:

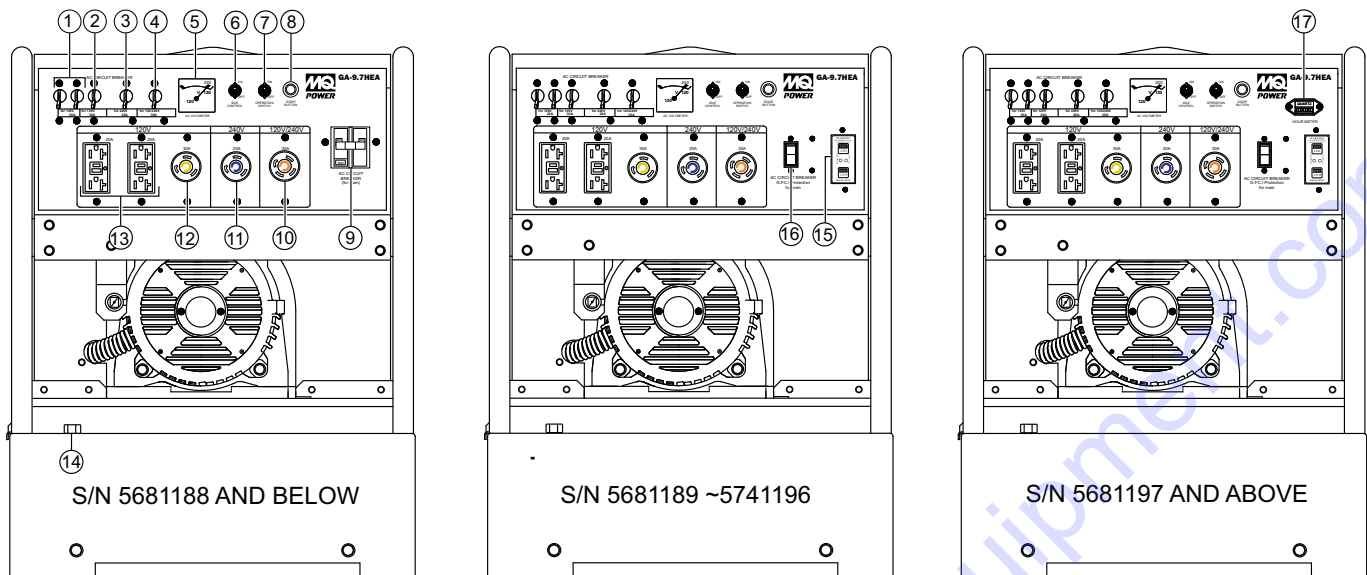
- 120/240V twist-lock output receptacle (single phase)
- 240V twist-lock receptacle (single phase)
- 120V GFCI single phase duplex output receptacles
- 40 Amp Main CB, 2-Pole (S/N 5681188 and below)
- 35 Amp Main CB, 2-pole (S/N 5681189 and above)
- Two 20 Amp GFCI Circuit Breakers (1-pole)
- 30 Amp Circuit Breaker (1-pole)
- 20 Amp Circuit Breaker (2-pole)
- 30 Amp Circuit Breaker (2-pole)
- AC Voltmeter
- Idle Control Switch
- Operation Switch
- Start Switch
- Hour Meter (S/N 5681197 and above)
- GFCI Sensing Module (S/N 5681189 and above)

### DANGER

Before connecting this generator to any building's electrical system, a licensed electrician must install an isolation (transfer) switch.

Serious injury or death may result without this transfer switch.

# COMPONENTS (GENERATOR)



**Figure 4. Generator Components**

1. **GFCI Breakers (2)** – These single pole circuit breakers (120V, 15 amps) protect the GFCI receptacles. When starting the generator, always have these circuit breakers placed in the "OFF" position.
2. **30 Amp Breaker** – Single pole 30 amp circuit breaker protects the 120V twist-lock receptacle. When starting the generator, always have this circuit breaker placed in the "OFF" position.
3. **20 Amp Breaker** – 2-pole 20 amp circuit breaker protects the 240V twist-lock receptacle. When starting the generator, always have this circuit breaker placed in the "OFF" position.
4. **30 Amp Breaker** – 2-pole 30 amp circuit breaker protects the 120/240V twist-lock receptacle. When starting the generator, always have this circuit breaker placed in the "OFF" position.
5. **AC-Voltmeter** – This voltmeter indicates (with a mark) the rated 60 Hz (single-phase) output voltage. In addition, the voltmeter can also be used as a diagnostic tool. If the voltmeter indicator (needle) is below the rated voltage, engine problems may exist (low/high RPM's). To prevent damage to the generator or power tools, turn the generator **OFF** and consult Discount-equipment.
6. **Idle Control Switch** – The generator is provided with an automatic idle control device for noise suppression and reduced fuel consumption. The automatic idle control automatically engages under a no-load condition. With the automatic idle control switched "ON", the engine revolutions will automatically drop to about 2600 rpm (low-speed operation) within 3 seconds after the load stops. When the operation is resumed, the engine speed is automatically increased to about 3600 rpm (high-speed operation) as soon as the load is connected.
7. **Operation Switch** – Place switch in the "ON" position (up) for normal operation. To turn off the generator, place the operation switch in the "OFF" position (down).
8. **Start Button** – Press this pushbutton switch to start the generator.
9. **Main Breaker** – 2-pole 40 amp circuit breaker protects the generator from short circuiting or overloading. When starting the generator always have this circuit breaker placed in the "OFF" position. Used on S/N 5681188 and below.

## COMPONENTS (GENERATOR)

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10. **120/240V Output Receptacle** – NEMA L14-30R twist-lock receptacle will provide 120/240V, 30 amps, 60 Hz.
11. **240V Output Receptacle** – NEMA L6-20R twist-lock receptacle will provide 240V, 20 amps, 60 Hz.
12. **120V Output Receptacle** – NEMA L5-30R twist-lock receptacle will provide 120V, 30 amps, 60 Hz.
13. **GFCI Duplex Receptacle** – NEMA 5-20R, GFCI receptacle will provide 120V, 20 amps.
14. **Ground Terminal** – This ground connection point should be connected to a good earth ground (ground rod).
15. **GFCI Sensing Module** – Interrupts power when a ground fault exist. Used on S/N 5681189 and above.
16. **Main Breaker** – This 2-pole, 35 amp circuit breaker protects the generator from short circuiting or overloading. When starting the generator always have the circuit breaker placed in the "OFF" position. Used on S/N 5681189 and above.
17. **Hour Meter** – Indicates the number of hours the generator has been in use. Used on S/N 5681197 and above.

## COMPONENTS (GENERATOR)

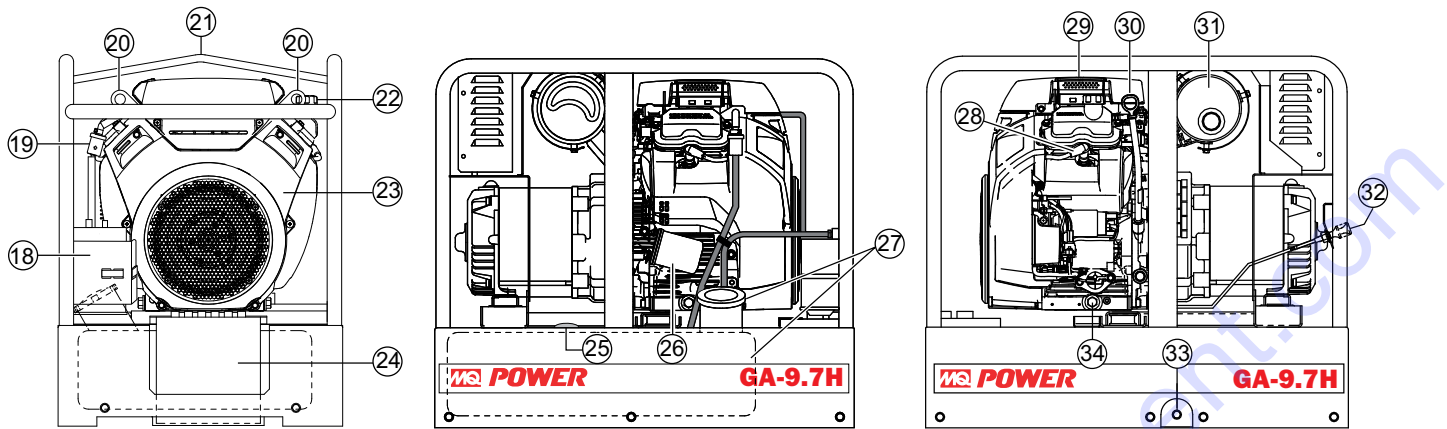


Figure 5. Generator Components (Continued)

18. **Charcoal Canister** – A container filled with activated charcoal that traps gasoline vapors emitted by the fuel system.
19. **In-Line Fuel Filter** – Prevents dirt and debris from entering the fuel system. Replace as recommended in the maintenance section of this manual.
20. **Engine Lifting Hook** – Attach a rope or chain to these two lifting hooks when lifting of the engine is required. Never stand underneath the generator while it is being lifted.
21. **Generator Lifting Bale** – Attach a rope or chain to this lifting point when lifting of the generator is required. Never stand underneath the generator while it is being lifted.
22. **Engine Oil Filler Hole** – Remove cap when the adding of engine oil is required. See Table 6 for recommended type engine oil.
23. **Engine** – This generator uses a Honda GX630, 20.8 HP gasoline engine. Refer to the Honda owner's manual for more detailed engine information.
24. **Battery** – This generator is equipped with a 12 VDC battery. Replace with only the recommended type battery.
25. **Fuel Gauge** – This gauge is located on top of the fuel tank. Read this gauge to determine when fuel is low.
26. **Oil Filter** – Replace oil filter as referenced in maintenance section of this manual.
27. **Fuel Tank/Cap** – Remove fuel cap to add fresh unleaded fuel. Fuel tank capacity is 10 gallons (38 liters).
28. **Spark Plug** – Provides spark to the ignition system. Set spark plug gap to 0.6 - 0.7 mm (0.028 - 0.031 inch) Clean spark plug once a week.
29. **Air Cleaner** – Prevents dirt and other debris from entering the fuel system. Release retaining clips on top of air filter cover to gain access to filter element. **NEVER** run the engine without an air cleaner.
30. **Engine Oil Dipstick** – Remove oil dipstick to check engine oil level.
31. **Muffler/Heat Shield** – Used to reduce noise and emissions. **NEVER** touch this heat shield when the generator/welder is in use. Always allow time for engine to cool before servicing.
32. **Choke Lever** – Used for starting the engine. Close the choke lever when starting a cold engine or in cold weather conditions. The choke enriches the fuel mixture. Open the choke lever if starting a warm engine or in warm weather conditions.
33. **Fuel Drain Plug** – Remove plug to drain fuel.
34. **Engine Oil Drain Plug** – Remove this drain plug when draining of the oil from the engine crankcase is required. Fill with recommended type oil as listed in Table 6.

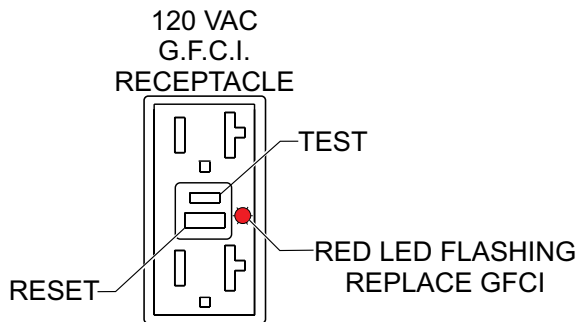
### NOTICE

This **HONDA** engine is equipped with a low oil shutdown capability. A built in sensor will automatically turn off the engine should the oil level fall below a safe operating condition. Make sure the generator is placed on level ground. Placing the generator on level ground will ensure that the low oil sensor will function properly.

## 120 VAC GFCI RECEPTACLES

There are two 120 VAC, 20 amp GFCI (Duplex Nema 5-20R) receptacles. Each receptacle is protected by a 20 amp circuit breaker (CB4/CB5). If the **red LED is flashing**, **DO NOT** use the GFCI receptacle. Replace it immediately.

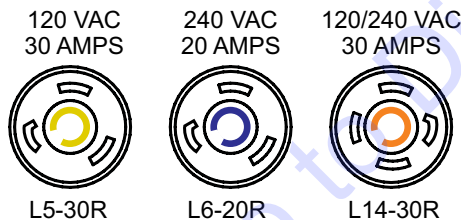
Pressing the **reset** button (Figure 6) resets the GFCI receptacle after being tripped. Reference the maintenance section of this manual for proper testing of the GFCI receptacle.



**Figure 6. G.F.C.I. Receptacle**

## Twist Lock Receptacles

There are three auxiliary twist-lock receptacles. These power receptacles (Figure 7) are described below.



**Figure 7. Auxiliary Twist-Lock Receptacles**

- **L5-30R** — Provides 120 VAC @30 amps
- **L6-20R** — Provides 240 VAC @20 amps
- **L14-30R** — Provides 120/240 VAC @30 amps (Dual Voltage receptacle)

## SINGLE PHASE LOAD

Always be sure to check the nameplate on the generator and equipment to insure the wattage, amperage, frequency, and voltage requirements are satisfactorily supplied by the generator for operating the equipment.

Generally, the wattage listed on the nameplate of the equipment is its rated output. Equipment may require 130—150% more wattage than the rating on the nameplate, as the wattage is influenced by the efficiency, power factor and starting system of the equipment.

### NOTICE

If wattage is not given on the equipment's name plate, approximate wattage may be determined by multiplying nameplate voltage by the nameplate amperage.

$$\text{WATTS} = \text{VOLTAGE} \times \text{AMPERAGE}$$

The power factor of this welder-generator is 1.0. See Table 4 below when connecting loads.

**Table 4. Power Factor By Load**

Type of Load	Power Factor
Single-phase induction motors	0.4-0.75
Electric heaters, incandescent lamps	1.0
Fluorescent lamps, mercury lamps	0.4-0.9
Electronic devices, communication equipment	1.0
Common power tools	0.8

**Table 5. Cable Selection (60 Hz, Single Phase Operation)**

Current in Amperes	Load in Watts		Maximum Allowable Cable Length			
	At 100 Volts	At 200 Volts	#10 Wire	#12 Wire	#14 Wire	#16 Wire
2.5	300	600	1000 ft.	600 ft.	375 ft.	250 ft.
5	600	1200	500 ft.	300 ft.	200 ft.	125 ft.
7.5	900	1800	350 ft.	200 ft.	125 ft.	100 ft.
10	1200	2400	250 ft.	150 ft.	100 ft.	
15	1800	3600	150 ft.	100 ft.	65 ft.	
20	2400	4800	125 ft.	75 ft.	50 ft.	

CAUTION: Equipment damage can result from low voltage

## GROUND POWER TOOLS

When using power tools or electrical equipment requiring AC power from the generator, make sure the power tool cord has a ground pin or is double insulated as shown in Figure 8.

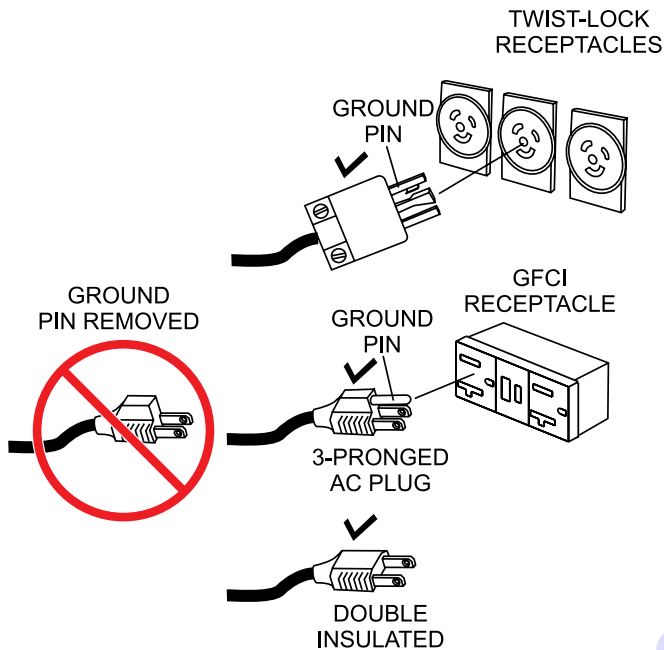


Figure 8. Ground Pin

### NOTICE

Double-insulated power tools and small appliances have specially insulated housings that eliminate the need for a ground. These types of double-insulated power cords are designed so that no part of the device will be electrically live even if the internal insulation fails.

## EXTENSION CABLE

When electric power is to be provided to various tools or loads at some distance from the generator, extension cords are normally used. Cables should be sized to allow for distance in length and amperage so that the voltage drop between the generator and point of use (load) is held to a minimum. Use the cable selection chart (Table 5) as a guide for selecting proper cable size.

### **⚠ DANGER**

**NEVER** use power tools or equipment that do not have a ground capability, the possibility exists of electrocution, electrical shock or burn, which can cause severe bodily harm or even **DEATH!**

## CIRCUIT BREAKERS

**ALWAYS** place the *main*, *auxiliary* and *GFCI* circuit breakers in the **OFF** position prior to starting the engine.

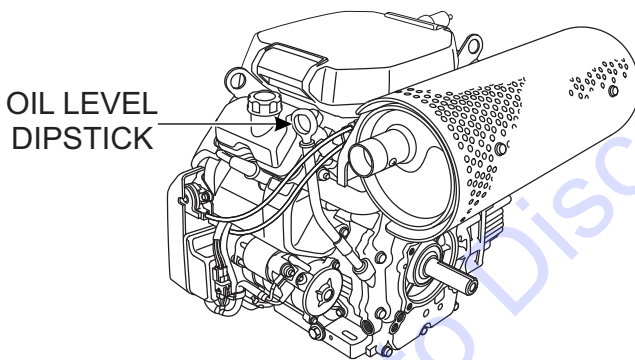


## BEFORE STARTING

1. Read safety instructions at the beginning of manual.
2. Clean the generator, removing dirt and dust, particularly the engine cooling air inlet, carburetor and air cleaner.
3. Check the air filter for dirt and dust. If air filter is dirty, replace air filter with a new one as required.
4. Check carburetor for external dirt and dust. Clean with dry compressed air.
5. Check fastening nuts and bolts for tightness.

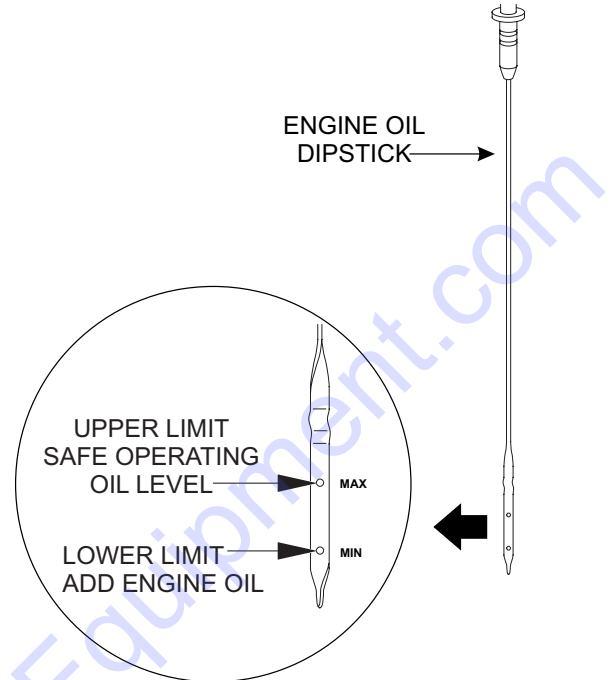
## ENGINE OIL CHECK

1. To check the engine oil level, place the generator on secure level ground with the engine stopped.
2. Remove the dipstick from its holder (Figure 9) and wipe clean.



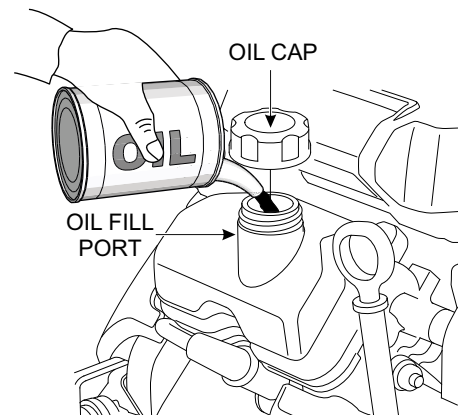
**Figure 9. Engine Oil Dipstick Removal**

3. Re-Insert dipstick (Figure 10), then remove dipstick from its holder. Check the oil level shown on the dipstick.



**Figure 10. Engine Oil Dipstick**

4. If the oil level is low, remove the oil filler cap (Figure 11) and fill to a safe operating level (max) as indicated by the dipstick. Fill with recommended type oil as listed in Table 6. Maximum oil capacity is 2.0 quarts (1.9 liters).



**Figure 11. Engine Oil Filler Port**

**Table 6. Oil Type**

Season	Temperature	Oil Type
Summer	25°C or Higher	SAE 10W-30
Spring/Fall	25°C~10°C	SAE 10W-30/20
Winter	0°C or Lower	SAE 10W-10

## FUEL CHECK

1. Close the fuel cock before filling the fuel tank.
2. Remove the fuel cap located on top of fuel tank.
3. Read the fuel gauge located on top of the fuel tank (Figure 12) to determine if the fuel level is low. If fuel is low, replenish with clean unleaded fuel.

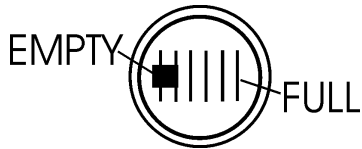


Figure 12. Fuel Gauge

4. When refueling, be sure to use a strainer for filtration. **DO NOT** top-off fuel. **DO NOT** fill the tank beyond capacity. Wipe up any spilled fuel **immediately!**

## BATTERY CHECK

**ALWAYS** be sure the battery cables (Figure 13) are properly connected to the battery terminals as shown below. The **red cable** is connected to the positive terminal of the battery, and the **black cable** is connected to the negative terminal of the battery.

### NOTICE

Inadequate battery connections may cause poor starting of the generator and create other malfunctions.

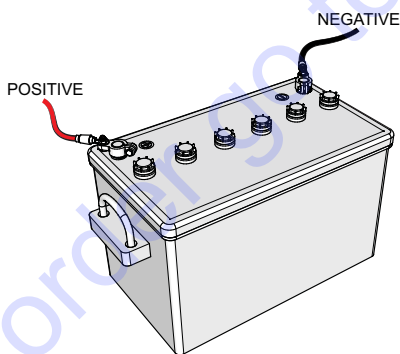


Figure 13. Battery Connections

### NOTICE

**ALWAYS** disconnect the negative terminal **first** and reconnect negative terminal **last**.

When connecting battery do the following:

1. **NEVER** use worn or damaged battery cables. Replace defective battery cables immediately.
2. Place a small amount of battery terminal treatment compound around both battery terminals. This will ensure a good connection and will help prevent corrosion around the battery terminals.

### NOTICE

If the battery cable is connected incorrectly, electrical damage to the generator will occur. Pay close attention to the polarity of the battery when connecting the battery.

## POLARITY

The polarity of the battery is extremely important. When an inverted circuit connection takes place, the circuit will be in short circuit instantaneously resulting in possible damage to the control box electronics and starter.

When connecting the battery cables to the battery terminals be sure to check the polarity.

## ALTERNATOR

The polarity of the alternator is negative grounding type. When an inverted circuit connection takes place, the circuit will be in short circuit instantaneously resulting in alternator failure.

**DO NOT** put water directly on the alternator. Entry of water into the alternator can cause corrosion and damage the alternator.

## WIRING

Inspect the entire generator for bad or worn electrical wiring or connections. If any wiring or connections are exposed (insulation missing), replace wiring immediately.

## PIPING AND HOSE CONNECTION

Inspect all piping, oil hose, and fuel hose connections for wear and tightness. Tighten all hose clamps and check hoses for leaks.

If any hose (**fuel or oil**) lines are defective, replace them immediately.



This section is intended to assist the operator with the initial start-up of the portable generator. It is extremely important that this section be read carefully before attempting to use the generator in the field.

## BEFORE STARTING THE ENGINE

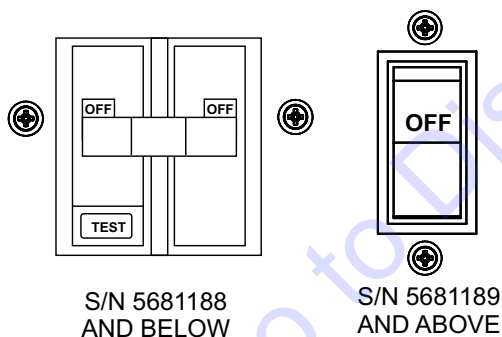
### CAUTION

The engine's exhaust contains harmful emissions. **ALWAYS** have adequate ventilation when operating. Direct exhaust away from nearby personnel.

### WARNING

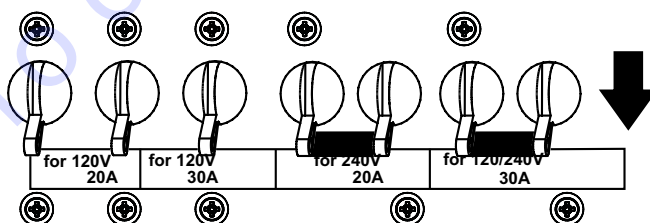
**NEVER** manually start the engine with the **main, GFCI duplex or auxiliary** circuit breakers in the **ON** (closed) position.

1. Be sure to disconnect all electrical loads from the generator prior to starting the engine.
2. **NEVER** start the engine with the main circuit breaker in the **ON** position. Always place circuit breaker (Figure 14) in the **OFF** position before starting.



**Figure 14. Main Circuit Breaker (OFF)**

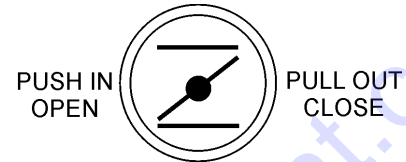
3. **NEVER** start the engine with the **GFCI** or **AUX.** circuit breakers in the **ON** position. Always place these circuit breakers (Figure 15) in the **OFF** position before starting the engine.



**Figure 15. GFCI/AUX. Circuit Breakers (OFF)**

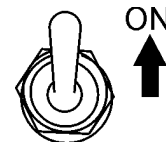
## STARTING THE ENGINE

1. Place the choke knob (Figure 16) in the **CLOSED** position if starting a cold engine.



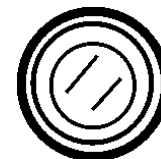
**Figure 16. Choke Knob**

2. Place the choke knob (Figure 16) in the **OPEN** position if starting a warm engine or if the temperature is warm.
3. Place the generator's operation switch (Figure 17) in the **ON** position.



**Figure 17. Operation Switch (ON)**

4. Press the generator's pushbutton start switch (Figure 18) and listen for the engine to start.

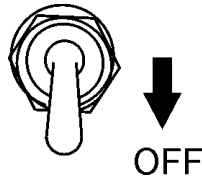


**Figure 18. Start Pushbutton Switch**

5. If the engine has started, slowly return the choke knob (Figure 16) to the **OPEN** position. If the engine has not started repeat steps 1 through 7.
6. Before the generator is placed into operation, run the engine for 3-5 minutes. Check for abnormal smells, fuel leaks, and noises that would associate with loose components.

# OPERATION

7. Place idle control switch (Figure 19) in the **OFF** (down) position. This will allow the engine speed to run at about 3600 RPM's.



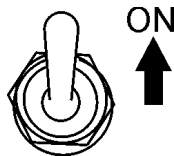
**Figure 19. Idle Control Switch (OFF)**

## NOTICE

Placing the idle control switch in the **OFF** position (Figure 19) allows the engine to operate at a maximum speed of about 3600 RPM's.

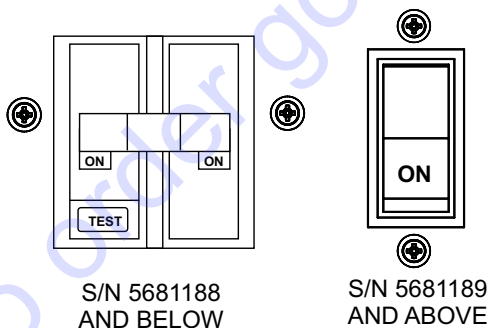
When the idle control switch (Figure 20) is placed in the up position (**ON**), the generator will run at idle speed (2200 RPM's) until a load is applied, at that time the engine speed will increase to 3600 RPM's as long as a load is being applied.

When the load is not in use, the engine speed will drop back to the idle mode after about 3 seconds.



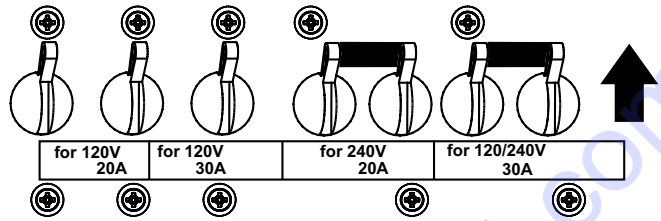
**Figure 20. Idle Control switch (ON)**

8. Place main circuit breaker (Figure 21) in the **ON** position.



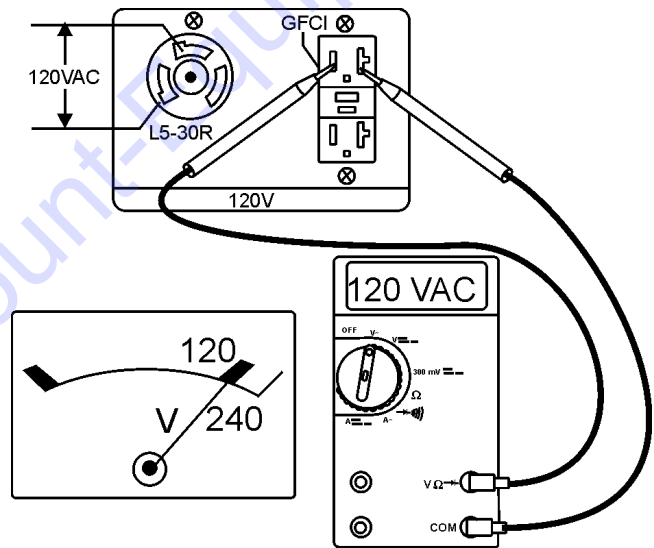
**Figure 21. Main Circuit Breaker (ON)**

9. Place **GFCI** and **AUX.** circuit breakers (Figure 22) in the **ON** position.



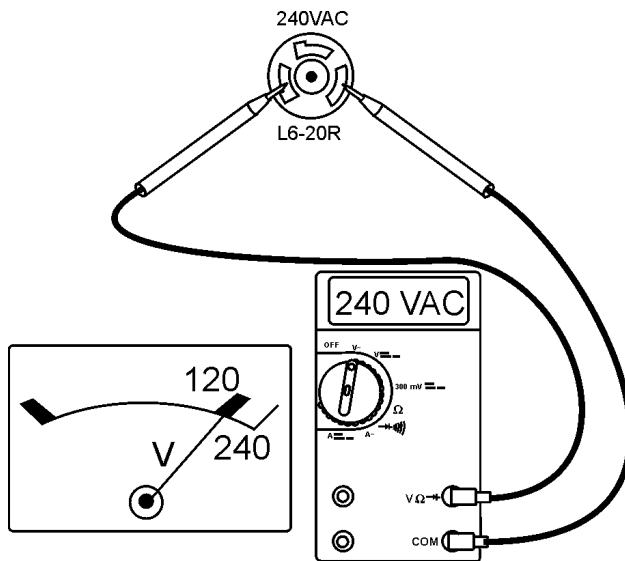
**Figure 22. GFCI/AUX. Circuit Breakers (ON)**

10. Read voltmeter on front panel of generator (Figure 23) and verify that 120 VAC is displayed. Using an external voltmeter as shown in Figure 23, verify that 120 VAC is present at the 120V twist-lock and GFCI duplex receptacles.



**Figure 23. 120V GFCI/AUX. Receptacles**

11. Read voltmeter on front panel of generator (Figure 24) and verify that 240 VAC is displayed. Using an external voltmeter as shown in Figure 24, verify that 240 VAC is present at the 240V twist-lock receptacle.

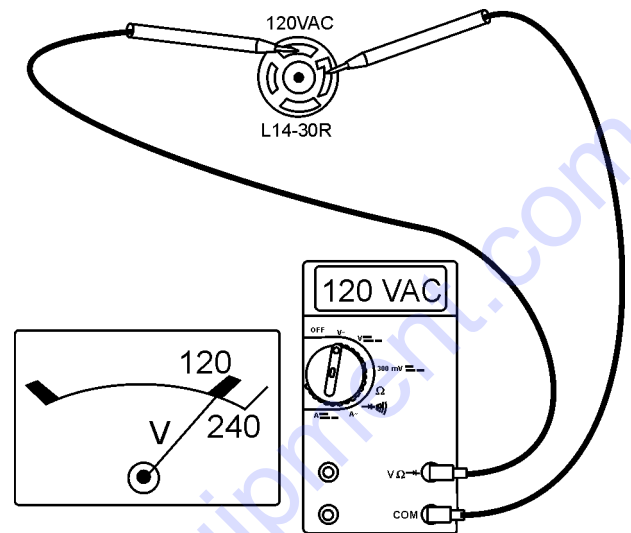


**Figure 24. 240V Receptacle**

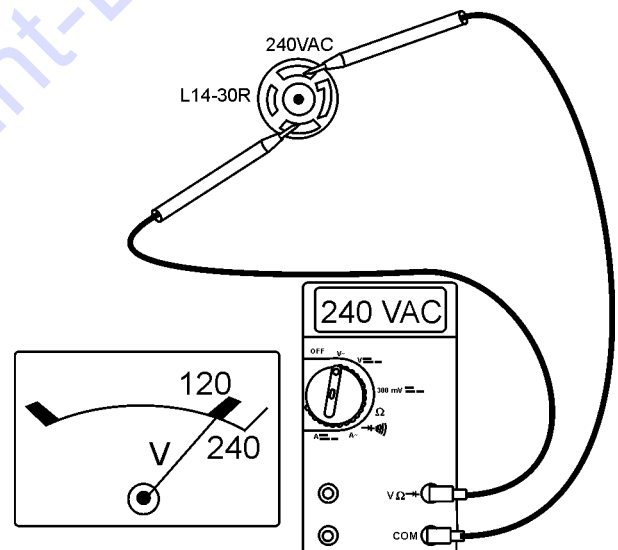
### NOTICE

When using a combination of dual receptacles, total load should not exceed the rated capacity of the generator.

12. The L14-30R receptacle is a dual voltage receptacle (120-240 volts). Reference Figure 25 and Figure 26 to verify voltages at this receptacle.



**Figure 25. 120/240V Receptacle (120V)**

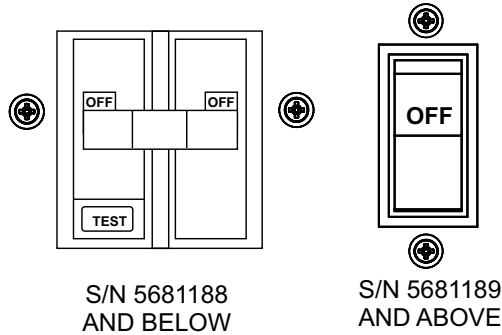


**Figure 26. 120/240V Receptacle (240V)**

13. Connecting of loads (power tools, lighting, etc.) to the generator receptacles can now be done.

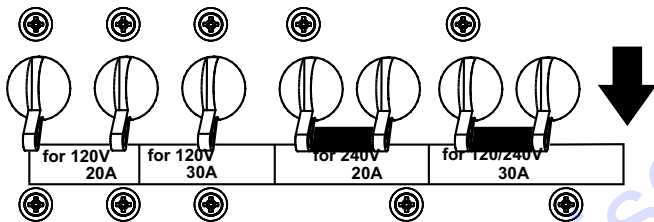
## STOPPING THE ENGINE (NORMAL SHUTDOWN)

1. Place **main** circuit breaker (Figure 27) in the **OFF** position.



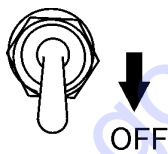
**Figure 27. Main Circuit Breaker (OFF)**

2. Place **GFCI** and **AUX.** circuit breakers (Figure 28) in the **OFF** position.



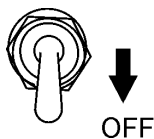
**Figure 28. GFCI/AUX. Circuit Breakers (OFF)**

3. Place idle control switch (Figure 29) in the **OFF** position.



**Figure 29. Idle Control Switch (OFF)**

4. Let engine run at idle with no load for 2-3 minutes.
5. To shut-down the engine, place the generator's operation switch (Figure 30) in the **OFF** position).



**Figure 30. Operation Switch (OFF)**

6. Remove all loads from the generator.

## EMERGENCY SHUTDOWN

1. Place operation switch (Figure 30) in the **OFF** position.

# PREPARATION FOR LONG TERM STORAGE

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## GENERATOR STORAGE

For storage of the generating set for over 30 days, the following is required:

- Drain the fuel tank completely, or add STA-BIL to the fuel.
- Run the engine until the gasoline in the carburetor is completely consumed.
- Completely drain the oil from the crankcase and refill with fresh oil.
- Remove the spark plug, pour 2 or 3 cc of SAE 30 oil into the cylinder and crank slowly to distribute the oil.
- Crank the engine a few times and install a new spark plug.
- Clean all external parts of the generating set with a cloth.
- Cover the generating set and store in a clean, dry place.

# MAINTENANCE

Use Table 7 as a general maintenance guideline when servicing your engine. For more detail engine maintenance information, refer to the engine owner's manual supplied with your engine.

Table 7. Engine Maintenance Schedule							
DESCRIPTION (3)	OPERATION	BEFORE	FIRST MONTH OR 10 HRS.	EVERY 3 MONTHS OR 25 HRS.	EVERY 6 MONTHS OR 50 HRS.	EVERY YEAR OR 100 HRS.	EVERY 2 YEARS OR 200 HRS.
Engine Oil	CHECK	X					
	CHANGE						
Air Cleaner	CHECK	X	X				
	CHANGE			X (1)			
All Nuts & Bolts	RETIGHTEN IF NECESSARY	X					
Spark Plug	CHANGE				X		
	REPLACE						X
Cooling Fins	CHECK				X		
Spark Arrester	CLEAN					X	
Fuel Tank	CLEAN					X	
Fuel Filter	CHECK					X	
Idle Speed	CHECK-ADJUST					X (2)	
Valve Clearance	CHECK-ADJUST						X (2)
Fuel lines	CHECK	Every 2 years, replace if necessary (2)					

(1) Service more frequently when used in **DUSTY** areas.

(2) These items should be serviced by your service dealer, unless you have the proper tools and are mechanically proficient. Refer to the HONDA Shop Manual for service procedures.

(3) For commercial use, log hours of operation to determine proper maintenance intervals.

## MAINTENANCE

Perform the scheduled maintenance procedures as defined by Table 7 on the previous page:

### DAILY

Thoroughly remove dirt and oil from the engine and control area. Clean or replace the air cleaner elements as necessary. Check and retighten all fasteners as necessary.

### WIRING

Inspect the entire generator for bad or worn electrical wiring or connections. If any wiring or connections are exposed (insulation missing), replace wiring immediately.

### PIPING AND HOSE CONNECTION

Inspect all piping, oil hose, and fuel hose connections for wear and tightness. Tighten all hose clamps and check fuel or leaks. If any hose (fuel or oil) lines are defective, replace them immediately.

### FUEL STRAINER

1. Thoroughly clean the area around the fuel cap.
2. Remove the fuel cap from the fuel tank.
3. Next, remove, inspect and clean the fuel strainer (Figure 31) with solvent.

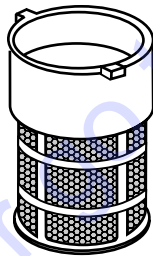


Figure 31. Fuel Strainer

### SPARK PLUG

1. Remove and clean the spark plug (Figure 32), then adjust the spark gap to 0.024 ~0.028 inch (0.6~0.7 mm). This unit has electronic ignition, which requires no adjustments.

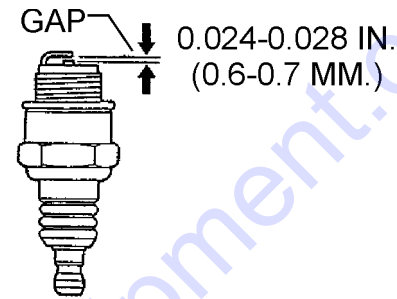


Figure 32. Spark Plug Gap

### ENGINE OIL AND FILTER

1. Drain engine oil when the oil is warm as shown in Figure 33.
2. Remove oil filler cap, dipstick, oil drain bolt and sealing washer. Allow engine oil to drain into a suitable container.

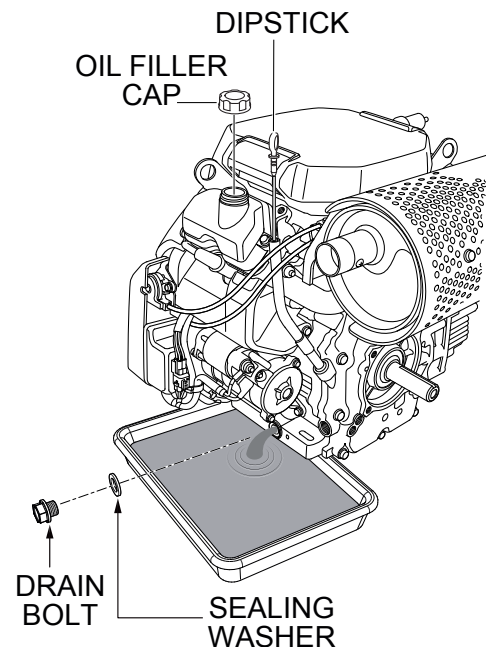


Figure 33. Draining Engine Oil

## MAINTENANCE

3. Use an oil filter socket tool and remove oil filter as shown in Figure 34.

### NOTICE

Use an oil filter socket, rather than a strap wrench, to avoid striking and damaging the oil pressure switch.

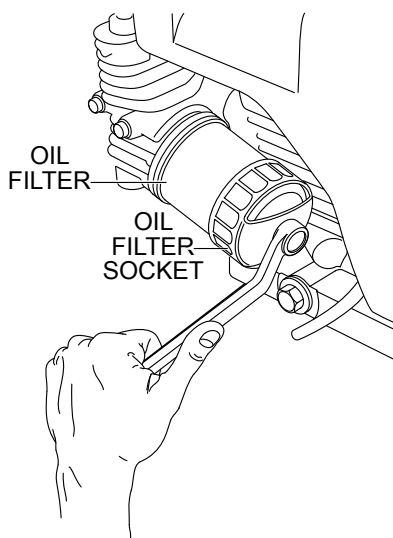


Figure 34. Oil Filter Removal

4. Coat oil filter seal with clean engine oil (Figure 35A) and clean oil filter mounting base (Figure 35B).

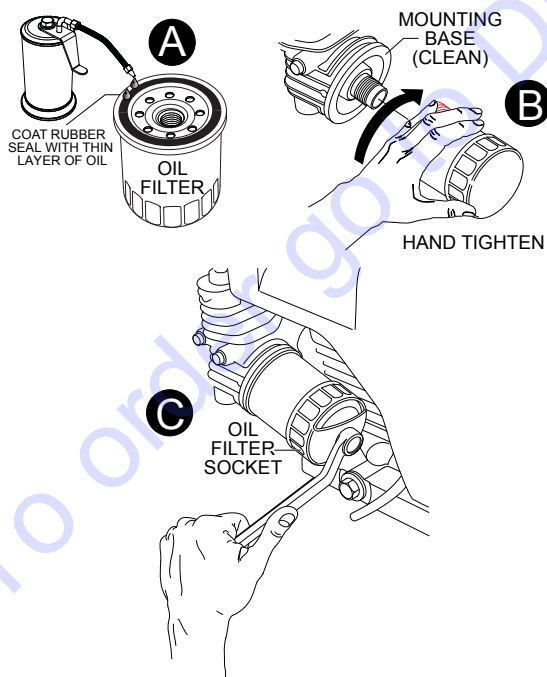


Figure 35. New Oil Filter Installation

5. Screw on new oil filter by hand (Figure 35B) until seal contacts the filter mounting base.
6. Using an oil filter socket tool (Figure 35C), tighten filter and additional 3/4-inch turn. Tighten filter to 9 ft-lbs. (12 N·m).
7. Install drain bolt with sealing washer and tighten securely.
8. Replace engine oil with recommended type oil as listed in Table 6. For engine oil capacity, see Table 2 (engine specifications). Fill to upper limit as shown in Figure 36.

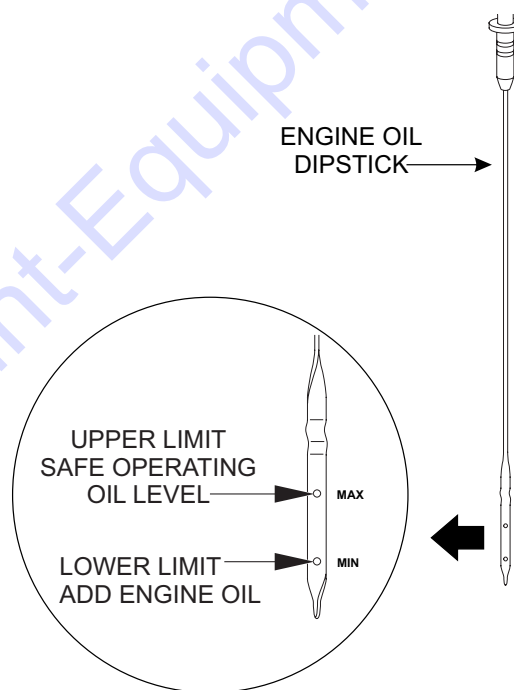


Figure 36. Checking Engine Oil Level

9. Reinstall oil level dipstick and oil filler cap.



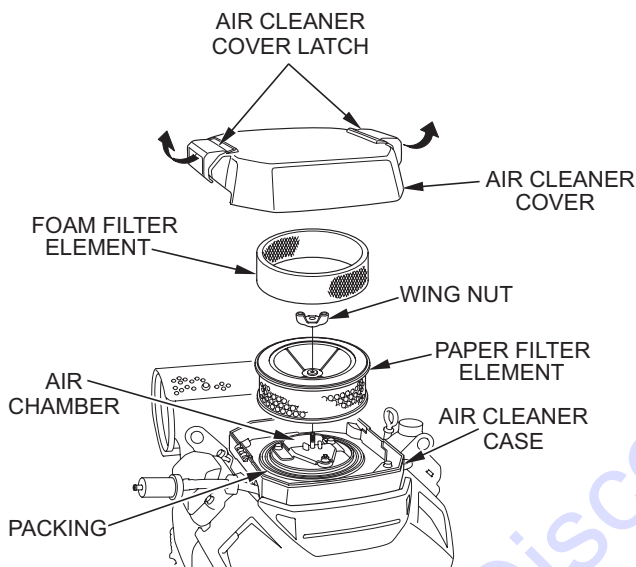
## ENGINE AIR CLEANER

### **⚠ DANGER**



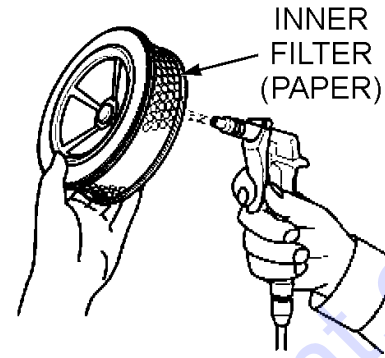
**DO NOT** use gasoline as a cleaning solvent, the possibility exists of fire or explosion which can cause damage to the equipment and severe bodily harm or even **DEATH!**

1. Pull the air cleaner cover latch (Figure 37) to the unlock position, and remove the cover.



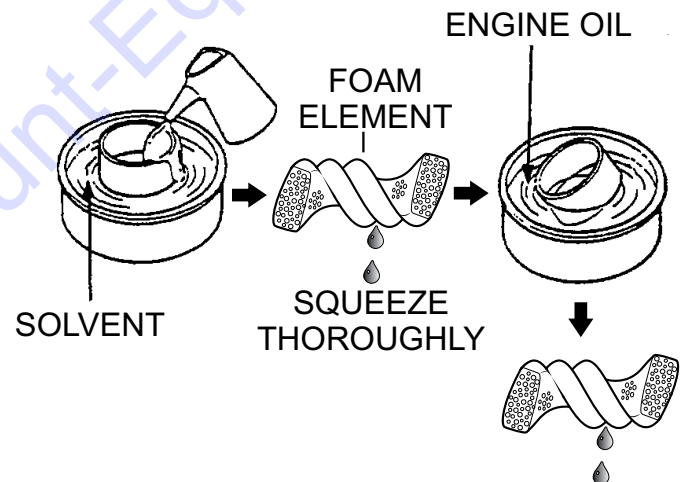
**Figure 37. Engine Air Cleaner**

2. Remove the wing nut from the paper filter element.
3. Remove the paper filter element and foam filter element from the air cleaner case.
4. Remove the foam filter element from the paper filter element.
5. Tap the paper filter element (Figure 38) several times on a hard surface to remove dirt, or blow compressed air [not exceeding 30 psi (207 kPa, 2.1 kgf/cm<sup>2</sup>)] through the filter element from the air cleaner case side. **NEVER** brush off dirt. Brushing will force dirt into the fibers. Replace the paper filter element if it is excessively dirty.



**Figure 38. Cleaning Inner Paper Filter**

6. Clean foam element (Figure 39) in warm, soapy water or non-flammable solvent. Rinse and dry thoroughly.
7. Next, dip the element in clean engine oil and completely squeeze out the excess oil from the element before installing.



**Figure 39. Cleaning Foam Element**

8. Wipe dirt from the inside of the air cleaner body and cover using a moist cloth. Be careful to prevent dirt and debris from entering the air chamber that leads to the carburetor.
9. Place the foam filter element over the paper filter element, and reinstall the assembled filter element. Be sure the packing is in place beneath the filter element. Tighten wing nut securely.
10. Lock the air cleaner cover latch securely.

## IN-LINE FUEL FILTER (200 HOURS)

1. Replace the engine fuel filter (Figure 40) every 200 hours.

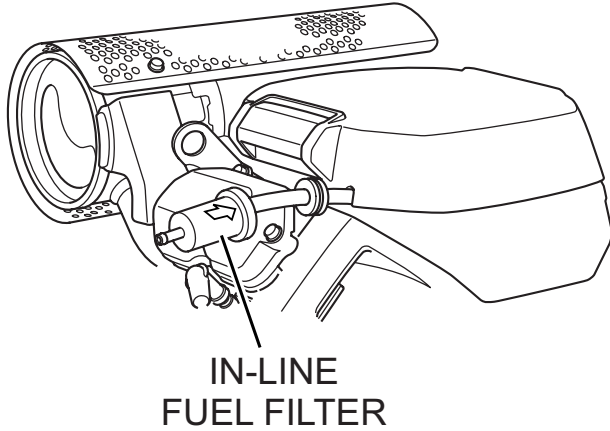


Figure 40. In-Line Fuel Filter

## REMOVING WATER FROM THE FUEL TANK

1. After prolonged use, water and other impurities accumulate in the bottom of the tank. Occasionally, inspect the fuel tank for water contamination and drain (Figure 41) the contents if required.

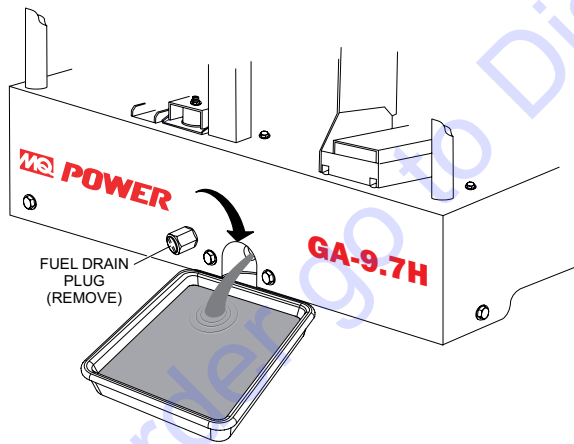


Figure 41. Draining Fuel Tank

2. During cold weather, the more empty volume inside the tank, the easier it is for water to condense. This can be reduced by keeping the tank full with fuel.

## CLEANING INSIDE THE FUEL TANK

1. If necessary, drain the fuel inside the fuel tank completely. Using a spray washer (Figure 42) wash out any deposits or debris that have accumulated inside the fuel tank.



Figure 42. Fuel Tank Cleaning

## FUEL TANK INSPECTION

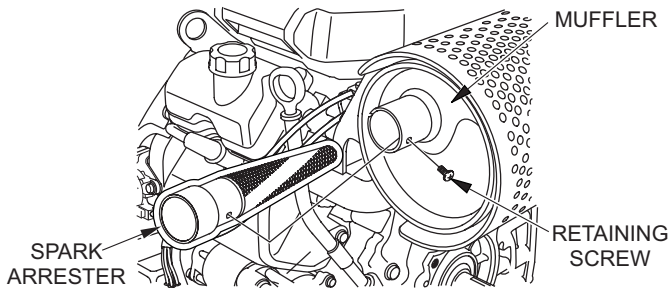
In addition to cleaning the fuel tank, the following components should be inspected for wear:

- **Rubber Suspension** — Look for signs of wear or deformity due to contact with oil. Replace the rubber suspension if necessary.
- **Fuel Hoses** — Inspect nylon and rubber hoses for signs of wear, deterioration and hardening.
- **Fuel Tank Lining** — Inspect the fuel tank lining for signs of excessive amounts of oil or other foreign matter.

## SPARK ARRESTER CLEANING

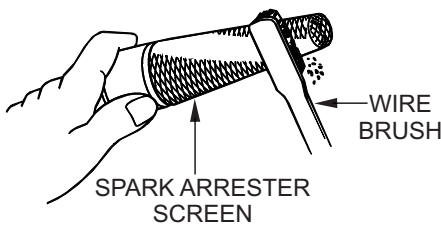
Clean the spark arrester every 6 months or 100 hours.

1. Remove retaining screw (Figure 43) that secures spark arrester to muffler, then remove spark arrester.



**Figure 43. Spark Arrester Removal**

2. Carefully remove carbon deposits from the spark arrester screen (Figure 44) with a wire brush.



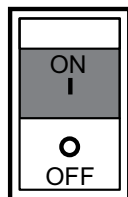
**Figure 44. Cleaning Spark Arrester**

3. Reinstall spark arrester.

## TESTING THE GFCI MODULE (S/N5741189 AND ABOVE)

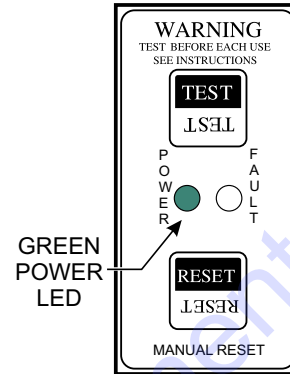
If tripping of the **main** circuit breaker persists after a load is replaced with a known good one (no short circuit), perform this test with no load.

1. Start the generator as outlined in the start up procedure in this manual.
2. Place the main circuit breaker (Figure 45) in the **ON** position.



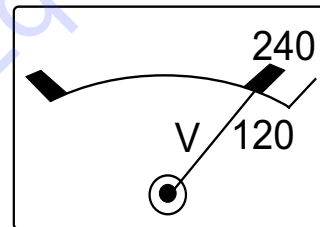
**Figure 45. Circuit Breaker ON (GFCI Test)**

3. On the GFCI module (Figure 46), verify that the **green** POWER LED is **ON**.



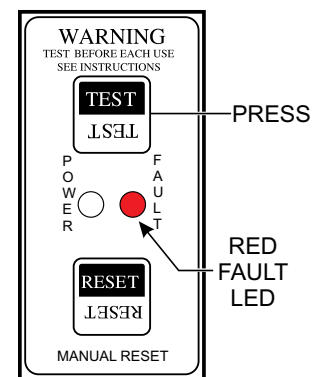
**Figure 46. GFCI Module (Green LED ON)**

4. Also verify that the AC voltmeter is registering a voltage reading as indicated by Figure 47.



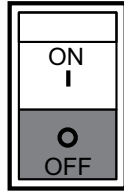
**Figure 47. AC Voltmeter (120/240V)**

5. Next, press the **TEST** button (Figure 48) on the GFCI module and verify that the **green** POWER LED turns **OFF** and the **red** FAULT LED turns **ON**.



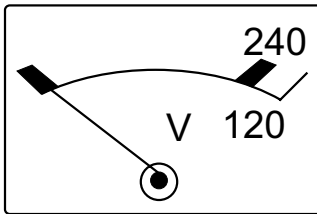
**Figure 48. GFCI Module (Red/Fault LED ON)**

6. Also verify that the main circuit breaker (Figure 49) switch trips to the **OFF** position.



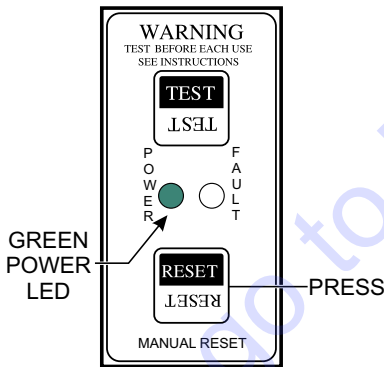
**Figure 49. Circuit Breaker OFF (GFCI Test)**

7. Verify that the AC voltmeter (Figure 50) on the generator reads zero volts.



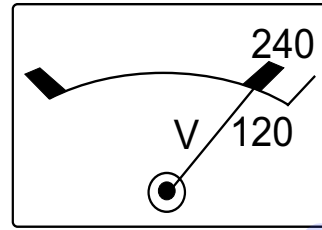
**Figure 50. AC Voltmeter (Zero Volts)**

8. To restore power, press the RESET button (Figure 51) on the GFCI module and verify that the **red** FAULT LED turns **OFF** and the **green** POWER LED should turn **ON**



**Figure 51. GFCI Module (Green LED ON Reset)**

9. Verify that the AC voltmeter is registering a voltage reading as indicated by Figure 52.



**Figure 52. AC Voltmeter (120/240V)**

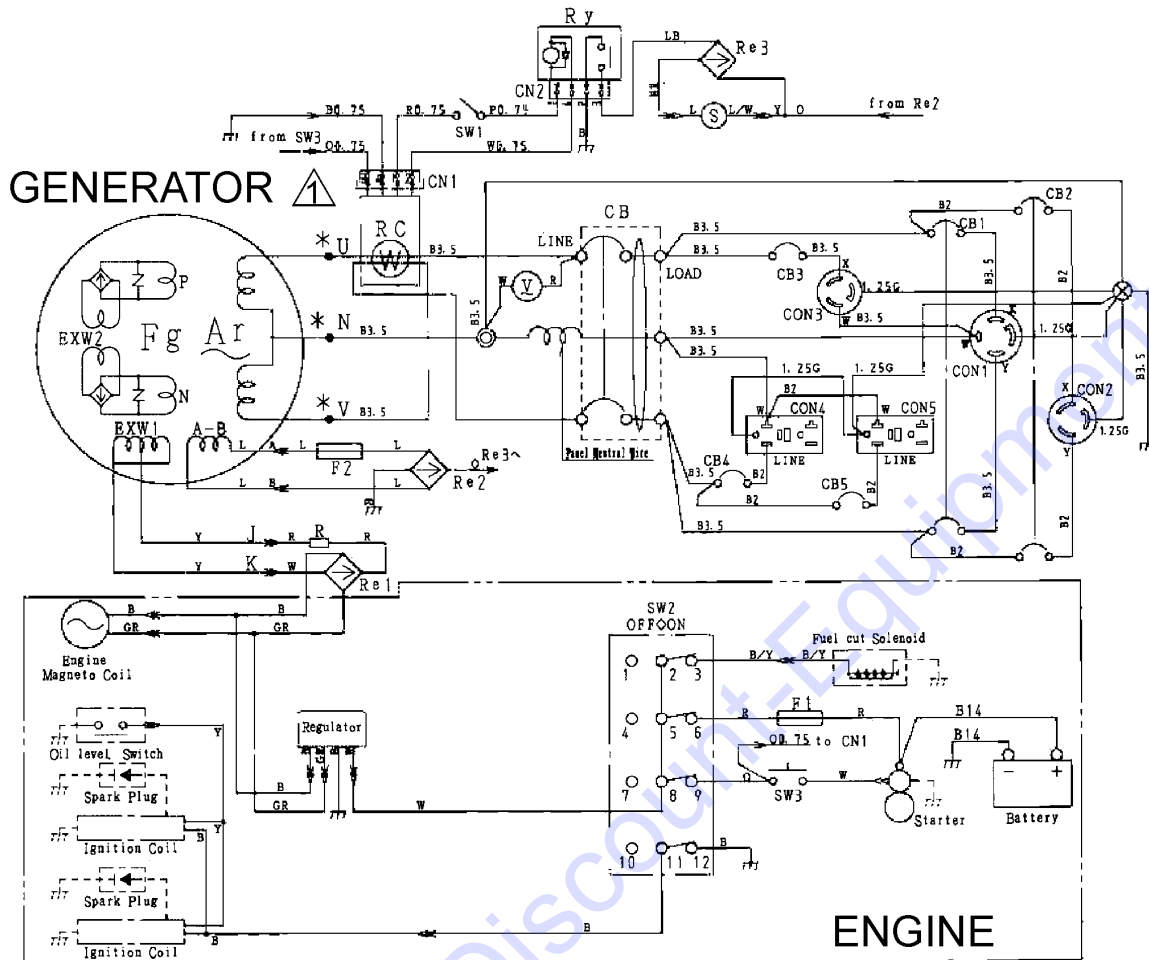
### NOTICE

It is recommended that the GFCI unit be tested when the generator is initially taken out of the box. Then, the generator should be tested daily at startup.

### CAUTION

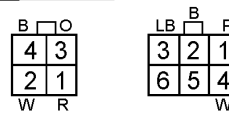
The GFCI module is designed to interrupt power when a ground fault exists to prevent injuries and shock hazards. **DO NOT** operate the generator if this test fails. Consult a qualified electrician for repair or replacement of the GFCI module.

# GENERATOR WIRING DIAGRAM (S/N 5681188 AND BELOW)



SYMBOL	DESIGNATION
Ar	MAIN GENERATOR ARMATURE WINDING
Fg	MAIN GENERATOR FIELD WINDING
EXW1-2	EXCITATION WINDING
V	AC VOLTMETER 120V/240V
Re1~3	RECTIFIER
CN1	RECEPTACLE, L14-30R, 120/240 VAC @ 30 AMPS
CN2	RECEPTACLE, L6-20R, 240 VAC @ 20 AMPS
CN3	RECEPTACLE, L5-30R, 120 VAC @ 30 AMPS
CN4-5	RECEPTACLE, 5-20R, 120 VAC @ 20 AMPS
CB	CIRCUIT BREAKER, 2P 35A
CB1	CIRCUIT BREAKER, 2P 30A
CB2	CIRCUIT BREAKER, 2P 20A
CB3	CIRCUIT BREAKER, 1P 30A
CB4-5	CIRCUIT BREAKER, 1P 20A
SW1	IDLE CONTROL SWITCH
SW2	OPERATION SWITCH
SW3	START SWITCH
RC	IDLE CONTROL DEVICE
F1~F2	FUSE, 10 AMP
R	RESISTOR
S	SOLENOID

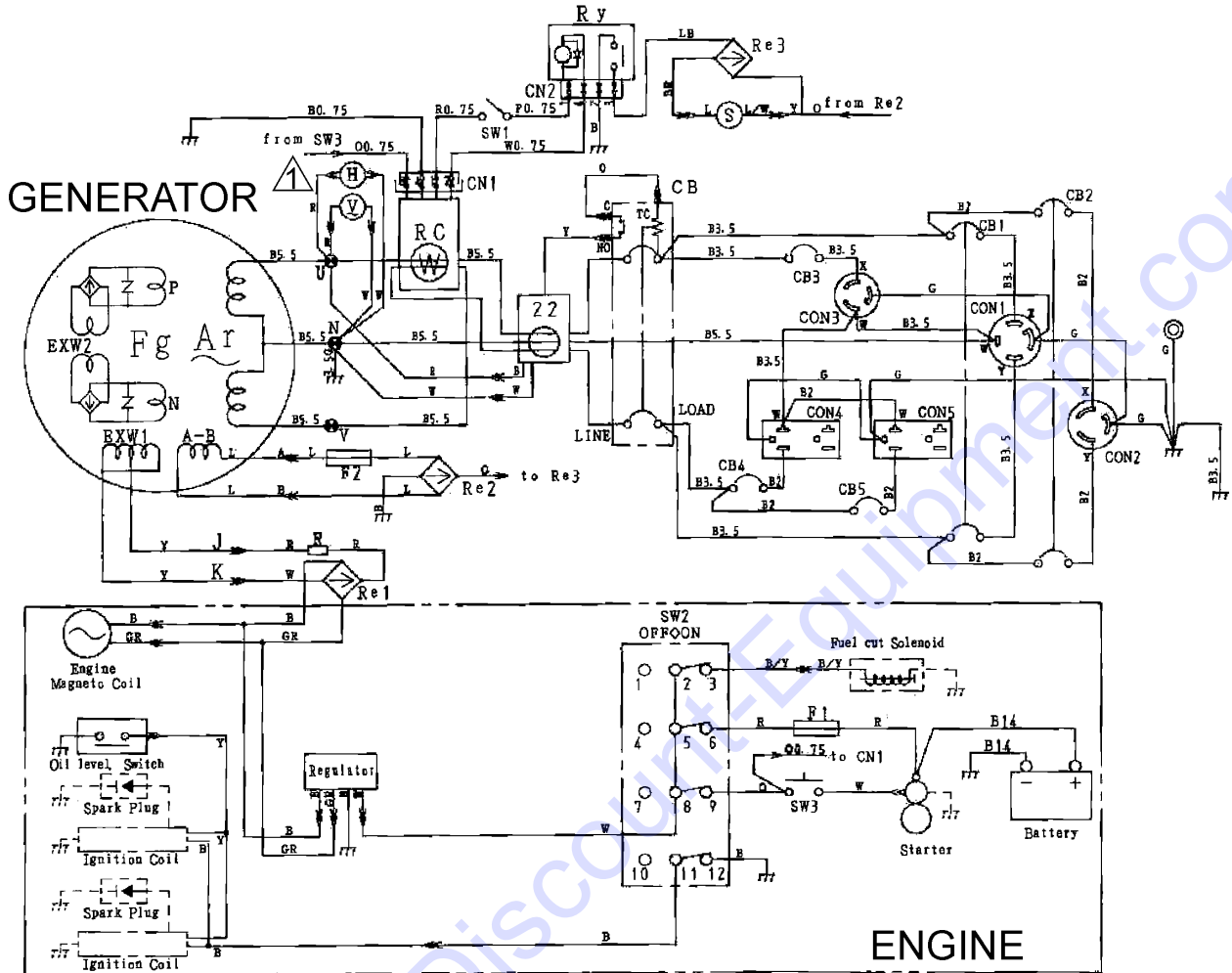
CODE/WIRE COLOR			
Symbol	Color	Symbol	Color
B	BLACK	R	RED
L	BLUE	W	WHITE
BR	BROWN	Y	YELLOW
G	GREEN	LB	LIGHT BLUE
GR	GRAY	LG	LIGHT GREEN
V	VIOLET	O	ORANGE
P	PINK		



CONNECTOR VIEWED AT WIRING SIDE

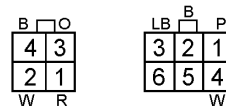
NOTE:  
 HOUR METER AND GFCI SENSING MODULE NOT INCLUDED ON S/N 5681189 AND BELOW

# GENERATOR WIRING DIAGRAM (S/N 5681189 AND ABOVE)



SYMBOL	DESIGNATION
Ar	MAIN GENERATOR ARMATURE WINDING
Fg	MAIN GENERATOR FIELD WINDING
EXW1~2	EXCITATION WINDING
V	AC VOLTMETER 120V/240V
Re1~3	RECTIFIER
CN1	RECEPTACLE, L14-30R, 120/240 VAC @ 30 AMPS
CN2	RECEPTACLE, L6-20R, 240 VAC @ 20 AMPS
CN3	RECEPTACLE, L5-30R, 120 VAC @ 30 AMPS
CN4~5	RECEPTACLE, 5-20R, 120 VAC @ 20 AMPS
CB	CIRCUIT BREAKER, 2P 35A
CB1	CIRCUIT BREAKER, 2P 30A
CB2	CIRCUIT BREAKER, 2P 20A
CB3	CIRCUIT BREAKER, 1P 30A
CB4~5	CIRCUIT BREAKER, 1P 20A
SW1	IDLE CONTROL SWITCH
SW2	OPERATION SWITCH
SW3	START SWITCH
RC	IDLE CONTROL DEVICE
F1~F2	FUSE, 10 AMP
⊕	TERMINAL BOARD
R	RESISTOR
H	HOUR METER
22	GFCI SENSING MODULE
S	SOLENOID

CODE/WIRE COLOR			
Symbol	Color	Symbol	Color
B	BLACK	R	RED
L	BLUE	W	WHITE
BR	BROWN	Y	YELLOW
G	GREEN	LB	LIGHT BLUE
GR	GRAY	LG	LIGHT GREEN
V	VIOLET	O	ORANGE
P	PINK		



CONNECTOR VIEWED AT WIRING SIDE

**NOTE:**

HOUR METER NOT INCLUDED  
WITH S/N 5681189 ~ 5741196



S/N 5741197 AND ABOVE INCLUDE  
HOUR METER

## TROUBLESHOOTING (ENGINE)

**Table 8. Engine Troubleshooting**

Symptom	Possible Cause	Solution
Difficult to start. Fuel is available but no SPARK at spark plug.	Spark plug bridging?	Check gap, insulation or replace spark plug.
	Carbon deposit on spark plug?	Clean or replace spark plug.
	Short circuit due to deficient spark plug insulation?	Check spark plug insulation. Replace if worn.
	Improper spark plug gap?	Set to proper gap.
Difficult to start. Fuel is available and SPARK is present at the spark plug.	ON/OFF switch is shorted?	Check switch wiring. Replace switch.
	Ignition coil defective?	Replace ignition coil.
	Improper spark gap, points dirty?	Set correct spark gap and clean points.
	Condenser insulation worn or short circuiting?	Replace condenser.
	Spark plug wire broken or short circuiting?	Replace defective spark plug wiring.
Difficult to start. Fuel is available, SPARK is present at the spark plug and compression is normal.	Wrong fuel type?	Flush fuel system and replace with correct type of fuel.
	Water or dust in fuel system?	Flush fuel system.
	Air cleaner dirty?	Clean or replace air cleaner.
Difficult to start. Fuel is available, SPARK is present at the spark plug and compression is low.	Suction/exhaust valve stuck or protruded?	Reseat valves.
	Piston ring and/or cylinder worn?	Replace piston rings or piston.
	Cylinder head and/or spark plug not tightened properly?	Torque cylinder head bolts and spark plug.
	Head gasket and/or spark plug gasket damaged?	Replace head and spark plug gaskets.
No fuel present at carburetor.	Fuel not available in fuel tank?	Fill with correct type of fuel.
	Fuel cock does not open properly?	Apply lubricant to loosen fuel cock lever. Replace if necessary.
	Fuel filter clogged?	Replace fuel filter.
	Fuel tank cap breather hole clogged?	Clean or replace fuel tank cap.
	Air in fuel line?	Bleed fuel line
Weak in power. Compression is proper and does not misfire.	Air cleaner dirty?	Clean or replace air cleaner.
	Improper level in carburetor?	Check float adjustment. Rebuild carburetor.
	Defective spark plug?	Clean or replace spark plug.



## TROUBLESHOOTING (ENGINE)

**Table 8. Engine Troubleshooting (Continued)**

Symptom	Possible Cause	Solution
Weak in power. Compression is proper but misfires.	Water in fuel system?	Flush fuel system and replace with correct type of fuel.
	Dirty spark plug?	Clean or replace spark plug
	Ignition coil defective?	Replace ignition coil.
Engine overheats.	Spark plug heat value improper?	Replace with correct type of spark plug.
	Incorrect type of fuel?	Replace with correct type of fuel.
	Cooling fins dirty?	Clean cooling fins.
Rotational speed fluctuates.	Governor adjusted correctly?	Adjust governor
	Governor spring defective?	Replace governor spring.
	Fuel flow restricted?	Check entire fuel system for leaks or clogs.
Recoil starter malfunction.	Recoil mechanism clogged with dust and dirt?	Clean recoil assembly with soap and water.
	Spiral spring loose?	Replace spiral spring.



# TROUBLESHOOTING (GENERATOR)

**Table 9. Generator Troubleshooting**

Symptom	Possible Problem	Solution
Low voltage	Engine speed too low?	Raise engine speed to rated RPM.
Low voltage. Engine speed normal 3650 RPM (unloaded), 2500 RPM (idle)	AC voltmeter not working?	Replace Ac voltmeter.
	Control box internal wiring malfunction?	Check control box wiring.
	Defective ignition coil?	Check red and green ignition wires. Replace ignition wires if necessary.
	Rotor winding malfunction?	Check or replace rotor.
	Stator winding malfunction?	Check or replace stator.
	Leakage breaker malfunction?	Check or replace CB1.
	Full power switch malfunction?	Check full power switch and full power switch circuit.
Voltage output too high.	Engine speed too high?	Lower engine speed to rated RPM.
Voltage output too high. Engine speed normal 3650 RPM (unloaded), 2500 RPM (idle)	Control box internal wiring malfunction	Check control box wiring.
Circuit breaker will not turn on "NO LOAD"	Defective circuit breaker?	Replace circuit breaker.
Circuit breaker will turn on "LOADED" but trips immediately.	Overload Condition?	Reduce load or replace breaker.
	Load circuit is shorted?	Check load circuit for short.
Does not accelerate from low to high "NO LOAD"	Stuck solenoid?	Check solenoid.
	Bad Idle control switch?	Check or replace idle control switch.
Does not accelerate from low to high "LOAD ACTIVE"	Idle control switch malfunction?	Check or replace idle control switch.
	Idle control device malfunction?	Check or replace idle control device.
	Control box internal wiring defective?	Check control box wiring.
Does not decelerate no "VOLTAGE OUTPUT".	Defective rotor windings?	Check or replace rotor.
	Defective solenoid?	Check or replace solenoid.
	Defective idle control device?	Check or replace idle control device.
	Defective solenoid?	Check or replace idle control device.
Does not decelerate but has "VOLTAGE OUTPUT".	Control box wiring malfunction?	Check control box wiring, replace any defective components.
	Defective solenoid?	Check or replace solenoid.
	Idle control device malfunction?	Check or replace idle control device.

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