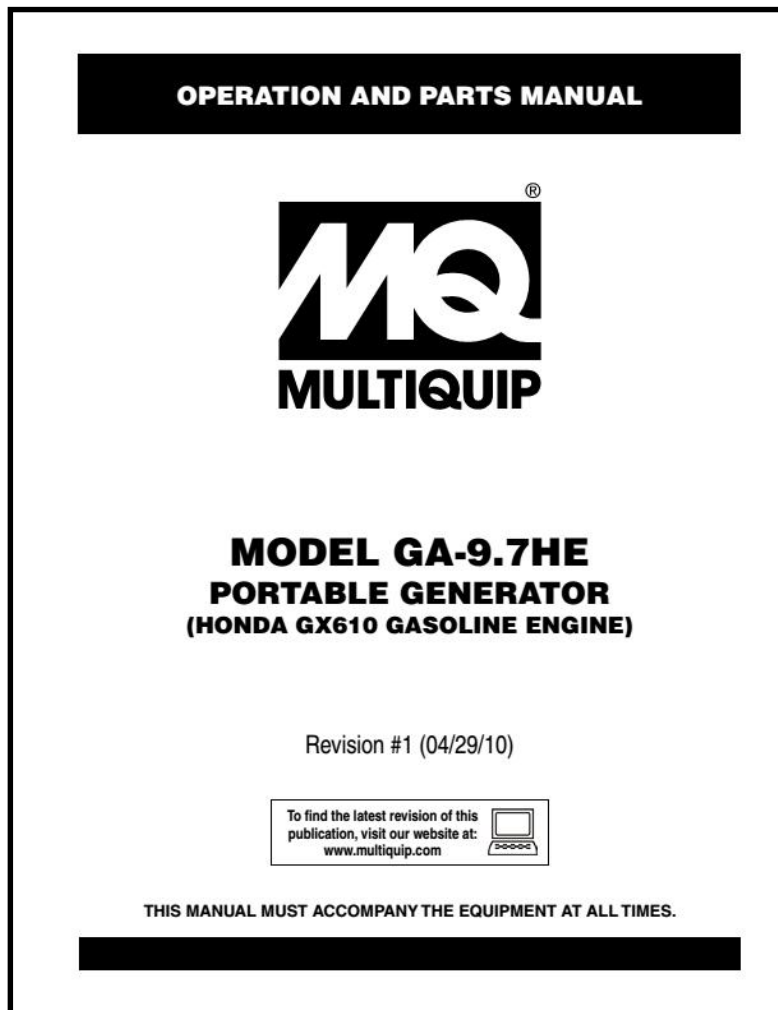
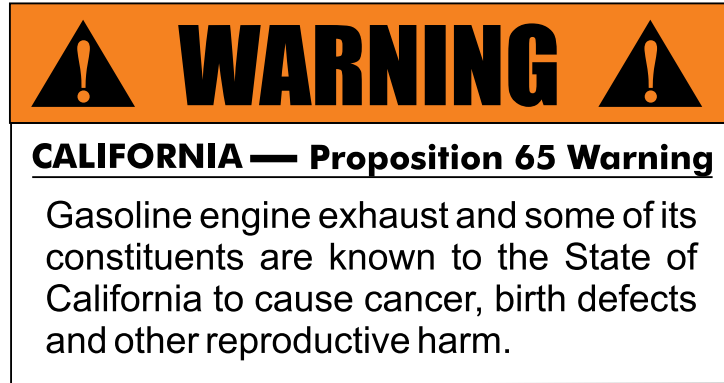


# SAFETY AND OPERATIONS INSTRUCTIONS FROM:



PLEASE READ THIS INFORMATION CAREFULLY PRIOR TO  
OPERATING EQUIPMENT




# 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






 <b>DANGER</b>
<p>Indicates a hazardous situation which, if not avoided, <b>WILL</b> result in <b>DEATH</b> or <b>SERIOUS INJURY</b>.</p>

 <b>WARNING</b>
<p>Indicates a hazardous situation which, if not avoided, <b>COULD</b> result in <b>DEATH</b> or <b>SERIOUS INJURY</b>.</p>

 <b>CAUTION</b>
<p>Indicates a hazardous situation which, if not avoided, <b>COULD</b> result in <b>MINOR</b> or <b>MODERATE INJURY</b>.</p>

<b>NOTICE</b>
<p>Addresses practices not related to personal injury.</p>

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.

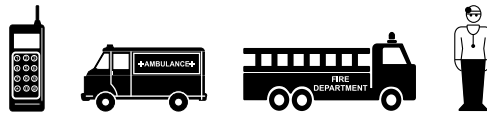
- **ALWAYS** know the location of the nearest fire extinguisher.



- **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

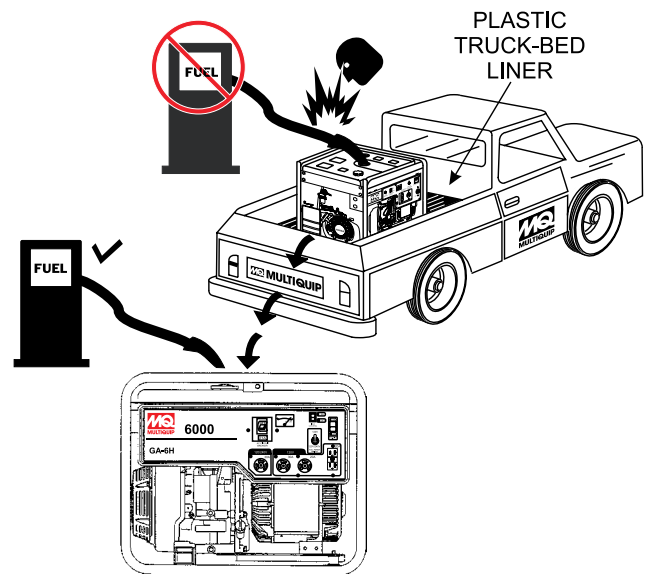


to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose. In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

## 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.



- **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.**



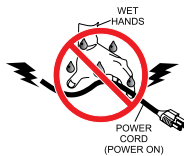
- Backfeed to a utility system can cause **electrocution** and/or property damage. **NEVER** connect the generator to a building's electrical system without a transfer switch or other approved device. All installations should be performed by a **licensed electrician** in accordance with all applicable 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

### NOTICE

- Dispose of hazardous waste properly. Examples of potentially hazardous waste are used motor oil, fuel and fuel filters. 
- **DO NOT** use food or plastic containers to dispose of hazardous waste.
- **DO NOT** pour waste, oil or fuel directly onto the ground, down a drain or into any water source.

## SPECIFICATIONS (GENERATOR)

<b>Table 1. Specifications (Generator)</b>		
<b>AC Generator 60 Hz AC Power Source</b>	Model	GA9.7HE
	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
<b>Battery</b>	12V CCA 230	
<b>Dimensions (L x W x H)</b>	31.49 x 21.25 X 27.55 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 GX610K1VD HONDA GX610U1VD</b>
	Type	Air-cooled 4 stroke, Single Cylinder, OHV, Horizontal Shaft Gasoline Engine
	Bore X Stroke	3.03 in. X 2.59 in. (77 mm x 66 mm.)
	Displacement	37.46 cu-in (614 cm <sup>3</sup> )
	Max Output	18.0 H.P./3600 R.P.M.
	Fuel	Unleaded Automobile Gasoline
	Fuel Capacity	10 gallons (38 liters)
	Lube Oil Capacity	1.90 quarts (1.8 liters)
	Oil Alert System	Yes
	Speed Control Method	Centrifugal Fly-weight Type
	Starting Method	Electric Start/Recoil
	Battery	12 Volt @ 35 Ah
<b>Dimensions (L x W x H)</b>		15.27 x 17.99 X 17.79 in. (388 X 457 X 452 mm)
<b>Dry Net Weight</b>		114.6 lbs. (42 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

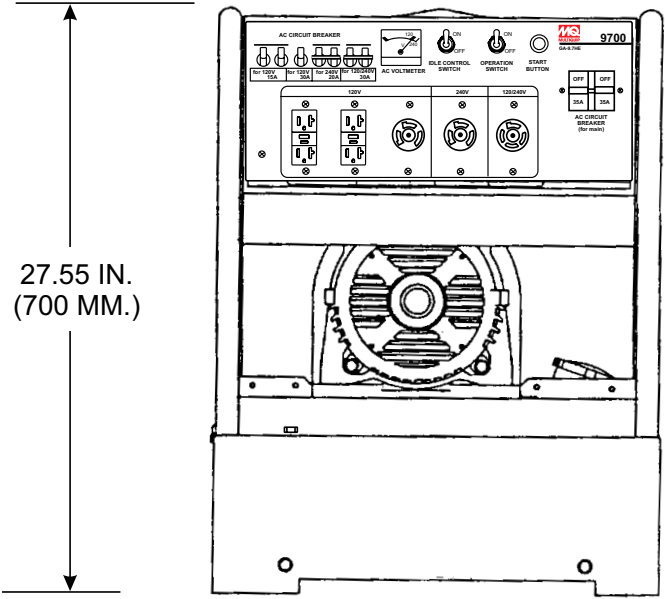
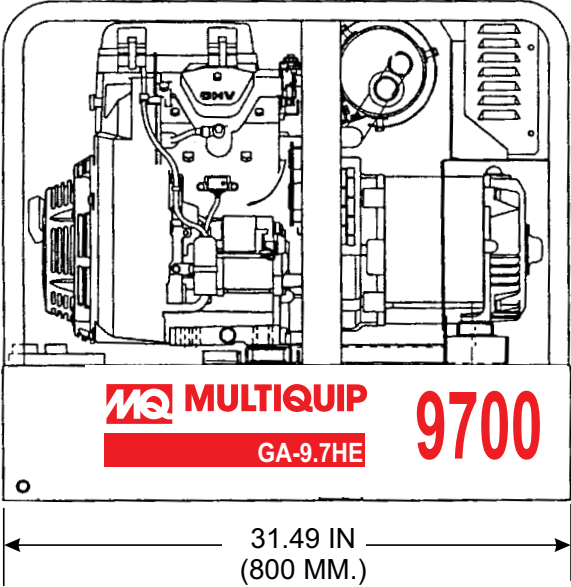


Figure 1. Dimensions

## CONNECTING THE GROUND

The nut and ground terminal on the generator should always be used to connect the generator to a suitable ground. The ground cable should be #8 size wire minimum.

At the generator, connect the terminal of the ground cable between the lock washer and the nut (Figure 2) and tighten the nut fully. Connect the other end of the ground cable to a suitable earth ground (ground rod).

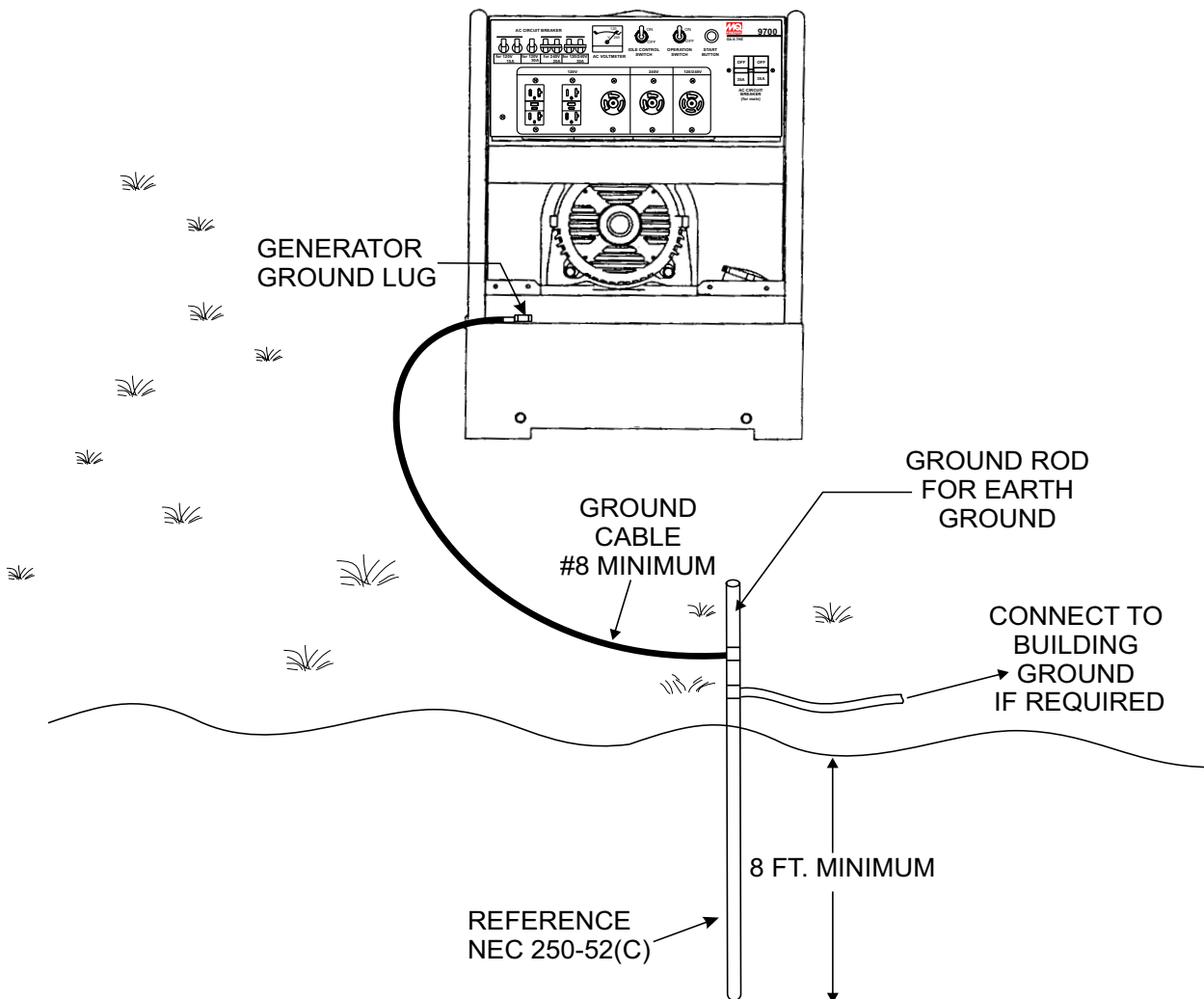



Figure 2. Generator Grounding


## 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 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

To guard against electrical shock and possible damage to the equipment, it is important to provide a good **EARTH** ground.

Article 250 (Grounding) of the National Electrical Code (NEC) provides guide lines 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 articles 250-64(b) and 250-66 set 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 the generator (Figure 2) connect the ground cable between the lock washer and the nut on the generator and tighten the nut fully. Connect the other end of the ground cable to earth ground.
3. NEC article 250-52(c) specifies that the earth ground rod should be buried a minimum of 8 ft. into the ground.

**NOTICE**

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

## FAMILIARIZATION

### Generator

The Multiquip GA9.7HE 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 GAC9.7HE 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:

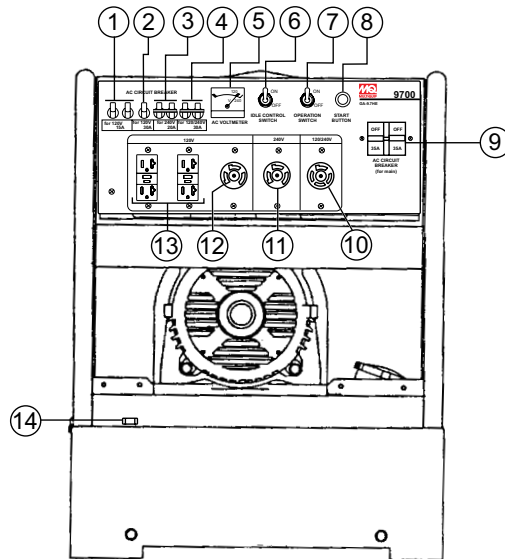
- 120/240V twist-lock output receptacle (single phase).
- 240V twist-lock receptacle (single phase).
- 120V GFCI single phase duplex output receptacles.
- 35 Amp Main Circuit Breaker (2-pole)
- Two 20 Amp GFCI Circuit Breakers (1-pole)
- 30 Amp Circuit Breaker (1-pole)
- 20 Amp Circuit Breaker (2-pole)
- 30 Amp Circuit Breaker (2-pole)
- AC Voltmeter
- Idle Control Switch
- Operation Switch
- Start Switch

### 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 3. 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 your authorized Multiquip service dealer.
6. **Idle Control Switch** – The generator is provided with an automatic idle control device for noise suppression and reduced fuel consumption.
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 35 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.
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 Lug** – This ground connection point should be connect to a good earth ground (ground rod).

## COMPONENTS (GENERATOR)

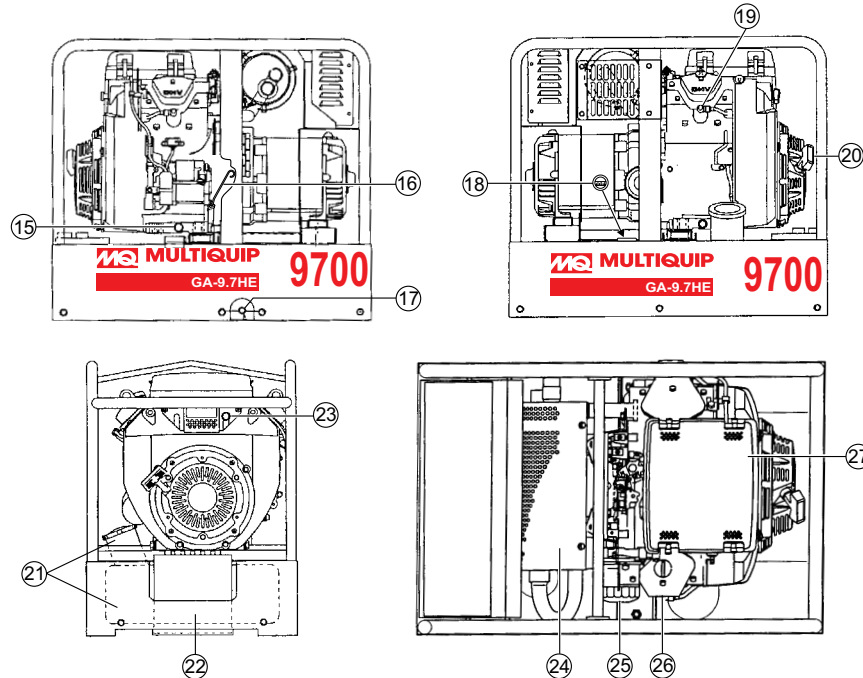


Figure 4. Generator Components (continued)

15. **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 4
16. **Engine Oil Dipstick** – Remove oil dipstick to check engine oil level.
17. **Fuel Drain Plug** – Remove plug to drain fuel.
18. **Fuel Gauge** – This gauge is located on top of the fuel tank. Read this gauge to determine when fuel is low.
19. **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.
20. **Recoil Starter (pull rope)** – Manual-starting method. Pull the starter grip until resistance is felt, then pull briskly and smoothly.
21. **Fuel Tank/Cap** – Remove fuel cap to add fresh unleaded fuel. Fuel tank capacity is 10 gallons (38 liters).
22. **Battery** – This generator is equipped with a 12 VDC battery. Replace with only recommended type battery.
23. **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
24. **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.
25. **Oil Filter** – Replace oil filter as referenced in maintenance section of this manual.
26. **Engine Oil Filler Hole** – Remove cap when the adding of engine oil is required. See Table 4 for recommended type engine oil.
27. **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.

### 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.

## GENERAL INSPECTION PRIOR TO OPERATION

### Ground Power Tools

When using power tools or electrical equipment requiring AC power from the generator, make sure power tool cord has a ground pin or is double insulated as shown in Figure 5.

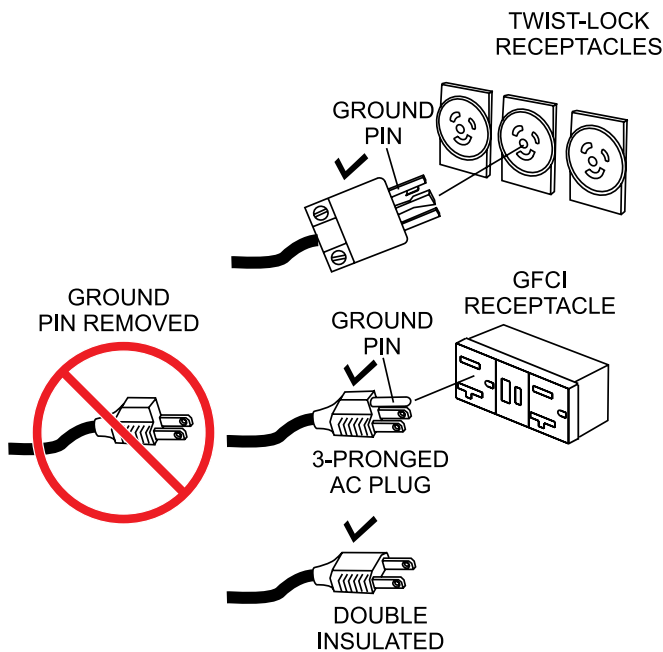


Figure 5. Ground Pin

### 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 3) 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.

Table 3. Cable Selection (60 Hz, Single Phase Operation)

Current In Amperes	Load In Watts		Maximum Allowable Cable Length			
	120 Volts	240 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.



## 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 6) and wipe clean.

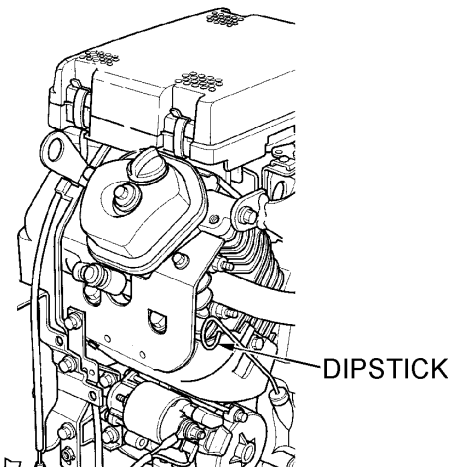


Figure 6. Engine Oil Dipstick Removal

3. Re-Insert dipstick (Figure 7), then remove dipstick from its holder. Check the oil level shown on the dipstick.

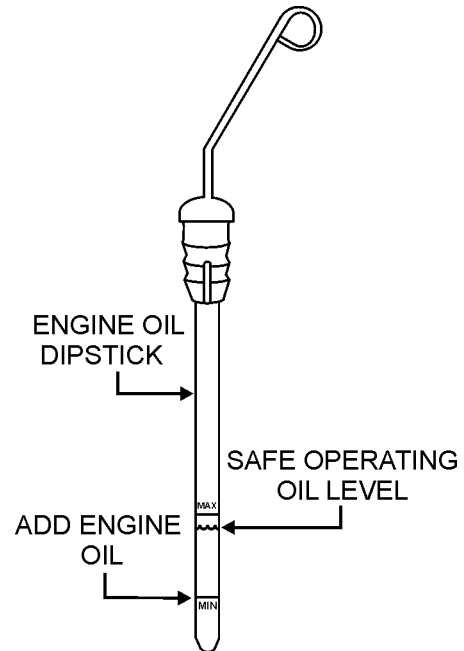


Figure 7. Engine Oil Dipstick

4. If the oil level is low, remove the oil filler cap (Figure 8) and fill to a safe operating level (max) as indicated by the dipstick. Fill with recommended type oil as listed in Table 4. Maximum oil capacity is 1.90 quarts (1.8 liters).

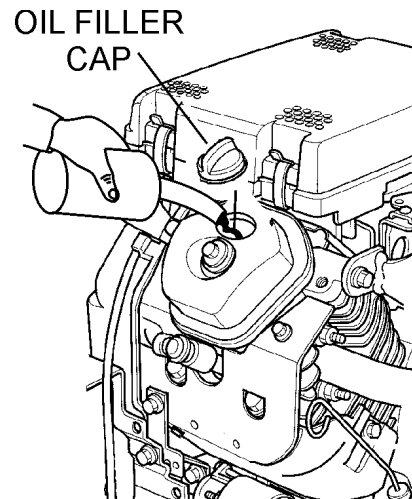


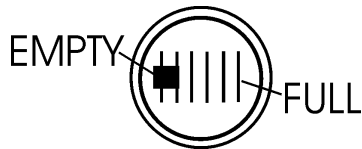
Figure 8. Engine Oil Filler Port

**Table 4. 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 9) to determine if the fuel level is low. If fuel is low, replenish with clean unleaded fuel.

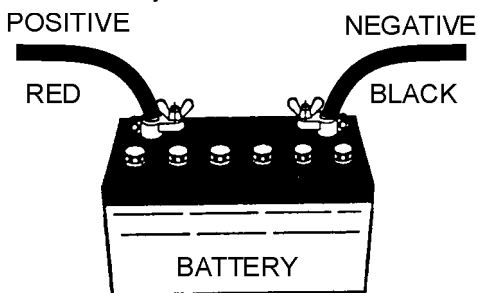


**Figure 9. Fuel Gauge**

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 10) 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.



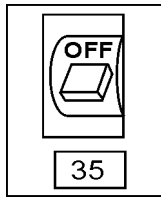
**Figure 10. Battery Connections**

# OPERATION

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.

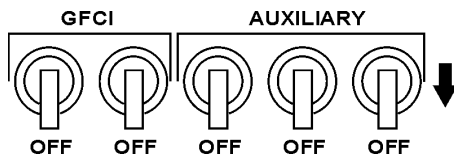
## Before Starting the Engine

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 11) in the **OFF** position before starting.



**Figure 11. Main Circuit Breaker (OFF)**

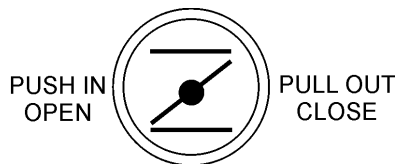
3. **NEVER** start the engine with the **GFCI** or **AUX.** circuit breakers in the **ON** position. Always place these circuit breakers (Figure 12) in the **OFF** position before starting the engine.



**Figure 12. GFCI/AUX. Circuit Breakers (OFF)**

## Starting the Engine

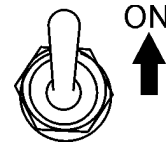
4. Place the choke knob (Figure 13) in the **CLOSED** position if starting a cold engine.



**Figure 13. Choke Knob**

5. Place the choke knob (Figure 13) in the **OPEN** position if starting a warm engine or the temperature is warm.

6. Place the generator's operation switch (Figure 14) in the **ON** position.



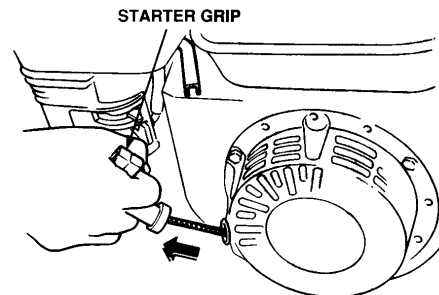
**Figure 14. Operation Switch (ON)**

7. Press the generator's pushbutton start switch (Figure 15) and listen for the engine to start. If the battery is not installed proceed to step 6.



**Figure 15. Start Pushbutton Switch**

8. Grasp the starter grip (Figure 16) and slowly pull it out. The resistance becomes the hardest at a certain position, corresponding to the compression point. Pull the starter grip briskly and smoothly for starting.



**Figure 16. Starter Grip**

### NOTICE

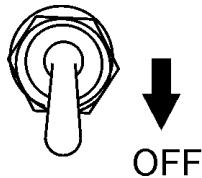
**DO NOT** pull the starter rope all the way to the end.

**DO NOT** release the starter rope after pulling. Allow it to rewind as soon as possible..

9. If the engine has started, slowly return the choke lever (Figure 13) to the **OPEN** position. If the engine has not started repeat steps 1 through 8.
10. 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 lose components.

# OPERATION

11. Place idle control switch (Figure 17) in the **OFF** (down) position. This will allow the engine speed to run at about 3600 RPM's.



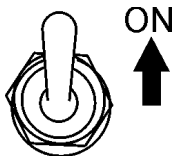
**Figure 17. Idle Control Switch (OFF)**

## NOTICE

Placing the idle control switch in the **OFF** position (Figure 17) allows the engine to operate at a maximum speed of about 3600 RPM's.

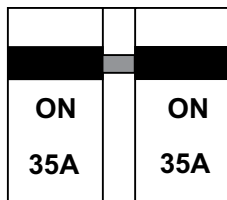
When the idle control switch (Figure 18) is placed in the up position (**ON**), the generator will run at idle speed (2200 RPM's) until a load is applied, at that time the engine speed will increase to 3600 RPM's as long as a load is being applied.

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



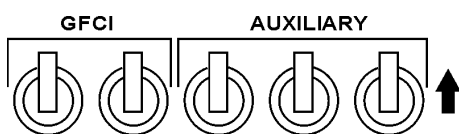
**Figure 18. Idle Control switch (ON)**

12. Place main circuit breaker (Figure 19) in the **ON** position.



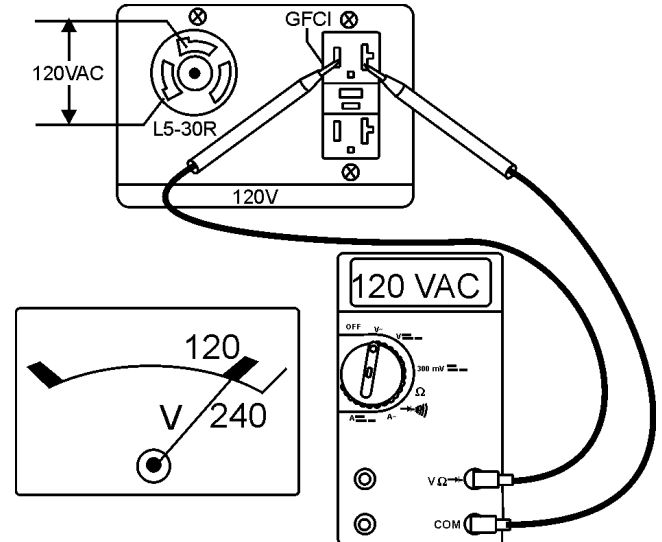
**Figure 19. Main Circuit Breaker (ON)**

13. Place **GFCI** and **AUX.** circuit breakers (Figure 20) in the **ON** position.



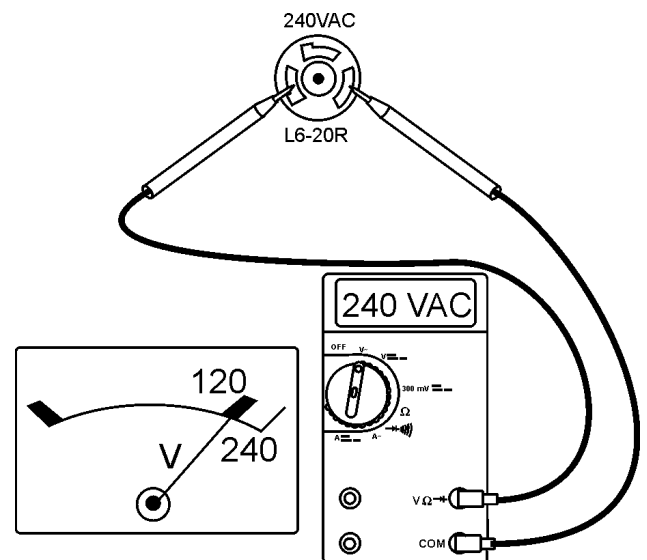
**Figure 20. GFCI/AUX. Circuit Breakers (ON)**

14. Read voltmeter on front panel of generator (Figure 21) and verify that 120 VAC is displayed. Using an external voltmeter as shown in Figure 21, verify that 120 VAC is present at the 120V twist-lock and GFCI duplex receptacles..



**Figure 21. 120V GFCI/AUX. Receptacles**

15. Read voltmeter on front panel of generator (Figure 22) and verify that 240 VAC is displayed. Using an external voltmeter as shown in Figure 22, verify that 240 VAC is present at the 240V twist-lock receptacle.



**Figure 22. 240V Receptacle**

# OPERATION/SHUTDOWN

## NOTICE

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

- The L14-30R receptacle is a dual voltage receptacle (120-240 volts). Reference Figures 23 and 24 to verify voltages at this receptacle.

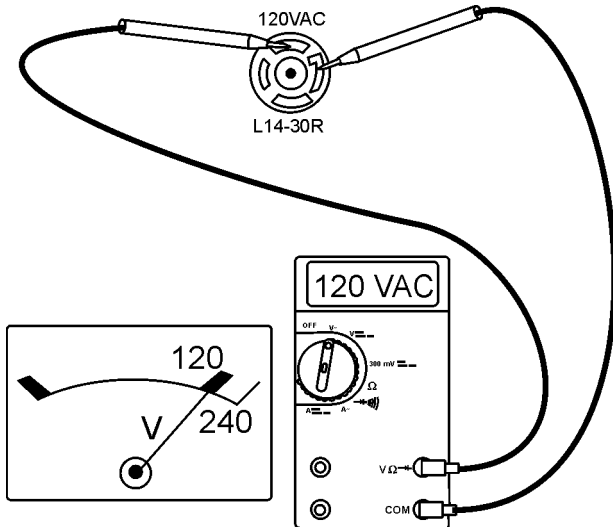


Figure 23. 120/240V Receptacle (120V)

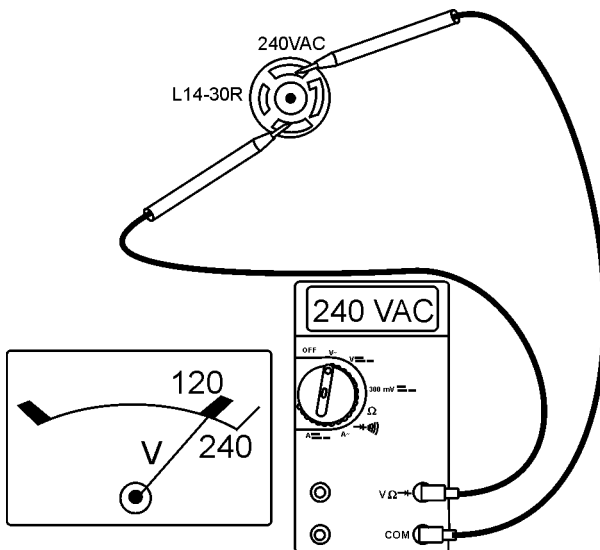


Figure 24. 120/240V Receptacle (240V)

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

## Stopping the Engine (Normal Shutdown)

- Place **main** circuit breaker (Figure 25) in the **OFF** position.

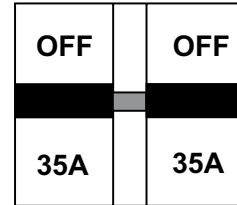


Figure 25. Main Circuit Breaker (OFF)

- Place **GFCI** and **AUX.** circuit breakers (Figure 26) in the **OFF** position.

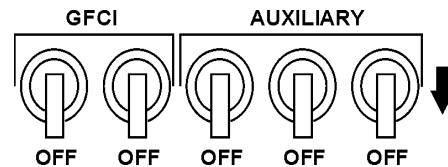


Figure 26. GFCI/AUX. Circuit Breakers (OFF)

- Place idle control switch (Figure 27) in the **OFF** position.



Figure 27. Idle Control switch (OFF)

- Let engine run at idle with no load for 2-3 minutes.
- To shut-down the engine, place the generator's operation switch (Figure 28) in the **OFF** position.



Figure 28. Operation Switch (OFF)

- Remove all loads from the generator.

## Emergency Shutdown

- Place operation switch (Figure 28) 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.
- Slowly rotate the engine a few times with the starter rope and install a new plug.
- Pull out the starter rope slowly and stop at the compression point.
- 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 5 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 5. 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 5 and below:

### 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.

### Weekly

- Remove the fuel filter cap and clean the inside of the fuel tank.
- Remove or clean the filter at the bottom of the tank.
- Remove and clean the spark plug (Figure 29), 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.

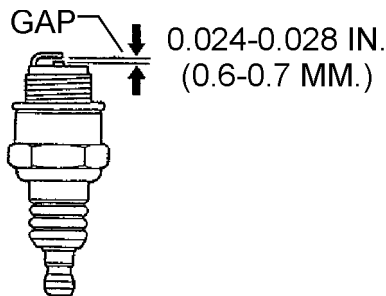


Figure 29. Spark Plug Gap

## Engine Oil and Filter

1. Drain engine oil when the oil is warm as shown in Figure 30.
2. Remove oil drain bolt and sealing washer and allow engine oil to drain into a suitable container.

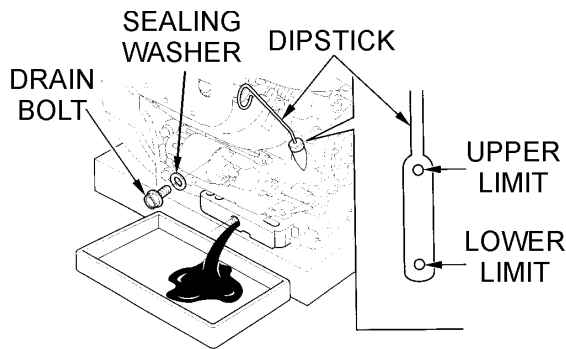


Figure 30. Draining Engine Oil

3. Use an oil filter socket tool and remove oil filter as shown in Figure 31

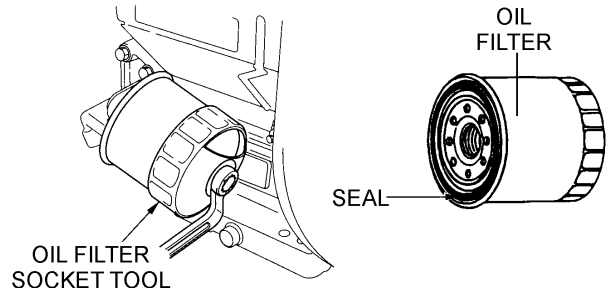


Figure 31. Oil Filter Removal


4. Clean oil filter mounting base, and coat oil filter seal (Figure 31) with clean engine oil.
5. Screw on new oil filter by hand until seal contacts the filter mounting base. Using an oil filter socket tool, tighten filter and additional 7/8-inch turn. Tighten filter to 16ft-lbs. (22 N·m).
6. Install drain bolt with sealing washer and tighten securely.
7. Replace engine oil with recommended type oil as listed in Table 4. For engine oil capacity, see Table 2 (engine specifications). Fill to upper limit as shown in Figure 30.



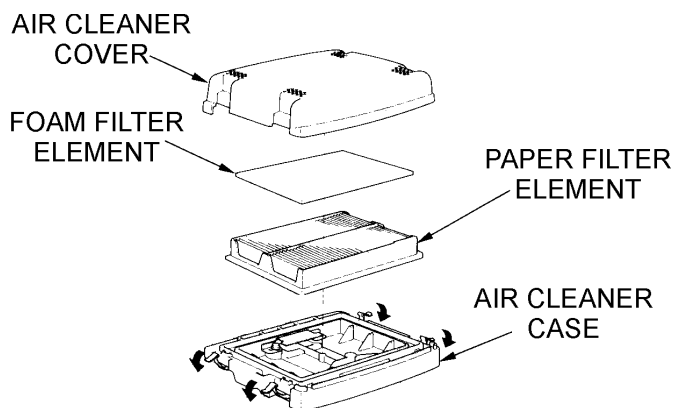
## Engine Air Cleaner

**! 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!**

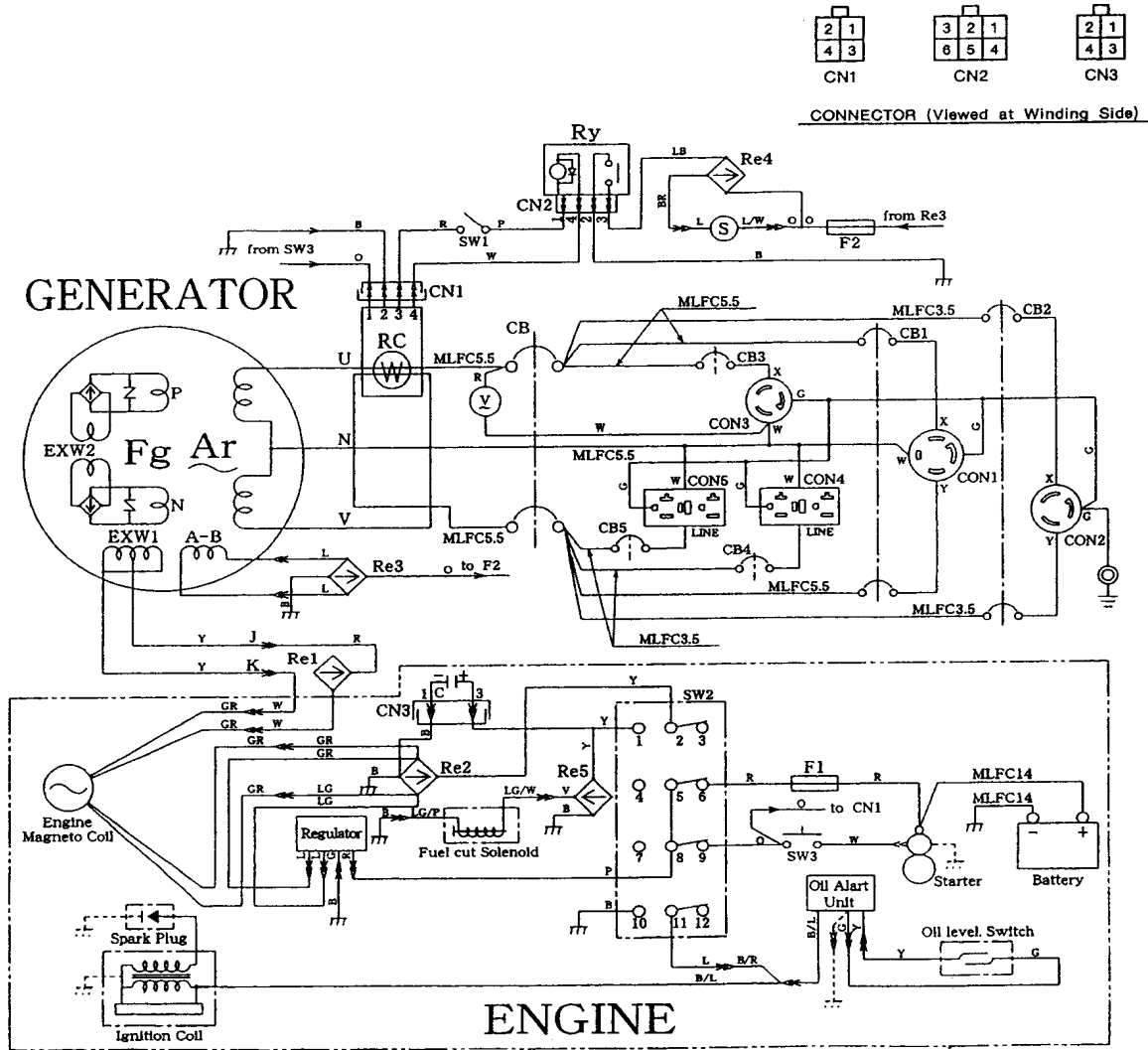


1. Remove the air cleaner cover and foam filter element as shown in Figure 32.
2. Tap the paper filter element (Figure 32) several times on a hard surface to remove dirt, or blow compressed air [not exceeding 30 psi (207 kPa, 2.1 kgf/cm<sup>2</sup>)] through the filter element from the air cleaner case side. **NEVER** brush off dirt. Brushing will force dirt into the fibers. Replace the paper filter element if it is excessively dirty.
3. Clean foam element in warm, soapy water or nonflammable solvent. Rinse and dry thoroughly. Dip the element in clean engine oil and completely squeeze out the excess oil from the element before installing.



**Figure 32. Engine Air Cleaner**

# GENERATOR WIRING DIGRAM



SYMBOL	PART NAME
Ar	Armature Winding
Fg	Field Winding
EXW1-2	Excitation Winding
V	AC Voltmeter (120/240)
Re1-5	Rectifier
CON1	Receptacle L14-30R
CON2	Receptacle L6-20R
CON3	Receptacle L5-30R
CON4-5	Receptacle 5-20R
CB	UPM-2 35A
CB1	CP-32E/30N 30A
CB2	CP-32E/20N 20A
CB3	CP31E/30N 30A
CB4-5	CP-31E/15N 20A
SW1	Idle Control Switch
SW2	Operation Switch
SW3	Starter Switch
RC	Idle Control Device
S	Idle Control Solenoid
RY	Relay
F1-F2	Fuse
C	Capacitor

Wiring Color Code			
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		

Figure 33. Generator Wiring Diagram (GAC9.7HZ)

# TROUBLESHOOTING (ENGINE)

**Table 6. 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 6. 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 7. 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.