

OPERATION MANUAL



MODEL GAC2.5HR PORTABLE GENERATOR (HONDA GX160RT2EMAN GASOLINE ENGINE)

Revision #1 (04/20/22)

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www.multiquip.com



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

PROPOSITION 65/START FIRES WARNINGS

WARNING

CALIFORNIA — Proposition 65 Warning

Gasoline engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

WARNING

Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

**GAC2.5HR
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 and need to be replaced, contact your nearest dealer or the Multiquip Parts Dept.

NOTICE

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

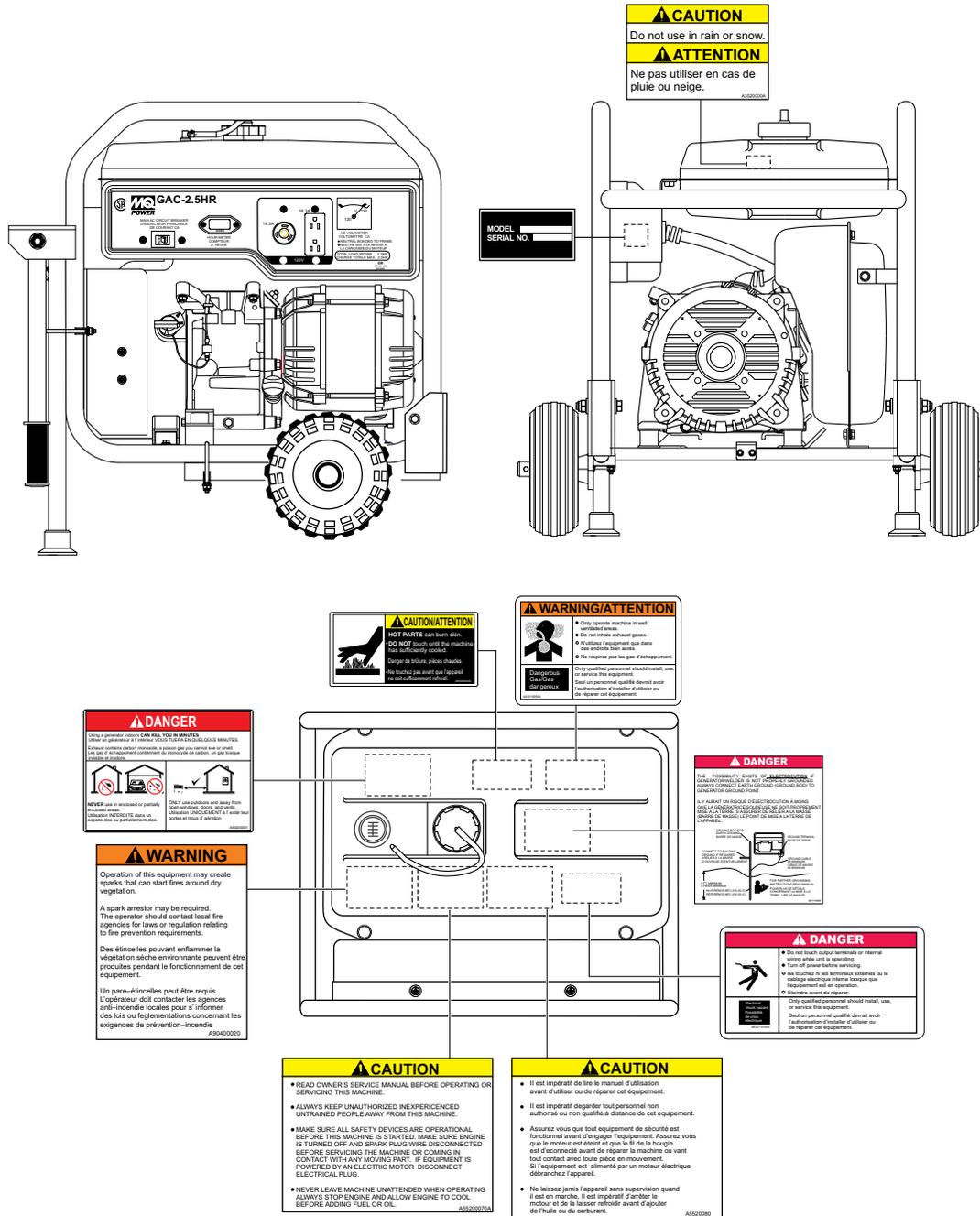


Figure 1. Nameplate And Safety Decals

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.



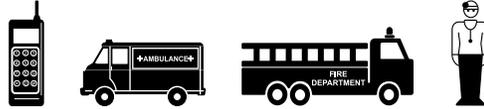
- **ALWAYS** check the equipment for loosened threads or bolts before starting.
- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

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

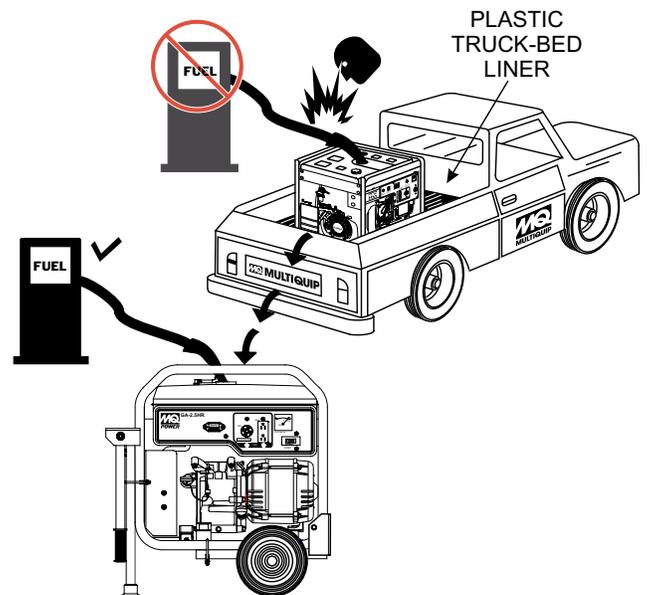


to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose. In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

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.



- **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 your authorized Honda Engine Distributor.

SPECIFICATIONS (GENERATOR)

Table 1. Specifications (Generator)		
AC Generator	Model	GAC2.5HR
	Type	Brushless Revolving Field Type
	Excitation	Solid State, Statically Excited System
	Speed	3,600 RPM
	Cooling System	Self-Ventilation
	Fuel Capacity	3.20 gallons (12 liters)
60 Hz AC Power Source	Continuous Power Output	2.2 kW
	Max Power Output	2.5 kW
	Rated Voltage	120V
	Current Max/Continuous (120V)	20.8/18.3 amps
	Phase	Single Phase (3 wire)
	Frequency	60 Hz
	Power Factor	1
Dimension (L x W x H)		20.9 x 17.7 x 20.1 in (530 x 450 x 510 mm)
Dry Net Weight		112 lbs. (51 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)

Table 2. Specifications (Engine)		
Engine	Model	HONDA GX160RT2EMAN
	Type	Air-cooled 4-stroke, Single Cylinder, OHV, Horizontal Shaft Gasoline Engine
	Bore X Stroke	2.7 in. x 1.8 in. (68 mm x 45 mm)
	Displacement	9.9 cu-in (163 cm ³)
	Max Output	5.0 H.P./3600 R.P.M.
	Fuel Tank Capacity	3.1 Liters Unleaded Gasoline, 86 Octane or Higher
	Lube Oil Capacity	0.63 quarts (0.60 liters)
	Oil Alert System	Yes
	Speed Control Method	Centrifugal Fly-weight Type
	Starting Method	Recoil Start
Dimensions (L x W x H)	12.2 x 14.3 x 13.6in. (312 x 362 x 346 mm)	
Dry Net Weight	33 lbs. (15.1 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

NOTICE

UWKB Wheel Kit is optional. Contact MQ inside sales to order.

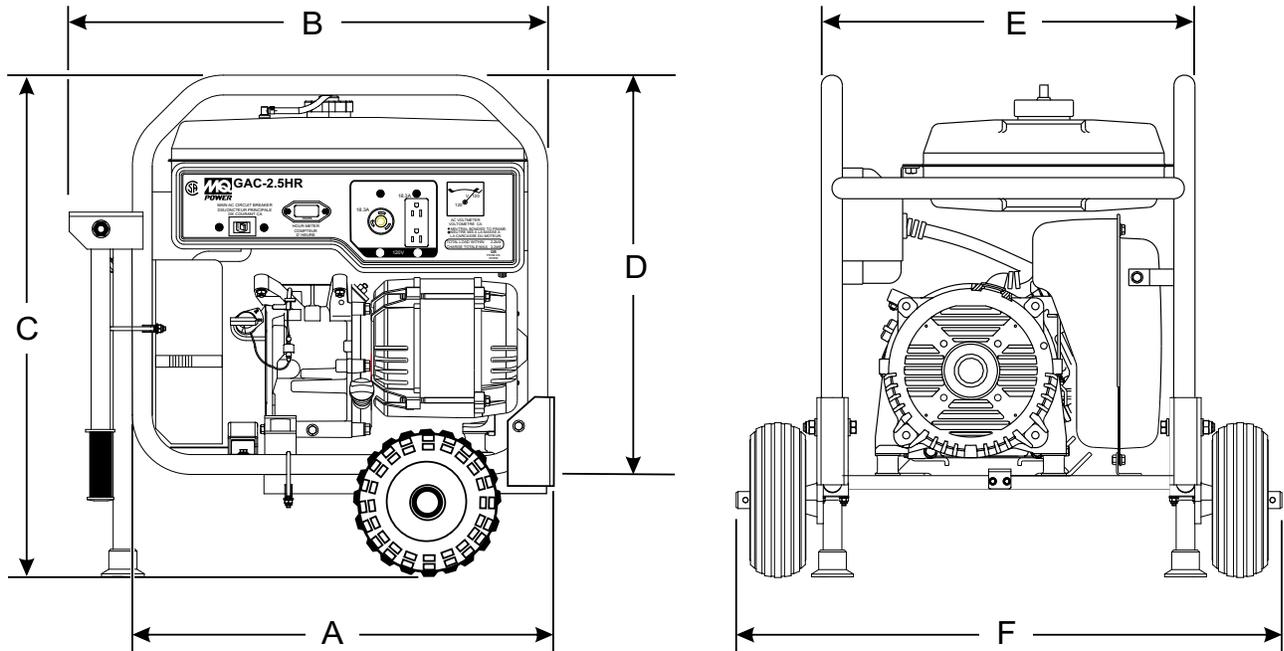


Figure 2. Dimensions

Table 3. Generator Dimensions

REFERENCE LETTER	DESCRIPTION	DIMENSIONS: IN. (MM)
A	LENGTH (FRAME)	20.86 (530)
B	LENGTH (W/HANDLE)	22.57 (760)
C	HEIGHT (FRAME/WHEELS)	24.07 (627) Approx.
D	HEIGHT (FRAME ONLY)	20.07 (510)
E	WIDTH (FRAME)	17.7 (450)
F	WIDTH (WHEELS)	20.7 (526) Approx.

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).

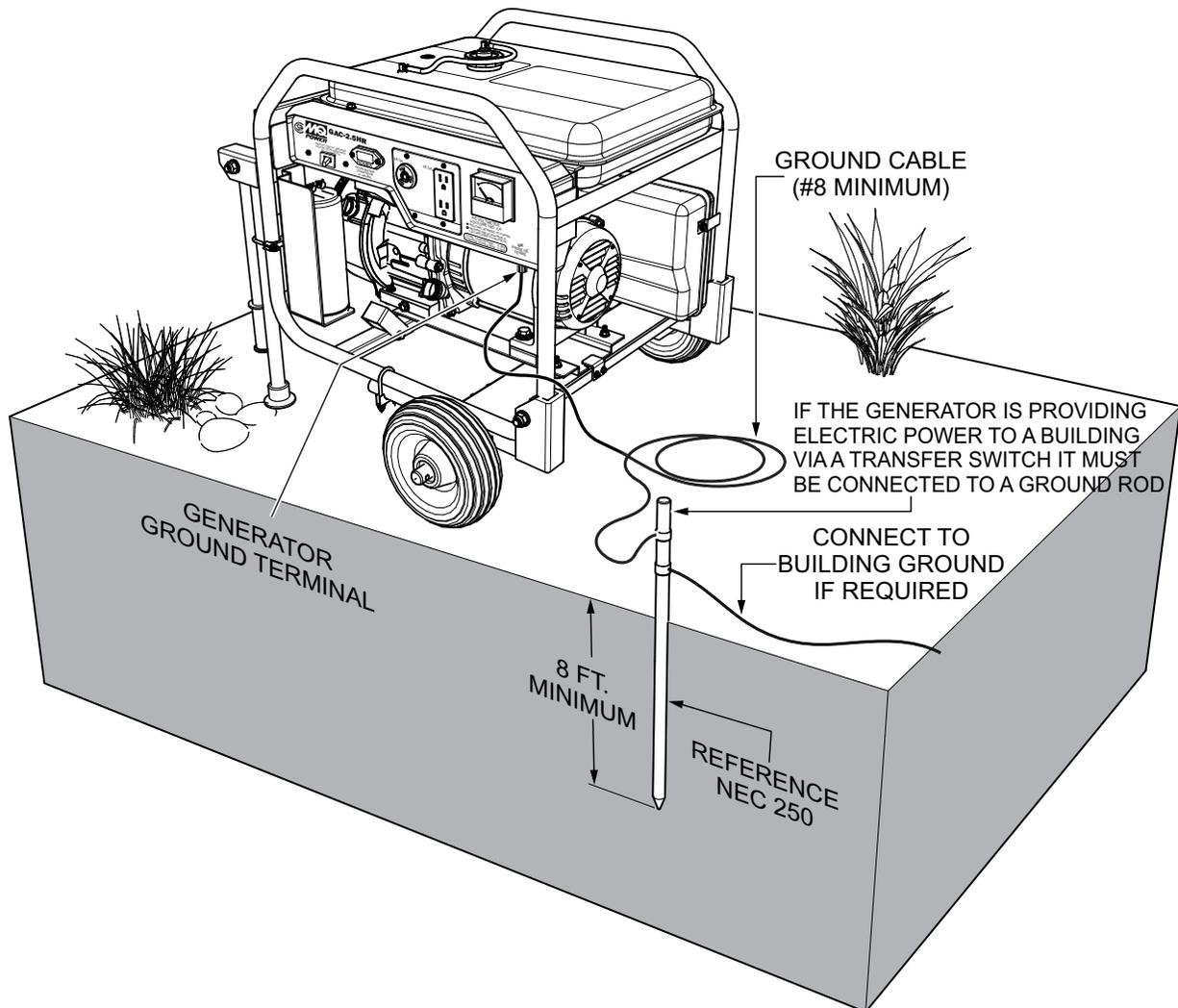


Figure 3. Generator Grounding

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 mm²) or larger.
 - b. Aluminum 8 AWG (8.4 mm²) 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 GAC2.5HR 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. Reference Figure 4 and Figure 5 for the basic controls and indicators for the GAC2.5HR generator.

These portable generators are supplied with an electrical control box (panel). To reduce vibration caused by the engine, the control box is also placed on rubber isolators.

Control Panel

The control panel is provided with the following:

- 120V Twist-Lock Output Receptacle (L5-20R)
- 120 VAC GFCI Receptacle (5-20R)
- 20 Amp Main Circuit Breaker
- AC Voltmeter
- Hour Meter

Excitation System

The GAC2.5HR generator uses a magnet attached to a flywheel to produce AC voltage from a lamp coil beneath the flywheel. As the magnet passes the coil it produces approximately 19-22 AC volts.

This volatage (19-22 VAC) is then sent to the control box that contains three rectifying diodes:

- Excitation (diode 1)
- Battery (diode 2)
- Slow Down (diode 3)

The AC voltage will pass through the excitation diode that converts the voltage to DC power.

This DC power is then sent to the excitation windings housed within the main windings commonly called the "stator".

This voltage is then transferred into the rotor through induction. The rotor contains two diodes within it which rectify the DC voltage and send it our through the main windings, as AC voltage.

Alternator

The alternator, a brushless revolving-field type, is permanently aligned to the engine through rigid coupling.

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

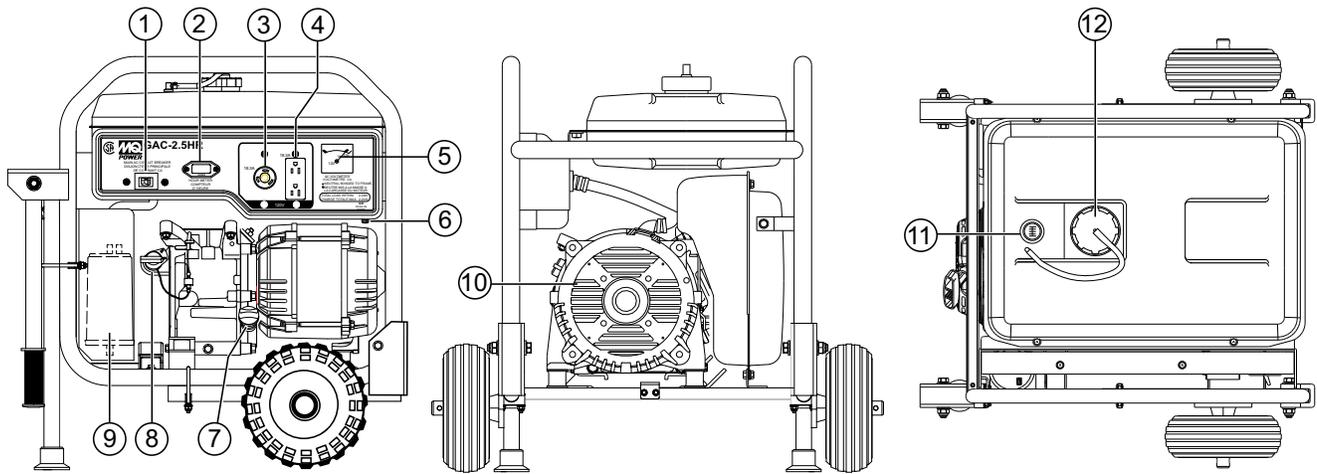


Figure 4. Generator Components

1. **Main Breaker** – This single-pole, 20 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.
2. **Hour Meter** – Indicates the number hours the generator has been in use.
3. **120V Output Receptacle** – NEMA L5-20R twist-lock receptacle will provide 120V, 18.3 amps, 60 Hz.
4. **GFCI Duplex Receptacles** – NEMA 5-20R, GFCI receptacle will provide 120V@ 18.3 amps.
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. **Ground Terminal** – This ground connection point should be connect to a good earth ground (ground rod)
7. **Engine Oil Filler Cap** – Remove this cap/dipstick when the adding of engine oil is required. See Table 5 for recommended type engine oil.
8. **ON/OFF Switch** – Place engine ON/OFF switch in the **"ON"** position for normal operation. To turn off the generator place the switch in the **"OFF"** position.
9. **Charcoal Canister** – A container filled with activated charcoal that traps gasoline vapors emitted by the fuel system.
10. **Generator Housing** – Contains the rotor, rectifier field coil assembly, armature, bearings and other components that make up generator assembly.
11. **Fuel Gauge** – This gauge is located on top of the fuel tank. Read this gauge to determine when fuel is low.
12. **Fuel Tank Cap** – Remove this cap to add unleaded gasoline to the fuel tank. Replenish with clean unleaded gasoline. Make sure cap is tightened securely. **DO NOT** over fill. Fuel tank capacity is 3.2 gallons (12 liters).

NOTICE

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

COMPONENTS GENERATOR (CONTINUED)

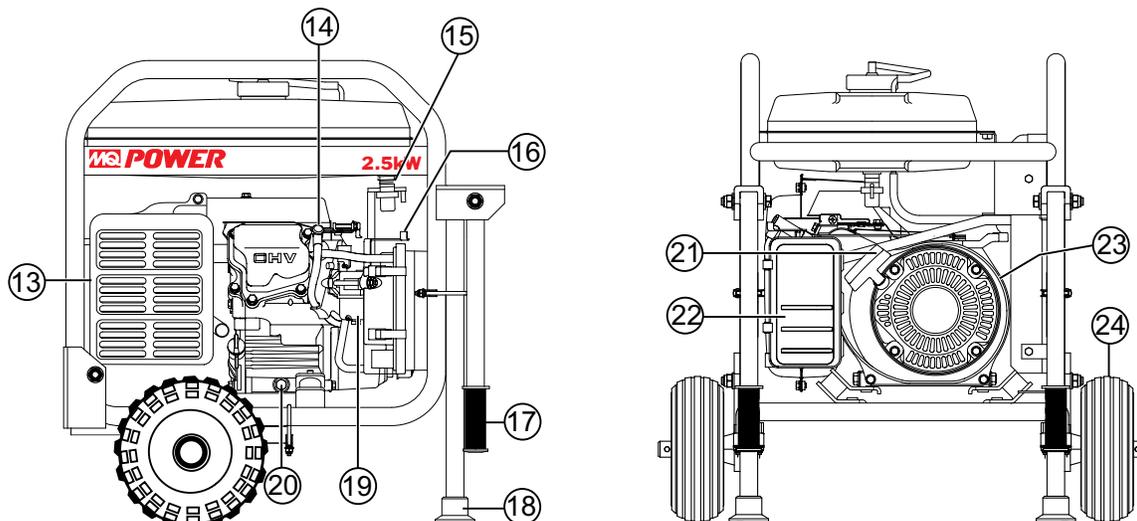


Figure 5. Generator Components (Continued)

13. **Muffler/Heat Shield** – Used to reduce noise and emissions. **NEVER** touch this heat shield when the generator is in use. Always allow time for engine to cool before servicing.
14. **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.
15. **Fuel Cock Lever** – Turn this lever downward (**ON**) to start the flow of fuel into the carburetor. Turn upward to stop (**OFF**) the flow of fuel.
16. **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.
17. **Transport Handles (Option)** – Lift up on each handle when transporting of the generator is required. Part of the UWKB Wheel Kit Assembly.
18. **Support Stand (Option)** – Supports the generator, part of the UWKB Wheel Kit Assembly.
19. **Carburetor Cup** – Inspect the fuel cup weekly for water and dirt. Clean as referenced in the maintenance section of this manual.
20. **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 5.
21. **Recoil Starter (pull rope)** – Manual-starting method. Pull the starter grip until resistance is felt, then pull briskly and smoothly.
22. **Air Cleaner** – Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter cannister to gain access to filter element. **NEVER** run the engine without an air cleaner.
23. **Engine** – This generator uses a 5.5 HP HONDA air-cooled, 4-stroke, single cylinder, overhead camshaft gasoline engine. Engine uses unleaded gasoline.
24. **Foam-Filled Tires** – Provided for ease of transport. Replace with only recommended tires.

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 generators is placed on level ground. Placing the generators on level ground will ensure that the low oil sensor will function properly.

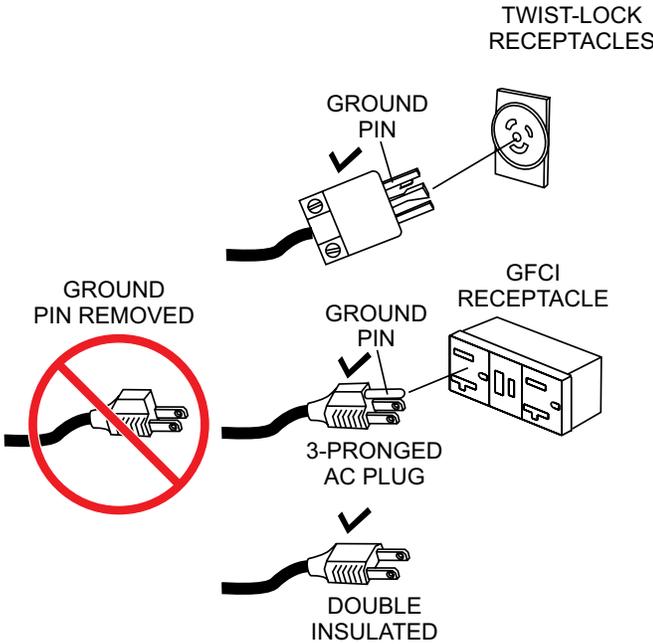
GENERAL INSPECTION PRIOR TO OPERATION

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 6.

NOTICE

Double-insulated power tools and small appliances have specially insulated housings that eliminate the need for a ground pin. 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 4) 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!**

Figure 6. Ground Pin

Table 4. 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

NOTICE

ALWAYS place the main circuit breaker in the **OFF** position prior to starting the engine.

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 filler dipstick from the engine oil filler hole (Figure 7) and wipe clean.

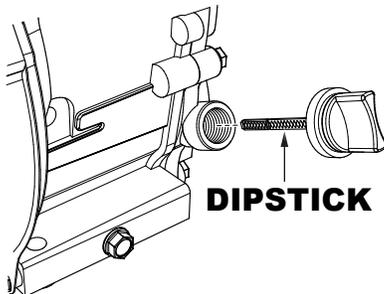


Figure 7. Engine Oil Dipstick Removal

3. Insert and remove the dipstick without screwing it into the filler neck. Check the oil level shown on the dipstick.

4. If the oil level is low (Figure 8), fill to the edge of the oil filler hole with the recommended oil type (Table 5). Maximum oil capacity is 0.63 quarts (0.60 liters).

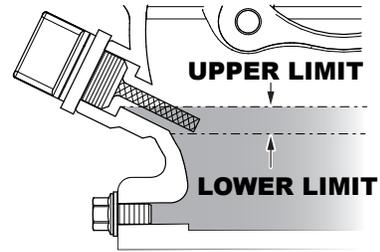


Figure 8. Engine Oil Dipstick(Oil Level)

Table 5. 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.

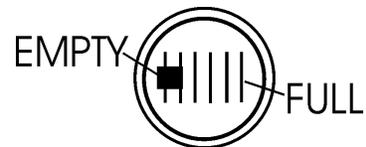


Figure 9. Fuel Gauge

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!**

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 main circuit breaker (Figure 10) in the **OFF** position before starting.

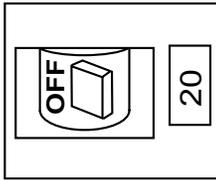


Figure 10. Main Circuit Breaker (OFF)

Starting the Engine (Recoil Start)

1. Place the engine fuel valve lever (Figure 11) in the **ON** position.

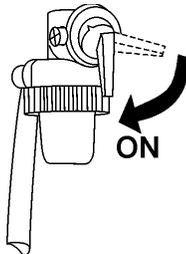


Figure 11. Engine Fuel Valve Lever (ON)

2. Place the choke lever (Figure 12) in the **CLOSED** position if starting a cold engine.

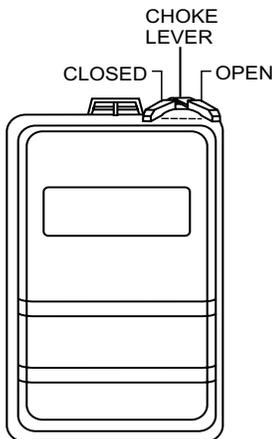


Figure 12. Choke Lever

3. Place the choke lever (Figure 12) in the **OPEN** position if starting a warm engine or the temperature is warm.
4. Place the engine ON/OFF switch (Figure 13) in the **ON** position.

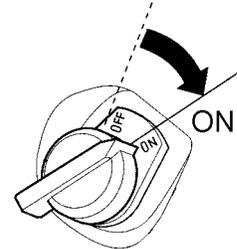


Figure 13. Engine ON/OFF Switch (ON)

5. If your generator is a recoil start only (no battery), grasp the starter grip (Figure 14) 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. Proceed to step 6 if your unit is an electric start model (battery installed).

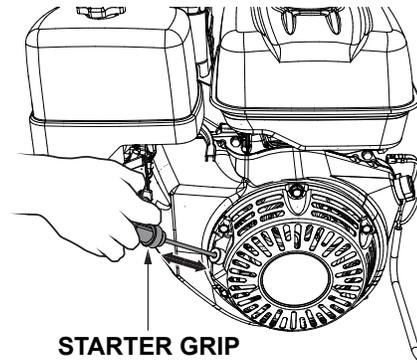


Figure 14. Starter Grip

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.

6. If the engine has started, slowly return the choke lever (Figure 12) to the **OPEN** position. If the engine has not started repeat steps 1 through 6.
7. 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.

- Place main circuit breaker (Figure 15) in the **ON** position.

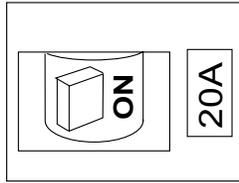


Figure 15. Main Circuit Breaker (ON)

- Read voltmeter on front panel of generator (Figure 16) and verify that 120 VAC is displayed. Using an external voltmeter as shown in Figure 16, verify that 120 VAC is present at the 120V twist-lock and duplex receptacles.

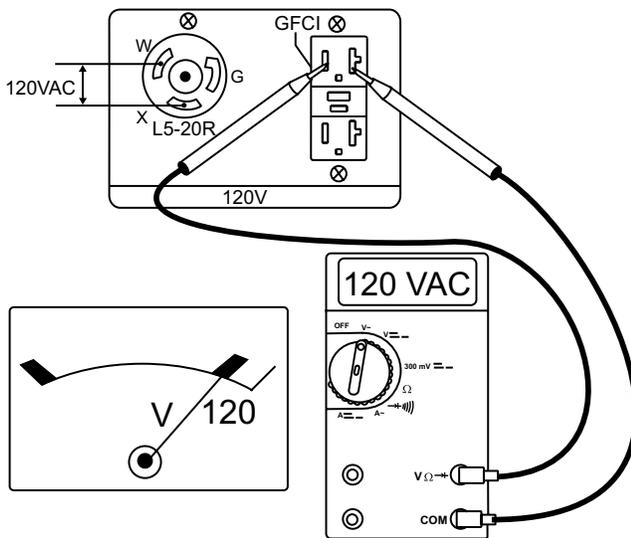


Figure 16. 120V Twist-Lock/Receptacles

Stopping the Engine (Normal Shutdown)

- Place main circuit breaker (Figure 17) in the **OFF** position.

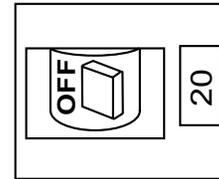


Figure 17. Main Circuit Breaker (OFF)

- Remove the load from the generator and let the engine run at idle for 3-5 minutes.
- Place the ON/OFF switch (Figure 18) in the "**OFF**" position.

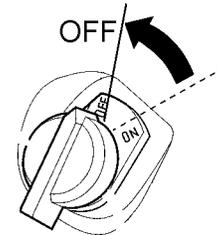


Figure 18. Engine ON/OFF Switch (OFF)

- Place engine fuel valve lever (Figure 19) in the "**OFF**" position.

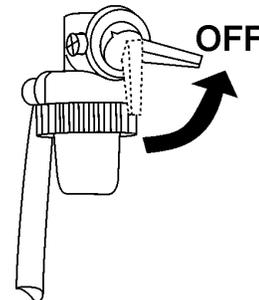


Figure 19. Engine Fuel Valve Lever (OFF)

- Remove all loads from the generator.

Emergency Shutdown

- Place the engine ON/OFF switch (Figure 18) in the "**OFF**" position.

PREPARATION FOR LONG TERM STORAGE

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 6 as a general maintenance guideline when servicing your engine. For more detailed engine maintenance information, refer to the engine owner's manual supplied with your engine.

Table 6. 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		X		X	X	X
Air Cleaner	CHECK	X	X				
	CHANGE			X (1)			
Charcoal Canister (4)	REPLACE						
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 Strainer	CHECK				X	X	
Idle Speed	CHECK-ADJUST					X (2)	
Valve Clearance	CHECK-ADJUST			X		X	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.

(4) Charcoal canister is maintenance free (non-servicable). Replace only if damaged.

MAINTENANCE

Perform the scheduled maintenance procedures as defined by Table 6 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 20) with solvent.

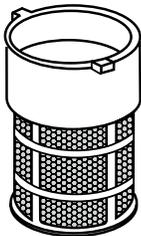


Figure 20. Fuel Strainer

Spark Plug

1. Remove and clean the spark plug (Figure 21), 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.

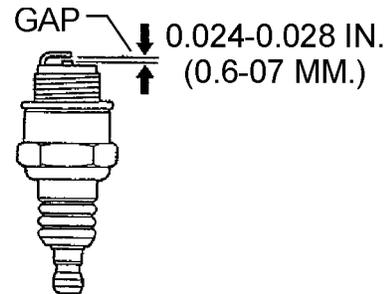


Figure 21. Spark Plug Gap

ENGINE OIL

2. Drain the engine oil when the oil is warm as shown in Figure 22.
3. Remove the oil drain bolt and sealing washer and allow the oil to drain into a suitable container.
4. Replace engine oil with recommended type oil as listed in Table 5. For engine oil capacity, see Table 2 (engine specifications). **DO NOT** overfill.
5. Install drain bolt with sealing washer and tighten securely.

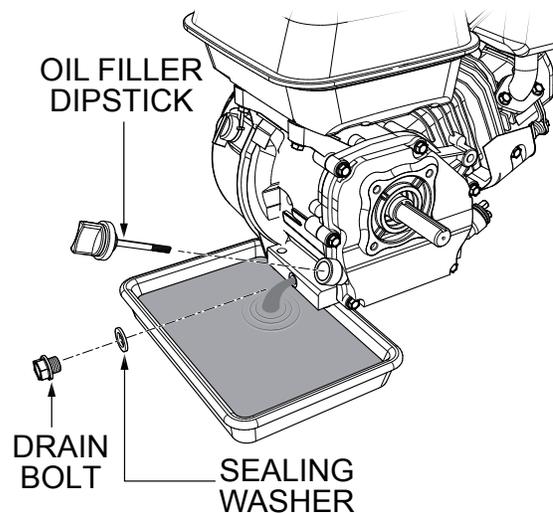


Figure 22. Draining Engine Oil

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 23.

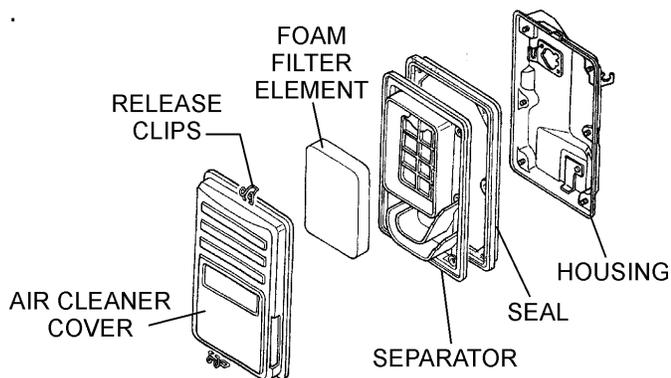


Figure 23. Engine Air Cleaner

2. Clean foam element (Figure 24) in warm, soapy water or non-flammable solvent. Rinse and dry thoroughly.
3. Next, dip the element in clean engine oil and completely squeeze out the excess oil from the element before installing.

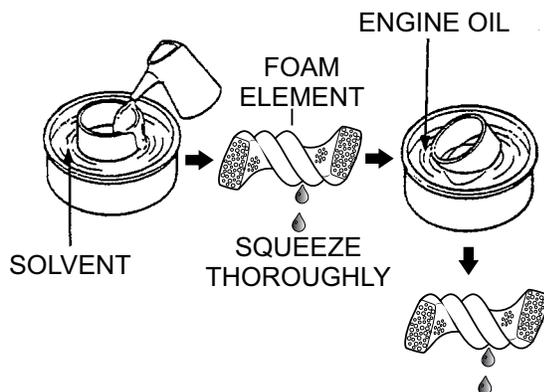


Figure 24. Cleaning Foam Element

SPARK ARRESTER CLEANING

Clean the spark arrester every 6 months or 100 hours.

1. Remove the muffler protector retaining bolts (Figure 25), then remove muffler protector.
2. Next, remove the retaining bolts and lock washers (2) that secures the exhaust pipe to the muffler, then remove spark arrester.

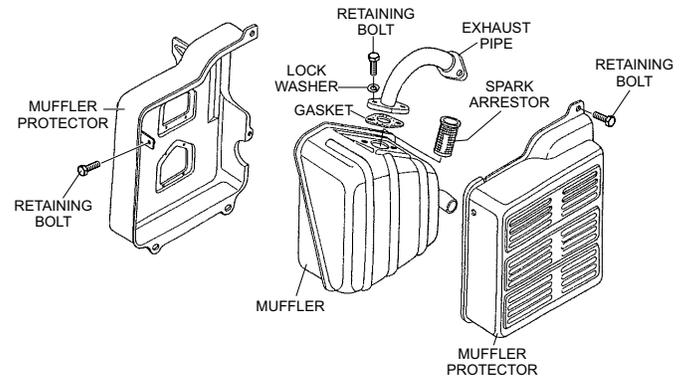


Figure 25. Spark Arrester Removal

3. Carefully remove carbon deposits from the spark arrester screen (Figure 26) with a wire brush.

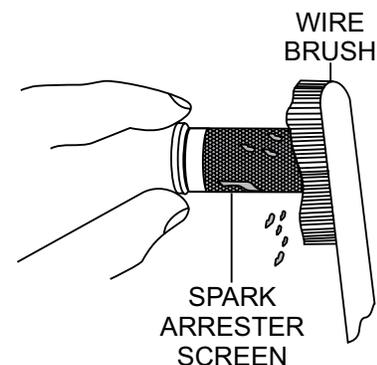
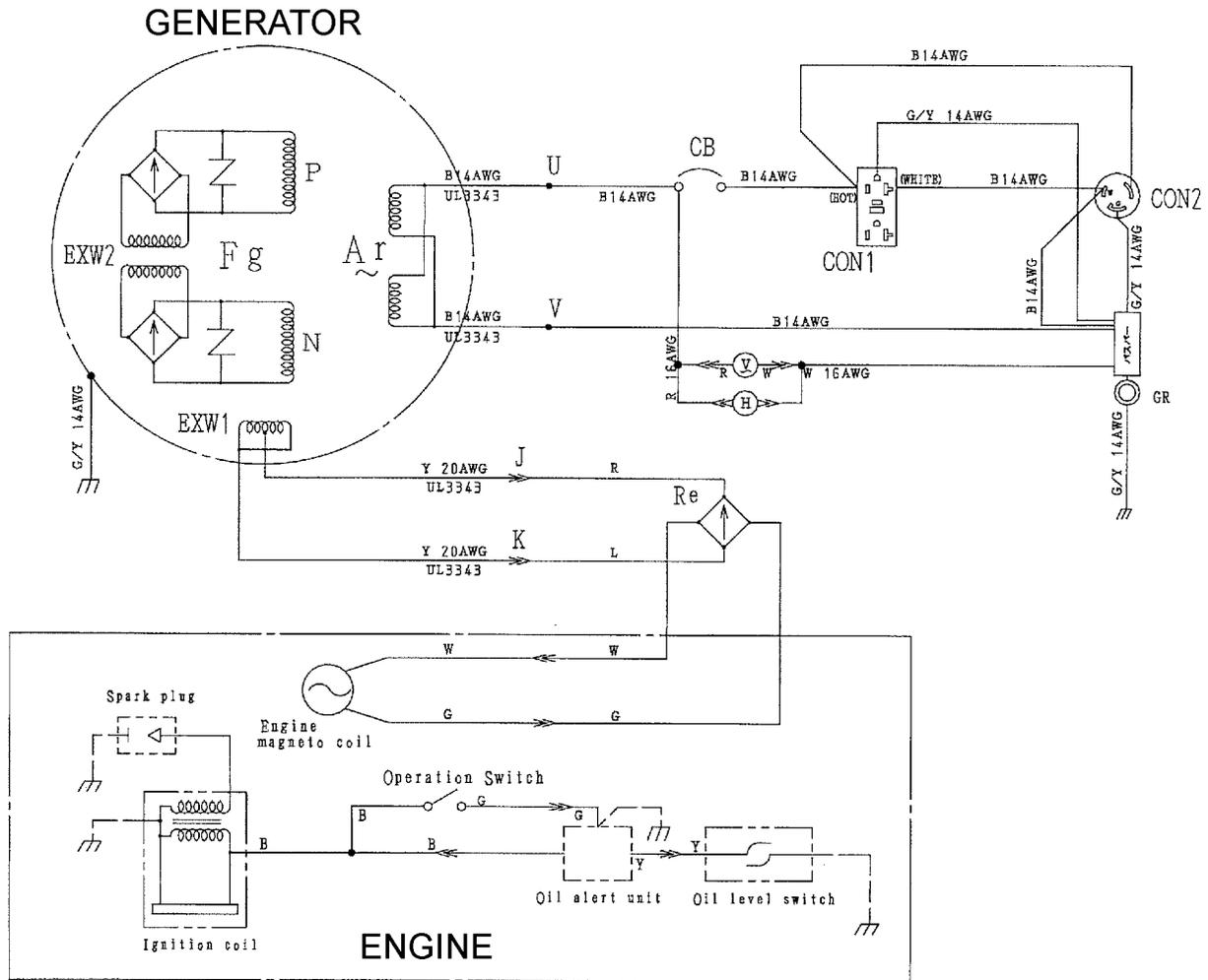


Figure 26. Cleaning The Spark Arrester

4. If the spark arrester is damaged and has breaks or holes, replace with a new one.
5. Reinstall the spark arrester and muffler protector in reverse order of disassembly.

GENERATOR WIRING DIAGRAM



COLOR CODE			
WIRE COLOR	WIRE COLOR	WIRE 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		

SYMBOL	DESIGNATION
Ar	ARMATURE WINDING
Fg-P, N	ROTOR ASSEMBLY
Ex W1	EXCITATION WINDING
Ex W2	EXCITATION WINDING
V	AC VOLTMETER 120/240V
RE	RECTIFIER
CB	CIRCUIT BREAKER 20A
CON 1	RECEPTACLE 5-20R GFCI 18.3A, 125V
CON 2	RECEPTACLE L5-20R 18.3A, 125V
H	HOUR METER
GR	GROUND TERMINAL

TROUBLESHOOTING (ENGINE)

Troubleshooting (Engine)		
Symptom	Possible Problem	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.
	Spark plug is red?	Check transistor ignition unit.
	Spark plug is bluish white?	If insufficient compression, repair or replace engine. If injected air leaking, correct leak. If carburetor jets clogged, clean carburetor.
	No spark present at tip of spark plug?	Check transistor ignition unit is broken, and replace defective unit. Check if voltage cord is cracked or broken and replace. Check if spark plug is fouled. Replace if fouled.
	No oil?	Add oil as required.
	Oil pressure alarm lamp blinks upon starting? (if applicable)	Check automatic shutdown circuit, "oil sensor". (if applicable)
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 and compression is normal.	Wrong fuel type?	Flush fuel system, replace with correct type of fuel.
	Water or dust in fuel system?	Flush fuel system.
	Air cleaner dirty?	Clean or replace air cleaner.
	Choke open?	Close choke.
Difficult to start, fuel is available, spark is present and compression is low.	Suction/exhaust valve stuck or protruded?	Reseat valves.
	Piston ring and/or cylinder worn?	Replace piston rings and/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.	No fuel 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/lines clogged?	Replace fuel filter.
	Fuel tank cap breather hole clogged?	Clean or replace fuel tank cap.
	Air in fuel line?	Bleed fuel line.
Will not start, no power with key "ON". (if applicable)	ON/OFF device not in ON position?	Place ON/OFF device in ON position.

TROUBLESHOOTING (ENGINE CONTINUED)

Troubleshooting (Engine) - continued		
Symptom	Possible Problem	Solution
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.
	Improper spark plug?	Set to proper gap.
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 incorrect?	Replace with correct type of spark plug.
	Wrong type of fuel?	Replace with correct type of fuel.
	Cooling fins dirty?	Clean cooling fins.
	Intake air restricted?	Clear intake of dirt and debris. Replace air cleaner elements as necessary.
	Oil level too low or too high?	Adjust oil to proper level.
Rotational speed fluctuates.	Governor adjusted incorrectly?	Adjust governor.
	Governor spring defective?	Replace governor spring.
	Fuel flow restricted?	Check entire fuel system for leaks or clogs.
Recoil starter malfunctions. (if applicable)	Recoil mechanism clogged with dust and dirt?	Clean recoil assembly with soap and water.
	Spiral spring loose?	Replace spiral spring.
Burns too much fuel.	Over-accumulation of exhaust products?	Check and clean valves. Check muffler and replace if necessary.
	Wrong spark plug?	Replace spark plug with manufacturer's suggested type.
Exhaust color is continuously "white".	Lubricating oil is wrong viscosity?	Replace lubricating oil with correct viscosity.
	Worn rings?	Replace rings.
Exhaust color is continuously "black".	Air cleaner clogged?	Clean or replace air cleaner.
	Choke valve set to incorrect position?	Adjust choke valve to correct position.
	Carburetor defective, seal on carburetor broken?	Replace carburetor or seal.
	Poor carburetor adjustment, engine runs too rich?	Adjust carburetor.

TROUBLESHOOTING (GENERATOR)

Troubleshooting (Generator)		
Symptom	Possible Problem	Solution
Low voltage	Engine speed too low?	Raise engine speed to rated RPM.
Low voltage, 3650 RPM (unloaded).	AC voltmeter not working?	Replace AC voltmeter.
	Control box internal wiring malfunction?	Check control box wiring.
	Rotor winding malfunction?	Check or replace rotor.
	Stator winding malfunction?	Check or replace stator.
	Circuit breaker malfunction?	Check or replace CB1.
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.

OPERATION MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON-HAND WHEN CALLING

UNITED STATES

Multiquip Inc.

(310) 537- 3700
6141 Katella Avenue Suite 200
Cypress, CA 90630
E-MAIL: mq@multiquip.com
WEBSITE: www.multiquip.com

CANADA

Multiquip

(450) 625-2244
4110 Industriel Boul.
Laval, Quebec, Canada H7L 6V3
E-MAIL: infocanada@multiquip.com

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Multiquip (UK) Limited Head Office

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Globe Lane,
Dukinfield, Cheshire SK16 4UJ
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MQ Power Inc.
by
DENYO MANUFACTURING CO.

