OPERATION MANUAL

MQ POWER®

MODEL
DA7000SSA2
DA7000SSA2GH
PORTABLE GENERATORS
(KUBOTA Z482-E4B-DGDE-2 DIESEL ENGINE)

Revision #2 (01/24/18)

THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

TO PURCHASE THIS PRODUCT PLEASE CONTACT US

Discount Equipment

Equipment Financing and
Extended Warranties Available

Discount-Equipment.com is your online resource for commercial and industrial quality parts and equipment sales.
561-964-4949
visit us on line @ www.discount-equipment.com

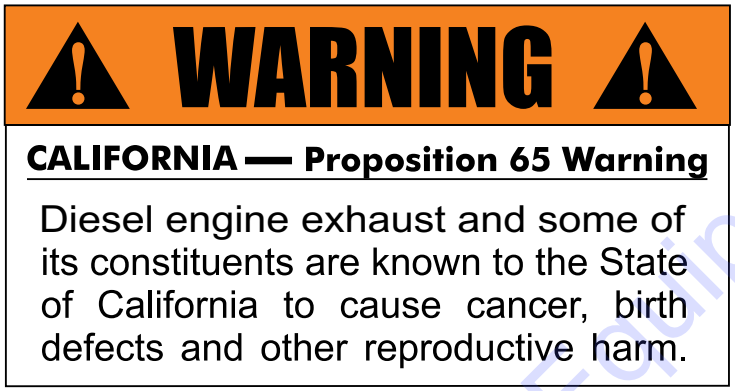
Select an option below to find your Equipment

Search by Manufacturer

Search by Product Type

Request a Quote

We sell worldwide for the brands: Genie, Terex, JLG, MultiQuip, Mikasa, Essick, Whiteman, Mayco, Toro Stone, Diamond Products, Generac Magnum, Airman, Haulotte, Barreto, Power Blanket, Nifty Lift, Atlas Copco, Chicago Pneumatic, Allmand, Miller Curber, Skyjack, Lull, Skytrak, Tsurumi, Husquvarna Target, Stow, Wacker, Sakai, Mi-T-M, Sullair, Basic, Dynapac, MBW, Weber, Bartell, Bennar Newman, Haulotte, Ditch Runner, Menegotti, Morrison, Contec, Buddy, Crown, Edco, Wyco, Bomag, Laymor, EZ Trench, Bil-Jax, F.S. Curtis, Gehl Pavers, Heli, Honda, ICS/PowerGrit, IHI, Partner, Imer, Clipper, MMD, Koshin, Rice, CH&E, General Equipment ,Amida, Coleman, NAC, Gradall, Square Shooter, Kent, Stanley, Tamco, Toku, Hatz, Kohler, Robin, Wisconsin, Northrock, Oztec, Toker TK, Rol-Air, APT, Wylie, Ingersoll Rand / Doosan, Innovatech, Con X, Ammann, Mecalac, Makinex, Smith Surface Prep,Small Line, Wanco, Yanmar



DA7000SSA2/SSA2GH Generator

NOTICE

Specifications and part numbers are subject to change without notice.

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
	Rotating parts hazards
	Pressurized fluid hazards
	Electric shock hazards

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 MQ Power 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.

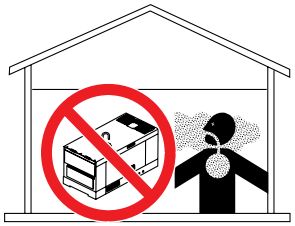
NOTICE

- **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.

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

- **DO NOT** place hands or fingers inside engine compartment when engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- Keep fingers, hands hair and clothing away from all moving parts to prevent injury.

- **DO NOT** remove the radiator cap while the engine is hot. High pressure boiling water will gush out of the radiator and severely scald any persons in the general area of the generator.

- **DO NOT** remove the coolant drain plug while the engine is hot. Hot coolant will gush out of the coolant tank and severely scald any persons in the general area of the generator.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank 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.

- Wet stacking is a common problem with diesel engines which are operated for extended periods with light or no load applied. When a diesel engine operates without sufficient load (less than 40% of the rated output), it will not operate at its optimum temperature. This will allow unburned fuel to accumulate in the exhaust system, which can foul the fuel injectors, engine valves and exhaust system, including turbochargers, and reduce the operating performance.

  In order for a diesel engine to operate at peak efficiency, it must be able to provide fuel and air in the proper ratio and at a high enough engine temperature for the engine to completely burn all of the fuel.

  Wet stacking does not usually cause any permanent damage and can be alleviated if additional load is applied to relieve the condition. It can reduce the system performance and increase maintenance. Applying an increasing load over a period of time until the excess fuel is burned off and the system capacity is reached usually can repair the condition. This can take several hours to burn off the accumulated unburned fuel.
- 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 Discount-equipment.

FUEL SAFETY

⚠ DANGER

- **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.
- **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

- **DO NOT** touch output terminals during operation. Contact with output terminals during operation can cause **electrocution, electrical shock or burn.**

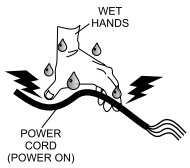
- The electrical voltage required to operate the generator can cause severe injury or even death through physical contact with live circuits. Turn generator and all circuit breakers **OFF** before performing maintenance on the generator or making contact with output terminals.
- **NEVER** insert any 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

⚠ 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.

⚠ 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.
- 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.

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

This engine has been certifi ed to meet US EPA Evaporative emissions requirements in the installed confi guration.

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 fi nes or other penalties.

Emission Control Label

The emission control label is an integral part of the emission system and is strictly controlled by regulations.

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

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

Table 1. Specifications (Generator)		
AC Generator 60 Hz AC Power Source	Model	DA7000SSA2/SSA2GH
	Type	2-Pole Brushless Revolving Field Type
	Excitation	Solid State, Statically Excited System
	Speed	3,600 RPM
	Cooling System	Self-Ventilation
	Max Power Output	7 kW
	Continuous Power Output	6 kW
	Rated Voltage	120/240V
	Current Max/Continuous (120V)	58.3/50 amps
	Current Max/Continuous (240V)	29.2/25 amps
	Phase	Single Phase (3 wire)
	Frequency	60 Hz
	Power Factor	1
Battery		12 -35Ah X 1
Dimensions (L x W x H)		25.6 X 44.9 X 31.3 in. (650 X 1,140 X 795 mm)
Dry Net Weight		527 lbs. (239 kg)

NOTICE

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

Table 2. Specifications (Engine)		
Engine	Kubota Engine Model	Z482-E4B-DGDE-2
	Tier	4
	Gen. Enclosure Color	White
	Type	Vertical, water-cooled, 4-cycle diesel engine
	Bore X Stroke	2.64 in. X 2.68 in. (67 mm X 68 mm.)
	Displacement	29.23 cu.-in. (479 cm^3)
	Number of Cylinders	2
	Max Output	12.5~13.9 H.P./3600 R.P.M.
	Fuel	#2 Diesel Fuel
	Fuel Capacity	6.6 gal. (25 liters)
	Fuel Consumption	0.7 gals. (2.63 liters)/hr.
	Coolant Capacity	2.95 quarts (2.8 liters)
	Lube Oil Capacity	2.64 quarts (2.5 liters)
	Oil Alert System	Yes
	Starting Method	Electric Start
	Battery	12 Volt @ 35 Ah

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).

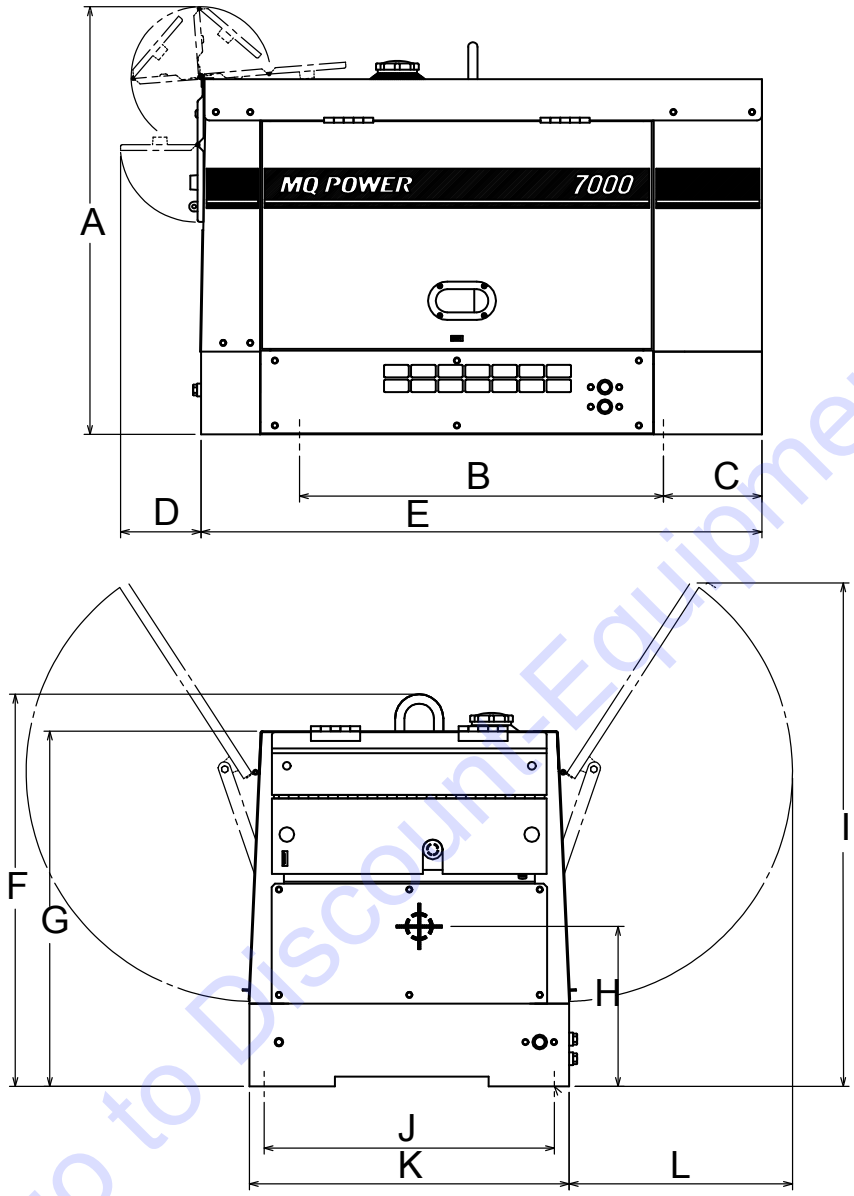


Figure 1. Dimensions

Table 3. Dimensions				
Housing	A	B	C	D
	approx. 34.3 in (870 mm)	29.1 in (740 mm)	7.9 in (200 mm)	approx. 6.5 in (165 mm)
	E	F	G	H
	44.9 in (1140 mm)	31.3 in (795 mm)	28.3 in (720 mm)	12.8 in (325 mm)
	I	J	K	L
	approx. 40.4 in (1025 mm)	23.2 in (590 mm)	25.6 in (650 mm)	approx. 17.9 in (455 mm)
Approx. Dry Weight	527 lbs (239 kg)			
Approx. Wet Weight	582 lbs (264 kg)			

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 2). Connect the other end of the ground cable to a suitable earth ground (ground rod).

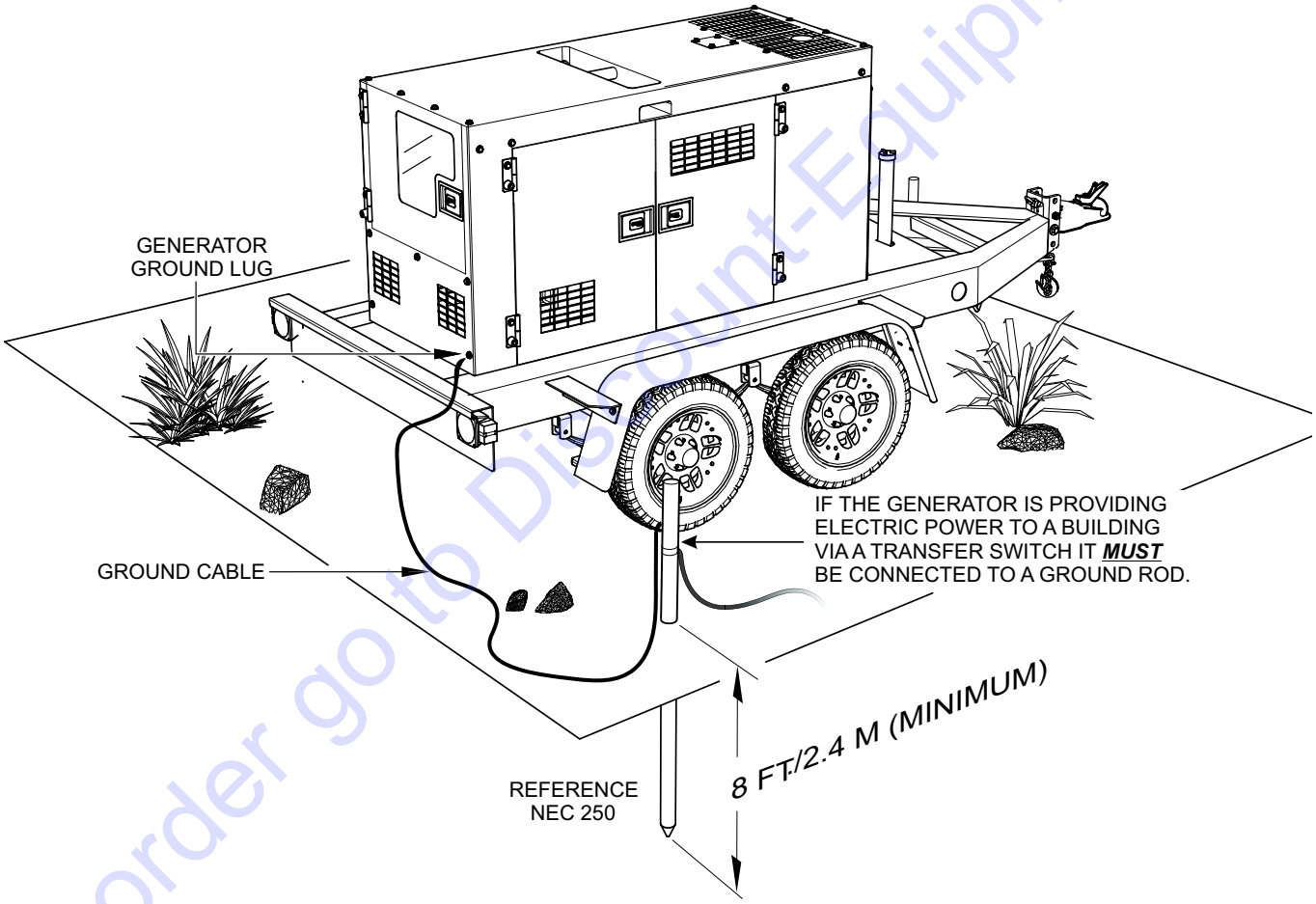


Figure 2. Generator Grounding

OUTDOOR INSTALLATION

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. Also install the generator in a manner so that the exhaust will not be discharged in the direction of nearby homes.

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.

⚠ CAUTION

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 diesel 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.

MOUNTING

The generator must be mounted on a solid foundation (such as concrete) and set firmly on the foundation to isolate vibration of the generator when it is running. The generator must set at least 6 inches above the floor or grade level (in accordance to NFPA 110, Chapter 54.1). **DO NOT** remove the metal skids on the bottom of the generator. They are to resist damage to the bottom of the generator and to maintain alignment.

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 a driven ground rod (Figure 2).

If applicable, to guard against electrical shock and possible damage to the equipment, it is important to provide a good **EARTH** ground, (Figure 2).

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 specifices 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^2) or larger.
   b. Aluminum 8 AWG (8.4 mm^2) or larger.
2. When grounding of the generator (Figure 2) is required, connect one end 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 buildings electrical system **ALWAYS** consult with a licensed electrician.

Generator

The Multiquip DA7000SSA2/SSA2GH is a 6.0 kW (continuous output), 7.0 kW (max output) A.C. generators designed as a portable dual purpose power source for 60 Hz (single phase), 120/240V for lighting facilities, power tools, submersible pumps and other industrial and construction machinery.

Control Panel

The control box is provided with the following:

- 120 VAC Receptacle (5-20R)
- 120 Twist-Lock Output Receptacle (L5-30R)
- 120/240 V Twist-Lock Output Receptacle (L14-30R)
- 120/240 V Twist-Lock Output Receptacle (CS6369)
- AC Voltmeter
- GFCI Sensing Module
- Main Circuit Breaker @25 Amps
- 30 Amp Circuit Breaker (for L14-30R)
- 30 Amp Circuit Breaker (for L5-30R)
- 20 Amp Circuit Breaker (for 5-20R)
- Idle Control Switch
- Full Power Switch
- Starter Switch
- Warning Lamp Unit
- Hour Meter
- Ground Terminal

Engine Protection System

Engine protection fail safe features are provided in the event of low oil pressure, high coolant temperature and failure of the battery to charge. If any of the above conditions occur while operating the generator it will cause a complete unit shut down.

Battery Charge Alarm

This unit is equipped with a protective shutdown device that signals the emergency relay and automatically stops the engine when loss of charge from the engine alternator occurs. An indicator lamp will be displayed on the control panel.

Water Temperature Alarm

This unit is equipped with a temperature switch that signals the emergency relay and automatically stops the engine when the temperature of the engine coolant becomes abnormally high. The coolant temperature switch will not function properly if the machine is operated with less than the proper amount of coolant.

Oil Pressure Warning Alarm

This unit is equipped with an oil pressure switch that detects low oil pressure. If the lubricating oil pressure of this unit should become abnormally low, the oil pressure switch signals the emergency relay to shutdown the engine. If this condition should occur, please refer to the engine troubleshooting table in this manual.

Idle Control Switch

The DA7000SSA2/SSA2GH generator is provided with an automatic idle (engine) control capability for noise suppression and fuel cost reduction. The automatic idle control feature automatically engages under a no-load condition when the switch is in the ON position.

With AC loads of more than 100W (such as lighting equipment, motor-powered tools, submersible water pumps, etc.), the engine runs at high speed. When a no load condition is produced, the engine automatically slows down.

Turn the idle control switch to the “ON” (up) position when AC loads drawing more than 150W are connected. Turn the idle control switch to the “OFF” (down) position when AC loads drawing less than 100W or when a magnetic switch is used.

Excitation System

The DA7000SSA2/SSA2GH generators use a brushless exciter to create rated output electricity. This system will use the mechanical energy generated by the 3600 RPM engine to spin the rotor (or armature) inside the generator (or alternator end).

Excitation current is sourced from the battery to the excitation winding in the stator. Current applied to this coil creates a magnetic field. The rotating armature within the stator is then induced with AC current.

Engine

The DA7000SSA2/SSA2GH generators are powered by a water-cooled, 4-cycle KUBOTA diesel engine. This engine is designed to meet every performance requirement of the generator. Reference Table 2, engine specifications.

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

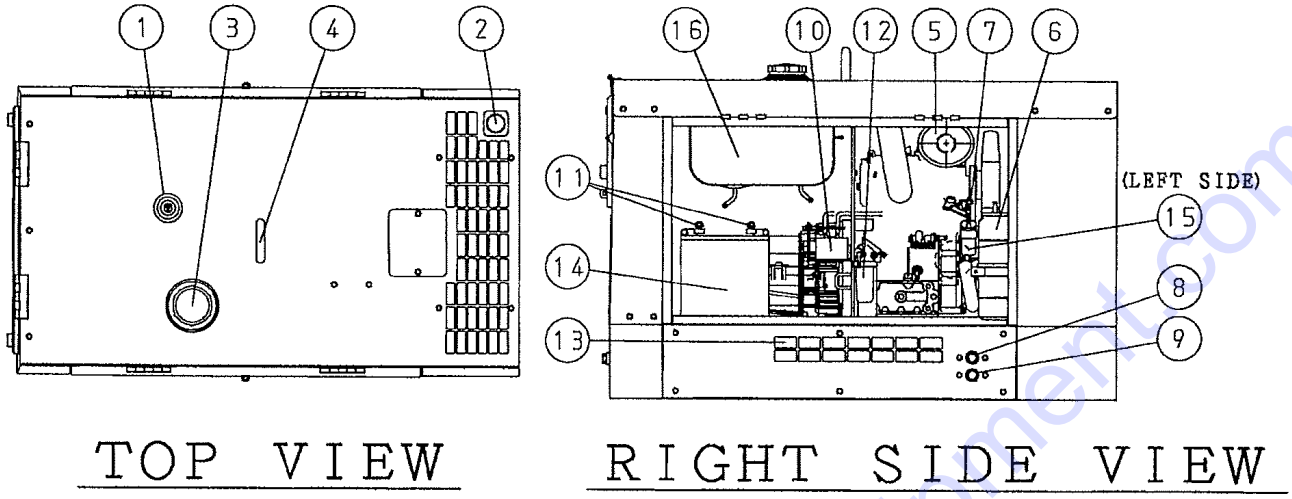


Figure 3. Generator Components (1 of 3)

1. **Fuel Gauge** — Indicates the amount of fuel in the fuel tank.
2. **Air Outlet Exhaust** — Allows engine exhaust to exit the generator into the open air. **NEVER** block this opening.
3. **Fuel Cap** — Remove this cap to add fuel. Add only #2 Diesel Fuel. Always keep an adequate amount of fuel in the tank. **DO NOT** top off. Wipe up any spilled fuel immediately.
4. **Lifting Hook** — Use this hook to lift the generator - 527 lb. (239 kg).
5. **Engine Air Cleaner** — Prevents dirt and other debris from entering the fuel system. Lift locking latch on air filter cannister to gain access to filter element.
6. **Expansion Bottle** — Supplies coolant to the radiator when radiator coolant level is low. Fill to indicated level as shown on expansion bottle.
7. **Engine Oil Filler Port** — Remove this cap to add engine oil. Use only the recommended oil type. See Table 6.
8. **Coolant Drain Plug** — Remove this plug to drain coolant from the radiator.
9. **Oil Drain Plug** — Remove this plug to drain oil from the engine.
10. **Automatic Idle Control Solenoid** — Automatically regulates engine speed depending on load.
11. **Battery Terminals** — Connect these output cables to the terminals on the battery. Always pay close attention to the polarity of the terminals when connecting to the battery, **RED** (positive), and **BLACK** (negative).
12. **Fuel Filter** — Prevents dirt and other debris from entering the fuel system. Change fuel filter as recommended in the maintenance section of this manual.
13. **Air Inlet Vent** — Allows outside air to enter the generator. **NEVER** block this opening.
14. **Battery** — Provides +12 VDC power for the generator. When replacing battery (12V 35 AH) use only recommended type battery.
15. **Oil Filter** — Provides filtering for the engine oil. Change oil filter as recommended in the maintenance section of this manual.
16. **Fuel Tank** — Holds 6.6 gallons (25 liters) of diesel fuel.

NOTICE

This **KUBOTA** 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.

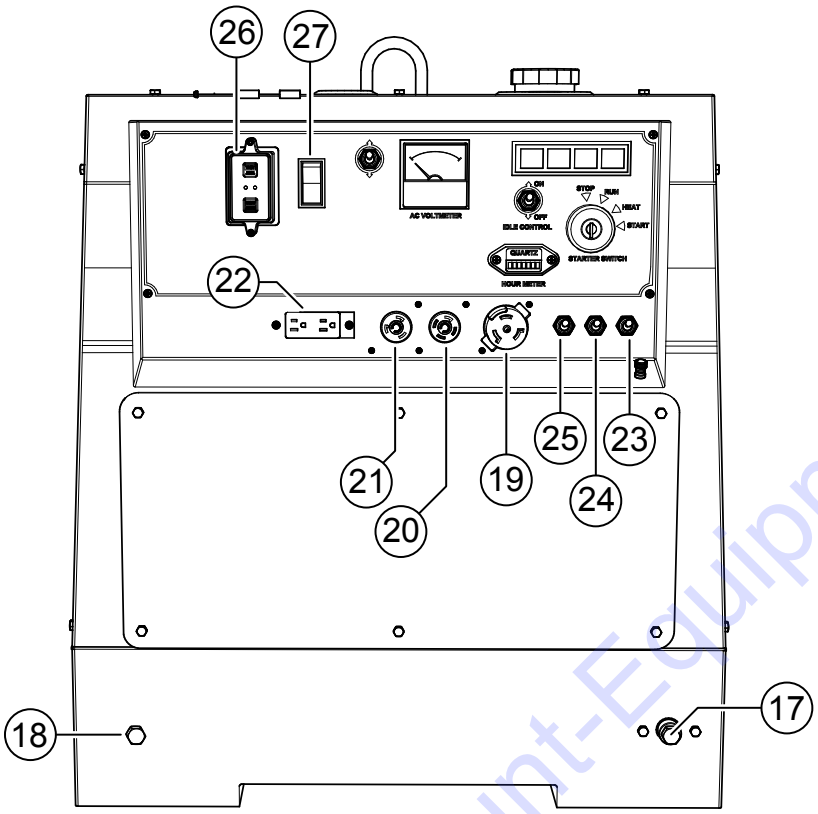


Figure 4. Generator Components (2 of 3)

17. **Fuel Drain Plug** — Remove this plug to drain fuel from the fuel tank.
18. **Frame Ground Lug** — Connect a ground strap between this lug and a ground rod. Make sure that the ground rod is inserted deep into the ground to provide a good earth ground. Consult with local Electrical and Safety Codes for proper connection based on condition of use.
19. **120/240V Output Receptacle** — CS6369 twist-lock receptacle provides 240 V, 60 Hz output at 25 amps, or 120V, 60 Hz at 50 amps (X2), depending on the position of the full power switch.
20. **120/240V Output Receptacle** — NEMA L14-30R twist-lock receptacle provides 240 V, 60 Hz output at 25 amps, or 120V, 60 Hz at 30 amps (X2), depending on the position of the full power switch.
21. **120V Output Receptacles** — NEMA 5-20R twist-lock receptacle provides 120V, 60 Hz output at 30 amps, depending on the position of the full power switch.
22. **Duplex Receptacle** — NEMA 5-20R receptacle provides 120V, 60 Hz output at 20 amps.
23. **30 Amp Breaker (for L14-30R)** — 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.
24. **30 Amp Breaker (for L5-30R)** — 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.
25. **20 Amp Breaker (for 5-20R)** — Single-pole, 20 Amp circuit breaker protects the 120V duplex receptacle. When starting the generator, always have this circuit breaker placed in the "OFF" position.
26. **GFCI Sensing Module** — Interrupts power, by opening the main breaker, when a ground fault exists.
27. **Main Breaker** — 2-pole, 25 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.

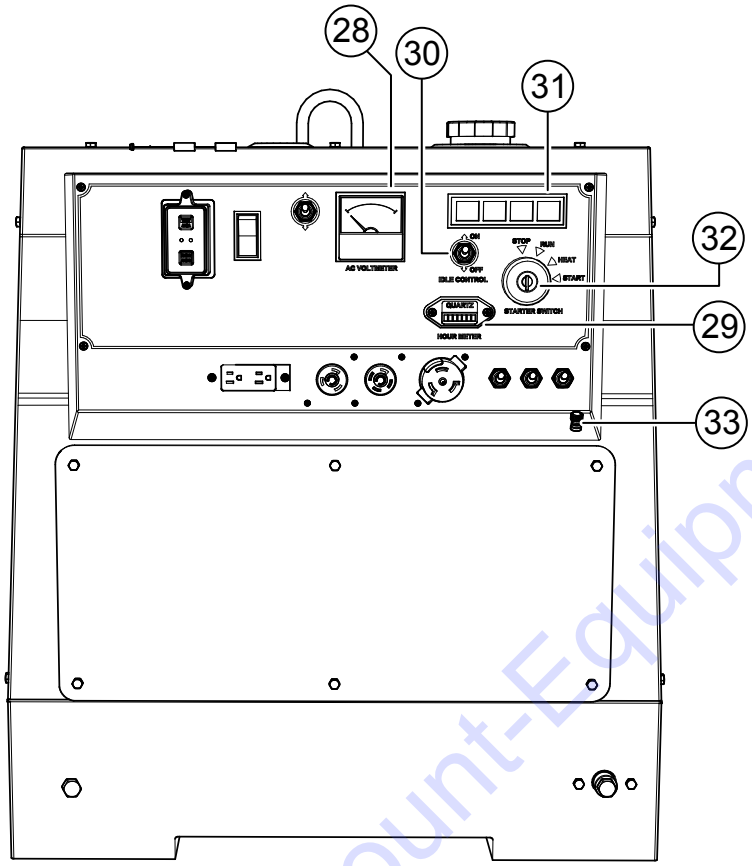


Figure 5. Generator Components (3 of 3)

28. **AC Voltmeter** — This voltmeter indicates (with a mark) the rated 60 Hz (single-phase) output voltage. In addition the voltmeter can also be used as a diagnostic tool. If the voltmeter indicator (needle) is below the rated voltage, engine problems may exist (low/high RPM's). To prevent damage to the generator or power tools turn the generator OFF and consult Discount-equipment.
29. **Hour Meter** — Indicates number of hours machine has been in use or hours engine was run.
30. **Idle Control Switch** — The generator is provided with an automatic idle control device for noise suppression and reduced fuel consumption.
    The automatic idle control automatically engages under a no-load condition. With the automatic idle control switched "**ON**", the engine revolutions will automatically drop to about 2200 rpm (low-speed operation) within 3 seconds after the load stops. When the operation is resumed, the engine speed is automatically increased to about 3600 rpm (high-speed operation) as soon as the load is connected.
31. **Warning Lamp Display** — Lights red when the following conditions occur:
    - **Oil Pressure Lamp** — If the oil pressure drops suddenly, the oil pressure lamp will go on, and the generator will shut down.
    - **Charge Lamp** — The charge lamp will go on when loss of engine alternator charge exists and the generator will shut down.
    - **Water Temperature Lamp** — The water temperature lamp will go on if the temperature rises to an abnormally high level, and the generator will shut down.
32. **Starter Switch** — With key inserted turn clockwise to start engine.
33. **Ground Terminal** — Used to connect exernal equipment ground so that the GFCI receptacle will have a ground path.

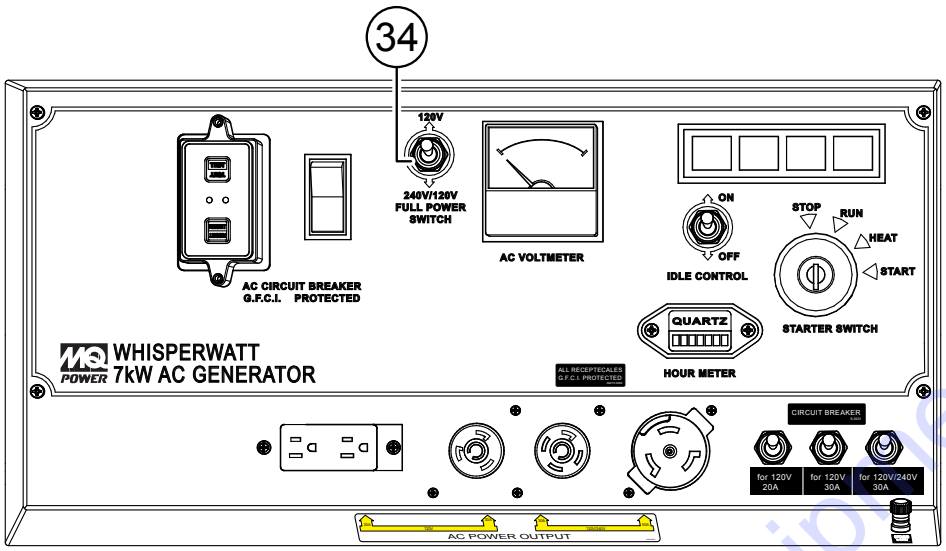


Figure 6. Full Power Switch

34. **Full Power Switch** — The generator is provided with a full power switch. See for simplified wiring diagrams of the dual voltage system.

    When the full power switch is in the 120 Volt position (up), you can access the full rated power of the generator at 120 Volts from the duplex receptacle and the 120V twist-lock receptacle, or a combination of both receptacles as long as the total load does not exceed the generating set capacity.

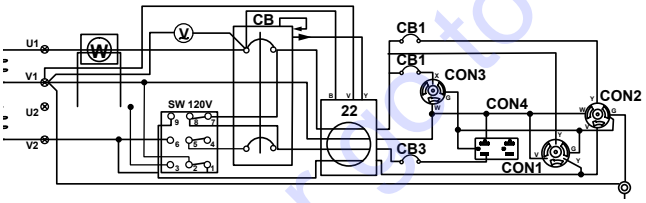


Figure 7. 120V Full Power Switch Simplified Diagram (Up Position)

When the full power switch is in the 240 Volt position (down), you can access half of the rated power of the generator at 120 Volts from the duplex receptacle and up to half of the rated power of the generator at 120 Volts from the 120V twist-lock receptacle, or full rated power of the generator at 240 Volts from the 240V twist-lock receptacle.

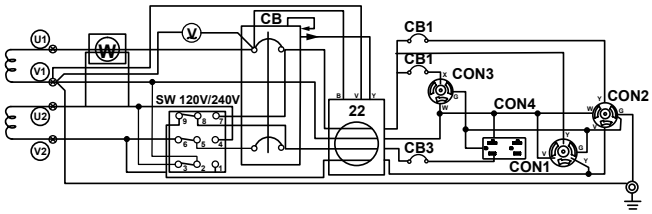
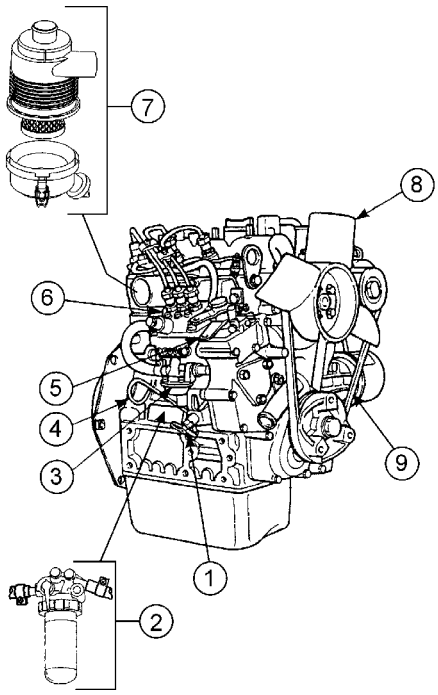


Figure 8. 240/120V Full Power Switch Simplified Diagram (Down Position)

NOTICE

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



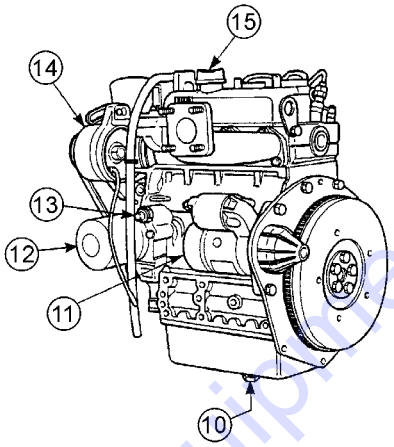


Figure 9. Kubota Z482 Series

INITIAL SERVICING

The engine (Figure 9) must be checked for proper lubrication and filled with fuel prior to operation. Refer to the manufacturer's engine manual for instructions and details of operation and servicing.

1. **Water Drain Cock** — Open this cock to drain water
2. **Fuel Filter** — Prevents dirt and other debris from entering the fuel system. Replace filter as recommended in the maintenance section of this manual.
3. **Fuel Feed Pump** — Pumps fuel to the injection system.
4. **Oil Dip Stick/Gauge** — Remove to check amount and condition of oil in crankcase. Refill or replace with recommended type oil as listed in Table 6.
5. **Speed Control Lever** — Controls engine speed. This lever is factory set at 3600 rpm to maintain proper voltage and frequency. **DO NOT** adjust this lever out of factory range.
6. **Injector Pump** — Provides fuel under pressure to the injector nozzles.
7. **Air Filter** — Prevents dirt and other debris from entering the air intake system. Loosen clips on side of air filter canister to gain access to filter element. Replace with manufacturer's recommended type air cleaner only.
8. **Cooling Fan Blades** — Make sure cooling fan blades are not bent or broken. A damaged fan blade can cause the engine to run hot and overheat.
9. **Fan V-Belt** — **ALWAYS** make sure V-belt is properly tensioned. A loose or defective V-belt can adversely affect the performance of the generator.
10. **Oil Drain Plug/Crankcase** — Remove to drain crankcase oil. Fill with recommended type oil as listed in Table 6. Crankcase holds a maximum of 2.64 quarts (2.5 liters) of motor oil.
11. **Starter** — Starts engine when ignition key is rotated clockwise to the "**ON**" position.
12. **Oil Filter** — Spin-on type, filters oil contaminants. Replace filter as recommended in the maintenance section of this manual.
13. **Oil Pressure Switch** — Monitors engine oil pressure. In the event of low oil pressure engine will shutdown.
14. **Alternator** — Provides power to the +12VDC electrical system. Replace with only manufactures recommended type alternator.
15. **Oil Filler Cap** — Fill with recommended type oil as listed in Table 6.

Single Phase Load — 60 Hz

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

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

NOTICE

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

WATTS = VOLTAGE x AMPERAGE

The power factor of this generators is 1.0 See Table 4 below when connecting loads.

Table 4. Power Factor By Load

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

NOTICE

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

NOTICE

When connecting power tools or equipment pay close attention to the required starting current capacity.

To determine the running wattage for your load, multiply the running wattage as indicated by steps 1, 2, and 3 below:

1. INCANDESCENT LOADS
   Lights, heaters and similar appliances.
   total the running wattage and multiply by 1.
   Example:
   29 light bulbs @ 100W each = 2.9 kW
   use a 3 kW generator.

2. SMALL MOTORS
   Drills and other small power tools.
   Total the running wattage and multiply by 2.
   Example:
   A 1 inch drill runs at 1 kW
   use a 2 kW generator

3. LARGE MOTORS
   Submersible pumps, table saws etc.
   Total the running wattage and multiply by 3.
   Example:
   A conveyor belt runs at 8 kW
   use a 24 kW generator.

NOTICE

Motors and motor-driven equipment draw much greater current for starting than during operation. Always use an adequate size extension cable which can carry the required load.

Extension Cables

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 generators and point of use (load) is held to a minimum.*** Use the cable selection chart (Table 5) as a guide for selecting proper cable size.

NOTICE

The idle control device is operated at a minimum load capacity of 100W. If the load capacity is less than 100W, place the idle control switch in the **OFF** position.

GENERAL INSPECTION PRIOR TO OPERATION

Ground Power Tools

When using power tools or electrical equipment requireing AC power from the generator, make sure power tool cord has a ground pin or is double insulated as shown in Figure 10.

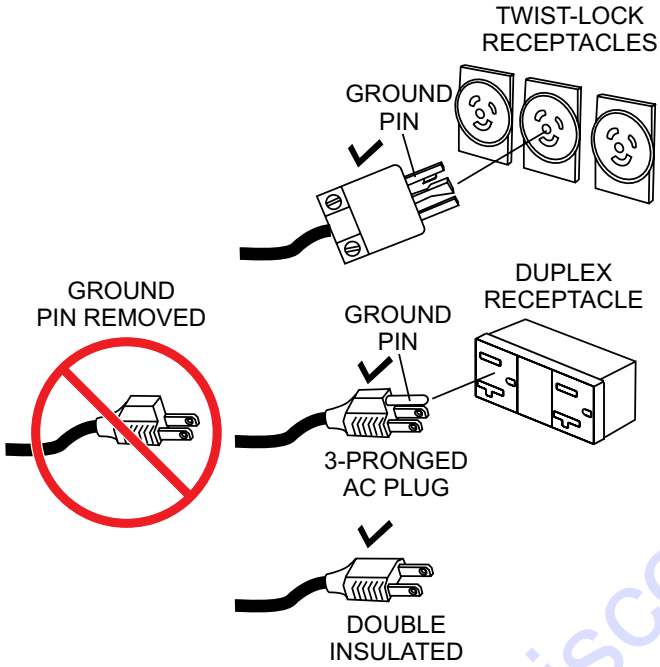


Figure 10. Ground Pin

NOTICE

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

Extension Cable

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

DANGER

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

Circuit Breakers

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

Table 5. 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. Caution must be taken to ensure generator is 100% dry before use.
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 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 11) and wipe clean.

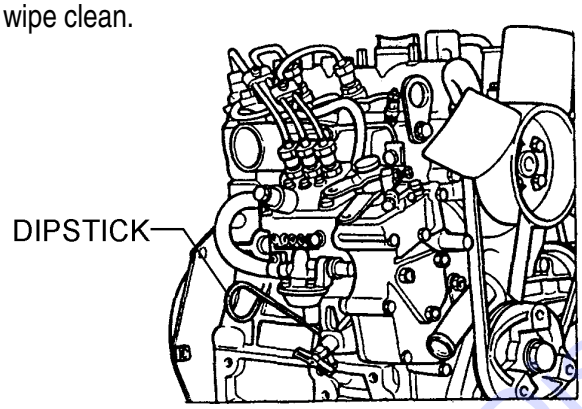


Figure 11. Engine Oil Dipstick Removal

3. Re-Insert dipstick (Figure 12), then remove dipstick from its holder. Check the oil level shown on the dipstick.

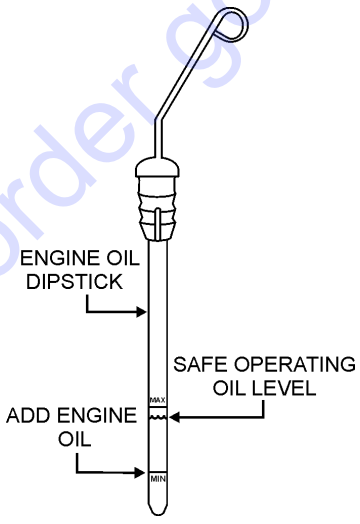


Figure 12. Engine Oil Dipstick

4. If the oil level is low, remove the oil filler cap (Figure 13) and fill to a safe operating level (max) as indicated by the dipstick. Fill with recommended type oil as listed in Table 6. Maximum oil capacity is 2.64 quarts (2.5 liters).

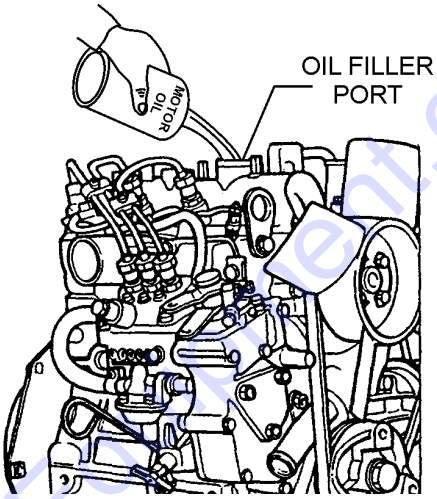


Figure 13. Engine Oil Filler Port

Table 6. Oil Type

Temperature	Oil Type
Above 77° F (25° C)	SAE 30 or SAE10W-30 SAE 15W-40
32°~ 77° F (0° ~ 25° C)	SAE 20 or SAE10W-30 SAE 15W-40
Below 32° F (0° C)	SAE 10 or SAE10W-30 SAE 15W-40

NOTICE

When adding engine oil **DO NOT** overfill.

Fuel Check

Fill the fuel tank with #2 diesel fuel. **DO NOT** fill the tank beyond capacity.

Pay attention to the fuel tank capacity when replenishing fuel. Refer to the fuel tank capacity listed in Table 2.

The fuel tank cap must be closed tightly after filling. Handle fuel in a safety container. If the container does not have a spout, use a funnel.

1. Read the fuel gauge located on top of the generator (Figure 14) to determin if the fuel level is low.

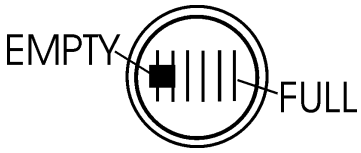


Figure 14. Fuel Gauge

2. If fuel is low, remove the fuel cap (Figure 15) located on top of the generator and replenish with clean #2 diesel fuel.

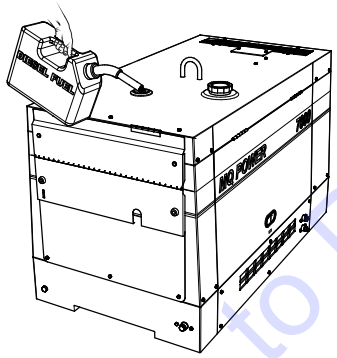


Figure 15. Adding Fuel

DANGER

Motor fuels are highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the generator if the engine is hot!, running or in the dark.

NOTICE

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!

Coolant (Antifreeze)

Kubota recommends Antifreeze/Summer Coolant for use in thier engines, which can be purchased in concentrate (and mixed with 50% demineralized water) or pre-diluted. See the Kubota Engine Owner's Manual for further details.

WARNING

If adding coolant/antifreeze mix to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. The possibility of hot coolant exists which can cause severe burns.

Day-to-day addition of coolant is done from the recovery tank. When adding coolant to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. See Table 7 for engine, radiator, and recovery tank coolant capacities. Make sure the coolant level in the recovery tank is always between the "**H**" and the "**L**" markings.

Table 7. Coolant Capacity	
Engine and Radiator	.74 gal (2.8 liters)
Reserve Tank (Full)	.23 gal (.87 liters)

Operation Freezing Weather

When operating in freezing weather, be certain the proper amount of antifreeze (Table 8) has been added.

Table 8. Anti-Freeze Operating Temperatures		
Vol % Anti-Freeze	Freezing Point	
	°C	°F
50	-37	-34

NOTICE

When the antifreeze is mixed with water, the antifreeze mixing ratio must be less than 50%.

CLEANING THE RADIATOR

The engine may overheat if the radiator fins become overloaded with dust or debris. Periodically clean the radiator fins with compressed air. Cleaning inside the machine is dangerous, so clean only with the engine turned off and the **negative** battery terminal disconnected.

AIR CLEANER

Periodic cleaning/replacement is necessary. Inspect it in accordance with the KUBOTA Engine Owner's Manual.

Fan Belt Tension

A slack fan belt may contribute to overheating, or to insufficient charging of the battery. Inspect the fan belt for damage and wear and adjust it in accordance with the Kubota Engine Owner's Manual.

The fan belt tension is proper if the fan belt bends 10 to 15 mm (Figure 16) when depressed with the thumb as shown below.

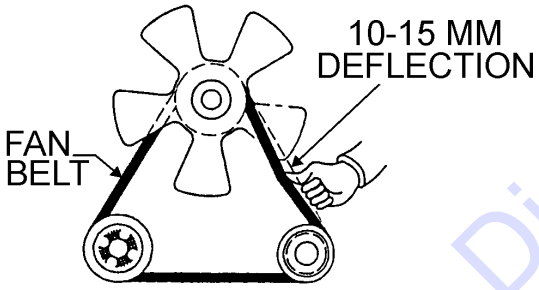


Figure 16. Fan Belt Tension

CAUTION

NEVER place hands near the belts or fan while the generator set is running.

BATTERY

This unit is of negative ground **DO NOT** connect in reverse. Always maintain battery fluid level between the specified marks. Battery life will be shortened, if the fluid level are not properly maintained. Add only distilled water when replenishment is necessary.

DO NOT over fill. Check to see whether the battery cables are loose. Poor contact may result in poor starting or malfunctions. **Always** keep the terminals firmly tightened. Coating the terminals with an approved battery terminal treatment compound. Replace battery with only recommended type battery.

The battery is sufficiently charged if the specific gravity of the battery fluid is 1.28 (at 68° F). If the specific gravity should fall to 1.245 or lower, it indicates that the battery is dead and needs to be recharged or replaced.

Before charging the battery with an external electric source, be sure to disconnect the battery cables.

Battery Cable Installation

ALWAYS be sure the battery cables (Figure 17) 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.

CAUTION

ALWAYS disconnect the negative terminal **FIRST** and reconnect negative terminal **LAST**.

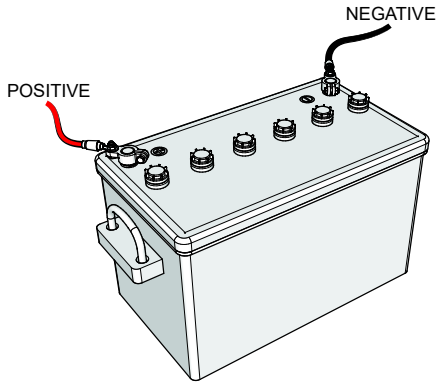


Figure 17. Battery Connections

When connecting battery do the following:

1. **NEVER** connect the battery cables to the battery terminals when the **Ignition Switch** is in the **START** position. **ALWAYS** make sure that the **Ignition Switch** is in the **OFF** position when connecting the battery.

2. Place a small amount of battery terminal treatment compound around both battery terminals. This will ensure a good connection and will help prevent corrosion around the battery terminals.

NOTICE

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

⚠ CAUTION

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

ALTERNATOR

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

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

WIRING

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

PIPING AND HOSE CONNECTION

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

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

Before Starting the Engine

⚠ CAUTION

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

NOTICE

The DA7000SSA2/SSA2GH generator is equipped with a GFCI sensing module. The purpose of this module is to sense a ground fault during operation of the generator and open the main breaker once the ground fault has been detected.
Multiquip recommends that the GFCI sensing module be tested before each use of the generator. Refer to the maintenance section of this manual for testing of the GFCI module.

1. Open the cabinet door and turn the fuel cock lever (Figure 18) to the "ON" position.

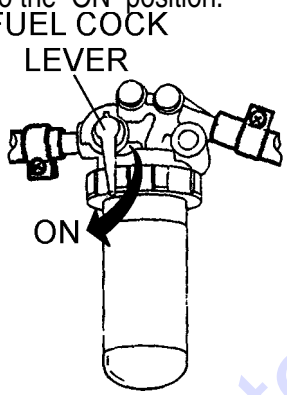


Figure 18. Fuel Cock Lever (ON)

2. **NEVER** operate the generator with the doors ***open*** (Figure 19). Operation with the doors open may cause insufficient cooling of the unit, and engine damage may result. Close the doors for normal operation.

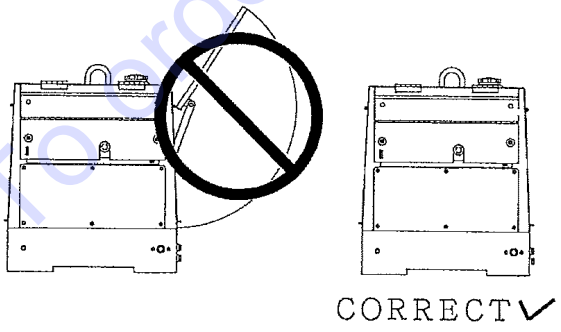


Figure 19. Generator Doors

3. **NEVER** start the engine with the main circuit breaker in the **ON** position. Always place circuit breaker (Figure 20) in the **OFF** position before starting.

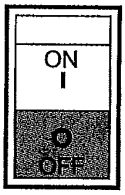


Figure 20. Main Circuit Breaker (OFF)

4. **NEVER** start the engine with the auxiliary circuit breakers in the **ON** position. Always place circuit breakers (Figure 21) in the **OFF** position before starting the engine.

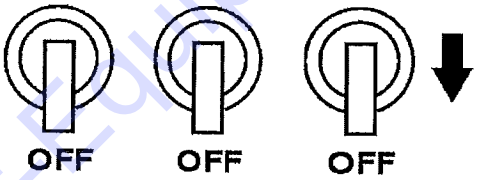


Figure 21. Auxiliary Circuit Breakers (OFF)

Starting the Engine

1. Insert the key into the starter switch (Figure 22) and turn it to the "**RUN**" position. Check to see that the oil pressure and charge Lights on the "Warning Lamp Unit Display" are lit. If either light is not lit, check the system and wiring (refer to the Engine Operation Manual).

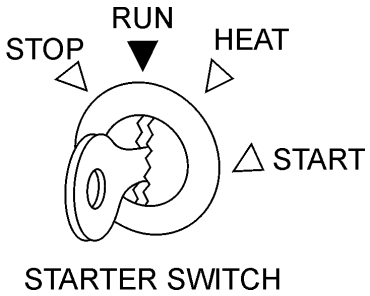


Figure 22. Starter Switch

2. Turn the ignition key to the **HEAT** position. When the preheat light goes off, turn the key to the **START** position to start the engine. As soon as the engine starts, release the key. The key will automatically return to the **RUN** position.

3. In cold weather conditions, it may be required to extend the duration of the HEAT position for proper starting.

4. If the engine does not start within 10 seconds after the key is turned to the **START** position, wait for about 30 seconds and repeat the procedure as described in steps 1-3.
5. When the engine starts, the oil pressure light and charge light should go out. If these lights stay on, immediately stop the engine and check the system and wiring (refer to the Engine Operation Manual).
6. Let the engine idle for five minutes with the ***Idle Control Switch*** (Figure 23) placed in the **ON** position.

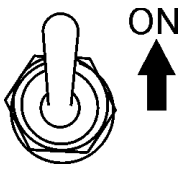


Figure 23. Idle Control Switch (ON)

NOTICE

Placing the idle control switch (Figure 23) in the **OFF** position allows the engine to operate at a maximum speed of about 3600 RPM's.

When the idle control switch 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.

Output Voltage Verification

1. Place ***main*** circuit breaker (Figure 24) in the **ON** position.

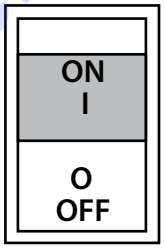


Figure 24. Main Circuit Breaker (ON)

2. Place auxiliary circuit breakers (Figure 25) in the **ON** position.

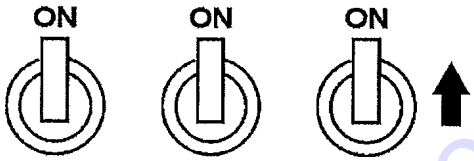


Figure 25. Auxiliary Circuit Breakers (ON)

3. Read the voltmeter on front panel of generator (Figure 26) and verify that 120 VAC is displayed. Using an external voltmeter as shown in Figure 26, verify that 120 VAC is present at the 120V twist-lock and duplex receptacles.

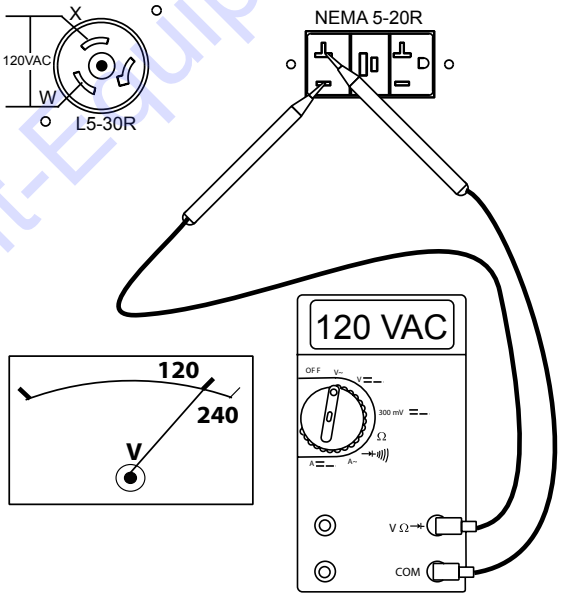


Figure 26. 120V GFCI/L5-30R Receptacles

NOTICE

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

4. The CS-6369 receptacle is a dual voltage receptacle (120/240 volts). Using an external voltmeter as shown in Figure 27, verify that 120/240 VAC is present at the CS-6369 twist-lock receptacle.

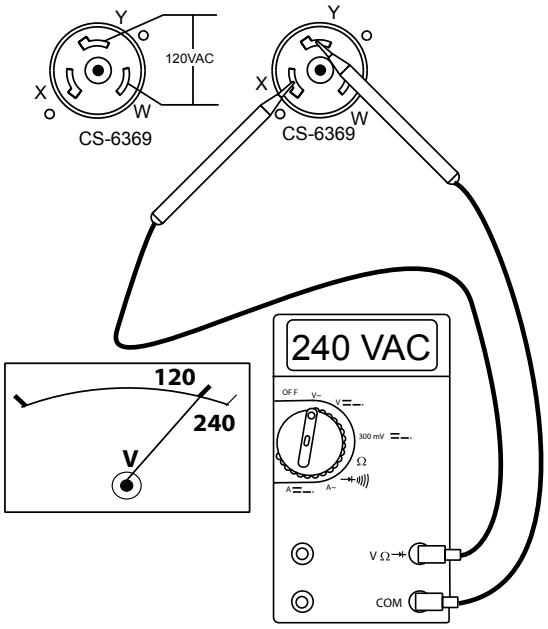


Figure 27. 120/240 CS-6369 Receptacle

5. The L14-30R receptacle is a dual voltage receptacle (120/240 volts). Using an external voltmeter as shown in Figure 28, verify that 120/240 VAC is present at the L14-30R twist-lock receptacle.

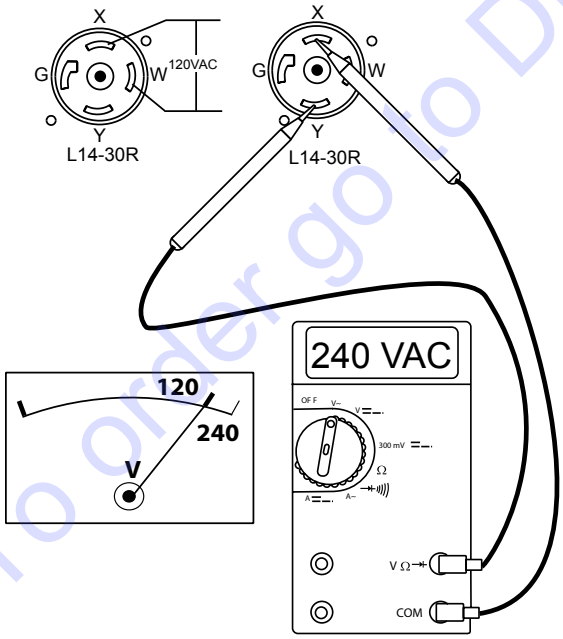


Figure 28. 120/240V L14-30R Receptacle

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

Stopping the Engine (Normal Shutdown)

1. Place ***main*** circuit breaker (Figure 29) in the **OFF** position.

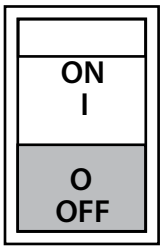


Figure 29. Main Circuit Breaker (OFF)

2. Place auxiliary circuit breakers (Figure 30) in the **OFF** position.

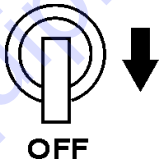


Figure 30. Auxiliary Circuit Breakers (OFF)

3. Place idle control switch switch (Figure 31) in the **ON** position.

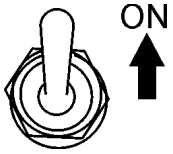


Figure 31. Idle Control switch (ON)

4. Let engine run at idle with no load for 3-5 minutes.

5. Place the starter switch key (Figure 32) in the **STOP** position and remove the key. Place fuel cock lever in the **OFF** position.

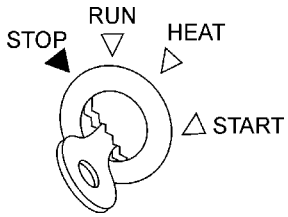


Figure 32. Starter Switch (Stop Position)

6. Remove all load connections from the generator.

Emergency Shutdown

1. Place starter switch key in **STOP** position. Remove key. Place fuel cock lever in the **OFF** position.

Generator Storage

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

- Run the engine until all the fuel is completely consumed.
- Drain the fuel tank completely, or add STA-BIL to the fuel.
- Completely drain the oil from the crankcase and refill with fresh oil.
- Disconnect the ***negative battery cable*** from the battery.
- Clean all external parts of the generating set with a cloth.
- If generator is mounted on a trailer, jack trailer up and place on blocks so tires do not touch the ground or block and completely remove the tires.
- Cover the generating set and store in a clean, dry place.

Use Table 9 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 9. Engine Maintenance Schedule

DESCRIPTION (3)	OPERATION	DAILY	FIRST MONTH OR 50 HRS.	EVERY 3 MONTHS OR 25 HRS.	EVERY 6 MONTHS OR 50 HRS.	EVERY YEAR OR 100 HRS.	EVERY 2 YEARS OR 200 HRS.	EVERY 8 YEARS OR 800 HRS.
Engine Oil	CHECK	X						
	CHANGE		X				X	
Oil Filter Cartridge	CHANGE		X			X	X	
Air Cleaner Element	CHECK	X			X			
	CHANGE				X (1)	X		
All Nuts & Bolts	RETIGHTEN IF NECESSARY	X						
Cooling Fins	CHECK				X			
Fuel Tank	CLEAN						X	
Fuel Filter	CLEAN						X	X
Fuel Filter Element	CHANGE		X				X	
Fuel lines	CHANGE	Every 2 years, replace if necessary (2)						
Battery	CHANGE						X	
Radiator Hoses/ Clamps	CHANGE	Every 2 years, replace if necessary (2)						
Radiator Coolant	CHANGE						X	
Idle Speed	CHECK-ADJUST					X (2)		
Valve Clearance	CHECK-ADJUST							X (2)
Fan Belt	CHECK TIGHTNESS					X		
WATER SEPARATOR	DRAIN					X		

(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 KUBOTA Shop Manual for service procedures.

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

NOTICE

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.

Maintenance

Perform the scheduled maintenance procedures as defined by Table 9 and below:

Engine Oil

Every 200 hours: Change engine oil after the first 50 hours of operation and 200 hours thereafter. Always check the crankcase oil level prior to each use, or when the fuel tank is filled. Insufficient oil may cause severe engine damage. Make sure generator is level when checking oil level. The oil level must be between the two notches on the dipstick as shown in Figure 12.

1. Remove engine oil drain plug located at the bottom of the generator enclosure (Figure 33) and drain oil from crankcase.For best results drain oil while engine is warm. Reinstall oil drain plug, and add engine oil as specified in Table 6. Crankcase oil capacity is 2.64 qts. (2.5 liters).

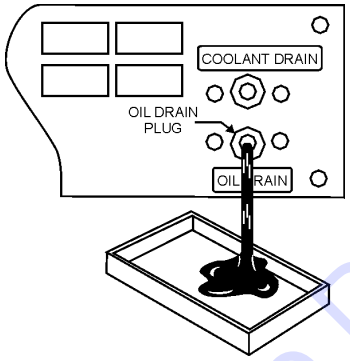


Figure 33. Engine Oil Drain Plug

Oil Filter Cartridge

Every 200 hours: Replace the engine oil filter cartridge after every 200 hours of operation.

1. Clean oil filter mounting base, and coat oil filter seal (Figure 34) with clean engine oil.

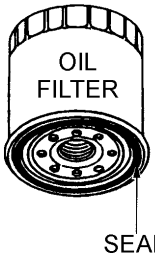


Figure 34. Oil Filter Cartridge

2. Screw on new oil filter by hand until seal contacts the filter mounting base. Install drain bolt with sealing washer and hand tighten.

> ***NOTICE***
>
> When installing the oil filter, coat rubber seal with a small amount of lubricant (motor oil). **DO NOT** over-tighten cartridge. Hand tighten only.

3. Replace engine oil with recommended type oil as listed in Table 6. For engine oil capacity, see Table 2 (engine specifications). Fill to upper limit as shown in Figure 12.

Engine Air Filter

Every 50 hours: Replace air filter employed on the KUBOTA Z482 series engines. This is a dry type filter. **NEVER** apply oil to it. If generator is used in severe dusty areas service air cleaner element more frequently.

1. Release the air cleaner retaining clamps (Figure 35) and remove the air cleaner element.

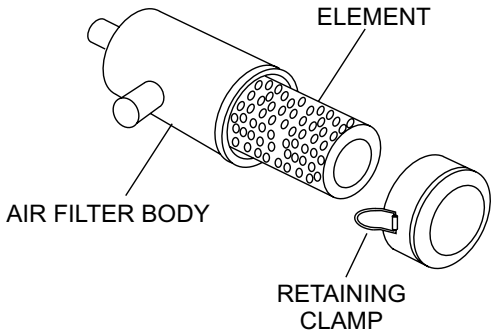


Figure 35. Air Cleaner

2. Wipe the inside of the air cleaner with a clamp cloth and remove all dust and debris that may have accumulated inside air cleaner body.
3. Remove and replace filter element with a factory replacement only; do not oil.

Cleaning the Fuel Filter

Every 100 hours: Clean fuel filter every 100 hours of operation or once a month to remove dust or water.

1. Place fuel cock lever (Figure 36) in the close position.
2. Disconnect fuel lines from fuel filter.

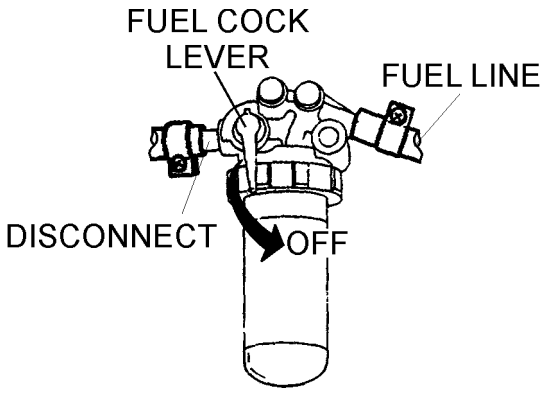


Figure 36. Fuel Cock Lever (OFF)

Replacing Fuel Filter Element

First 50 And Then Every 200 hours: Replace fuel filter element.

1. Remove the top cap (Figure 37) from the fuel filter and rinse cap and filter bowl with diesel fuel.
2. Remove element, and rise with diesel fuel.
3. Reinstall fuel filter and connect fuel lines.

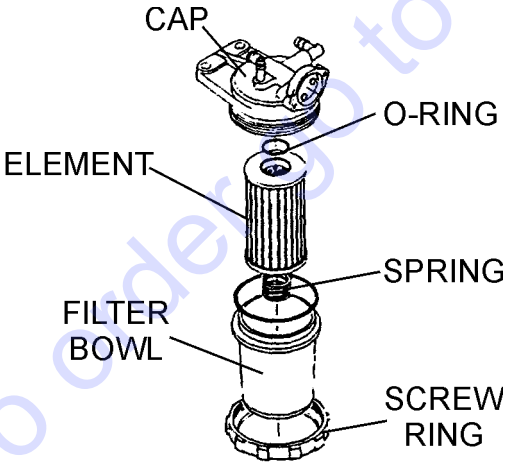


Figure 37. Fuel Filter Disassembly

4. Inspect all fuel lines every 50 hours.

Radiator

Check Daily: Always check the level of the coolant in the radiator before starting the engine. Remove the radiator cap and verify that the coolant reaches top of radiator coils.

1. **DO NOT** remove the radiator cap while the coolant is hot. The possibility exists of severe burns or scalding from the coolant gushing out. Let the coolant cool before removing radiator cap.
2. Check coolant in the reserve tank daily (Figure 38). Make sure the level is between the FULL (**H**) and LOW (**L**) markings. Fill reserve tank with a mixture of 50/50 antifreeze/water.

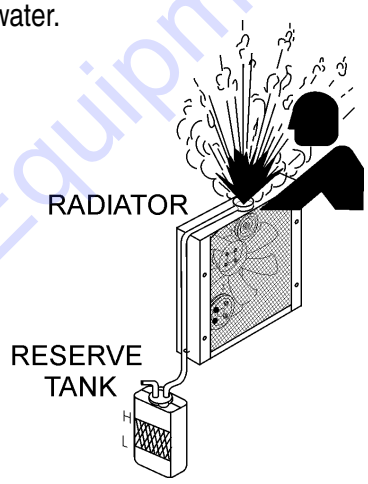


Figure 38. Radiator/Reserve Tank

Flushing Out Radiator and Replacing Coolant

1. Remove radiator coolant plug (Figure 39) located at the bottom of the generator enclosure and drain radiator coolant. Open the radiator cap while draining. Remove the overflow tank and drain.

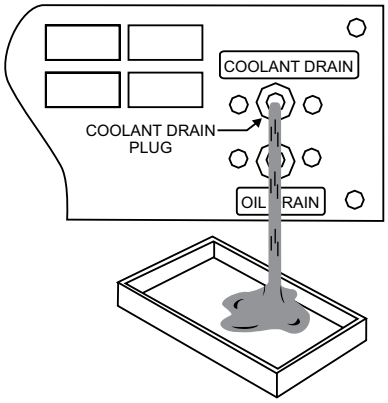


Figure 39. Coolant Drain Plug

2. Flush the radiator by running clean tap water through radiator until signs of rust and dirt are removed. **DO NOT** clean radiator core with any objects, such as a screwdriver.
3. Check hoses for softening and kinks. Check clamps for signs of leakage; replace as needed.
4. Tighten coolant drain plug and reinstall the overflow tank.
5. Fill with coolant as recommended by the engine manufacturer.
6. Close radiator cap tightly.

WARNING

Allow engine to **cool** when flushing out radiator. Flushing the radiator while hot could cause serious burns from water or steam.

RADIATOR CLEANING

The radiator (Figure 40) should be sprayed (cleaned) with a high pressure washer when excessive amounts of dirt and debris have accumulated on the cooling fins or tube. When using a high pressure washer, stand at least 5 feet (1.5 meters) away from the radiator to prevent damage to the fins and tube.

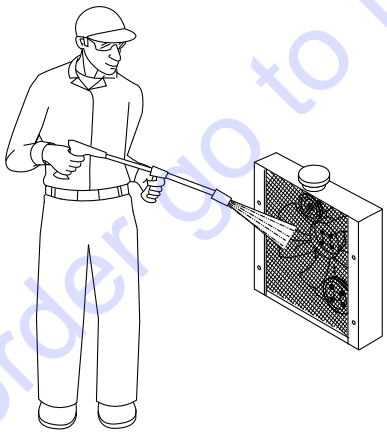


Figure 40. Radiator Cleaning

TESTING THE GFCI MODULE

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

1. Start the generator as outlined in the startup procedure in this manual.
2. Place the main circuit breaker in the ON position (Figure 41).

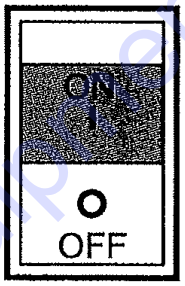


Figure 41. Main Circuit Breaker ON (GFCI Test)

3. On the GFCI module, verify that the green power LED is ON (Figure 42).

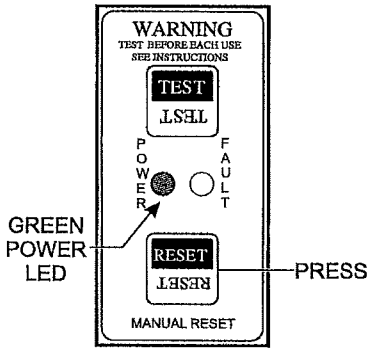


Figure 42. GFCI Module (Green LED ON)

4. Also verify that the AC voltmeter is registering a voltage reading as shown in Figure 46.

5. Next, press the **TEST** button on the GFCI module and verify that the green POWER LED turns **OFF** and the red fault LED turns **ON** (Figure 43).

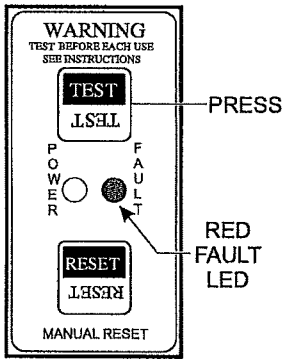


Figure 43. GFCI Module (Red/Fault LED ON)

6. Also verify that the main circuit breaker switch trips to the **OFF** position (Figure 44).

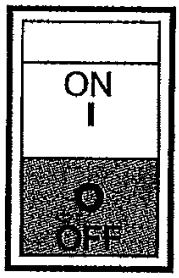


Figure 44. Circuit Breaker OFF (GFCI Test)

7. To restore power, press the **RESET** button on the GFCI module and verify that the red fault LED turns **OFF** and the green power LED should turn **ON** (Figure 45).

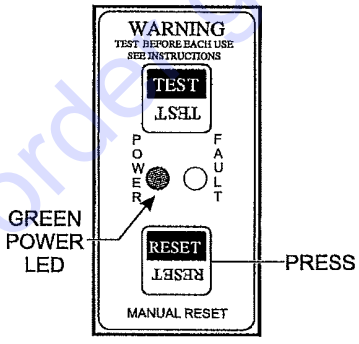


Figure 45. GFCI Module (Green LED ON Reset)

8. Verify that the AC voltmeter is registering a voltage reading as shown in Figure 46.

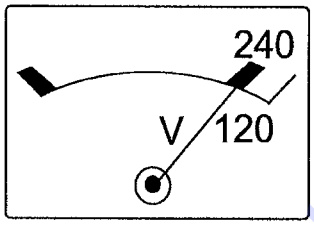


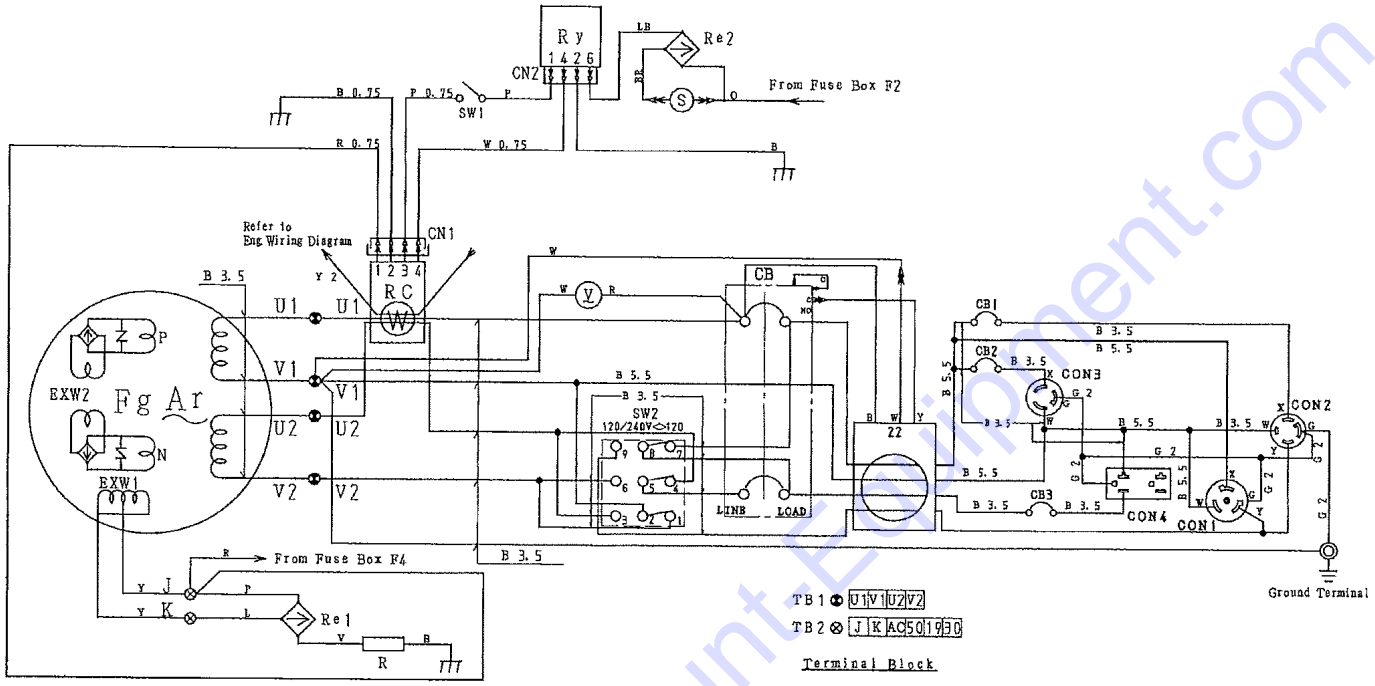
Figure 46. AC Voltmeter (120/240V)

NOTICE

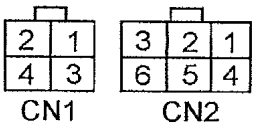
It is recommended that the GFCI module be tested when the generator is initially taken out of the box. Then, the generator should be tested daily at startup.

⚠ CAUTION

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

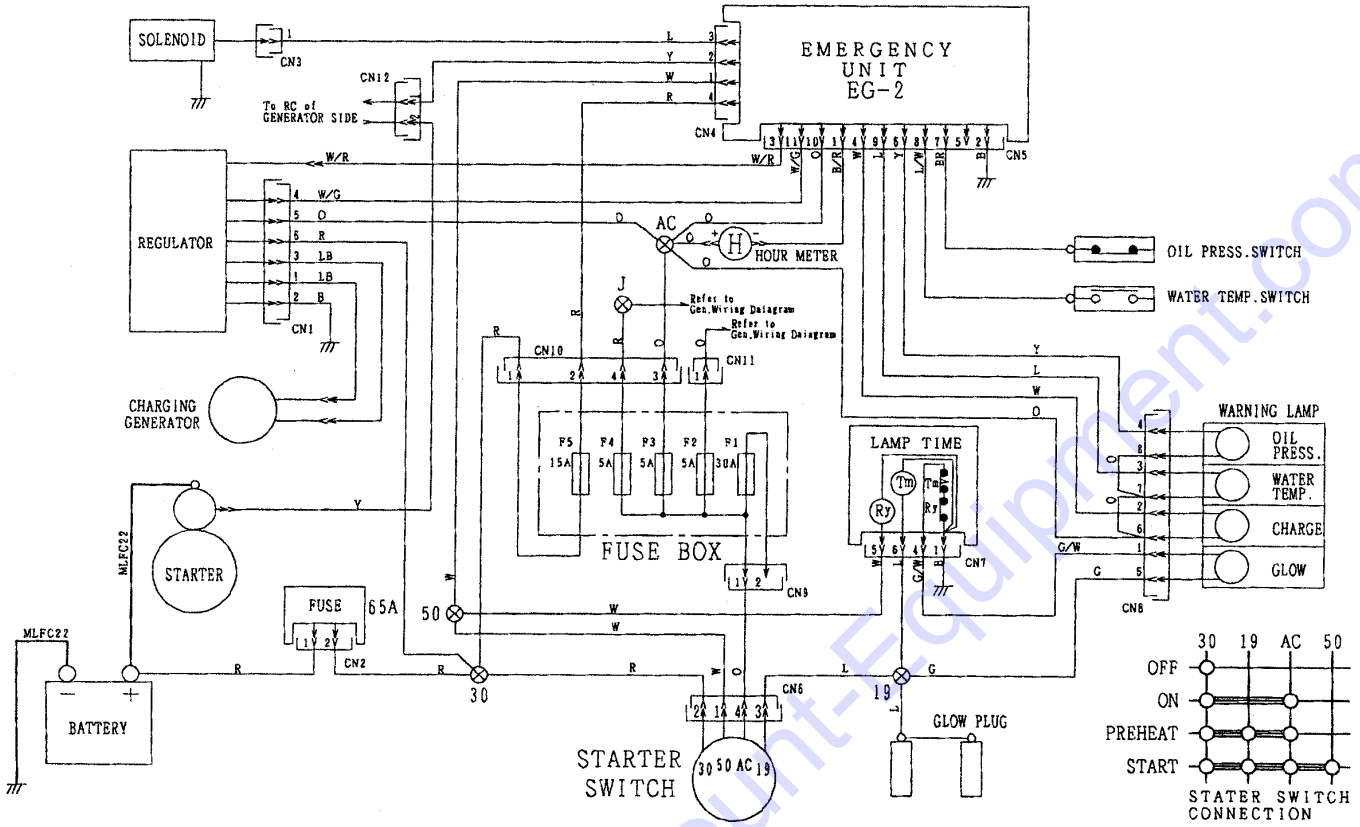


WIRING COLOR CODE	
SYMBOL	COLOR
B	BLACK
L	BLUE
BR	BROWN
G	GREEN
GR	GRAY
V	VIOLET
P	PINK
R	RED
W	WHITE
Y	YELLOW
LB	LIGHT BLUE
LG	LIGHT GREEN
O	ORANGE



SYMBOL	PARTS NAME
Ar	Armature Winding
Fg	Field Winding
EXW1~2	Excitation Winding
V	AC Voltmeter
Re1~2	Rectifier
CON1	Receptacle (120V/240V, 50A)
CON2	Receptacle (120V/240V, 30A)
CON3	Receptacle (120V, 30A)
CON4	Receptacle (120V, 20A)
CB	Circuit Breaker (FOR MAIN)
CB1	Circuit Protector (FOR 120/240V, 30A)
CB2	Circuit Protector (FOR 120V, 30A)
CB3	Circuit Protector (FOR 120V, 20A)
22	GFCI Sensing Module
SW1	Idle Control Switch
SW2	Full Power Switch
RC	Idle Control Device
S	Solenoid
Ry	Relay
R	Resistor

Figure 47. Generator Wiring Diagram (DA7000SSA2/SSA2GH SERIES)



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

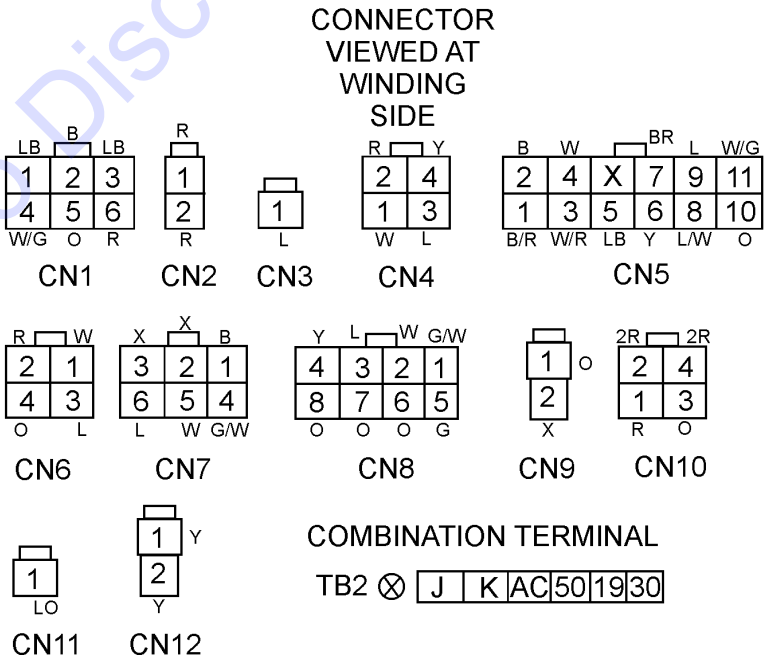


Figure 48. Engine Wiring Diagram

Table 10. Engine and Generator Troubleshooting		
SYMPTOM	**POSSIBLE PROBLEM**	**SOLUTION**
Engine fails to start and starter does not rotate.	Dead Battery?	Replace Battery.
	Defective Starter Switch?	Replace Switch.
	Defective Starter?	Replace Starter.
	Fuse F5 Burned Out?	Replace Fuse.
Engine fails to start and starter rotates.	Broken Pre-Heat Circuit?	Check Pre-Heat Circuit.
	No Fuel?	Add Fuel.
	Defective Wiring?	Check Wiring.
Engine starts "Idle Control Switch" is in OFF position and engine remains at low speed.	Defective Idle Control Switch?	Replace Switch.
	Clogged Fuel Strainer?	Clean or Replace.
	Clogged Air Cleaner?	Clean or Replace.
	Defective Idle Control Device?	Replace.
	Disconnected Wiring?	Check and Repair Wiring.
Engine starts and "Idle Control Switch" is in OFF position. Engine speed rises and battery discharges too soon.	Defective Engine Regulator?	Replace Regulator.
	Defective Wiring?	Repair or Replace Wiring.
Engine starts and "Idle Control Switch" is in OFF position. Engine speed rises and engine seems overloaded.	Defective Alternator?	Repair or Replace Alternator.
	Damaged Alternator Bearing?	Replace Alternator Bearings.
Engine starts and "Idle Control Switch" is in OFF position. Engine speed rises and engine has abnormal noise.	Loose Engine Parts?	Check All Engine Parts For Tightness.
	Defective Alternator?	Check Alternator for Damaged Bearing or Loose Clamping Bolts.
Engine starts and "Idle Control Switch" is in OFF position. Engine speed rises and remains at high speed when Idle Control switch is placed in the ON position.	Defective Idle Control Device?	Repair or Replace Idle Control Device.
	Defective Idle Control Switch?	Replace Idle Control Switch.
	Defective Solenoid?	Replace Solenoid.
	Defective Relay?	Replace Relay.

Table 11. Engine Troubleshooting		
SYMPTOM	**POSSIBLE PROBLEM**	**SOLUTION**
Engine does not start.	No fuel?	Replenish fuel.
	Air in the fuel system?	Bleed system.
	Water in the fuel system?	Remove water from fuel tank.
	Fuel pipe clogged?	Clean fuel pipe.
	Fuel filter clogged?	Clean or change fuel filter.
	Excessively high viscosity of fuel or engine oil at low temperature?	Use the specified fuel or engine oil.
	Fuel with low cetane number?	Use the specified fuel.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Incorrect injection timing?	Adjust.
	Fuel cam shaft worn?	Replace.
	Injection nozzle clogged?	Clean injection nozzle.
	Injection pump malfunctioning?	Repair or replace.
	Seizure of crankshaft, camshaft, piston, cylinder liner or bearing?	Repair or replace.
	Compression leak from cylinder?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.
	Improper valve timing?	Correct or replace timing gear.
	Piston ring and liner worn?	Replace.
	Excessive valve clearance?	Adjust.
Starter does not run.	Battery discharged?	Charge battery.
	Starter malfunctioning?	Repair or replace.
	Key switch malfunctioning?	Repair or replace.
	Wiring disconnected?	Connect wiring.

Table 11. Engine Troubleshooting (Continued)		
SYMPTOM	**POSSIBLE PROBLEM**	**SOLUTION**
Engine revolution is not smooth.	Fuel filter clogged or dirty?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Injection pump malfunctioning?	Repair or replace.
	Incorrect nozzle opening pressure?	Adjust.
	Injection nozzle stuck or clogged?	Repair or replace.
	Fuel over flow pipe clogged?	Clean.
	Governor malfunctioning?	Repair.
Either white or blue exhaust gas is observed.	Excessive engine oil?	Reduce to the specified level.
	Piston ring and liner worn or stuck?	Repair or replace.
	Incorrect injection timing?	Adjust.
	Deficient compression?	Adjust top clearance.
Either black or dark gray exhaust gas is observed.	Overload?	Lessen the load.
	Low grade fuel used?	Use the specified fuel.
	Fuel filter clogged?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Deficient nozzle injection?	Repair or replace the nozzle.
Deficient output.	Incorrect injection timing?	Adjust.
	Engine's moving parts seem to be seizing?	Repair or replace.
	Uneven fuel injection?	Repair or replace the injection pump.
	Deficient nozzle injection?	Repair or replace the nozzle.
	Compression leak?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.

TO PURCHASE THIS PRODUCT PLEASE CONTACT US

Discount Equipment

Equipment Financing and
Extended Warranties Available

Discount-Equipment.com is your online resource for commercial and industrial quality parts and equipment sales.
561-964-4949
visit us on line @ www.discount-equipment.com

Select an option below to find your Equipment

Search by Manufacturer

Search by Product Type

Request a Quote

We sell worldwide for the brands: Genie, Terex, JLG, MultiQuip, Mikasa, Essick, Whiteman, Mayco, Toro Stone, Diamond Products, Generac Magnum, Airman, Haulotte, Barreto, Power Blanket, Nifty Lift, Atlas Copco, Chicago Pneumatic, Allmand, Miller Curber, Skyjack, Lull, Skytrak, Tsurumi, Husquvarna Target, Stow, Wacker, Sakai, Mi-T-M, Sullair, Basic, Dynapac, MBW, Weber, Bartell, Bennar Newman, Haulotte, Ditch Runner, Menegotti, Morrison, Contec, Buddy, Crown, Edco, Wyco, Bomag, Laymor, EZ Trench, Bil-Jax, F.S. Curtis, Gehl Pavers, Heli, Honda, ICS/PowerGrit, IHI, Partner, Imer, Clipper, MMD, Koshin, Rice, CH&E, General Equipment ,Amida, Coleman, NAC, Gradall, Square Shooter, Kent, Stanley, Tamco, Toku, Hatz, Kohler, Robin, Wisconsin, Northrock, Oztec, Toker TK, Rol-Air, APT, Wylie, Ingersoll Rand / Doosan, Innovatech, Con X, Ammann, Mecalac, Makinex, Smith Surface Prep,Small Line, Wanco, Yanmar