

# KOSHIN

# GENERATOR

High Performance Gasoline Generator

## OPERATION MANUAL

[GV-3000 • GV-3200 • GV-7000S • GV-7600S]



**KOSHIN LTD.**

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# INTRODUCTION

Thank you for purchasing a KOSHIN generator. This manual will provide you a basic understanding of the operation and maintenance of this generator.

Please read it carefully.

We continually seek advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your machine and this manual. We reserve the right to make changes at any time without incurring any obligation

This manual should be considered a permanent part of this generator and should remain with this generator when resold.

## **PLEASE READ AND UNDERSTAND THIS MANUAL COMPLETELY BEFORE OPERATING THE MACHINE.**

Important information is distinguished in this manual by the following notation:

 **DANGER** Failure to follow “DANGER” instructions can result in severe injury or death to the engine operator, a bystander or a person inspecting or repairing the generator.

 **WARNING** Failure to follow “WARNING” instructions can result in severe injury to the engine operator, a bystander or a person inspecting or repairing the generator.

 **CAUTION** A “CAUTION” indicates special precautions that must be taken to avoid damage to the generator.

 **NOTE** A NOTE provides key information to make procedures easier or clearer.

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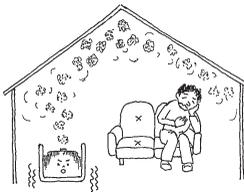
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# **SAFETY INFORMATION**

## **OPERATOR RESPONSIBILITY**

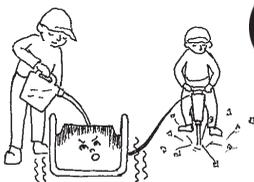
- Be knowledgeable of how to use all generator controls, output receptacles and connections.
- Know ways to stop the generator operation quickly in case of emergency.
- Person operating the generator must receive proper training and instructions.
- No child should operate the generator without proper parental or adult instruction.
- Keep children away from the area of operation.
- Make sure the generator is on firm and level surface. Do not place on unstable surface such as sand or snow. Fuel spillage may occur when generator is tilted or overturned.

## **EXHAUST FUMES ARE POISONOUS**



- Never operate the engine in a closed area. It may cause unconsciousness and death within a short time. Operate the engine in a well ventilated area.

## **FUEL IS HIGHLY FLAMMABLE AND POISONOUS**



- Always turn off the engine when refueling.



- Never refuel while smoking or in the vicinity of an open flame.



- Take care not to spill any fuel on the engine or muffler when refueling.

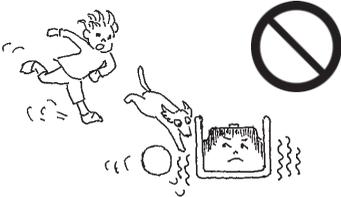


- When operating or transporting the machine, be sure it is kept upright. If it tilts, fuel may leak from the carburetor or fuel tank.

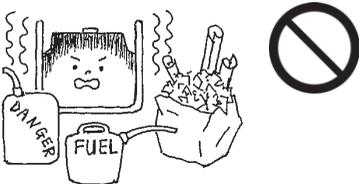


- If you swallow any fuel, inhale fuel vapor, or allow any to get in your eye(s), see your doctor immediately. If any fuel spills on your skin or clothing, immediately wash with soap and water and change your clothes.

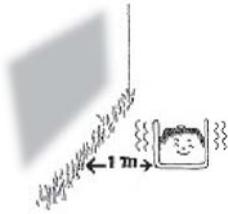
## ENGINE AND MUFFLER MAY BE HOT



- Place the machine so pedestrians or children are not likely to touch the machine.



- Avoid placing any flammable materials near the exhaust outlet during operation.



- Keep the machine at least 1 m (3 ft) from building or other equipment, the engine may overheat.



- The engine and muffler remain hot for a while after stopping the engine. Be careful not to touch them.



- Avoid operating the engine with a dust cover on.

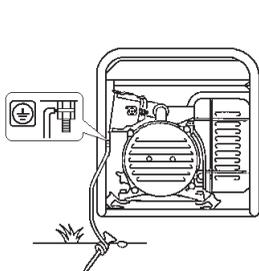
## ELECTRIC SHOCK PREVENTION



- Never operate the generator in wet conditions such as in rain or snow.



- Never touch the machine with wet hands, an electrical shock will occur.



- Be sure to ground the generator to the earth.

**NOTE**

Use ground lead of sufficient current capacity.

Ground (earth) Lead Diameter : 0.12mm (0.005 in) / ampere  
 EX : 10 Ampere → 1.2mm (0.05 in)

**EXTENSION CORD NOTES**

- When using an extension cord, its total length should not exceed 60 meters for cross section of 1.5 mm<sup>2</sup> and 100 meters for cross section of 2.5 mm<sup>2</sup> or more.  
 Long extension cables will lower usable power due to resistance in extension cable.
- This extension cord should be protected by a tough flexible rubber sheath (IEC 245) or the equivalent to withstand mechanical stresses.

**CONNECTION NOTES**

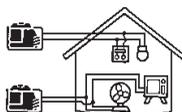
- Do not connecting the generator to commercial power outlet.
- Do not connecting the generator in parallel with any other generator.

**⚠ WARNING**

Before the generator can be connected to a building's electrical system, a licensed electrician must install an isolation (transfer) switch in the building's main fuse box. The switch is the connection point for generator power and allows selection of generator or main line power to the building. This will prevent the generator from charging the main power line (backfeeding) when the main power supply has failed or has been turned off for line repair. Backfeeding can electrocute or injure line maintenance personnel. Also, generator and building electrical system damage can occur when normal operating power returns if unit is used without an isolation switch.



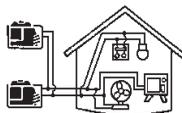
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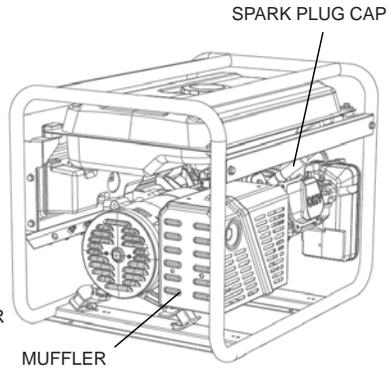
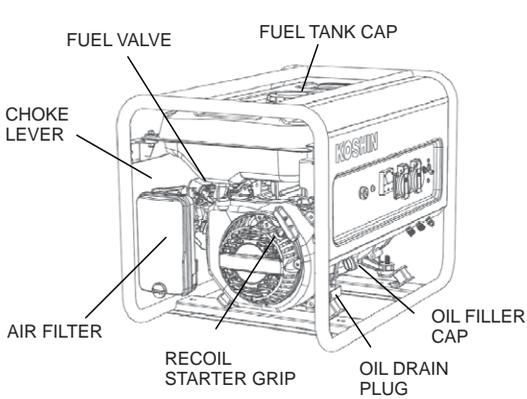
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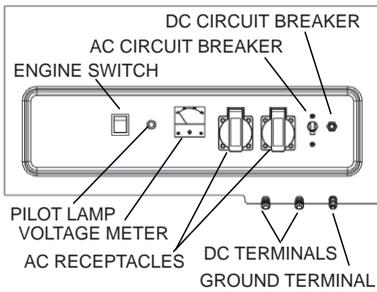
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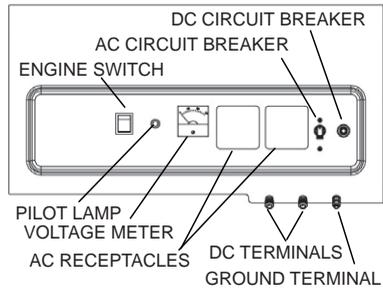
# COMPONENT IDENTIFICATION



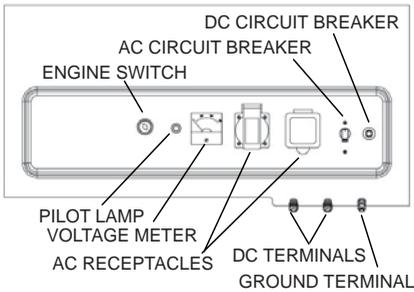
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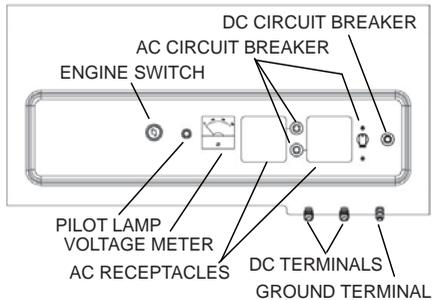
**GV-3000**



**GV-3200**



**GV-7000S**



**GV-7600S**

# CONTROLS

## ENGINE SWITCH



GV-7000S  
GV-7600S



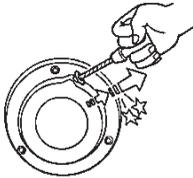
GV-3000  
GV-3200

The engine switch controls the ignition system to start and stop the engine.

- ① **ON** :  
Ignition circuit is switched on.  
The engine can be started.
- ② **OFF** :  
Ignition circuit is switched off.  
The engine will not run.
- ③ **START** :  
Starting circuit is switched on.  
The starter motor starts.

**CAUTION** (GV-7000S, GV-7600S)  
Take your hand off the switch immediately after the engine starts.

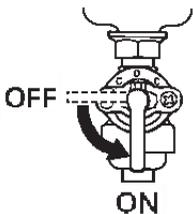
## RECOIL STARTER



To start the engine, pull slowly on the recoil starter until it is engaged, then pull it briskly.

Do not allow the starter grip to snap back against the engine, Return it gently to prevent damage to the starter.

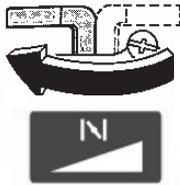
## FUEL VALVE



Before starting the engine, turn the fuel valve to "ON" position so the fuel flows from the fuel tank to the carburetor.

Be sure to return the fuel valve lever to the OFF position after stopping the engine.

## CHOKE



When starting a cold engine, turn the choke lever to CLOSE “|” position.

It can be opened and closed by operating the choke lever manually.

### NOTE

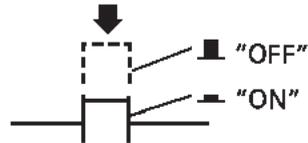
The choke is not required to start a warm engine.

## AC CIRCUIT BREAKER

The AC circuit breaker turns off automatically when overload or if there is a short circuit. Reduce the load to the specified generator rated output if the AC circuit breaker turns off.



GV-3000·GV-3200  
GV-7000S·GV-7600S



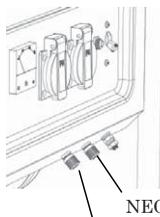
GV-7600S

## OIL ALERT SYSTEM

When the oil level falls below the lower level, the engine will stop automatically. (Though the generator switch still remains in the ON position.)

Unless you refill with oil, the engine will not start again. Check the engine oil lever before troubleshooting in other areas.

## DC TERMINALS

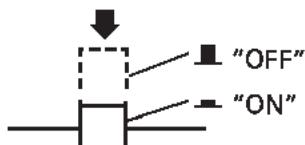


NEGATIVE TERMINAL (BLACK)  
POSITIVE TERMINAL (RED)

The DC terminals may **ONLY** be used for charging 12V batteries for automotive use.

The terminal colored red is positive (+) terminal, and colored black is negative (-) terminal.

## DC CIRCUIT BREAKER



The DC circuit breaker turns off automatically when DC charging circuit is overloaded or the battery has problem.

Press to reset the DC circuit breaker. After reducing the load to the specified DC rated output

## **PRE-OPERATION CHECK**

### **NOTE**

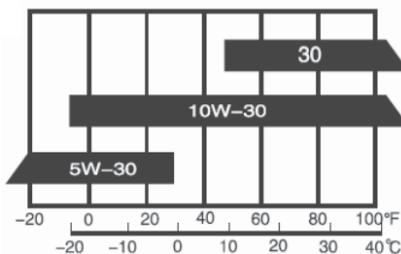
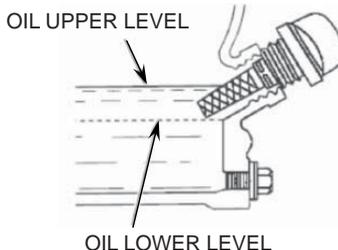
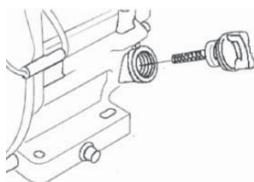
Pre-operation checks should be made each time the generator is used.

### **ENGINE OIL**

Engine oil is a major factor affecting engine performance and service life. Make sure the engine oil is at the upper level of the oil filler hole. Add oil as necessary.

### **CAUTION**

2-stroke gasoline engine oil or diesel engine oils will damage the engine.



Recommended engine oil  
4-stroke gasoline engine oil  
SF under API service classification  
or SAE10W-30 (equivalent to SG class).

Method of checking engine oil level:

- 1, Remove the oil filler cap and wipe the dipstick to clean it.
- 2, Check the oil level by inserting the dipstick into the filler neck without screwing it in.
- 3, If the level is low, add the recommended engine oil until level can reach the upper mark on the dipstick. After adding, don't forget to refit and screw the oil dipstick tight.

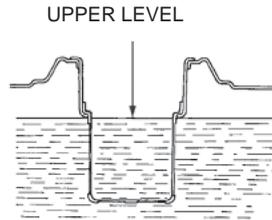
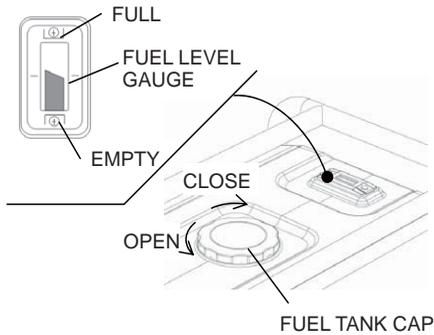
### **CAUTION**

**The generator has been shipped without engine oil. Fill with oil or it will not start.**

## REFUELING

Check the fuel level gauge and make sure there is sufficient fuel in the fuel tank.

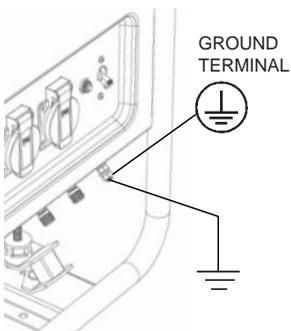
Recommended fuel: Unleaded gasoline



### **⚠ WARNING**

- Fuel is highly flammable and poisonous. Check “SAFETY INFORMATION” (See page 3) carefully before refueling.
- Do not fill above the top of the fuel filter, or it may overflow when the fuel heats up and expands.
- Wipe any spilled fuel immediately.
- After refueling, make sure the tank cap is tightened securely.

## GROUND (Earth)



Make sure to ground the generator to prevent electrical shock. Connect the ground lead between the ground terminal and the ground.

Check “SAFETY INFORMATION” on page 6.

## BATTERY

### WARNING

- If improper operation, the battery may be explosive and may potentially hurt persons nearby. Keep the fire and inflammable materials far away from the battery.
- The battery will release the explosive gas, please keep the fire far away from it. Keep a good air ventilation condition when battery is being charged or used.

### NOTE

- Clamp the red wire to the positive (+) terminal first, then the black wire to the negative (-) terminal of the battery. Do not reverse these positions. Otherwise serious damage may be caused to the generator set and battery.
- Please read the enclosed user's manual for proper usage of the battery you have purchased.

## **OPERATION**

### **CAUTION**

The generator has been shipped without engine oil. Fill with oil or it will not start.

## **STARTING THE ENGINE**

### **NOTE**

Before starting the engine, do not connect any electric devices.

1. Turn the AC circuit breaker to "OFF" position. The generator may be hard to start if a load is connected.
2. Turn the fuel valve lever to the ON position.
3. To start a cold engine, move the choke lever to the CLOSE "CLOSE" position. To restart a warm engine, leave the choke lever in the OPEN position.
4. Turn the engine switch to the ON position.
5. Pull slowly on the recoil starter until it is engaged, then pull it briskly.

### **NOTICE**

Do not allow the starter grip to snap back against the engine. Return it gently to prevent damage to the starter or housing.

6. Turn the choke lever back to the "OPEN" position.

Turn the engine switch to the START position.

### **CAUTION**

#### **Electric Starting Model (GV-7000S, GV-7600S)**

- Take your hand off the switch immediately after the engine starts.
- If the engine fails to start, release the switch, wait a few seconds, and then try again. Each attempt should be as short as possible to preserve the battery. Do not crank the engine more than 10 seconds on any one attempt.

## APPLICATION RANGE

Most motorized appliances require more than their rated wattage for start-up. Please use the list below as reference.

AC				DC 
Power factor	1	0.8~0.95	0.4~0.75	
GV-3000	~2000W	~1600W	~750W	Rated voltage 12V Rated current 8.3A
GV-3200	~2300W	~1600W	~750W	Rated voltage 12V Rated current 8.3A
GV-7000S	~5000W	~4000W	~2000W	Rated voltage 12V Rated current 8.3A
GV-7600S	~5500W	~4000W	~2000W	Rated voltage 12V Rated current 8.3A

### NOTE

Application wattage is indicated when each device is used by itself.

### CAUTION

Substantial overloading will switch off the AC circuit breaker. Exceeding the time limit for maximum power operation or slightly overloading the generator may not switch the AC circuit breaker OFF, but will shorten the life of the generator.

Limit operation requiring maximum power to 30 minutes.

Maximum power is:

GV-3000: 2.2kVA, GV-3200: 2.5kVA, GV-7000S:5.5kVA, GV-7600S:6kVA

For continuous operation, do not exceed the rated power.

Rated power is:

GV-3000: 2kVA, GV-3200: 2.3kVA, GV-7000S:5kVA, GV-7600S:5.5kVA

The total power requirements (VA) of all appliances connected must be considered. Appliance and power tool manufacturers usually list rating's information near the model number or serial number.

### NOTE

Some precision equipment is voltage sensitive and may require a more uniform voltage supply than portable generators provide. Examples include some medical equipment, personal computers and some inverters that sense peak and RMS voltage values. Consult the precision equipment vendor before relying on any portable generator to provide power to such equipment.

# CONNECTION

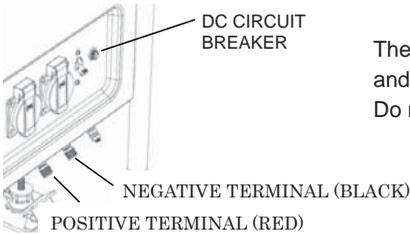
## Direct Current (DC) OPERATION

### Connecting the battery cables:

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

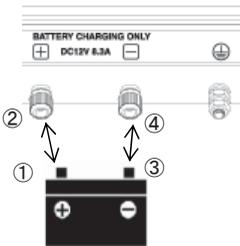


**A battery can explode if you do not follow the correct procedure, seriously injuring anyone nearby. Keep all sparks, open flames, and smoking materials away from the battery.**



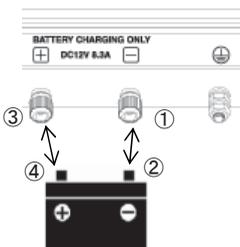
The terminal colored red is positive terminal (+), and colored black is negative terminal (-). Do not reverse these positions.

2. Connect the battery cables:



- ① Connect one end of the positive (+) battery cable to the battery positive (+) terminal.
- ② Connect the other to the positive (+) DC terminal.
- ③ Connect one end of the negative (-) battery cable to the negative (-) battery terminal.
- ④ Connect the other to the negative (-) DC terminal.

3. Disconnecting the battery cables:



- ① Disconnect one end of the negative (-) battery cable from the negative (-) DC terminal.
- ② Disconnect the other from the negative (-) battery terminal.
- ③ Disconnect one end of the positive (+) battery cable from the positive (+) DC terminal.
- ④ Disconnect the other from the positive (+) battery terminal.

## Alternating Current (AC) OPERATION

### CAUTION

- Be sure all electric devices including the lines and plug connections are in good condition before connecting to the generator.
- Be sure any electric devices are turned off before plugging in.
- Be sure the total load is within generator rated output.
- Be sure the receptacle load current is within receptacle rated current.
- Limit maximum power operation to 30 minutes.

1. Start the engine.
2. Plug into AC receptacle.
3. Make sure the voltmeter indicates the rated voltage.
4. Turn the AC circuit breaker to the "ON" position.
5. Turn on electrical devices one by one.

### CAUTION

If an overloaded circuit causes AC circuit breaker to turn OFF reduce the electrical load on the circuit, wait a few minutes and then reset AC circuit breaker.

## STOPPING THE ENGINE

### In an emergency:

Turn the engine switch to the "OFF" position.

### In normal use:

1. Turn off any electric devices.
2. Turn the AC circuit breaker to the OFF position.
3. Disconnect any electric devices.  
Disconnect the DC battery charging cables.
4. Turn the fuel valve to "OFF" position.

### NOTE

When using the generator at a high altitude, more than 1000m (3300ft) above sea level, consult an authorized generator dealer.

# PERIODIC MAINTENANCE

## MAINTENANCE CHART

The engine must be properly maintained to ensure its operation be safe, economy and zero-failure, as well as eco-friendly.

In order to keep your gasoline engine in good working condition, it must be periodically serviced. Please follow this Maintenance Schedule:

Items		Frequency	Each time	First 1 month or first 20hrs of operation	Thereafter, every 3 months or every 50hrs of operation	Every year or every 100 hrs of operation
Engine oil	Check-Refill		√			
	Replace			√	√	
Air filter element	Check		√			
	Clean			√		
	Replace				√	
Deposit cup (if applicable)	Clean					√
Spark Plug	Check-adjust					√*
Idling(if applicable)**	Check-adjust					√
Valve clearance**	Check-adjust					√
Fuel tank & fuel filter**	Clean					√
Fuel line	Check	Every 2 years (change if necessary)				
Cylinder head, piston	Clean up carbon**	$< 225\text{cc}$ , Every 125hrs $\geq 225\text{cc}$ , Every 250hrs				
* These items should be replaced if replacement needed. ** These items should be maintained and repaired by our authorized dealer, unless the owner has appropriate tools and are proficient with mechanical maintenance.						

### NOTE

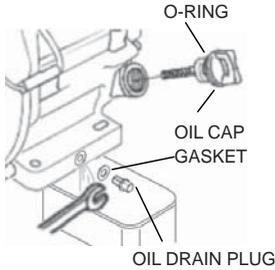
- If the gasoline engine frequently work under high temperature or high load, change the oil every 25 hours.
- If the engine frequently work under dusty or other harsh circumstances, clean the air filter element every 10 hours; If necessary, change the air filter element every 25 hours.
- The maintenance period and the exact time (hour), the one which comes first should govern.
- If you have missed the scheduled time to maintain your engine, do it as soon as possible.

### WARNING

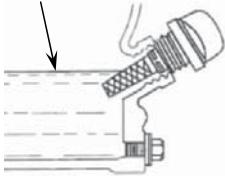
Stop the engine before servicing. Put the engine in horizontal position and remove the spark plug cap to prevent the engine from starting.

Do not operate the engine in an unventilated room or other enclosed area, be sure to keep good ventilation in working area. The exhaust from the engine contains toxic CO, inhaling of it would cause shock, unconsciousness and even death.

## ENGINE OIL REPLACEMENT



OIL UPPER LEVEL

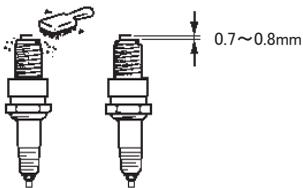
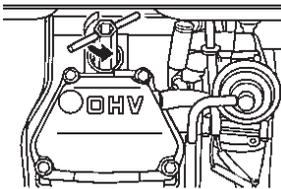


1. Place the machine on a level surface and warm up the engine for several minutes. Then stop the engine.
2. Remove the oil cap.
3. Place an oil pan under the engine. Remove the oil drain plug so that the oil can be drained completely.
4. Check the drain plug, gasket, oil filler cap and O-ring. If damaged, replace.
5. Reinstall the oil drain plug.
6. Add Engine oil to the upper level.

### CAUTION

Be sure no foreign material enters the crankcase.

## SPARK PLUG INSPECTION



1. Remove the spark plug cap.
2. Remove the spark plug using the wrench supplied.
3. Check for discoloration and remove the carbon.  
Standard electrode color: Tan Color
4. Check the spark plug gap.  
Spark Plug Gap: 0.7-0.8 mm (0.028-0.031 in)
5. Install the spark plug.

## AIR FILTER

A dirty air cleaner will restrict air flow into the carburetor. To prevent carburetor malfunction, service the air cleaner regularly. Service more frequently when operating the generator in extremely dusty areas.

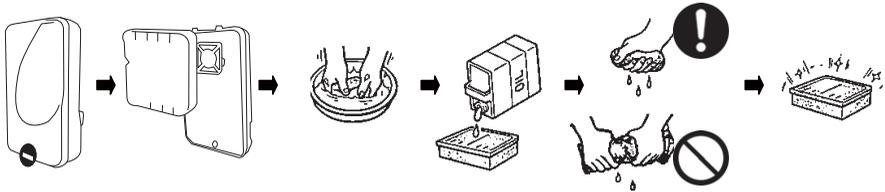
1. Remove the air filter cover and element.
2. If the element is dirty, use only soapy water or a nonflammable solvent to wash the element and dry.
3. Spark the air filter in clean engine oil and squeeze out the excess oil. Too much oil in the element will cause engine to smoke during initial start-up.

**CAUTION** Do not wring out the element. This could cause to tear.

4. Reinstall the element and the cover.

### NOTE

Be sure the element sealing surface matches the air filter so there is no air leak.



**CAUTION** The engine should never run without the element, excessive piston and cylinder wear may result.

## CARBURETOR ADJUSTMENT

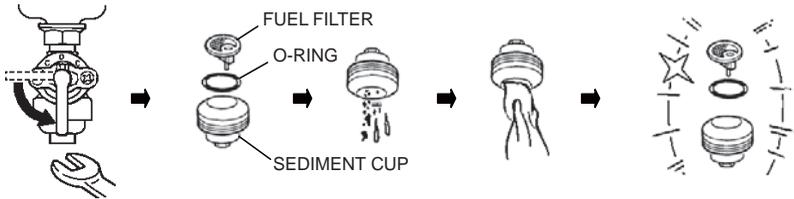
The carburetor is vital part of the engine. Adjusting should be left to a dealer with professional knowledge.

## FUEL VALVE

1. Stop the engine.
2. Turn the fuel valve to "OFF".
3. Remove the sediment cup, fuel filter and O-ring.
4. Clean the cup with solvent and wipe it off.
5. Check the fuel filter and O-ring. Replace if damaged.
6. Reinstall the O-ring, fuel filter and sediment cup.

### WARNING

Be sure the sediment cup is tightened securely.



## FUEL TANK FILTER

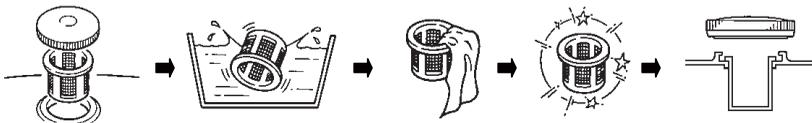
### WARNING

Never smoke or be in the vicinity of an open flame when using fuel or solvent.

1. Remove the fuel tank cap and filter.
2. Clean the filter with solvent. If damaged, replace.
3. Wipe the filter and insert it.

### WARNING

Be sure the tank cap is tightened securely.



## **STORAGE**

Before storing the unit for an extended period:

1. Be sure the storage area is free of excessive humidity and dust.
2. Service according to the table below:

<b>STORAGE TIME</b>	<b>RECOMMENDED SERVICE PROCEDURE TO PREVENT HARD STARTING</b>
Less than 1 month	No preparation required
1 to 2 months	Fill with fresh gasoline.
2 months to 1 year	Fill with fresh gasoline. Drain the carburetor float bowl. (page 22). Drain the fuel sediment cup. (page 20).
1 year or more	Fill with fresh gasoline. Drain the carburetor float bowl. (page 22). Drain the fuel sediment cup. (page 20). Remove the spark plug. Put a tablespoon of engine oil into the cylinder. Turn the engine slowly with the starter grip to distribute the oil. Reinstall the spark plug. Change the engine oil. (page18). After removal from storage, drain the stored gasoline into a suitable container, and fill with fresh gasoline before starting.

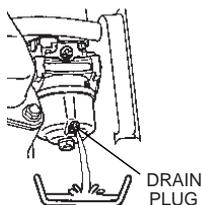
## Storage Procedure

- 1 . Drain the fuel tank, the carburetor and the fuel sediment cup.
  - a. Remove the carburetor drain screw.
  - b. Drain the gasoline from the carburetor into a suitable container.
  - c. Install and tighten the carburetor drain screw.
  - d. Turn the fuel valve lever off and drain the fuel sediment cup.
  - e. Turn the fuel valve lever on and drain the gasoline from the fuel tank into a suitable container
  - f. Install and tighten the fuel sediment cup securely.
  - g. Turn the fuel valve lever off.

### **WARNING**

**Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.**

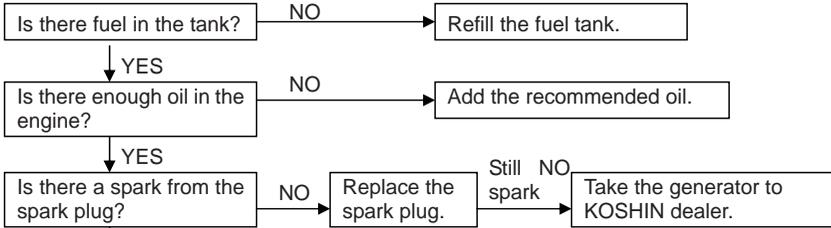
- **Keep heat, sparks, and flame away.**
- **Handle fuel only outdoors.**
- **Wipe up spills immediately.**



2. Change the engine oil (page18).
3. Remove the spark plug, and pour about a tablespoon of clean engine oil into the cylinder. Crank the engine several revolutions to distribute the oil, then reinstall the spark plug.
4. Slowly pull the starter grip until resistance is felt. At this point, the piston is coming up on its compression stroke and both the intake and exhaust valves are closed. Storing the engine in this position will help to protect it from internal corrosion

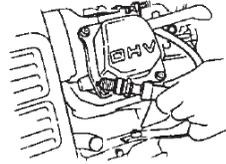
# TROUBLESHOOTING

## Engine not to start:



### How to check the spark:

- 1) Remove the spark plug cap and clean any dirt from around the spark plug.
- 2) Remove the spark from and install the spark plug in the removed plug cap.
- 3) Set the plug side electrode on the cylinder head.
- 4) Crank the engine, spark should jump across the gap.

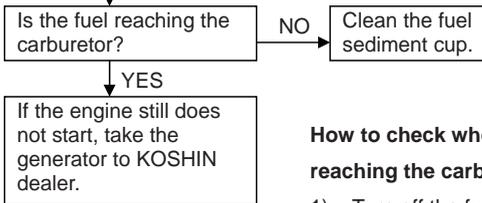


YES



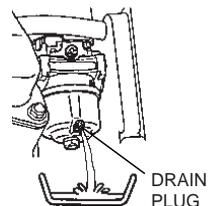
### WARNING

Be sure there is no spilled fuel around the spark plug.  
Spilled fuel may ignite.



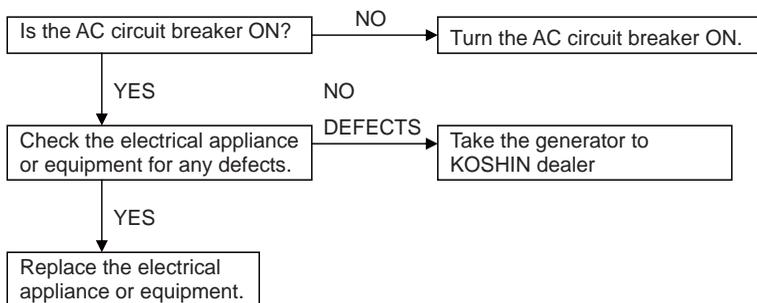
### How to check whether the fuel reaching the carburetor:

- 1) Turn off the fuel valve lever and remove the drain screw.
- 2) Turn on the fuel valve lever. Fuel should flow the drain.

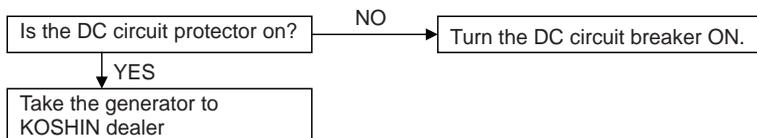


DRAIN PLUG

### Generator won't produce power:



### No electricity at the DC terminals:



# SPECIFICATIONS

## Dimensions

Model	GV-3000	GV-3200	GV-7000S	GV-7600S
Length	615mm (24.2in)		697mm (27.4in)	
Width	445mm (17.5in)		525mm (20.7in)	
Height	457mm (18in)		530mm (20.9in)	
Dry weight	43kg		86kg	

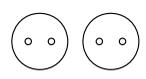
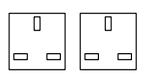
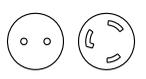
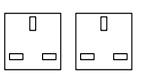
## Engine

Model	KOSHIN K210		KOSHIN K420	
Engine Type	4-Stroke, overhead valve, single cylinder			
Displacement [Bore × Stroke]	212cc 170 × 55mm		420cc 190 × 66mm	
Compression Ratio	8.5:1			
Engine Speed	3,000rpm	3,600rpm	3,000rpm	3,600rpm
Starting Method	Recoil		Recoil + Electric starter	
Cooling System	Forced air			
Ignition System	Transistorized magneto			
Oil capacity	0.6L		1.1L	
Fuel Tank Capacity	12.6L		22.6L	
Spark Plug	LG F6TC (NGK BP6ES)			

## Generator

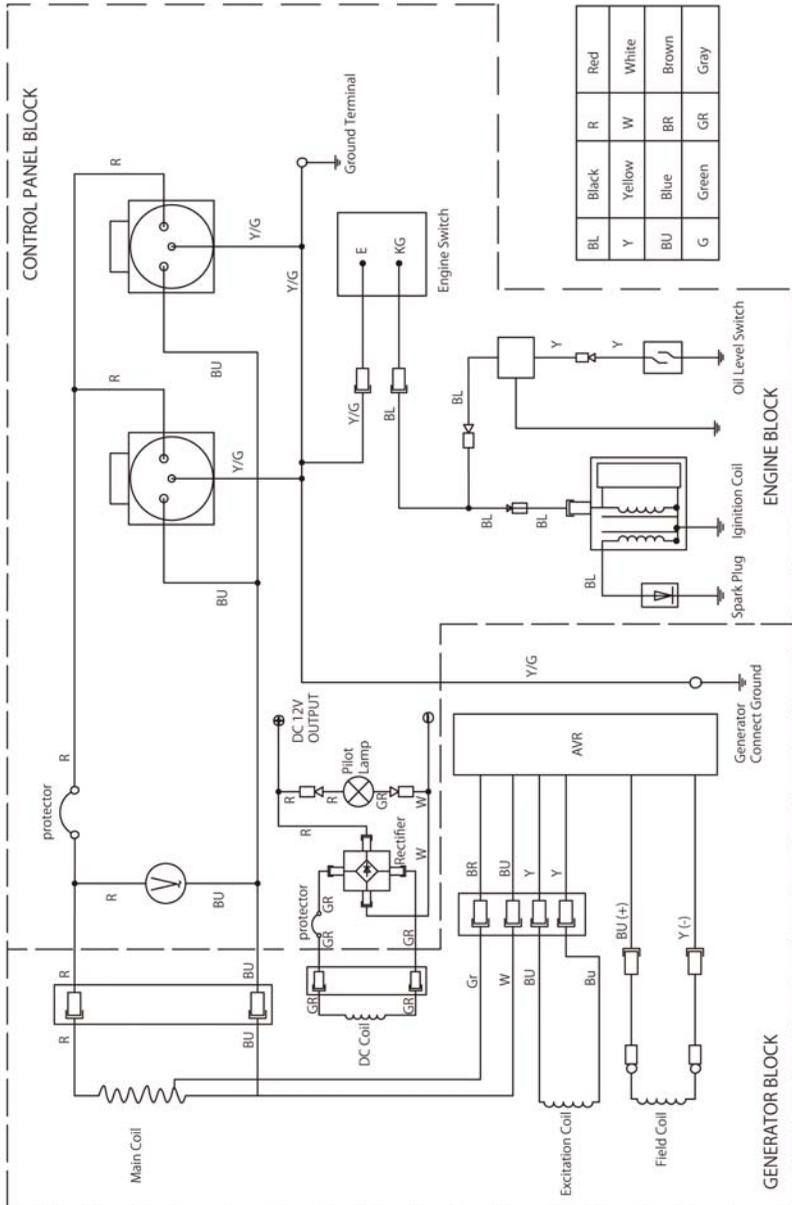
AC	Rated Voltage	220V	230V	220V	220V	230V	220V
	Rated Frequency	50Hz		60Hz	50Hz		60Hz
	Rated Ampere	9.1A	8.7A	10.5A	22.7A	21.7A	25A
	Rated Output	2kVA		2.3kVA	5kVA		5.5kVA
	Maximum Output	2.2kVA		2.5kVA	5.5kVA		6kVA
	Rated Power Factor (Cosφ)	1					
DC	Rated	8.3A / 12V / 100VA					

## Control Panel

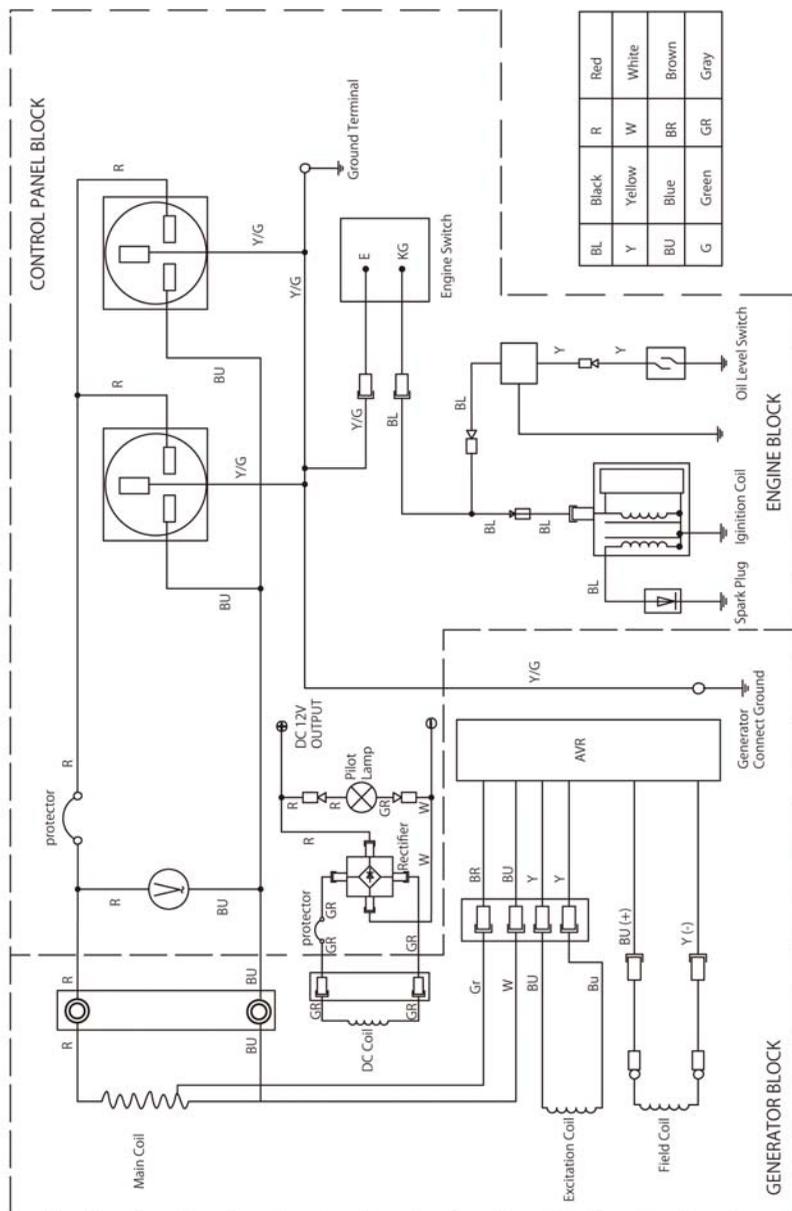
Receptacle				
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# WIRING DIAGRAM

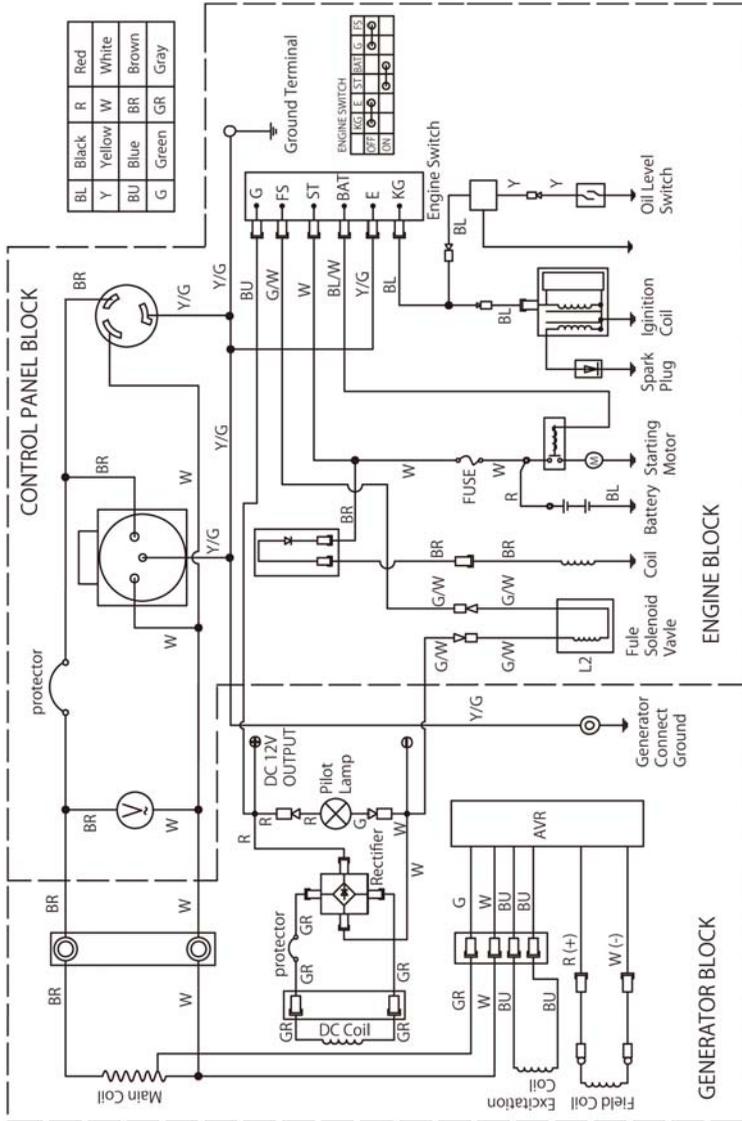
GV-3000



# GV-3200



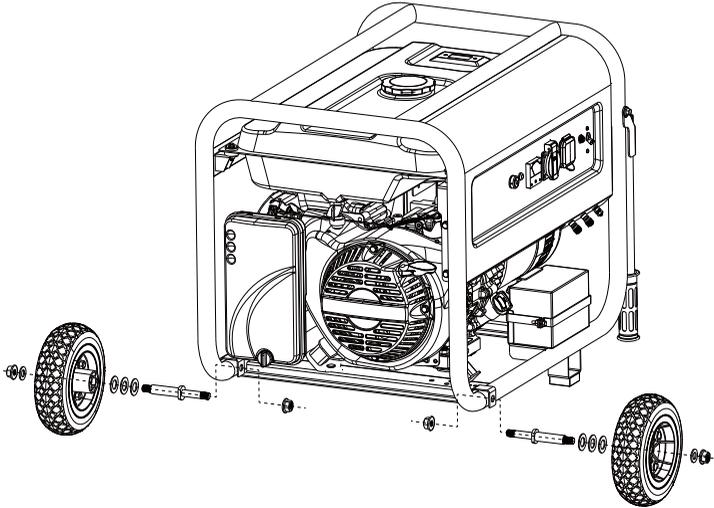
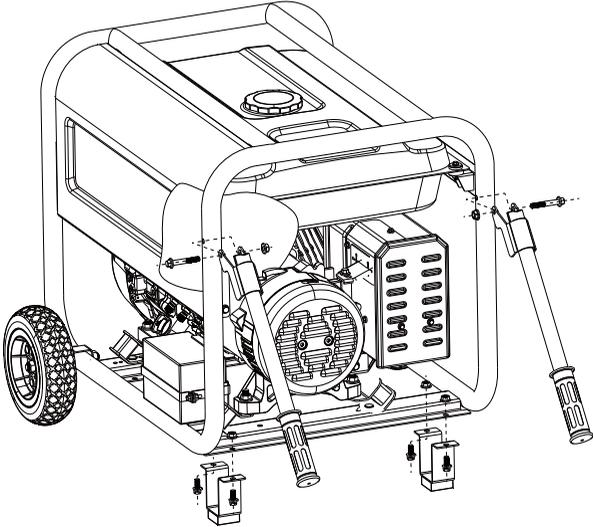
# GV-7000S





# Installation Instructions

## Wheel Kit and Handle Assembly



**MEMO**



