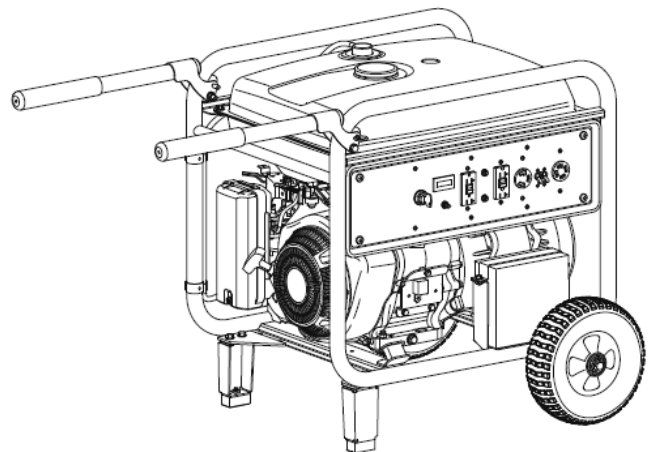


Generator

SGX3500

SGX5000

SGX7500



SERVICE MANUAL

CONTENTS

Section	Title	Page
1.	SPECIFICATIONS.	1
2.	PERFORMANCE CURVES.	2
3.	GENERAL DESCRIPTION.	5
4.	RANGE OF APPLIANCES THAT CAN BE POWERED BY GENERATOR	8
5.	MEASURING PROCEDURES.	15
5-1	MEASURING INSTRUMENTS.	16
5-2	AC OUTPUT MEASURING.	17
5-3	MEASURING INSULATION RESISTANCE.	18
6.	CHECKING FUNCTIONAL MEMBERS.	19
6-1	RECEPTACLES.	19
6-2	CIRCUIT BREAKER.	19
6-3	STATOR.	20
6-4	ROTOR ASSEMBLY.	20
6-5	BRUSH.	21
6-6	A.V.R. (AUTOMATIC VOLTAGE REGULATOR).	22
6-7	OIL SENSOR	23
7.	DISASSEMBLY AND ASSEMBLY	24
7-1	PREPARATION and PRECAUTIONS.	24
7-2	DISASSEMBLY PROCEDURES.	24
7-3	COMPONENT PARTS.	28
7-4	ASSEMBLY PROCEDURES.	33
7-5	CHECKING, DISASSEMBLY and REASSEMBLY of the CONTROL PANEL.	39
8.	TROUBLESHOOTING.	40
8-1	NO AC OUTPUT.	40
8-2	AC VOLTAGE IS TOO HIGH OR TOO LOW.	41
8-3	AC VOLTAGE IS NORMAL AT NO-LOAD, BUT NO OUTPUT AVAILABLE WHEN CONNECTING WITH LOAD.	42
9.	WIRING DIAGRAM	43

NOTE

This Service Manual excludes information for engine.

In case you need service information for engine, please refer to the Robin EX series OHC Engine Service Manual.

1. SPECIFICATIONS

MODEL		SGX3500	SGX5000	SGX7500
GENERATOR	Type	Brush, self-exciting, 2-pole, single phase		
	Voltage regulation system	AVR type		
	AC Output	120/240-60		
	Rated voltage- Frequency V-Hz			
	Rated current A	26.6/13.3	37.5/18.7	55.8/27.9
	Rated output VA (W)	3200	4500	6700
	Maximum output VA (W)	3500	4900	7500
	Power factor	1		
	Safety device type	No-Fuse Breaker		
ENGINE	Model	EX21D	EX30D	EX40D
	Type	SUBARU, Air-cooled, 4-stroke, OHC, Gasoline Engine		
	Displacement MI(cu.in.)	211(12.88)	287(17.51)	404(24.65)
	Fuel	Automotive Unleaded Gasoline		
	Fuel tank capacity L(U.S.gal)	11	22.5	22.5
	Engine oil capacity L(U.S.gal)	0.6 (0.16)	1.0 (0.26)	1.2 (0.32)
	Spark plug	TORCH E6RC (NGK BR-6HS)	NGK-BR-6HS	
	Starting system	Recoil starter		Electric starter / Recoil
Direction of rotation		Counter clockwise		
DIMENTION	Length mm(in)	683	748	
	Width mm(in)	617	717	
	Height mm(in)	645	734	
Dry weight kg(lb)		53.3kg		96kg

Specifications : Subject to change without notice.

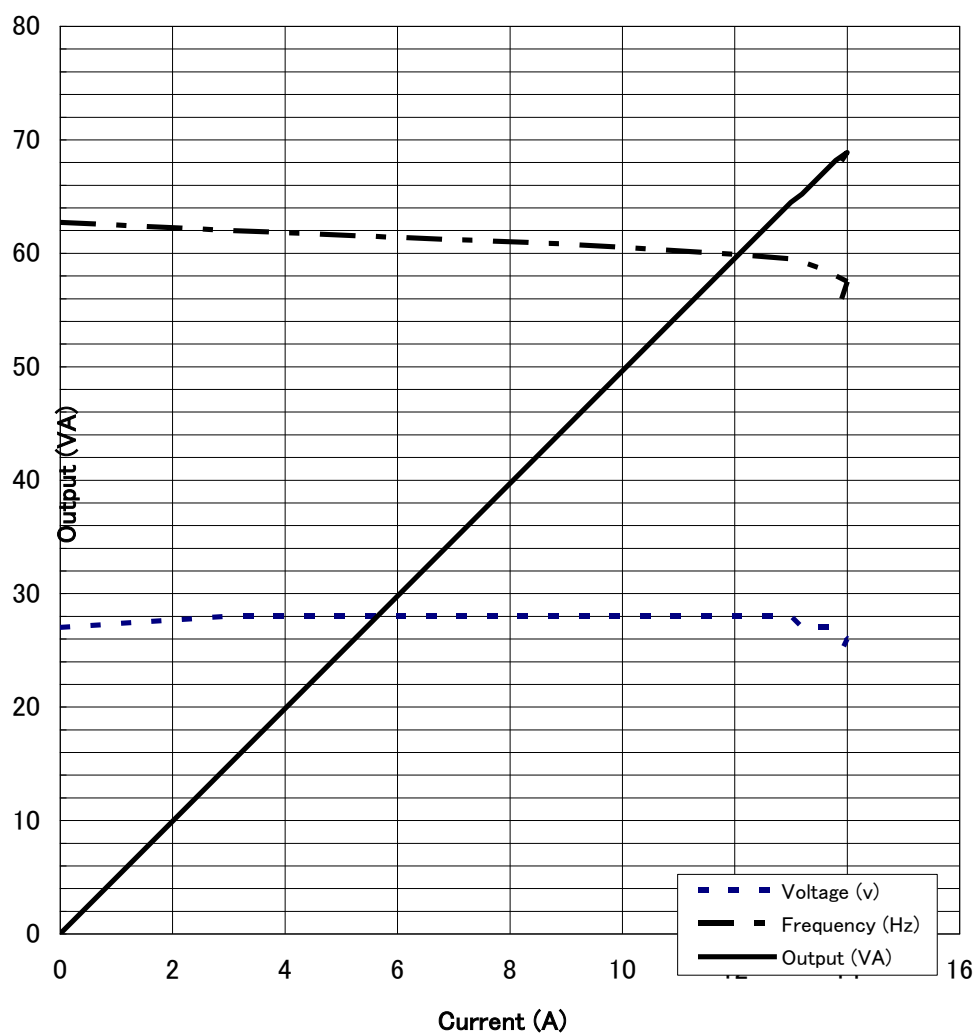
NOTE

Dimentions are in dry weight including two wheels, handles and battery.

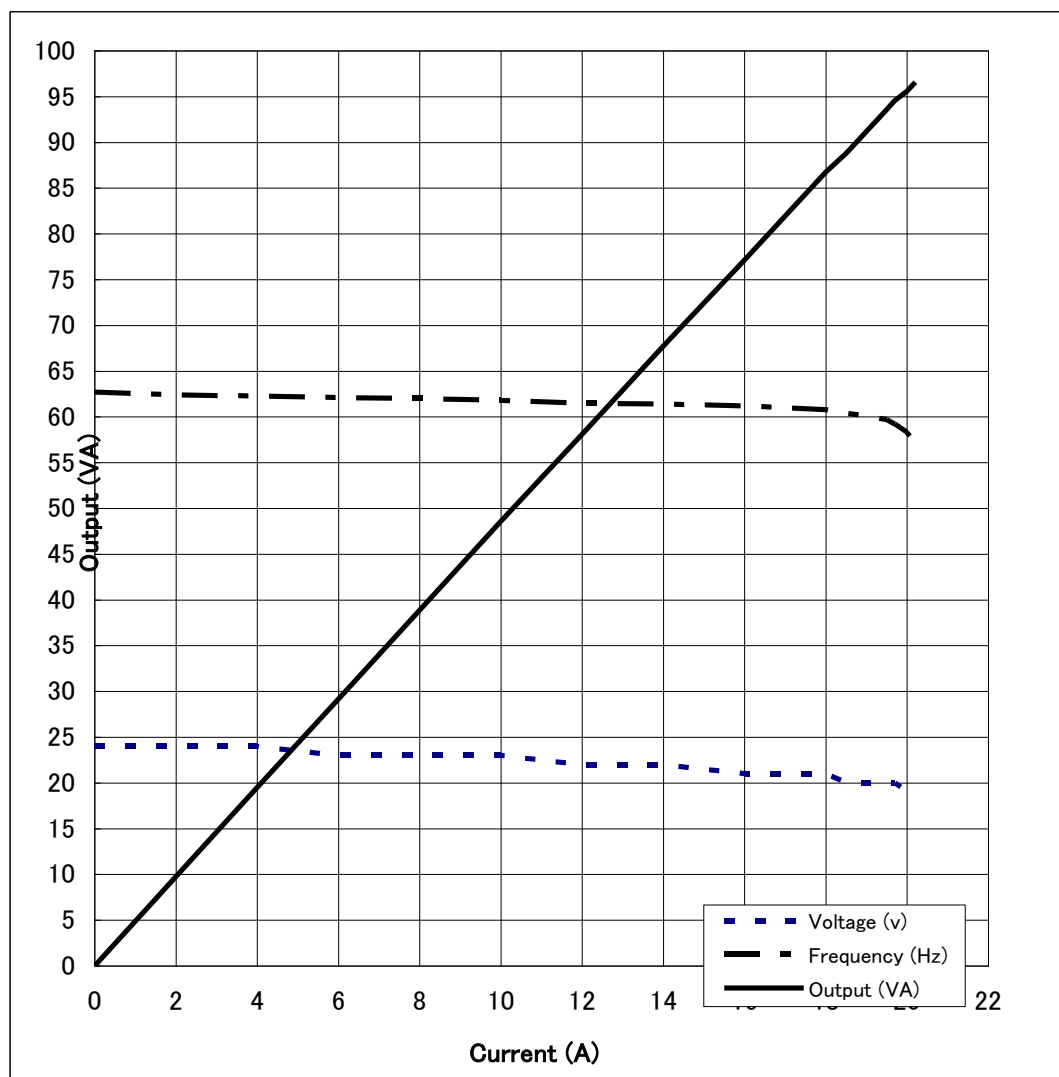
In dimentions, handles are being closed.

2. PERFORMANCE CURVES

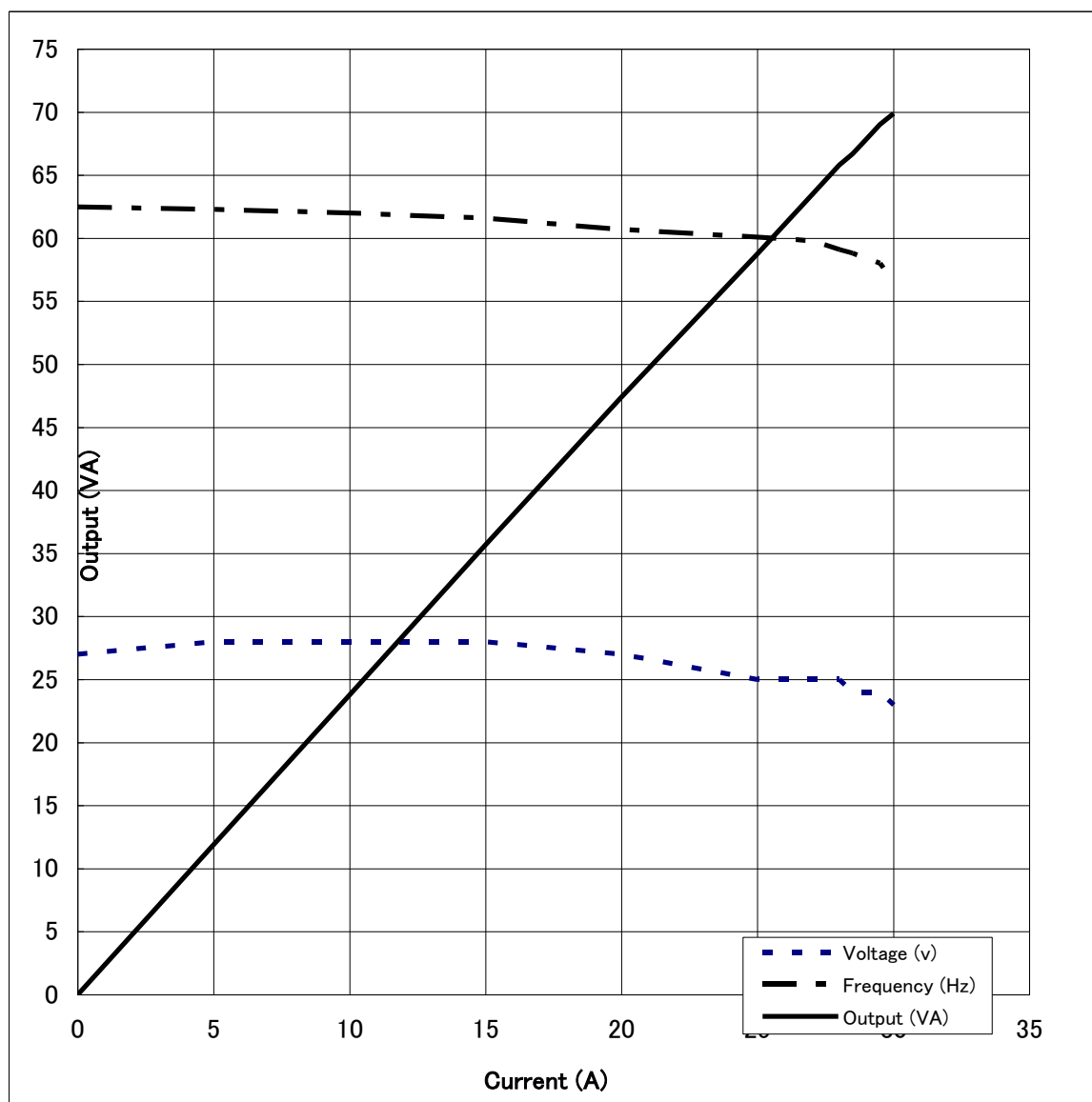
SGX3500



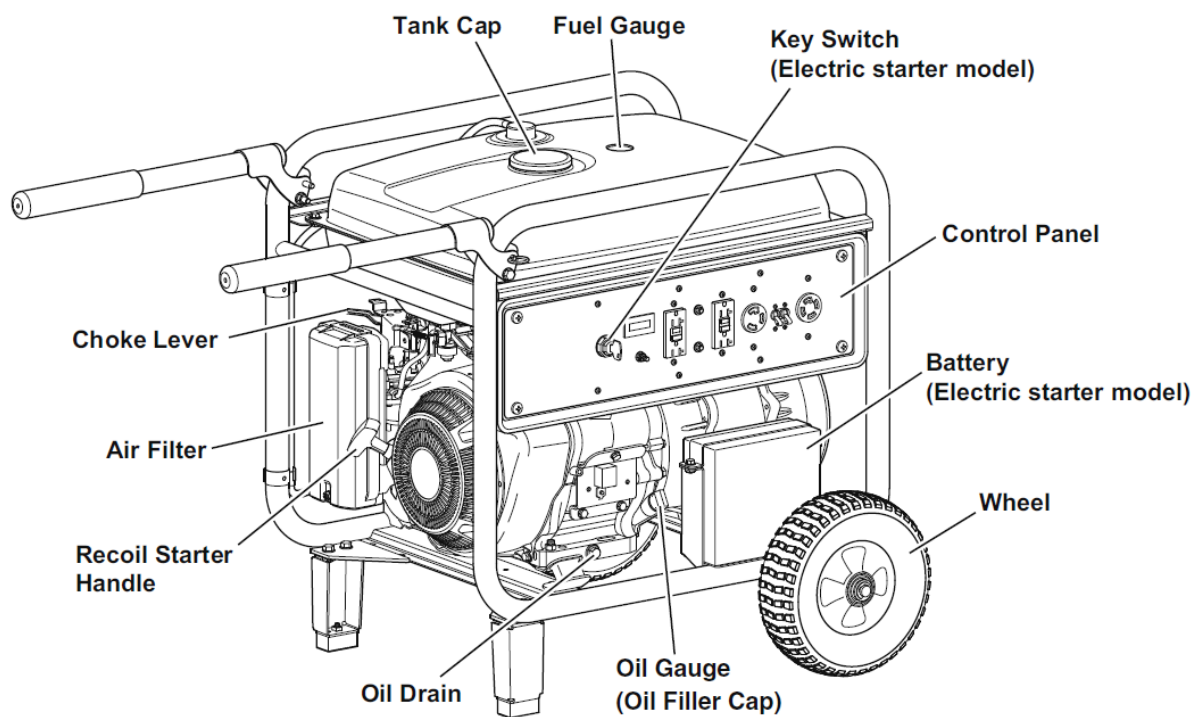
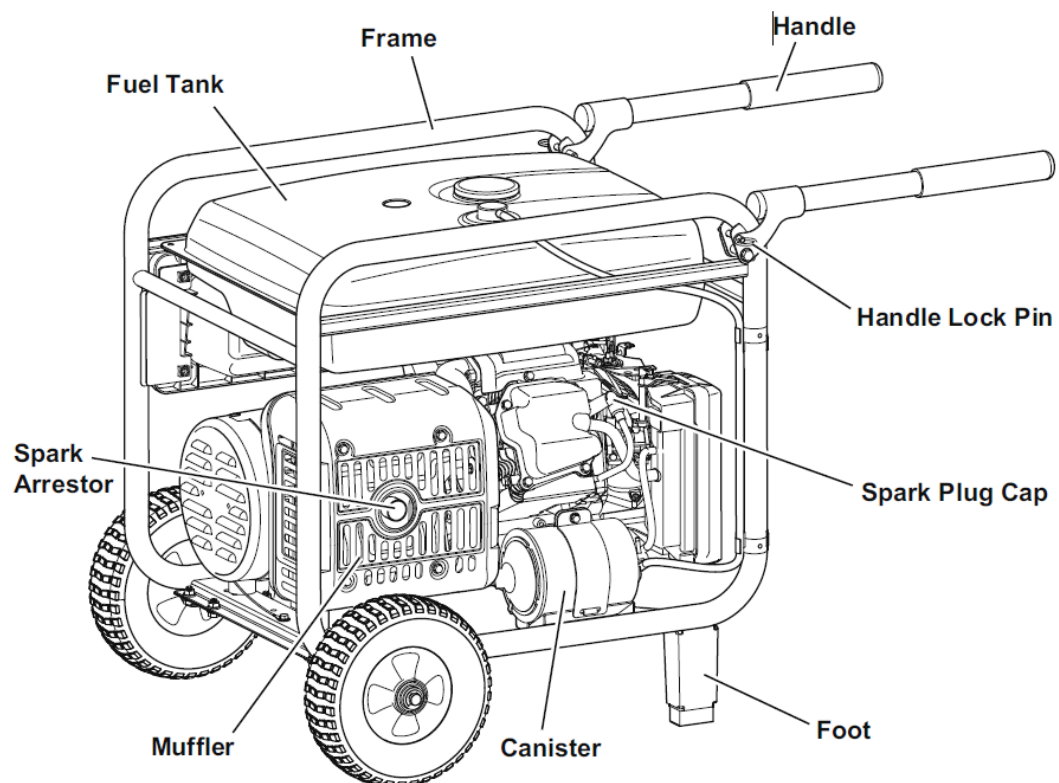
SGX5000



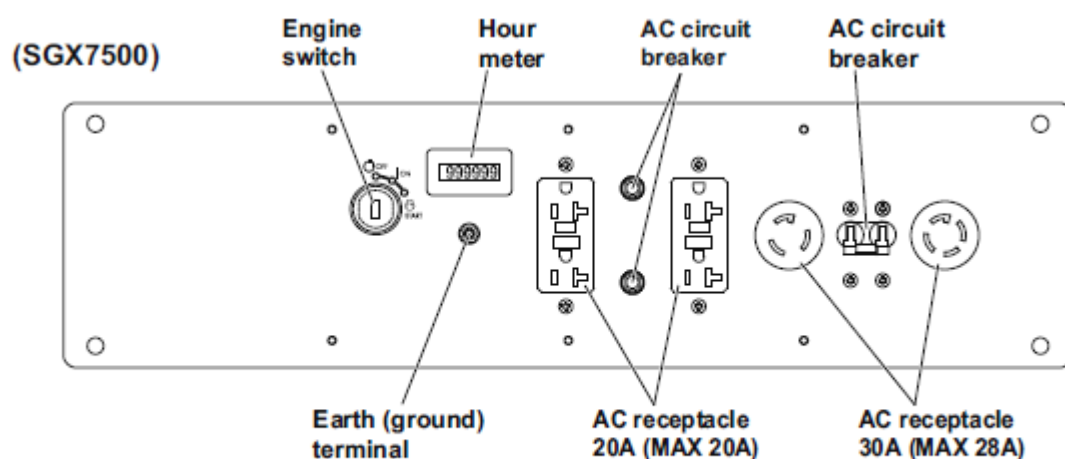
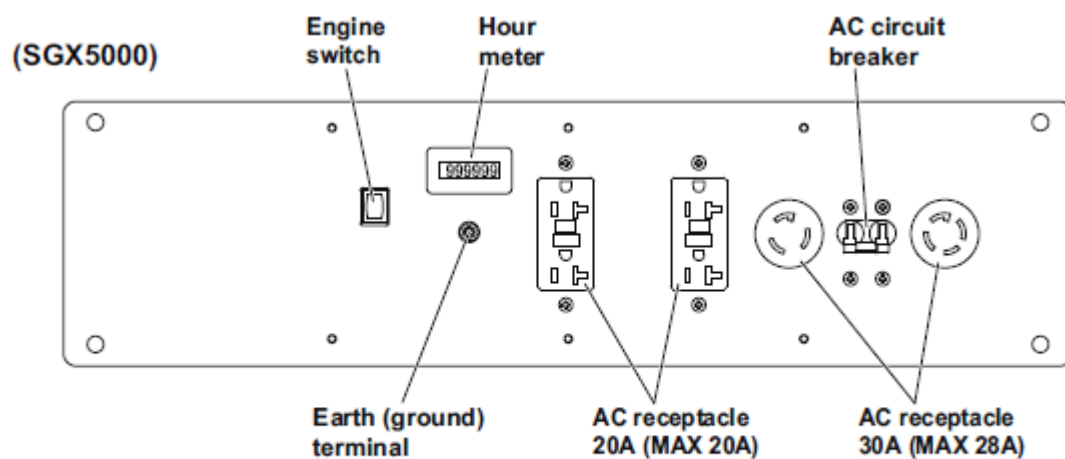
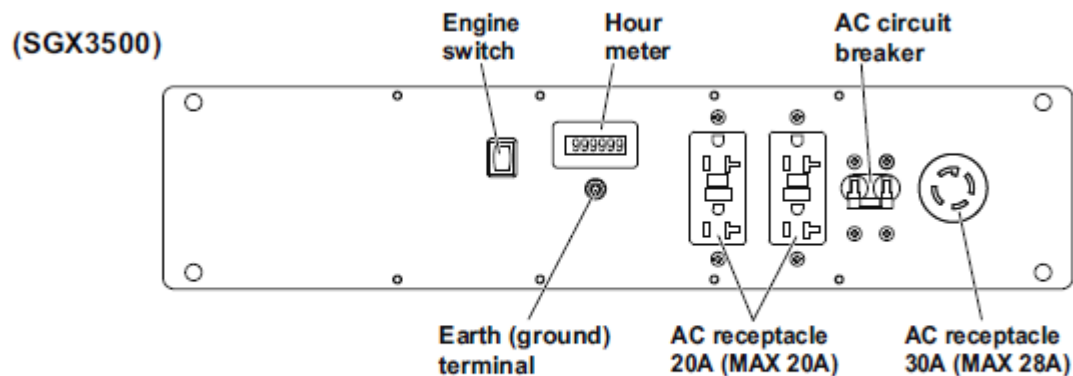
SGX7500



3. GENERAL DESCRIPTION



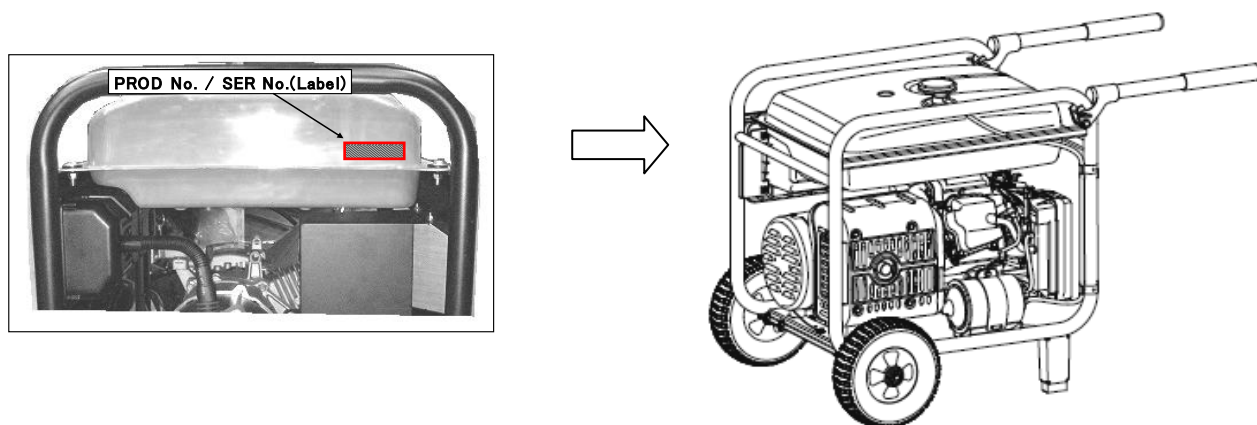
CONTROL PANEL



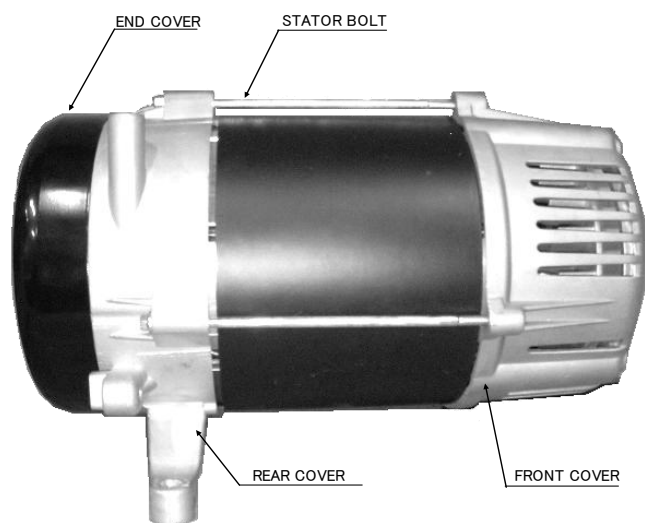
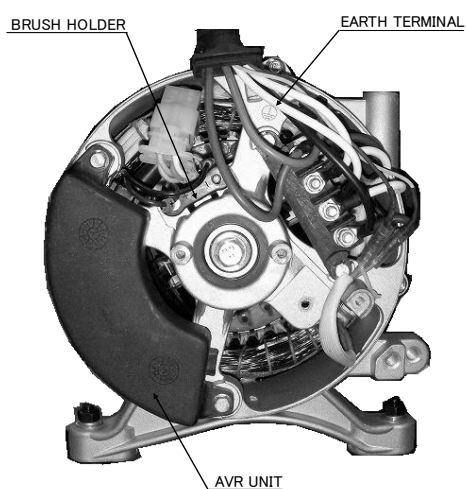
SERIAL NUMBER

Serial number is stamped on the label stuck on the fuel tank.

NOTE : Always specify serial number when inquiring about the generator or ordering spare parts in order to get correct parts and suitable service.



CONSTRUCTION



4. RANGE OF APPLIANCES THAT CAN BE POWERED BY GENERATOR

Generally, the power rating of an electrical appliance indicates the amount of work that can be done by it. The electric power required for operating an electrical appliance is not always equal to the output wattage of the appliance. The electrical appliances generally have a label showing their rated voltage, frequency, and power consumption (input wattage). The power consumption of an electrical appliance is the power necessary for using it. When using a generator for operating an electrical appliance, the power factor and starting wattage must be taken into consideration. In order to determine the right size generator, it is necessary to add the total wattage of all appliances to be connected to the unit.

Refer to the followings to calculate the power consumption of each appliance or equipment by its type.

(1) Incandescent lamp, heater, etc. with a power factor of 1.0

Total power consumption must be equal to or less than the rated output of the generator.

Example : A rated 3000W generator can light thirty 100W incandescent lamps on.

(2) Fluorescent lamps, motor driven tools, light electrical appliances, etc. . with a smaller power factor

Select a generator with a rated output equivalent to 1.2 to 2 times of the power consumption of the load. Generally the starting wattage of motor driven tools and light electrical appliances are 1.2 to 3 times larger than their running wattage.

Example: A rated 250 W electric drill requires a 400 W generator to start it.

NOTE 1: If a power factor correction capacitor is not equipped with the fluorescent lamp, the more power shall be required to light the lamps.

NOTE 2: Nominal wattage of the fluorescent lamp generally indicates the output wattage of the lamp. Therefore, if the fluorescent lamp has no special indication as to the power consumption, efficiency should be taken into account as explained in Item (5) on the following page.

(3) Mercury lamps with a smaller power factor

Loads for mercury lamps require 2 to 3 times than the indicated wattage during start-up.

Example : A 400 W mercury lamp requires 800 W to 1200 W power source to be turned on. A rated 3000 W generator can power two or three 400 W mercury lamps.

(4) Motor driven appliances which are initially loaded, such as water pumps, compressors, etc.

These appliances require large starting wattage which is 3 to 5 times of running wattage.

Example : A rated 900 W compressor requires a 4500 W generator to drive it.

NOTE 1: Motor-driven appliances require the aforementioned generator output only at the starting. Once their motors are started, the appliances consume about 1.2 to 2 times than their rated power consumption so that the excess power generated by the generator can be used for other electrical appliances.

NOTE 2 : Motor-driven appliances mentioned in item (4) vary in their required motor starting power, depending on the kind of motor and start-up load. If it is difficult to determine the optimum generator capacity, select a generator with a larger capacity.

(5) Appliances without any indication of power consumption

Some appliances have no indication of power consumption; but instead the work load (output) is indicated. In such a case, power consumption is to be worked out according to the numerical formula mentioned below.

$$\frac{(\text{Output of electrical appliance})}{(\text{Efficiency})} = (\text{Power consumption})$$

Efficiencies of some electrical appliances are as follows :

Single-phase motor 0.6 to 0.75

Fluorescent lamp 0.7 to 0.8

The smaller the motor, the
Lower the efficiency.

Example 1 : A 40W fluorescent lamp means that its luminous output is 40W. Its efficiency is 0.7 and accordingly, power consumption will be $40 \div 0.7 = 57\text{W}$. As explained in Item (2), multiply this power consumption value of 57 W by 1.2 to 2 and you will get the figure of the necessary capacity of a generator. In other words, a generator with a rated output of 1000W capacity can light nine to fourteen 40 W fluorescent lamps.

Example 2 : Generally speaking, a 400 W motor means that its work load is 400 W. Efficiency of this motor is 0.7 and power consumption will be $400 \div 0.7 = 570\text{ W}$. When this motor is used for a motor-driven tool, the capacity of the generator should be multiply of 570 W by 1.2 to 3 as explained in the Item (3). $570\text{ (W)} \times 1.2\text{ to }3 = 684\text{ (W) to }1710\text{ (W)}$

Applications	Applicable Wattage(approx. W)		
	SGX3500	SGX5000	SGX7500
Incandescent lamp, Heater	3200	4500	6700
Fluorescent lamp, Electric tool	1750	2500	3700
Mercury lamp	1250	1800	2650
Pump, Compressor	800	1100	1650

Table.4-1

NOTES : Wiring between generator and electrical appliances

1. Allowable current of cable

Use a cable with an allowable current that is higher than the rated input current of the load (electrical appliance). If the input current is higher than the allowable current of the cable used, the cable will become excessively heated and deteriorate the insulation, possibly burning it out. Table 4-2 shows cables and their allowable currents for your reference.

2. Cable length

If a long cable is used, a voltage drop occurs due to the increased resistance in the conductors decreasing the input voltage to the load (electrical product). As a result, the load can be damaged. Table 4-2 shows voltage drops per 100 meters of cable.

Nominal cross section	A.W.G.	Allowable current	No.of strands / strands dia.	Resistance	Current Amp.							Voltage drop
mm ²	No.	A	No./mm	Ω /100m	1A	3A	5A	8A	10A	12A	15A	
0.75	18	7	30/0.18	2.477	2.5V	7.5V	12.5V	–	–	–	–	
1.25	16	12	50/0.16	1.486	1.5V	4.5V	7.5V	12V	15V	18V	–	
2.0	14	17	37/0.26	0.952	1V	3V	5V	8V	10V	12V	15V	
3.5	12 to 10	23	45/0.32	0.517	–	1.5V	2.5V	4V	5V	6.5V	7.5V	
5.5	10 to 8	35	70/0.32	0.332	–	1V	2V	2.5V	3.5V	4V	5V	

Table.4-2

Voltage drop indicates as $V = \frac{1}{100} \times R \times I \times L$

R means resistance (Ω /100 m) on the above table.

I means electric current through the wire (A).

L means the length of the wire (m).

The length of wire indicates round length, it means twice than the length from generator to electrical tools.

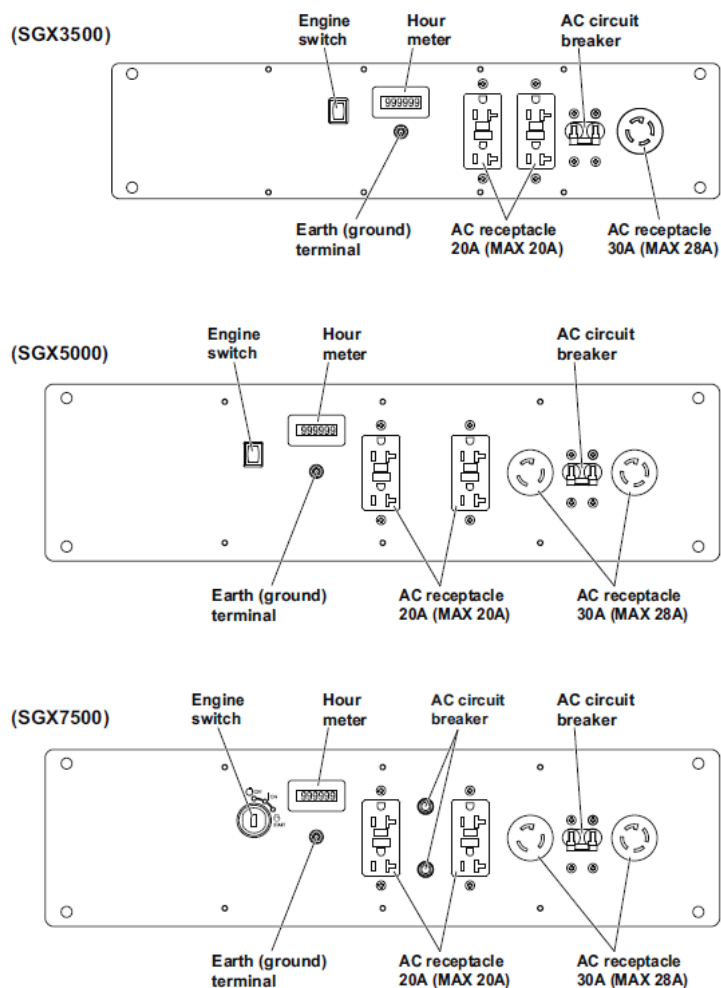
(6) AC Receptacle

AC receptacles are used for taking AC output power from the generator.
Based on rated current, 3 kinds of receptacle are prepared.

The rated current for each receptacle is shown as follows;

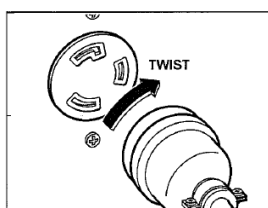
CAUTION

Be careful not to use the receptacles
beyond the specified amperage limits to
prevent burning.



CAUTION

To connect the appliance the rocking
type receptacle, insert the plug in to the
receptacle and then turn it clockwise to
rock.



Check the amperage of the receptacles used referring to table.4-3, and be sure not to take a current exceeding the specified amperage.

Be sure that the total wattage of all appliances does not exceed the rated output of the generator.




Style	Ampere	Receptacle	AC plug	Description
	up to 20A	NEMA 5-20R	NEMA 5-20P	GFCI (Ground Fault Circuit Interrupter) Receptacle, duplex
	up to 30A	NEMA L5-30R	NEMA L5-30P	Locking Receptacle
	up to 30A	NEMA L14-30R	NEMA L14-30P	Locking Receptacle

Table. 4-3

NOTE :

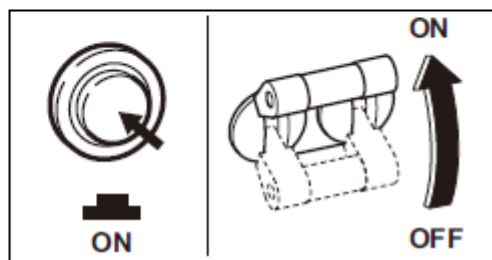
When the AC circuit breaker turns off during operation, the generator must be overloaded or the appliance must be with defect. Stop the generator immediately, check the appliance and / or generator for overloading and have repaired if necessary, by Robin America dealer or service shop.

[CAUTION]

The duplex 120V receptacle is protected by a GFCI (Ground Fault Circuit Interrupter). GFCI shuts off the output current from the duplex 120V receptacle when a ground fault occurs in the generator or the appliance. Please note that other receptacles are not protected by GFCI.

Turn the AC circuit breaker to the position "ON".

Turn on the switch of the appliance.



GFCI RECEPTACLE

After starting the engine, check the GFCI for proper functioning by the following test procedures.

- Push the TEST button, The RESET button will pop out exposing the word TRIP. Power is now off at the outlets protected by the GFCI, indicating that the device is functioning properly.
- If TRIP does not appear when testing, do not use the generator. Call a qualified electrician.
- To restore power, push RESET button.

WARNING

If the RESET button pops out during operation, stop the generator immediately and call a qualified electrician for checking generator and appliances.

CONNECTING TO DOMESTIC CIRCUIT (HOUSE WIRING)

WARNING

This generator is neutral floating type.

If a generator is to be connected to residential or commercial power lines, such as a stand by power source during power outage, all connections must be by a licensed electrician.

Failure in connection may result in death, personal injury, damage to generator, damage to appliances, damage to the building's wiring or fire.

(a) When connecting a SUBARU generator to a house wiring, generator output power must be taken from the 240V-4P receptacle.

(b) Install a transfer switch.

A transfer switch is to transfer the load from the generator to commercial power source.

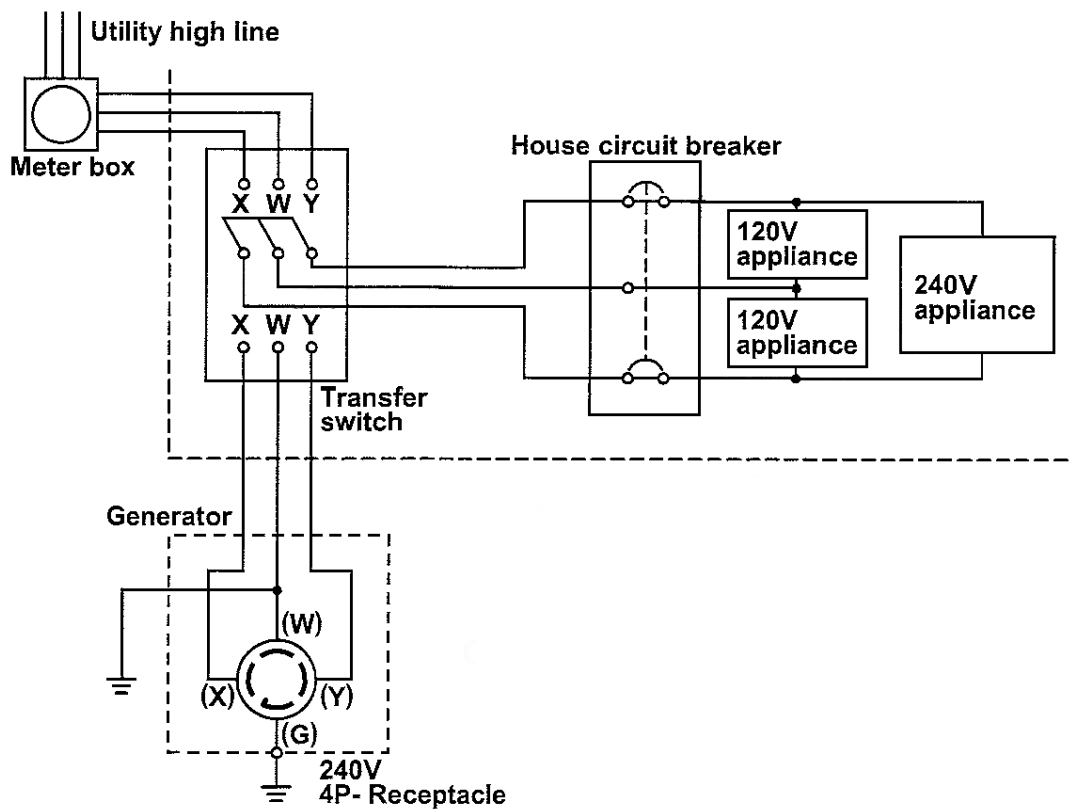
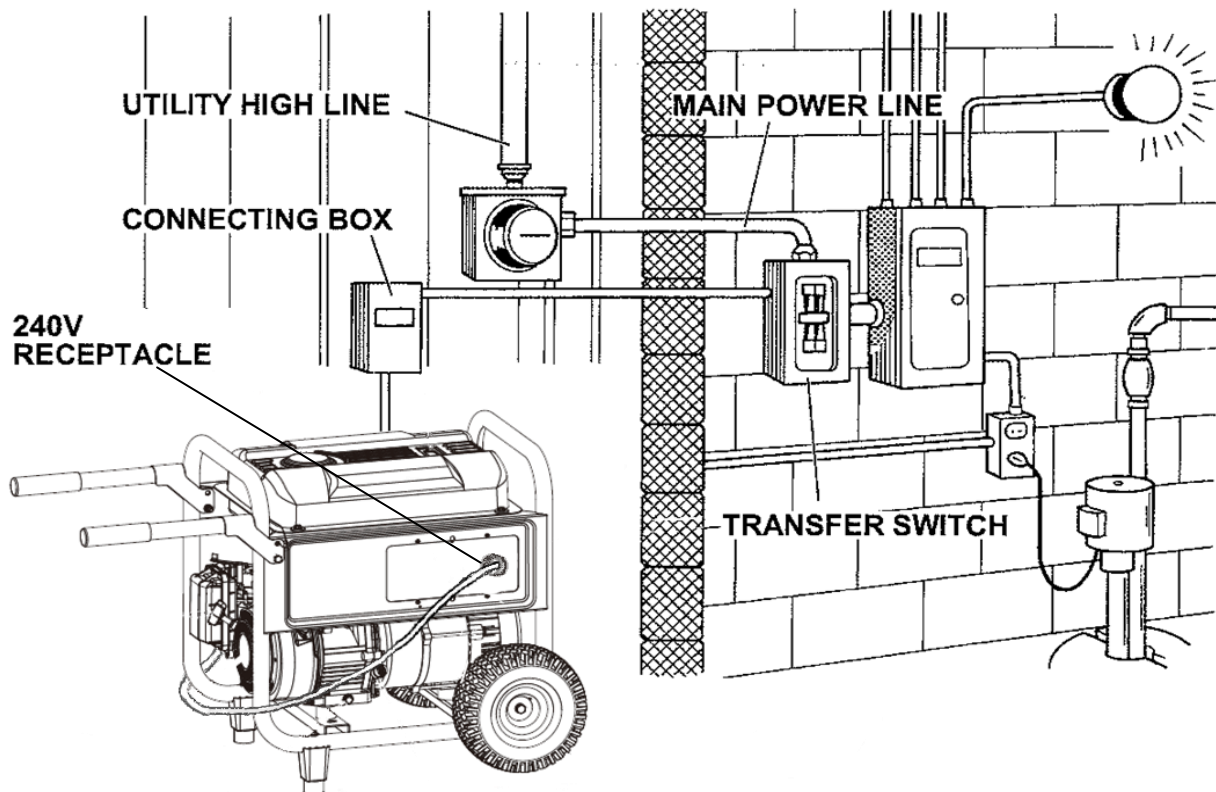
This switch is necessary to prevent accidents caused by the recovery from power outage.

Use a transfer switch of the correct capacity.

Install transfer switch in between the meter and the fuse or AC breaker box.

[CAUTION]

IF the neutral wire of house wiring is grounded, be sure to ground the ground terminal of the generator, Otherwise an electric shock may occur to the operator.



5. MEASURING PROCEDURES

5-1 MEASURING INSTRUMENTS

(1) VOLTMETER

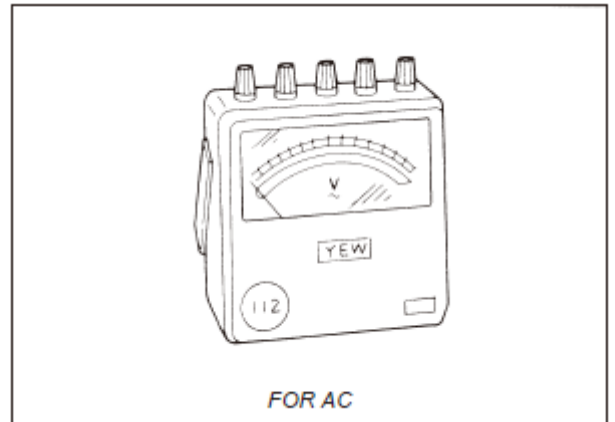
AC voltmeter is necessary.

Ranges of voltage to be used for our various types of generators are as follows :

0 to 150V : Type of voltage range as
110 or 120 V

0 to 300V : Type of voltage range as
220, 230 or 240 V

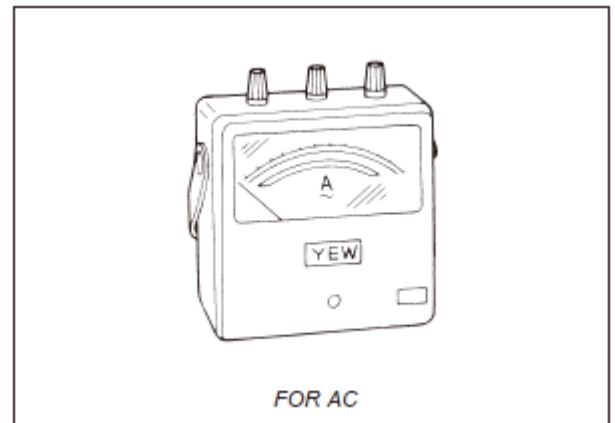
0 to 150V, 0 to 330V : Dual voltage type



(2) AMMETER

AC ammeter is necessary.

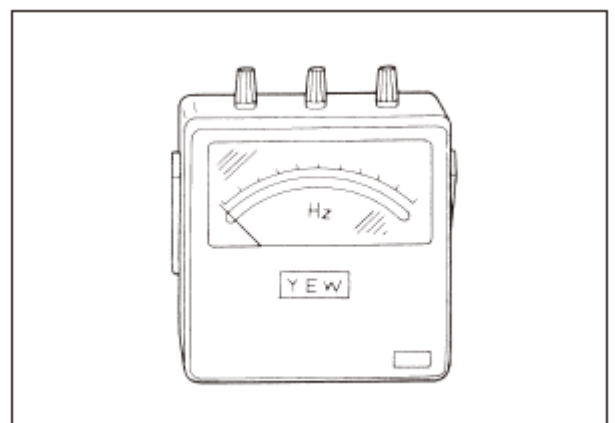
AC ammeter capable of changing the range as 10A, 20A, and 100A is preferable.



(3) FREQUENCY METER

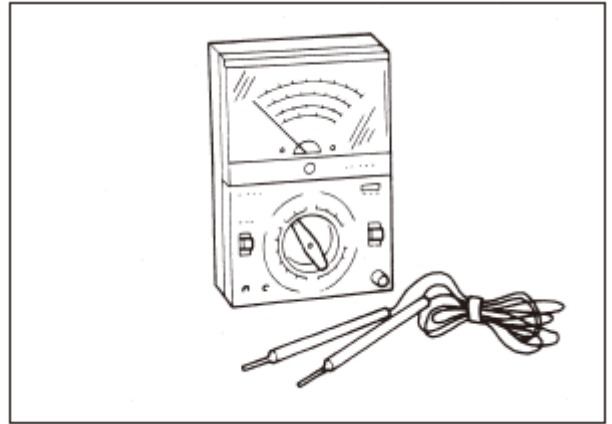
Frequency meter, capable of measuring 45 to 65 HZ is necessary.

NOTE : Be careful of the frequency meter's input voltage range.



(4) CIRCUIT TESTER

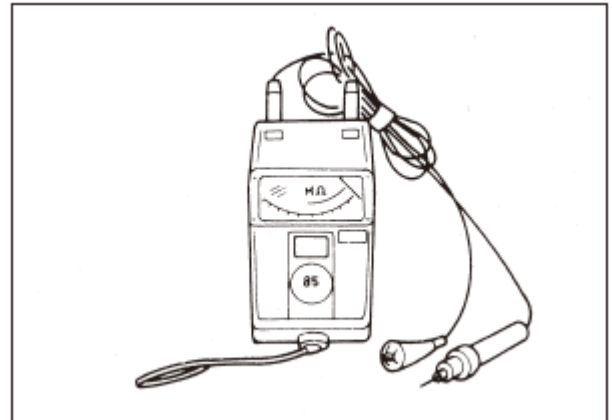
For measuring resistance, etc.



(5) MEGGER TESTER

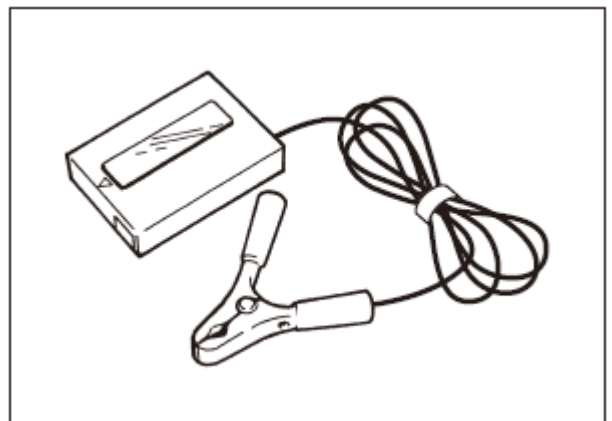
For measuring generator insulation resistance.

Select the one with testing voltage range of 500V.

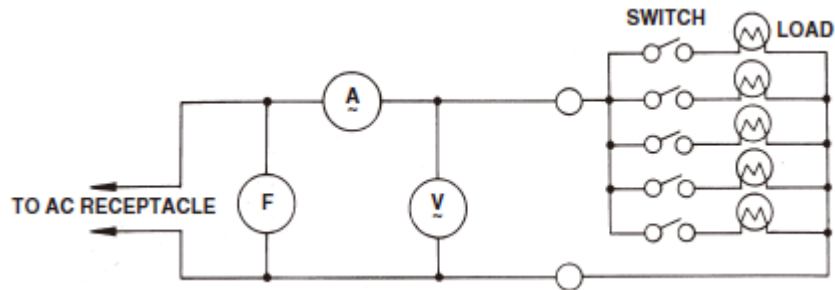


(6) TACHOMETER

Use the contactless type tachometer for checking engine speed.



5-2 AC OUTPUT MEASURING



Use a circuit above for measuring AC output. A hot plate or lamp with a power factor of 1.0 to be used as load. Adjust the load and rpm and check if the voltage range is as specified in the following table with the rated load and rated rpm.

model	Rated voltage	Voltage range
	240V-60Hz	
SGX3500	239-249	
SGX5000	239-249	
SGX7500	239-249	

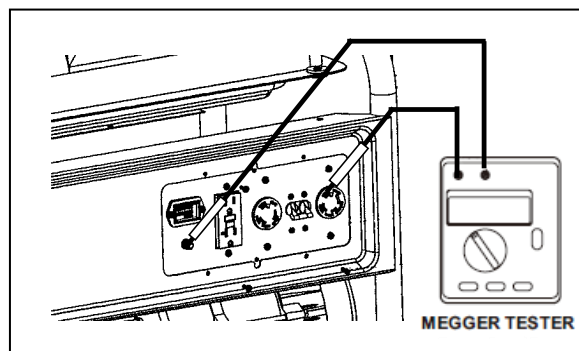
5-3 MEASURING INSULATION RESISTANCE

(1) GENERATOR

Use a Megger tester to check insulation resistance.

Disconnect the GREEN lead wire for ground.

Connect a Megger tester to one of receptacle's output terminals and the ground terminal to measure insulation resistance. Then, measure the same between the other terminal and the ground terminal. Move on to different receptacles respectively.



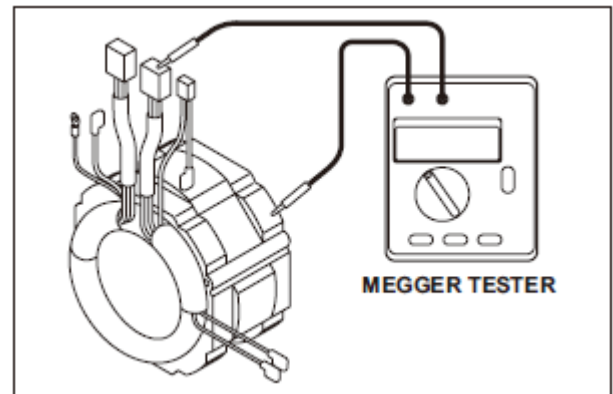
An insulation resistance of 1 megohm and more than the same is normal.

(The original insulation resistance at the time of shipment from the factory is 10 megohm or more.)

If it is less than 1 megohm, disassemble the generator and measure insulation resistance of stator, rotor and control panel individually.

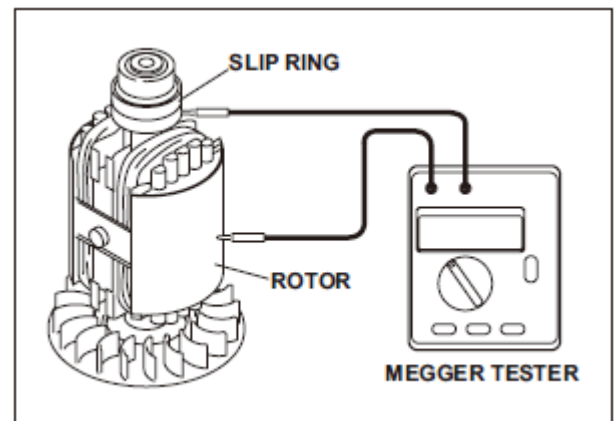
(2) STATOR

Measure insulation resistance between each lead wire and the core.



(3) ROTOR

Measure insulation resistance between the slip ring and the core.



(4) CONTROL PANEL

Measure insulation resistance between the live parts and the grounded parts.

Any part whose insulation resistance is less than $1\text{M}\Omega$, its insulation is faulty, and may cause electric leakage and electric shock.

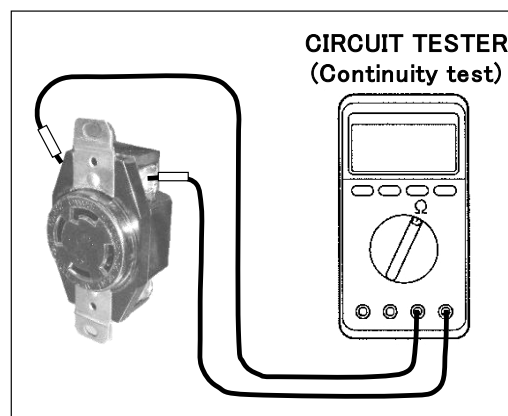
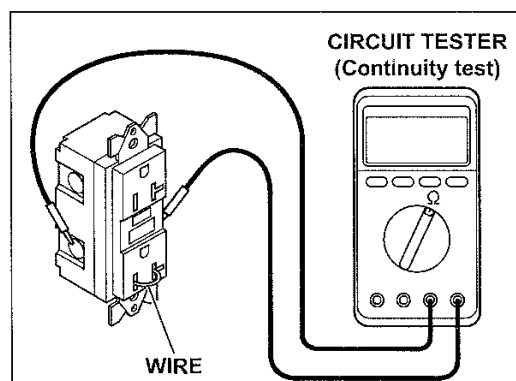
Replace faulty part.

6. CHECKING FUNCTIONAL MEMBERS

6-1 RECEPTACLES

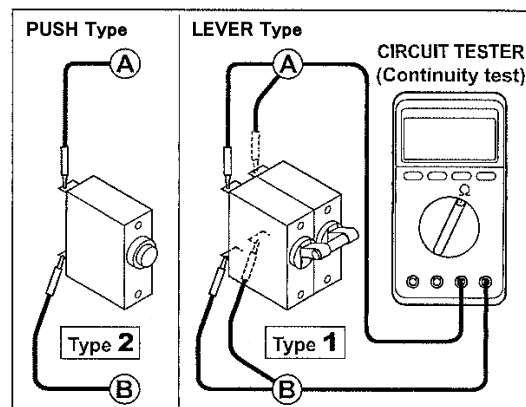
Using a circuit tester, check continuity between the two terminals at the rear of the receptacles while the receptacle is mounted on the control panel.

When continuity is found between the output terminals of the receptacle with a wire connected across these terminals, the receptacle is normal. When the wire is removed and no continuity is found between these terminals, the receptacles are also normal.



6-2 CIRCUIT BREAKER

Check continuity between each of two terminals at the rear of the circuit breaker while it is mounted on the control panel. Normally, there is continuity between each of the two when the circuit breaker is on, while there is no continuity when the circuit breaker is off.



AC CIRCUIT BREAKER (Type 1)

AC CIRCUIT BREAKER	Frequency	Rated output	Max voltage	Rated fault current
SGX3500	60Hz	3200VA	250V	18.75A
SGX5000		4500VA	250V	25A
SGX7500		6700VA	250V	37.5A

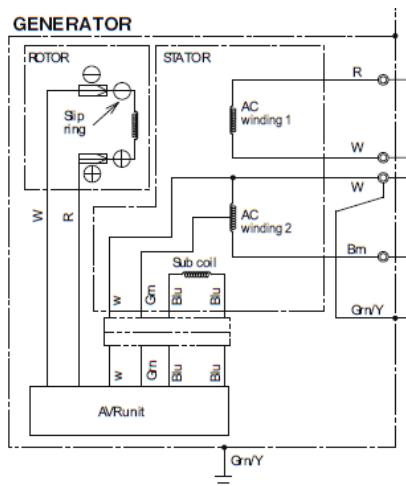
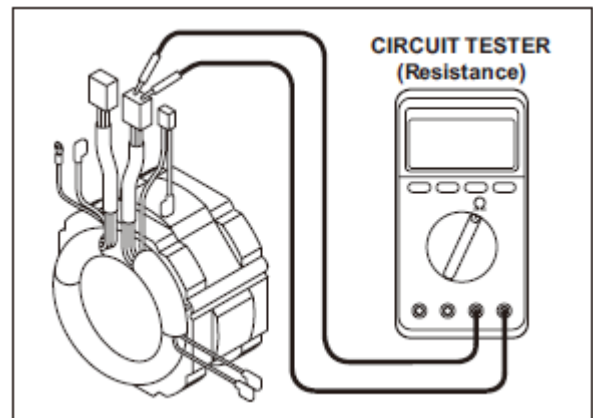
AC CIRCUIT BREAKER (Type 2)

AC CIRCUIT BREAKER	Frequency	Rated output	Rated voltage	Rated fault current
SGX7500	60Hz	6700VA	125V	20A

6-3 STATOR

Disengage connectors on the wires from stator and check the resistance between wires with a circuit tester referring to the following table.

NOTE : If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings. Erroneous readings will also occur when there is a wide variation of resistance among coil windings or when measurement is performed at ambient temperatures different from 20 ° C (68 ° F).



*Ambient temperature at 20°C (68° F)		(Ω)		
		SGX3500	SGX4000	SGX7500
FREQUENCY		60Hz		
RATED VOLTAGE		120V/240V		
AC WINDING 1	BLACK①-WHITE	0.72	0.39	0.31
AC WINDING 2	BLACK②-WHITE	0.72	0.39	0.31
SUB COIL	Blue-Blue	0.62	0.93	0.99
HOUR METER COIL	Red-White	0.68	0.34	0.26
AC WINDING 1	Green-Black	0.05	0.09	0.08

6-4 ROTOR ASSEMBLY

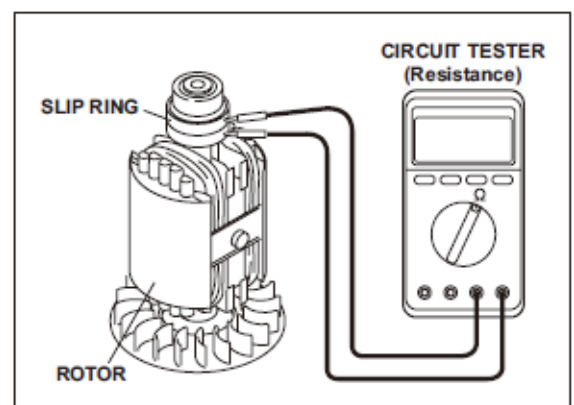
1) Field coil

Remove the brush holder and measure resistance between the slip rings.

*Ambient temperature at 20° (Ω)	
ROTOR (SLIP R)	60Hz-120/240V
RGX3500	15.12
RGX5000	17.68
RGX7500	29.87

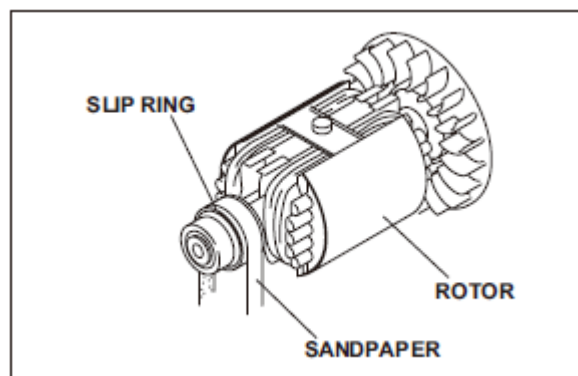
NOTE : If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings.

Erroneous reading will also occur when there is a wide variation of resistance among coil windings or when measurement is performed at ambient temperatures different from from 20° C (68° F).



2) Cleaning Slip rings

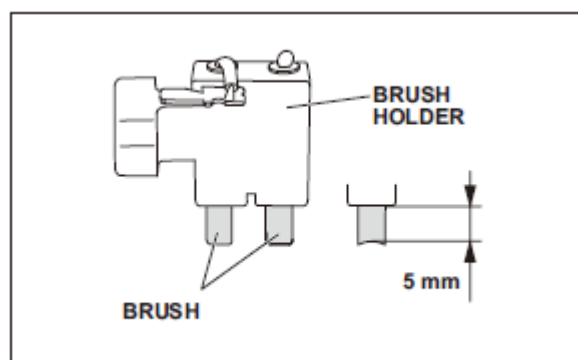
The slip ring surfaces must be uniformly bright. Slip rings showing black spots, excessive wear, or uneven wear must be repaired. A stained slip ring lowers generator efficiency and output voltage. Polish the slip rings with fine sandpaper while turning the rotor until rough spots disappear. Care should be taken not to touch the rotor coils with the sandpaper.



6-5 BRUSH

The brushes should be smooth when they contact the slip rings. If not, polish the brushes with sandpaper. A brush that is not smooth produces arcs between the brush and slip ring. It is a cause of possible damage. Usable brush lengths are from 5 mm to 11 mm (0.20 "to 0.43").

A brush shorter than 5 mm should be replaced, because decreased contact pressure between the brush and slip ring lowers generator efficiency and output voltage.



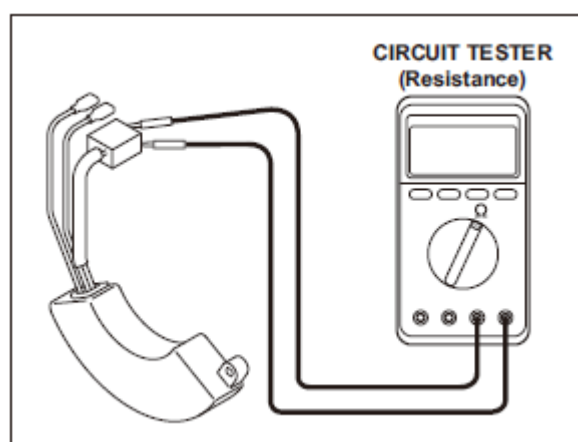
6-6 A.V.R. .

(AUTOMATIC VOLTAGE REGULATOR)

1) Features

This A.V.R. is to control the field current in order to maintain the output voltage for the AC current, which generated by the magnetic flux by the field coil.

2) A.V.R. trouble may be identified by outside (simply looking at the A.V.R.), or by the inter-lead resistance with a tester, or mount it in the generator and operating it.



(a) A.V.R. TROUBLE IDENTIFICATION by APPEARANCE

If an A.V.R. electronic part is burnt dark, or the surface epoxy resin is melted, it often indicates A.V.R. trouble.

(b) IDENTIFYING A.V.R. TROUBLE by CHECKING INTER-LEAD RESISTANCE

Check the inter-lead resistance of the A.V.R. with a tester, referring to the following table.
If the tester readings vary greatly from the values specified in the table on next page, the A.V.R. is faulty.

NOTE : Take tester inaccuracy into account in reading the tester

(c) IDENTIFYING A.V.R. TROUBLE by MOUNTING and OPERATING in THE GENERATOR

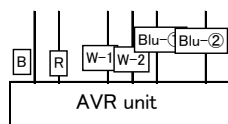
SCR or transistor damage cannot be detected by simply looking at the A.V.R. or checking the lead resistance.

Check it by mounting the possible faulty A.V.R. in a normal generator, or mount a normal A.V.R. in a generator which fails to generate voltage.

*Checking table for analogue circuit tester (Resistance).

SGX3500

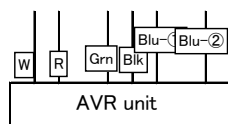
SGX3500(60Hz-120/240V)



RGX3500 (60Hz-120/240V)		apply black ? needle of the circuit tester (Ω) ($R \pm 20\%$)					
Apply red ? needle of the circuit tester	Black		12.7K	>50K	>50K	>50K	>50K
	Red	>50k		>100k	>100k	>100k	>100k
	w-1	>50k	>50k		53K	50K	50K
	w-2	>50k	>50k	53K		50K	50K
	Blue-①	>50k	>170K	>200k	>200k		>200k
	Blue-②	>50k	>170K	>200k	>200k	>200k	

SGX5000

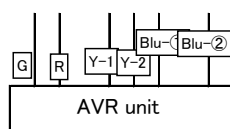
SGX5000(60Hz-120/240V)



RGX5000(60Hz-120/240V)		apply black ? needle of the circuit tester (Ω) ($R \pm 20\%$)					
Apply red ? needle of the circuit tester	White		12.7K	>50K	>50K	>50K	>50K
	Red	>50k		>100k	>100k	>100k	>100k
	Green	>50k	>50k		53K	50K	50K
	Black	>50k	>50k	53K		50K	50K
	Blue-①	>50k	>170K	>200k	>200k		>200k
	Blue-②	>50k	>170K	>200k	>200k	>200k	

SGX7500

SGX7500(60Hz-120/240V)



RGX7500(60Hz-120/240V)		apply black ? needle of the circuit tester (Ω) ($R \pm 20\%$)					
Apply red ? needle of the circuit tester	Green		12.7K	>50K	>50K	>50K	>50K
	Red	>50k		>100k	>100k	>100k	>100k
	Yellow-1	>50k	>50k		53K	50K	50K
	Yellow-2	>50k	>50k	53K		50K	50K
	Blue-①	>50k	>170K	>200k	>200k		>200k
	Blue-②	>50k	>170K	>200k	>200k	>200k	

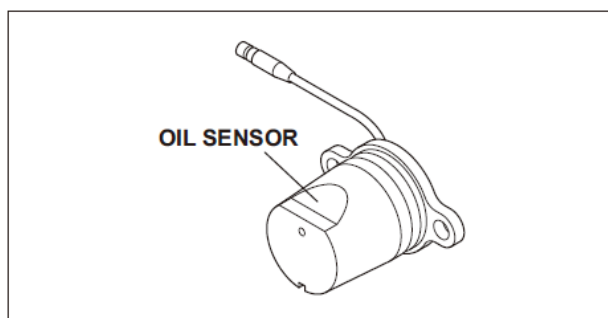
6-7 OIL SENSOR

- (1) Disconnect wires coming from the sensor at the connection.
- (2) Loosen the sensor to remove it from the engine.
- (3) Plug the opening of oil filler hole (created after sensor is removed) with suitable means such as oil gauge.
- (4) Connect the removed wires again with the oil sensor.
- (5) Start the engine with the oil sensor removed and confirm if ;
 - a. Engine stops after 5 seconds which is normal, or
 - b. Engine does not stop after more than 10 seconds which is unusual.

*NOTE : The sensor will not operate properly when wire is broken or poorly connected.
Check the wires for correct connection. If it fails to stop within 5 seconds after the wirings have checked, the sensor is wrong. Replace the sensor with new one.*

6-7-1 SPECIFICATIONS

Type	Float type (with lead switch incorporated)
Resistance (at FULL oil level)	100 M ohms or over
Operating Temperature	-30 to +180 degree Celsius



6-7-2 CONSTRUCTION AND OPERATION

Disconnect wires coming from the sensor. The oil sensor is composed of the float, permanent magnet incorporated into the float and the oil sensor.

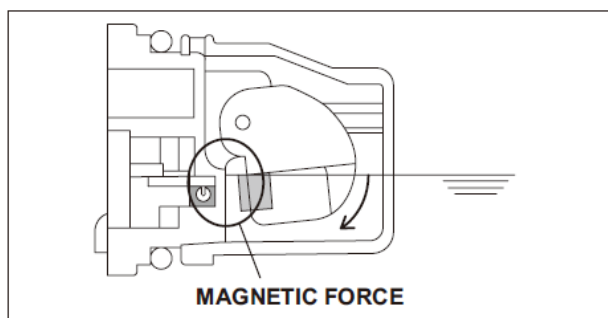
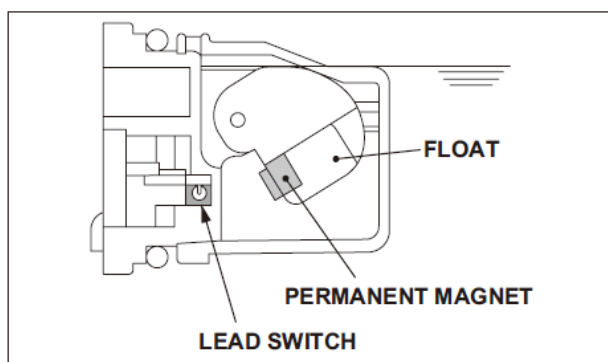
In accordance with the oil level, the float moves up and down.

When the oil level is upper level, the float moves up.

When the oil level is lower level, the float moves down.

The permanent magnet is close to the lead switch, and the lead switch is activated by the magnetic force.

NOTE : With regards to the wiring diagram, please refer to the section 9 (Page 43) .



7. DISASSEMBLY AND ASSEMBLY

7-1 PREPARATION and PRECAUTIONS

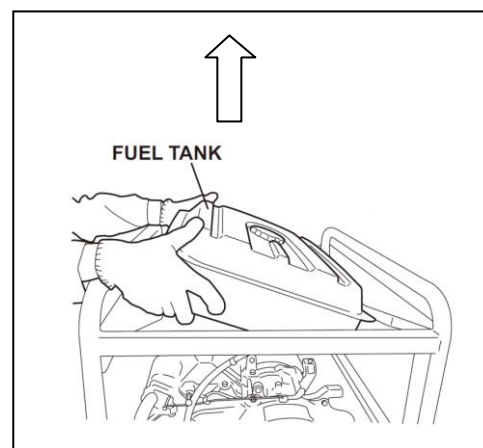
- (1) Be sure to memorize the location of individual parts when disassembling the generator so that the generator can be reassembled correctly. Tag the disassembled part with the necessary information to facilitate easier and smoother reassembly.
- (2) For more convenience, divide the parts into several groups and store them in boxes.
- (3) To prevent bolts and nuts from being misplaced or installed incorrectly, replace them temporarily to their original position.
- (4) Handle disassembled parts with care; clean them before reassembly by using a neutral cleaning fluid.
- (5) Remove the battery before disassembling the generator. (Electric start models)
- (6) Use all disassembly/assembly tools properly, and use the proper tool for each specific job.
- (7) Be sure to attach the foam rubber linings inside the covers on their original position when reassembling the generator. When deformation or damage or falling-off of foam rubber lining is found, replace it with new part. Failure to do so will result in poor performance and durability of the generator.
- (8) Bind the wires and fuel pipes using wire bands as they have been done in original configuration.

NOTE : If information for servicing procedures on engine necessary, please refer to Robin engine service manual for "EX series".

7-2 DISASSEMBLY PROCEDURES

7-2-1 FUEL TANK

- (1) Disconnect rubber pipe from carburetor.
Open fuel valve and discharge fuel from the fuel tank.
(Connect rubber pipe to carburetor.)
- (2) Disconnect the rubber pipe from strainer.
Disconnect the rubber pipe from canister.
- (3) Remove the fuel tank from the frame.
M6 bolt and washer ... 2 pcs
Take off rubber mount for fuel tank ... 2 pcs



7-2-2 MUFFLER

- (1) Remove the Muffler Cover.
M6 flange bolt 4 pcs
(Take off rubber for insulation ... 2 pcs)



Muffler cover

-
- (2) Loosen flange bolt for the muffler bracket.

(5/16-18 x 38. . . . 1PC (SGX3500))__

M8 flange bolt 2,



- (3) Remove the muffler from the generator set.

M8 flange nut 2

- (4) Remove the muffler gasket



7-2-3 CABLES AND CONTROL BOX

- (1) Remove the end cover.

M6 flange bolt . . . 2 pcs.

- (2) Cut plastic band for wires.

- (3) Loosen nuts on the wiring board and
disconnect all wiring from the control box.

Loosen bolt and disconnect an earth wire.



- (4) Disconnect connector for the AVR and terminals for the Brush holder.

- (5) Remove the AVR unit, and the brush holder.

- (6) Disconnect primary wire between the control box and
the Engine.

- (7) Remove the control box from the frame.

Bolt4 pcs



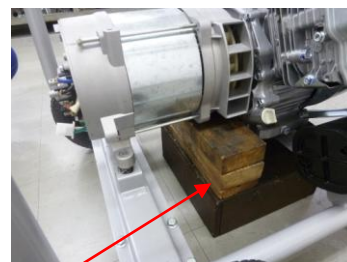
7-2-4 ALTERNATOR

- (1) Disconnect ground wire from the Rear cover.
- (2) Loosen bolts for the rear cover and the stator.

Flange bolt M6 4pcs.

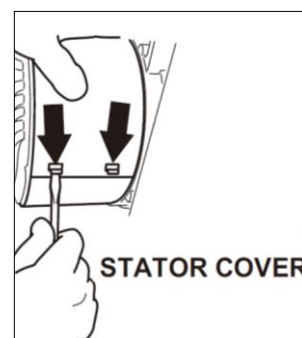
- (3) Loosen nuts for rubber mount

- (4) Put wooden support under the alternator
- (5) Remove rubber mounts from the rear cover



Support

- (6) Remove the stator cover from the alternator.



- (7) Remove the rear cover and the stator
By using plastic hammer



NOTE) Stator is heavy. Be careful do not hit the coil of the stator to the rotor.

(8) Loosen through bolt for the rotor.

SGX3500 M8 X 233mm

SGX5000 M10 X 260mm

SGX7500 M10 X 260mm

(9) Fix the generator set as the rotor upwards

(10) Use a bolt and oil as a tool for pulling out the rotor by following procedures :

1. Pour engine oil into center hole of the rotor shaft up until shaft end.

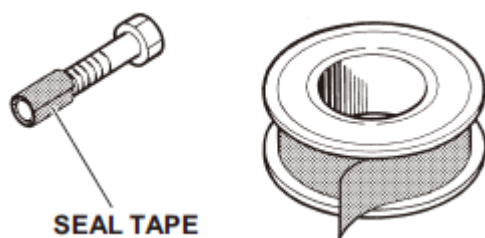
2. Prepare a bolt with the following thread

size : M10 X 1.25 (SGX3500)

M14 X 2 (SGX5000)

M16 X 2 (SGX7500)

3. Apply a few turns of seal tape around tip of the bolt



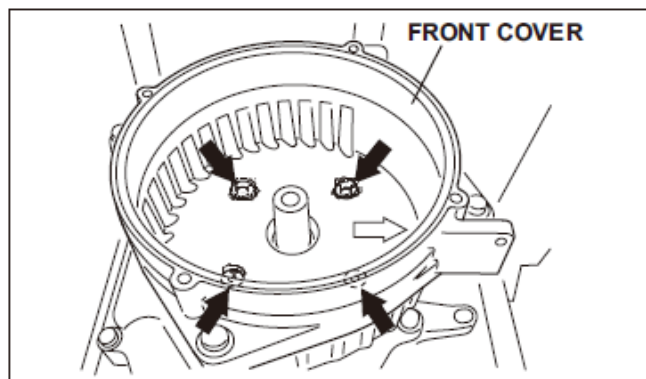
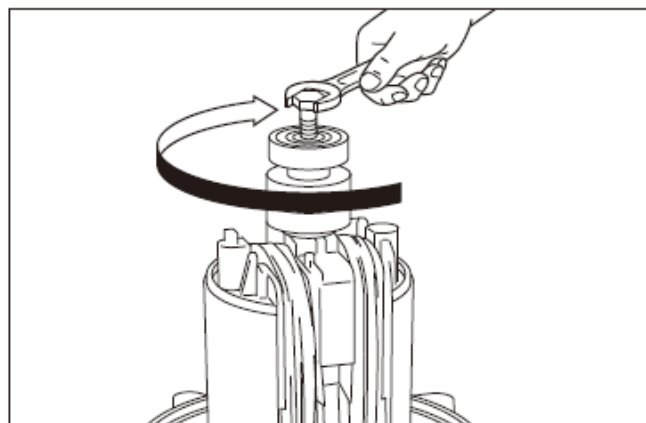
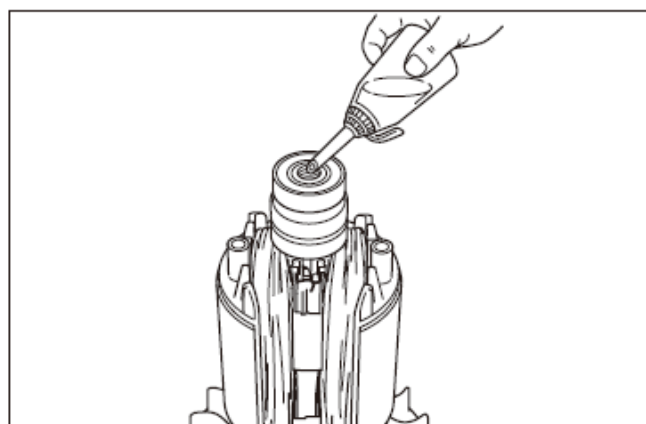
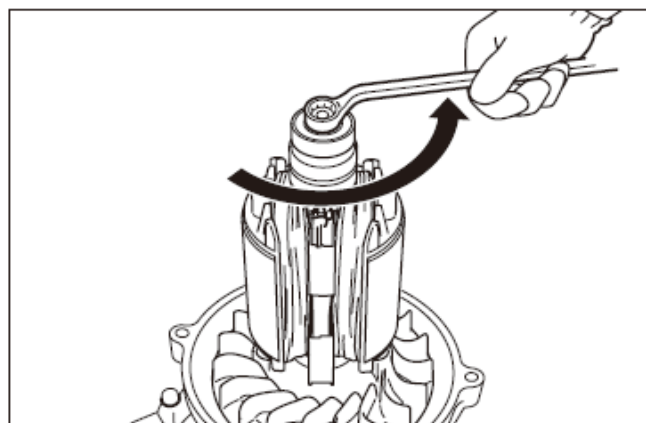
4. Screw the bolt into the thread of the rotor shaft.

5. Tighten the bolt by using a socket wrench until the rotor comes off loose.

* The hydraulic pressure inside the rotor shaft takes apart the rotor from the engine shaft.

(11) Remove the front cover.

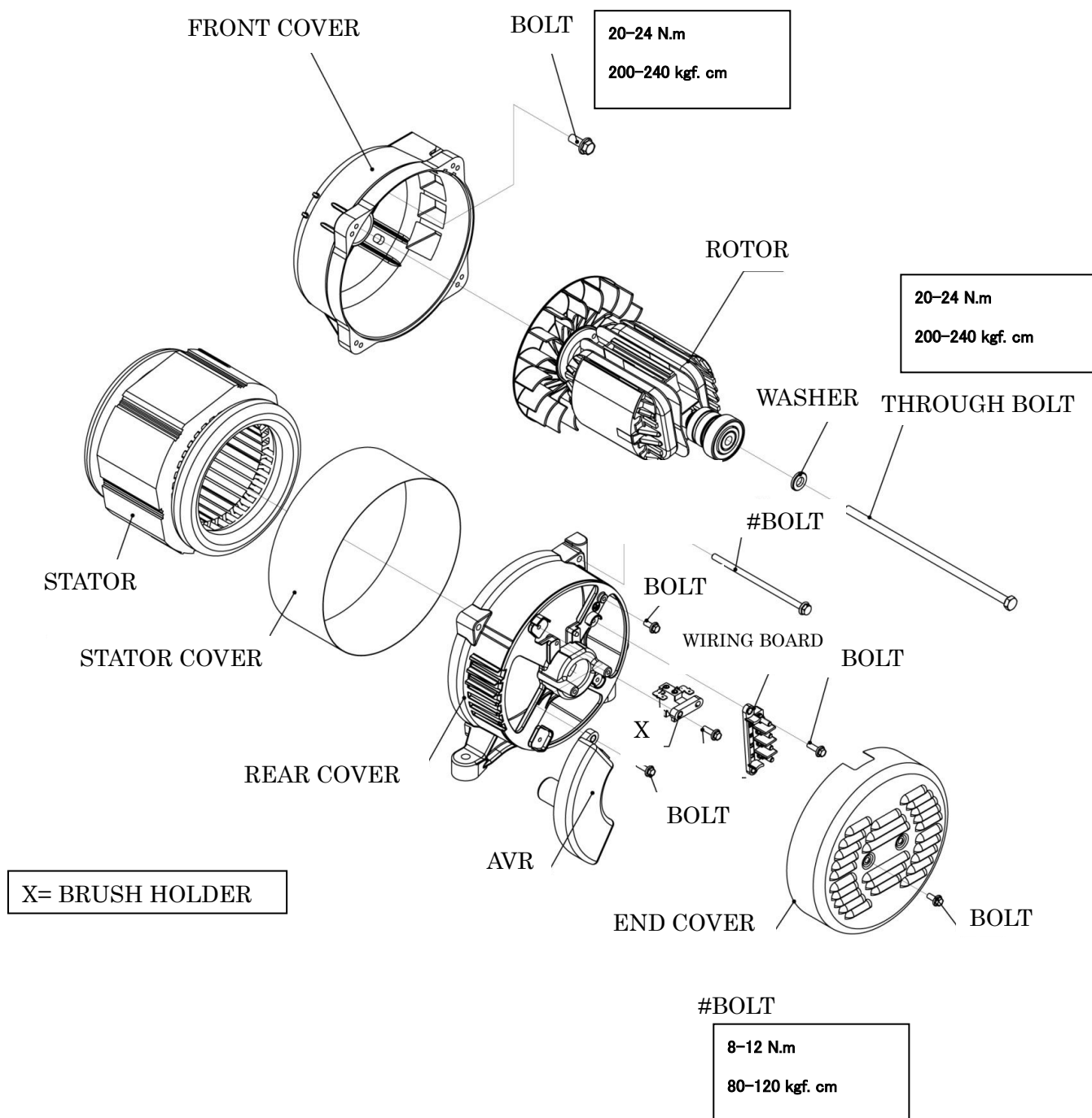
M8 × 20 flange bolt . . . 4 pcs.



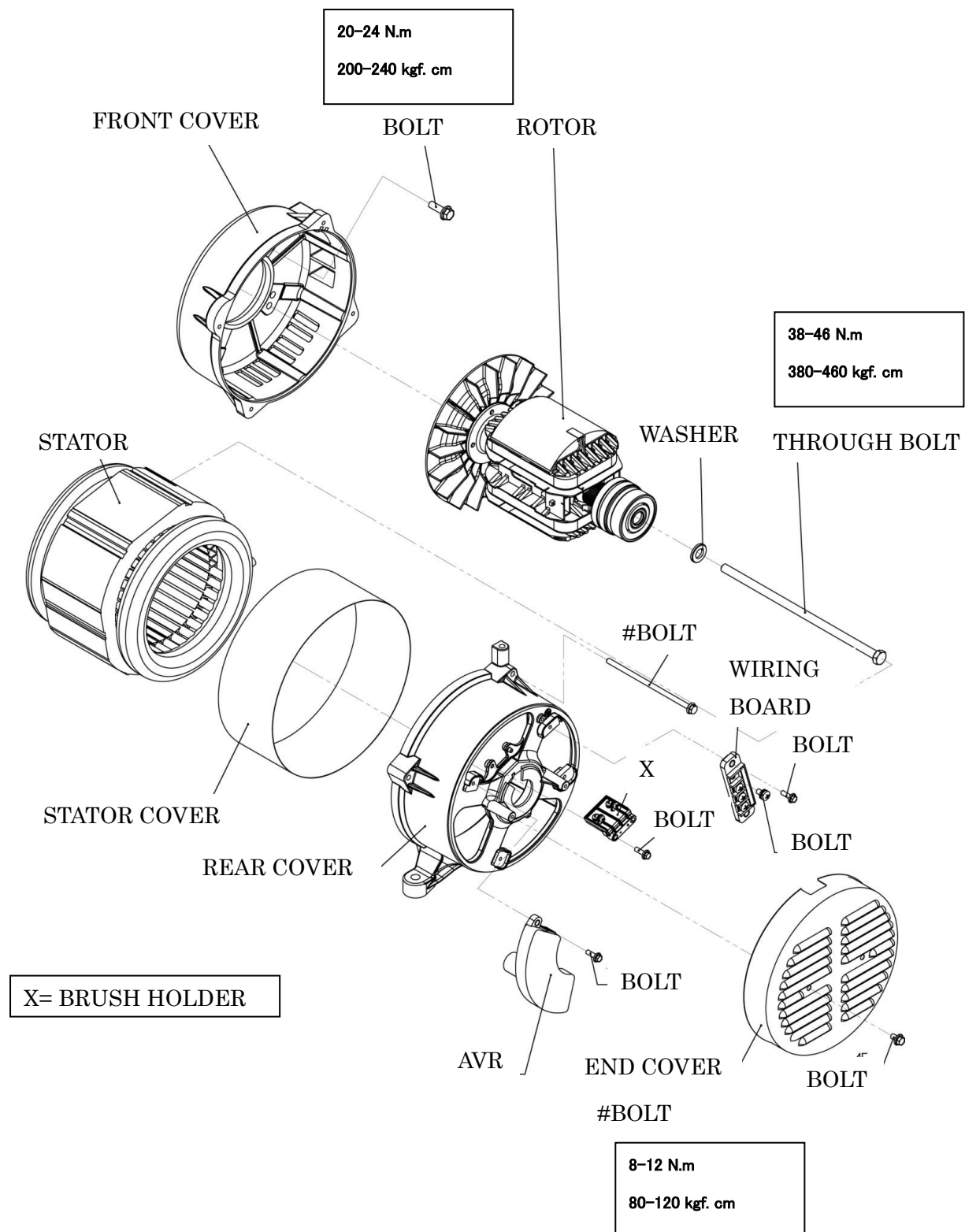
7-3 COMPONENT PARTS

(1) Generator assembly

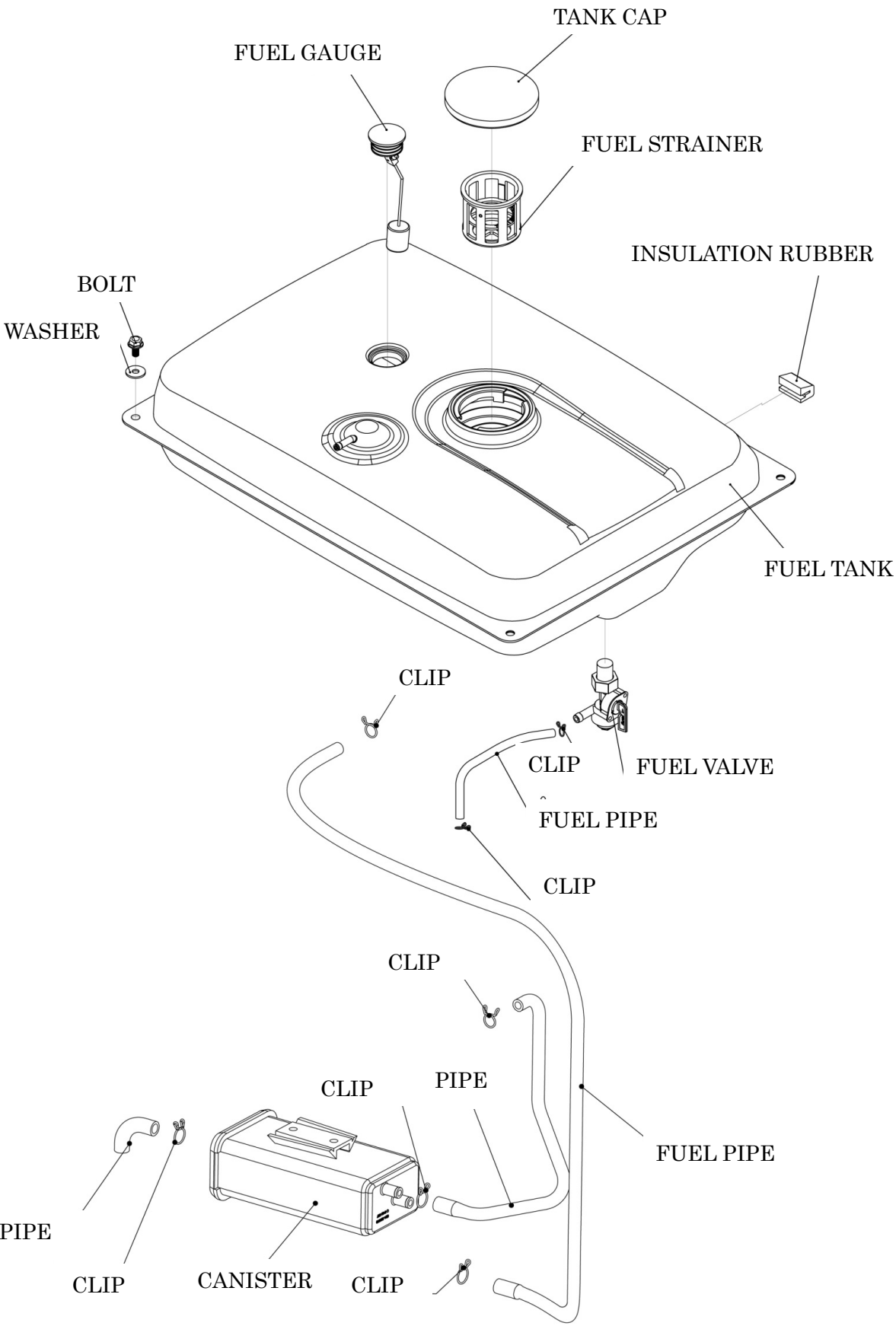
SGX3500



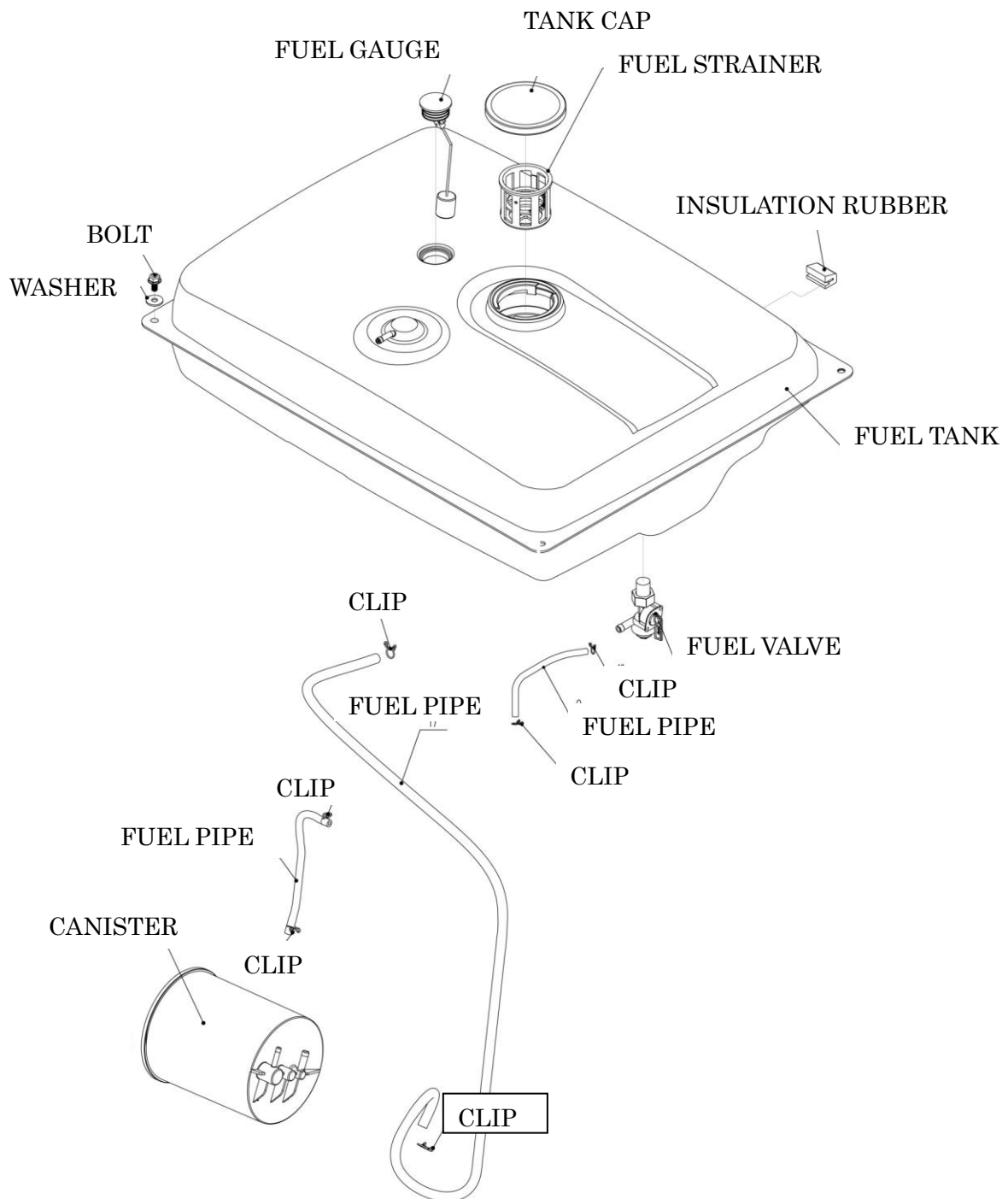
SGX5000, 7500



(2) Fuel tank
SGX3500



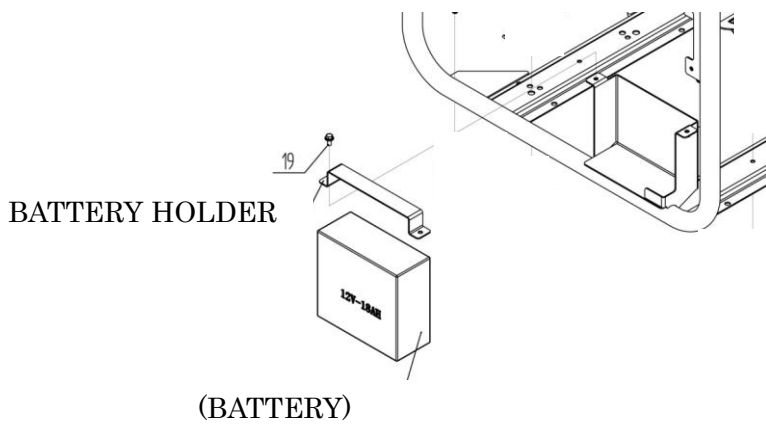
SGX5000, 7500



Exploded view diagram of a hand truck assembly. The diagram shows the following components and their assembly relationships:

- FRAME**: The main structural frame of the hand truck.
- HANDLE**: The vertical handle assembly, consisting of a **GLIP** (a sleeve) and a **SPACER** (a block).
- WHEEL HOLDER**: A bracket that holds the wheel.
- WHEEL**: A pneumatic tire mounted on a rim.
- CLIP**: A small metal clip used to secure the wheel holder.
- WASHER**: A flat circular disc used as a spacer between the wheel holder and the frame.
- Other parts**: Various screws, pins, and spacers (labeled 1 through 29) that hold the assembly together.

The diagram illustrates the assembly process, showing how the handle is attached to the frame, how the wheel holder is mounted, and how the wheel is secured with a clip and washer.



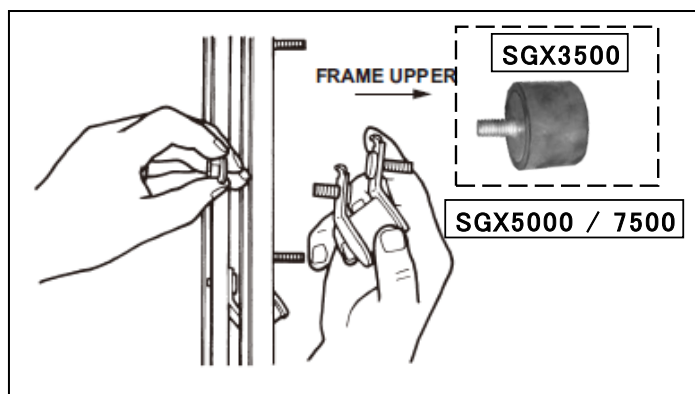
7-4 ASSEMBLY PROCEDURES

7-4-1 ENGINE and FRAME

- (1) Attach the mount rubbers to the frame. Insert the setting tongue of mount rubber into the hole on the frame and tighten the nut from the bottom of the frame.

M8 flange nut . . . 4 pcs.

Tightening torque :	18.0-25.0 N•m
	180-250 kgf•cm
	(13.3-18.5 ft•lbs)



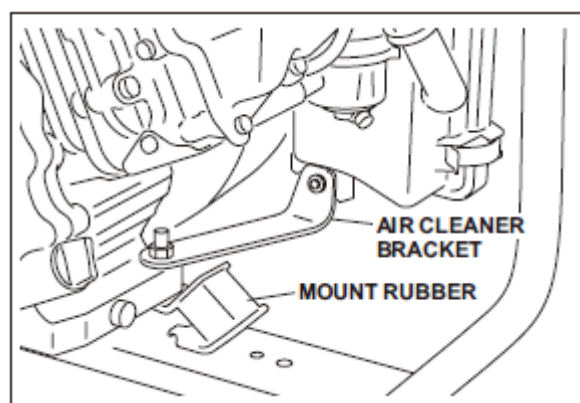
*NOTE : The mount rubbers are selected to reduce vibration most effectively by model.
Be sure to use the correct mount rubber for your generator.
Although mount rubbers have the same appearance, their characteristics are different.*

- (2) Install the engine into the frame from the side of it.
Tighten the nuts over the mount rubber bolts to fix.

NOTE : Tighten nut together with air cleaner bracket in air cleaner side. (SGX3500 / 5000)

SGX3500 / 5000

M8 flange nut . . . 2 pcs.



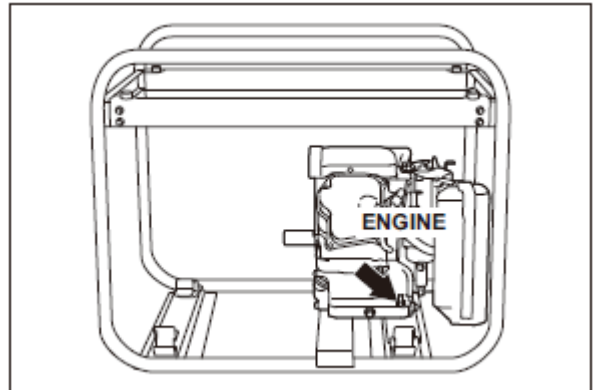
NOTE : Remove the air cleaner cover for easier installation.

NOTE : When tightening the nuts, slightly lift the engine so that the weight is not applied to the mount rubbers.

- (3) Install the engine into the frame from the side of it. Insert the bolt of mount rubbers into the hole on the mount base. Tighten the nuts over the mount rubber bolts to fix.

M8 nut/washer/lock washer . . . 2 pcs ea.

Tightening torque :	18.0-25.0 N•m
	180-250 kgf•cm
	(13.3-18.5 ft•lbs)



Tighten the temporally fixed bolt and nut for mount base.

NOTE : When tightening the nuts, slightly lift the engine so that the weight is not applied to the mount rubbers.

7-4-2 FRONT COVER

- (1) Put the front cover on the main bearing cover.

SGX3500 / 5000 / 7500

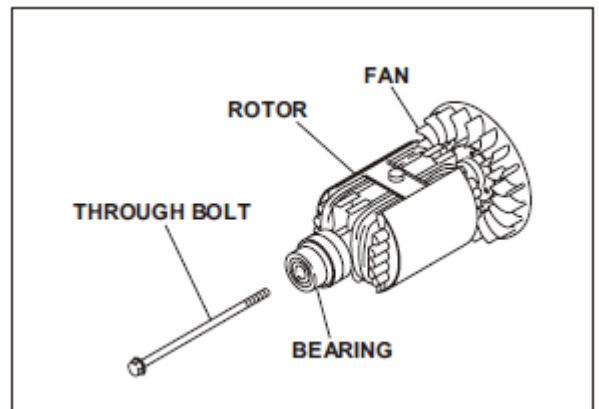
M8 flange bolt . . . 4 pcs.

Tightening torque :	20 – 24 N.m
	200 – 240 Kgf. Cm
	(14.8 – 17.8 ft.lbs)



7-4-3 ROTOR

- (1) Clean oil, grease and dust from the crank shaft and taper hole of the rotor shaft.
- (2) Mount the rotor on the crank shaft.
- Tighten the through bolt.
- flange bolt . . . 1 pc.



SGX3500

Through bolt

Tightening torque : 20 – 24 N.m 200 – 240 Kgf. Cm (14.8 – 17.8 ft.lbs)

SGX5000 / 7500

Through bolt

Tightening torque : 38 – 46 N.m 380 – 460 Kgf. Cm (28.2 – 34.1 ft.lbs)

7-4-4 STATOR

- (1) Put the rear cover and stator on the front cover through rotor.
Make rotor bearing into the rear cover by hammer.
- (2) Tighten rear cover bolts evenly.
flange bolt . . . 4 pc.

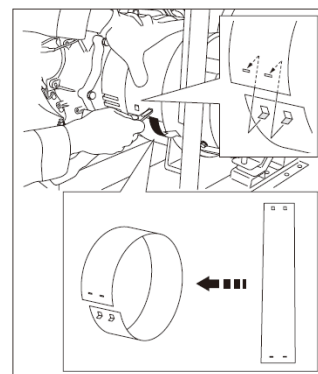


Tighten the earth wire together with rear cover bolt and connect to the frame.

NOTE : Tighten the bolts evenly and in turns.

Tightening torque : 8 – 12 N.m 80 – 120 Kgf. Cm (5.9 – 8.9 ft.lbs)

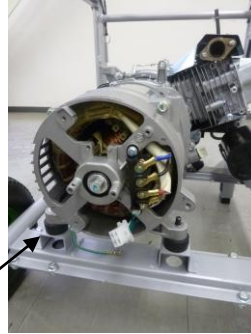
- (3) Fix stator cover



(4) Fix rubber mount between the rear cover and the frame.

nut . . . 4 pcs.

Rubber mount



7-4-5 CONTROL BOX

(1) Put the control box on the frame.

Bolt . . . 4 pcs.

(2) Connect the primary wire to the engine.

(3) Fix the brush holder and the AVR unit

M6 bolt . . . 1 pc.

M6 bolt . . . 2 pcs.

Connect terminals for the brush holder and connector for the AVR.

Brush holder

A.V.R. unit

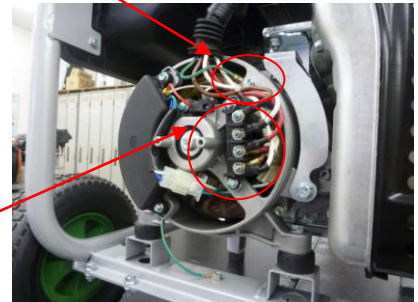


NOTE : If the brush is installed oblique to the slip ring, there is possibility of the brush holder could be broken when the screw is tightened : or the brush may be broken when generator is started. Make this process carefully.

Grand wire

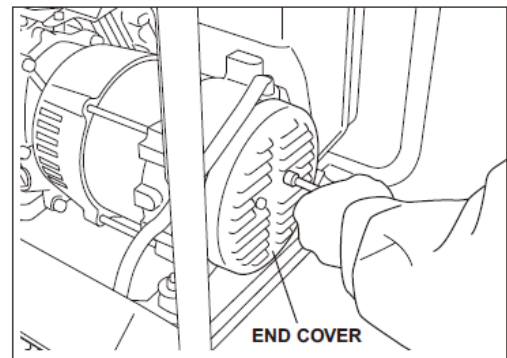
- (4) Fix wires on the wiring board and tighten with washers and nuts.
- (5) Connect the ground wire and tighten with bolt.
- (6) Clamp wires by plastic band.

Wiring board



- (7) Put the end cover to the rear cover.

M6 bolt . . . 2 pcs.



7-4-6 MUFFLER and MUFFLER COVER

- (1) Put the muffler gasket on exhaust flange and muffler on the generator set.

M8 flange nut . . . 2 pcs.

M8 bolt . . . 2 pcs.

Muffler



-
- (3) Put the muffler cover on the muffler
M6 flange bolts . . . 4 pcs.
Put the insulation rubber to the cover

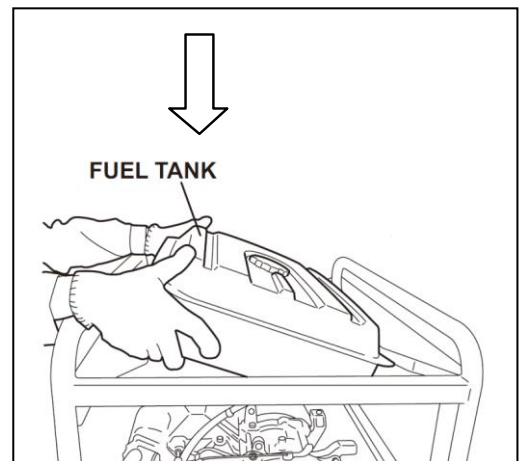


Muffler cover

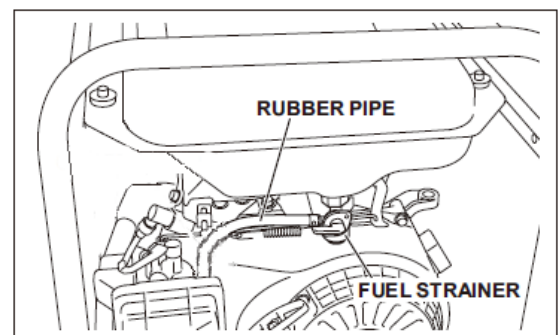
7-4-7 FUEL TANK

- (1) Mount the fuel tank on the frame.

Put the mount rubber to the fuel tank.
M6 flange bolt . . . 2 pcs.



Connect the rubber pipe to the strainer.
Connect the rubber pipe from canister to the fuel tank.



7-5 CHECKING, DISASSEMBLY and REASSEMBLY of the CONTROL PANEL

7-5-1 CHECKING OF THE CONTROL PANEL

Dis-assemble the control box assy. from frame. Remove the control panel from control box and check each components and wiring. Refer to Section 6 for the detail of checking procedure for the components in the front panel.

7-5-2 DISASSEMBLY

- (1) Remove the end cover and disconnect the wires to the control panel.
- (2) Remove the control box assy. from the frame and remove the control panel.
- (3) After disconnecting individual wires, remove the control panel components.

7-5-3 REASSEMBLY

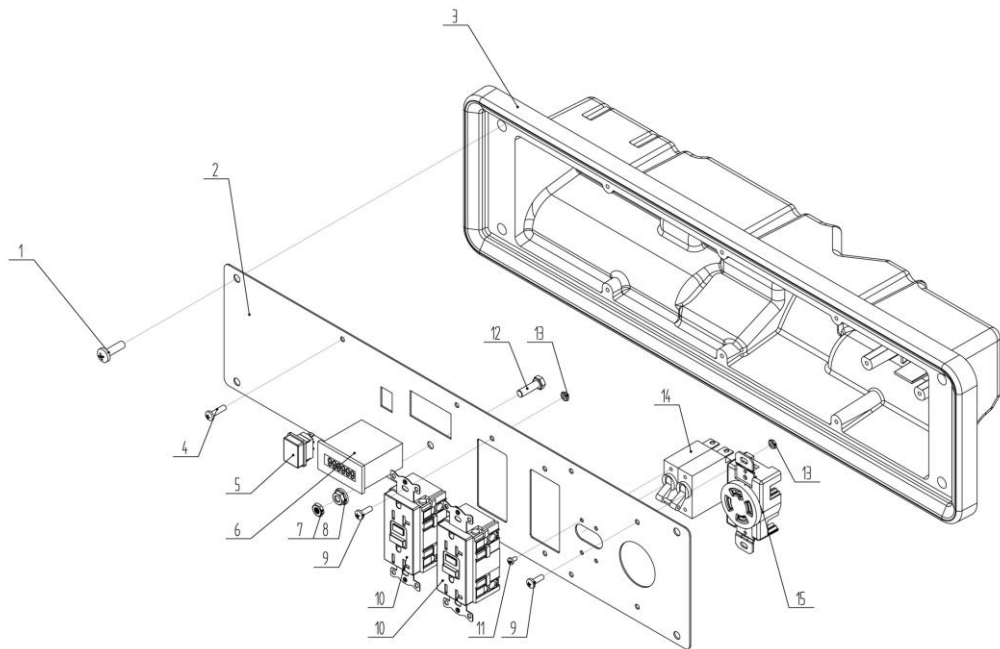
- (1) Install the receptacles, circuit breakers, terminals, switches, etc. on the control panel and wire them.

NOTE : Circuit diagrams are shown in Section 9. Colored wires are used for easy identification, and are of the correct capacity and size. Use heat-resistant type wires (permissible temperature range 75° C or over) in the specified gauge shown in the circuit diagrams.

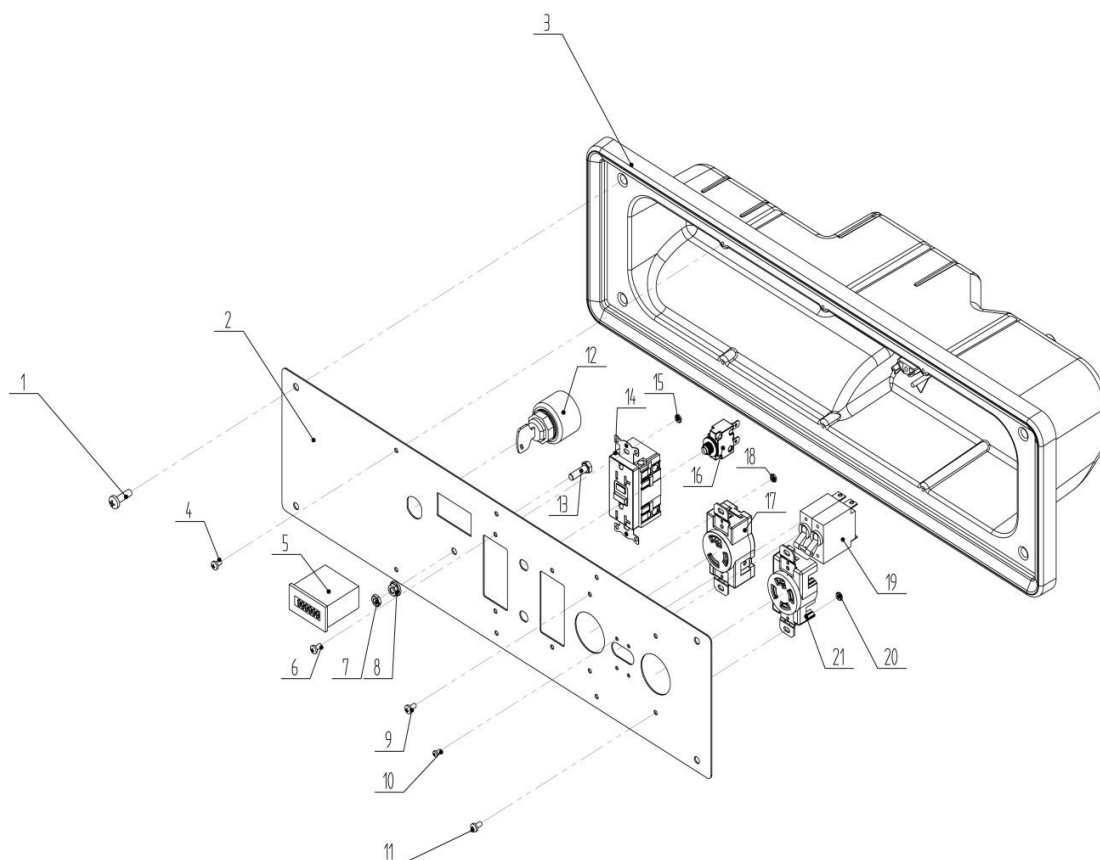
- (2) Connect the wires of control panel components.
- (3) Attach the control panel to the control box and assemble control box assy. to the frame.

Control box AY

SGX3500



(SGX5000), 7500 E.S.



8. TROUBLESHOOTING

8-1 NO AC OUTPUT

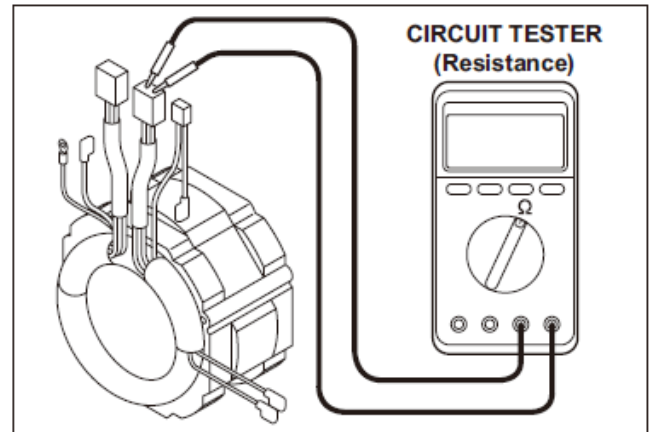
8-1-1 CHECKING STATOR

(1) Remove control panel and disconnect stator wires at the connectors.

(2) Measure resistance between terminals on stator wire.

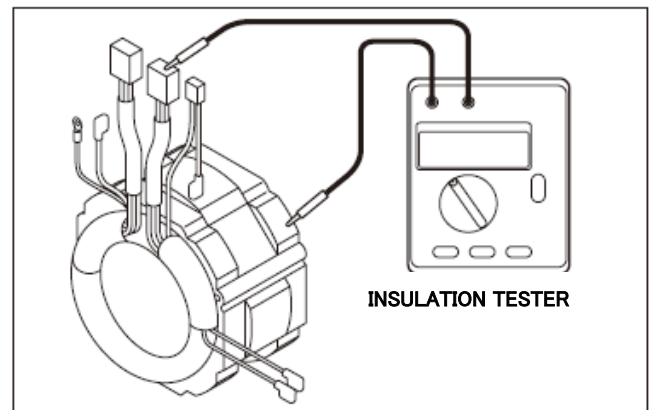
Refer to Table of Section 6-3 STATOR for normal resistance.

If stator is faulty, replace it with a new one.



(3) Check insulation resistance between the stator core and each stator wire by using an insulation tester.

If insulation is bad, replace the stator with a new one.

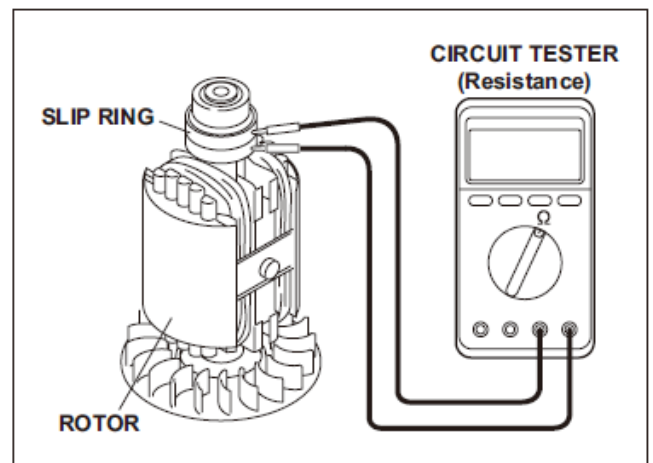


8-1-2 CHECKING ROTOR

1) Field coil

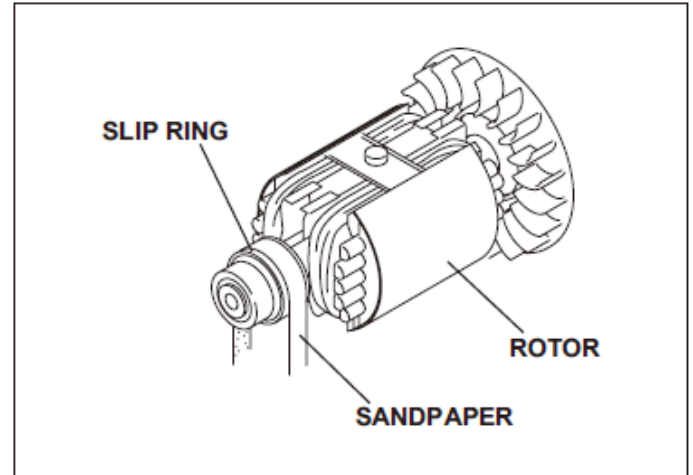
Remove the brush holder and measure resistance between the slip rings. Refer to Section 6-4 ROTOR ASSEMBLY for normal Resistance

NOTE : *Tester is not so accurate that we need to consider its range of error indication.
We are unable to expect correct indication, if resistance between those coils vary remarkably or ambient temperature is different from 20° C (68° F).*



2) Cleaning Slip rings

The slip ring surface should be uniformly bright. Slip ring showing black spots, excessive wear, or uneven wear has to be repaired. Stained slip ring lowers generator efficiency and output voltage. Polish the slip ring with fine sandpaper while turning the rotor until rough spots disappear. Be careful not to touch the rotor coils with the sandpaper.



3) Checking brush

Check brush referring to STEP 6-5.

8-2 AC VOLTAGE IS TOO HIGH OR TOO LOW

8-2-1 CHECKING ENGINE SPEED

If the engine speed is too high or too low, adjust it to the rated r.p.m.

[How to adjust engine r.p.m.]

- * Loosen the lock nut on the adjusting screw.
- * Turn the adjusting screw clockwise to decrease engine speed or counterclockwise to increase engine speed.

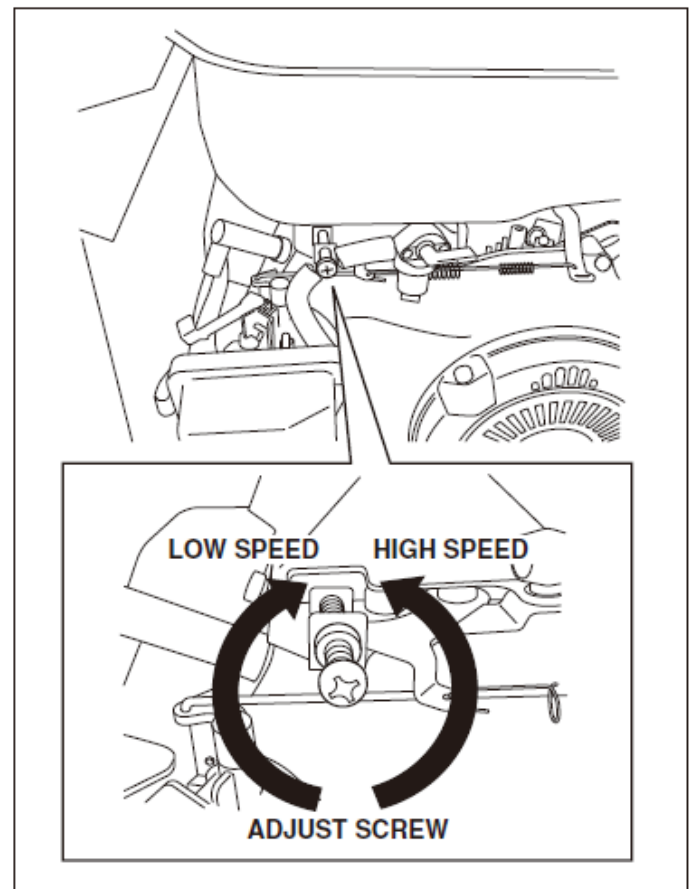
Normal engine speed at no load :
3700 to 3900 rpm

8-2-2 CHECKING STATOR

Check the stator referring to Step 8-1-1.

8-2-3 CHECKING ROTOR

Check the rotor referring to Step 8-1-2.



8-3 AC VOLTAGE IS NORMAL AT NO-LOAD, BUT NO OUTPUT AVAILABLE WHEN CONNECTING WITH LOAD.

8-3-1 CHECK THE ENGINE SPEED.

If the engine speed is low, adjust it to the rated r.p.m.

*Refer to Step 8-2-1 for engine speed adjustment.

8-3-2 CHECK THE TOTAL WATTAGE OF APPLIANCES CONNECTED TO THE GENERATOR.

Refer to Section 4 "RANGE OF APPLICATIONS" for the wattage of the appliances.

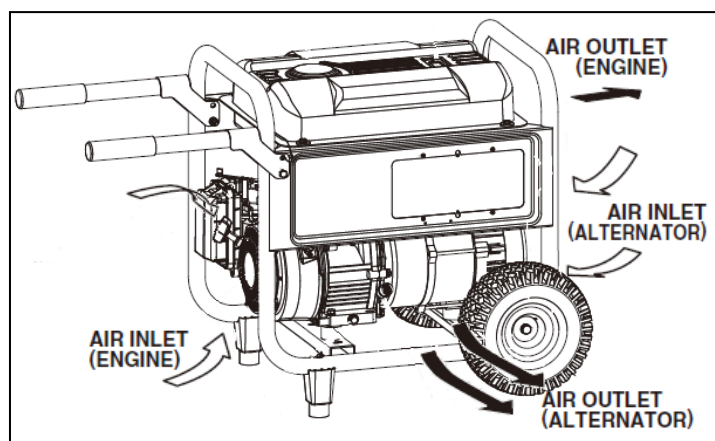
If the generator is overloaded, reduce the load to the rated output of the generator.

8-3-3 CHECK THE APPLIANCE FOR TROUBLE.

If the appliance is faulty, repair it.

8-3-4 CHECK IF THE ENGINE IS OVERHEATED.

If the cooling air inlet and/or cooling air outlet is clogged with dirt, grass, chaff or other debris, remove it.



8-3-5 CHECK THE INSULATION OF THE GENERATOR.

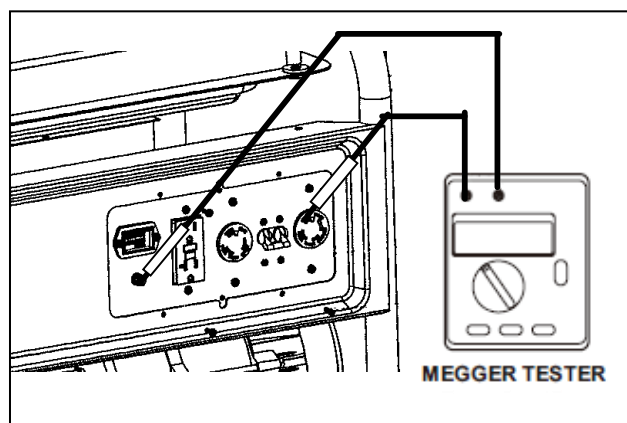
(1) Stop the engine. Remove the control panel, and disconnect the connector of GREEN lead for ground.

(2) Measure the insulation resistance between the live terminal of the receptacle and the ground terminal.

If the insulation resistance is less than $1M\Omega$, disassemble the generator and check the insulation resistance of the stator, rotor and the live parts in the control box. (Refer to Section 5-4.)

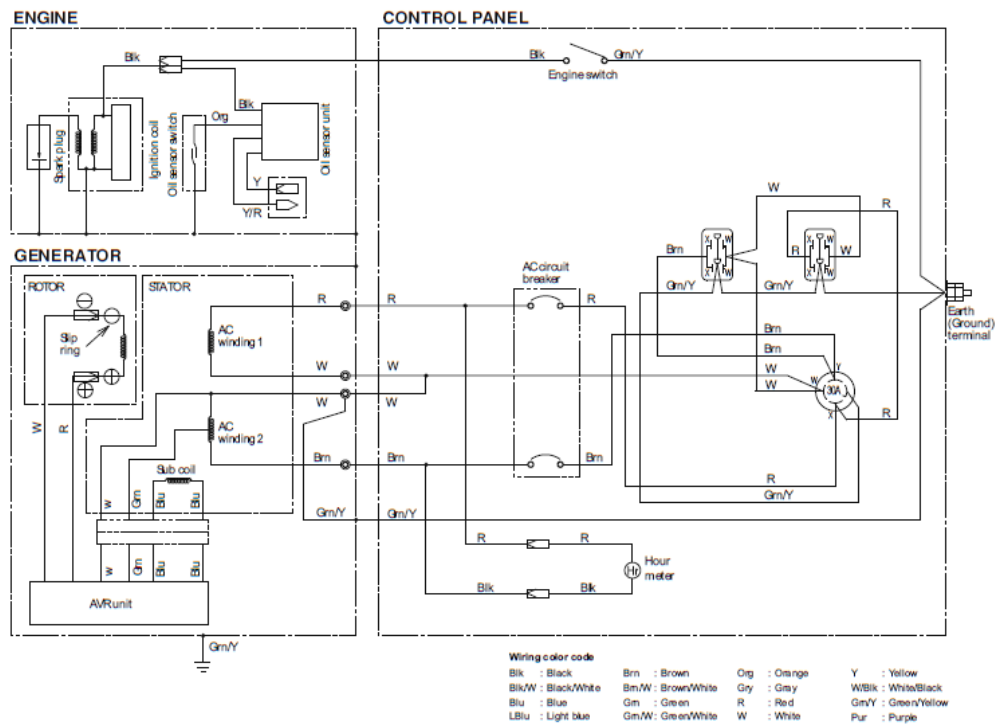
Any part where the insulation resistance is less than $1M\Omega$, the insulation is faulty and may cause electric leakage.

Replace the faulty part.

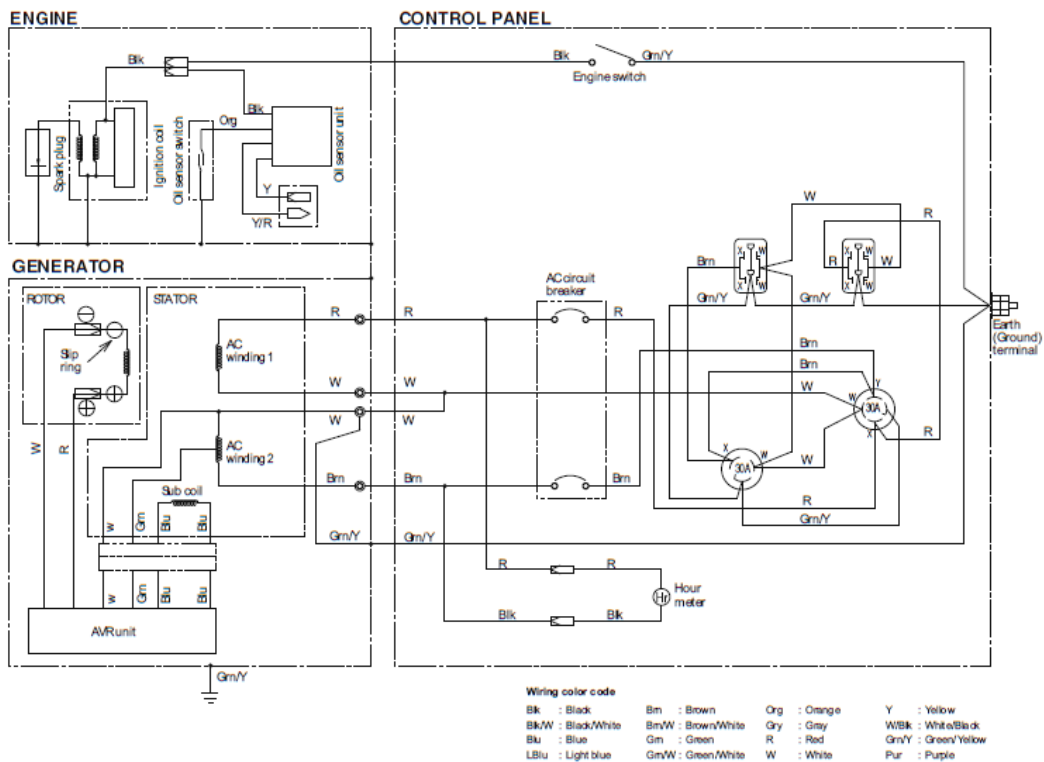


9. WIRING DIAGRAM

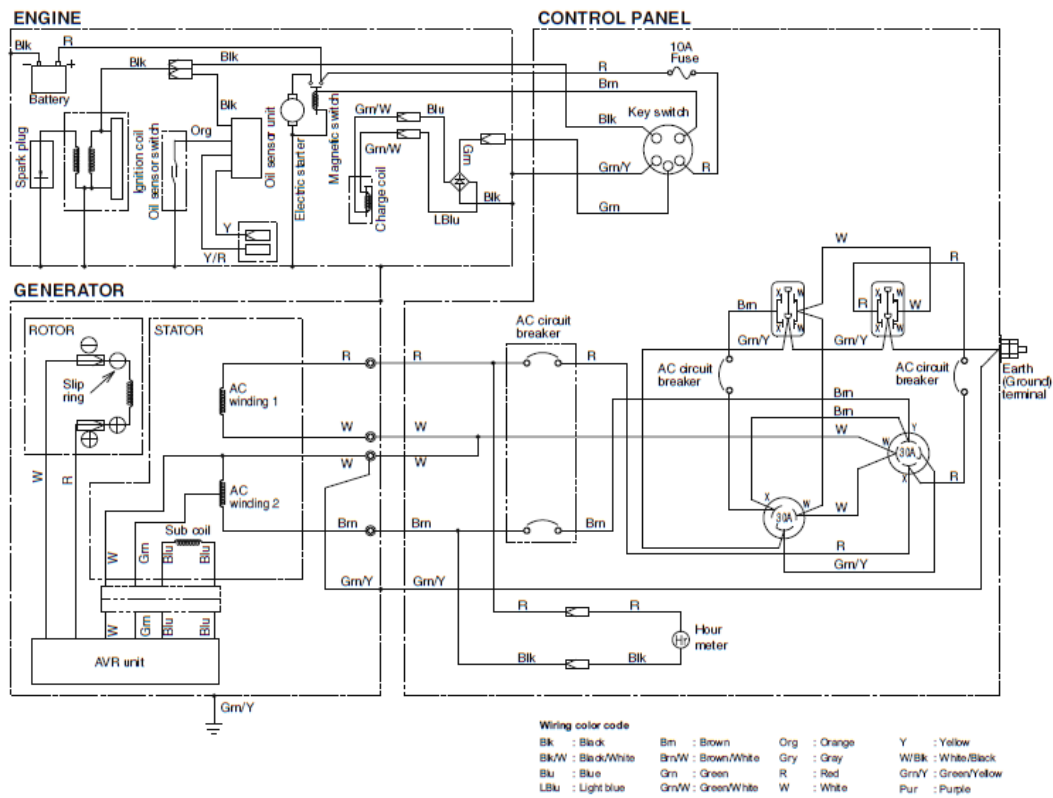
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