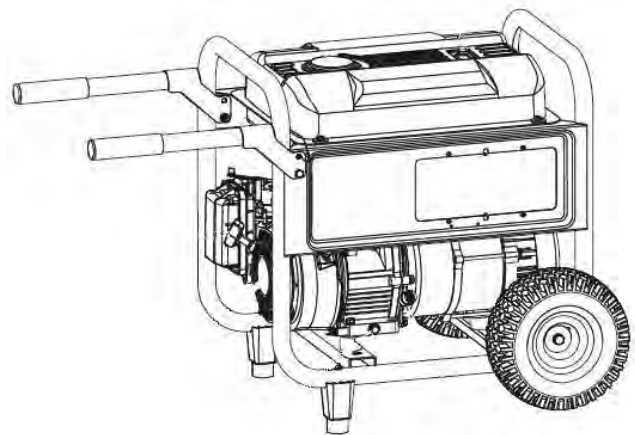


Generator

SGX3500

SGX5000

SGX7500



SERVICE MANUAL

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NOTE

This Service Manual excludes information for engine.

As for the total servicing information as a generator set, please refer in conjunction with the Subaru EX series OHC Engine Service Manual.

SGX Specification sheet

Model	SGX3500	SGX5000	SGX7500E
Emission Compliancy	49 state	49 state	49 state
CSA Compliant	Yes	Yes	Yes
Type	Brush Type	Brush Type	Brush Type
Voltage Regulation	AVR	AVR	AVR
Frequency	60HZ/Single	60HZ/Single	60HZ/Single
Voltage	120/240	120/240	120/240
Max Output (watts)	3500	4900	7300
Max Amps	29.2/14.6	40.8/20.4	60.8/30.4
Rated Output (watts)	3200	4500	6700
Rated Amps	26.6/13.3	37.5/18.8	55.8/27.9
dba @ rated output (7 meters)	72	76	76
Current Protection	Dual pole magnetic circuit breaker & GFCI	Dual pole thermal magnetic circuit breakers & GFCI	Dual pole thermal magnetic circuit breakers & GFCI
Model	EX21 7 HP	EX30 10 HP	EX40 14 HP
Type	Subaru OHC	Subaru OHC	Subaru OHC
Low Oil System	Low Oil Shutdown	Low Oil Shutdown	Low Oil Shutdown
Fuel Tank Capacity	4 gallons	7 gallons	8 gallons
Continuous Operation:			
Hours at rated load	8 hours	9.4 hours	7 hours
Hours at rated 1/2 load	10.7 hours	12.7 hours	10.3 hours
Starting System	Recoil	Recoil	Electric w/Recoil backup
Battery Included - Battery replacement or equal	N/A	N/A	12 V. 18 AH (nut & bolt type) Interstate BSL1116
Dimensions (LxWxH)	27"x25"x25"	31"x28"x27"	34"x28"x27"
Dry Weight (includes wheel kit)	122 lbs.	154 lbs.	212 lbs.
GFCI 120V, 20A duplex	1	2	2
120V. 20A Twistlock	1	1	N/A
120/240V. 20A Twistlock	1	1	N/A
120V. 30A Twistlock	N/A	N/A	1
120/240V, 30A Twistlock	N/A	N/A	1
Hourmeter	*	*	*
Wheel Kit	*	*	*
Oil SAE30W 1 Quart	*	*	*

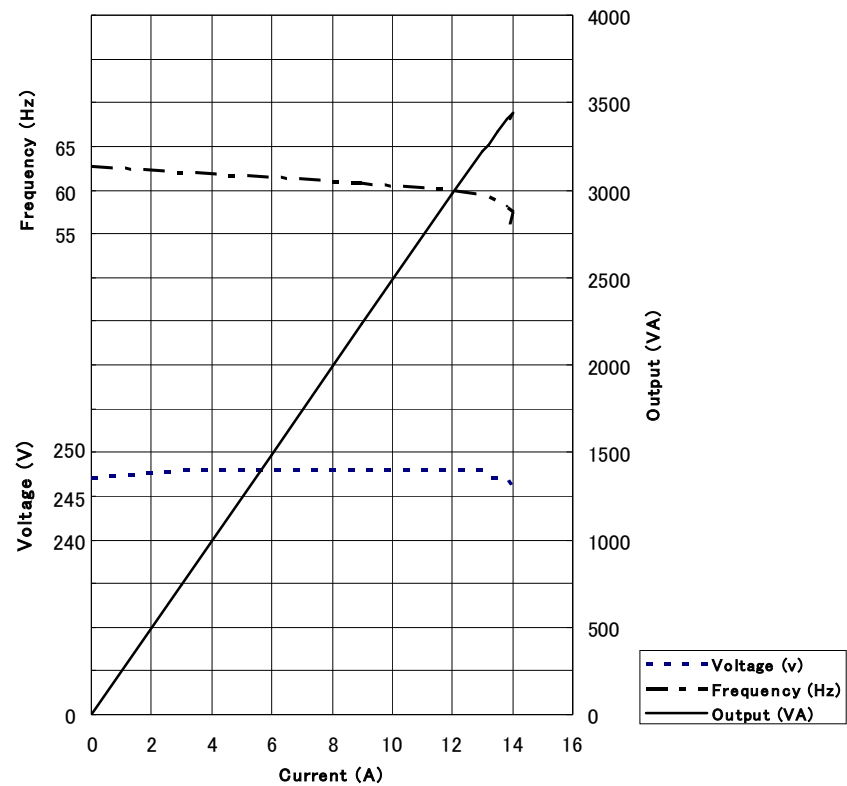
Note:

* Fuel tank capacity measured at a 20% incline is as follows:
SGX3500 - 2.9 gal., SGX5000 - 5.25 gal., SGX7500E - 5.94 gal.

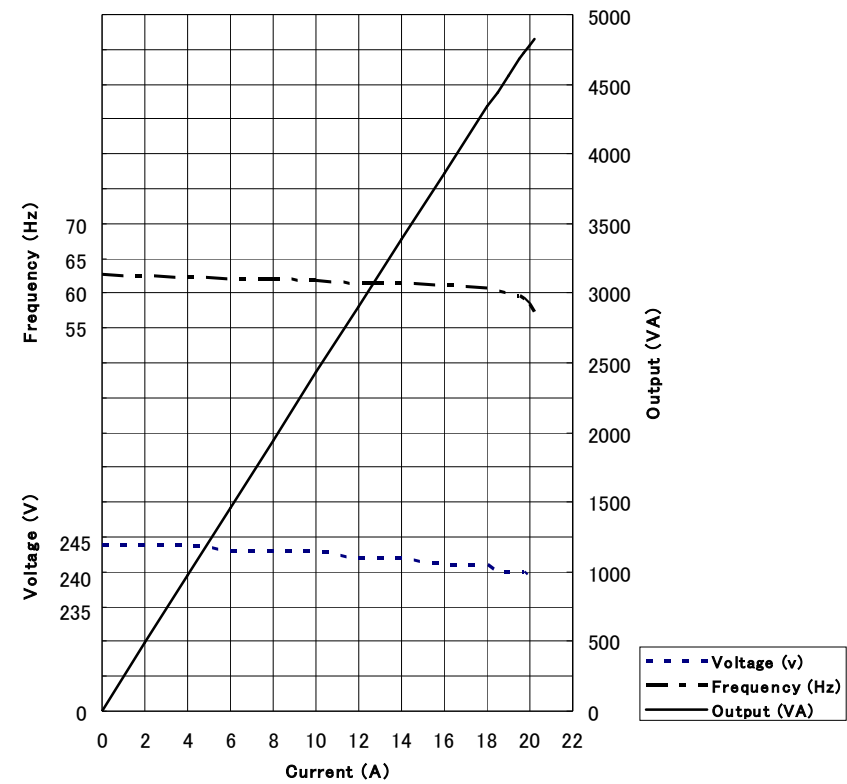
** Dimensions and Dry Weight include battery and wheel kit, less extended handles

2. PERFORMANCE CURVES

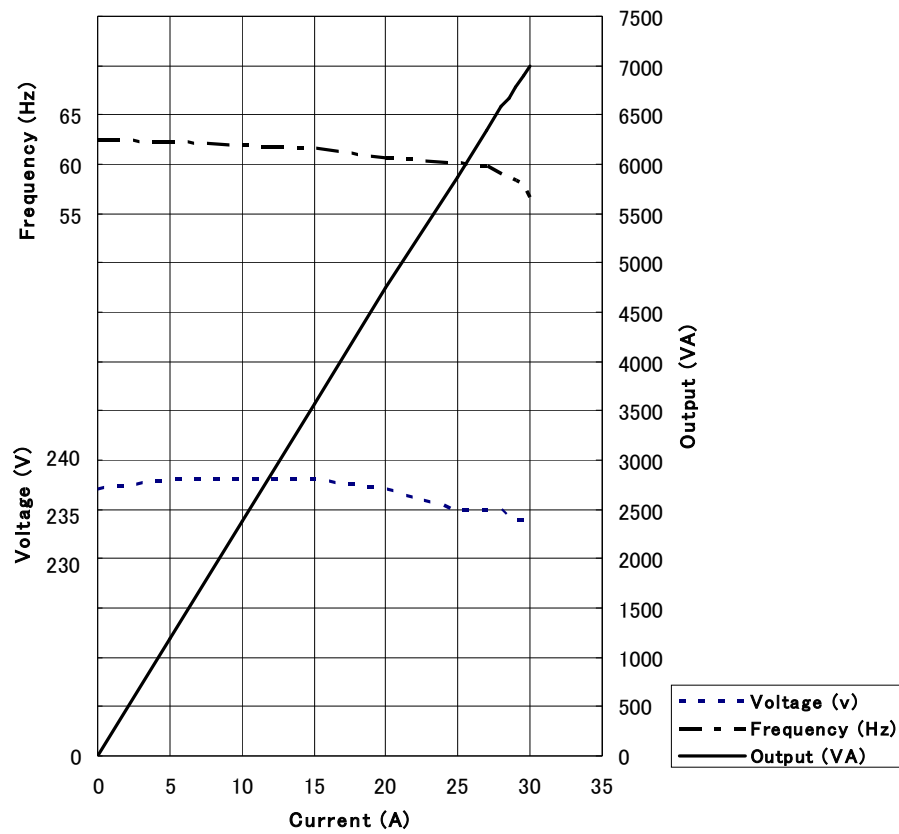
SGX3500
60Hz-240V



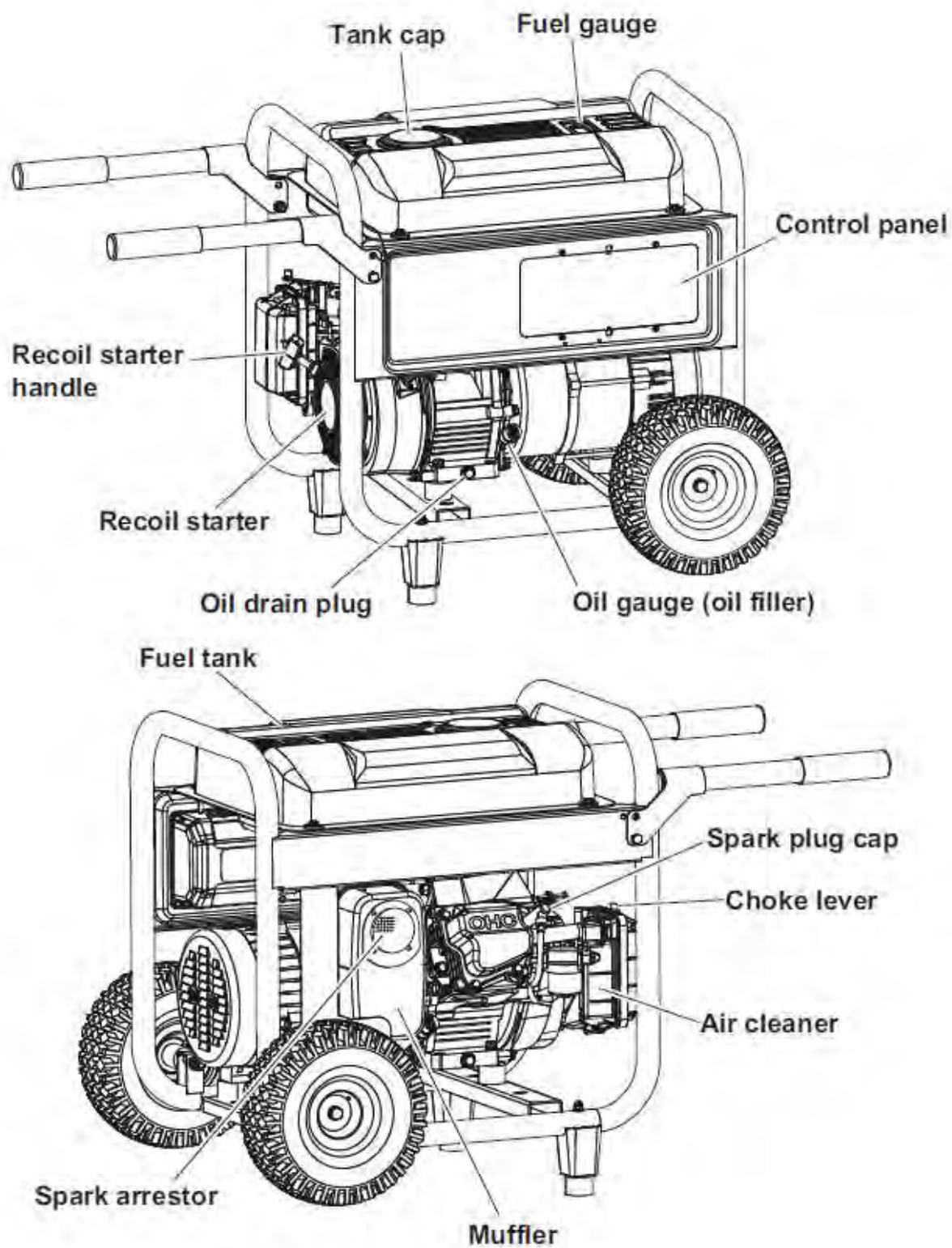
SGX5000
60Hz-240V



SGX7500
60Hz-240V

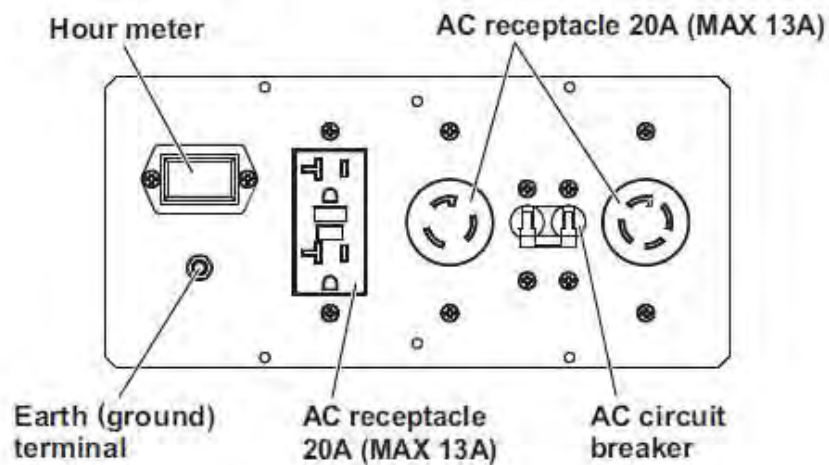


3. GENERAL DESCRIPTION

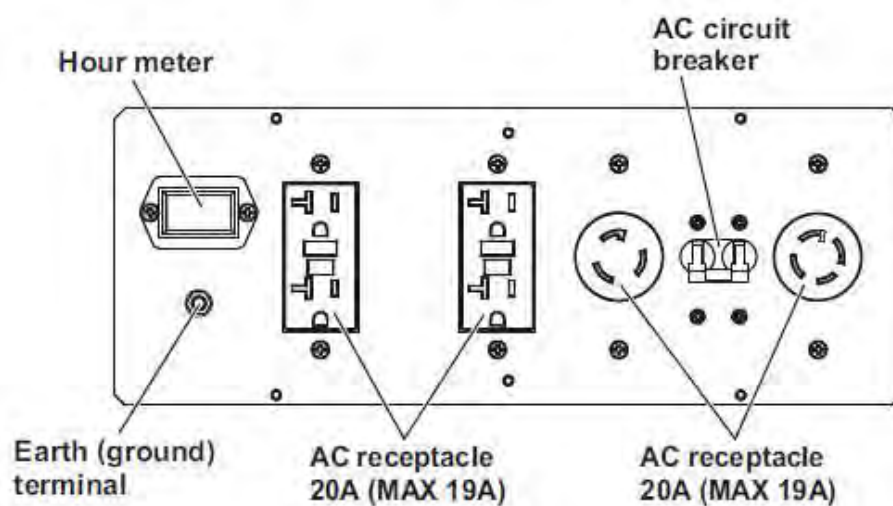


CONTROL PANEL

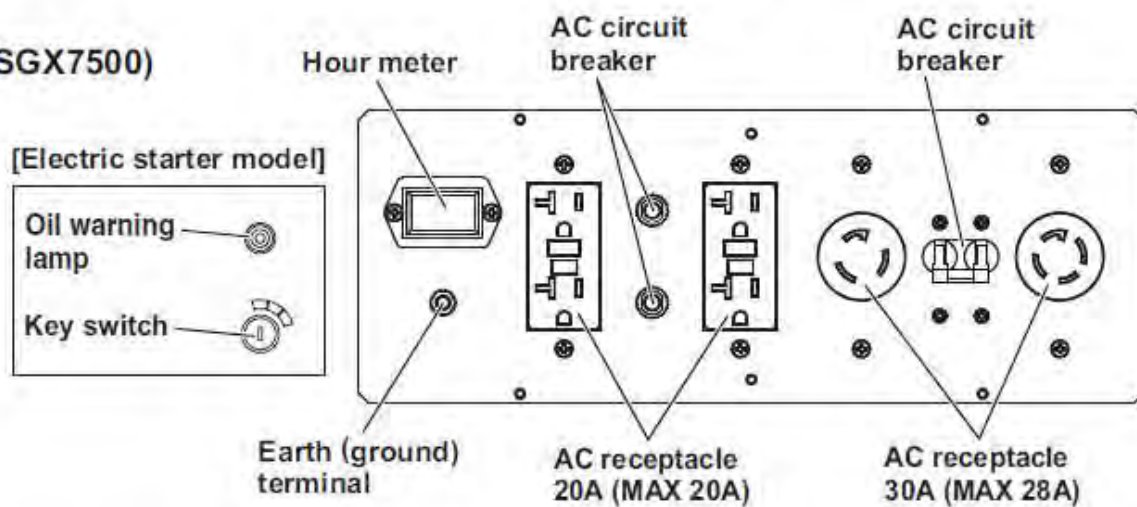
(SGX3500)



(SGX5000)



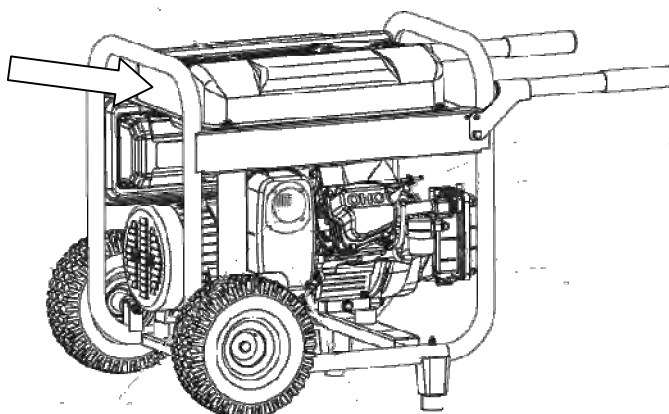
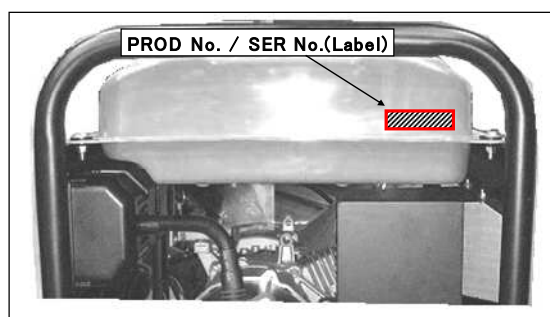
(SGX7500)



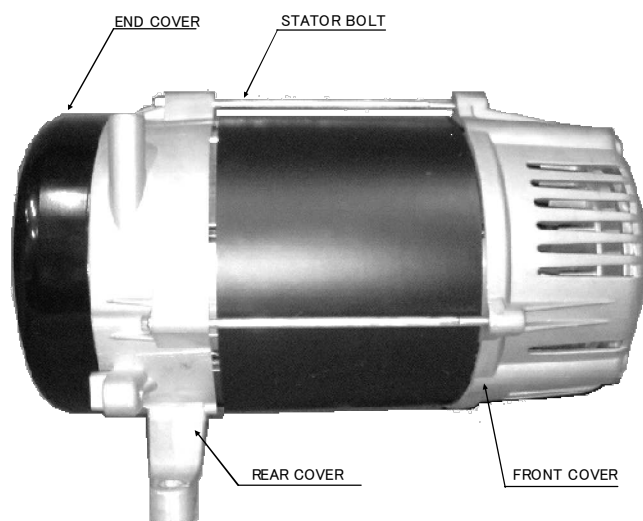
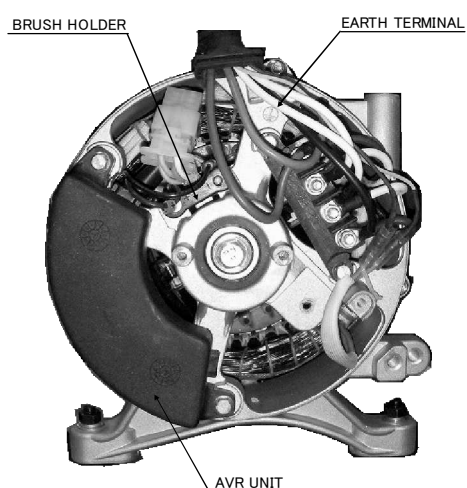
SERIAL NUMBER

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 accurate service.



CONSTRUCTION



4. RANGE OF APPLICATIONS

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 turn 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 applied to the fluorescent lamp, the more power shall be required to drive 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 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) Initially loaded motor driven appliances 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 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 items (3) and (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 as to power consumption

Some appliances have no indication as to 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 multiple 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 the length from generator to electrical tools.

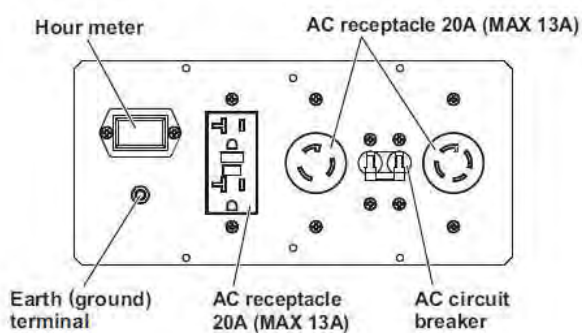
(6) AC Receptacle

AC receptacles are used for taking AC output power from the generator.
The rated current for each receptacle is shown as follows;

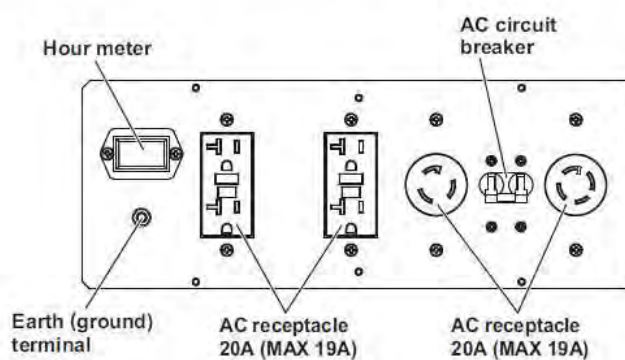
CAUTION

Be careful not to use the receptacles beyond the specified amperage limits to prevent circuit breaker tripping.

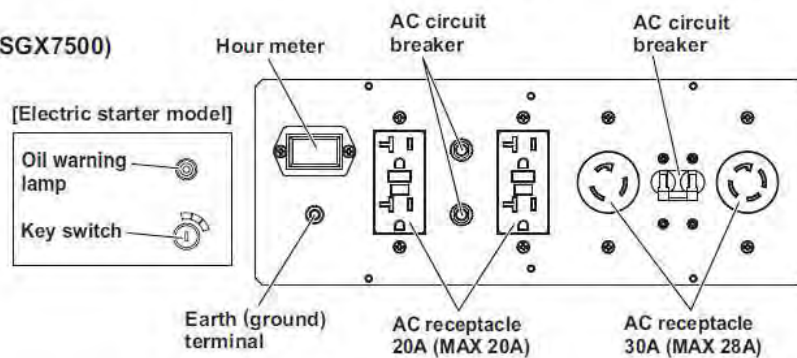
(SGX3500)



(SGX5000)

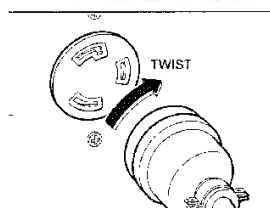


(SGX7500)



CAUTION

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



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 :

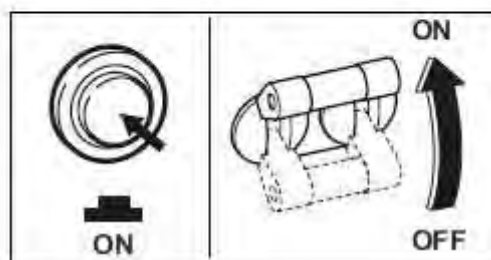
When the AC circuit breaker turns off during operation, the generator is overloaded or the appliance is defective. Stop the generator immediately, check the appliance and / or generator for overloading or detect and have repaired as necessary by Subaru Industrial Power Products dealer or service shop.

[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.

(d) Turn the AC circuit breaker to the position "ON".

(e) Turn on the switch of the appliance.



GFCI RECEPTACLE

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

- 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 bonded 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.

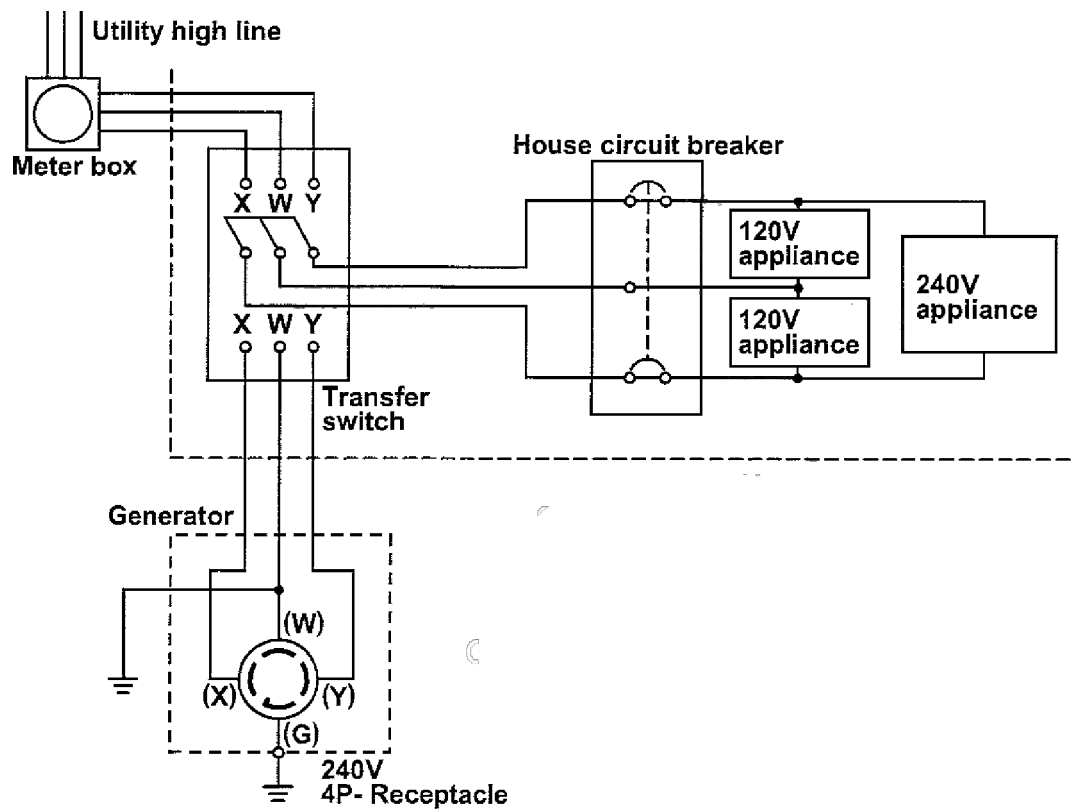
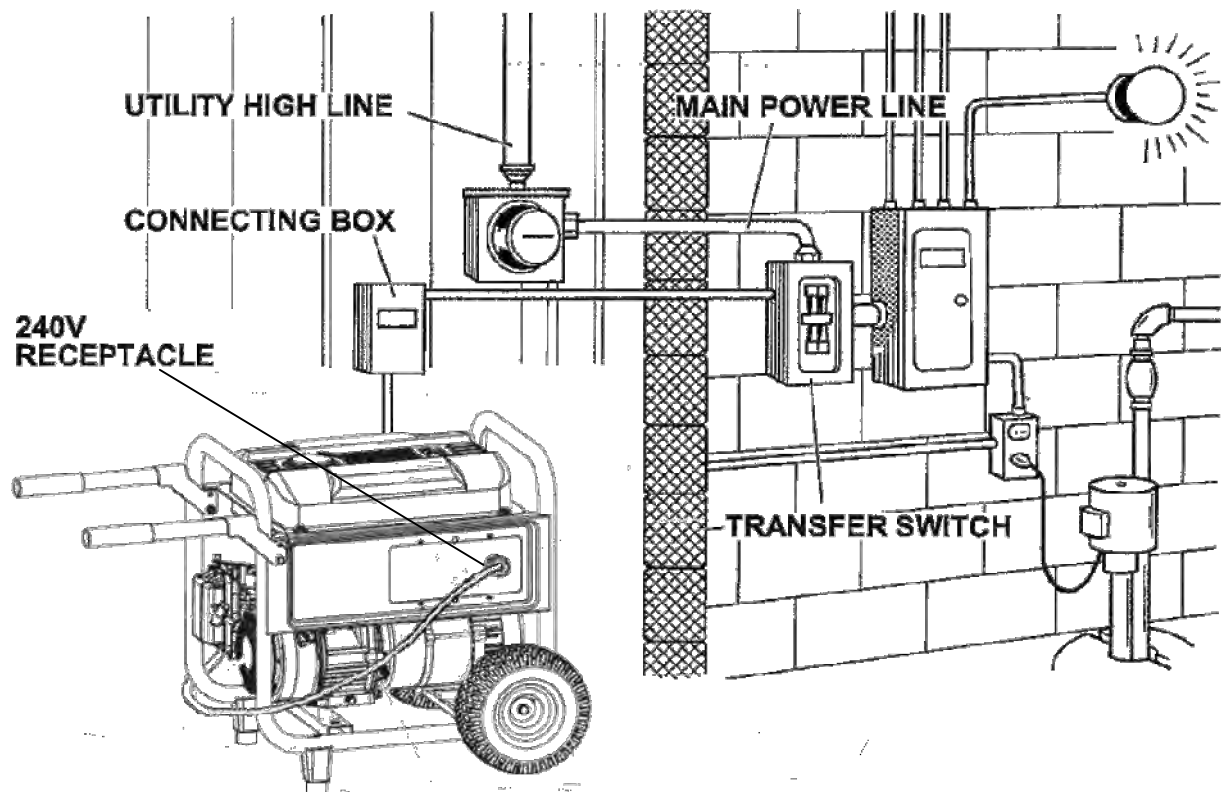
(b) Install a transfer switch.

A transfer switch must be installed to transfer the load from the commercial power source to the generator. 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 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

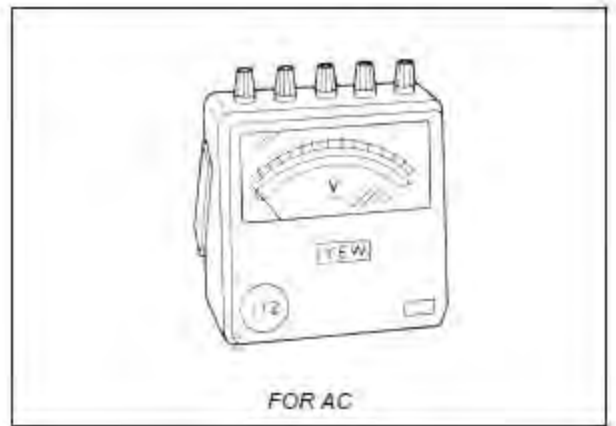
AC voltmeter is necessary.

The approximate AC voltage ranges of the voltmeters to be used for various types of generators are as follows :

0 to 150 V : Type with an output voltage of 110 or 120 V

0 to 300 V : Type with an output voltage of 220, 230 or 240 V

0 to 150 V, 0 to 300 V : Dual voltage type

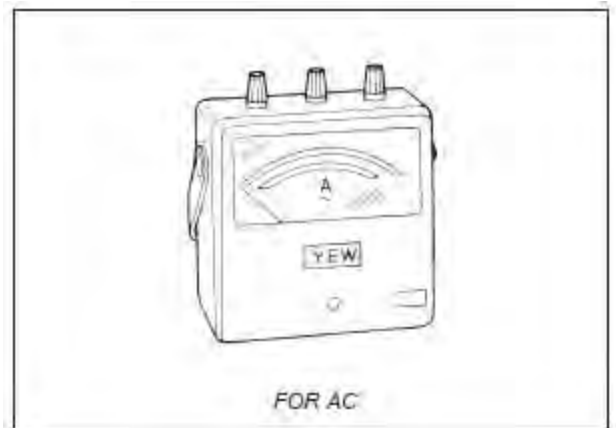


(2) AMMETER

AC ammeter is necessary.

An AC ammeter with a range that can be changed according to the current rating of a given generator is most desirable.

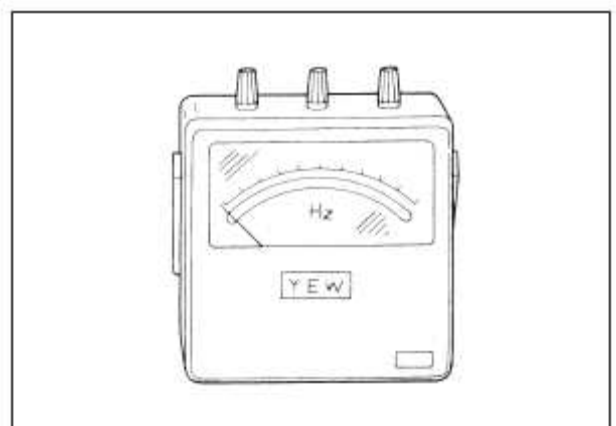
(About 10 A, 20 A, 100 A)



(3) FREQUENCY METER

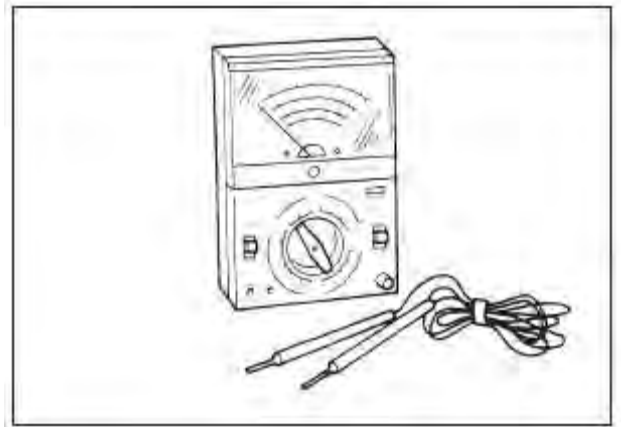
Frequency range : About 45 to 65Hz

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



(4) CIRCUIT TESTER

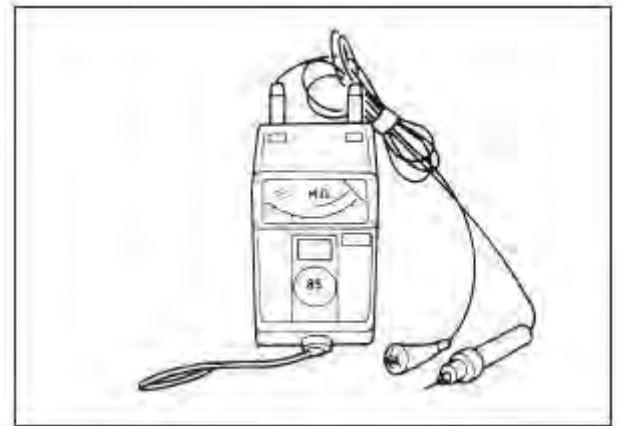
Used for measuring resistance, etc.



(5) MEGGER TESTER

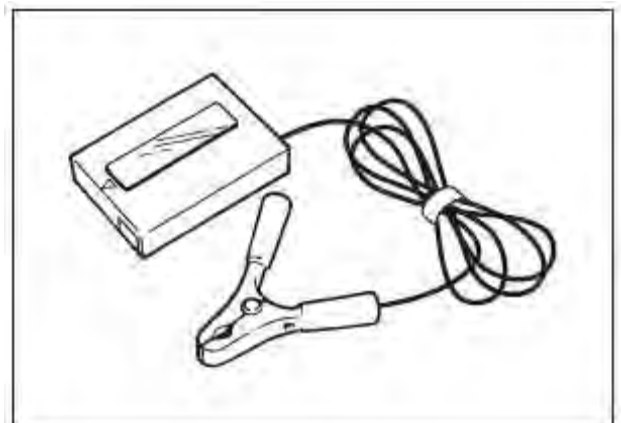
Used for measuring generator insulation resistance.

Select one with testing voltage range of 500V.

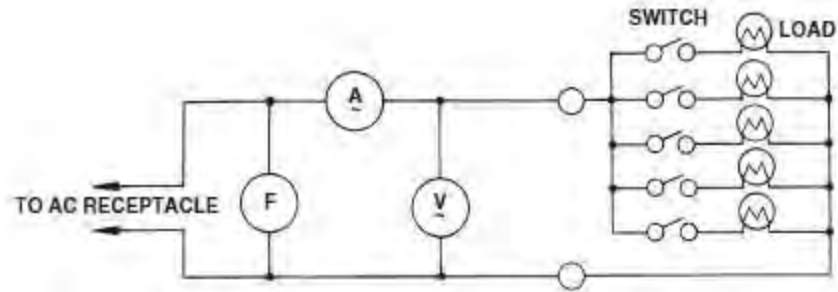


(6) TACHOMETER

Use the contactless type tachometer.



5-2 AC OUTPUT MEASURING

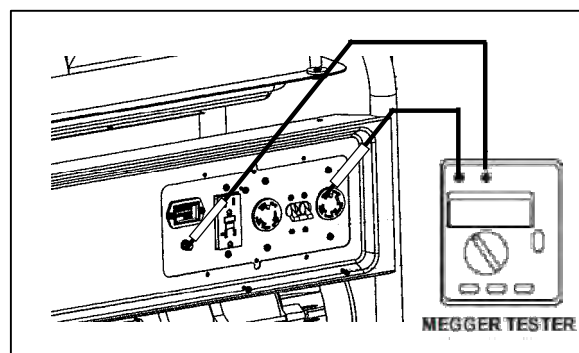


Use a circuit above for measuring AC output. A hot plate or lamp with a power factor of 1.0 may be used as a load. Adjust the load and rpm. and check that the voltage range is as specified in the following table at the rated amperage and rated rpm.

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

5-3 MEASURING INSULATION RESISTANCE

Use a megger tester to check the insulation resistance. Remove the control panel, and disconnect the connector of GREEN lead for ground. Connect a megger tester to one of receptacle output terminals and the ground terminal, then measure the insulation resistance.



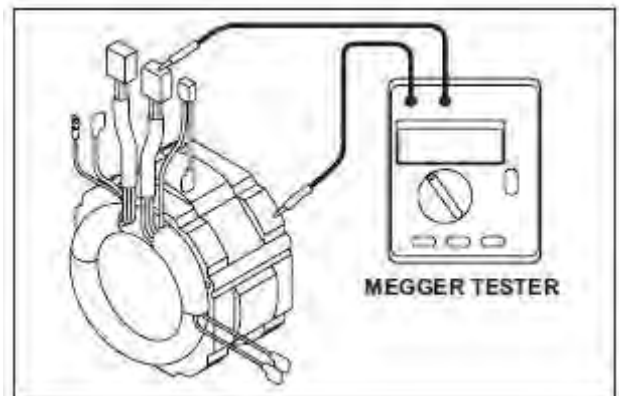
An insulation resistance of 1 megohm or more is normal.

(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 the insulation resistance of the stator, rotor and control panel individually.

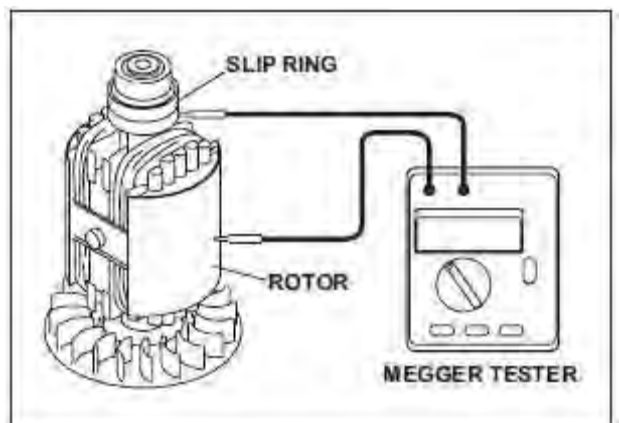
(1) STATOR

Measure the insulation resistance between each lead wire and the core.



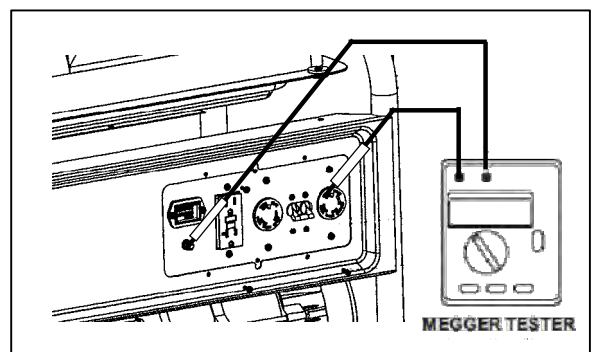
(2) ROTOR

Measure the insulation resistance between the slip ring and the core.



(3) CONTROL PANEL

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



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

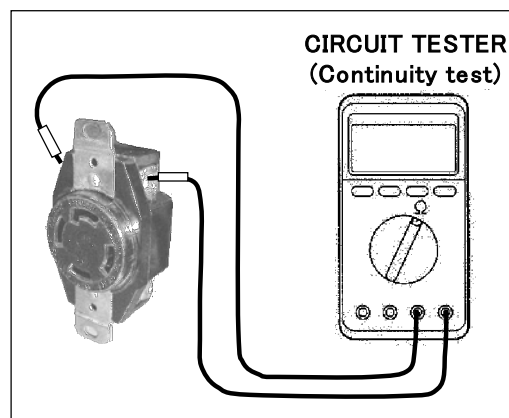
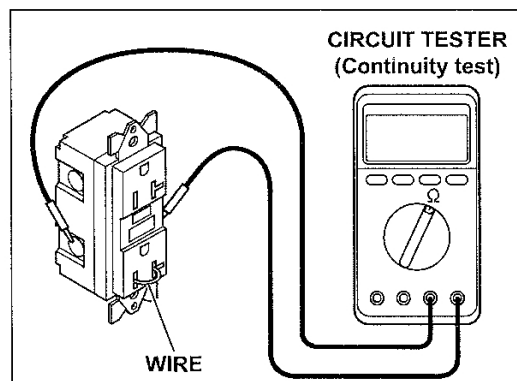
Replace the faulty part.

6. CHECKING FUNCTIONAL MEMBERS

6-1 RECEPTACLES

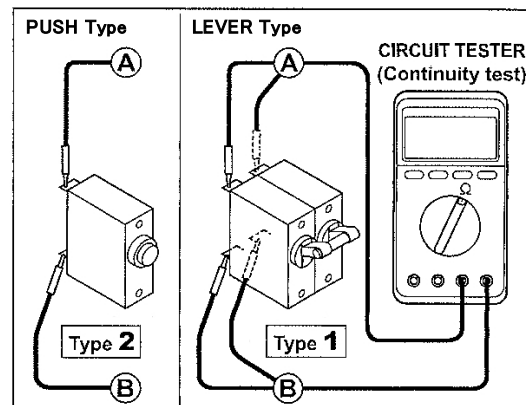
Using a circuit tester, check continuity between the two terminals at the rear of the receptacles while the receptacle is mounted on the control panel.

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

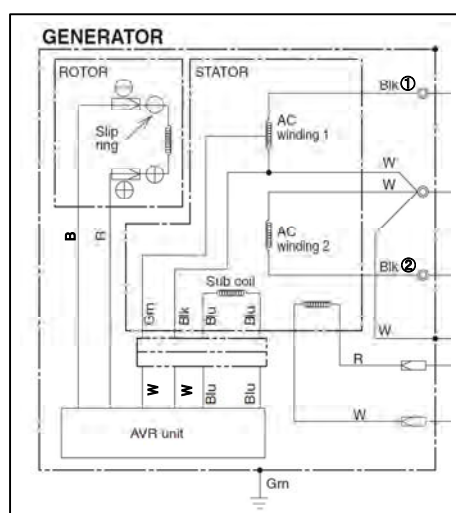
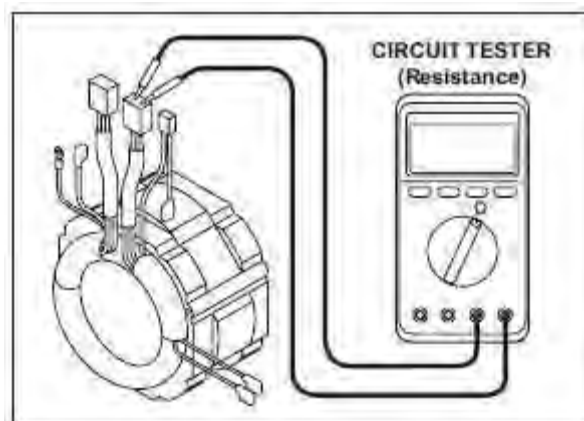
AC CIRCUIT BREAKER (Type 2)

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	SGX5000	SGX7500
FREQUENCY		60Hz		
RATED VOLTAGE		120V/240V		
AC WINDING 1	BLACK①-WHITE	0.481	0.26	0.18
AC WINDING 2	BLACK②-WHITE	0.487	0.26	0.18
SUB COIL	Blue-Blue	2.1	2.06	0.32
HOUR METER COIL	Red-White	48.5	55.6	58.9
AC WINDING 1	Green-Black	0.27	0.26	0.21

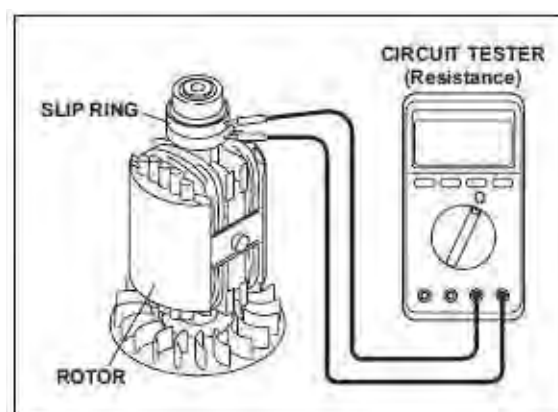
6-4 ROTOR ASSEMBLY

1) Field coil

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

*Ambient temperature at 20°C (68° F) (Ω)

ROTOR (SLIP RING)	60Hz-120/240V
SGX3500	48.5
SGX5000	55.6
SGX7500	58.9

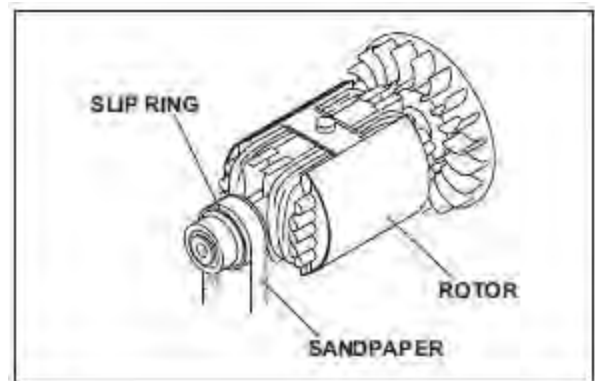


NOTE : If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings.

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 20° C (68° F).

2) Cleaning Slip rings

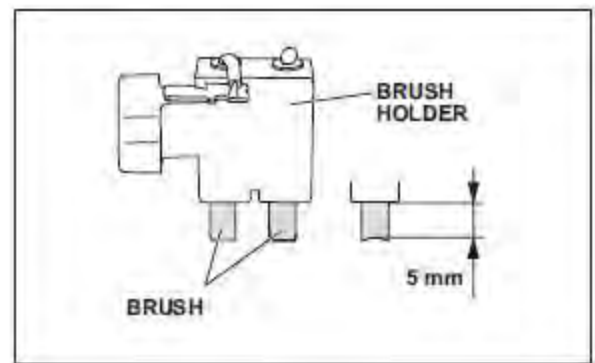
The slip ring surfaces must be uniformly bright. Slip rings showing black spots, excessive wear, or uneven wear must be repaired. A stained slip ring lowers generator efficiency and output voltage. Polish the slip rings with fine sandpaper while turning the rotor until rough spots disappear. Care should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



6-5 BRUSH

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

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



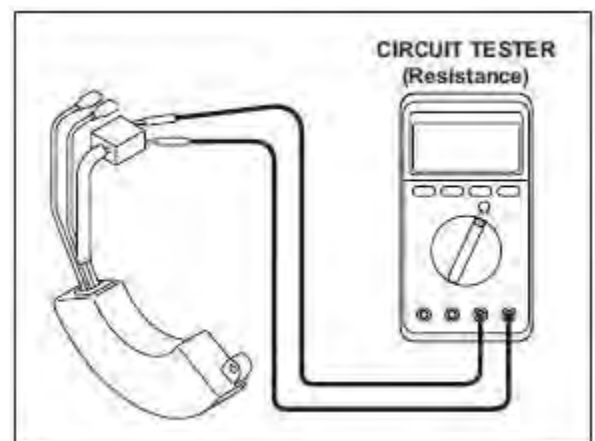
6-6 A.V.R. .

(AUTOMATIC VOLTAGE REGULATOR)

1) Features

This A.V.R. operates 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 simply looking at the A.V.R., or by the inter-lead resistance with a tester, or actually mounting 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 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.

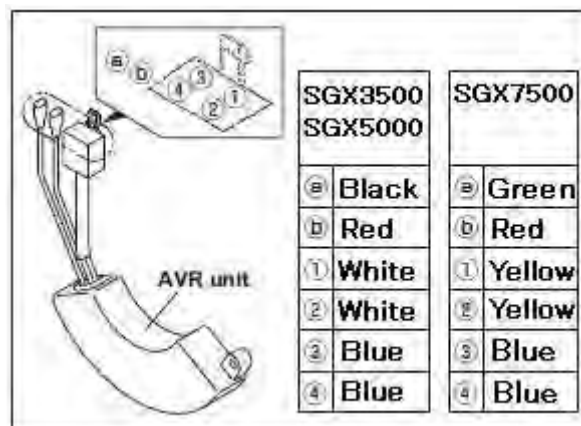
If the tester readings very greatly from the values specified in the table on next page, the A.V.R. is faulty.

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 suspectedly faulty A.V.R. in a normal generator, or mount a normal A.V.R. in a generator which fails to generate voltage.



*Chacking table for analogue circuit tester (Resistance).

(Ω) (R±20%)

SGX3500/5000 (60Hz-120/240V)		apply black ⊖ needle of the circuit tester					
Apply red ⊕ needle of the circuit tester	Black	Black	Red	White-①	White-②	Blue-①	Blue-②
	Black		407K	6.07M	5.66M	5.12M	5.20M
	Red	5.47M		9.42M	9.72M	9.50M	9.68M
	White-①	3.02M	6.90M		7.0M	6.75M	6.90M
	White-②	2.42M	6.10M	6.2M		6.09M	6.25M
	Blue-①	8.48M	2.54M	12M	12.25M		12.18M
	Blue-②	8.88M	2.95M	12.45M	12.69M	11.92M	

(Ω) (R±20%)

SGX7500(60Hz-120/240V)		apply black ⊖ needle of the circuit tester					
Apply red ⊕ needle of the circuit tester	Green	Green	Red	Yellow-①	Yellow-②	Blue-①	Blue-②
	Green		22.33k	2.88M	2.90M	2.52M	3.40M
	Red	23K		3.13M	3.17M	2.73M	3.60M
	Yellow-①	2.23M	2.95M		5.41M	5.70M	6.56M
	Yellow-②	2.82M	2.86M	6.02M		5.53M	6.40M
	Blue-①	2.74M	2.72M	5.98M	5.96M		13.5M
	Blue-②	2.62M	2.56M	13.06M	12.88M	12.3M	

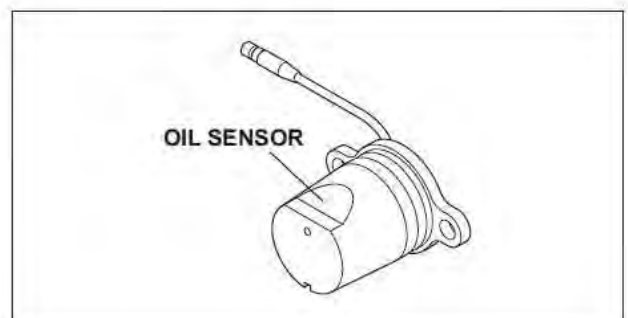
6-8 OIL SENSOR

- (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.*

6-8-1 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



6-8-2 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.

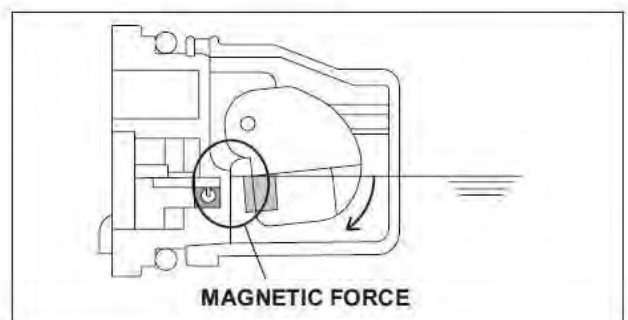
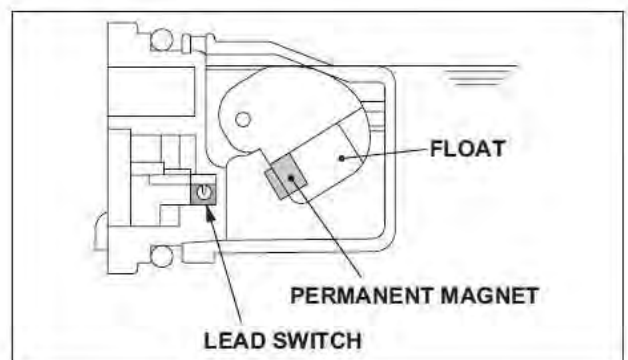
In accordance with the oil level, the float moves up and down.

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

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

The premanent 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

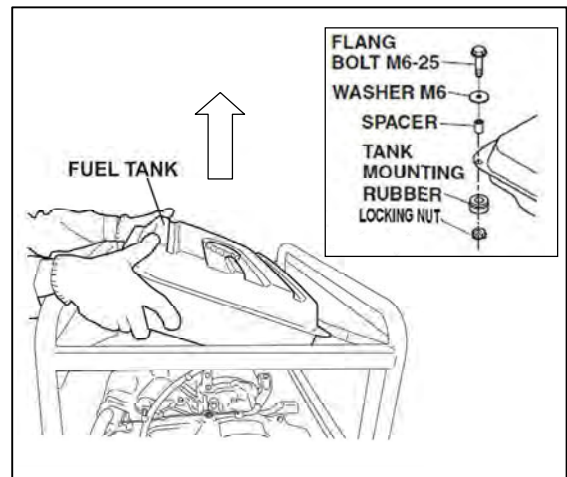
- (1) Be sure to memorize the location of individual parts when disassembling the generator so that the generator can be reassembled correctly. Tag the disassembled part with the necessary information to facilitate easier and smoother reassembly.
- (2) For more convenience, divide the parts into several 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 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 : As to detailed information for servicing procedures on engine portion, please refer to Subaru engine service manual for "EX series".

7-2 DISASSEMBLY PROCEDURES

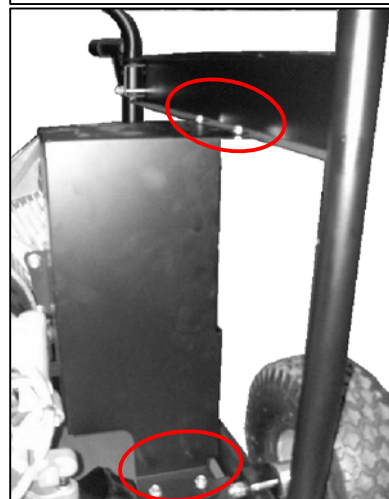
7-2-1 FUEL TANK

- (1) Shut the fuel valve and discharge fuel from fuel tank and carburetor.
- (2) Disconnect rubber pipe from the strainer.
- (3) Remove the fuel tank.
M6 flange bolt and nut . . . 4 pcs.



7-2-2 MUFFLER

- (1) Remove the Muffler Cover.
Tapping screw 2 pcs.
M5 Flange bolt and nut. . . . 2 pcs.

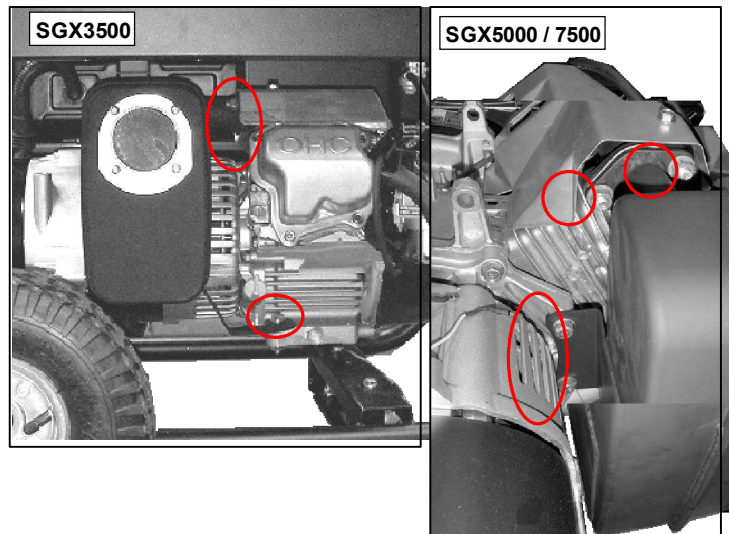


- (2) Loosen flange bolt and nut for the muffler stay.

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

5/16-24 x 16. . . . 2PCS (SGX5000 / 7500)

- (3) Remove the muffler from Exhaust pipe.



7-2-3 CONTROL BOX

- (1) Remove the end cover.

M6 flange bolt . . . 2 pcs.

- (2) Disconnect the connectors on the wiring from the alternator.

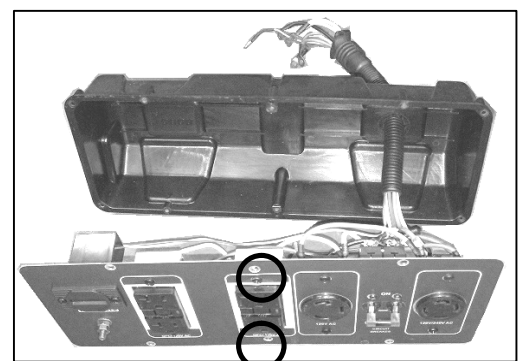
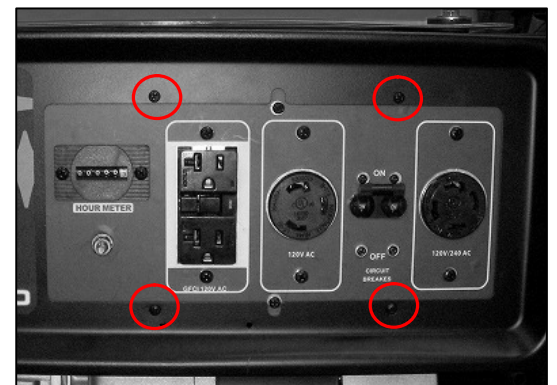
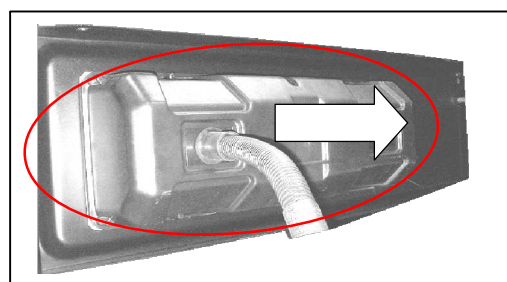
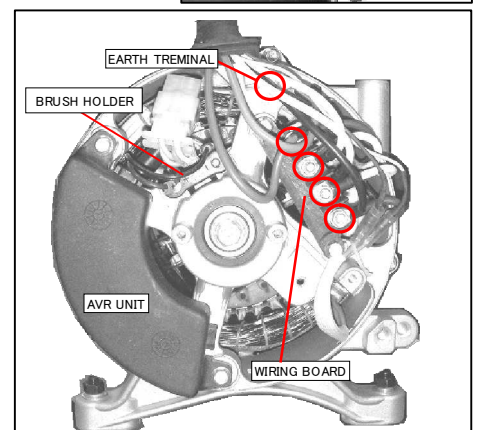
- (3) Remove the wiring terminals from wiring board and disconnect all wiring from control box.

- (4) Remove the control box.

M4 screw . . . 4pcs

- (5) Loosen the control panel.

M4 screw . . . 2pcs

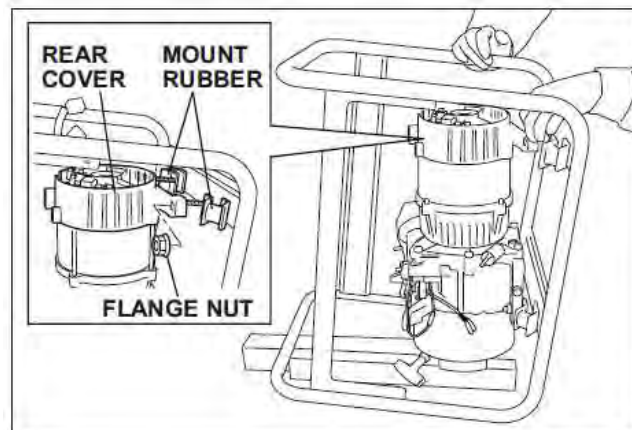


7-2-4 ALTERNATOR

- (1) Remove the AVR unit, brush holder.
- (2) Set the generator set with the rear cover upwards.

NOTE) Before starting this work, make sure engine oil has been discharged.

- (3) Remove the two flange nuts (SGX3500: bolt) fixing rear cover onto the mount rubbers.
M8 flange nut (bolts) . . . 2 pcs.

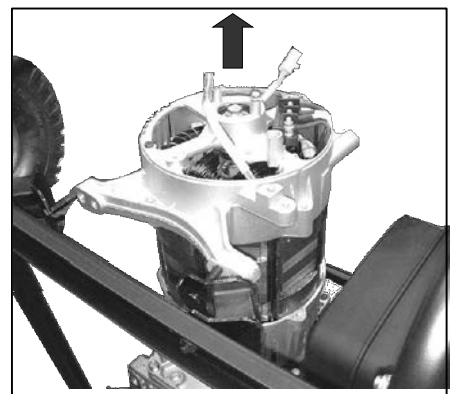
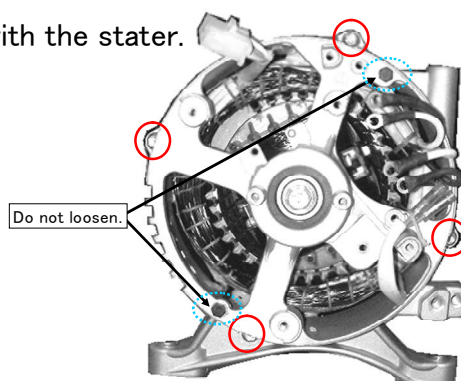


- (4) Remove the stator

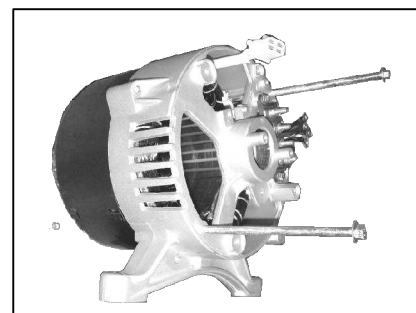
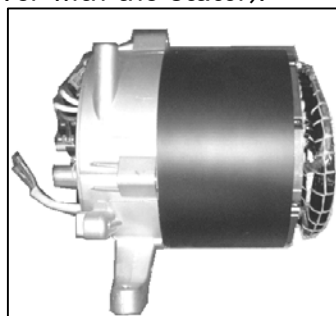
NOTE) The rear cover and the stator are clamped together by two of M6 bolts and nuts.

Do not loosen these bolts prior to being removed of the rear cover united with the stator.

- (4)-1 Remove the rear cover united with the stator.
Flange bolt M6 4pcs.

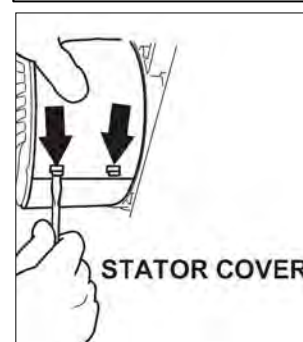
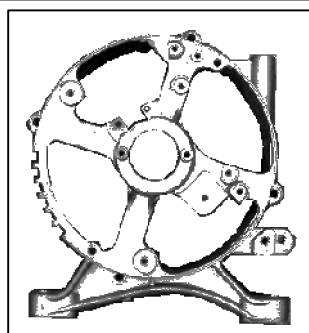


- (4)-2 Loosen the bolt and nut. (united the rear cover with the stator).
Bolt M6 2pcs.



- (4)-3 Remove the rear cover

- (4)-4 Remove the stator cover with claws (2pcs)
Raised up by using screw driver.



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

(5) Take off the through bolt of the rotor.

SGX3500 M8 X 195mm

SGX5000 M8 X 195mm

SGX7500 M8 X 252mm

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

1. Pour engine oil into the center hole of rotor shaft. Fill with oil to the shaft end.

2. Prepare a bolt with the following thread size : M12 × 1.75 (SGX3500/5000/7500)

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



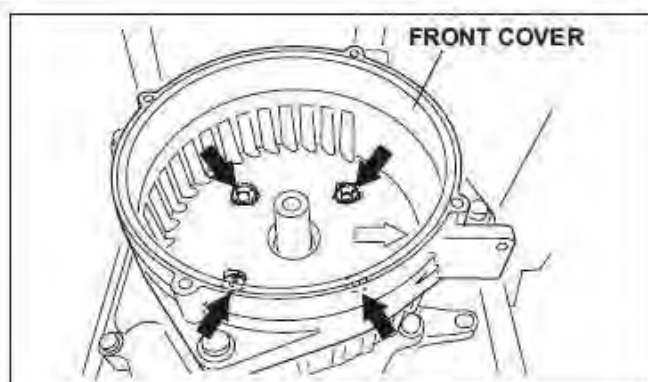
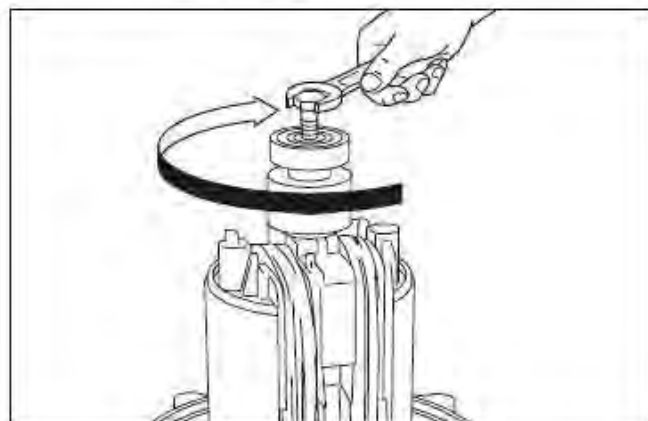
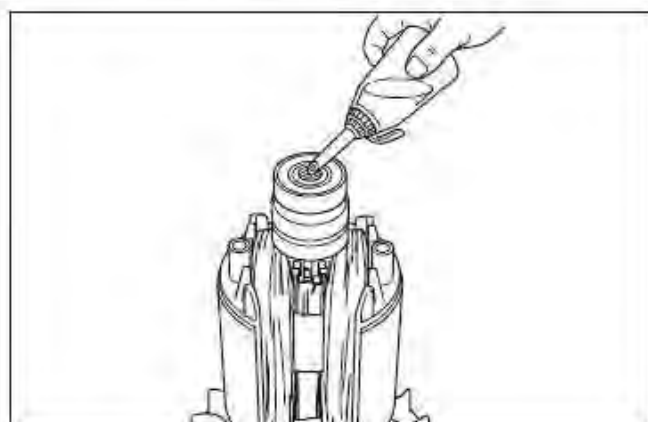
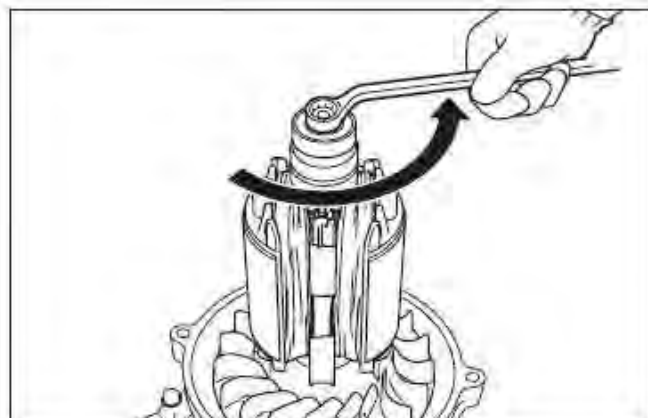
4. Screw the bolt into the thread of the rotor shaft.

5. Torque the bolt 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

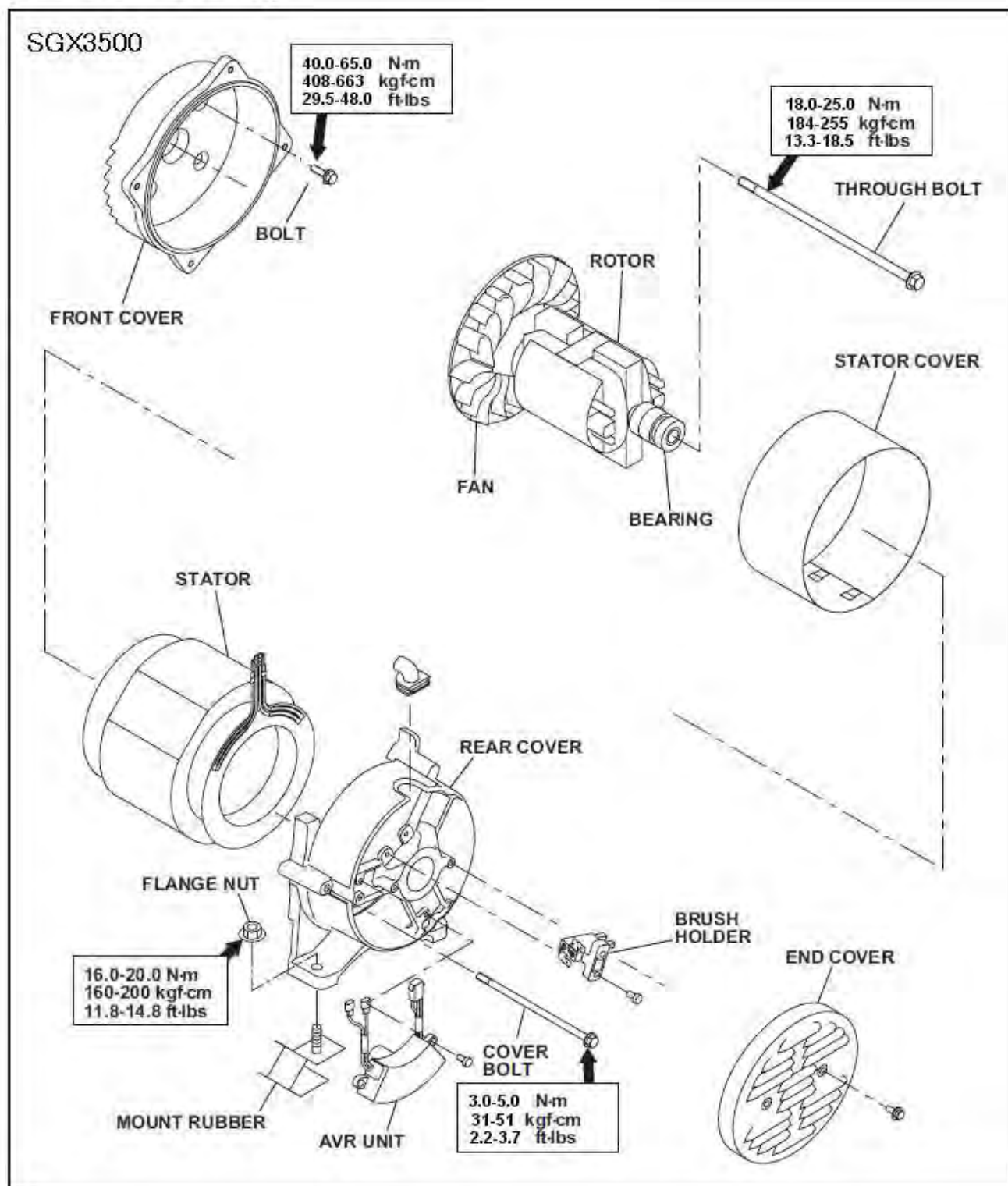
(11) Remove the front cover.

M8 × 20 flange bolt . . . 4 pcs.

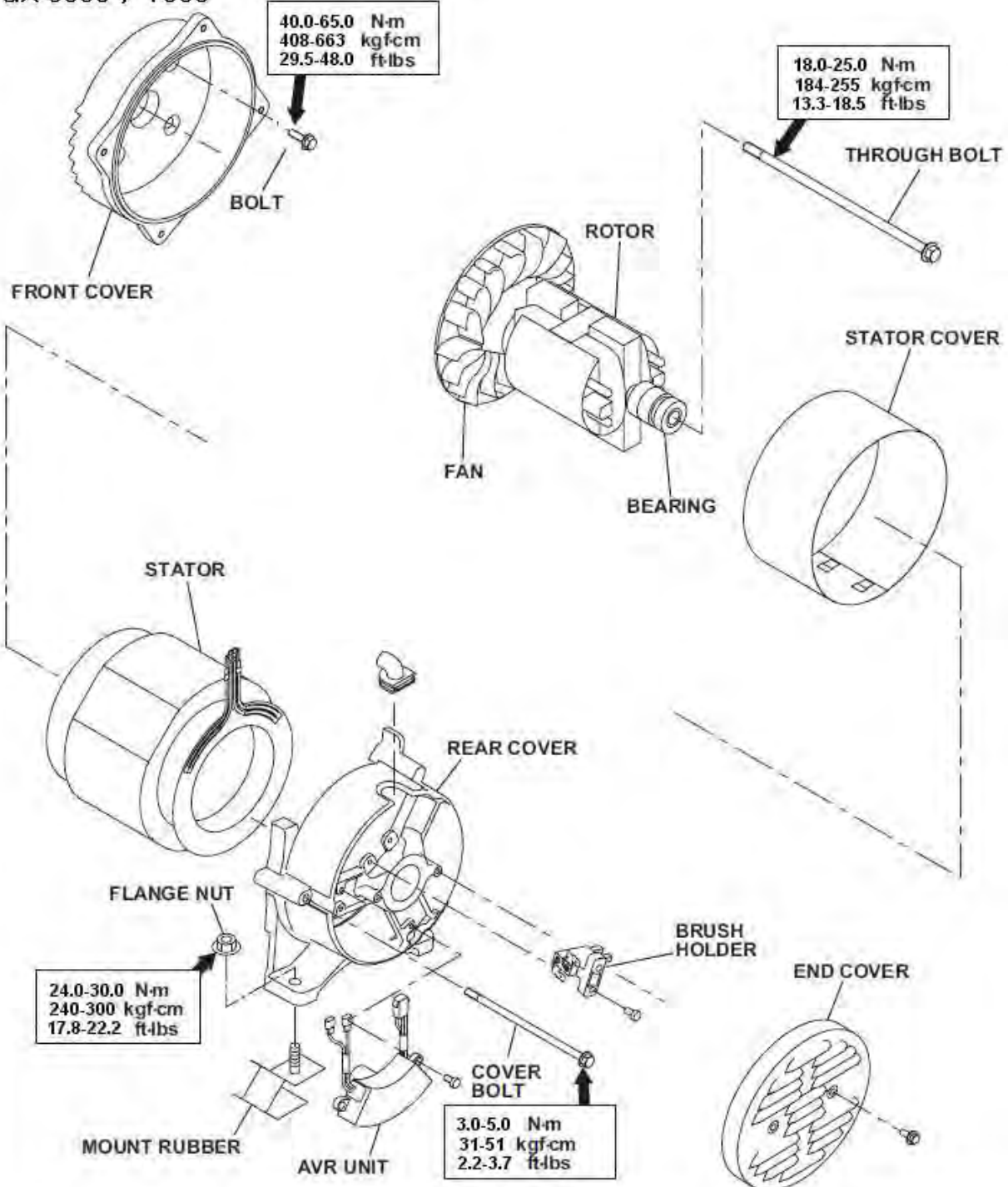


7-3 COMPONENT PARTS

(1) Generator assembly

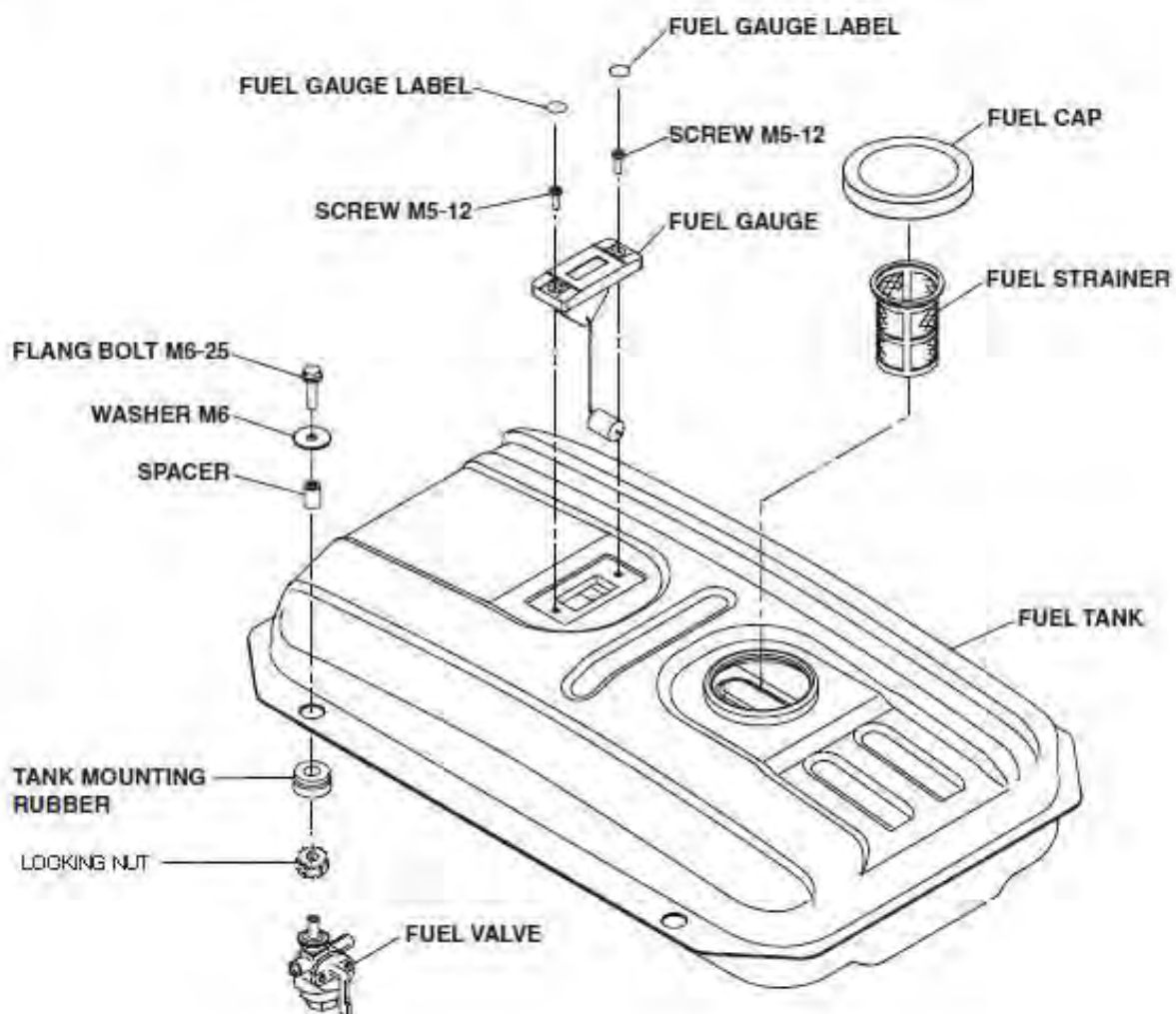


SGX 5000 / 7500

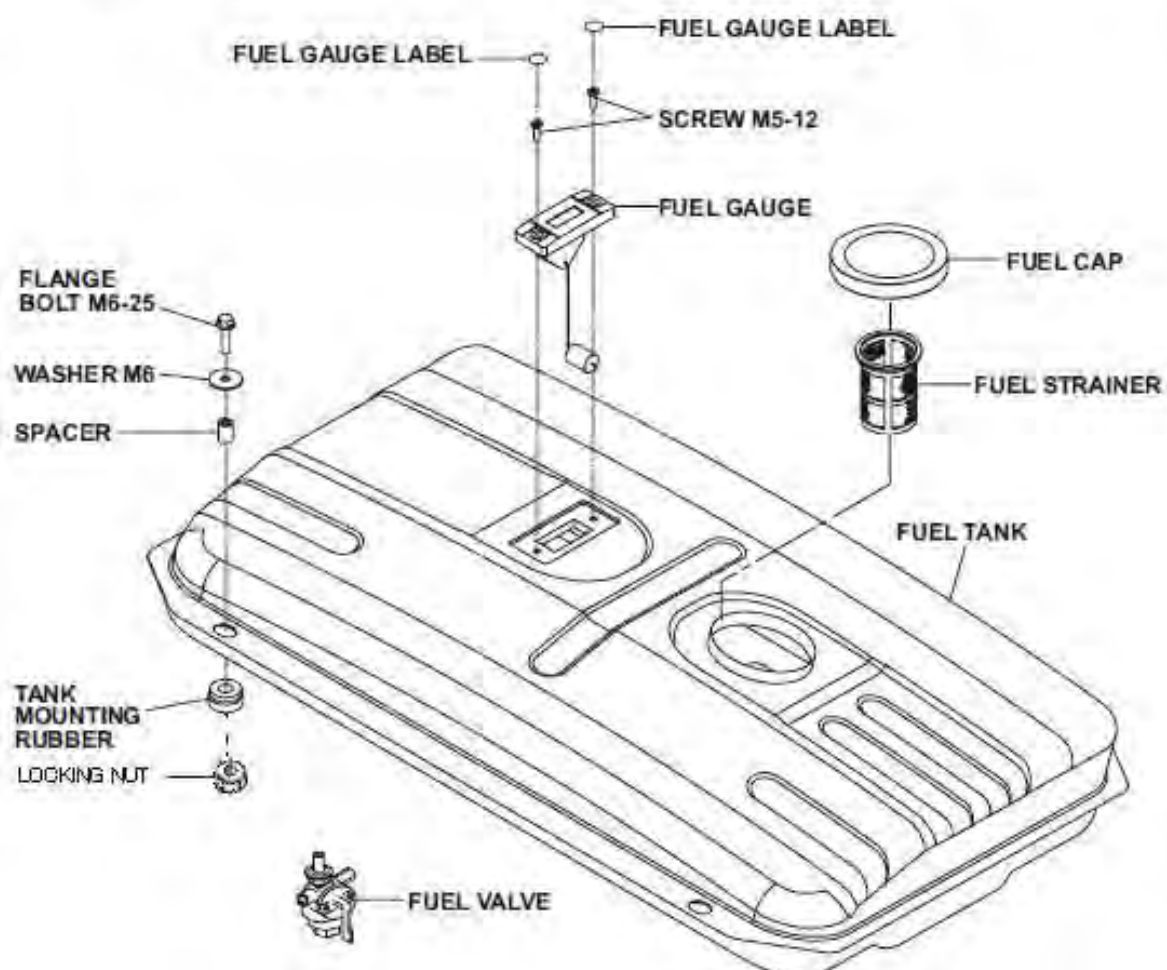


(2) Fuel tank

SGX3500



SGX5000 /7500



(3) Frame and accessories

NOTE :

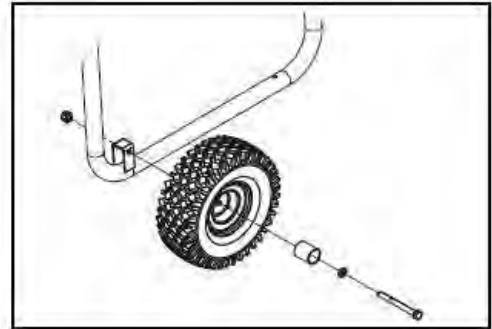
Do not put fuel or lubricant in the generator before installing the feet, wheels and handles.

INSTALLING THE WHEELS

Wheels are provided to assist in moving the generator to the desired location and should be installed on the opposite side of the handle

Locate the following items:

- 2 Bolts(3/8-16 × 4-1/4in.)
- 2 Washers(3/8 in.)
- 2 Spacers(0.38in.ID)
- 2 Wheels
- 2 Lock nuts(3/8-16)

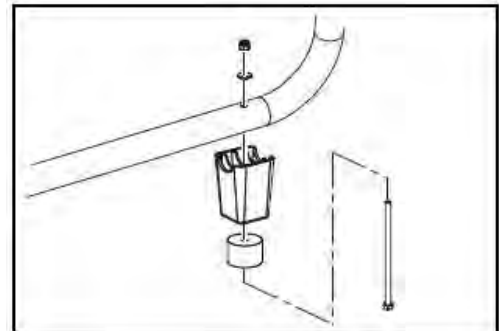


Tightening torque: 8 to 12N·m (80 to 120kg·cm)

Locate the following items:

- 2 Rubber feet
- 2 Rubber support
- 2 Lock nuts(1/4-20)
- 2 Washers(M6)
- 2 Bolts(1/4-20 × 115mm)

Tightening torque: 2 to 3N·m (20 to 300kg·cm)



NOTE:

Be careful not to over tighten so that foot material collapses.

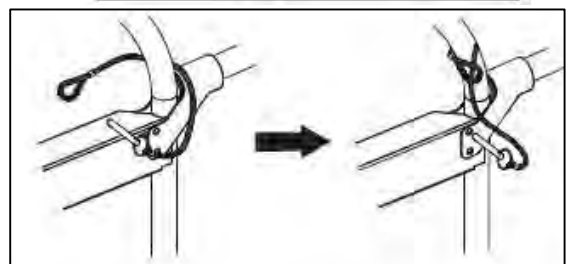
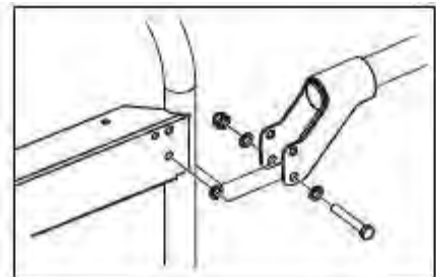
Repeat with remaining foot.

Locate the following items:

- 2 Handles
- 2 Bolts(5/16-8 × 2-1/4in.)
- 2 Washers(5/16in.)
- 2 Lock nuts(5/16in.)
- 2 Nylon washer(5/16in.)

Tightening torque: 4 to 6N·m (40 to 60kg·cm)

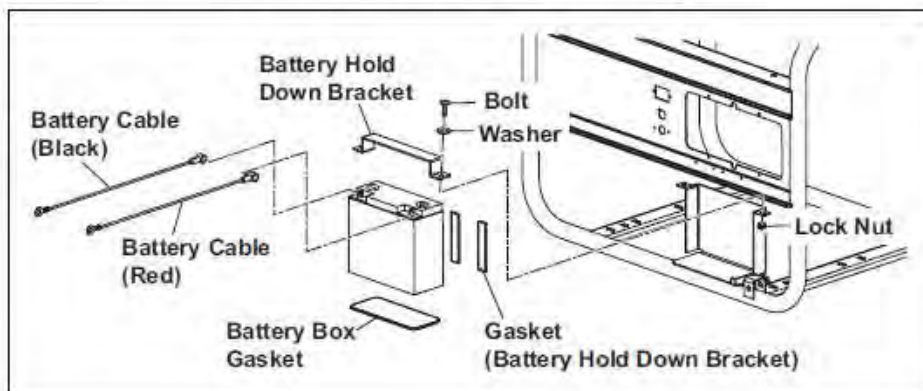
- 2 Handle lock pins
- 2 Lanyards



BATTERY INSTALLATION (Electric Starter Model)

Recommended Battery

Type ; Lead-acid battery (SEALAKE FM12180)
Capacity (Ah/20hr) ; 12V-18AH
Size ; 178(L) x 75(W) x 167(H) mm



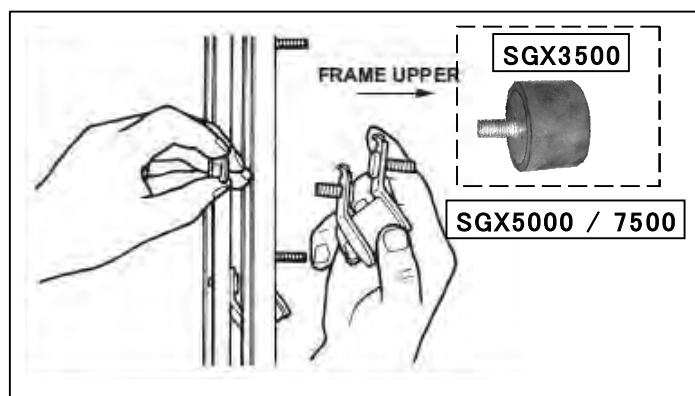
7-4 ASSEMBLY PROCEDURES

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)



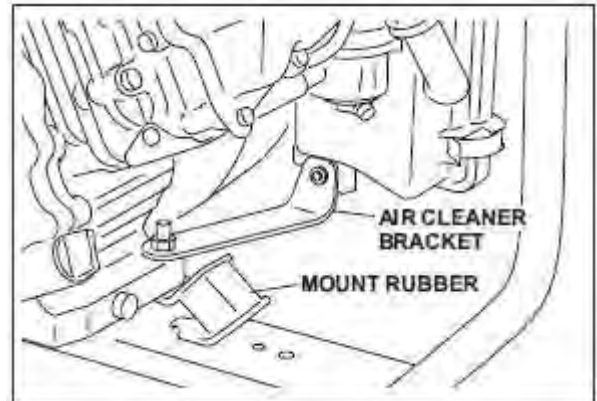
*NOTE : The mount rubbers are selected to reduce vibration most effectively by model.
Be sure to use the correct mount rubber for your generator.
Although mount rubbers have the same appearance, their characteristics are different.*

- (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.



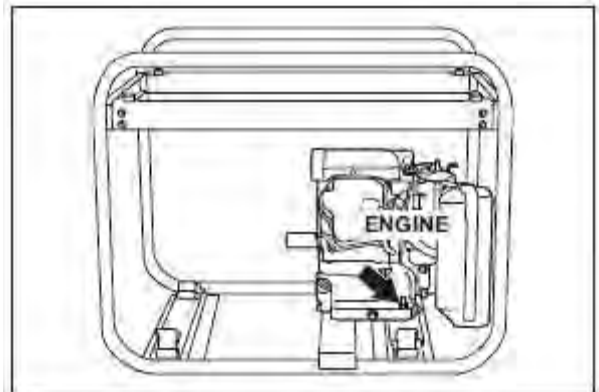
NOTE : Remove the air cleaner cover for easier installation.

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.

7-4-3 FRONT COVER

(1) Attach the front cover to the engine main bearing cover.

SGX3500

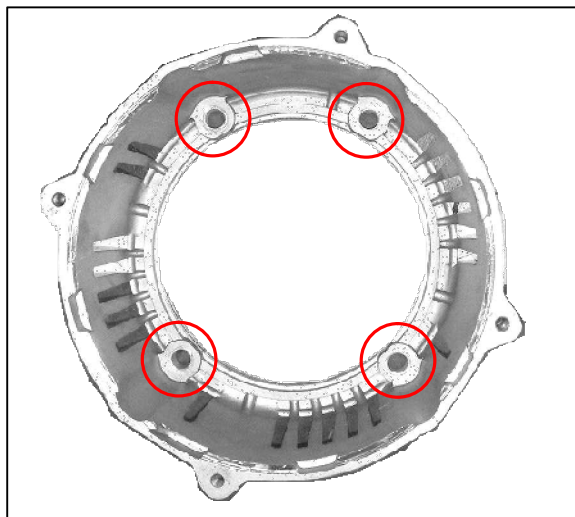
5/16-24 flange bolt . . . 4 pcs.

Tightening torque : 24.0-30.0 N·m 240-300 kgf·cm (17.8-22.2 ft·lbs)
--

SGX 5000 / 7500

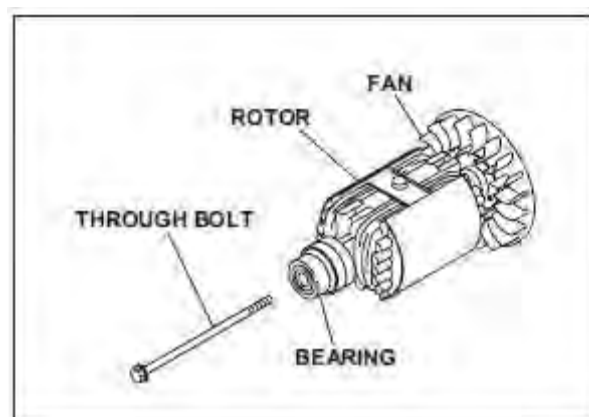
3/8-16 flange bolt . . . 4 pcs.

Tightening torque : 40.0-65.0 N·m 408-663 kgf·cm (29.5-48.0 ft·lbs)
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7-4-4 ROTOR

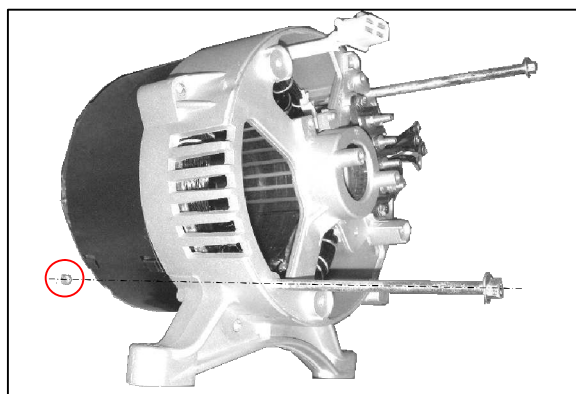
- (1) Wipe off oil, grease and dust from the tapered portion of engine shaft and matching tapered hole of rotor shaft.
- (2) Mount the rotor to the engine shaft.
Tighten the through bolt.
flange bolt . . . 1 pc.



7-4-5 STATOR

- (1) Put the rear cover on the stator and pull out the stator wirings through the opening of the rear cover.
- (2) Tighten the stator and the rear cover
With flange bolt and nut.

Tightening torque : 3.0-5.0 N·m 30-50 kgf·cm (2.2-3.7 ft·lbs)
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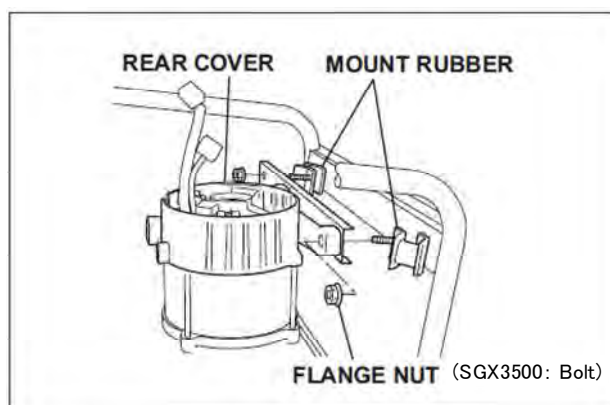


- (3) Put on the stator with rear cover evenly
with a plastic hammer to press the rotor bearing
into the rear cover.

- (3) Fix the rear cover with flange bolts.
flange bolt . . . 4 pc.

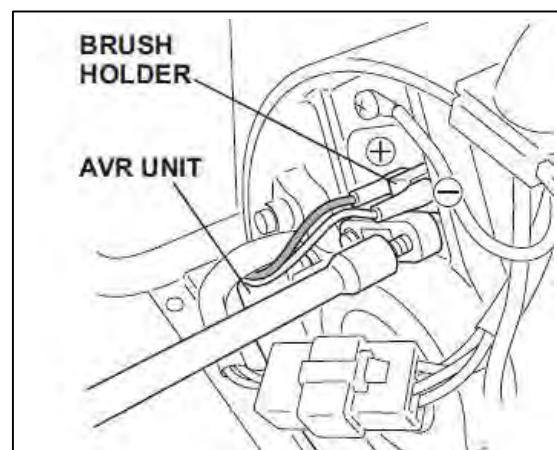
NOTE : Tighten the bolts evenly and in turns.

Tightening torque :	3.0-5.0	N•m
	30-50	kgf•cm
	(2.2-3.7	ft•lbs)



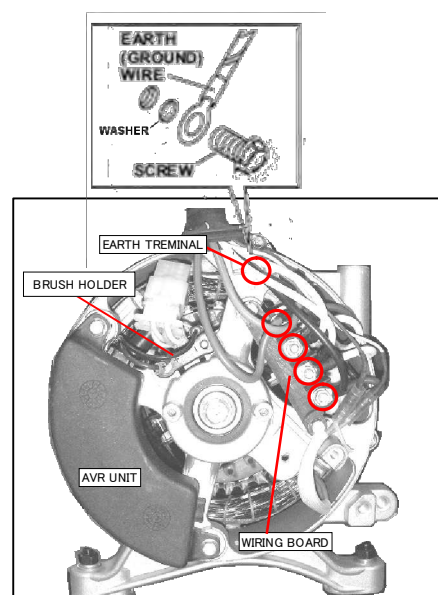
- (4) Set the mount rubber bolts into the rear
cover holes.
Do not tighten the nut at this moment.
- (5) Install the brush holder, AVR unit and wiring board
in the rear cover.
M5 × 16 bolt . . . 5 pcs.
(AVR unit, brush holder, wiring board)

Tightening torque :	3.0-5.0	N•m
	30-50	kgf•cm
	(2.2-3.7	ft•lbs)

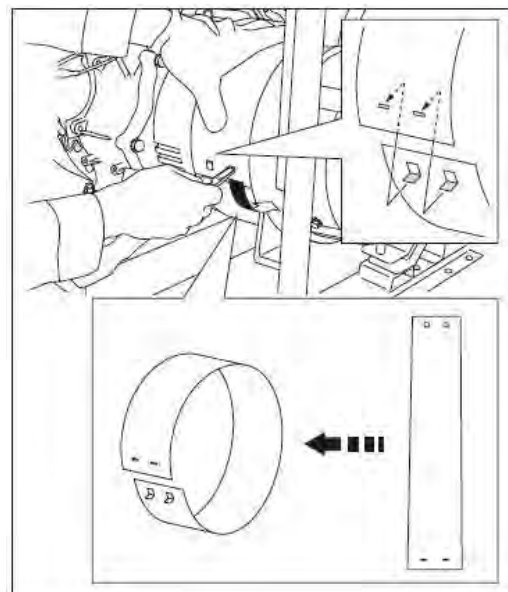


*NOTE : If the brush is installed oblique to the slip ring, there is possibility that the brush holder can
break when the screw is tightened : or the brush may break when generator of started.
Make this process carefully.*

- (6) Attach the connectors to the brush holder, AVR unit.
- (7) Set the wires on the wiring board and tighten with
washers and nuts.
- (8) Connect the earth (ground) wire (green) with the
rear cover at earth terminal with screw and washer.
- (9) Connect earth (ground) wire between frame
and rear cover mount rubber nut (bolt).
On frame side: M6 × 12 bolt . . . 1 pc.
(commonly tighten the mount rubber bolt)



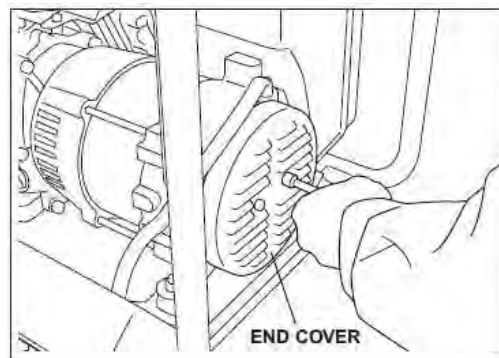
(10) Set stator cover with the claw inserted into slit and bent (2 pcs).



(11) Attach the end cover to the rear cover.

M5 × 8 bolt . . . 2 pcs.

Tightening torque : 3.0-5.0 N·m
30-50 kgf·cm
(2.2-3.7 ft·lbs)

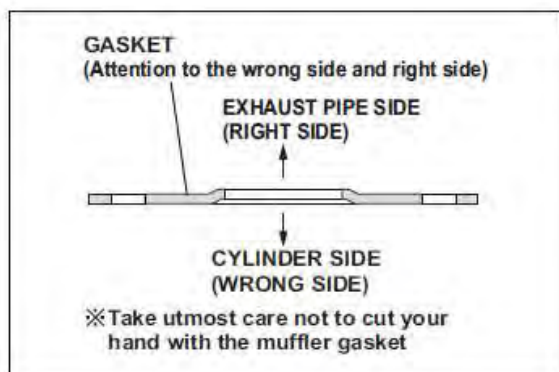
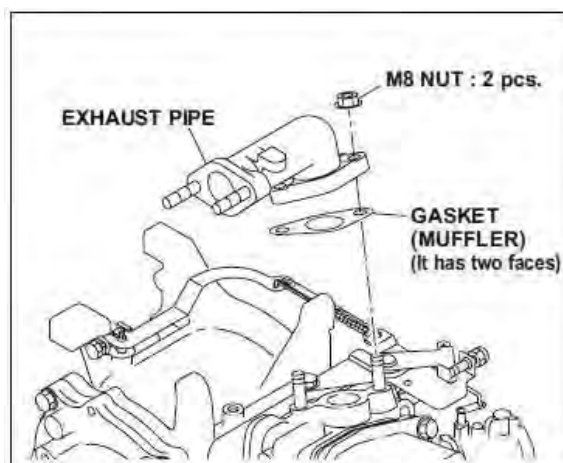


7-4-6 MUFFLER and MUFFLER COVER

(1) Mount the Exhaust pipe and the gasket on the cylinder head.

M8 flange nut . . . 2 pcs.

Tightening torque : 18.0-22.0 N·m
180-220 kgf·cm
(13.3-16.2 ft·lbs)



- (3) Temporally attach the muffler and gasket to the exhaust pipe.

Temporally attach the muffler bracket 2 to
After that, tighten the nuts and flange bolts.
M8 flange nuts . . . 2 pcs. (exhaust pipe)

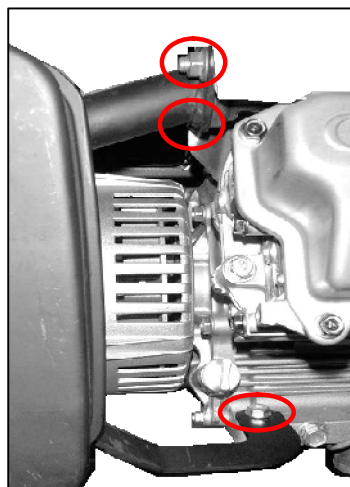
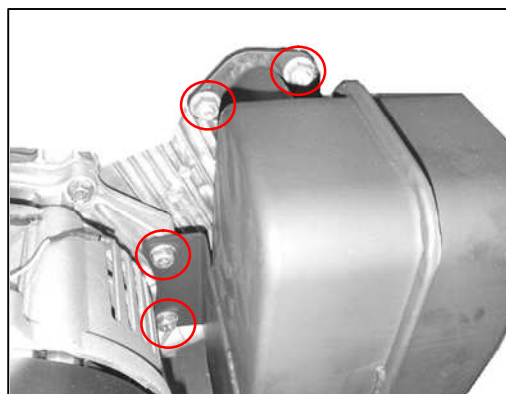
Tightening torque :	18.0-22.0 N•m
	180-220 kgf•cm
	(13.3-16.2 ft•lbs)

5/16-24 x 16 flange bolt . . . 2 pcs.

SGX3500

5/16-18 x 38 bolt, nut and washer (1pc).

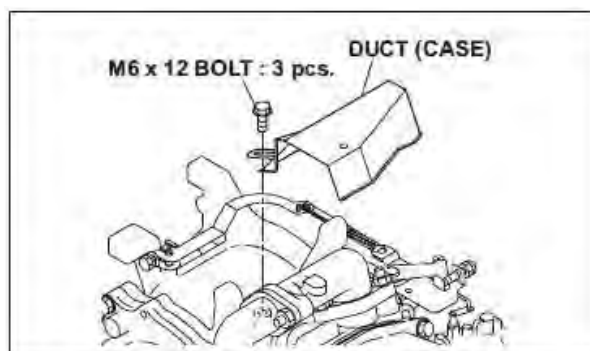
Tightening torque :	18-25 N•m
	180-250 kgf•cm
	(13.3-18.5 ft•lbs)



- (4) Assemble the duct.

M6 x 12 flange bolt . . . 3 pcs.

Tightening torque :	6.5-8.5 N•m
	65-85 kgf•cm
	(4.8-6.3 ft•lbs)



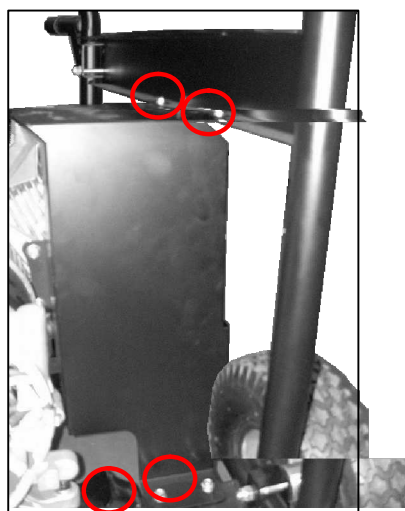
- (5) Attach the muffler cover to the flame.

Temporally attach the muffler cover to the Home.

Tapping screw 2pcs.

M5 x 12 flange bolt and nut . . . 2 pcs.

Tightening torque :	4.0-6.0 N•m
	40-60 kgf•cm
	(3.0-4.4 ft•lbs)



7-4-7 FUEL TANK

(1) Hand tighten the strainer screw as far as it will go, loosen it again by one or two rotations (fuel outlet faces down), then tighten the lock nut.

(2) Mount the fuel tank on the frame.

M6 x 25 mm flange bolt . . . 4 pcs.

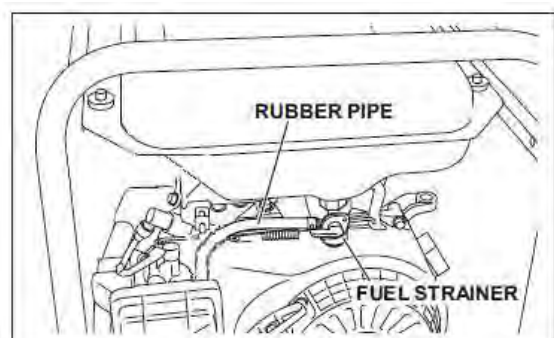
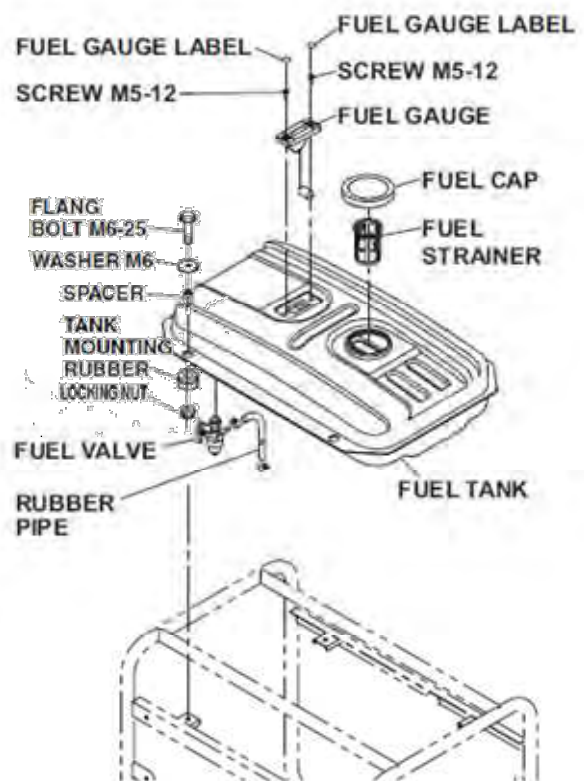
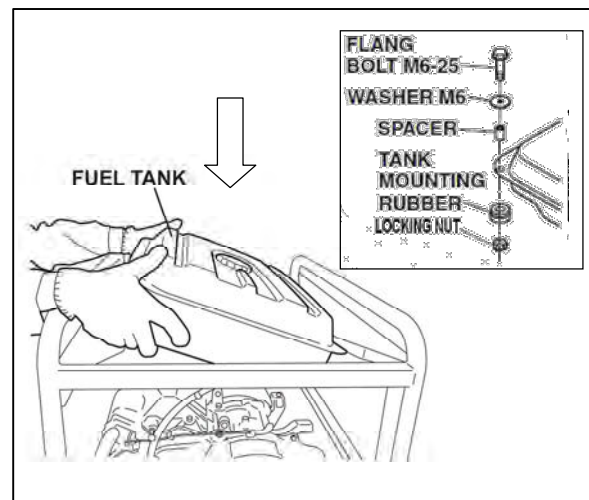
Washer M6 . . . 4 pcs.

Spacer . . . 4 pcs.

Tank mounting rubber . . . 4 pcs.

Locking nut. 4 pcs.

NOTE : For easy tank assembly, glue the rubber washers over the mounting holes of the frame.



7-4-8 CONTROL BOX ASSY

- (1) Pass wires drawn out generator and engine to the control box.
- (2) Connect the wires coming from the control panel with wires coming from generator and engine.

NOTE : Connect the wires of the same color.

- (3) Mount the control panel together with the control box (Control box Assembly) onto the frame.

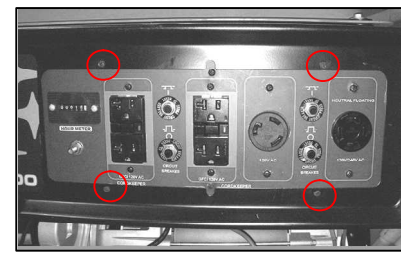
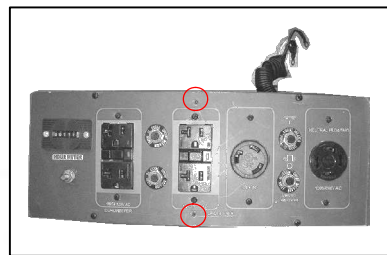


M4 × 12 mm flange bolt . . . 2 pcs.

- (4) Install the control box onto the frame.

M4 × 12 mm flange bolt . . . 4 pcs.

Tightening torque :	1.0-1.5	N·m
	10-15	kgf·cm
	(0.7-1.1	ft·lbs)



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

7-5-1 CHECKING OF THE CONTROL PANEL

Dismount the control box assy. from frame. Remove the control box from control panel 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 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 and control box to the frame.
(Refer to 7-4-9 for details.)

8. TROUBLESHOOTING

8-1 NO AC OUTPUT

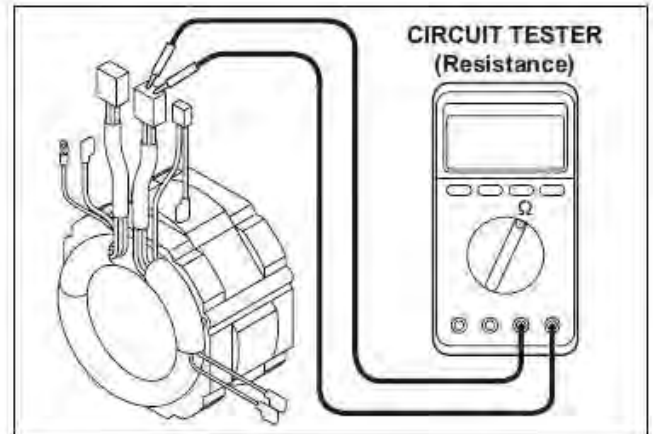
8-1-1 CHECKING STATOR

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

(2) Measure the resistance between terminals on stator leads.

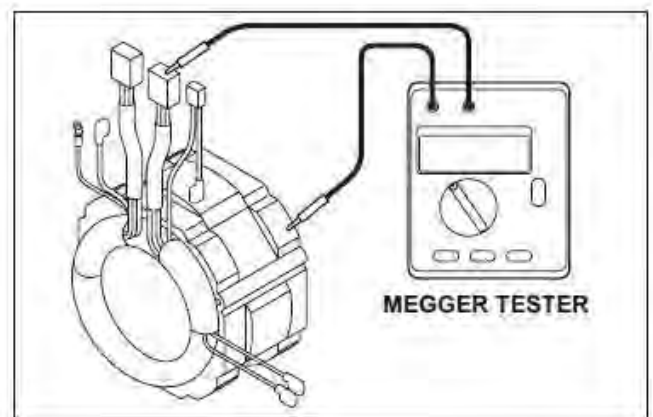
Refer to Table of Section 6-3 STATOR for normal resistance.

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



(3) Check the insulation resistance between stator core and each stator lead using a megger tester.

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

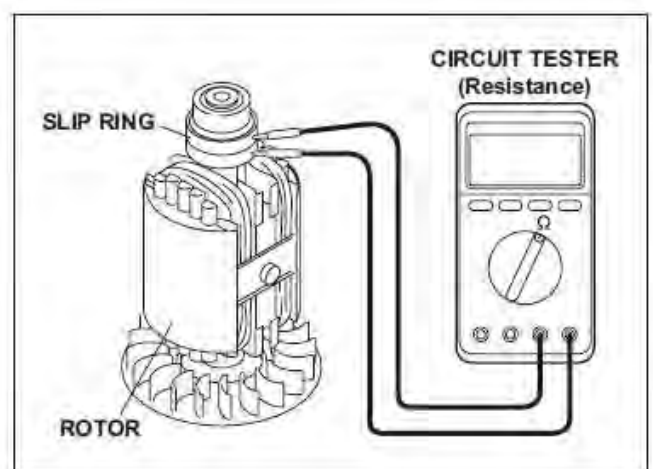


8-1-2 CHECKING ROTOR

1) Field coil

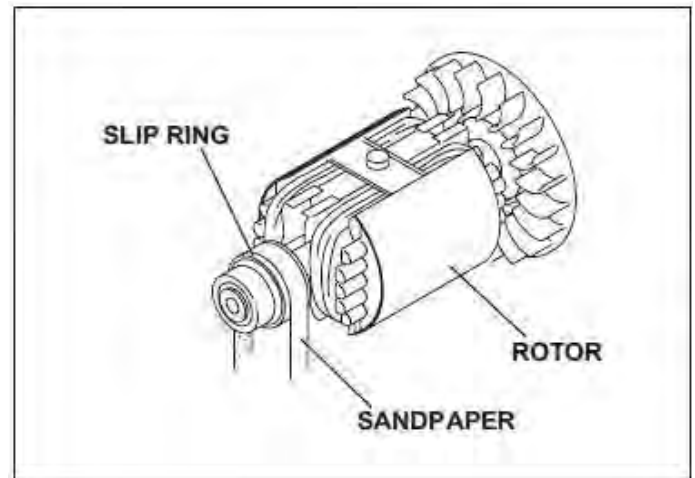
Remove the brush holder and measure resistance between the slip rings. Refer to Section 6-4 ROTOR ASSEMBLY for normal Resistance

NOTE : 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 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.



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.

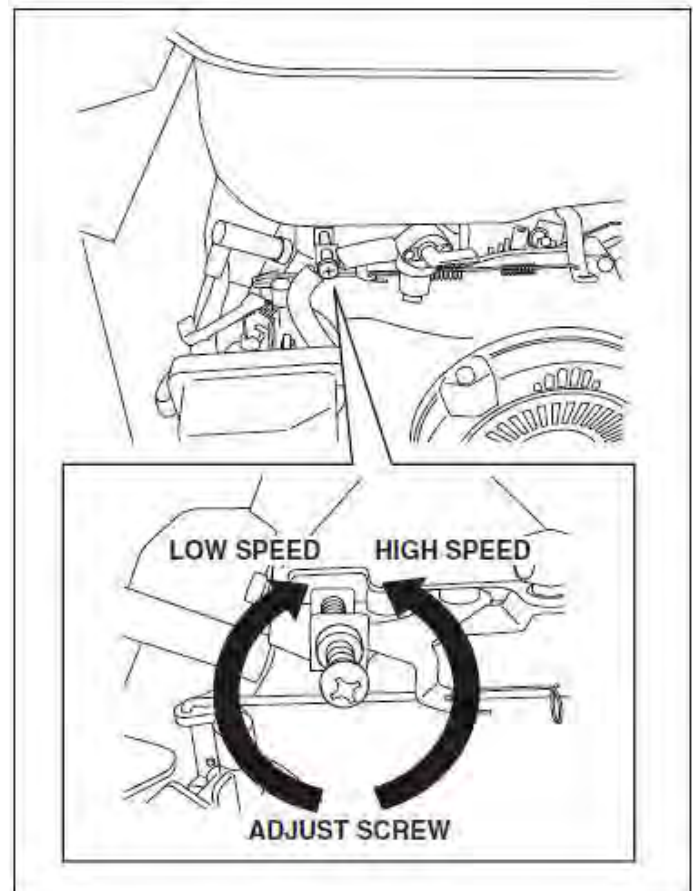
Normal engine speed at no load :
3700 to 3900 rpm

8-2-2 CHECKING STATOR

Check stator referring to Step 8-1-1.

8-2-3 CHECKING ROTOR

Check rotor referring to Step 8-1-2.



8-3 AC VOLTAGE IS NORMAL AT NO-LOAD, BUT THE LOAD CANNOT BE APPLIED.

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.

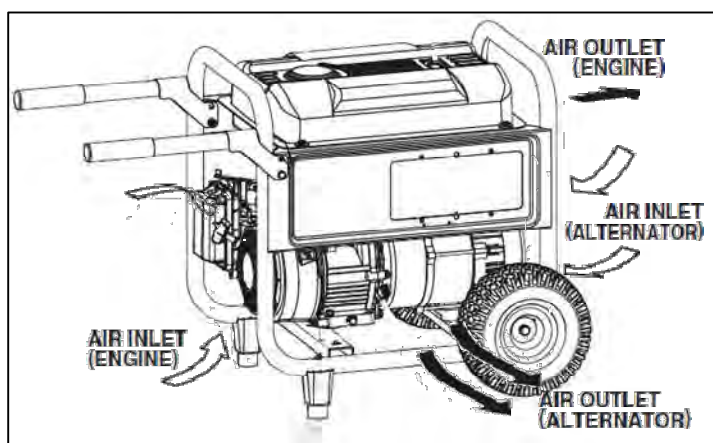
If the generator is overloaded, reduce the load to the rated output of the generator.

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.

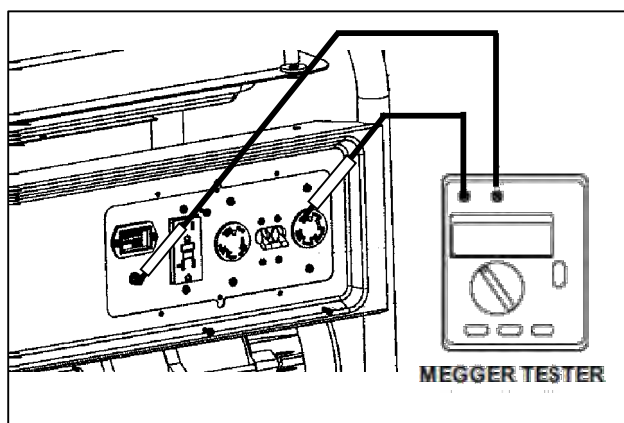
(1) Stop the engine. Remove the control panel, and disconnect the connector of GREEN lead for ground.

(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.)

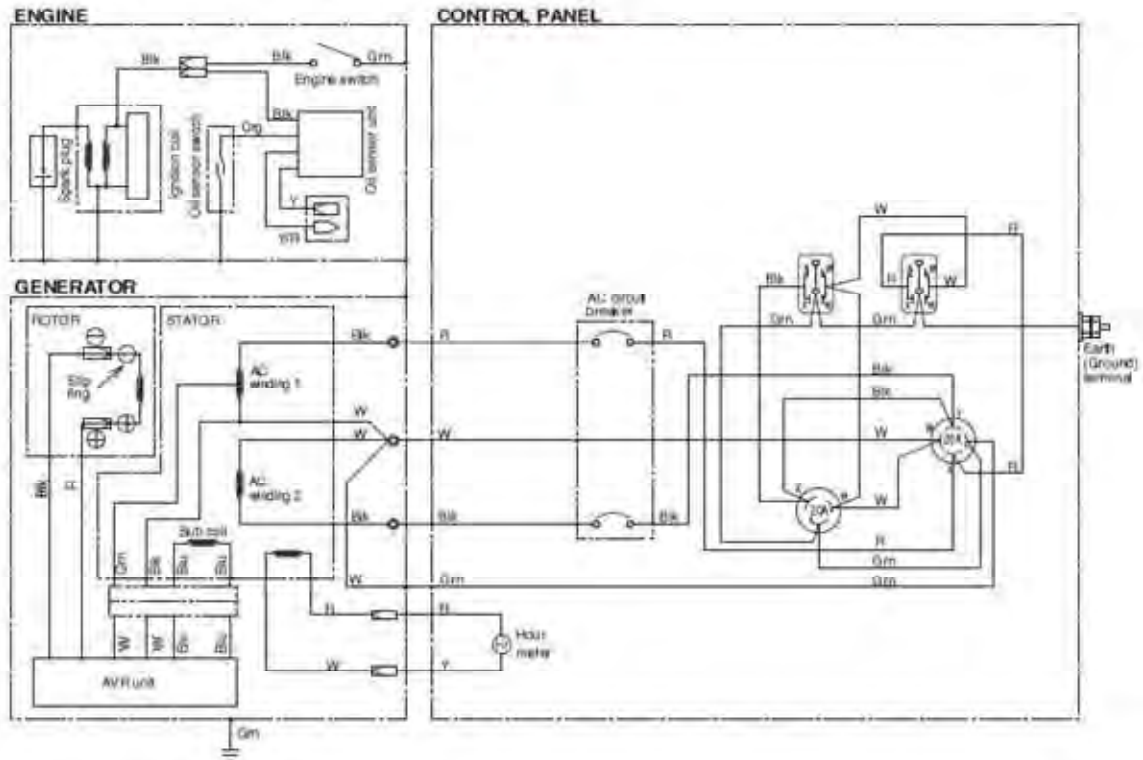
Any part where the insulation resistance is less than $1M\Omega$, the insulation is faulty and may cause electric leakage.

Replace the faulty part.

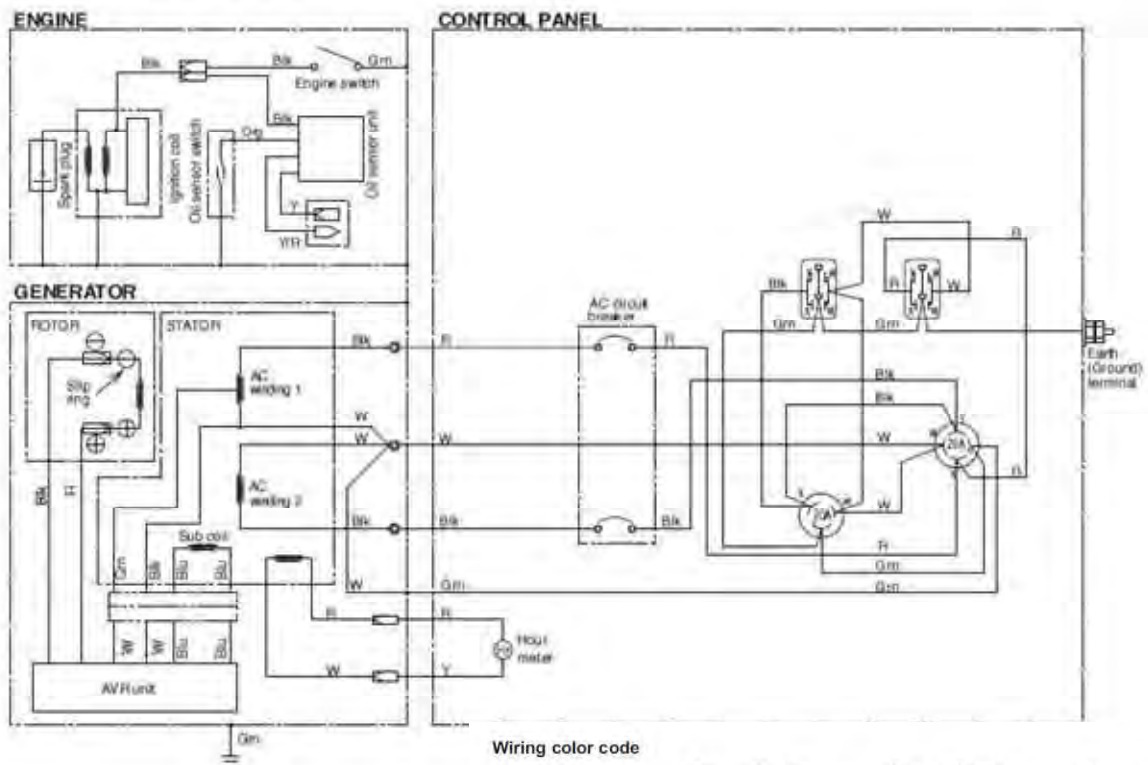


9. WIRING DIAGRAM

SGX3500 (60Hz-120/240V)



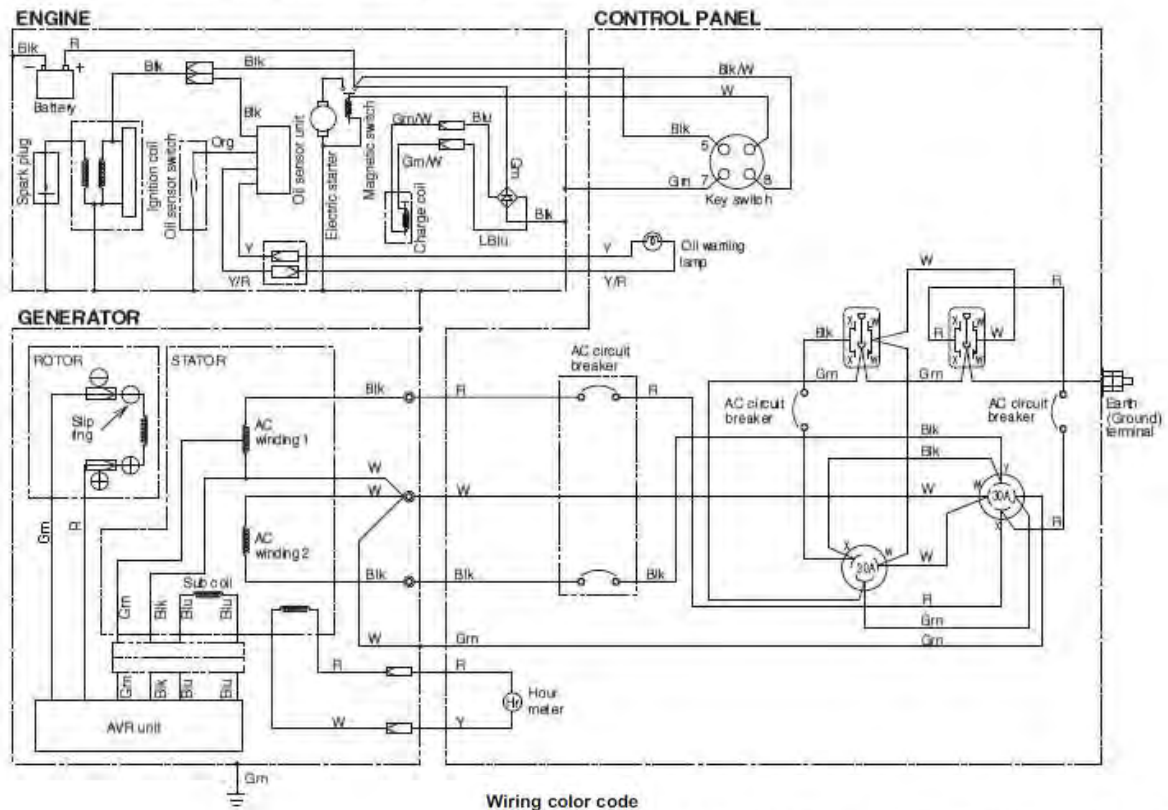
SGX5000 (60Hz-120/240V)



Wiring color code

Blk : Black	Brn : Brown	Org : Orange	Y : Yellow
Blk/W : Black/White	Brn/W : Brown/White	Gry : Gray	W/Blk : White/Black
Blu : Blue	Gm : Green	R : Red	Gm/Y : Green/Yellow
LBlu : Light blue	Gm/W : Green/White	W : White	Pur : Purple

SGX7500 [Electric Starter Model] (60Hz-120/240V)



Wiring color code

Blk : Black	Brn : Brown	Org : Orange	Y : Yellow
Blk/W : Black/White	Brn/W : Brown/White	Gry : Gray	W/Blk : White/Black
Blu : Blue	Grn : Green	R : Red	Grn/Y : Green/Yellow
LBlu : Light blue	Grn/W : Green/White	W : White	Pur : Purple