



Robin Generator

Model RGX 180

RGX 240, RGX 240D

ISSUE EMD-GS0068

Technical Data & Overhaul Instructions
SERVICE MANUAL

CONTENTS

	<i>Page</i>
1. SPECIFICATIONS	1
2. PERFORMANCE	2
2-1 Model RGX180	2
2-2 Model RGX240	3
2-3 Model RGX240D	4
2-4 DC OUTPUT (RGX240, RGX240D)	5
3. FEATURES	6
4. GENERAL DESCRIPTION of GENERATOR	8
4-1 External View of Generator	8
4-2 RGX180 Panel	9
4-3 RGX240 Panel	10
4-4 RGX240D Panel	11
5. CONSTRUCTION and FUNCTION	12
5-1 Construction	12
5-2 Functions	13
5-3 Description of Generator Operation	19
5-4 Change of Engine Parts	22
6. SAFETY PRECAUTIONS	26
7. RANGE of APPLICATIONS	27
8. MEASURING PROCEDURE	30
9. CHECKING FUNCTIONAL MEMBERS	34
9-1 Stator Assembly	34
9-2 Rotor Assembly	35
9-3 Brushes	36
9-4 AVR (Automatic Voltage Regulator)	36
9-5 Fuse Holder and Circuit Breaker	38
9-6 Receptacle and AC Plug	39
9-7 Voltmeters and Pilot Lamp	39
9-8 Diode Stack Assembly	39
9-9 Primary Exciting Circuit	40
10. DISASSEMBLY and REASSEMBLY	41
10-1 Preparations and Suggestions	41
10-2 How to Disassemble	41
10-3 How to Reassemble	47
10-4 Control Box Check, Disassembly, and Reassembly	55
11. TROUBLE-SHOOTING	56
12. OPTIONS	60
12-1 Caster	60
13. CIRCUIT DIAGRAM	61

1. SPECIFICATIONS

Model		RGX180				RGX240				RGX240D								
GENERATOR	Type	Self-Exciting, 2 Pole, Single Phase, Revolving-Field																
	Frequency	50Hz				60Hz				50Hz				60Hz				
		Max. Output	1500W				1800W				2000W				2400W			
	AC Voltage	Rated	1300W				1500W				1700W				2000W			
		Rated Current	110V	11.8A	110V	13.6A	110V	15.5A	110V	18.2A	110V	15.5A	110V	9.1A x 2	110V	9.1A		
	220V		5.9A	120V	12.5A	220V	7.7A	120V	16.7A	220V	7.7A	220V	9.1A	220V	9.1A			
	230V		5.7A	--	--	230V	7.4A	--	--	230V	7.4A	--	--	230V	8.3A x 2			
	240V		5.4A	--	--	240V	7.1A	--	--	240V	7.1A	--	--	240V	8.3A			
	Power Factor	1.0																
	DC Output	Not available						12V - 8.3A 100W										
Voltage Regulator	AVR (Automatic Voltage Regulator)																	
Voltage Regulation	Within 3%																	
Type	Robin Air-Cooled 4 Cycle, Single Cylinder, Gasoline Engine																	
ENGINE	Model	EY20D (W1-185)*																
	Displacement	183 cc (11.17 cu. in.)																
	Max. Output	4.7 Ps/3600 rpm, 4.0 Ps/3000 rpm																
	Fuel	Automobile Gasoline																
	Fuel Tank Capacity	10 liters (2.6 U.S. gal.)																
	Oil Capacity	0.6 liters (1.3 U.S. pints)																
	Revolution/min	50Hz-3000 rpm, 60Hz-3600 rpm																
	Ignition System	Robin Solid State Ignition System																
	Starting System	Recoil Starter																
	Fuel Consumption Ratio	1.1 liter/Hr (50Hz) 1.3 liter/Hr (60Hz)						1.3 liter/Hr (50Hz) 1.5 liter/Hr (60Hz)										
Dimensions	Length	552 mm (21.7 in.)																
	Width	377 mm (14.8 in.)																
	Height	482 mm (19.0 in.)																
Dry Weight	43 kg. (9.5 lbs.)						44.5 kg. (98 lbs.)											

*For U.S.A. and Canadian markets

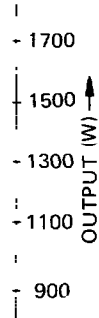
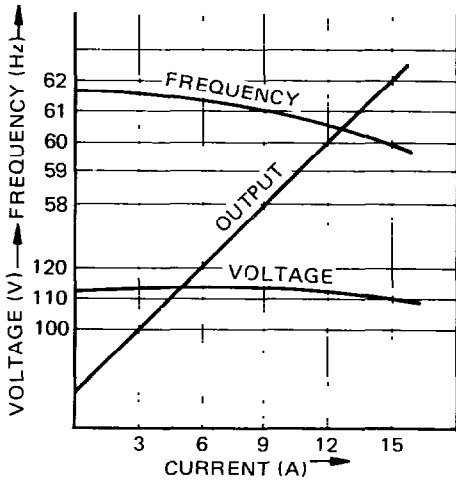
2. PERFORMANCE

2-1 MODEL RGX180

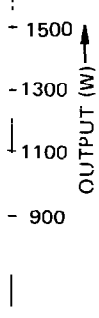
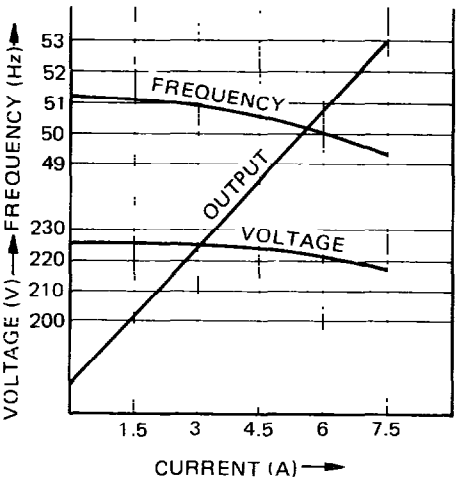
Type Self-Exciting, 2-Pole, Single Phase

Power Factor 1.0

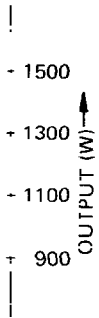
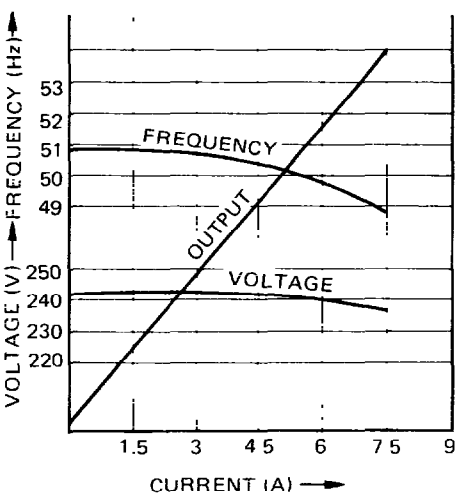
Engine EY20D *(W1-185)



Output Max. 1800W
 Rated 1500W
 Frequency 60Hz
 Voltage 110V



Output Max. 1500W
 Rated 1300W
 Frequency 50Hz
 Voltage 220V



Output Max. 1500W
 Rated 1300W
 Frequency 50Hz
 Voltage 240V

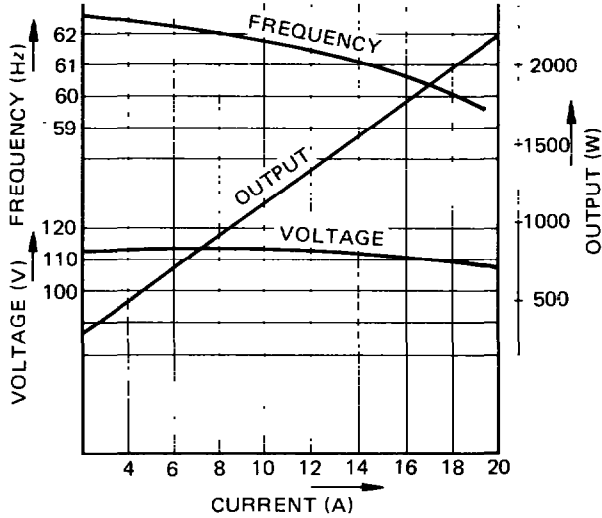
NOTE: These characteristics are typical. Those of 60Hz 120V and 50Hz 110V or 230V are similar to the above.

2-2 MODEL RGX240

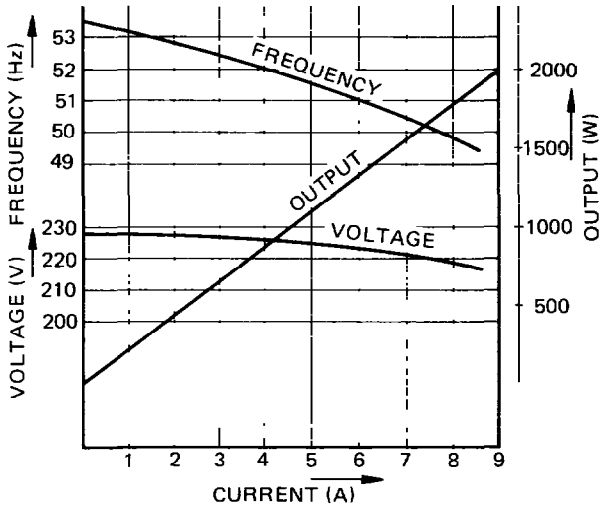
Type Self-Exciting, 2-Pole, Single Phase

Power Factor 1.0

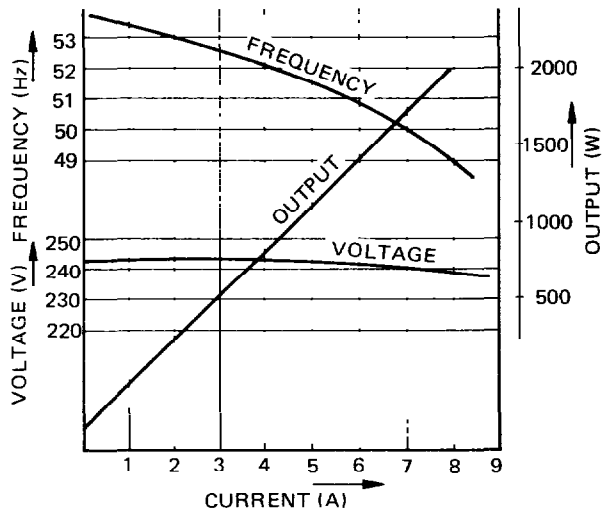
Engine EY20D *(W1-185)



Output Max. 2400W
 Rated 2000W
 Frequency 60Hz
 Voltage 110V



Output Max. 2000W
 Rated 1700W
 Frequency 50Hz
 Voltage 220V



Output Max. 2000W
 Rated 1700W
 Frequency 50Hz
 Voltage 240V

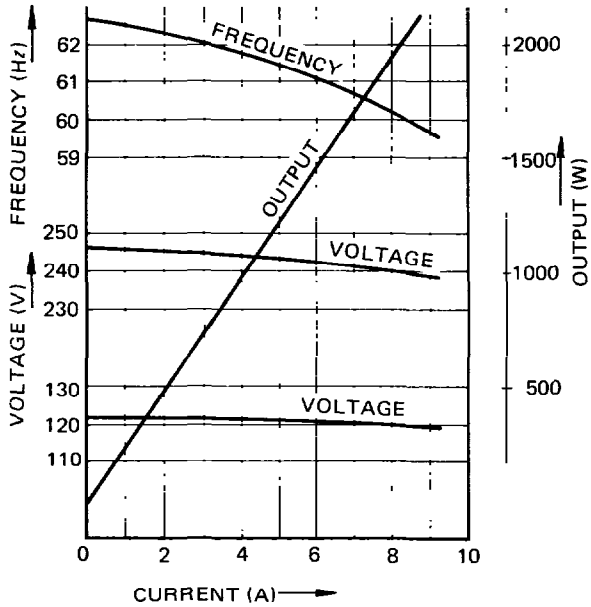
NOTE: These characteristics are typical. Those of 60Hz 120V and 50Hz 110V or 230V are similar to the above.

2-3 MODEL RGX240D

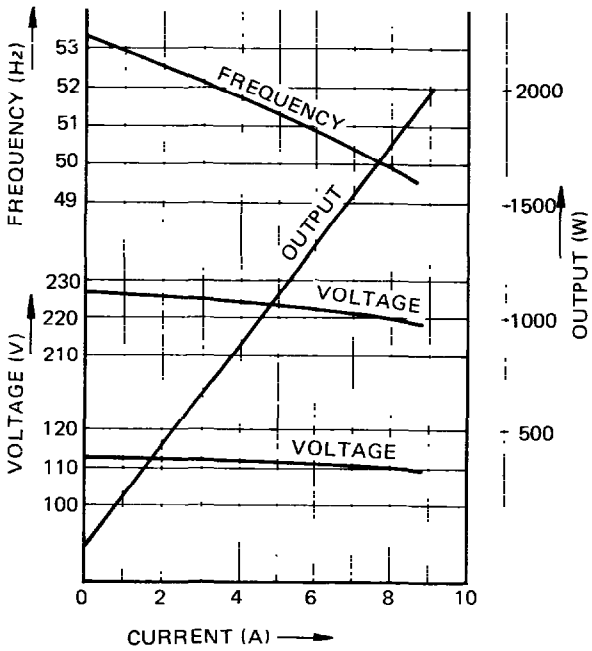
Type Self-Exciting, 2-Pole, Single Phase

Power Factor 1.0

Engine EY20D *(W1-185)



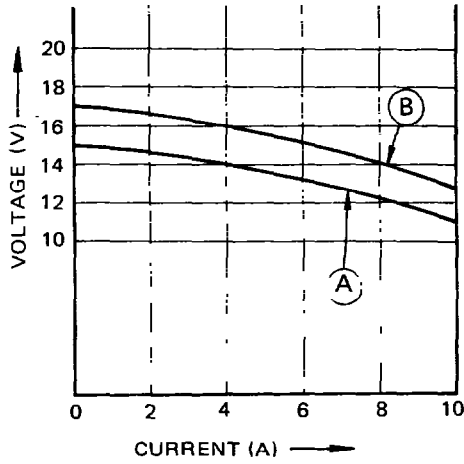
Output Max. 240V-2400W
 120V-1200W x 2
 Rated 240V-2000W
 120V-1000W x 2
 Frequency 60Hz
 Voltage 120V/240V



Output Max. 220V-2000W
 110V-2000W x 2
 Rated 220V-1700W
 110V-850W x 2
 Frequency 50Hz
 Voltage 110V/120V

NOTE: These characteristics are typical. Those of 60Hz 110V/220V and 50Hz 120V/240V are similar to the above.

2-4 DC OUTPUT (RGX240, RGX240D)



DC Voltage 12V
 DC Ampere 8.3A
 DC Output 100W

If the generator is connected to a battery to charge it, its DC output voltage increases. The battery is charged at the increased voltage level. Performance curve (A) applies to a case under a resistance load only; and curve (B) represents battery charging characteristics.

NOTE: Up to the rated output it is possible to take out simultaneously the output of both AC and DC in total.

3. FEATURES

1. Lightweight, Compact

The Robin engine and revolving field generator designs provide added output power per weight and economical operation.

2. Centralized Control

The switches, meters, and receptacles are located together on a large-sized control box, and all operating controls are located on top of the engine for easy generator operation.

3. Large 10-Liter Gas Tank

*10-liter (2.6 U.S. gal.) fuel tank is provided for nine hours of operation for Model RGX180 and eight hours for Model RGX240 (at the 50Hz rated output power).

*The tank has a fuel gauge which shows the remaining amount of fuel in the tank.

4. Solid State Ignition System

*Unlike the breaker point system, the solid state ignition system has no contact points so that maintenance due to point wear is unnecessary and constant output power can be maintained for long periods.

*Increased spark energy makes starting easy.

5. Extra-Quiet Operation

*All models are equipped with a large-sized, low-noise muffler.

*All models have a cyclone type air cleaner of a low-noise, dustproof type.

6. Small Voltage Fluctuations by AVR (Automatic Voltage Regulator)

The automatic voltage regulator automatically adjusts the exciting current to hold voltage regulation down to less than 3%. This helps prolong product life without damaging the electric devices.

7. DC Output for Battery Charging (RGX240, RGX240D)

The generator can generate a DC output (12V, 100W) while generating an AC output so that batteries can be charged during AC operation. In this case, make sure that the total AC and DC output does not exceed the rated output.

8. Dual Voltages are Available on RGX240D.

*A dual voltage type which supplies AC voltage is available.

9. Output Voltage Waveform Close to Sine Wave

The output voltage waveform is close to a sine wave and is free of surges so that the load will not be damaged.

10. Resistant to Inductive Load

Exciting power is obtained from the sub coil which is wound apart from the main coil. This means less output voltage fluctuations against load variation, and thus a steady level of power. This feature is effective particularly for induction motors, for example, which are subject to sharp current variation.

11. 100% Copper Windings

The windings are made only of copper having low internal resistance. This feature also helps improve generator efficiency and prolong generator life.

12. Easy Starting with Recoil Starter

13. Circuit Breaker for Troublefree Operation

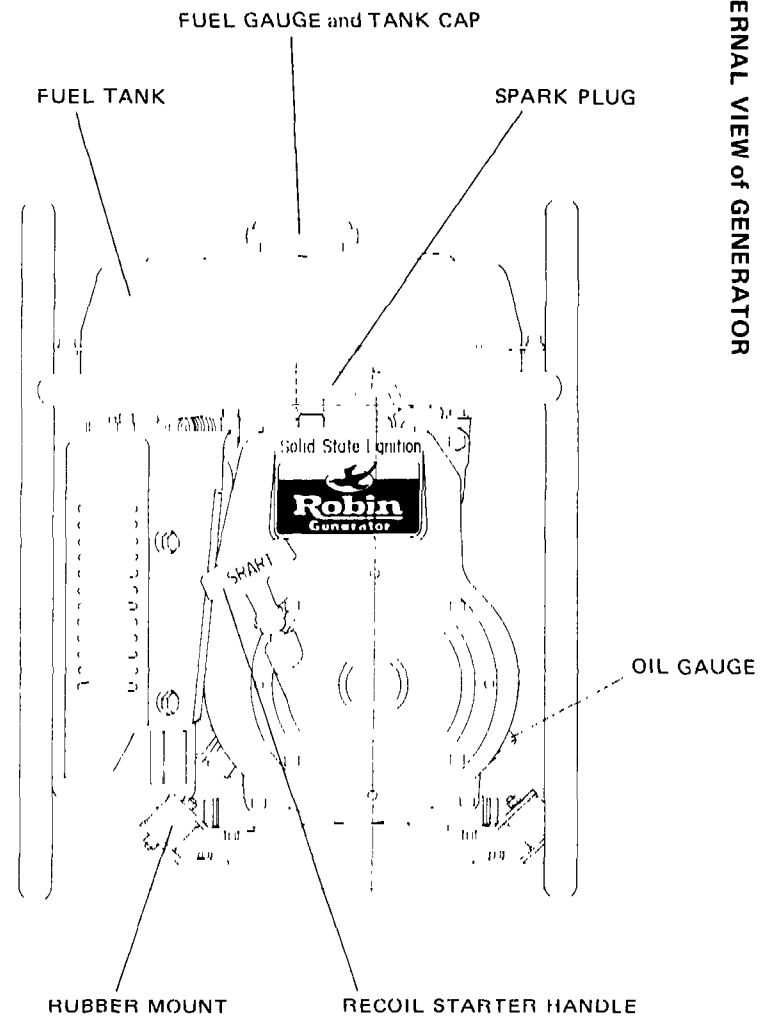
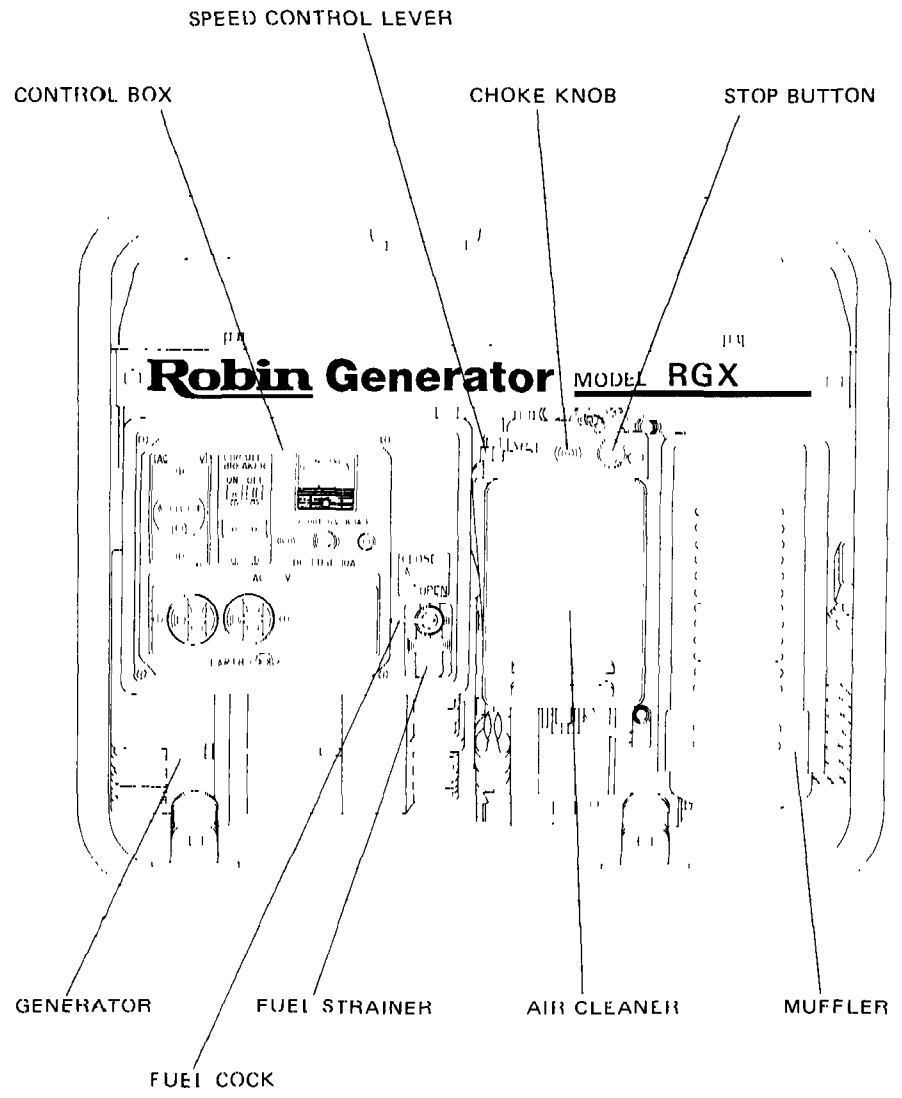
14. Ruggedly Built Frame

The box type frame is so ruggedly built that two or more generators can be stacked. Another convenient feature of the Robin generators.

15. A Caster Type is Optionally Available.

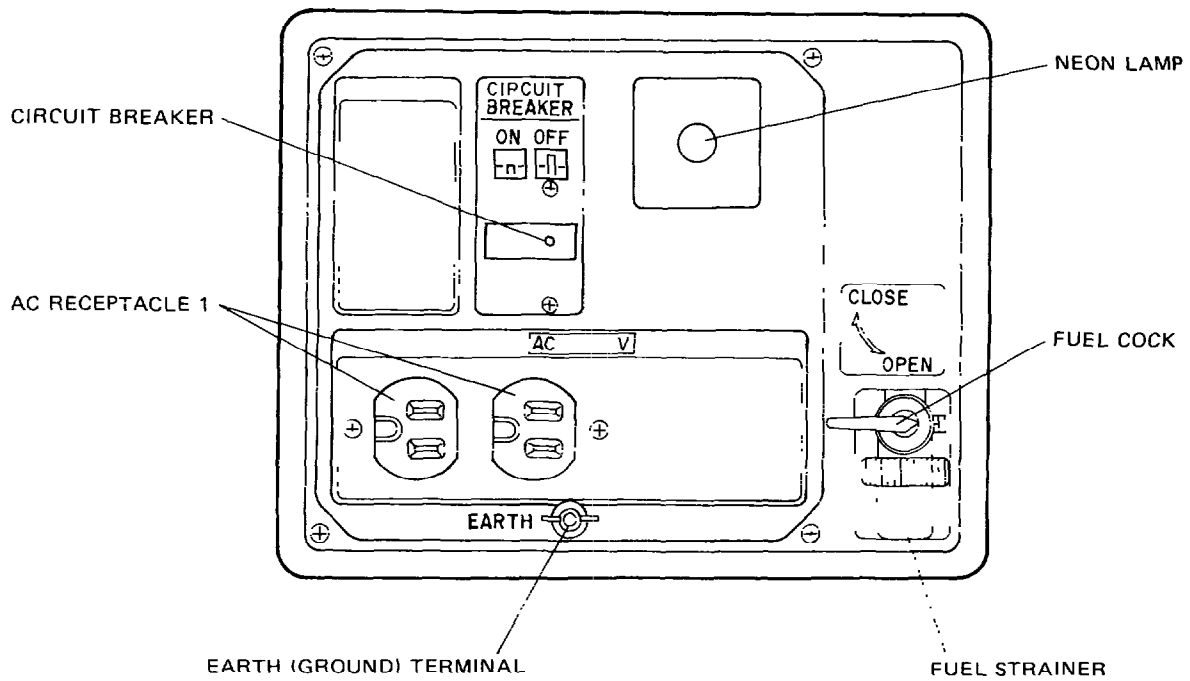
4. GENERAL DESCRIPTION of GENERATOR

4.1 EXTERNAL VIEW of GENERATOR

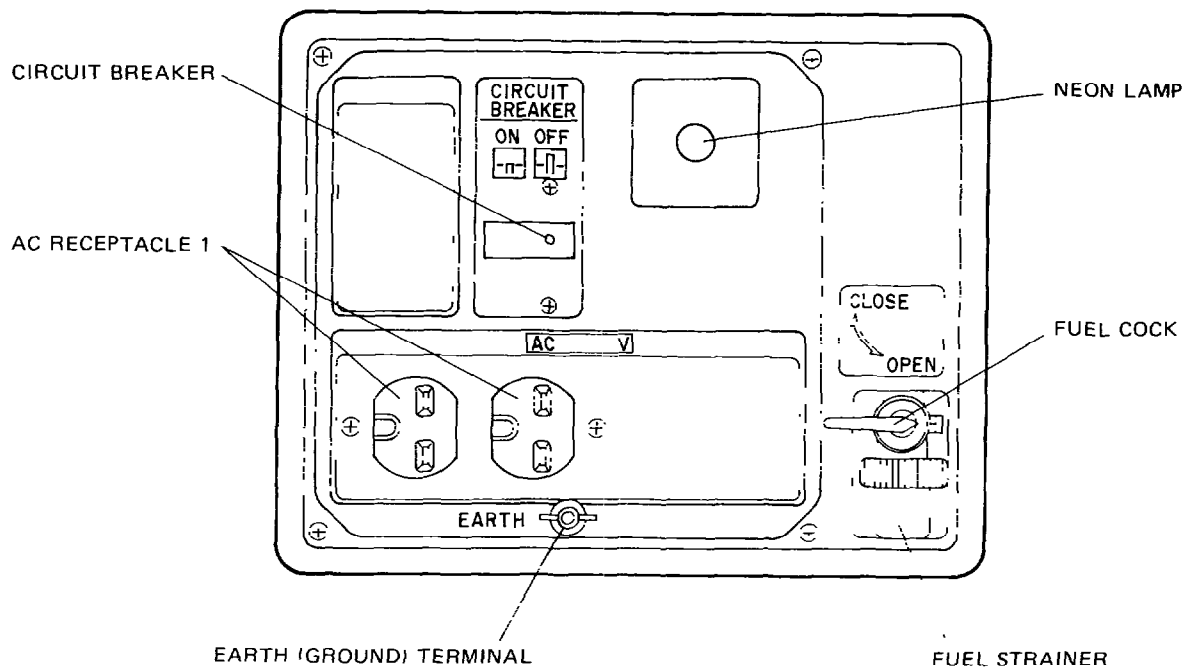


4-2 RGX180 PANEL

4-2-1 110V, 120V

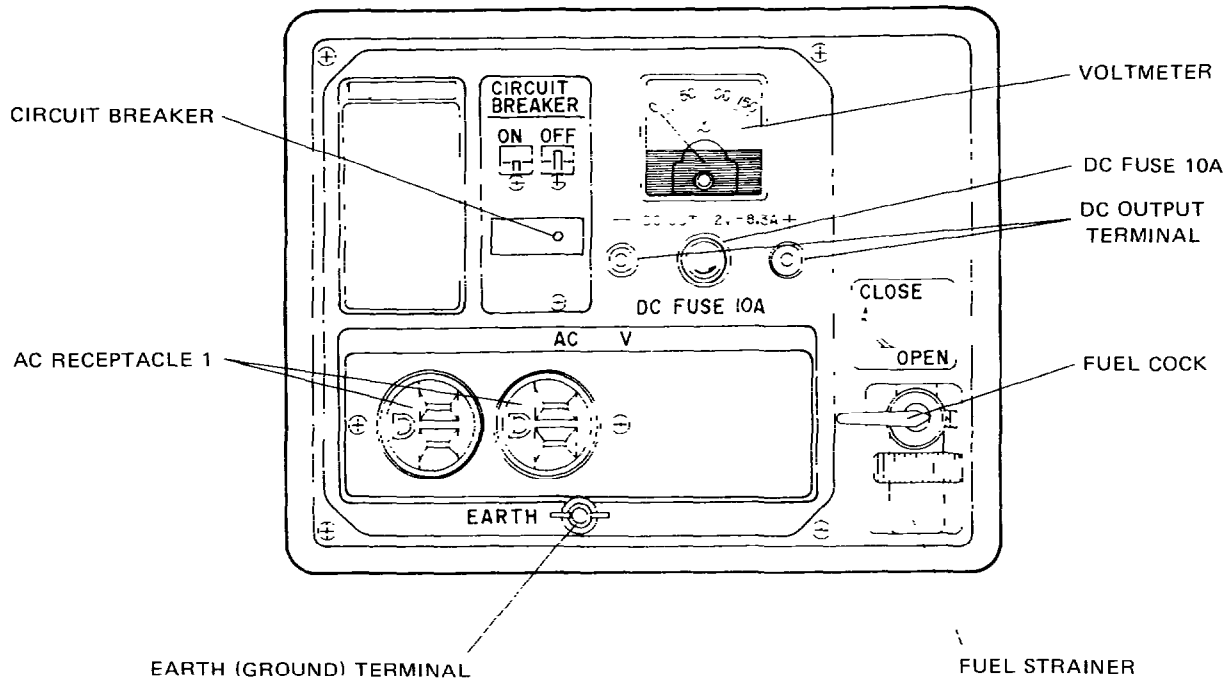


4-2-2 220V, 230V, 240V

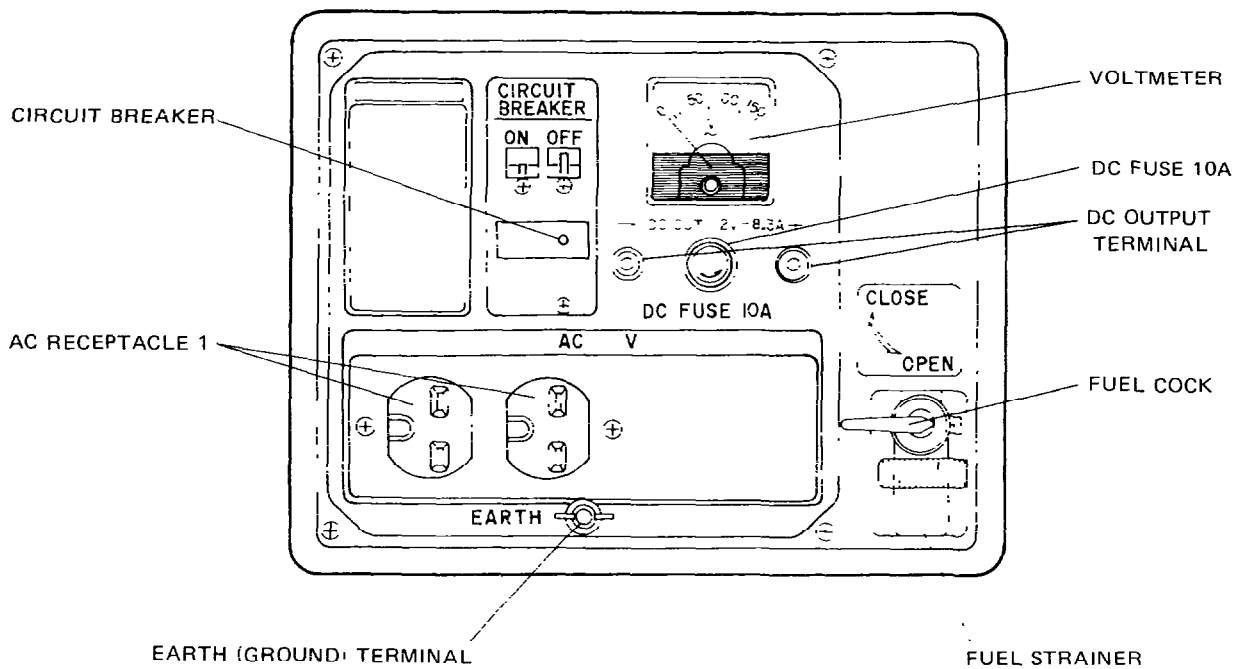


4-3 RGX240 PANEL

4-3-1 110V, 120V

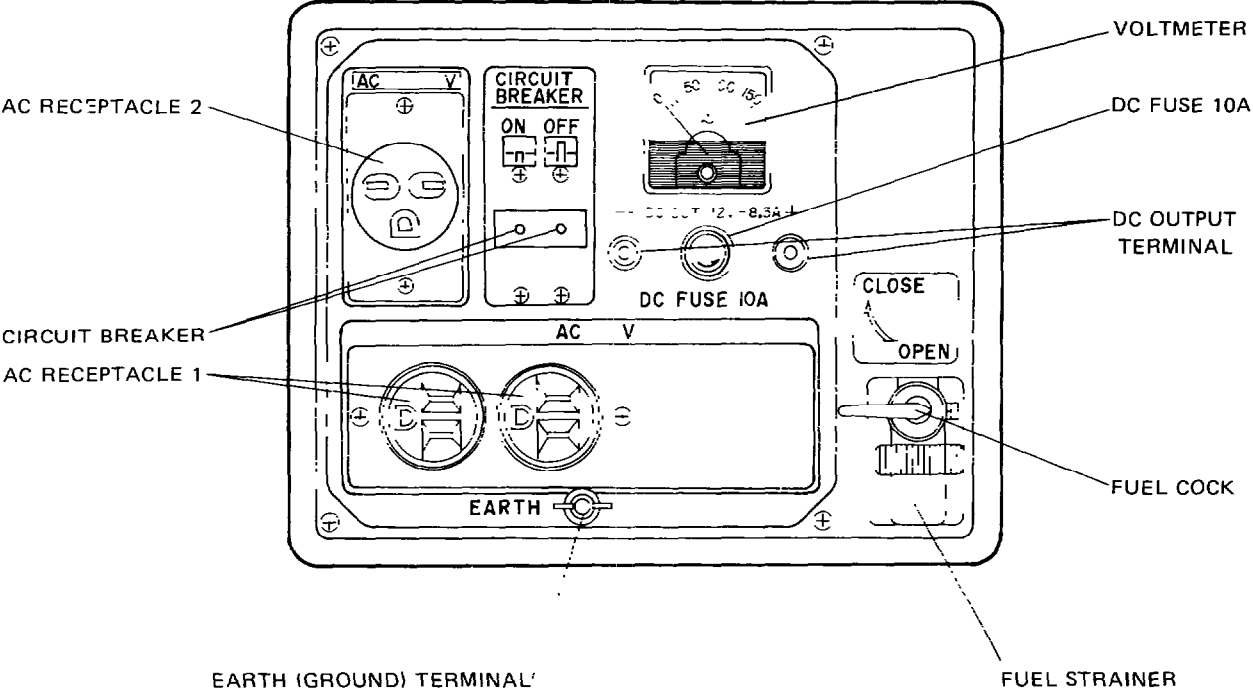


4-3-2 220V, 230V, 240V



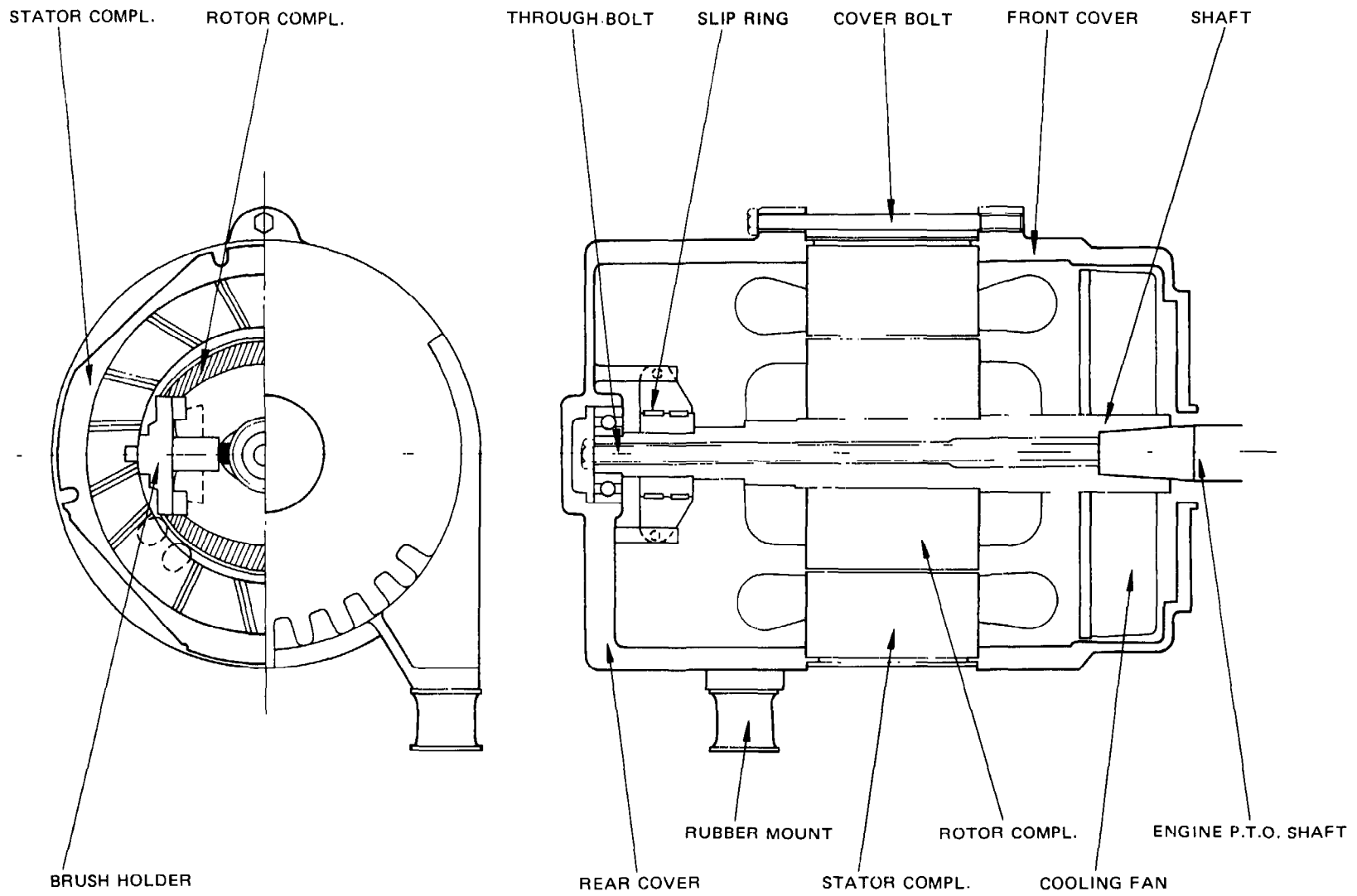
4-4 RGX240D PANEL

4-4-1 110V/220V, 120V/240V



5. CONSTRUCTION and FUNCTION

5-1 CONSTRUCTION



5-2 FUNCTIONS

5-2-1 STATOR

The stator consists of a laminated silicon steel sheet core, copper wire which winds the core, and lead wires which deliver the power. The copper wire is wound into the main coil, sub (auxiliary) coil, and DC coil. AC output power is taken from the main coil, and DC output power from the DC coil. (DC coil is installed on Models RGX240 and RGX240D only.) The outside diameters and laminated core thickness of various models are as shown below.

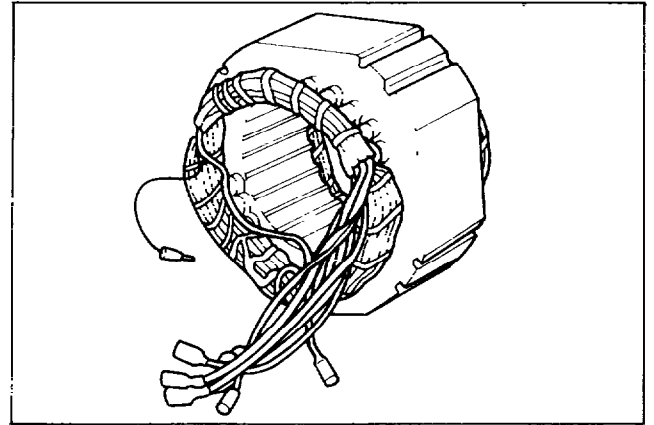


Fig. 5-1

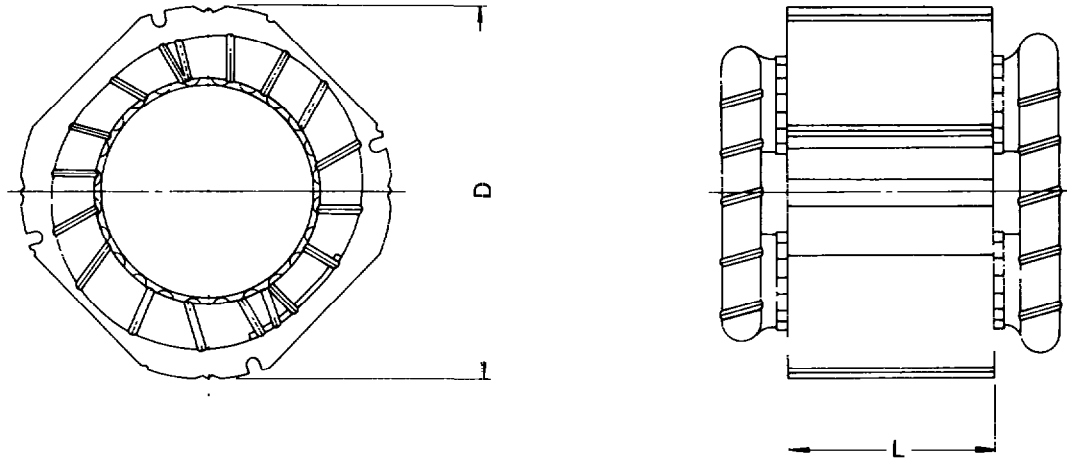


Fig. 5-2

MODEL	RGX180	RGX240 RGX240D
D (mm)	177	177
(in.)	6.97	6.97
L (mm)	60	70
(in.)	2.36	2.76

Table 5-1

5-2-2 ROTOR

The rotor consists of a laminated silicon steel sheet cover with a field coil wound around it and cooling fans and slip rings at both ends of the shaft. The field coil leads are connected to the slip rings and direct current (DC) to the field coil turns the rotor and magnet. The cooling fans cool the generator by drawing cooling air from the slip rings and discharging it through the fans.

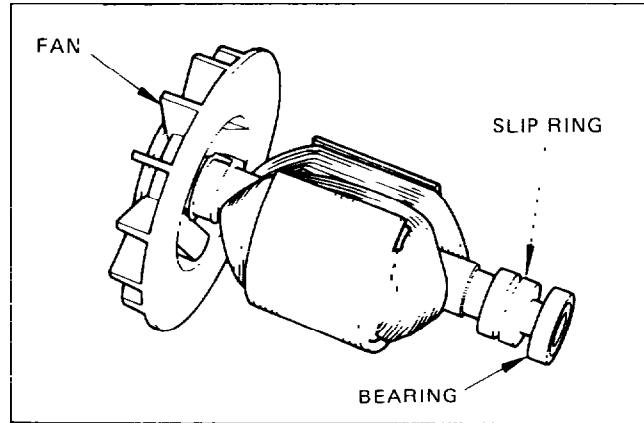


Fig. 5-3

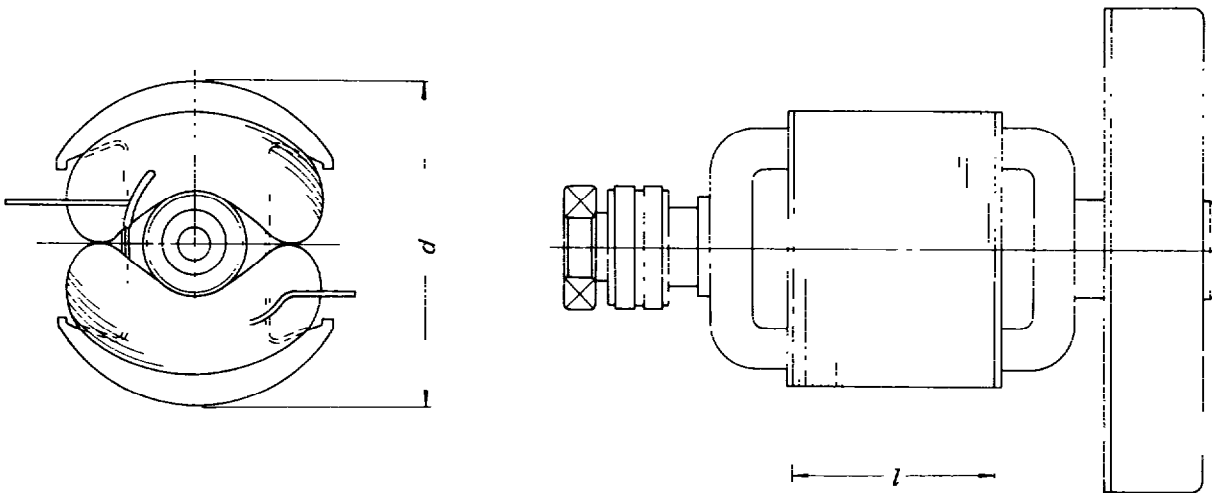


Fig. 5-4

MODEL		RGX180	RGX240 RGX240D
d	(mm)	99.6	99.6
	(in.)	3.92	3.92
l	(mm)	60	70
	(in.)	2.36	2.76

Table 5-2

5-2-3 BRUSHES

An exciting current is supplied from the AVR to the rotor. The brushes are made of carbon, and the brush-holders of plastic. It is necessary to keep the contact pressure between the brushes and slip rings within specific limits. Thus, care must be taken about brush length. (See 9-3 BRUSHES.)

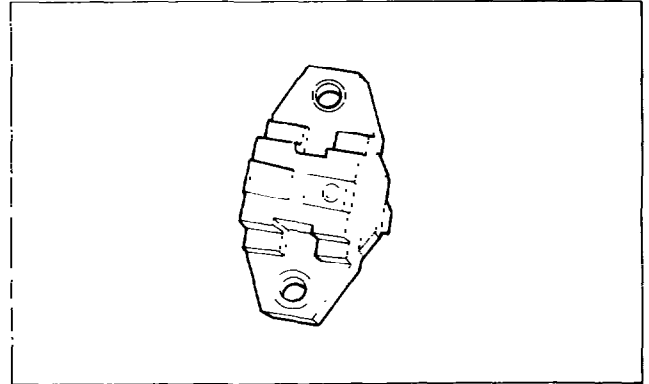


Fig. 5-5

5-2-4 AVR (AUTOMATIC VOLTAGE REGULATOR)

The automatic voltage regulator employs an electronic circuit to automatically regulate voltage.

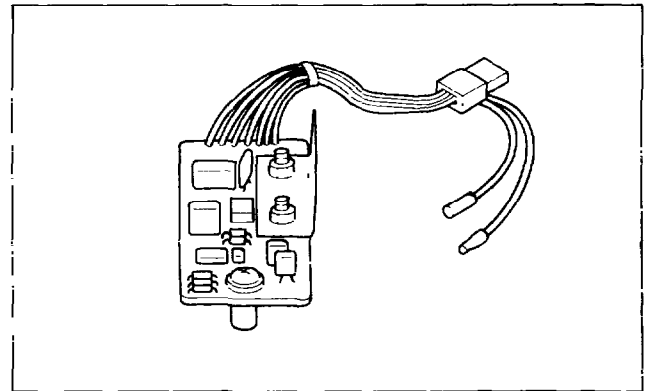


Fig. 5-6

5-2-5 VOLTMETER and PILOT LAMP

Models RGX240 and RGX240D have a voltmeter that comes in two types: 150V maximum type and 300V maximum type. The type of voltmeter indicates generator output voltages. The generators with a generated voltage of 110V or 120V and dual voltage type use the 150V maximum type voltmeter; and those of 220V, 230V and 240V specifications use the 300V maximum type voltmeter.

Model RGX180 employs a pilot lamp. The lamp lights when a voltage is generated. The pilot lamp also comes in two types: 125V type and 240V type. These types are selected to suit generator output voltage.

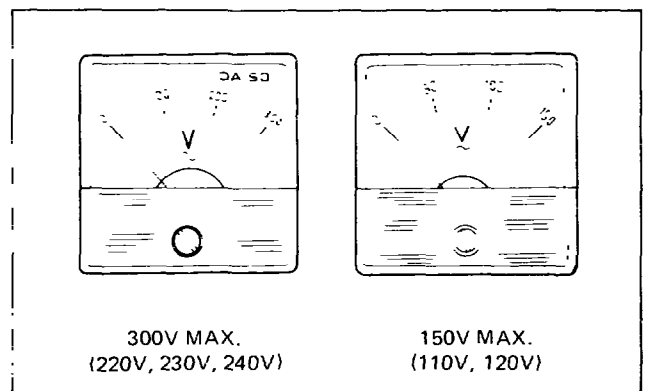


Fig. 5-7 (I)

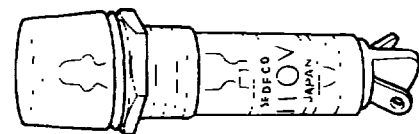


Fig. 5-7 (II)

5-2-6 CIRCUIT BREAKERS

Models RGX180 and RGX240 have a pushbutton circuit breaker and Model RGX240D two pushbutton circuit breakers. Normally, the pushbutton circuit breaker is closed with the button pushed into the panel to keep the circuit live. If an overcurrent runs, the button comes out to break the circuit. The circuit can be closed again by simply pushing the button in. The circuit breaker is a thermo-sensitive type so, if the temperature inside the circuit breaker is still high immediately after the circuit has opened, the button may not be able to be pushed in to the ON position, or may come back out again at once. In that case, wait a while until the inside temperature falls, and then push the button in.

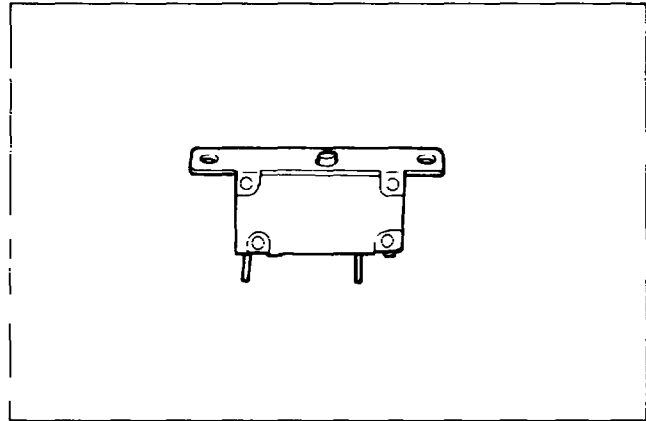


Fig. 5-8

Circuit breaker capacities are as follows:

Model	Specification	Circuit Breaker Capacity	Quantity per Unit
RGX180	110V, 120V	15A	1
RGX180	220V, 230V, 240V	8A	1
RGX240	110V, 120V	20A	1
RGX240	220V, 230V, 240V	10A	1
RGX240D	110/220V, 120/240V	10A	2

Table 5-3

5-2-7 FUSE

The fuse prevents DC output overcurrent and shortcircuit overcurrent. If the generator is operated at a level exceeding the maximum current, it can cause insulation deterioration, burning, electric shock, and electric leakage. The fuse protects the generator from these troubles.

Fuse capacity: 10A

5-2-8 RECEPTACLE and AC PLUGS

These are used for taking AC output power from the generator. A total of three kinds of receptacles, each varying in rated voltage and current from another, are used. As many AC plugs as the receptacles, each matching the corresponding receptacle, are provided. Table 5-4 shows the rated current for each receptacle. Be careful not to use the receptacles and AC plugs beyond the specified limits to prevent burning.



	up to total 15 amperes from two receptacles
	up to 15 amperes

Fig. 5-4

5-2-9 TERMINALS

The terminals are for producing DC output power, and come in two colors, red and black. The red one is positive (+), and the black one negative (-).

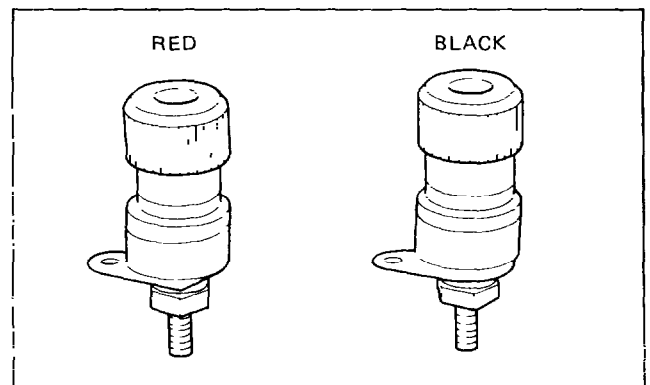


Fig. 5-10

5-2-10 FRONT COVER

The front cover is an aluminum die casting and is mounted on the main bearing cover of the engine. It has vents to discharge cooling air from the generator and the vents are designed to prevent fingers from entering.

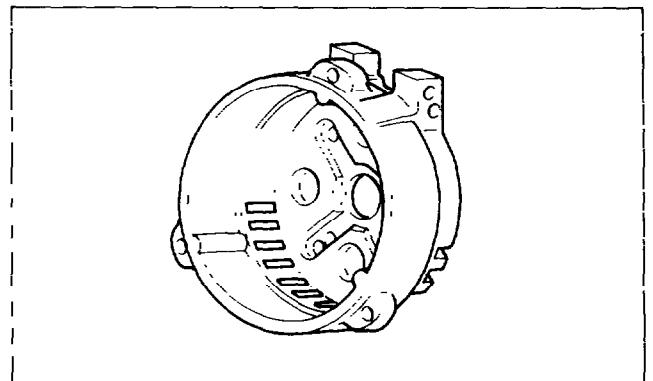


Fig. 5-11

5-2-11 REAR COVER

The rear cover is also an aluminum die casting, and has a faucet joint to hold the stator together with the front cover. It has bosses inside for holding the brushes, and slits for taking cooling air in. The slits are so designed that human fingers will not go in.

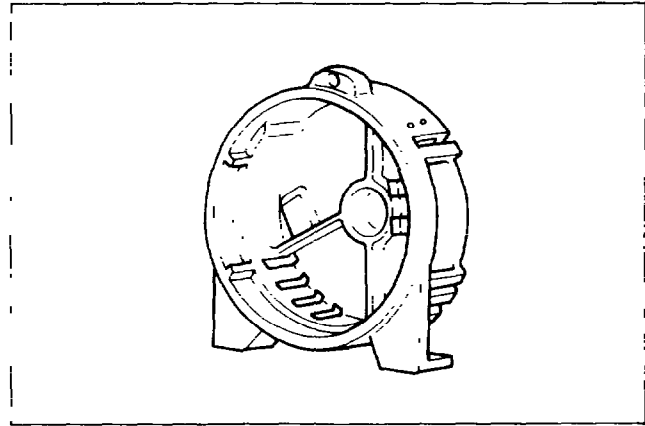


Fig. 5-12

5-2-12 RUBBER MOUNTS (RUBBER VIBRATION ISOLATORS)

Rubber pads for controlling generator vibration and dislocation. These are made of the most suitable rubber material to optimum shape and hardness.

Models RGX180, RGX240, and RGX240D in particular use diagonal support rubbers to reduce vibration.

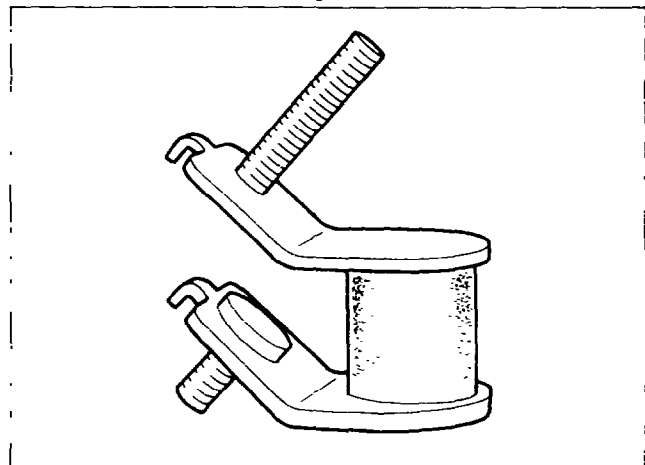


Fig. 5-13

5-2-13 PIPE FRAME

The pipe frame consists of a pipe frame skeleton, side plates A and B and box stay.

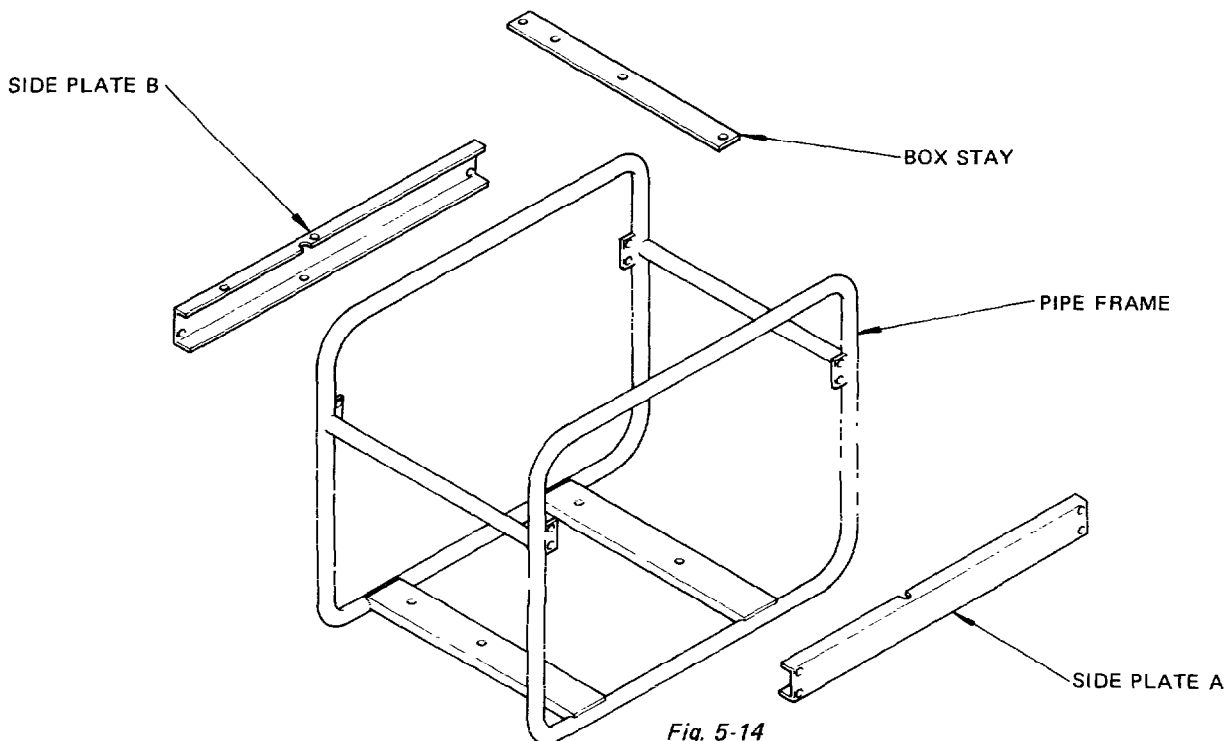


Fig. 5-14

5-3 DESCRIPTION of GENERATOR OPERATION

5-3-1 REVOLVING ARMATURE TYPE and REVOLVING FIELD TYPE

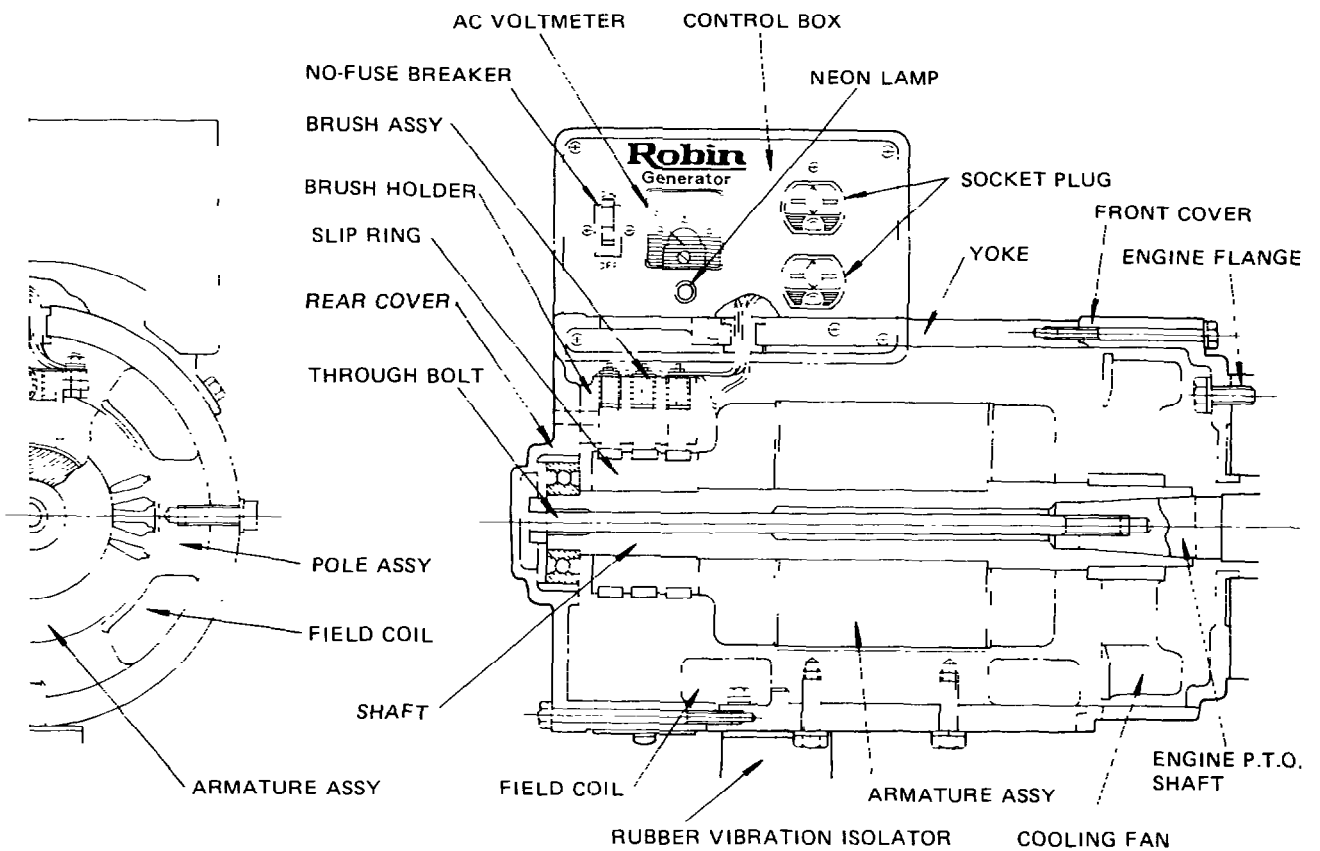


Fig. 5-15

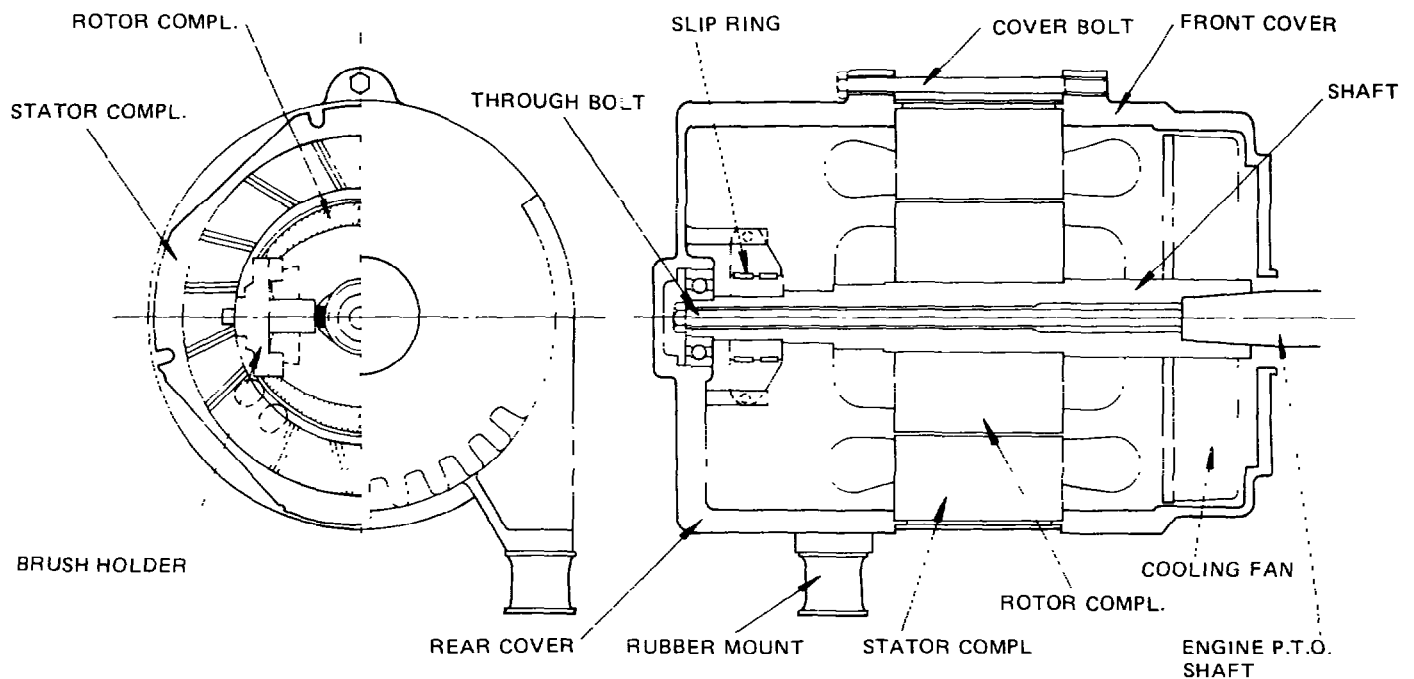


Fig. 5-16

The RG Series is the revolving armature type, and the RGX Series is the revolving field type. The differences between these types and their features are described below. The construction of the revolving armature type is shown in Fig. 5-15, and that of the revolving field type in Fig. 5-16.

The basic operating principle of the generator is this. As a conductor moves in a magnetic flux (between poles N and S of a magnet), a voltage is generated in the conductor and can be taken out as electric power. Generally, an electromagnet is used for generators. The electromagnet consists of poles and field coils wound around them, and the poles become magnets as a direct current runs through the field coils. The revolving armature type has static poles and a revolving armature which consists of a conductor for taking electric power out. The revolution of the armature generates a voltage.

It was earlier explained that a conductor moves in a magnetic flux. Actually, however, a relative speed between the two is sufficient for generating a voltage. That is, a voltage can also be generated by rotating the magnet while keeping the conductor still.

The revolving field type falls in the latter category: The pole serving as an electromagnet rotates, and armature which consists of a conductor remains still.

The features of the revolving field type are as follows:

a) Only two slip rings

As generator applications diversified, it became necessary for generators to meet increasingly varied conditions involving AC output, DC output, dual voltage, three-phase, and usefulness with induction motors. Accordingly, AC windings, DC windings, auxiliary windings, etc. became necessary for generators. Because the revolving armature type takes electric power from the revolving part, it requires as many slip rings as the number of winding output terminals, and this increases the generator dimensions. The revolving field type is small in size because it requires only two slip rings for feeding a current to operate the electromagnet.

b) Easy maintenance

As many brushes as the number of slip rings are necessary. The revolving field type is easier to maintain than the revolving armature type because it has fewer slip rings and brushes than the latter.

c) Lightweight

The revolving armature type is heavy because it requires yokes to fix the poles and serve as flux passage. The revolving field type is light in weight because the stator and rotor can be made by laminating steel sheets of the same material.

5-3-2 PRIMARY EXCITING ACTION

The RGX Series employs an exciting coil in the engine magneto for raising the primary voltage. This action is explained. The RG Series generates a voltage when the generator is started again because of the residual magnetism remaining in the yokes and poles. If a generator of this type is disassembled and stored for a long period of time, the residual magnetism may dissipate so that the generator may not generate a voltage when it is restarted. The RGX Series has an exciting coil for primary exciting action to eliminate such a phenomenon.

The primary exciting action of the new type is explained below.

When the generator is started, the permanent magnet on the engine rotates to generate a voltage in the exciting coil. This voltage is regulated by a diode in the AVR to feed a current to the generator field coil (FC). (See Fig. 5-17(A).)

The rotor is turned into an electromagnet by that current and rotates so that voltages are generated in the stator coils (main coil, sub coil, and DC coil). The voltage generated in the sub coils is operated by the AVR to feed a current to increase the field coil current (See Fig. 5-17(B).) As a result, the rotor magnetism increases. This operation is repeated to generate the rated voltage at 50Hz or 60Hz in the main coil and DC coil.

5-3-3 VOLTAGE REGULATING MECHANISM

Connect a load to the AC output terminal and increase current. Output voltage varies as shown in Fig. 5-17(C) depending on whether an automatic voltage regulator is used or not. The operation of the AVR is explained below.

When an AC output is taken, the engine is loaded and its rpm falls. Also the AC voltage falls due to the voltage drop caused by the internal resistance of the coils. The AVR detects this voltage drop and its built-in SCR automatically increases the current flows to the field coil. As a result, the rotor magnetism increases, the voltage lowered by the load current is raised, and the output voltage is kept constant. If the AC output is reduced, the SCR operates in the opposite way to similarly keep the output voltage constant.

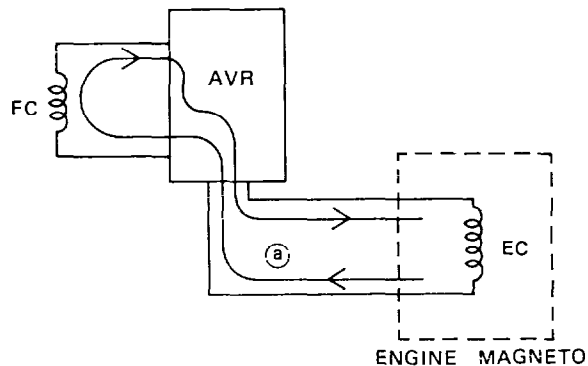


Fig. 5-17(A)

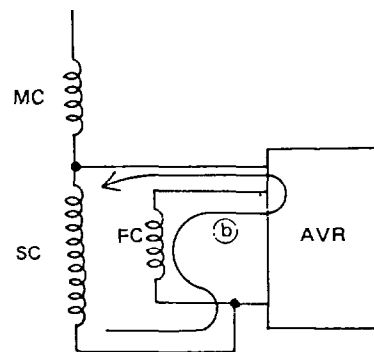


Fig. 5-17(B)

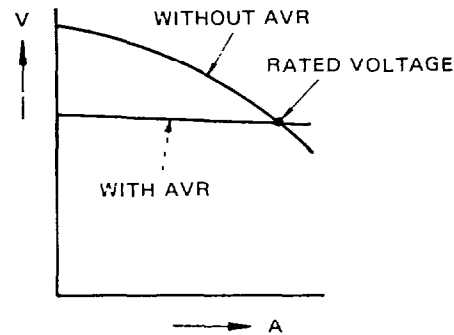


Fig. 5-17(C)

5-3-4 DUAL VOLTAGE TYPE (RGX240D)

The dual voltage type can generate two voltages from a single generator. It comes in two varieties: 120V/240V and 110V/220V. The circuit is shown in Fig. 5-18.

Each of MC1 and MC2 generates an AC 120V (or 110V) with the same phase, which is one half the rated output voltage. This model has two receptacles to output one half of the rated voltage from each of the receptacles (120V or 110V).

MC1 and MC2 are connected in series to each other so that the rated voltage (240V or 220V) can be obtained from the receptacles. (See Fig. 5-19.)

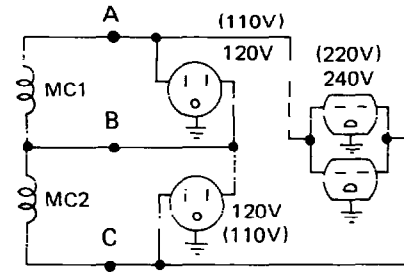


Fig. 5-18

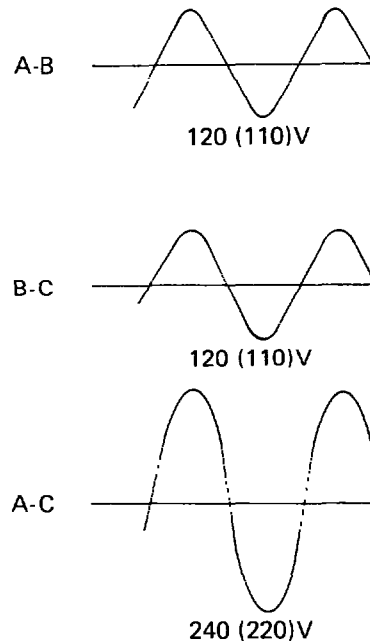


Fig. 5-19

5-4 CHANGE of ENGINE PARTS

For details of the engine, please refer to the EY20 service manual. The RGX Series employs engine parts special to the RGX to suit the modified engine. The engine parts can be classified by ignition system, control system, fuel system, and cooling system. The engine parts for each of these systems are explained below.

5-4-1 IGNITION SYSTEM

RGX Series employs a solid state ignition system (T.I.C.). Please refer to the section on Robin Solid State Ignition Engine in the EY15, EY20 Service Manual.

All models use a primary exciting coil of especial performance and lead length.

NOTE: Be careful not to use an exciting coil of different performance because it can damage the automatic voltage regulator.

5-4-2 CONTROL SYSTEM

The control parts are certainly located to permit centralized control at the top of the engine. The parts added or changed are as shown in Fig. 5-20.

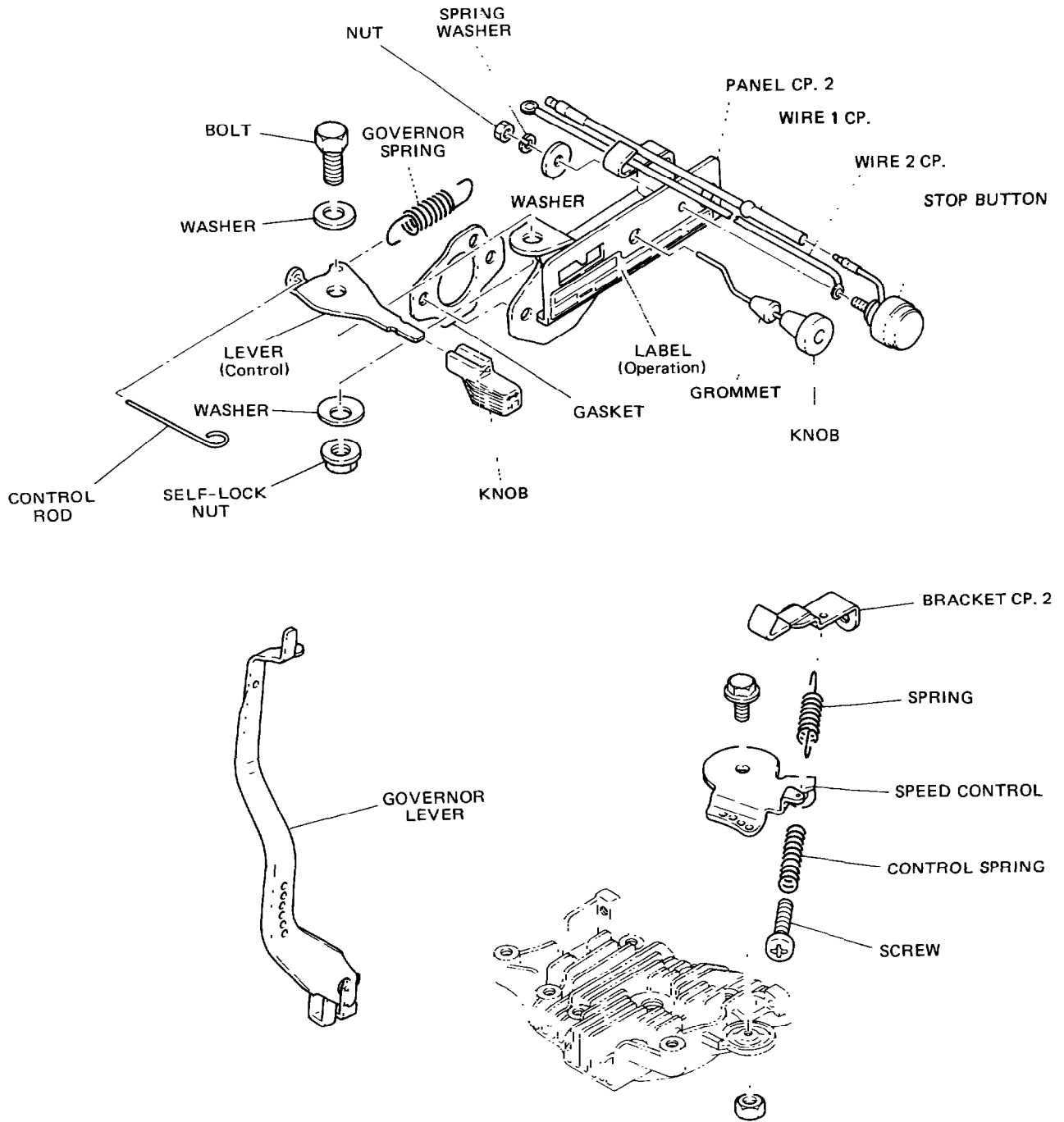


Fig. 5-20

5-4-3 FUEL SYSTEM

The large-sized 10-liter fuel tank is mounted in the frame.
The fuel piping was changed as a result as shown in Fig. 5-21.

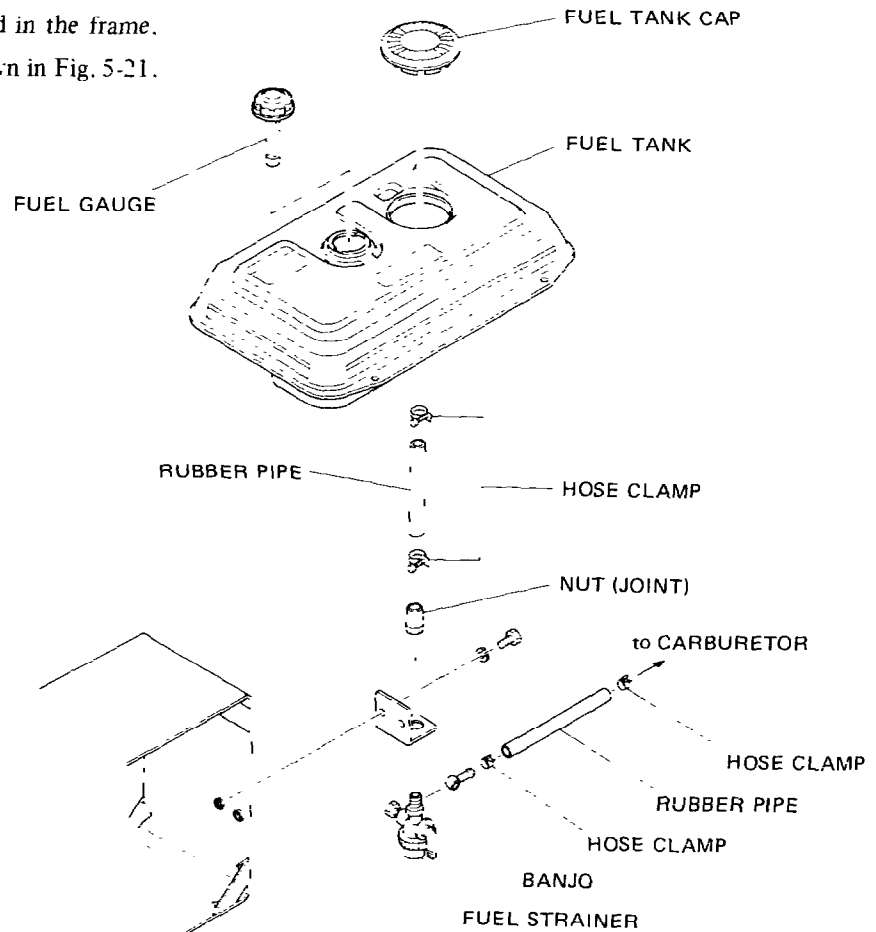
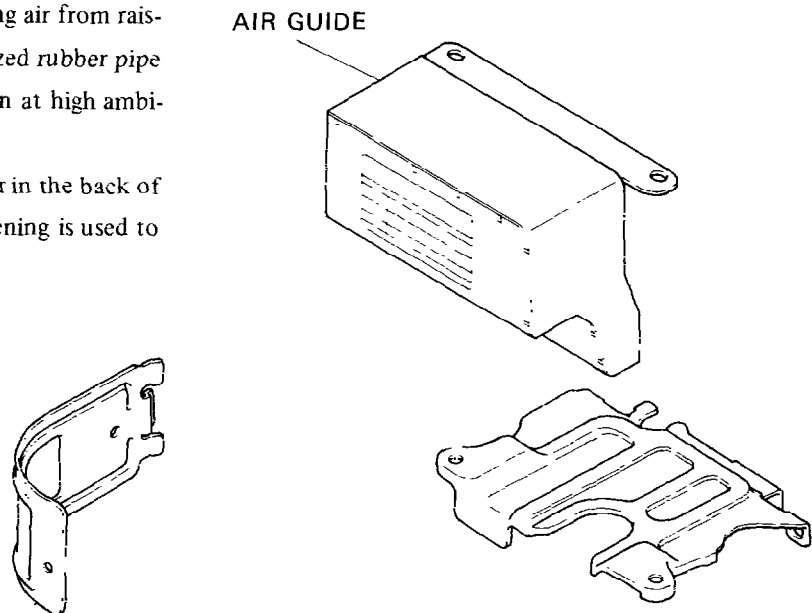


Fig. 5-21

5-4-4 COOLING SYSTEM

A baffle is provided to prevent engine cooling air from raising the temperature of other parts. A large sized rubber pipe shown in Fig. 5-21 prevents vapor lock even at high ambient temperature (up to about 45°C).

The air guide discharges the engine cooling air in the back of the generator. A cylinder baffle with an opening is used to improve air flow.



CYLINDER BAFFLE

Fig. 5-22

5-4-5 CARBURETOR

The carburetor has an air vent and a rubber pipe to ensure stabilized performance at high temperature.

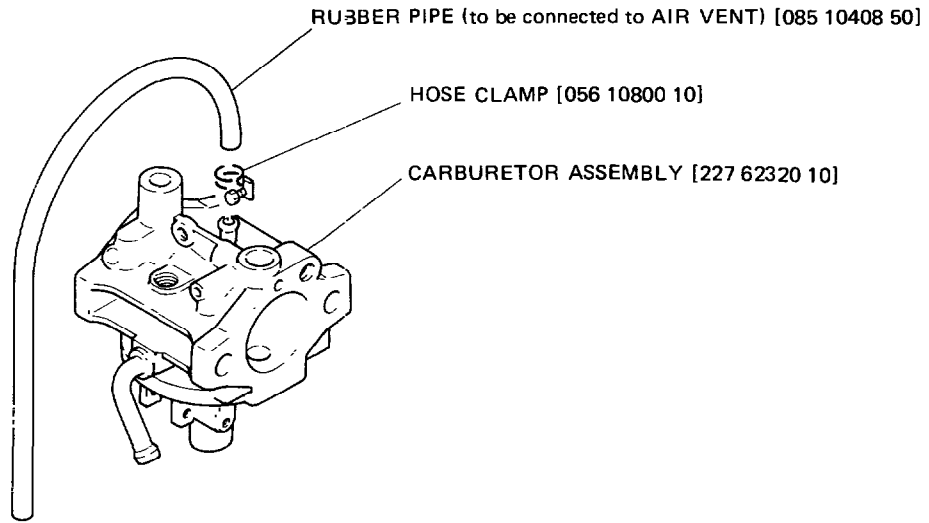


Fig. 5-23

5-4-6 OTHERS

The air cleaner and muffler were modified in shape, but are installed in the same way as before. The air cleaner element is the same as the one used in the cyclone type.

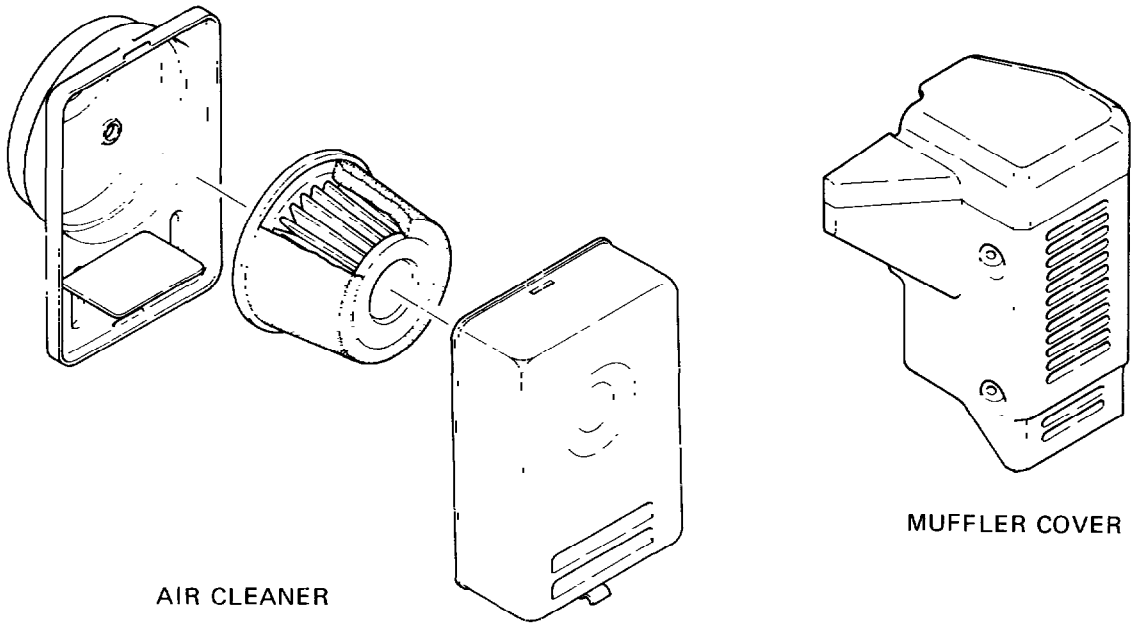


Fig. 5-24

6. SAFETY PRECAUTIONS

1. Use extreme caution near gasoline. A constant danger of explosion or fire exists.

Do not fill the fuel tank with gasoline while the engine is running. Do not smoke or use open flame near the fuel tank. Be careful not to spill fuel when refueling. If spilt, wipe it and let dry before starting the engine.

2. Do not place inflammable materials near the generator.

Be careful not to put gasoline, matches, gunpowder, oil cloth, straw, trash or any other inflammables near the generator.

3. Do not operate the generator in a room, cave or tunnel. Always operate in a well-ventilated area.

Otherwise the engine may become overheated and also, the poisonous carbon monoxide contained in the exhaust gases will endanger human lives. Keep the generator at least 1 m (4 feet) away from structures or facilities during use.

4. Operate the generator on a level surface.

If the generator is tilted or moved during use, there is a danger of fuel spillage and a chance that the generator may tip over.

5. Do not operate with wet hands or in the rain.

Severe electric shock may occur. If the generator is moistened by rain or snow, wipe it and fully dry it before starting. Don't pour water over the generator directly or wash it with water.

If the generator is wet with water, the insulations will be adversely affected and may cause current leakage and electric shock.

6. Do not connect the generator to commercial power lines.

This may cause a short-circuit or destroy the generator. Use a transfer switch for connecting with indoor wiring.

NOTE: The parts numbers of the transfer switches and of the plastic box to store them are as shown in Table 6-1.

Part No.	Part Name	Q'ty	Phase	Allowable Current
365 45604 08	Transfer Switch	1	1	15A
367 45605 08	Transfer Switch	1	1	30A
340 45606 08	Transfer Switch	1	1	60A
340 45608 08	Transfer Switch	1	3	15A
348 45609 08	Transfer Switch	1	3	30A
367 43008 08	Plastic Box	1	1, 3	30A
348 43009 08	Plastic Box	1	1	60A

Table 6-1

7. Use fuses of the correct capacity.

If the generator rpm is increased exorbitantly in the overload condition by using a fuse in excess of the rated capacity, the generator could be burnt and the AVR be damaged.

CAUTION: If the fuse is burned out or the circuit breaker tripped off when using an electrical appliance, the cause may be an overload or a short-circuit. In such a case, stop operation immediately and carefully check the electrical appliance and AC plugs for faulty wiring.

8. Stopping

In stopping the generator, turn the speed control lever to the low position to slow it down to idling speed, and then stop it. If the generator is stopped suddenly from high speed, the engine may backfire.

7. RANGE of APPLICATIONS

Generally, the rated power of an electrical appliance often refers to the amount of work that can be done by it. The electric power required for operating an electrical appliance is not necessarily equal to the amount of work that can be done by it. Electrical products generally have a label showing their rated voltage, frequency, and power consumption (input power). The power consumption of an electrical product is the power necessary for using it. When using a generator for operating an electrical product, however, the power factor and starting current must also be taken into consideration.

Determine the required capacity of your generator from the power required for operating electrical products that are classified as follows:

1. Incandescent lamps, hot plates, 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 generator with a rated output power of 1000W can light ten 100W lamps.

2. Fluorescent lamps, mercury lamps, etc. with a smaller power factor

Select a generator with a rated output equivalent to 1.2 to 2 times the power consumption of the load.

Example: A generator with a capacity of 100W to 160W is necessary for lighting a 80W fluorescent lamp. A generator with a rated output of 1000W can light six to ten 40W fluorescent lamps.

NOTE: Wattage of the fluorescent lamp generally does not indicate the power consumption but indicates the output of the lamp. Therefore, if the fluorescent lamp has no special indication as to the power consumption or input power, efficiency should be taken into account as explained in Item 5 on the following page.

3. Electric tools, etc. that are driven by a motor

Power 1.2 to 3 times the power consumption of a motor-driven tool is required for starting so select a generator with a maximum output 1.2 to 3 times the power consumption of the load.

Example: A 300W motor-driven drill requires a generator with a maximum output of 400 to 900W or more.

4. Water pumps, compressors, etc. that are driven by a motor which is loaded at starting

3 to 5 times the power consumption of the load is necessary for starting so select a generator with a maximum output 3 to 5 times its power consumption.

Example: A water pump with a power consumption of 400W requires a generator with a maximum output of 1200 to 2000W or more.

NOTE 1: Motor-driven products mentioned in Items 3 and 4 require the aforementioned generator capacities only when starting their motors. Once their motors are started, the products consume only 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 products 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 indicated 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 ~ 0.75 ———
 - Three-phase motor 0.65 ~ 0.9 ———
 - Fluorescent lamp 0.7 ~ 0.8
- The smaller the capacity, the worse the efficiency,
and vice versa.

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 57W by 1.2 ~ 2 and you will get the figure of necessary capacity of a generator. In other words, a generator with a rated output of 1000W capacity can light nine to fourteen 40W fluorescent lamps.

Example 2: Generally speaking, a 400W motor means that its work load is 400W. 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 multiplied by 1.2 to 3 and 570W as explained in **Item 3**. Moreover, when this motor is used for the submerged pump or air compressor, it requires 3 ~ 5 times as powerful a generator as in **Item 4**.

Model	RGX180		RGX240 RGX240D	
	50Hz	60Hz	50Hz	60Hz
Incandescent lamp, hot plate, etc.	1300W	1500W	1700W	2000W
Fluorescent lamp, mercury lamp, etc.	about 850W	about 1000W	about 1100W	about 1300W
Motor-driven tool, general-purpose motor, etc.	about 750W	about 850W	about 1000W	about 1200W
Water pump, compressor	about 350W	about 400W	about 500W	about 600W

Table 7-1

NOTE: Wiring between generator and electrical appliances

1. Allowable current of cable

Use a cable with a 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 7-2 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 so that the input voltage to the load (electrical product) decreases. As a result, the load can be damaged. Table 7-2 shows voltage drops per 100 meters of cable.

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

Table 7-2

Voltage decrease indicates as $V = \frac{1}{100} \times R \times I \times \lambda$.

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

I means electric current through the wire (A).

λ means the length of the wire (m).

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

8. MEASURING PROCEDURE

8-1 METERS

8-1-1 VOLTMETERS

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

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

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

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

The DC voltmeter range is approximately from 0 to 30V.

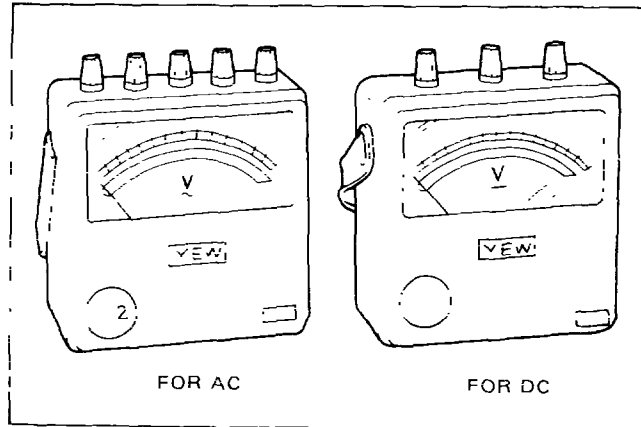


Fig. 8-1

8-1-2 AMMETERS

AC and DC ammeters are necessary. An AC ammeter with a range that can be changed according to the current rating of a given generator is most desirable. (About 10A, 20A, 100 A)

The DC ammeter range is approximately from 0 to 15A.

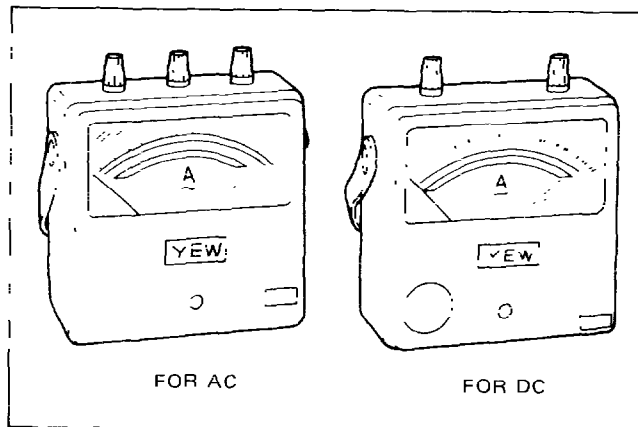


Fig. 8-2

8-1-3 FREQUENCY METER

Frequency range: About 45 to 65Hz

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

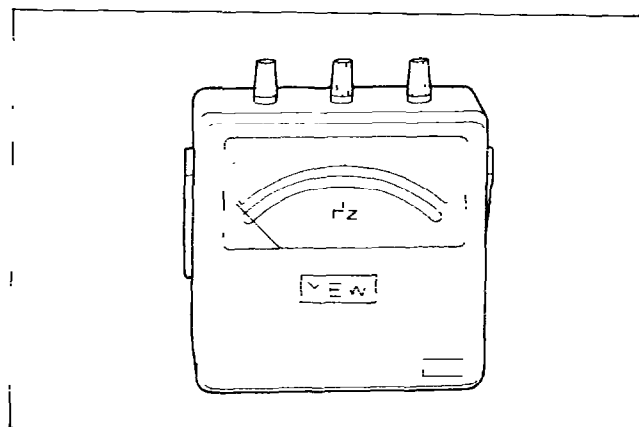


Fig. 8-3

8-1-4 TESTER

Used for measuring resistance, etc.

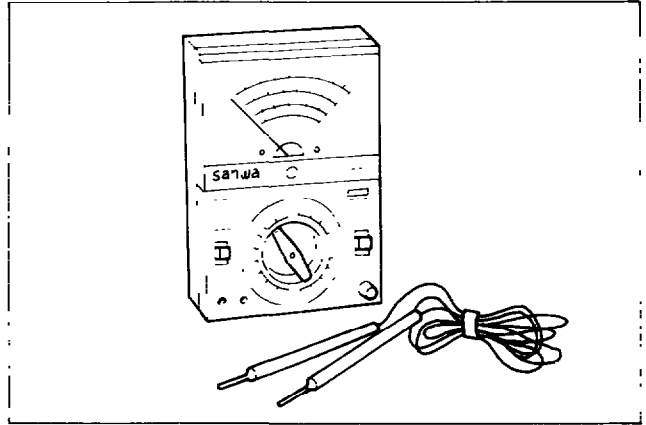


Fig. 8-4

8-1-5 MEGGER TESTER

Used for measuring generator insulation resistance. Select one with testing voltage range of 500V.

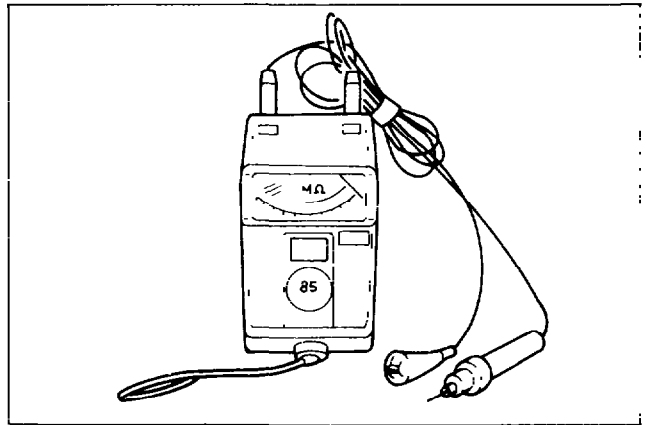


Fig. 8-5

8-1-6 TACHOMETER

There are various types of tachometers, such as contactless type, contact type, and strobe type. The contact type can be used only when the generator and engine have been disassembled. The contactless type is recommended.

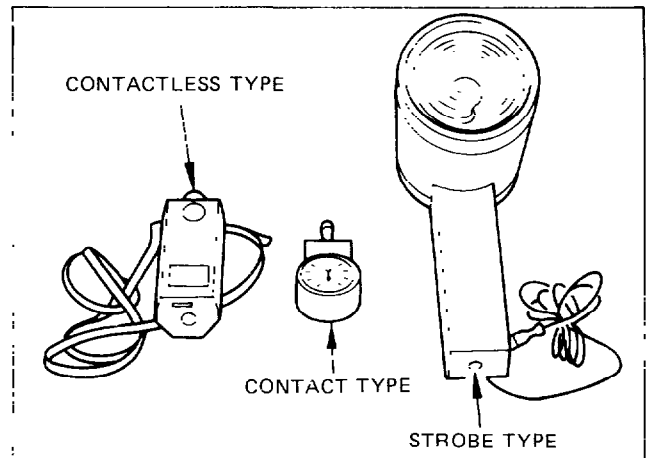


Fig. 8-6

8-2 AC OUTPUT MEASURING

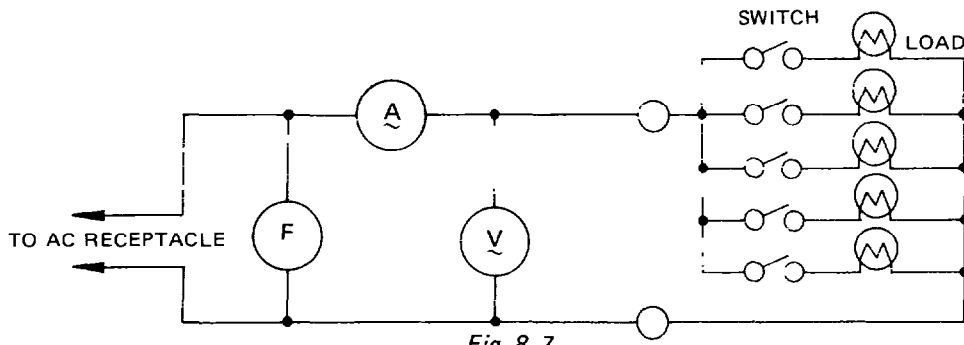


Fig. 8-7

Use a circuit like the one shown in Fig. 8-7 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 Table 8-1 at the rated amperage and rated rpm.

Rated voltage	110V	120V	220V	230V	240V
Voltage range	108 ~ 115V	118 ~ 125V	218 ~ 225V	228 ~ 235V	238 ~ 245V

Table 8-1

8-3 DC OUTPUT MEASURING

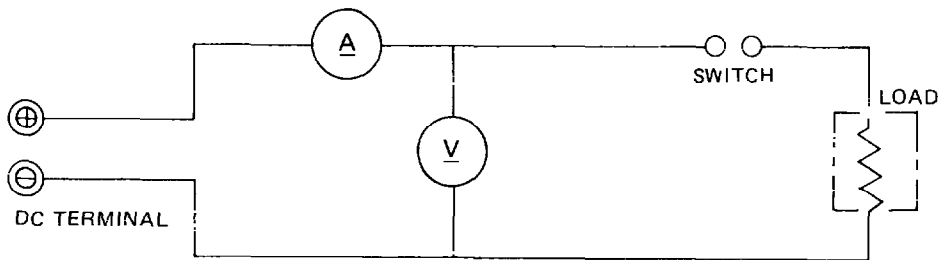


Fig. 8-8

Switch the power on. When 1.45Ω resistance is attached as a load, check that the voltage is within the 13 to 11V range. **NOTE:** If a battery is connected as the load, the output voltage increases by about 1 to 2V, possibly causing battery overcharge. Control battery liquid level during charging to prevent overcharging.

8-4 MEASURING INSULATION RESISTANCE

Connect a megger tester to one of the two receptacle output terminals and the ground terminal, then measure the insulation resistance. An insulation resistance of 1 megohms or more is normal. (The original insulation resistance at the time of shipment from the factory is 10 megohms or more.) If it is less than 1 megohm, disassemble the generator and measure the insulation resistance of the stator, rotor and control box individually.

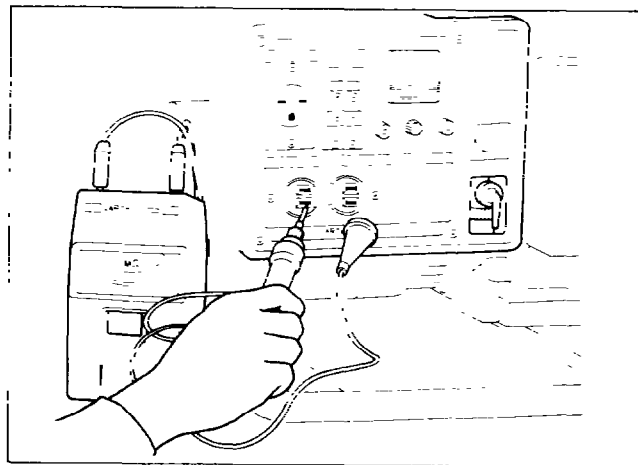


Fig. 8-9

• **STATOR**

Measure the insulation resistance between the red or white coupler from the stator and the core.

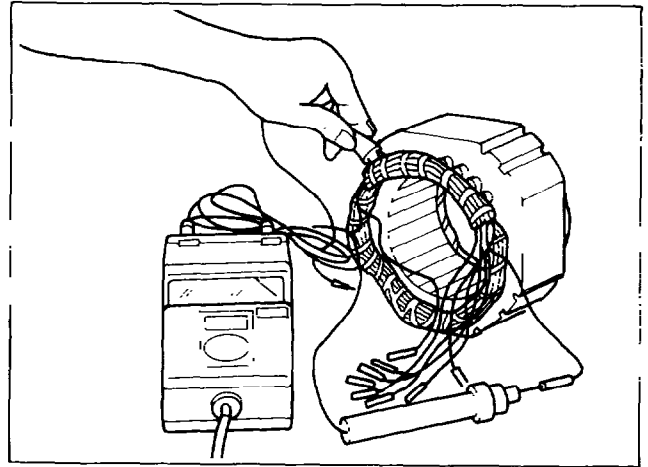


Fig. 8-10

• **ROTOR**

Measure the insulation resistance between the core and one of the slip rings of the rotor.

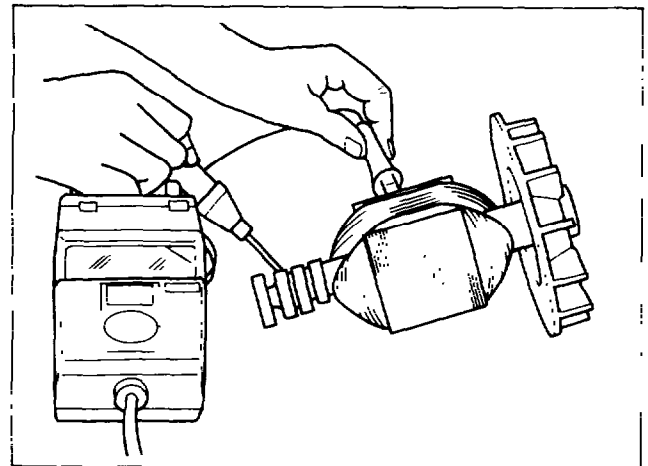


Fig. 8-11

• **CONTROL BOX**

Measure the insulation between the live parts and the casing or grounded part. Close the no-fuse breaker first, then measure it.

Any part which has an insulation resistance of less than 1 megohm has a faulty insulation, which can cause electric shock or leakage. Replace such parts.

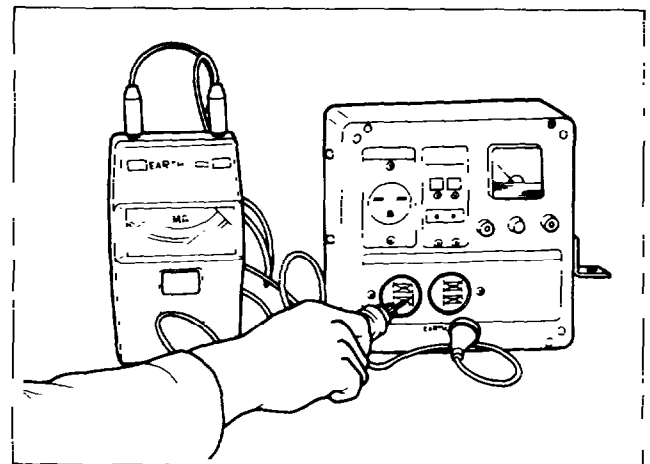


Fig. 8-12

9. CHECKING FUNCTIONAL MEMBERS

9-1 STATOR ASSEMBLY

9-1-1 MEASURING WINDING RESISTANCE

Check the resistances of the leads from the stator with a tester (See Fig. 9-1.)

Check all the leads which are shown by type in the tables below. Any lead which is inactive is faulty.

NOTE: Testers are not so accurate that some margin of error need not be taken into account when reading the tester against the values shown in the tables.

It is measured by wheatstone bridge in regularly. In this time, please care enough not to exist the contact resistance.

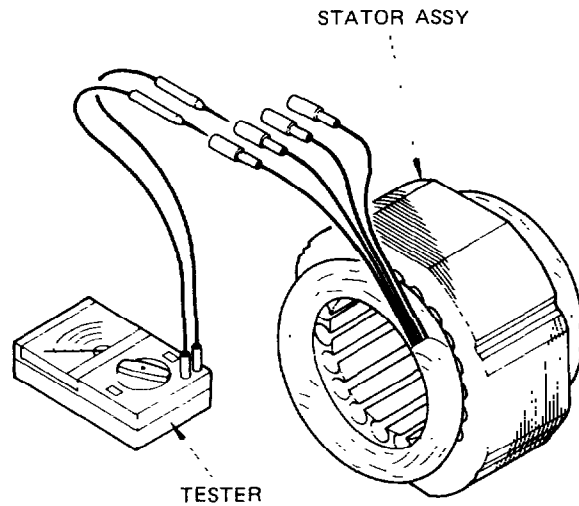


Fig. 9-1

*RGX180

●50Hz 220V, 230V, 240V

Wire color	RED	GREEN
WHITE	3.2 Ω	4.0 Ω

●50Hz 110V

Wire color	RED	GREEN
WHITE	0.8 Ω	4.0 Ω

●60Hz 110V, 120V

Wire color	RED	GREEN
WHITE	2.3 Ω	3.3 Ω

*RGX240, RGX240D

●50Hz 220V, 230V, 240V

Wire color	RED	GREEN
WHITE	2.3 Ω	3.12 Ω

Wire color	BLUE
BLUE	0.3 Ω

●50Hz 110V

Wire color	RED	GREEN
WHITE	0.57 Ω	3.1 Ω

Wire color	BLUE
BLUE	0.3 Ω

●60Hz 110V, 120V

Wire color	RED	GREEN
WHITE	0.4 Ω	3.0 Ω

Wire color	BLUE
BLUE	0.35 Ω

●50Hz 110V/220V, 120V/240V

Wire color	RED	BLACK	GREEN	Wire color	BLUE
WHITE	1.15 Ω	1.15 Ω	3.1 Ω	BLUE	0.3 Ω

●60Hz 110V/220V, 120V/240V

Wire color	RED	BLACK	GREEN	Wire color	BLUE
WHITE	0.8 Ω	0.8 Ω	3.0 Ω	BLUE	0.35 Ω

9-1-2 MEASURING INSULATION RESISTANCE

Refer to 8-4 MEASURING INSULATION RESISTANCE.

9-2 ROTOR ASSEMBLY

9-2-1 WINDING RESISTANCE MEASURING

Check the resistance between the two slip rings with a tester. (See Fig. 9-2.)

The resistance is normal if it is anywhere from 6 ohms to 13 ohms.

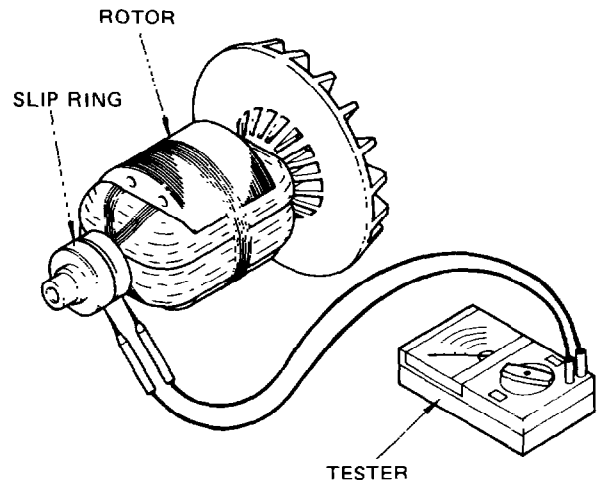


Fig. 9-2

9-2-2 MEASURING INSULATION RESISTANCE

Refer to 8-4 MEASURING INSULATION RESISTANCE.

9-2-3 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. (See Fig. 9-3.)

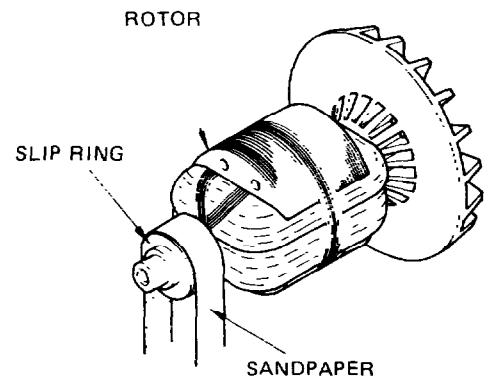


Fig. 9-3

9-3 BRUSHES

The brushes must be smooth where they contact the slip rings. If not, polish the brushes smooth 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 5mm to 15mm as shown in Fig. 9-4. A brush shorter than 5mm must be replaced because decreased contact pressure between the brush and slip ring lowers generator efficiency and output voltage.

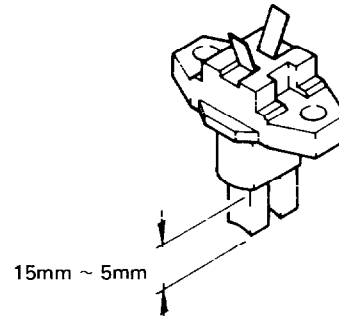


Fig. 9-4

9-4 AVR (AUTOMATIC VOLTAGE REGULATOR)

AVR trouble may be identified by simply looking at the AVR, or by checking the inter-lead resistance with a tester, or actually mounting it in the generator and operating it.

9-4-1 AVR TROUBLE IDENTIFICATION by APPEARANCE

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

9-4-2 IDENTIFYING AVR TROUBLE by CHECKING INTER-LEAD RESISTANCE

Check the inter-lead resistance of the AVR with a tester. (See Fig. 9-5.) If the tester readings vary greatly from the values specified in the Table 9-1, the AVR is faulty.

NOTE: Take tester inaccuracy into account in reading the tester.

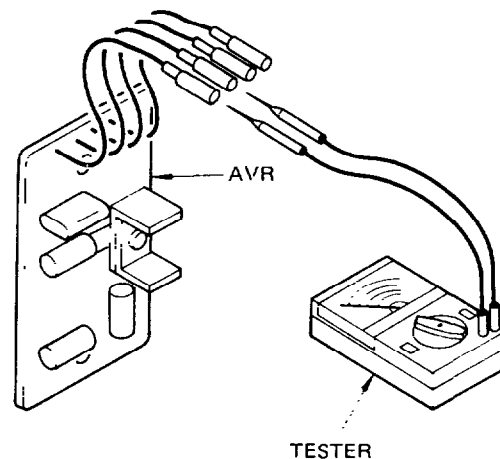


Fig. 9-5

MODEL RGX305, RGX305D

Tester polarity (+) / (-)	Yellow	Red	White	Green	Brown
	Yellow	∞	700K ~ 1M Ω	72K ~ 120K Ω	One wire: 0 Ω Another: ∞
Yellow	∞	400K ~ 500K Ω	72K ~ 120K Ω	One wire: 0 Ω Another: ∞	65K ~ 10K Ω
Red	—	—	250K ~ 300K Ω	∞	400K ~ 500K Ω
Red	—	—	130K ~ 140K Ω	∞	220K ~ 250K Ω
White	—	250K ~ 300K Ω	—	∞	45K ~ 50K Ω
White	—	130K ~ 140K Ω	—	∞	45K ~ 50K Ω
Green	—	600K ~ 1M Ω	70K ~ 110K Ω	—	7K ~ 9.5K Ω
Green	—	400K ~ 500K Ω	70K ~ 110K Ω	—	6.5K ~ 8.5K Ω
Brown	—	400K ~ 500K Ω	40K ~ 46K Ω	∞	—
Brown	—	250K ~ 300K Ω	40K ~ 46K Ω	∞	—

*Upper rows are for the 220, 230, 240V specifications; lower rows for the 110, 120V specifications and the dual voltage type.

Table 9-1

9-4-3 IDENTIFYING AVR TROUBLE by MOUNTING AVR in THE GENERATOR and OPERATING AVR

SCR or transistor damage cannot be detected by simply looking at the AVR or checking the lead resistances. Check it by mounting the suspectedly faulty AVR in a normal generator, or mount a normal AVR in a generator which fails to generate voltage.

9-5 FUSE HOLDER and CIRCUIT BREAKER

9-5-1 CIRCUIT BREAKER

Push the power switch on and check continuity. If current flows, it is normal.

Devices such as that shown in Fig. 9-7 are necessary for checking the circuit breaker if it properly operates. The rated current is shown on the side of the circuit breaker.

Adjust the load switch until the ammeter reads about twice the rated current marked on the circuit breaker. The circuit breaker is normal if it turns off anywhere between 0.5 and 30 seconds.

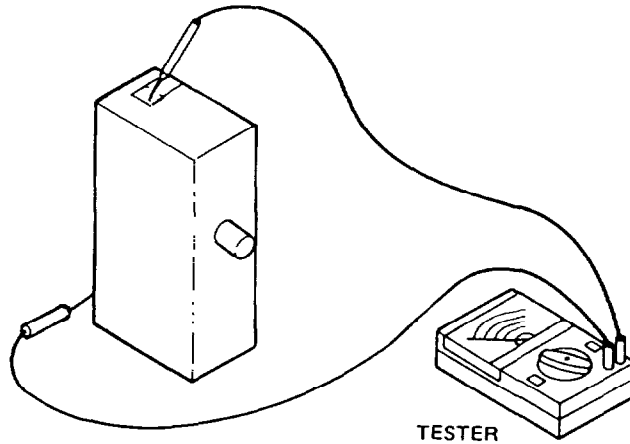


Fig. 9-6

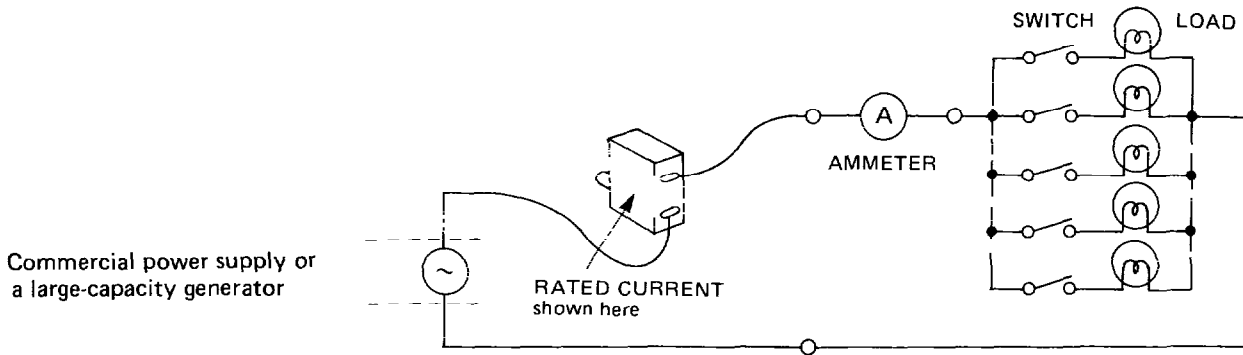


Fig. 9-7

9-5-2 FUSE HOLDER

Check that a fuse is in the fuse holder and check its continuity with a tester. (See Fig. 9-8.) If it carries current, it is normal.

If there is no current, take the fuse out and check it for continuity. If the fuse carries current, the fuse holder is faulty. If the fuse carries no current, replace it with a fuse of the correct capacity, and check the fuse holder again for continuity.

Fuse capacity is 10A.

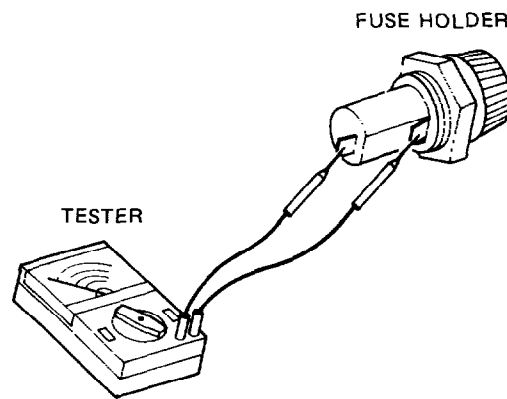


Fig. 9-8

9-6 RECEPTACLE and AC PLUG

Check the current-carrying parts of the receptacles and AC plugs and their leads and plastic parts for burns.

9-7 VOLTMETERS and PILOT LAMP

Apply AC voltage to a terminal and check if the voltmeter reads normal or pilot lamp lightens.

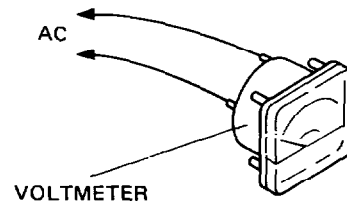


Fig. 9-9

9-8 DIODE STACK ASSEMBLY

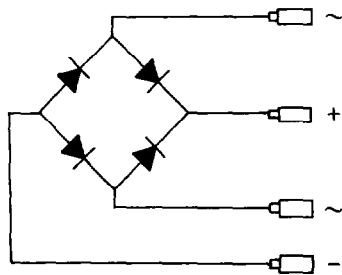


Fig. 9-10

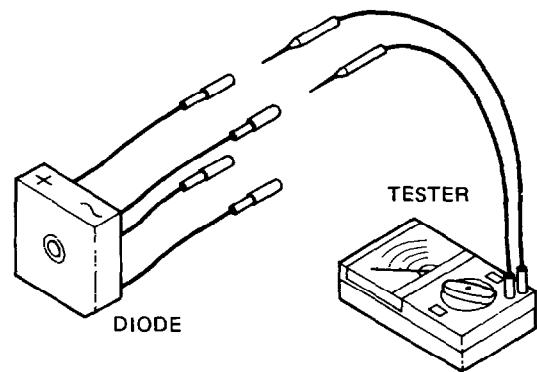


Fig. 9-11

The internal circuitry of the diode stack assembly is as shown in Fig. 9-10. Check inter-terminal continuity with a tester as shown in Fig. 9-11 to see that the results are as shown in Table 9-2.

TERMINAL	CURRENT	TERMINAL
~		+
~		-

NOTE:

A B Current flows from A (+) to B (-).

C D Current does not flow from C (+) to D (-).

~ Check both terminals.

Table 9-2

9-9 PRIMARY EXCITING CIRCUIT

As described in 5-3 DESCRIPTION of GENERATOR OPERATION, the primary exciting coil is in the magneto mounted on the engine, and the AVR has a circuit for it.

9-9-1 EXCITING COIL

The normal inter-terminal resistance of the exciting coil is about 10 to 30 ohms. Its voltage at the rated rpm is about AC 10 to 30V. Check the resistance and voltage with a tester to see if they meet these requirements.

9-9-2 OTHERS

No output voltage from the generator.

If the trouble cannot be detected by Step 9-9-1 above, check the primary exciting circuit as follows:

- A. Disconnect the control box and operate the generator at the rated rpm. Disconnect the two yellow wires from the exciting coil to the AVR, and momentarily connect the positive (+) and negative (-) leads of a 12V battery in their place. If no output voltage is generated, reconnect the battery leads the other way. If output voltage is generated, the exciting coil is defective.
- B. If no output voltage is generated by the test conducted as described in Step A., operate the generator at the rated rpm and momentarily connect a 12V battery to the brushes. The green lead is positive (+) and the black or brown lead negative (-) (See Fig. 9-13.). If output voltage is generated, the primary exciting circuit in the AVR is defective. Replace the AVR.

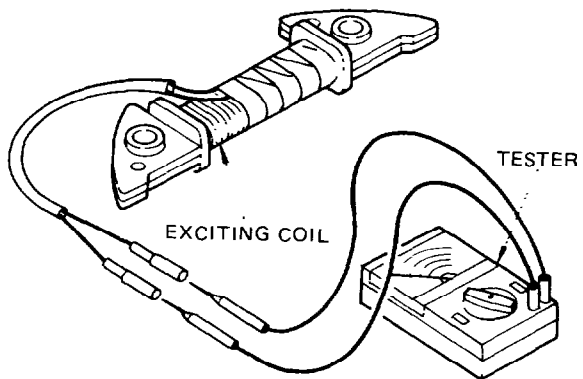


Fig. 9-12

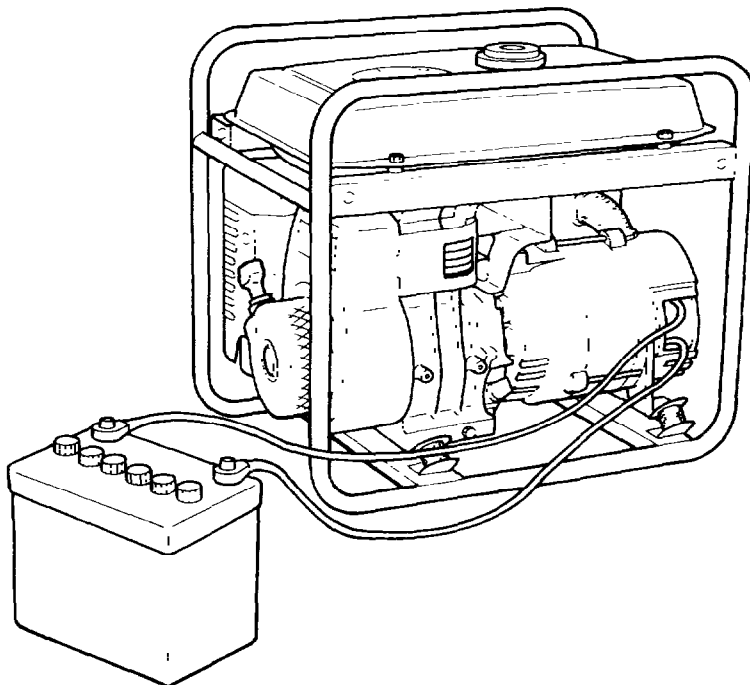


Fig. 9-13

10. DISASSEMBLY and REASSEMBLY

10-1 PREPARATIONS and SUGGESTIONS

- 1) When disassembling the engine, remember the locations of individual parts well so that they can be reassembled correctly. If you are uncertain of identifying some parts, it is suggested that tags be attached to them.
- 2) Have boxes ready to keep disassembled parts in groups.
- 3) To prevent losing or misplacing, temporarily assemble each group of disassembled parts.
- 4) Use the correct tools in the correct way.

10-2 HOW TO DISASSEMBLE

Order	Item	Procedure	Remarks	Tool
1	Fuel Tank	(1) Remove the front panel. (See Fig. 10-1.) 4ø screw . . . 4 pcs.		(+) screwdriver
		(2) Discharge the fuel. Close the fuel strainer, remove the cap, place some vessel for gasoline under the strainer, and open the strainer to discharge the fuel. (See Fig. 10-2)	Absolutely no smoking. Use a vessel large enough to receive the remaining gasoline.	
		(3) Disconnect the fuel pipe. Loosen the hose clamp on top of the strainer, and disconnect the fuel pipe that connects the fuel tank to the fuel strainer. (See Fig. 10-3.)	Apply a drop of oil to the nut on top of the strainer to smooth removal.	(-) screwdriver
		(4) Remove the fuel tank bolts. (See Fig. 10-4.) 6ø bolt . . . 4 pcs.		13mm spanner or box spanner
		(5) Remove the fuel tank.	Be careful not to lose the rubber washers located between the fuel tank mounting side plates.	

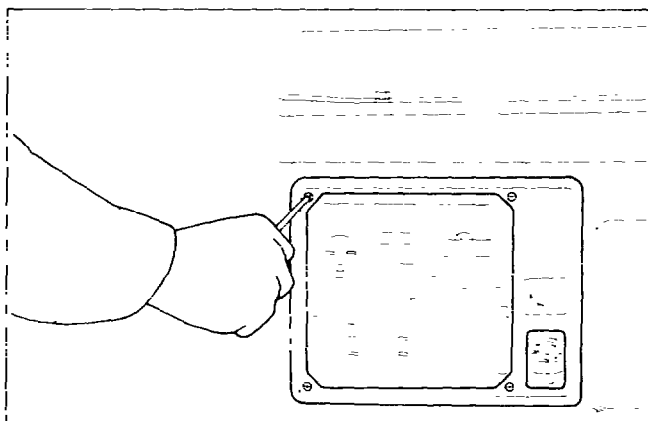


Fig. 10-1

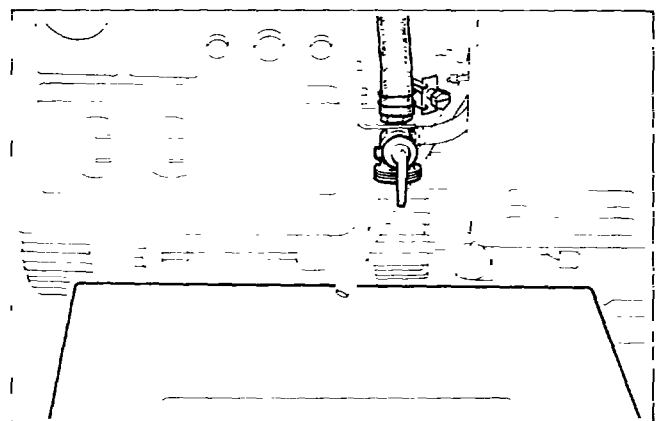


Fig. 10-2

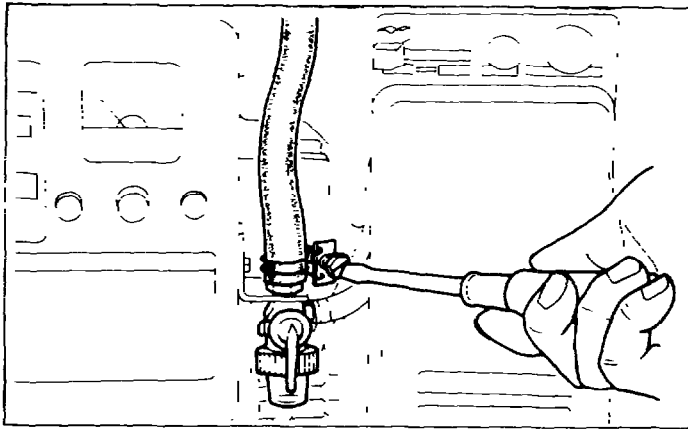


Fig. 10-3

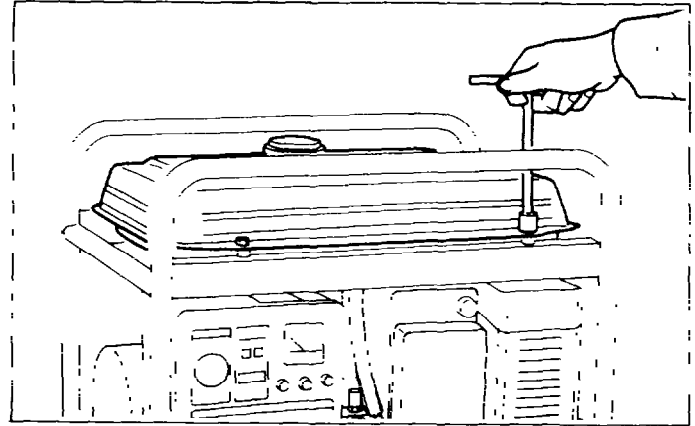


Fig. 10-4

Order	Item	Procedure	Remarks	Tool
2	Control Box	<p>(1) Remove the grommet from the rear of the control box.</p> <p>(2) Pull out the connector from the control box, and take it off.</p> <div data-bbox="426 968 817 1159" data-label="Image"> <p style="text-align: center;">Fig. 10-5 (I)</p> </div> <p>(3) Remove the coupler that is connected to the rear of the control box.</p> <div data-bbox="487 1308 792 1670" data-label="Image"> <p style="text-align: center;">Fig. 10-5 (II)</p> </div>	<p>The connector and coupler are so designed as to lock, so push and pull out as shown in Fig. 10-5.</p>	
		<p>(4) Remove the fuel strainer. Remove the nut on top of the fuel strainer located beside the control box. (See Fig. 10-6)</p>		14mm spanner
		<p>(5) Remove the control box bolts and the control box. Remove the bolts from the frame and box stay. (See Fig. 10-7) 6φ bolt . . . 4 pcs</p>	Be careful not to lose the spacer between the control box and frame.	10mm spanner or box spanner

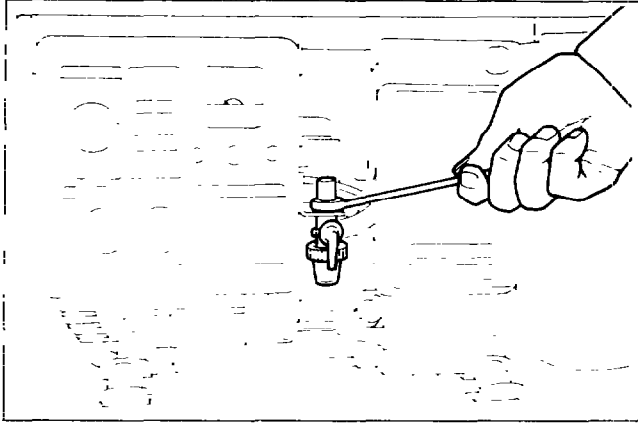


Fig. 10-6

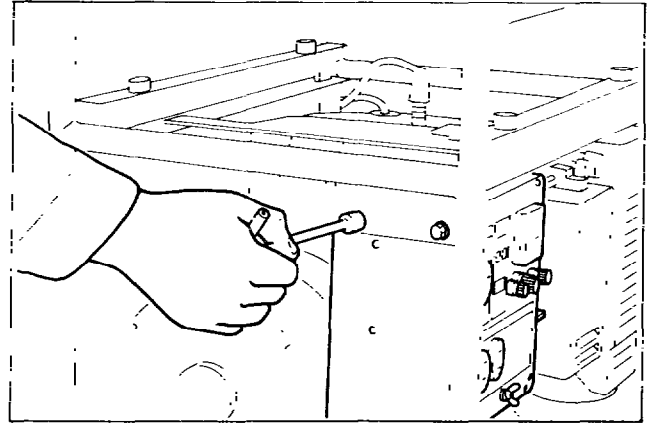


Fig. 10-7

Order	Item	Procedure	Remarks	Tool
3	Frame	(1) Remove the box stay. 6φ bolt . . . 2 pcs.		10mm spanner . . . 2 pcs.
		(2) Remove the side plates, front and rear. (See Fig. 10-8.) 6φ bolt . . . 4 pcs.	Black special bolts are used.	10mm spanner or box spanner
		(3) Remove the generator mounting nuts. Remove the nuts that fasten the engine and rubber mount and the nuts that fasten the generator and rubber mount. 8φ nut . . . 4 pcs.		13mm spanner
		(4) Remove the generator. Lift the generator with a chain block, and remove the frame. (See Fig. 10-9.)	Be careful about the generator balance.	
		(5) Remove the rubber mount. Turn the frame on its side, and remove the nuts that fasten the rubber mounts to the bottom of the frame 8φ nut . . . 4 pcs.		13mm spanner or box spanner

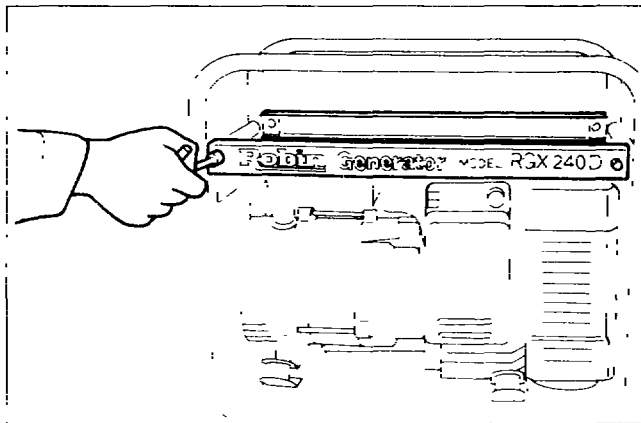


Fig. 10-8

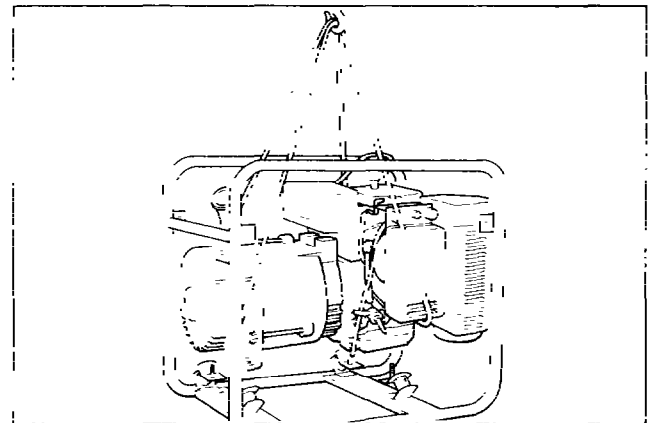


Fig. 10-9

Order	Item	Procedure	Remarks	Tool
4	Brush holder	(1) Remove the brush cover. Remove the brush cover in the back of the rear cover. 4φ screw . . . 2 pcs.		(+) screwdriver
		(2) Remove the brush holders. (See Fig. 10-10.) Disconnect the terminals wired to the brushes before removing the brush holders. 5φ screw . . . 2 pcs.	Be sure to remove the brush holders first because if the rear cover is removed from the generator without removing the brush holders, the brushes will break.	
5	Rear cover	(1) Loosen the cover bolts and remove them 6φ bolt . . . 3 pcs.		10mm spanner or box spanner
		(2) Remove the stator cover. Turn up the stator cover edge and remove the stator cover.		(-) screwdriver
		(3) Remove the rear cover. (See Fig. 10-11.) Lightly tap the rear cover with a plastic hammer, and remove it.	The type that uses a connector does not permit complete separation of the stator and rear cover because the connector cannot be pulled out of the rear cover or grommet. In this case, simply remove the rear cover from the bearing.	

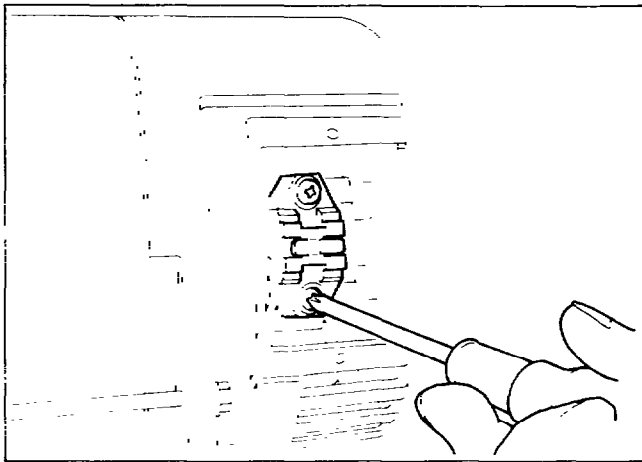


Fig. 10-10

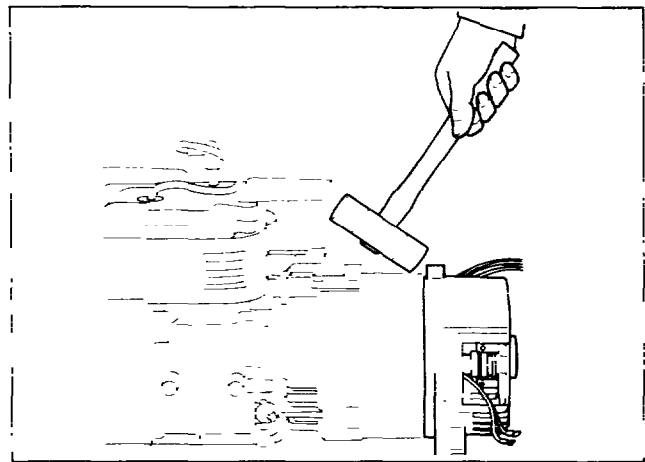


Fig. 10-11

Order	Item	Procedure	Remarks	Tool
6	Stator	<p>(1) Remove the stator. Pull out the stator from the front cover by lightly tapping the outside of the core with a plastic hammer. (See Fig. 10-12.) If the stator does not come out, insert a screwdriver between the front cover and stator, and twist it.</p>	<p>Never hammer the windings and leads. Be careful not to peel the stator steel sheets.</p>	<p>Plastic hammer or (-) screwdriver</p>
		<p>(2) Separate the stator and rear cover. Separate the connector and wire. Push the terminal locks in the connector with a pin having a needle-like sharp point, and remove the terminals. (See Fig. 10-13.)</p>	<p>It is not necessary to separate the stator and rear cover except when replacing the stator, rear cover, or diode stack.</p>	

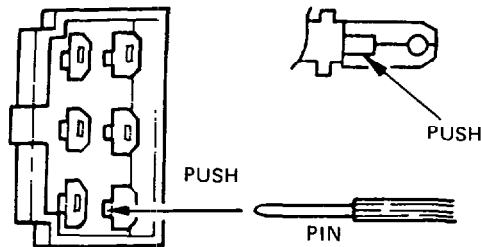


Fig. 10-13

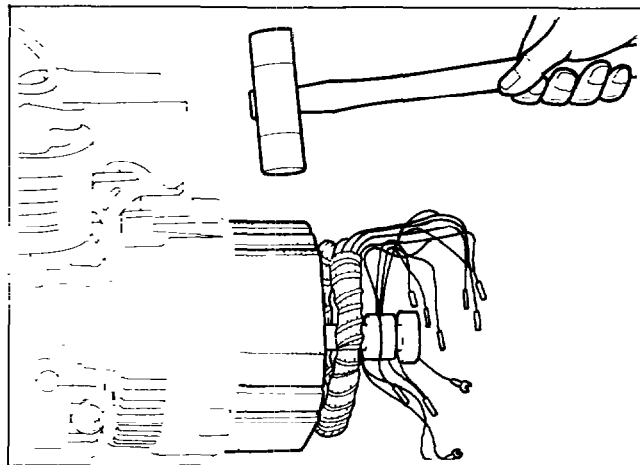


Fig. 10-12

Order	Item	Procedure	Remarks	Tool
	Rotor	(1) Pull out the through-bolt. Fit a box spanner or socket wrench over the head of the through-bolt. strike it hard counterclockwise with a hammer to loosen, and remove the through-bolt. (See Fig. 10-14.) 10φ bolt . . . 1 pc.	If an air spanner is available, use it for easy removal.	Hammer Box spanner, or socket wrench 14mm
		(2) Remove the rotor. Strike the rotor by the core with a plastic hammer, and remove the rotor from the engine taper shaft. If the rotor does not come out, change its angle and strike it again. (See Fig. 10-15.)	Never strike the slip rings or windings.	

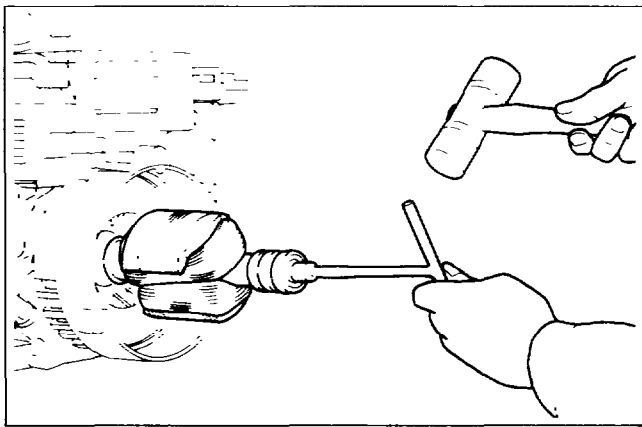


Fig. 10-14

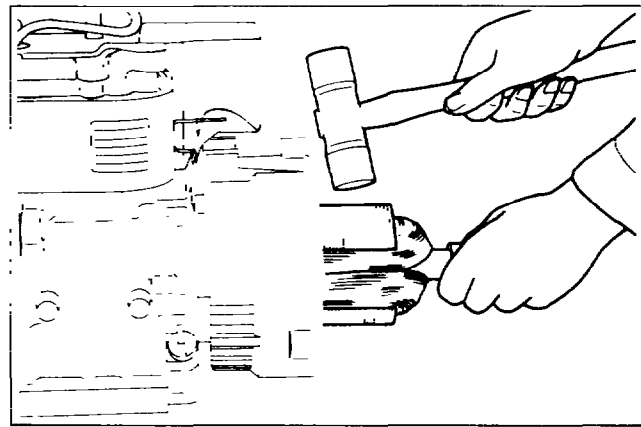


Fig. 10-15

Order	Item	Procedure	Remarks	Tool
8	Front cover	(1) Remove the front cover. Remove the bolts that fasten the engine's main bearing cover to the front cover. 8φ bolt . . . 4 pcs.		13mm box spanner

10-3 HOW TO REASSEMBLE

10-3-1 FRONT COVER

Attach the front cover to the engine main bearing cover.
Match the faucet joint, and tighten the bolts.

8φ × 18mm bolt . . . 4 pcs.

8φ spring washer . . . 4 pcs.

Tightening torque 120 to 140 kg-m

NOTE: Make sure that the slits for cooling air are down.

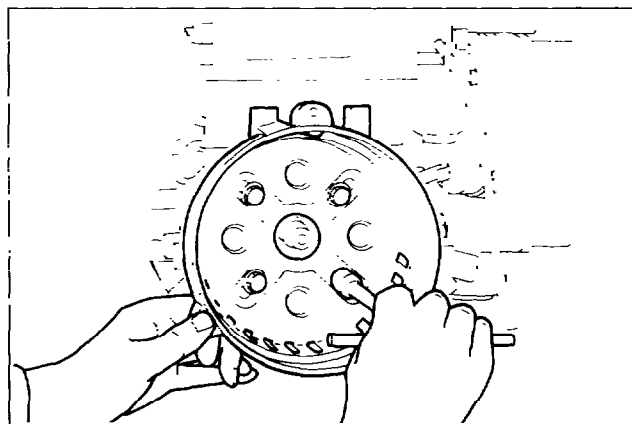


Fig. 10-16

10-3-2 ROTOR

- 1) Clean the tapered part of the engine output shaft and the female tapered part of the rotor shaft of oil and other foreign matter with waste cloth.

- 2) Install the rotor and tighten the through-bolt. (See Fig. 10-17.)

Tighten the through-bolt by striking a box spanner or socket wrench hard clockwise.

NOTE: The outside diameter and lamination thickness of the rotor is shown in 5-2-2 ROTOR under Paragraph 5-2 FUNCTIONS.

NOTE: The through-bolt is shaped as shown below.

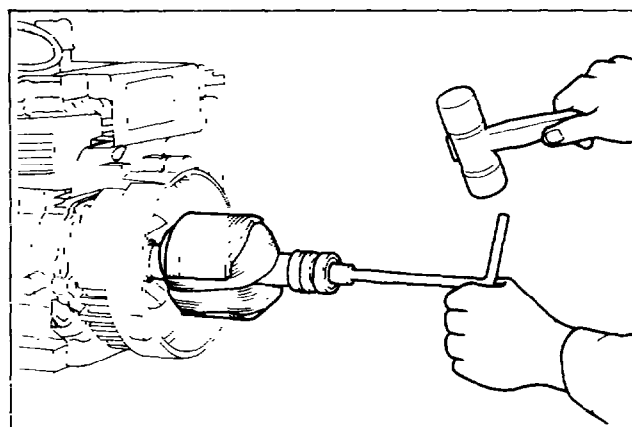
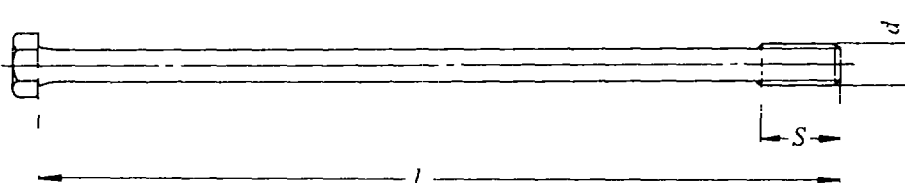


Fig. 10-17



Model	d	l	S
RGX180	8 mm 5.16 in.	222 mm 8.74 in.	25 mm 0.98 in.
RGX240 RGX240D	8 mm 5.16 in.	230 mm 9.06 in.	25 mm 0.98 in.

Table 10-1

10-3-3 STATOR

Install the stator to fit the faucet joint of the front cover.

If it does not fit properly, lightly strike the stator core with a plastic hammer as shown in Fig. 10-19.

NOTE: Never strike the winding.

NOTE: Make sure that the wires to the control box are up and that the wires to the brushes are to the back. (See Fig. 10-18.)

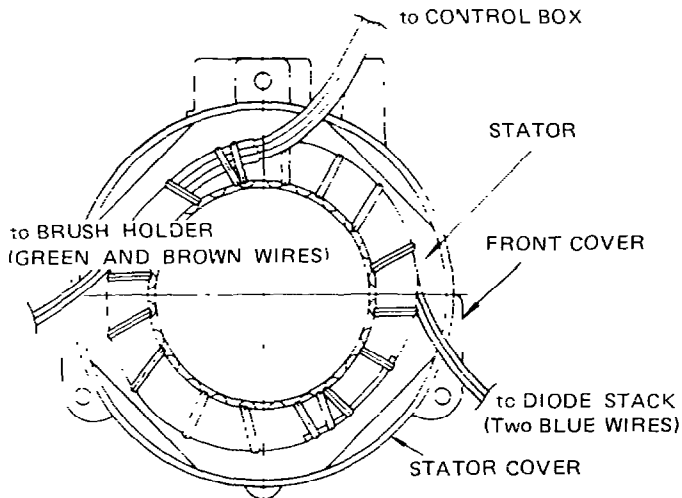


Fig. 10-18

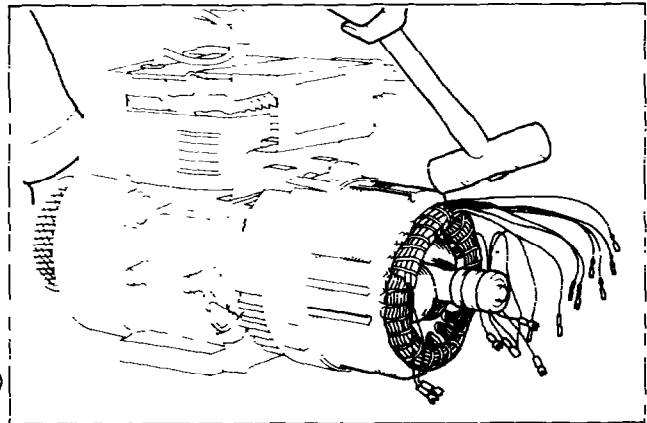


Fig. 10-19

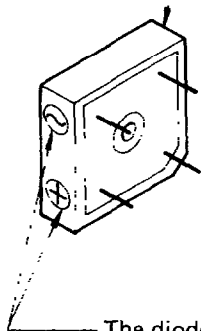
10-3-4 REAR COVER

1) Install the diode stack in the rear cover. (See Fig. 10-20)

3φ × 12 mm screw . . . 1 pc.

NOTE: Solder an assembly of leads, of the colors that meet the specifications of the circuit diagram, and a connector, to the diode stack.

DIODE



The diode has markings of input (~), positive (+) and negative (-), on this side.
Two (~) leads are blue; (+) orange; and (-) brown.

Fig. 10-21

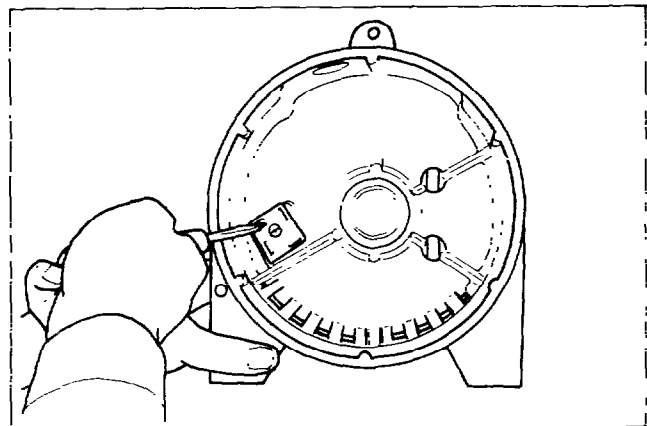


Fig. 10-20

2) Pass the wires which connect to the control box from the stator through the hole in the top of the rear cover.

- 3) Install the rear cover to fit the rotor bearing.
Lightly strike the circumference of the rear cover evenly with a plastic hammer. (See Fig. 10-22.)
NOTE: Be careful not to pinch the wires between the stator and rear cover.

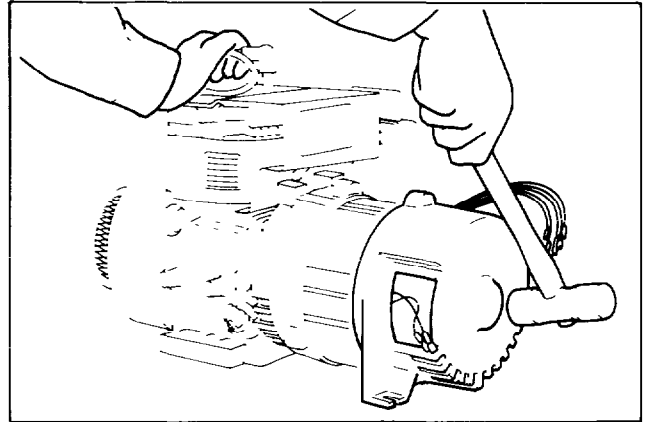
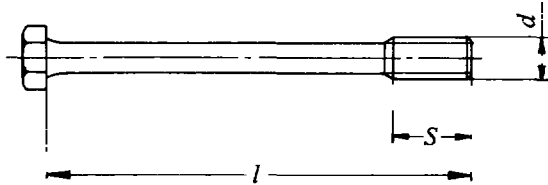


Fig. 10-22

- 4) Tighten the cover bolt.
NOTE: The bolt cannot be tightened unless the front cover and rear cover are positioned correctly.
The shape of the cover bolt is shown below.



Model	d	l	S
RGX180	6 mm 0.24 in.	90 mm 3.54 in.	15 mm 0.54 in.
RGX240 RGX240D	6.3 mm 0.24 in.	100 mm 3.94 in.	15 mm 0.54 in.

Table 10-2

- 5) Install the stator cover.
Fit the stator cover between the stator and cover bolts until it covers all the cover bolts, and fold back the edge.
- 6) Pass the wires out of the top of rear cover through the grommet, and fit the grommet into the hole in the rear cover. (See Fig. 10-23.) Then, reverse the bushing for mounting the control box and place it on the grommet. The bushing has a larger diameter than the grommet.

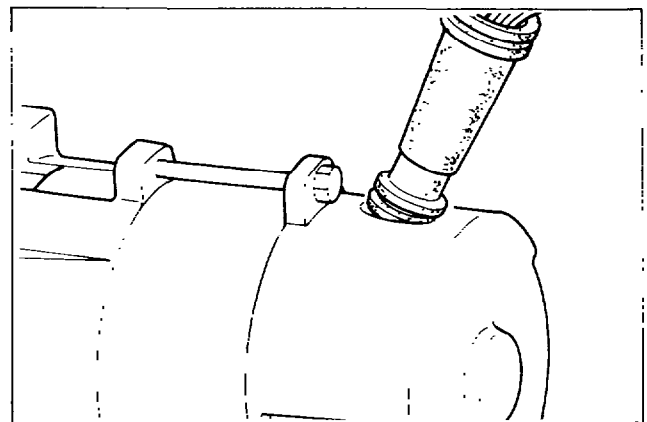


Fig. 10-23

7) Insert the wires into the connectors.

The connector positions and wire colors are shown in Table 10-3.

NOTES: Terminals ① through ④ and ⑪, ⑫ are for 2mm² wire, terminals ⑤, ⑥ for 1.25 mm² wire, and ⑦ through ⑩ for 0.75 mm² wire.

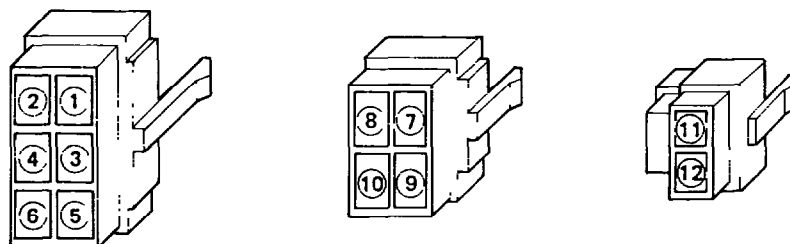


Fig. 10-24

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
RGX180	—	—	—	—	—	—	WHITE	RED	BROWN	GREEN	WHITE	RED
RGX240	—	—	WHITE	RED	BROWN / WHITE	ORANGE	WHITE	RED	BROWN	GREEN	—	—
RGX240D	—	BLACK	WHITE	RED	BROWN / WHITE	ORANGE	WHITE	RED	BROWN	GREEN	—	—

Table 10-3

10-3-5 BRUSH HOLDER

1) Install the brush holders in the rear cover.

Pass the mounting screws through the brush holders, push the brush holders so that the brushes will be perpendicular to the slip rings, and tighten the screws. (See Fig. 10-25.)

5φ x 18 mm screw . . . 2 pcs.

5φ washer . . . 2 pcs.

5φ spring washer . . . 2 pcs.

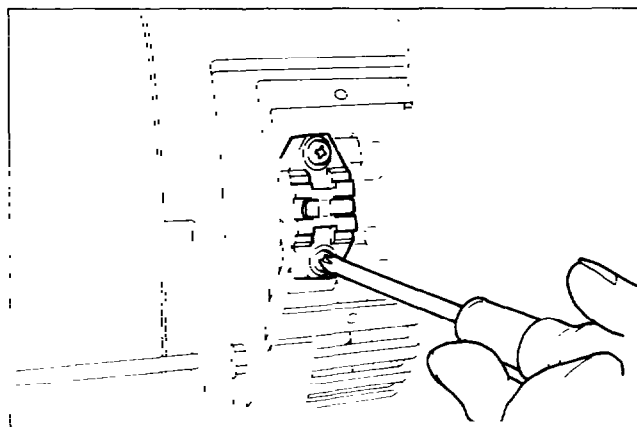


Fig. 10-25

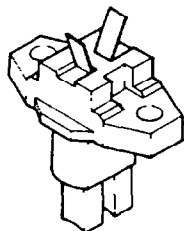


Fig. 10-26

- 2) Attach the connector to the brush holder. Connect the green lead to the stator side and the brown lead to the bearing side.

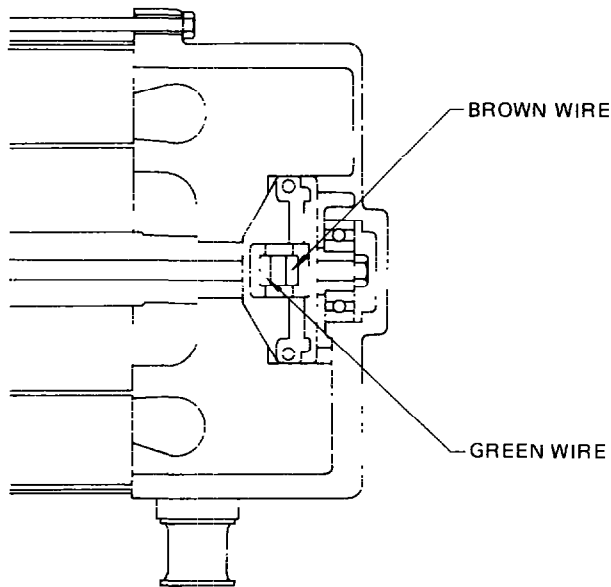


Fig. 10-27

- 3) Install the brush cover.
4φ x 10 mm screw . . . 3 pcs.

10-3-6 FRAME

- 1) The frame has holes for the rubber mount locks. Hold the rubber mounts so their locks are in line with the holes, and tighten the nuts on the bottom of the frame.
(See Fig. 10-28.)

8φ nut . . . 4 pcs.

8φ spring washer . . . 4 pcs.

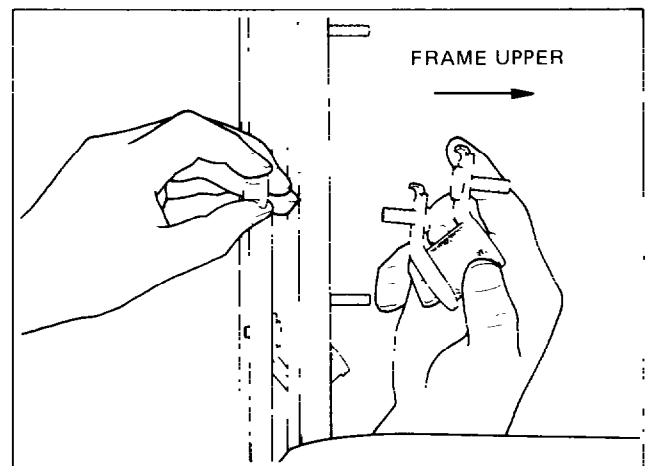


Fig. 10-28

NOTE: The rubber mounts are so selected as to assure optimum vibration depending on model and frequency. Be sure to use the rubber mounts of the correct parts number. Rubber mounts may appear the same in shape but differ in hardness. Especially, models RGX180, RGX240, and RGX240D use diagonal support rubber mounts.

- 2) Install the generator in the frame.

Lift the generator with a chain block, install it in the frame, and tighten the nuts. (See Fig. 10-29.)

- 8φ nuts 4 pcs.
- 8φ washers 4 pcs.
- 8φ spring washers 4 pcs.

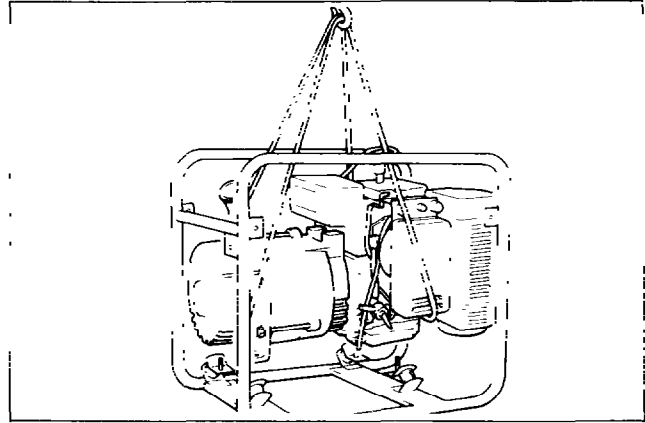


Fig. 10-29

- 3) Attach the side plates to the frame.

Mount the side plate that reads "Robin Generator Model" to the front, and the blank side plate to the rear.

NOTE: Use the black bolts for tightening them.

- 5φ × 13 mm bolts 8 pcs.

- 4) Attach the box stay to the side plates.

- 6φ × 15 mm bolts 2 pcs.
- 6φ washer 2 pcs.
- 6φ spring washer 2 pcs.
- 6φ nut 2 pcs.

10-3-7 CONTROL BOX

- 1) Fasten the control box to the frame and box stay.

NOTE: Spacers must be placed between the frame and control box. (See Fig. 10-30.)

- 6φ × 15 mm bolts 4 pcs.
- 6φ washer 4 pcs.
- 6φ spring washer 4 pcs.

Attach the control box to the frame in sub-assembling the control box.

Refer to Paragraph 10-4 for sub-assembling the control box.

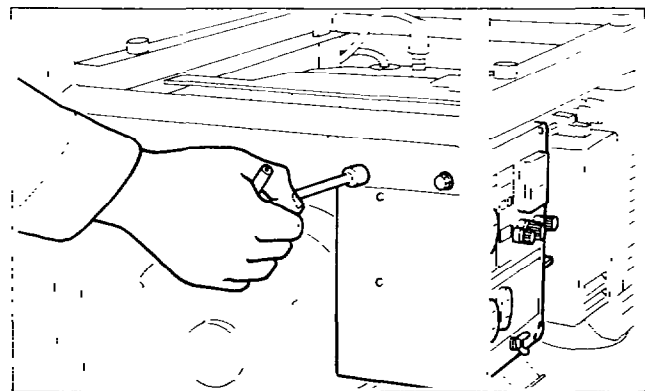


Fig. 10-30

- 2) Wire the primary exciting circuit.

Connect the two yellow wires of the automatic voltage regulator in the control box to the exciting coil wires of the engine, and clamp them to the control box with cord bushings. (See Fig. 10-31.)

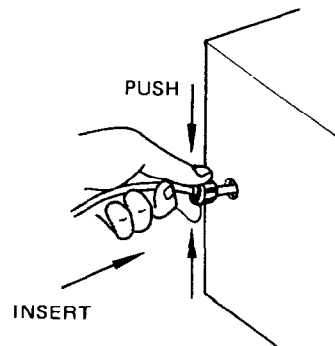


Fig. 10-31

- 3) Connect the connectors to the control box. And push the connectors into the control box.
- 4) Install the bushing on the control box.

NOTE: No clearance is allowed between the grommet and bushing. (See Fig. 10-32.)

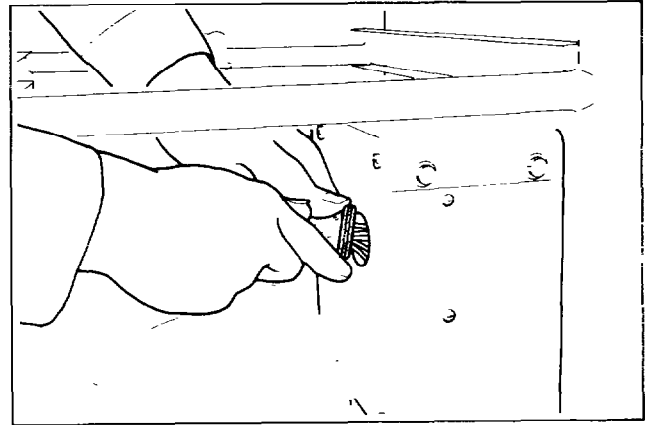


Fig. 10-32

10-3-8 FUEL TANK

- 1) Connect the rubber pipe to the engine carburetor and fasten it with the hose clamp. Attach the banjo to the opposite end of the rubber pipe, tighten it with the hose clamp, and fasten the pipe to the fuel strainer with the banjo bolt.
- 2) Attach the strainer bracket to the control box.

4φ × 10 mm bolts 2 pcs.

4φ spring washer 2 pcs.

- 3) Fasten the strainer to the strainer bracket with the joint nuts.

- 4) Mount the fuel tank on the side plates with rubber washers between the two.

6φ × 20 mm bolts 4 pcs.

6φ washers 4 pcs.

6φ spring washers 4 pcs.

NOTE: For easy tank assembly, glue the rubber washers around the holes in the side plates.

- 5) Connect the rubber pipe

First, fit the hose clamps on the rubber pipe, connect the strainer and fuel tank, then fasten the rubber pipe with the hose clamps.

NOTE: Apply a drop of oil to the rubber pipe so that it may easily be connected to the strainer and the fuel tank.

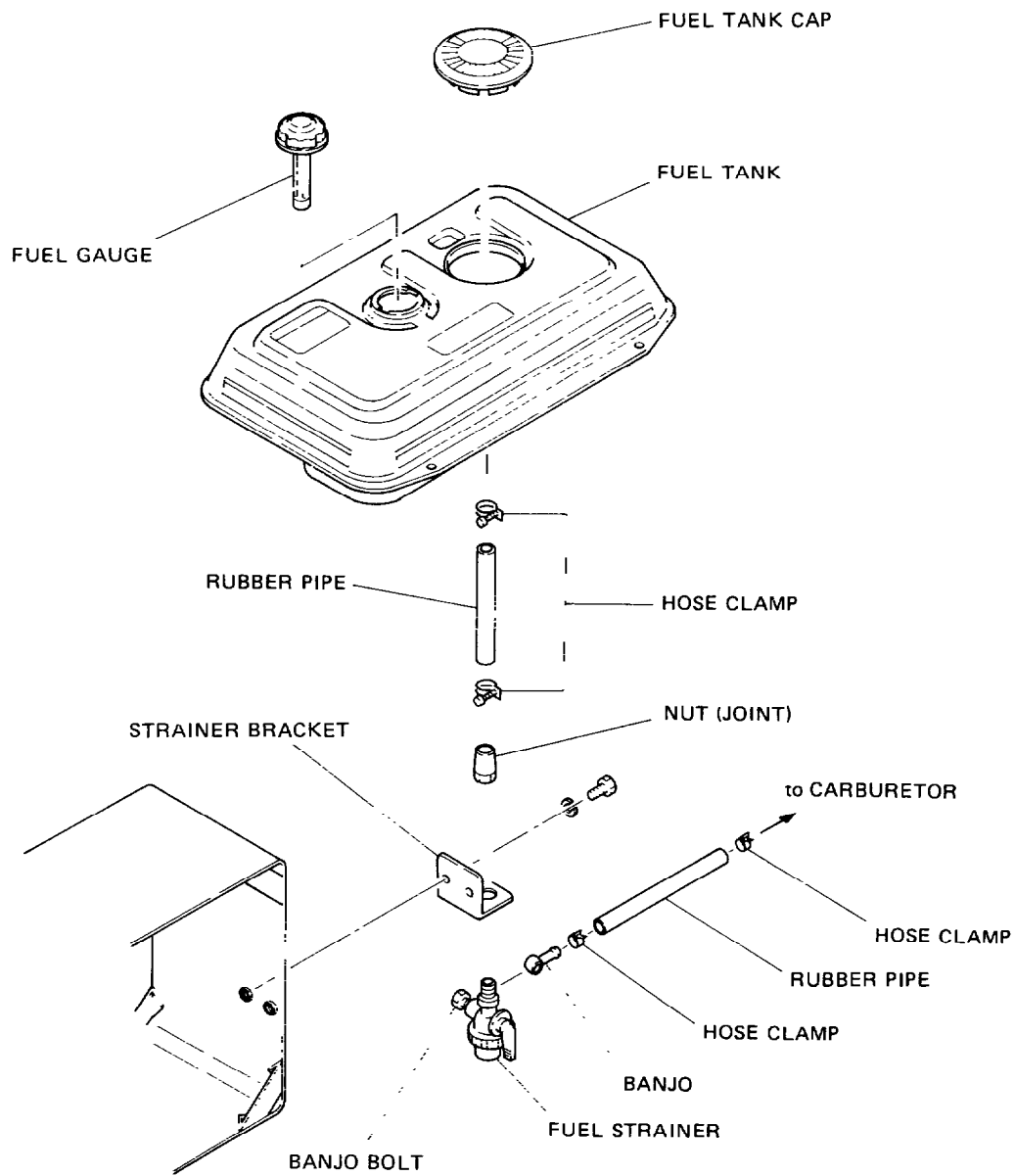


Fig. 10-33

10-4 CONTROL BOX CHECK, DISASSEMBLY, and REASSEMBLY

10-4-1 CHECK

Check the wiring by removing the control box from the frame and taking the panel B (rear panel) off.

10-4-2 DISASSEMBLY

- 1) Remove the control box panel B (rear panel) and the front panel from the control box. (See Fig. 10-34.)
- 2) Remove the connectors from the control box, and the wires from the connectors.

NOTE: Push the terminal locks in the connectors with a long, pointed pin to unlock the terminals, and remove them. (See Fig. 10-35.)

- 3) Remove the automatic voltage regulator.
- 4) After disconnecting the wire from each part, remove the parts.

NOTE: The DC fuse and the full power switch have their wires soldered to them. Unsolder their wires first, and then remove them.

10-4-3 REASSEMBLY

Reverse the disassembly procedure.

NOTE: The wires are colored for identification of capacity and gauge. Be sure to use the same wires when disconnected.

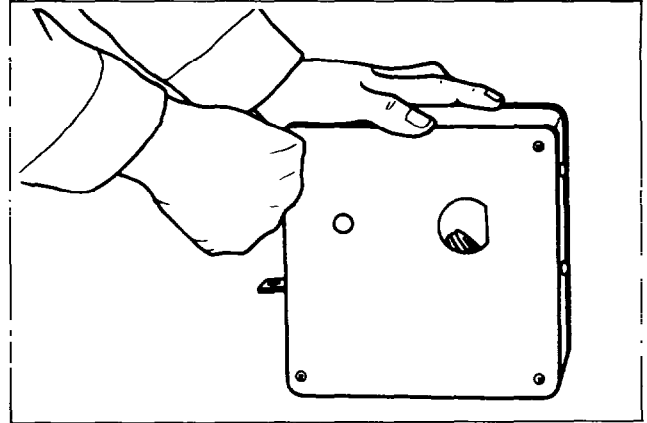


Fig. 10-34

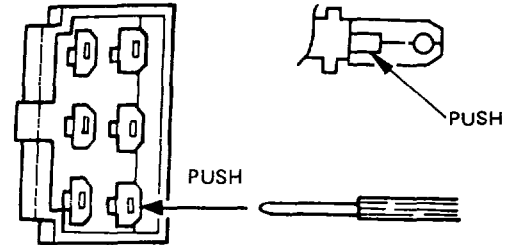


Fig. 10-35

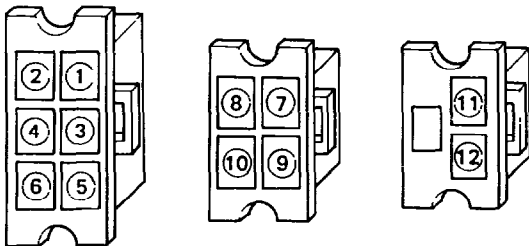


Fig. 10-36

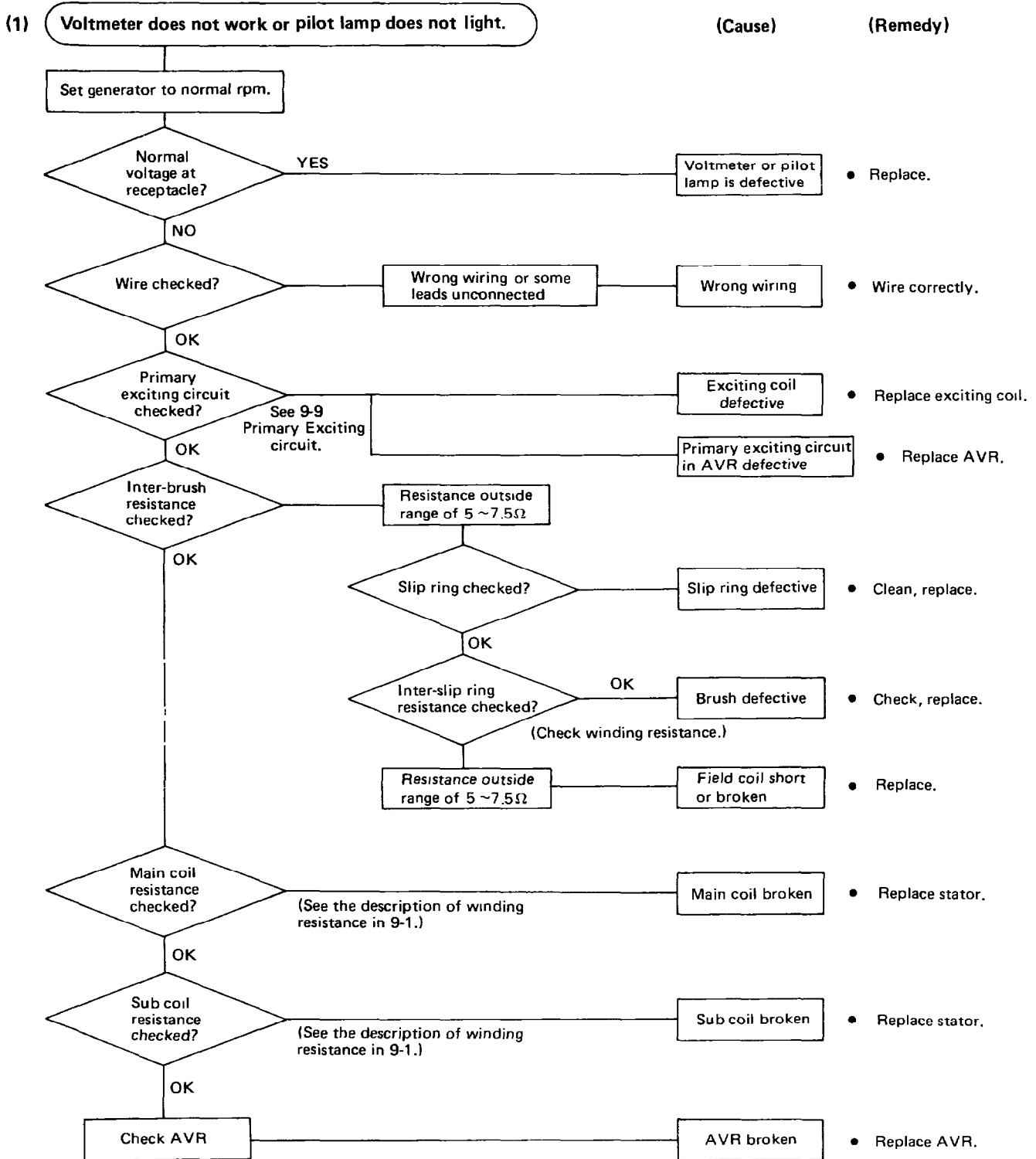
NOTE: Terminals ③ through ⑥ and ⑪, ⑫ are for 2mm² wire, terminals ①, ② are for 1.25 mm², and terminals ⑦ through ⑩ are for 0.75 mm².

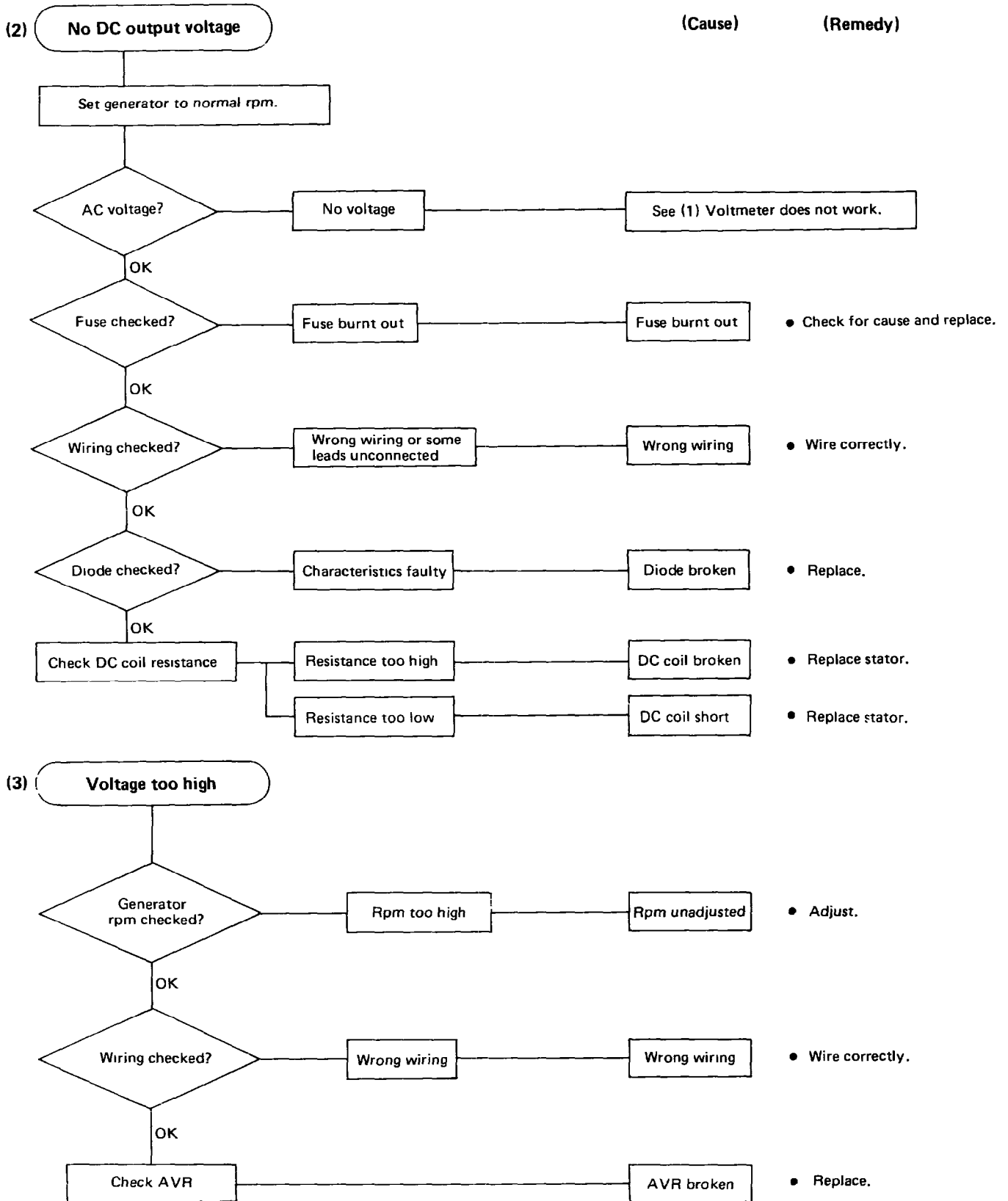
MODEL	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
RGX180	—	—	—	—	—	—	BROWN	GREEN	WHITE	RED	RED	WHITE
RGX240	BROWN WHITE	ORANGE	WHITE	RED	—	—	BROWN	GREEN	WHITE	RED	—	—
RGX240D	BROWN WHITE	ORANGE	WHITE	RED	—	BLACK	BROWN	GREEN	WHITE	RED	—	—

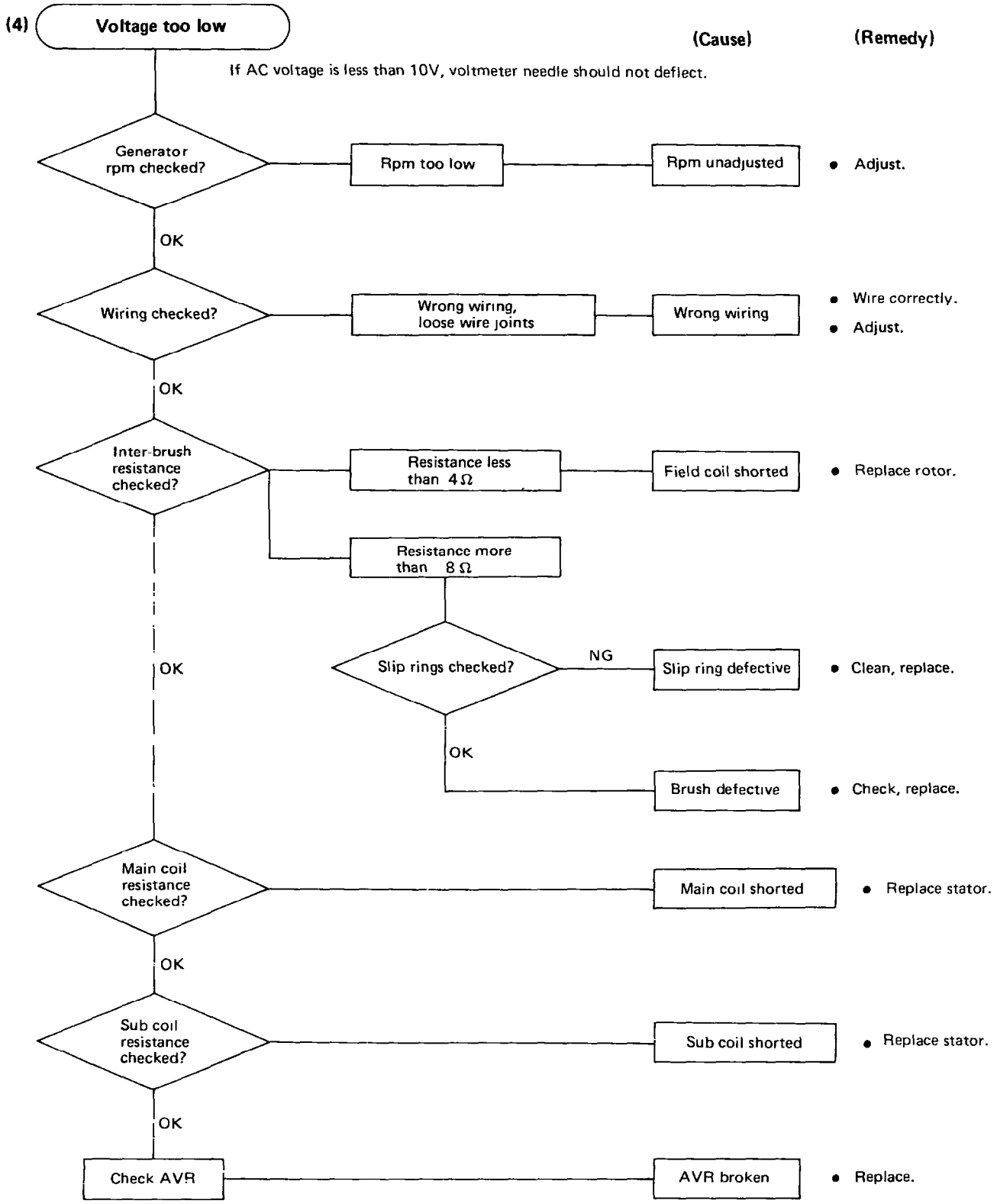
Table 10-4

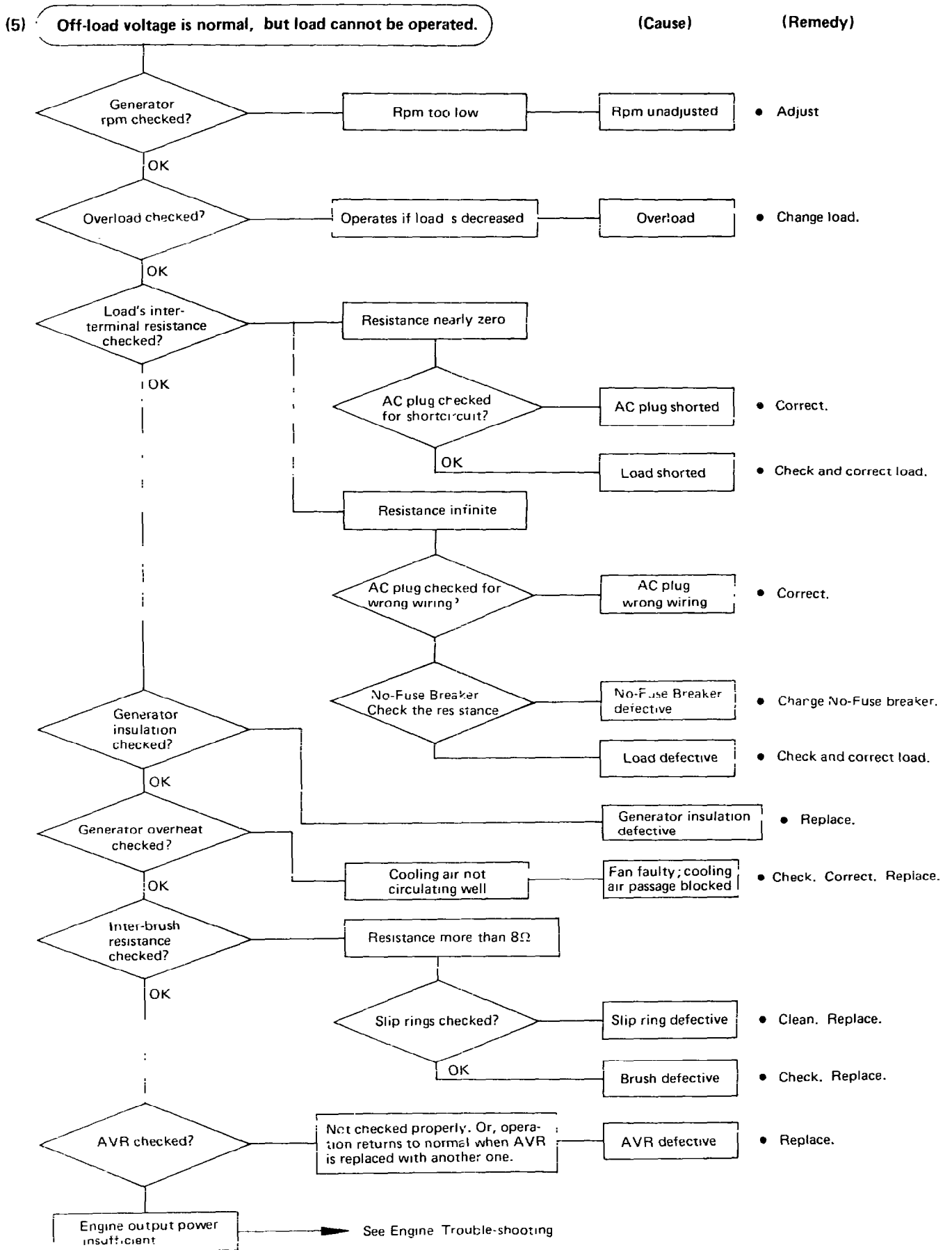
11. TROUBLE-SHOOTING

When the generator is in trouble, carefully check the trouble and remedy it.





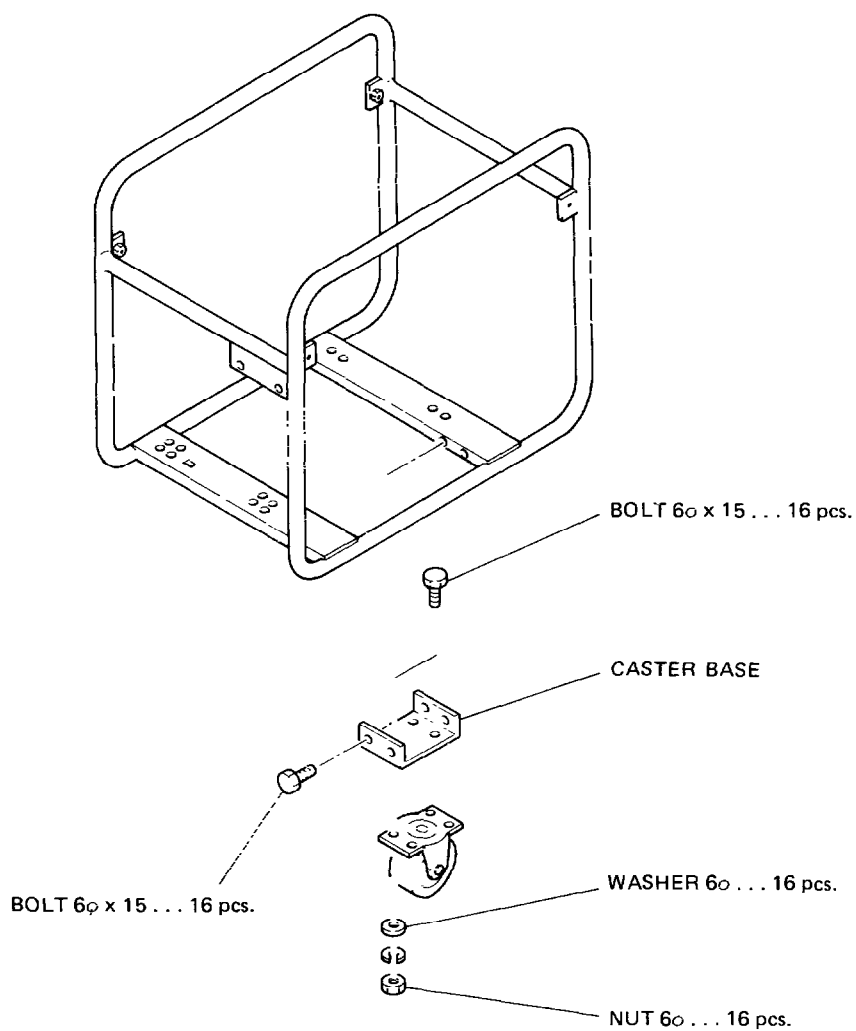




12. OPTIONS

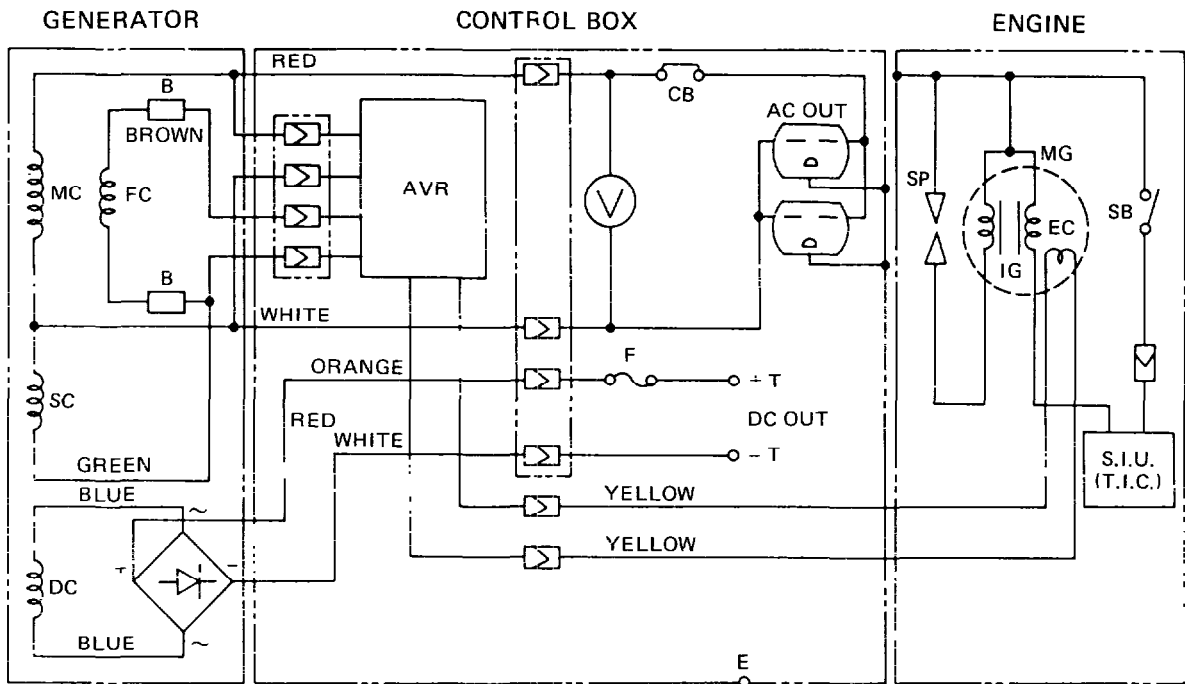
12-1 CASTER

- 1) The caster base is fitted with rubber casters 50mm in diameter and the caster base is bolted to the frame.
- 2) The frame has threaded holes for mounting the caster bases.

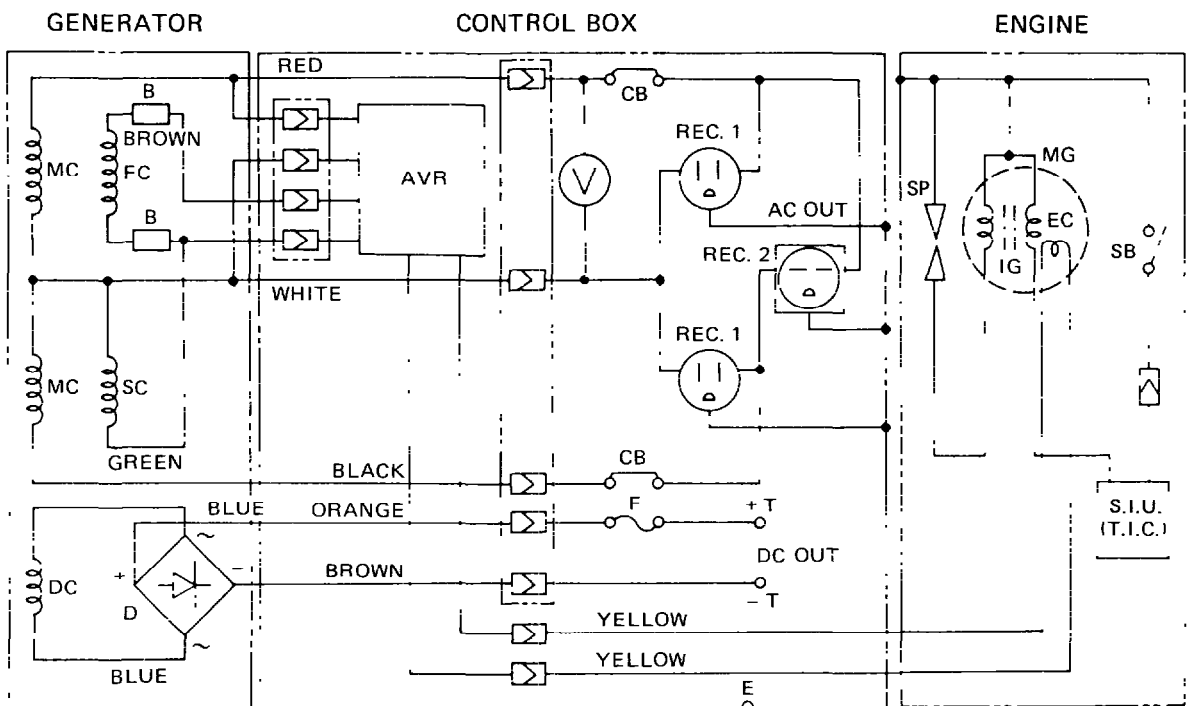


13. CIRCUIT DIAGRAM

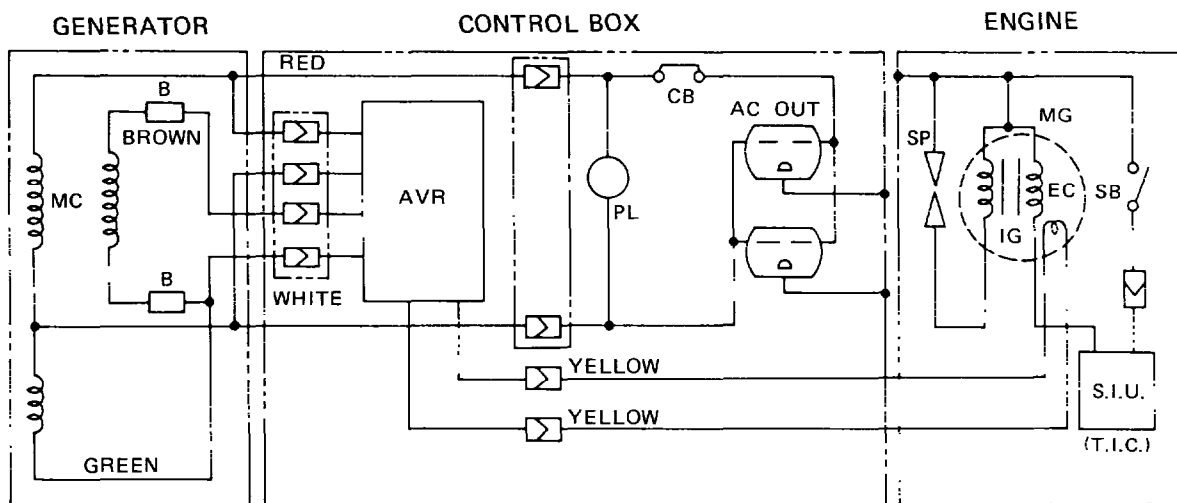
MODEL RGX240



MODEL RGX240D



MODEL RGX180



• **SYMBOLS**

Symbols	Name of Parts
MC	AC Winding
SC	Auxiliary Winding
DC	DC Winding
FC	Field Winding
B	Brush
AVR	Automatic Voltage Regulator
V	Voltmeter
PL	Pilot Lamp
D	Diode Stack Assy
E	Earth (Ground) Terminal
F	Fuse

Symbols	Name of Parts
REC ₁	Receptacle (110V or 120V)
REC ₂	Receptacle (220V or 240V)
T	Terminal
CB	Circuit Breaker
SP	Spark Plug
MG	Magneto
IG	Ignition Coil
EC	Exciting Coil
SB	Stop Button
S.I.U.	Solid State Ignition Unit



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