



Robin Generator

**Model RGX305,305D
RGX405,405D
RGX505,505D**

**Technical Data & Overhaul Instructions
SERVICE MANUAL**

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1. SPECIFICATIONS

Model				RGX305				RGX305D				RGX405				RGX405D			
Type				Revolving-Field, Self-Exciting, 2-pole, Single Phase															
GENERATOR	AC	Frequency		50Hz		60Hz		50Hz		60Hz		50Hz		60Hz		50Hz		60Hz	
		Output	Max. Rated	3000W 2500W		3400W 2900W		3000W 2500W		3400W 2900W		4000W 3300W		4400W 3700W		4000W 3300W		4400W 3700W	
		Voltage	Rated Current	110V	22.7A	110V	26.4A	110V	22.7A	110V	26.4A	110V	30.0A	110V	33.6A	110V	30.0A	110V	33.6A
				220V	11.4A	120V	24.2A	220V	11.4A	220V	13.2A	220V	15.0A	120V	30.8A	220V	15.0A	220V	16.8A
				230V	10.9A	—	—	120V	20.8A	120V	24.2A	230V	14.3A	—	—	120V	27.5A	120V	30.8A
				240V	10.4A	—	—	240V	10.4A	240V	12.1A	240V	13.8A	—	—	240V	13.8A	240V	15.4A
	Power Factor	1.0																	
DC Output	12V 8.3A 100W																		
Voltage Regulator	AVR (Automatic Voltage Regulator)																		
Voltage Regulation	Within 3%																		
ENGINE	Type	Robin Air-Cooled, 4-Cycle Gasoline Engine																	
	Model	EY25-2D(EY25-W)*								EY35D(W1-340)*									
	Displacement	252 cc (15.40 cu. in)								334 cc (20.39 cu. in)									
	Max. Output	7HP/4000 rpm								8.5HP/3600 rpm									
	Fuel	Automobile Gasoline																	
	Fuel Tank Capacity	16 Liters (4.2 U.S. gal)																	
	Oil Capacity	0.85 Liter (1.8 pints)								1.2 liters (2.6 pints)									
	Revolutions/min	50Hz—3000 rpm, 60Hz—3600 rpm																	
	Ignition System	Robin Solid State Ignition System																	
	Starting System	Recoil Starter (Electric Starter Optional)																	
Fuel Consumption Ratio				1.7 Liters/Hr (50Hz), 1.9 Liters (60Hz)								2.2 Liters/Hr (50Hz), 2.6 Liters/Hr (60Hz)							
Dimensions	Length			681 mm (26.8 in)								706 mm (27.8 in)							
	Width			466 mm (18.3 in)								486 mm (19.1 in)							
	Height			561 mm (22.1 in)								596 mm (23.5 in)							
Dry Weight				62 kg (137 lbs)								73.5 kg (162 lbs.)							

*For U.S.A. and Canadian markets

Model				RGX505				RGX505D							
Type				Revolving-Field, Self Exciting, 2-pole, Single Phase											
GENERATOR	AC	Frequency		50Hz		60Hz		50Hz		60Hz					
		Output	Max. Rated	5000W 4400W		5500W 4800W		5000W 4400W		5500W 4800W					
		Voltage	Rated Current	110V	40.0A	110V	43.6A	100V	40.0A	110V	43.6A				
				220V	20.0A	120V	40.0A	220V	20.0A	220V	20.0A				
				230V	19.1A	—	—	120	36.7A	120V	40.0A				
				240V	18.3A	—	—	240V	18.3A	240V	20.0A				
	Power Factor		1.0												
DC Output		12V 8.3A 100W													
Voltage Regulator		AVR (Automatic Voltage Regulator)													
Voltage Regulation		Within 3%													
ENGINE	Type		Robin Air-Cooled, 4-Cycle Gasoline Engine												
	Model		EY40D (W1-390)*												
	Displacement		388 cc (23.68 cu. in)												
	Max. Output		10.0HP/3600 rpm												
	Fuel		Automobile Gasoline												
	Fuel Tank Capacity		16 liters (4.2 U.S. gal)												
	Oil Capacity		1.2 liters (2.6 pints)												
	Revolution/min		50Hz— 3000 rpm, 60Hz— 3600 rpm												
	Ignition System		Robein Solid State Ignition System												
	Starting System		Recoil Starter (Electric Starter Optional)												
Fuel Consumption Ratio		2.7 Liters/Hr (50Hz), 3.1 Liters/Hr (60Hz)													
Dimensions	Length		706 mm (27.8 in)												
	Width		486 mm (19.1 in)												
	Height		596 mm (23.5 in)												
Dry Weight		77.5 kg (171 lbs.)													

*For U.S.A. and Canadian markets

2. PERFORMANCE

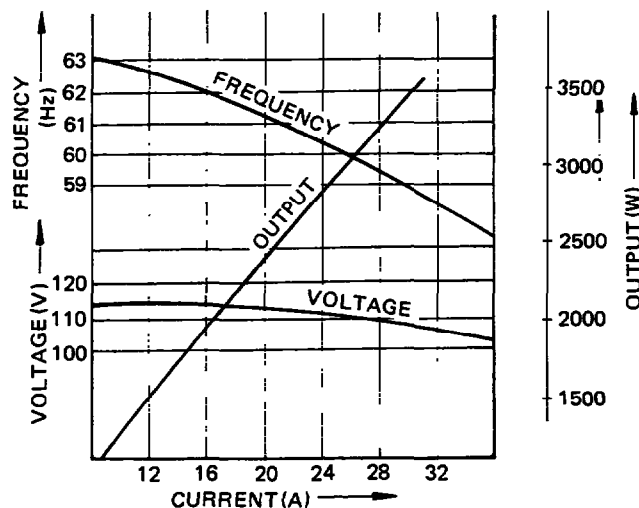
2-1 OUTPUT

MODEL RGX305

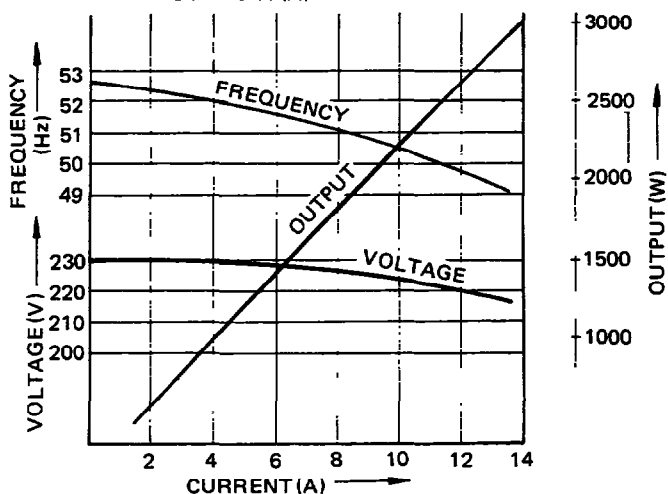
Type Self Exciting, 2-Pole, Single Phase

Power Factor 1.0

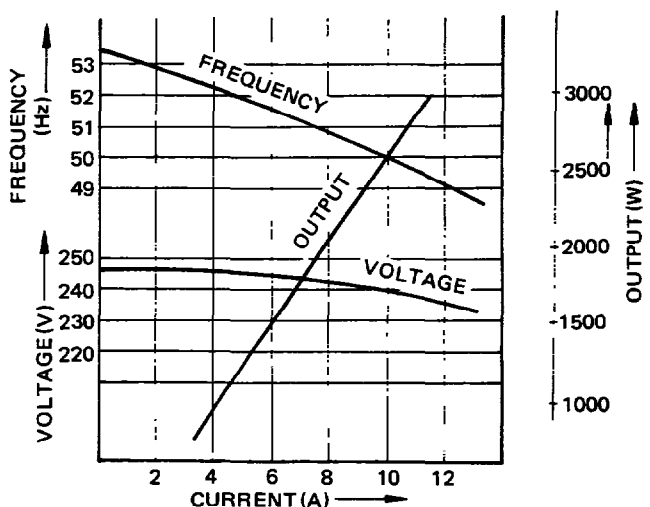
Engine EY25-2D (EY25W)*



Output Max. 3400W
 Rated 2900W
 Frequency 60Hz
 Voltage 110V



Output Max. 3000W
 Rated 2500W
 Frequency 50Hz
 Voltage 220V



Output Max. 3000W
 Rated 2500W
 Frequency 50Hz
 Voltage 240V

NOTE: These diagrams show the RGX305 characteristics at the main line frequencies and voltages. The characteristics are similar to 60Hz 120V, 50Hz 110V, and 50Hz 230V.

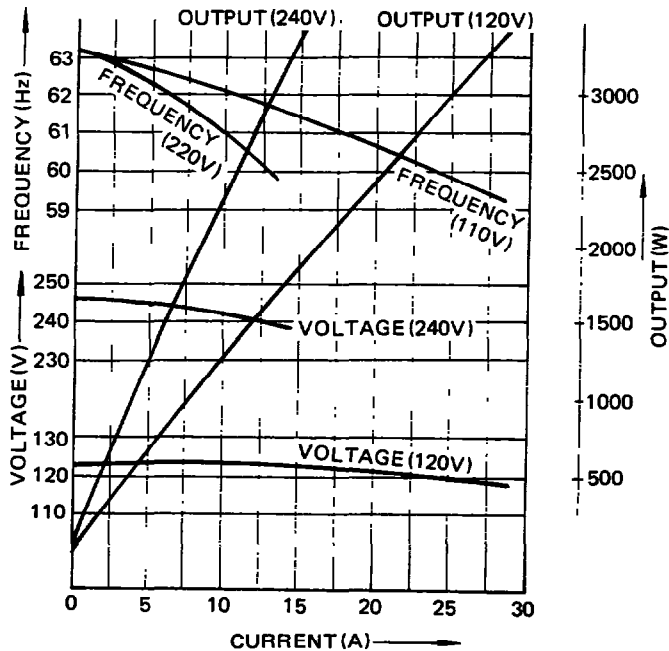
**For U.S.A. and Canadian markets*

MODEL RGX305D

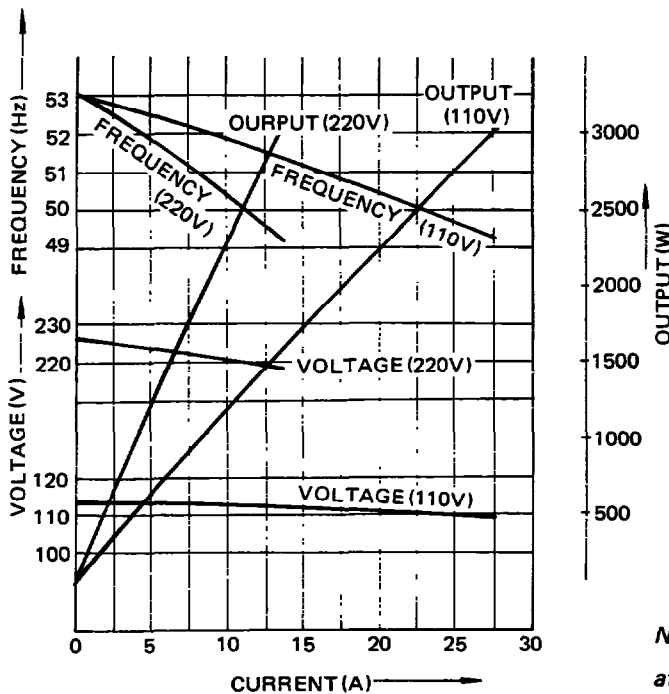
Type Self Exciting, 2-Pole, Single Phase

Power Factor 1.0

Engine EY25-2D (EY25W)*



Output Max. 3400W
 Rated 2900W
 Frequency 60Hz
 Voltage 120V/240V



Output Max. 3000W
 Rated 2500W
 Frequency 50Hz
 Voltage 110V/220V

NOTE: These diagrams show the RGX305D characteristics at the main line frequencies and voltages. The characteristics are similar to 60Hz 110V/220V, 50Hz 120V/240V.

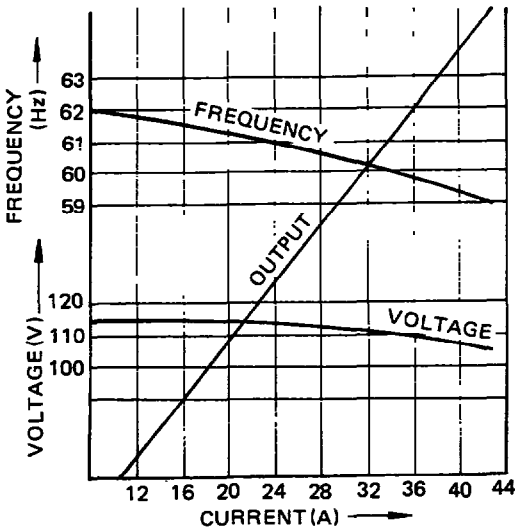
*For U.S.A. and Canadian markets

MODEL RGX405

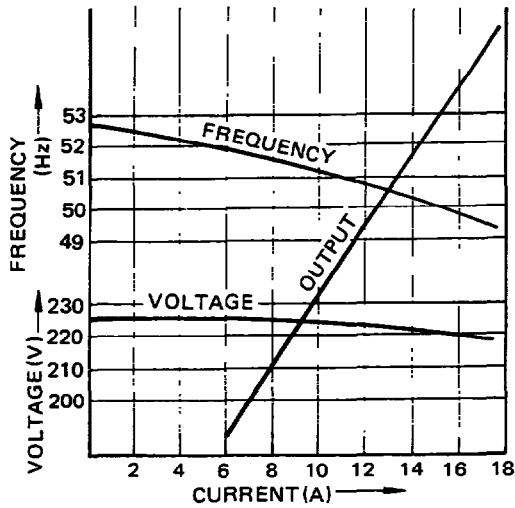
Type Self Exciting, 2-Pole, Single Phase

Power Factor 1.0

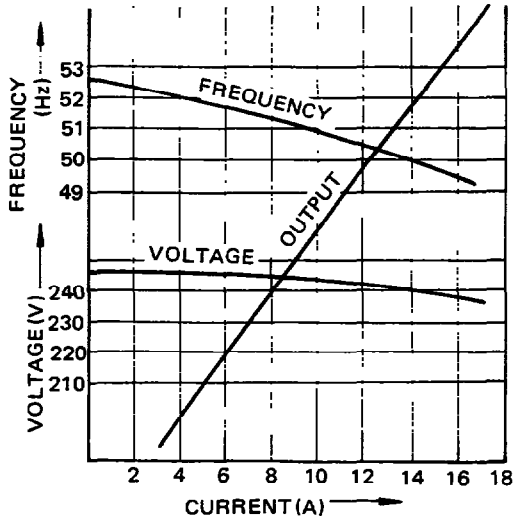
Engine EY35D (W1-340)*



Output Max. 4400W
Rated 3700W
Frequency 60Hz
Voltage 110V



Output Max. 4000W
Rated 3300W
Frequency 50Hz
Voltage 220V



Output Max. 4000W
Rated 3300W
Frequency 50Hz
Voltage 240V

NOTE: These diagrams show the RGX405 characteristics at the main line frequencies and voltages. The characteristics are similar to 60Hz 120V, 50Hz 110V, and 50Hz 230V.

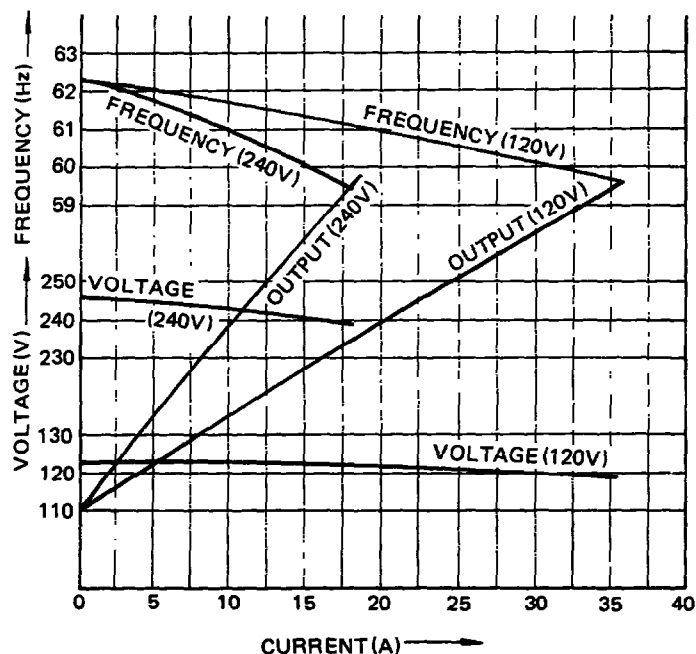
**For U.S.A. and Canadian markets*

MODEL RGX405D

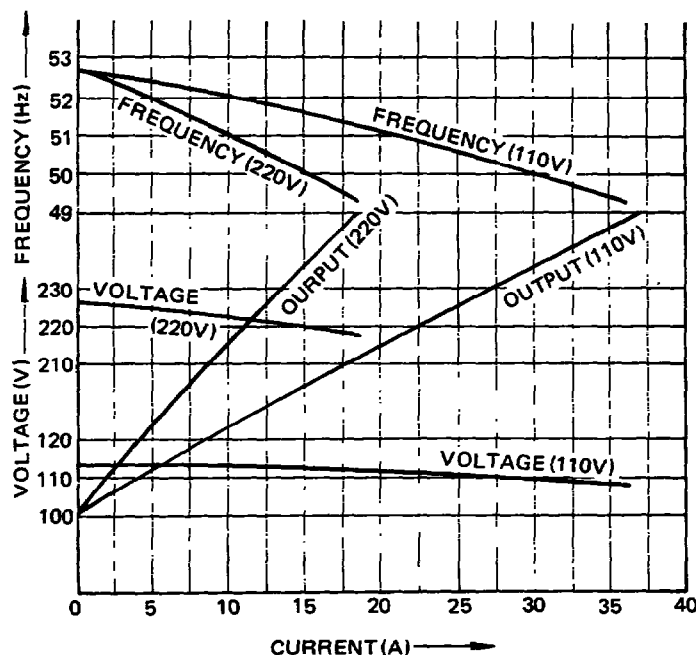
Type Self Exciting, 2-Pole, Single Phase

Power Factor 1.0

Engine EY35D (W1-340)*



Output Max. 4400W
 Rated 3700W
 Frequency 60Hz
 Voltage 120V/240V



Output Max. 4000W
 Rated 3300W
 Frequency 50Hz
 Voltage 110V/220V

NOTE: These diagrams show the RGX405D characteristics at the main line frequencies and voltages. The characteristics are similar to 60Hz 110V/220V, 50Hz 120V/240V.

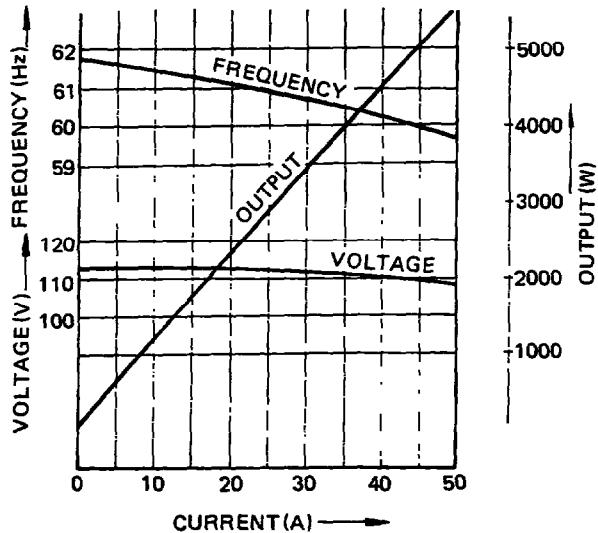
**For U.S.A. and Canadian markets*

MODEL RGX505

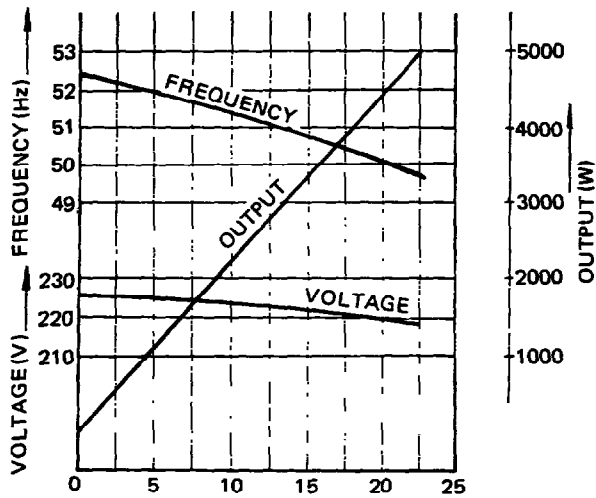
Type Self Exciting, 2-Pole, Single Phase

Power Factor 1.0

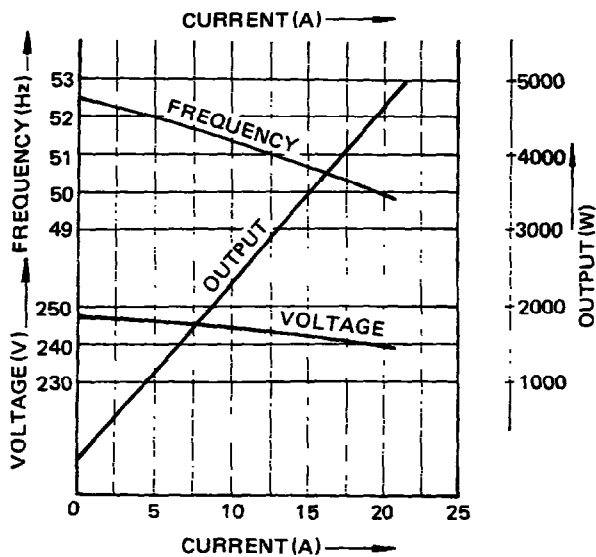
Engine EY40D (W1-390)*



Output Max. 5500W
 Rated 4800W
 Frequency 60Hz
 Voltage 110V



Output Max. 5000W
 Rated 4400W
 Frequency 50Hz
 Voltage 220V



Output Max. 5000W
 Rated 4400W
 Frequency 50Hz
 Voltage 240V

NOTE: These diagrams show the RGX505 characteristics at the main line frequencies and voltages. The characteristics are similar to 60Hz 120V, 50Hz 110V, and 50Hz 230V.

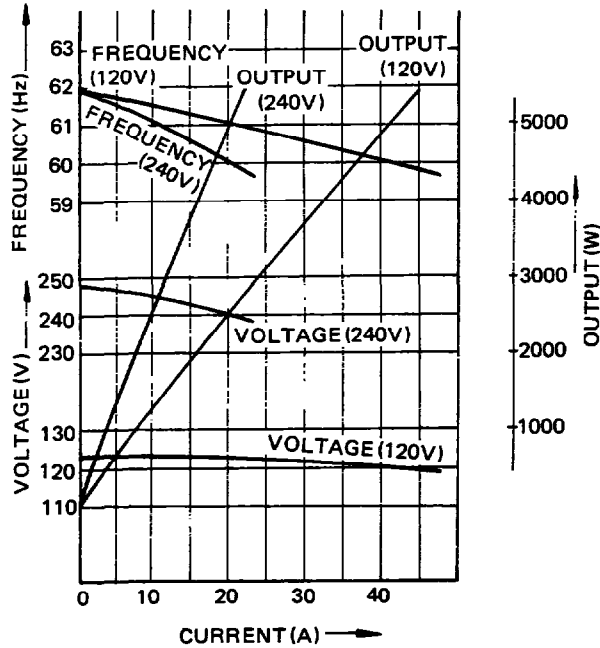
**For U.S.A. and Canadian markets*

MODEL RGX505D

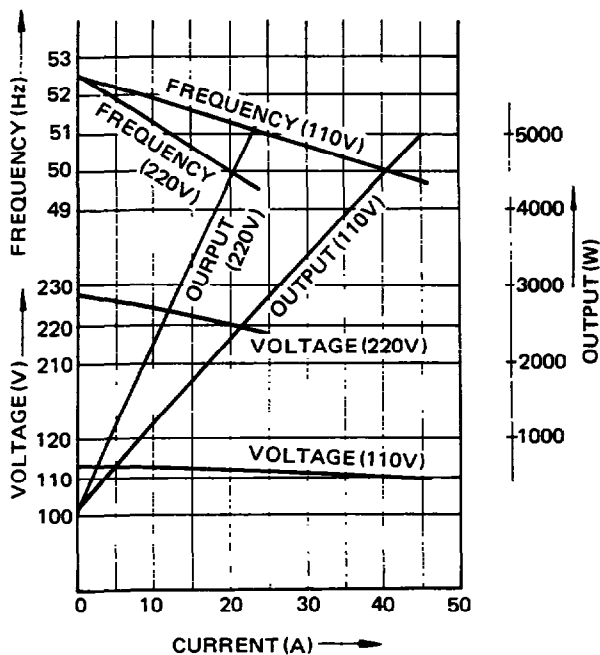
Type Self Exciting, 2-Pole, Single Phase

Power Factor 1.0

Engine EY40D (W1-390)*



Output Max. 5500W
 Rated 4800W
 Frequency 60Hz
 Voltage 120V/240V



Output Max. 5000W
 Rated 4400W
 Frequency 50Hz
 Voltage 110V/220V

NOTE: These diagrams show the RGX505D characteristics at the main line frequencies and voltages. The characteristics are similar to 60Hz 110V/220V, 50Hz 120V/240V.

**For U.S.A. and Canadian markets*

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 16-Liter Gas Tank**
 - *16-liter (4.2-gallon) fuel tank is provided for ten hours of operation for Model RGX305 or seven hours for Model RGX405. (at the 50Hz rated output power)
 - *RGX505 can operate for six hours (at the 50Hz rated output power) with a full tank.
 - *The tank has a fuel gauge which shows the remaining amount of fuel in the tank.
4. **Solid State Ignition System**
 - *Unlike the 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.
 - *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**
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. **Full Power Switch**
The dual voltage type has a full power switch as a standard component. The rated output can be generated at both 120V (110V) and 240V (220V).
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. **No-Fuse Breaker for Troublefree Operation**

14. Ruggedly Built Frame

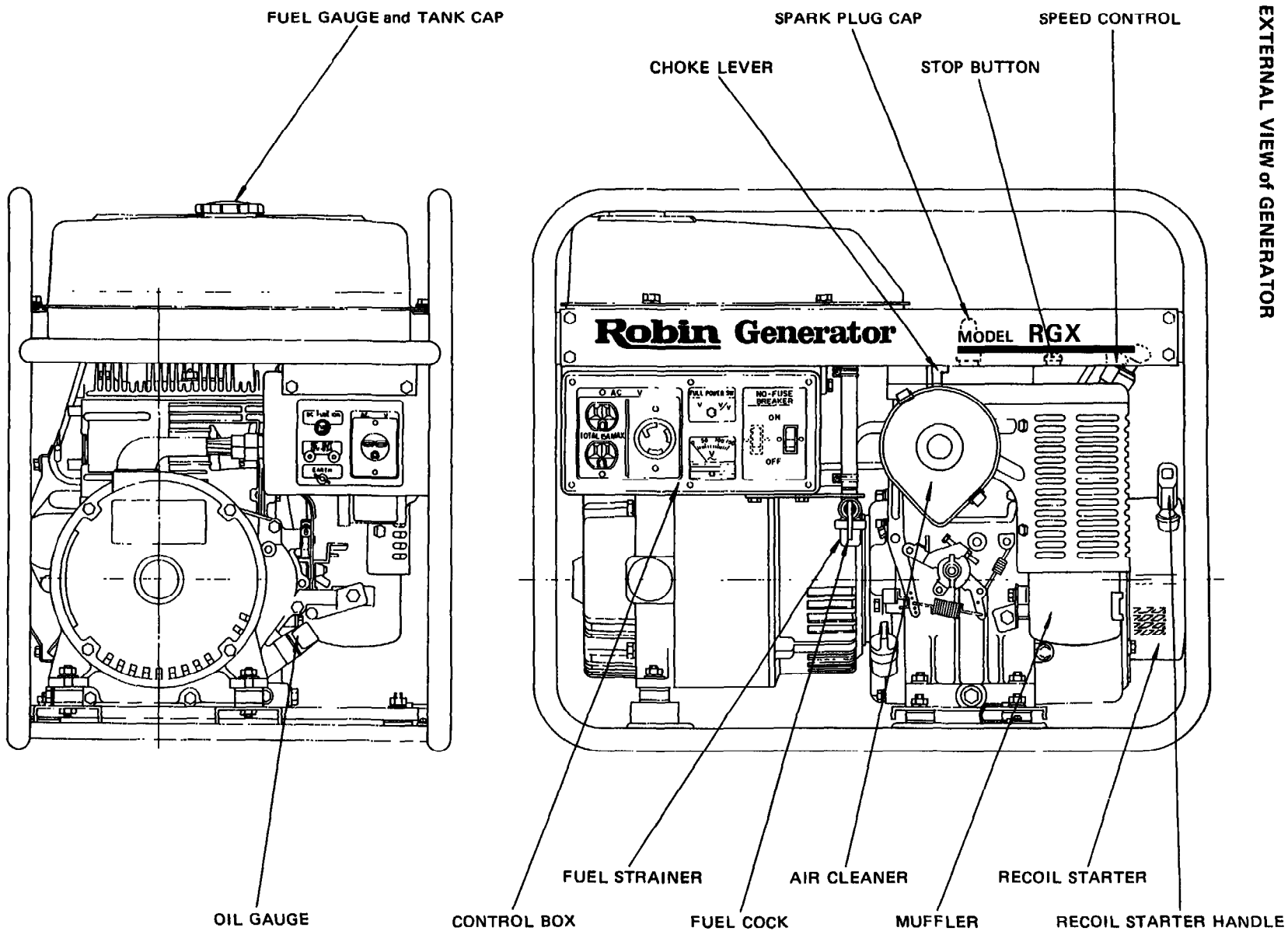
The box type frame is so ruggedly built that two or more generators can be stacked. Another convenient feature for the Robin generators.

15. Wide Range of Options

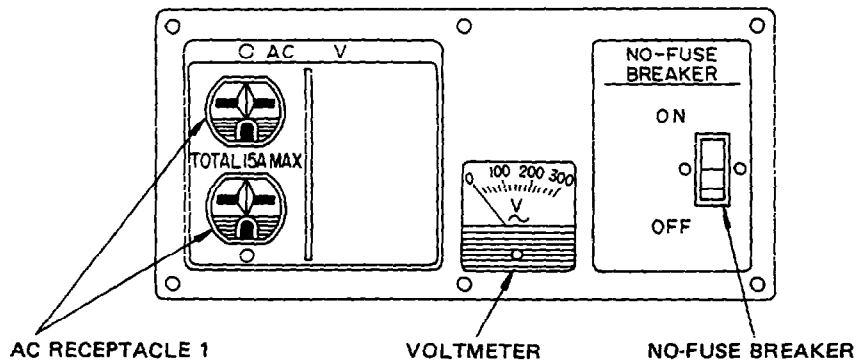
The electric starter type, wheels, and econo-throttle are available as options.

4. GENERAL DESCRIPTION of GENERATOR

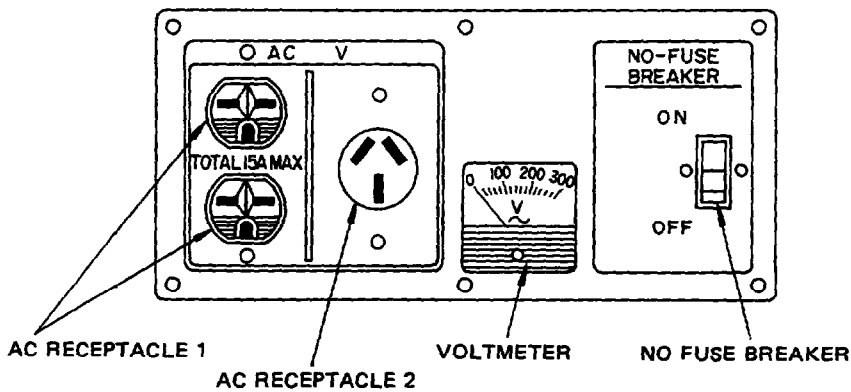
4-1 EXTERNAL VIEW of GENERATOR



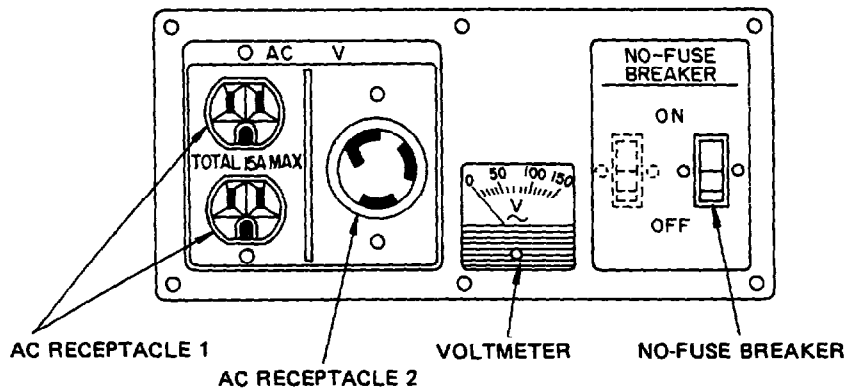
4-2 PANEL A



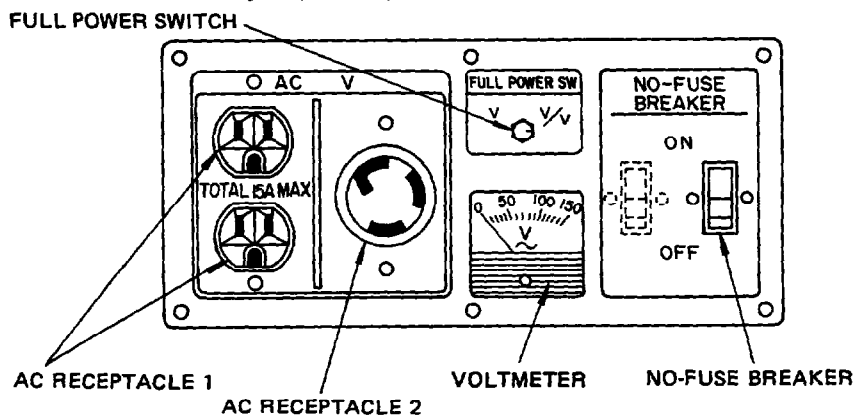
MODEL
RGX305 220V, 230V, 240V
RGX405 220V, 230V, 240V



MODEL
RGX505 220V, 230V, 240V

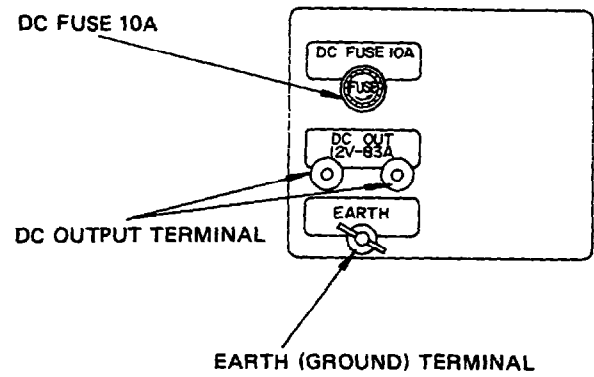


MODEL
RGX305 110V, 120V
RGX405 110V, 120V
RGX505 110V, 120V

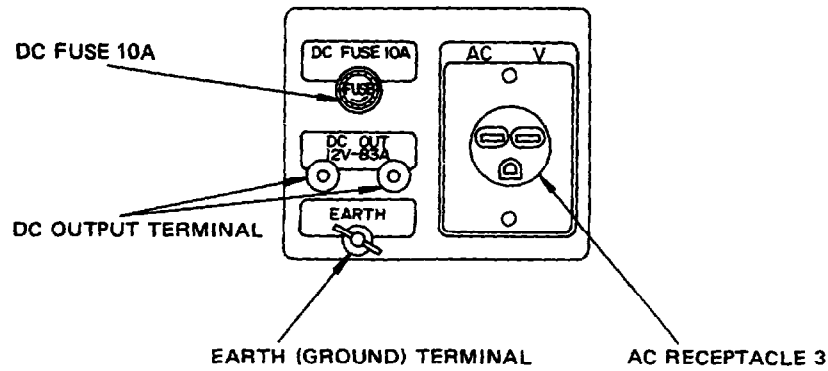


MODEL
RGX305D
RGX405D
RGX505D

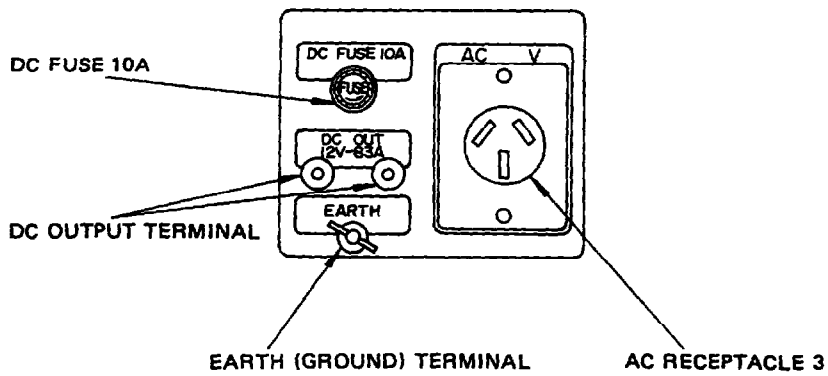
4-3 PANEL B



MODEL
RGX305
RGX405
RGX505



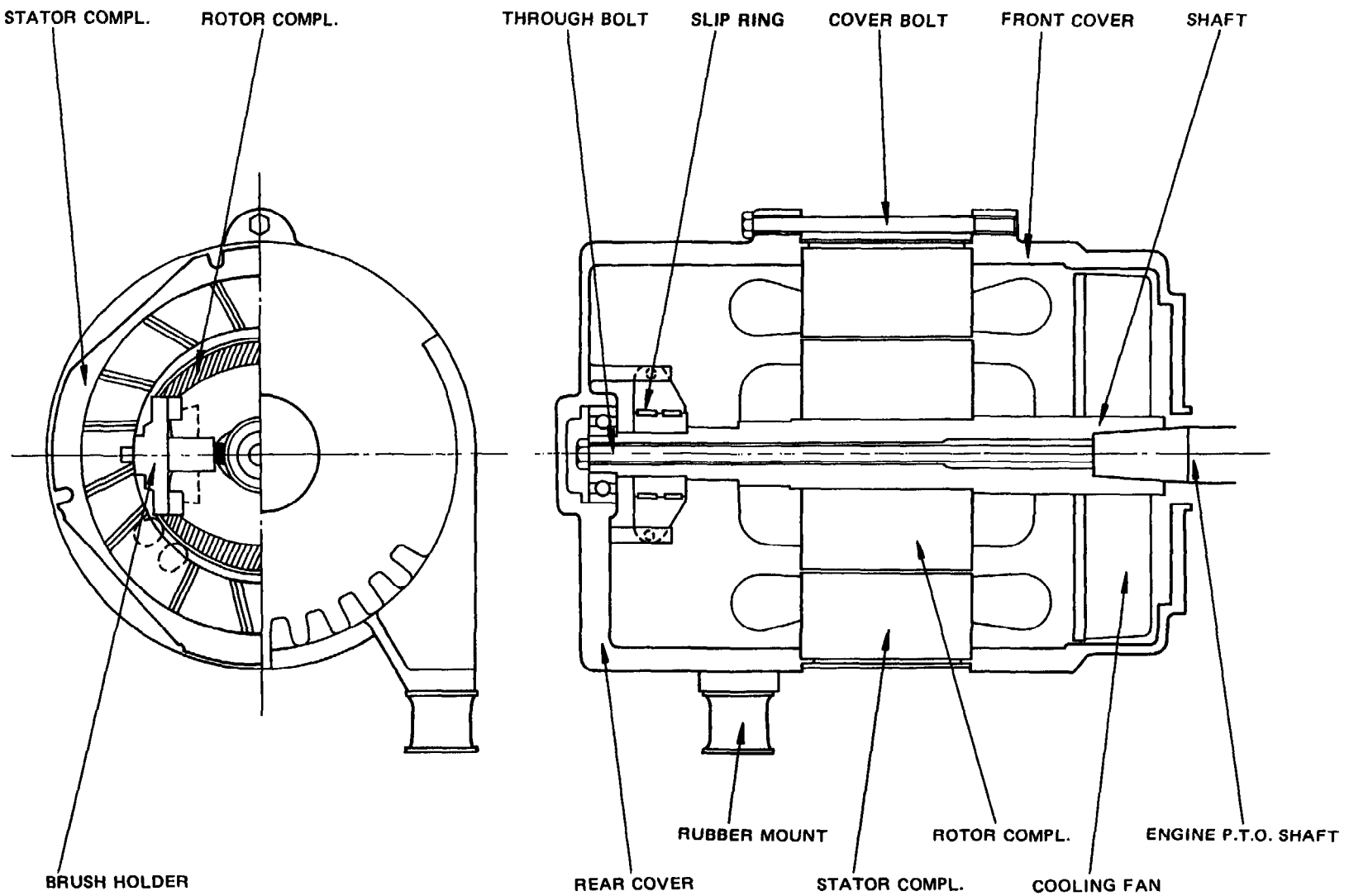
RGX305D
RGX405D



RGX505D

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. The outside diameters and laminated core thicknesses of various models are as shown below.

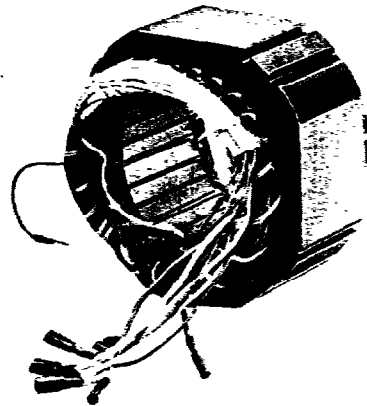


Fig. 5-1

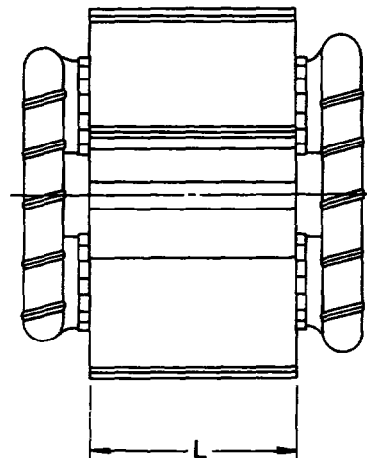
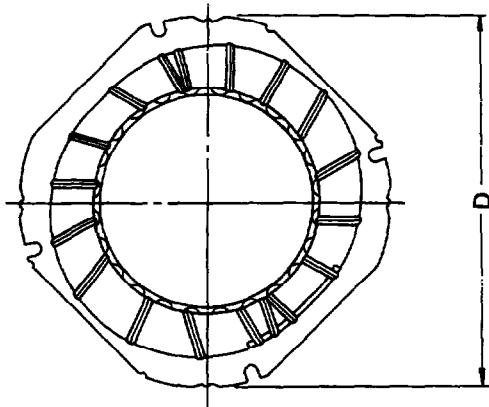


Fig. 5-2

MODEL	RGX305 RGX305D	RGX405 RGX405D	RGX505 RGX505D
D (mm)	177	204	204
(inch)	6.97	8.03	8.03
L (mm)	100	80	100
(inch)	3.94	3.15	3.94

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.

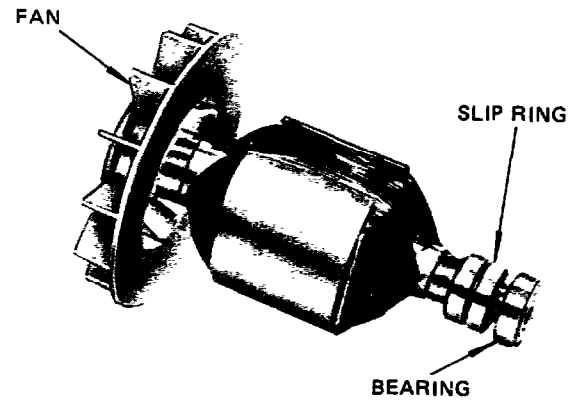


Fig. 5-3

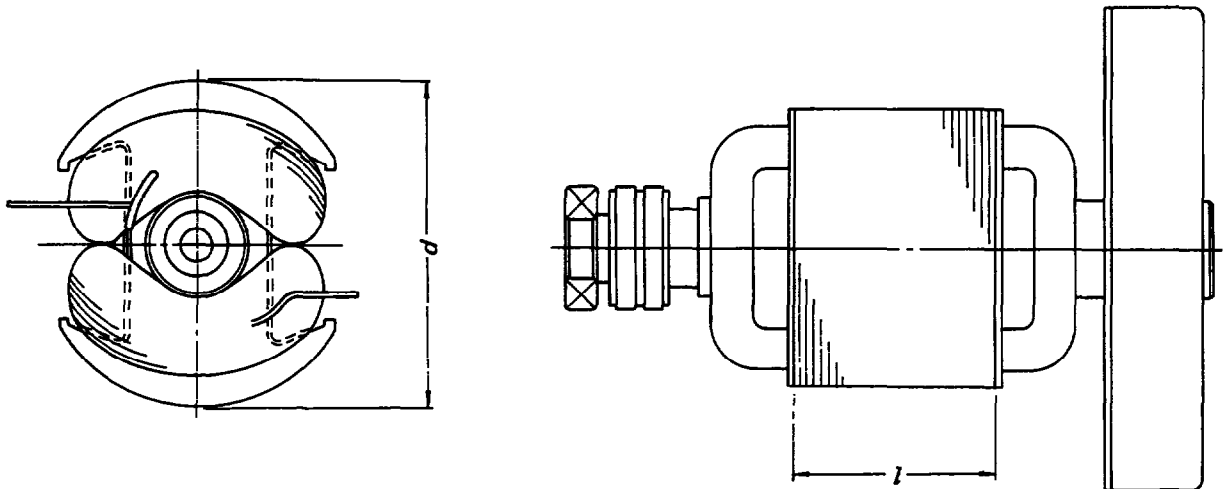


Fig. 5-4

MODEL	RGX305 RGX305D	RGX405 RGX405D	RGX505 RGX505D
d (mm)	99.6	118	118
(inch)	3.92	4.65	4.65
l (mm)	100	80	100
(inch)	3.94	3.15	3.94

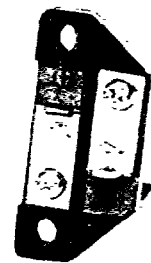
Table 5-2

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 of brush length. (See 9-3 BRUSHES.)



RGX305, RGX305D



RGX405, RGX405D
RGX505, RGX505D

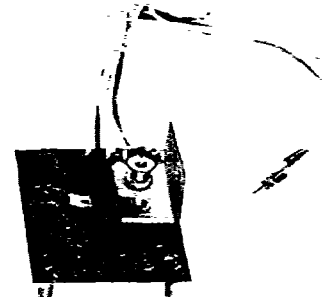
Fig. 5-5

5-2-4 AVR (AUTOMATIC VOLTAGE REGULATOR)

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



RGX305, RGX305D

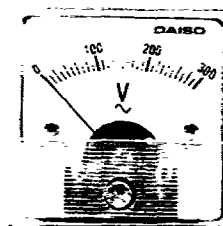


RGX405, RGX405D
RGX505, RGX505D

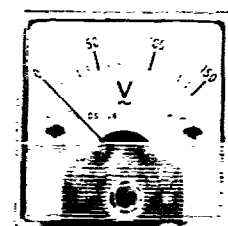
Fig. 5-6

5-2-5 VOLTMETER

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



300 V MAX.
(220 V, 230 V, 240 V)



150 V MAX.
(110 V, 120 V)

Fig. 5-7

5-2-6 NO-FUSE BREAKER

The no-fuse breaker prevents AC output overcurrent and shortcircuit overcurrent.

Some models have one no-fuse breaker, and the others have two. The single no-fuse breaker protects the generator from maximum current; and the double no-fuse breakers protect the generator from maximum current, and its receptacles.

If the generator is operated for long above the maximum current, the internal temperature of the generator abnormally rises to cause insulation deterioration, burning, electric shock, and electric leakage. The no-fuse breaker protects the generator from such troubles. The receptacles and AC

plug have their own rated capacities. (Refer to 5-2-8 RECEPTACLES AND PLUG.) If they are used above the rated current, insulation deterioration, burning, electric shock, or leakage can occur. These troubles are prevented by the no-fuse breaker.

Table 5-3 shows breaker capacities and protecting objects.



NO-FUSE BREAKER



FUSE HOLDER

Fig. 5-8

Model	Specifications	N.F.B.	Protecting Object	N.F.B.	Protecting Object
RGX305	110V	30A	Maximum current		
	220V, 230V, 240V	15A (2P2E)	Maximum current		
RGX305D	110/220V, 120/240V	15A (2P2E)	Maximum current		
RGX405	50Hz-110V, 60Hz-120V	30A	Maximum current		
	60Hz-110V	35A	Maximum current		
	220V, 230V	20A(2P2E)	Maximum current		
	240V	15A (2P2E)	Maximum current		
RGX405D	110/220V, 60Hz-120/240V	20A (2P2E)	Maximum current		
	50Hz-120/240V	15A(2P2E)	Maximum current		
RGX505	50Hz-110V, 60Hz-120V	40A	Maximum current	30A	30A Receptacle
	220V, 230V	25A(2P2E)	Maximum current		
	240V	20A(2P2E)	Maximum current		
	60Hz-110V	45A	Maximum current	30A	30A Receptacle
RGX505D	110/220V, 60Hz-120/240	25A (2P2E)	Maximum current	20A (2P2E)	30A Receptacle
	50Hz-120/240V	20A (2P2E)	Maximum current		

Table 5-3

**2P2E means the bipolar double-element type, and if either of two pairs of currents running through the no-fuse breaker exceeds the rated current, the no-fuse breaker operates to turn power off.*

The 220V, 230V, and 240V types use the two pairs connected in series, and the 100V and 120V type have them connected in parallel.

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 five kinds of receptacles, each varying in rated voltage and current from another, are used. Each model has at least one receptacle to deliver the rated generator output. 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.





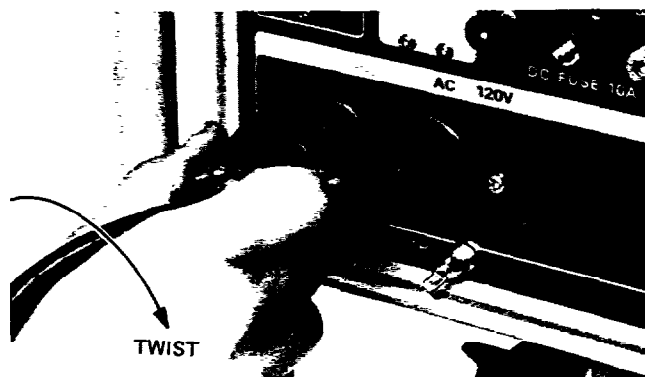
	up to total 15 amperes from two receptacles
	up to 15 amperes
	up to 20 amperes
	up to 30 amperes (See Caution.)

Table 5-4



Caution: Taking out power from TWIST LOCK RECEPTACLE, put the plug into outlet and turn clockwise to lock it.

Fig. 5-9

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 (-).

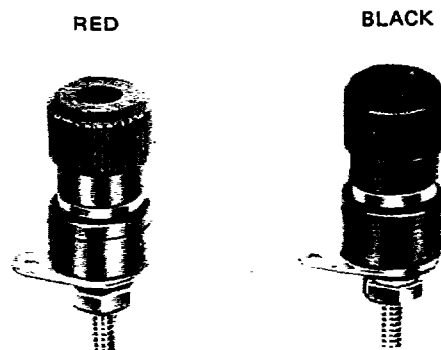


Fig. 5-10

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.

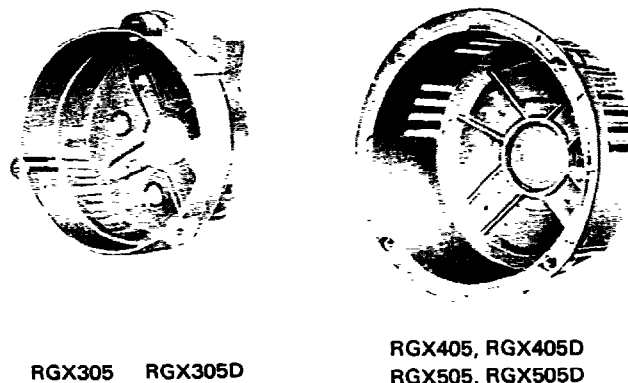


Fig. 5-11

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.



RGX305 RGX305D

RGX405, RGX405D
RGX505, RGX505D

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.

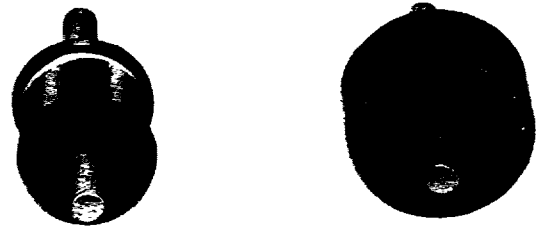


Fig. 5-13

5-2-13 PIPE FRAME

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

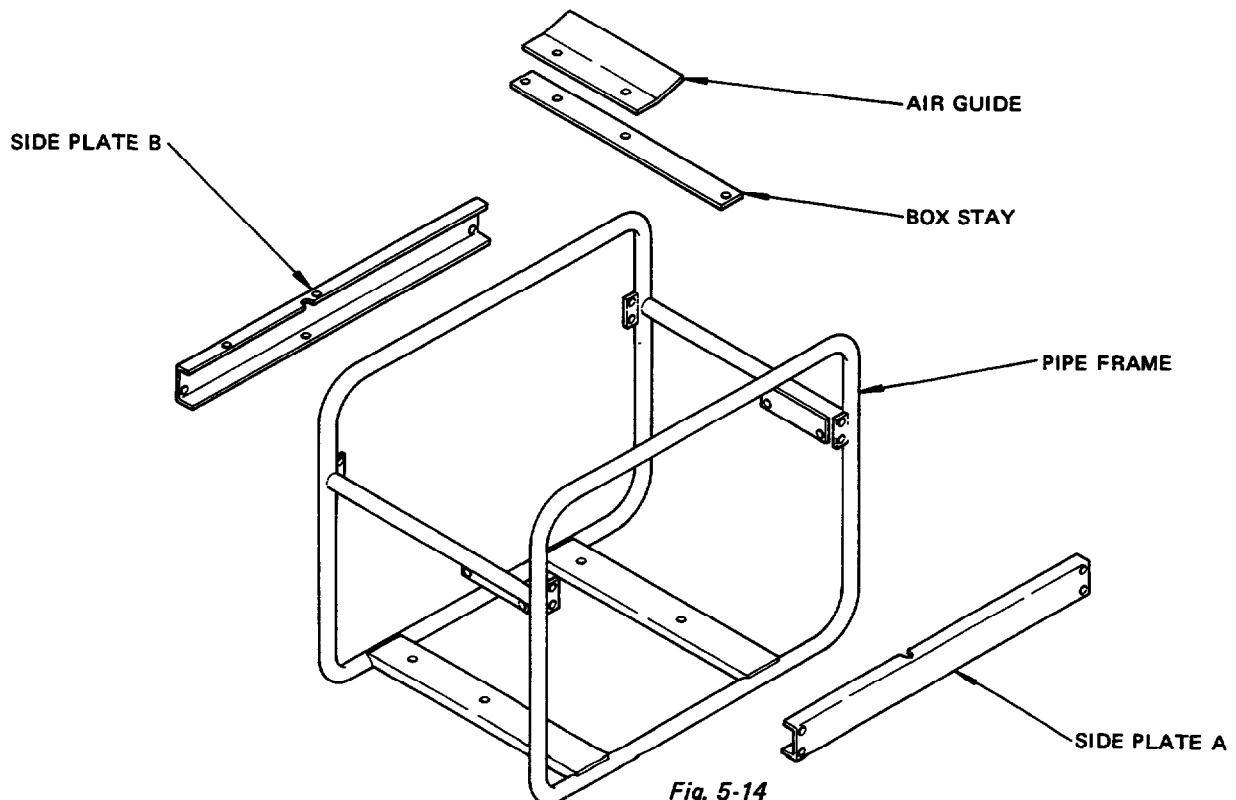


Fig. 5-14

5-3 DESCRIPTION of GENERATOR OPERATION

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

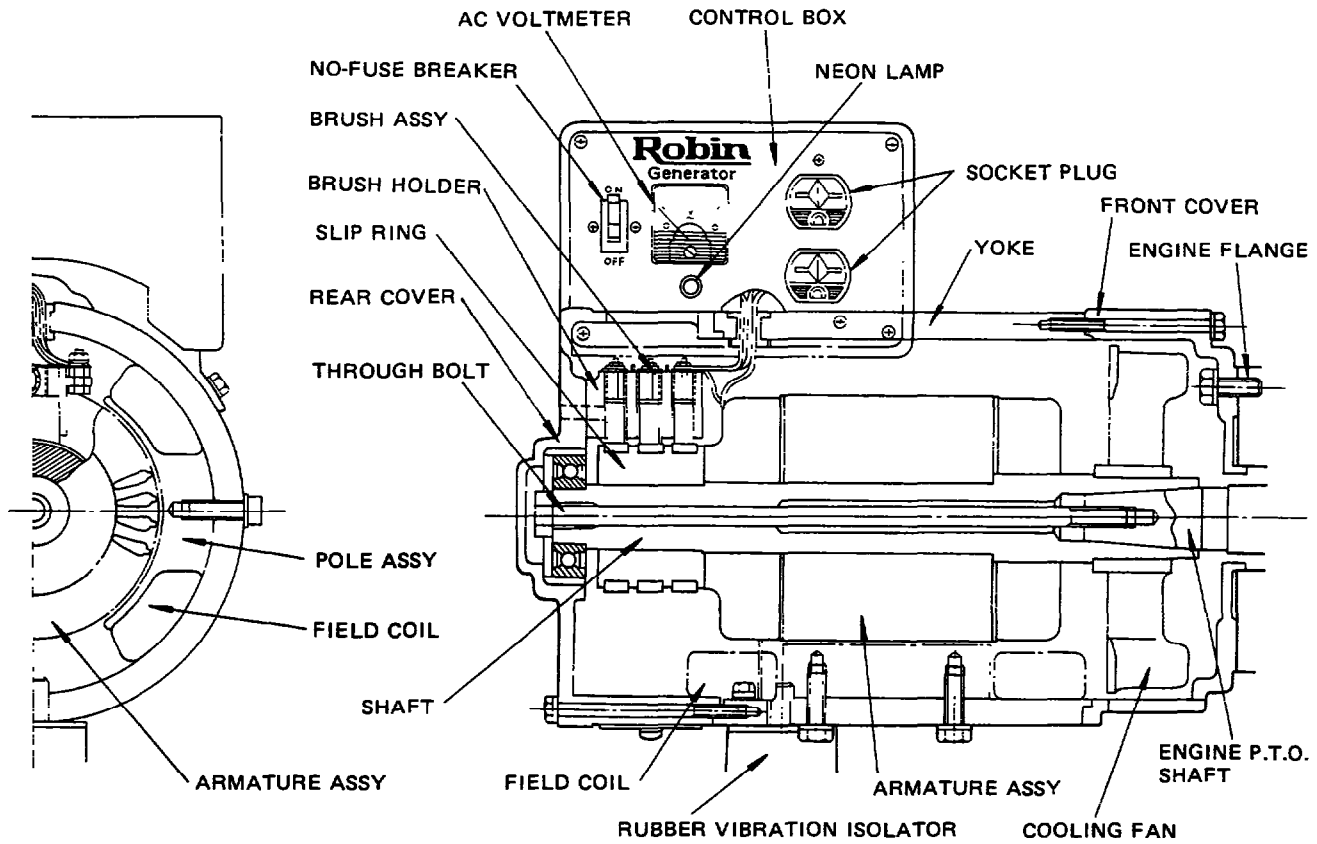


Fig. 5-15

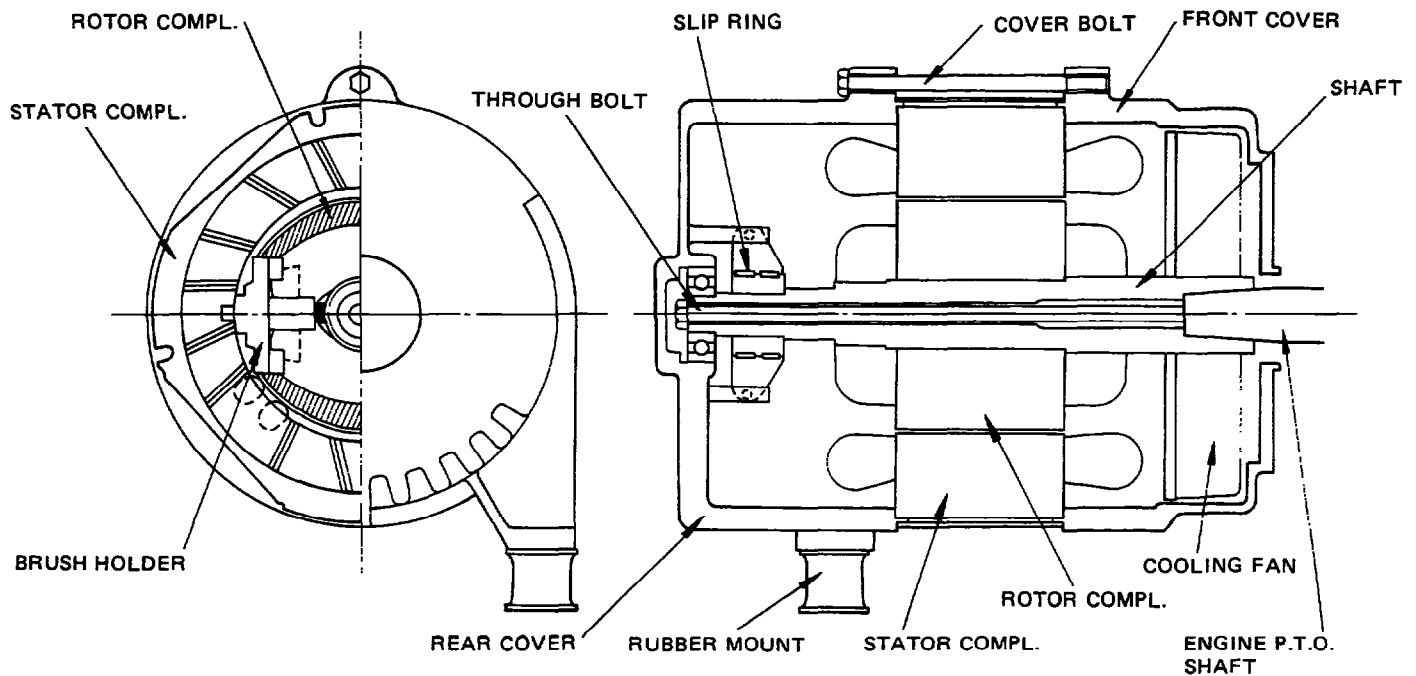


Fig. 5-16

The RG Series is the revolving armature type, and the RGX Series is now 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 this 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 other.

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 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 fallen 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.

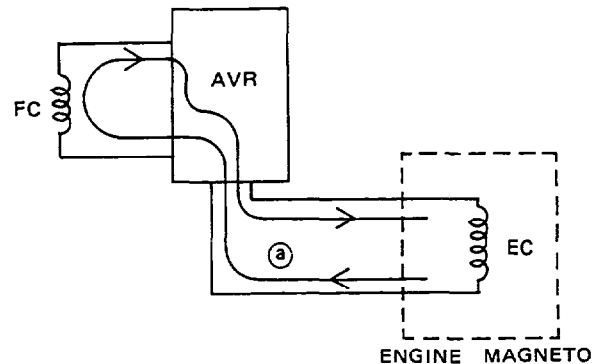


Fig. 5-17(A)

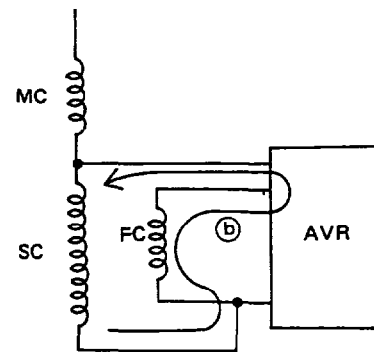


Fig. 5-17(B)

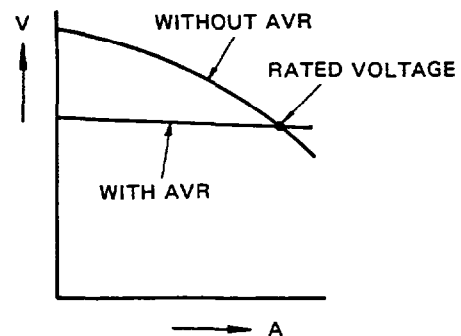


Fig. 5-17(C)

5-3-4 FULL POWER SWITCH

The dual voltage type has a full power switch to produce the rated output from a single 110V or 120V receptacle. The full power switch operates as described below. (The full power switch for 120V/240V is described as the construction of both full power switches for 120V/240V and 110V/220V is same.

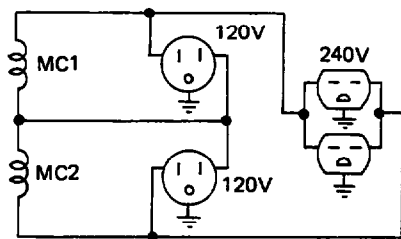


Fig. 5-18

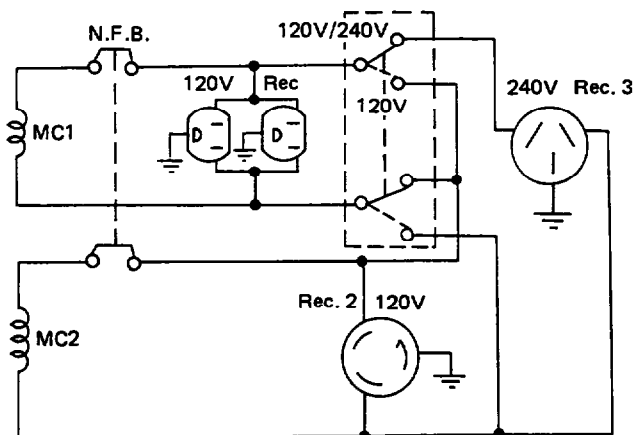


Fig. 5-19

A circuit diagram of the conventional dual voltage type is shown in Fig. 5-18, and a circuit diagram of the RGX Series' dual voltage type which is fitted with a full power switch is shown in Fig. 5-19. AC windings MC1 and MC2 generate a voltage of 120V each.

Fig. 5-18 shows MC1 and MC2 kept connected in series. In this case, an output can be generated from either the 240V or 120V receptacle. The 240V receptacle outputs the rated output (or the maximum output in a short-time operation), but one 120V receptacle can output only one half of the rated output. Since two 120V receptacles are provided, the rated output can be outputted by combining the outputs of the two 120V receptacles.

The RGX Series shown in Fig. 5-19 changes the connection of MC1 and MC2 to series or parallel with the full power switch. When the full power switch is shifted to the 120V/240V position, the switch is up as indicated by the solid line in Fig. 5-19, and connects MC1 and MC2 in series as shown in Fig. 5-18. In this case, voltages up to the rated level can be outputted from Receptacle 3, and voltages up to one half (120V) of the rated voltage from Receptacle 1 and Receptacle 2. (If the rated current is over 30A at 120V, up to 15A can be outputted from Receptacle 1 as the combined output of the two.) When the full power switch is shifted to the 120V position, the switch is down as indicated by the broken line in Fig. 5-19, and connects MC1 and MC2 parallel to each other. In this case, no 240V can be outputted, and Receptacle 3 cannot be used. Receptacle 2, which outputs 120V can generate up to the rated power; and Receptacle 1 can output up to 15A in total (or up to 30A if the rated current is over 30A at 120V). The above is summarized in Table 5-5. Use the full power switch as suitable to the voltage and input ratings of the electric devices.

Switch	LOW VOLTAGE RECEPTACLE	HIGH VOLTAGE RECEPTACLE
110V or 120V	Rated output	Cannot use
110/220V or 120/240V	Half of rated output	Rated output

Table 5-5

5-4 CHANGE of ENGINE PARTS

In detail of the engine, please refer to the service manual, RGX305, RGX305D are refer to EY25, RGX405, RGX405D, RGX505 and RGX505D are refer to EY35 and EY40.

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

All models of the RGX Series employ a solid state ignition system. For the RGX305, RGX305D, refer to the section on EY25 CDI in the Electrical Ignition Service Manual.

For the RGX405, RGX405D and RGX505, RGX505D, refer to the section on Robin Solid State Ignition in the EY35 and EY40 Service Manuals.

All models use a primary exciting coil (or lighting coil) of special 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 centrally located to permit centralized control at the top of the engine. The parts added or changed are as shown in Fig. 5-20.

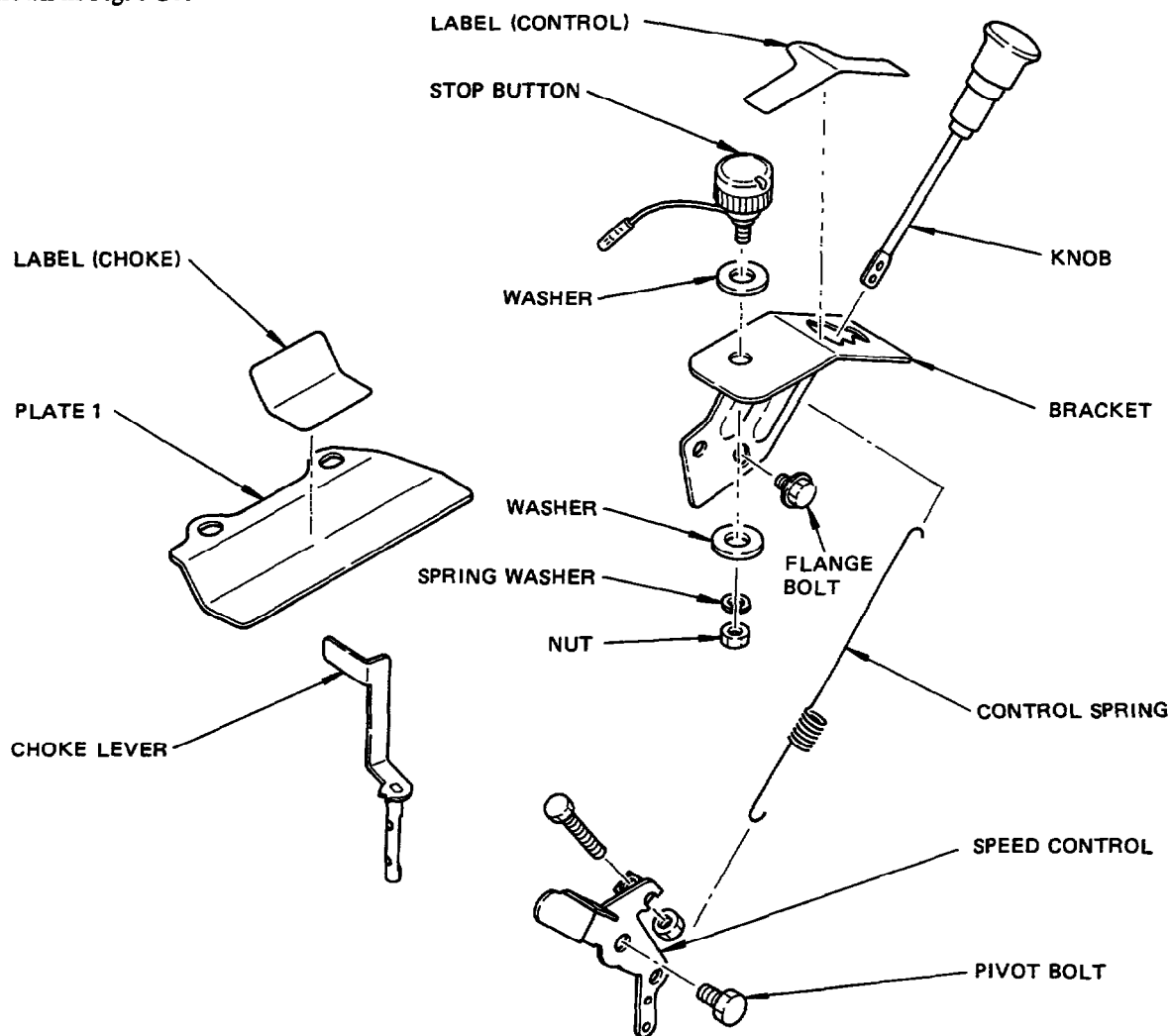


Fig. 5-20(1)

The blower housing has nuts for mounting the bracket, and a wire for the stop button which runs inside the blower housing.

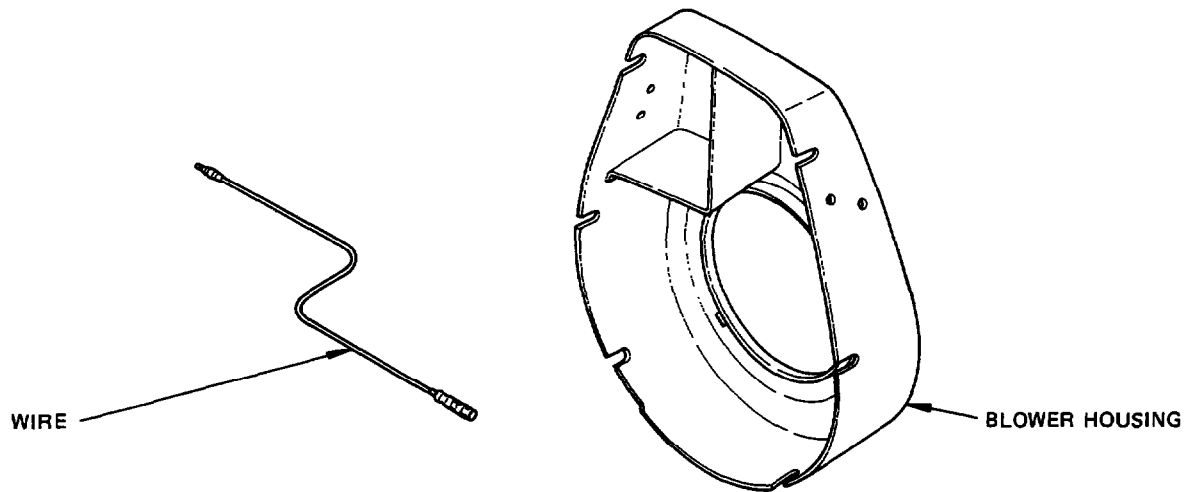


Fig. 5-20 (2)

5-4-3 FUEL SYSTEM

The large-sized 16-liter fuel tank is mounted in the frame. The fuel piping was changed as a result as shown in Fig. 5-21.

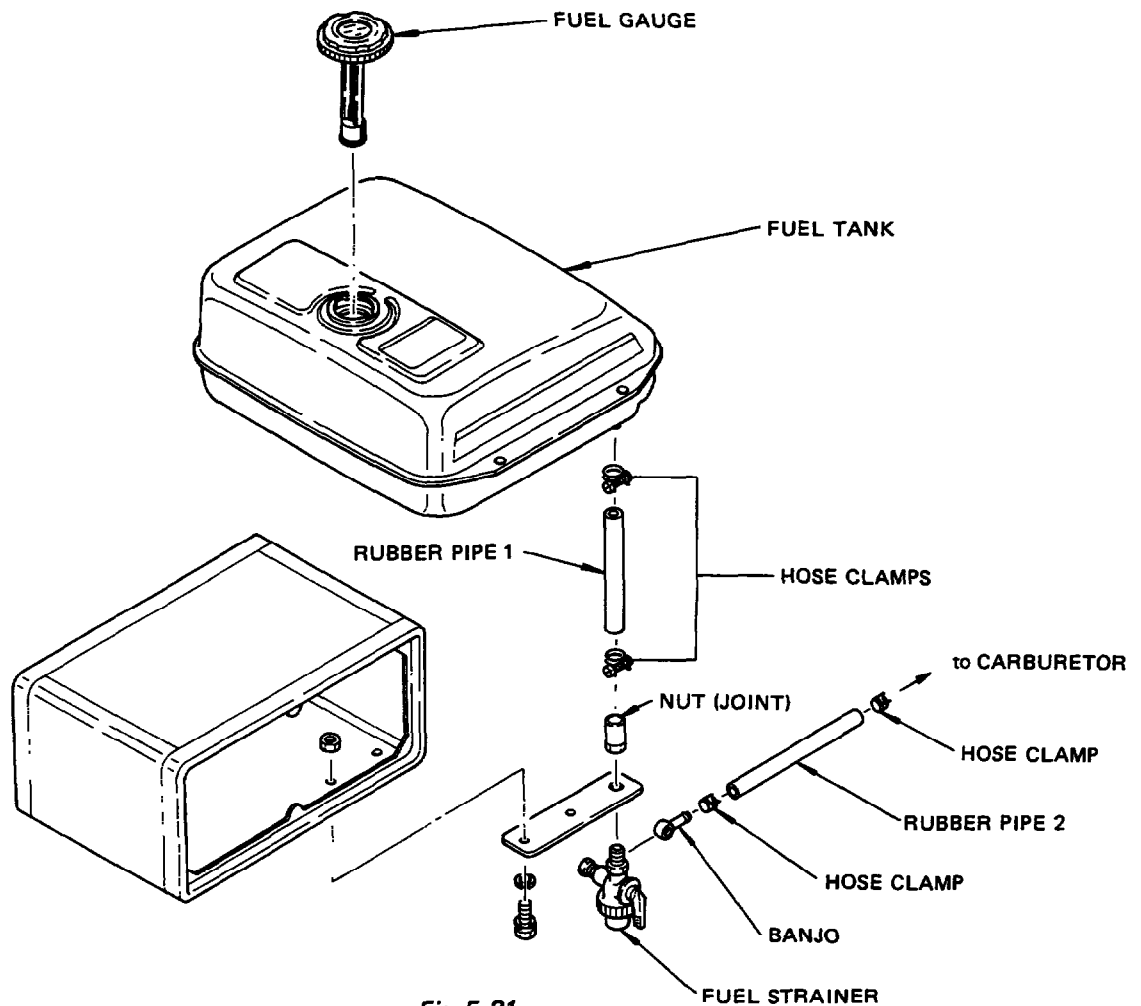


Fig. 5-21

5-4-4 COOLING SYSTEM

A baffle is provided to prevent engine cooling air from raising the temperature of other parts. Large sized rubber pipe 1 shown in Fig. 5-21 prevents vapor lock even at high ambient temperature (up to about 45°C).

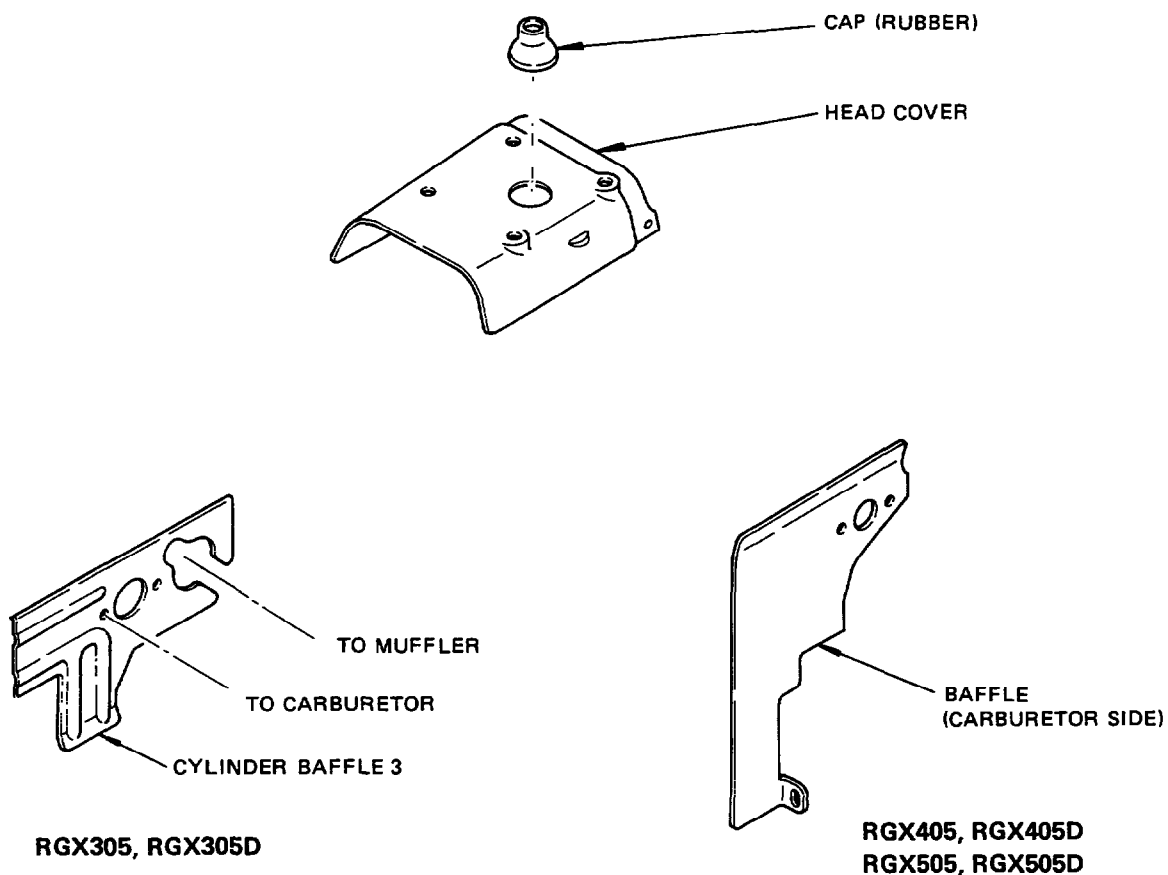


Fig. 5-22

5-4-5 OTHERS

The RGX405, RGX405D and RGX505, RGX505D are fitted with an iron plate under the engine to reduce vibration. The oil drain parts shown in Fig. 5-23 are newly employed for these models to solve the problem of inconvenience in oil change.

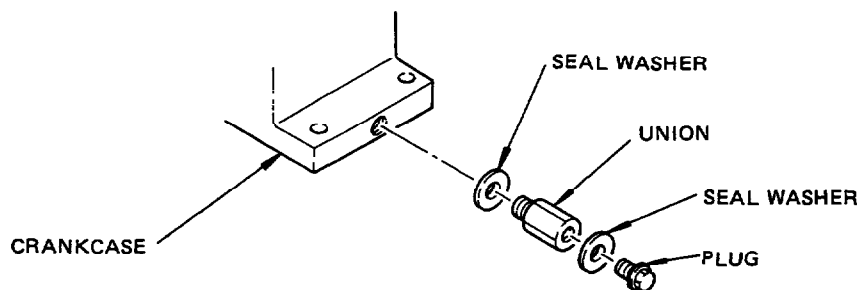


Fig. 5-23

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 and 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 the 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 burnt out or the circuit breaker tripped off as a result of using an electrical appliance, the cause can 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.

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 products 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 1000 W can light ten 100 W 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 100 W to 160 W is necessary for lighting a 80 W fluorescent lamp. A generator with a rated output of 1000 W can light 6 to 10 40 W 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 accounts 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 300 W motor-driven drill requires a generator with a maximum output of 400 to 900 W 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 400 W requires a generator with a maximum output of 1200 to 2000 W or more.

NOTE 1: Motor-driven products mentioned in Items 3 and 4 required 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 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 ~ 0.75	The smaller the capacity, the worse the efficiency, and vice versa.
Three-phase motor	0.65 ~ 0.9	
Fluorescent lamp	0.7 ~ 0.8	

Example 1: A 40 W fluorescent lamp means that its luminous output is 40 W. Its efficiency is 0.7 and accordingly, power consumption will be $40 \div 0.7 = 57$ W. As explained in **Item 2**, multiply this power consumption value of 57 W by 1.2 ~ 2 and you will get the figure of the necessary capacity of a generator. In other words, a generator with a rated output of 1000 W capacity can light 9 ~ 14 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 $400 \div 0.7 = 570$ 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 570 W as explained in the **Item 3**. Moreover, in case when used this motor for the pump in the water or compressor, it is necessary 3 ~ 5 times powerful generator according to the **Item 4**.

Model	RGX305 RGX305D		RGX405 RGX405D		RGX505 RGX505D	
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Incandescent lamp, hot plate, etc.	2500W	2900W	3300W	3700W	4400W	4800W
Fluorescent lamp, mercury lamp, etc.	about 1600W	about 1900W	about 2200W	about 2500W	about 2900W	about 3200W
Motor-driven tool, general-purpose motor, etc.	about 1500W	about 1700W	about 2000W	about 2200W	about 2500W	about 2800W
Water pump, compressor	about 750W	about 850W	about 1000W	about 1100W	about 1250W	about 1400W

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
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 $V = \frac{1}{100} \times R \times I \times \ell$

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

I means electric current through the wire (A)

ℓ means the length of the wire (m)

The length of the wire indicates round length, it means two times of 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 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

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

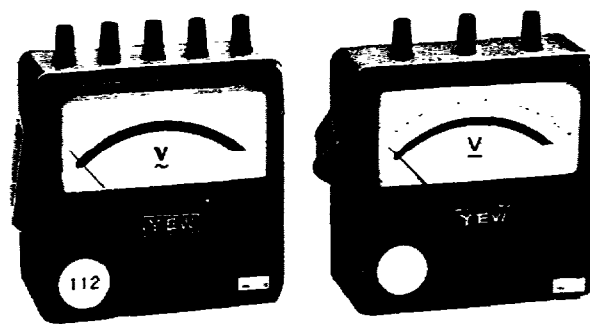


Fig. 8-1

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 10 A, 20 A, 100 A)

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

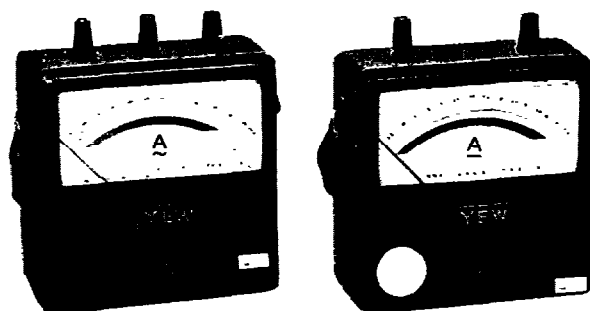


Fig. 8-2

8-1-3 FREQUENCY METER

Frequency range: About 45 to 65 Hz

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



Fig. 8-3

8-1-4 TESTER

Used for measuring resistance, etc.

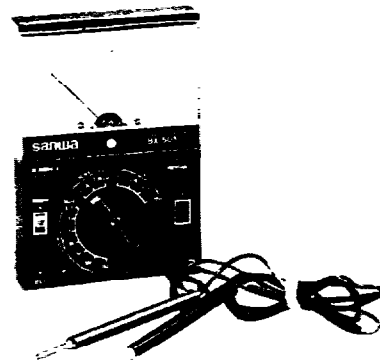


Fig. 8-4

8-1-5 MEGGER TESTER

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

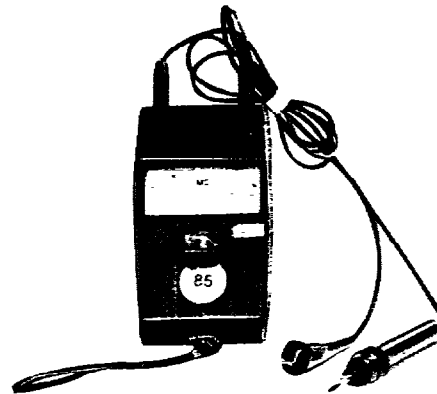


Fig. 8-5

8-1-6 TACHOMETER

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

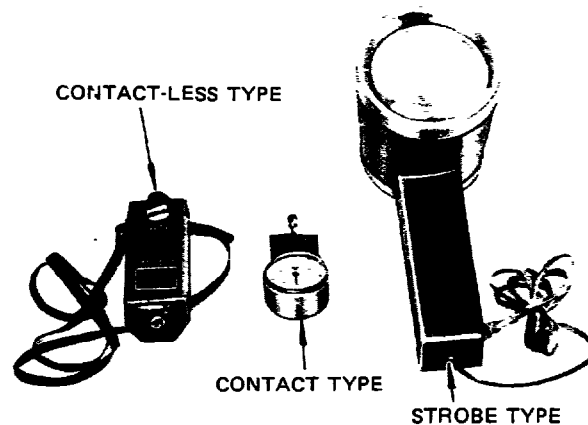


Fig. 8-6

8-2 AC OUTPUT MEASURING

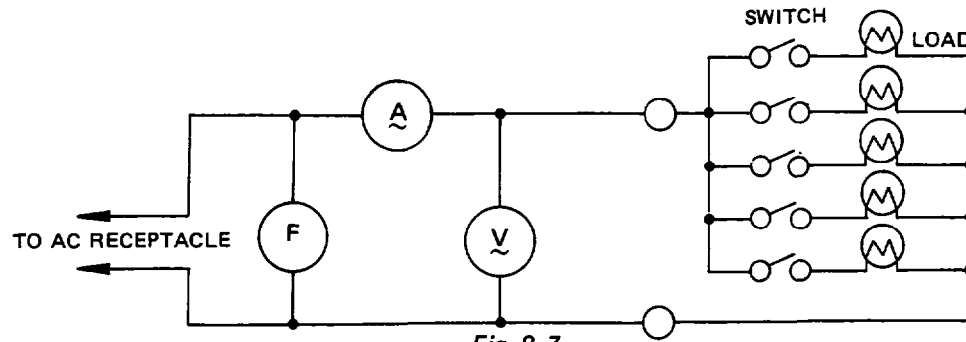


Fig. 8-7

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

Table 8-1

8-3 DC OUTPUT MEASURING

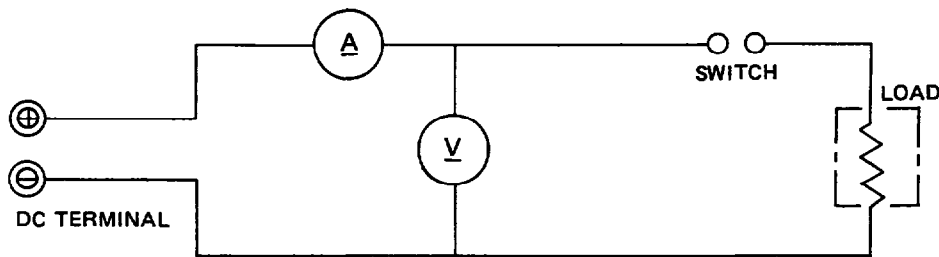


Fig. 8-8

Switch the power on, when 1.45Ω resistance attached as a load, check that the voltage is within the range of 13 to 11V. **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 receptable 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.

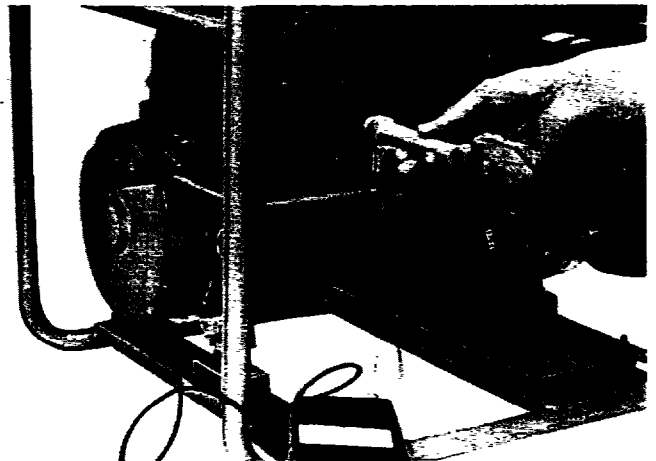


Fig. 8-9

• STATOR

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

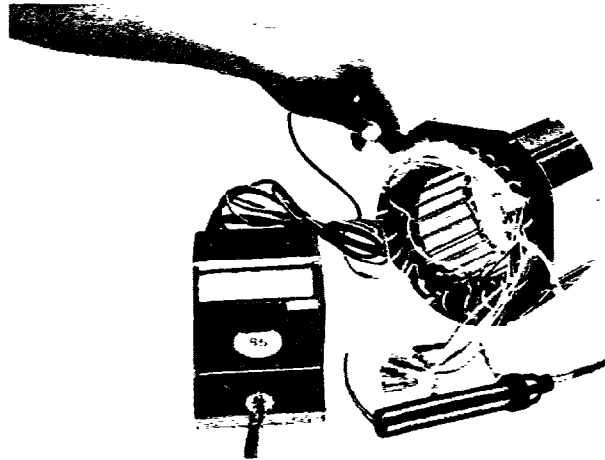


Fig. 8-10

• ROTOR

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

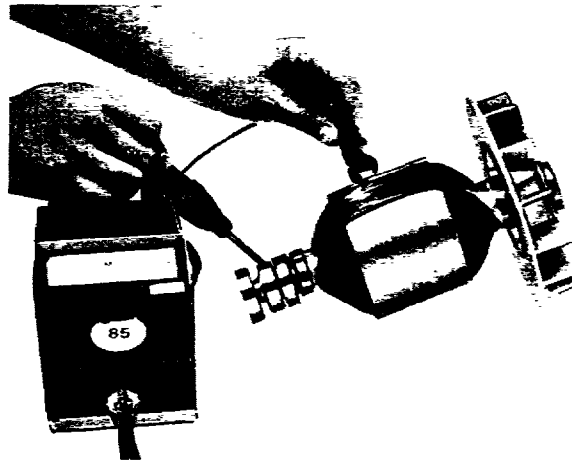


Fig. 8-11

• 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.

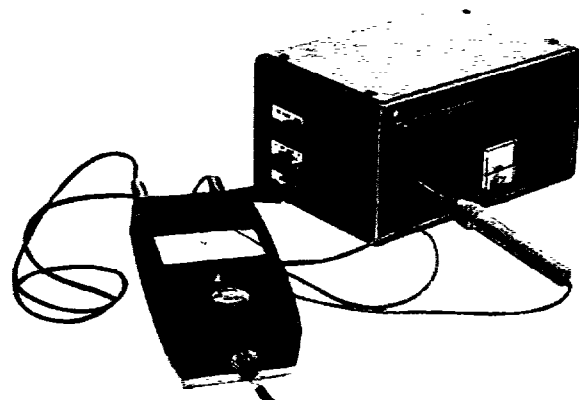


Fig. 8-12

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 must 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.

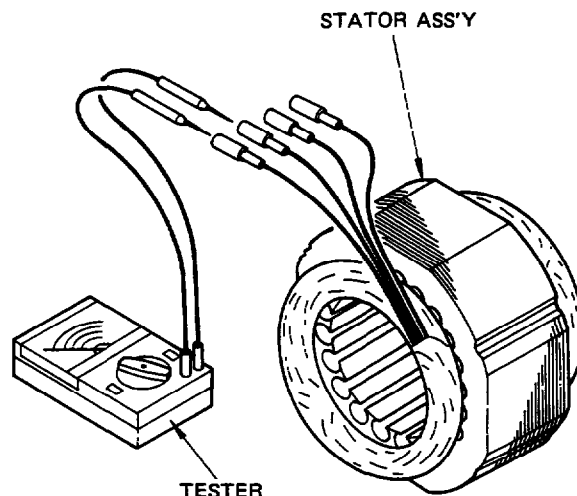


Fig. 9-1

★RGX305, RGX305D

•50Hz 220V, 230V, 240V

Wire color	RED	GREEN
WHITE	1.2 Ω	1.9 Ω

Wire color	BLUE
BLUE	0.2 Ω

•50Hz 110V, 110V/220V, 120V/240V

Wire color	RED	GREEN
WHITE	0.6 Ω	1.9 Ω

Wire color	YELLOW
BLACK	0.6 Ω

Wire color	BLUE
BLUE	0.2 Ω

•60Hz 110V, 120V, 110V/220V, 120V/240V

Wire color	RED	GREEN
WHITE	0.4 Ω	1.7 Ω

Wire color	YELLOW
BLACK	0.4 Ω

Wire color	BLUE
BLUE	0.17 Ω

★RGX405, RGX405D

•50Hz 220V, 230V, 240V

Wire color	RED	GREEN
WHITE	1.1 Ω	2.2 Ω

Wire color	BLUE
BLACK	0.2 Ω

•50Hz 110V, 110V/220V, 120V/240V

Wire color	RED	GREEN
WHITE	0.55 Ω	2.2 Ω

Wire color	YELLOW
BLACK	0.55 Ω

Wire color	BLUE
BLUE	0.2 Ω

•60Hz 110V, 120V, 110V/220V, 120V/240V

Wire color	RED	GREEN
WHITE	0.36 Ω	1.75 Ω

Wire color	YELLOW
BLACK	0.36 Ω

Wire color	BLUE
BLUE	0.15 Ω

★RGX505, RGX505D

•50Hz 220V, 230V, 240V

Wire color	RED	GREEN
'WHITE	0.7 Ω	1.6 Ω

Wire color	BLUE
BLACK	0.14 Ω

•50Hz 110V, 110V/220V, 120V/240V

Wire color	RED	GREEN
WHITE	0.35 Ω	1.6 Ω

Wire color	YELLOW
BLACK	0.35 Ω

Wire color	BLUE
BLUE	0.14 Ω

•60Hz 110V, 120V, 110V/220V, 120V/240V

Wire color	RED	GREEN
WHITE	0.2 Ω	1.3 Ω

Wire color	YELLOW
BLACK	0.2 Ω

Wire color	BLUE
BLUE	0.12 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 5 ohms to 7.5 ohms.

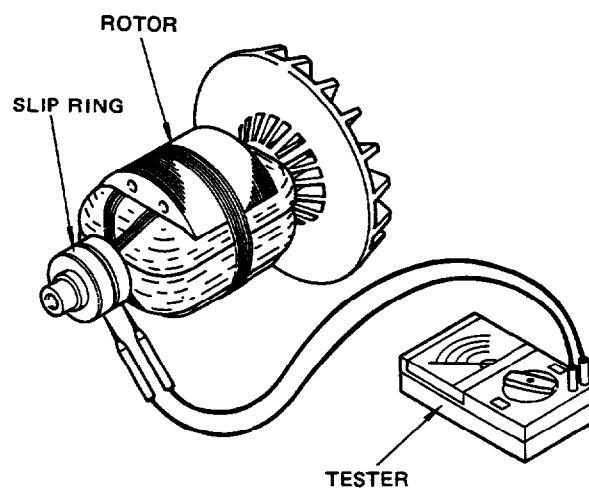


Fig. 9-2

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.)

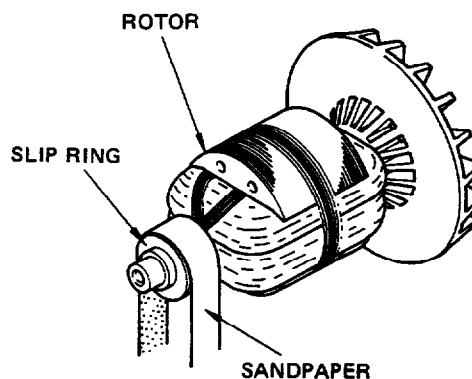


Fig. 9-3

9-3 BRUSHES

The brushes must be smooth where they contact the slip rings. If not, polish 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 15 mm as shown in Fig. 9-4. 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.

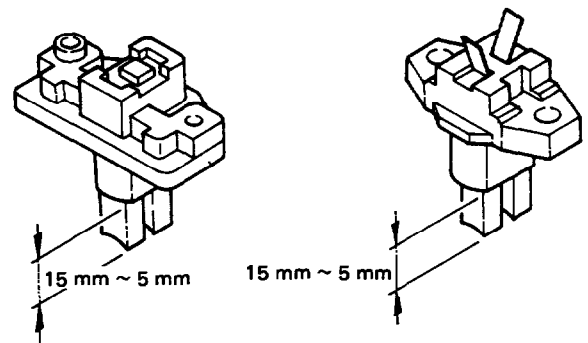


Fig. 9-4

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 tables below, the AVR is faulty.

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

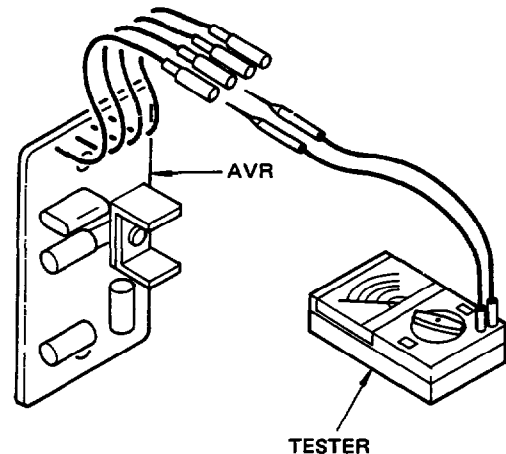


Fig. 9-5

MODEL RGX305, RGX305D

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

MODEL RGX405, RGX405D, RGX505, RGX505D

Tester polarity (+) / (-)	Yellow	Red	White	Green	Brown
Yellow	∞	300K ~ 500K Ω	10K Ω ~ 70K Ω	One wire: 0 Ω Another: ∞	lead resistance existence
	∞	150K ~ 250K Ω	10K Ω ~ 70K Ω	One wire: 0 Ω Another: ∞	lead resistance existence
Red	∞	—	220K ~ 250K Ω	∞	300K Ω
	∞	—	110K ~ 125K Ω	∞	150K Ω
White	∞	220K ~ 250K Ω	—	∞	lead resistance existence
	∞	110K ~ 125K Ω	—	∞	lead resistance existence
Green	∞	330K ~ 500K Ω	10K ~ 70K Ω	—	lead resistance existence
	∞	150K ~ 250K Ω	10K ~ 70K Ω	—	lead resistance existence
Brown	∞	300K ~ 500K Ω	10K ~ 40K Ω	∞	—
	∞	150K ~ 250K Ω	10K ~ 40K Ω	∞	—

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

* Lead resistance existence does not change so big in the amplitude degree of the hand when change the range of the tester.

Table 9-2

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 NO-FUSE HOLDER

9-5-1 FUSE HOLDER

Only the LG301 and LG301D have a no-fuse breaker.

Push the power switch off and check continuity. If no current flows, it is normal. Then push the power switch on and check continuity again. If current flows, it is normal.

If the breaker is a two-pole type, the two pairs of terminals must carry current.

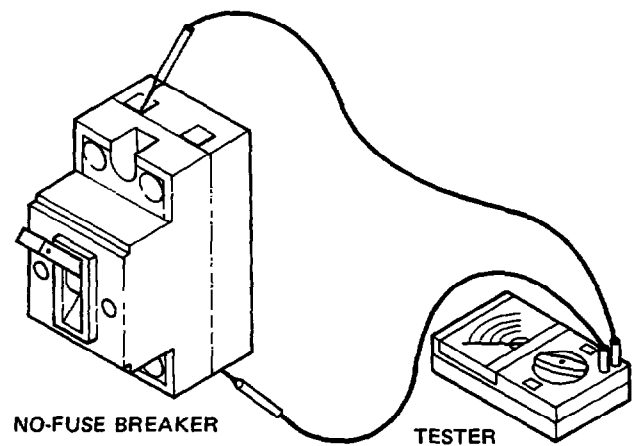


Fig. 9-6

9-5-2 NO-FUSE BREAKER

Check that a fuse is in the fuse holder and check its continuity with a tester. (See Fig. 9-7.) 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.

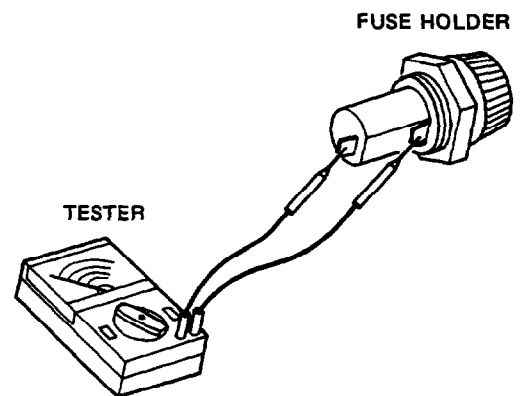


Fig. 9-7

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

Apply AC voltage to a terminal and check if the voltmeter reads normal.

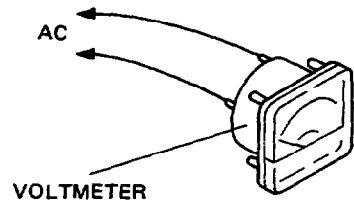


Fig. 9-8

9-8 DIODE STACK ASSEMBLY

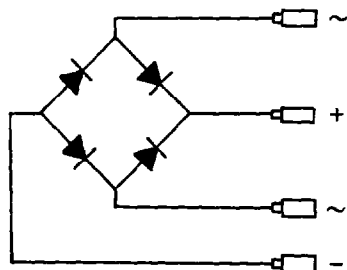


Fig. 9-9

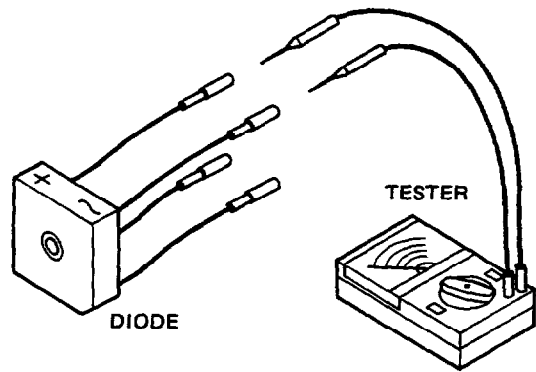


Fig. 9-10

The internal circuitry of the diode stack assembly is as shown in Fig. 9-9. Check inter-terminal continuity with a tester as shown in Fig. 9-10 to see that the results are as shown in Table 9-8.

TERMINAL	CURRENT	TERMINAL
~		+
~		-

Table 9-8

NOTE:
A B Current flows from A (+) to B (-).
C D Current does not flow from C (+) to D (-).
~ Check both terminals.

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 30 V. 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. 9-11.). If output voltage is generated, the primary exciting circuit in the AVR is defective. Replace the AVR.

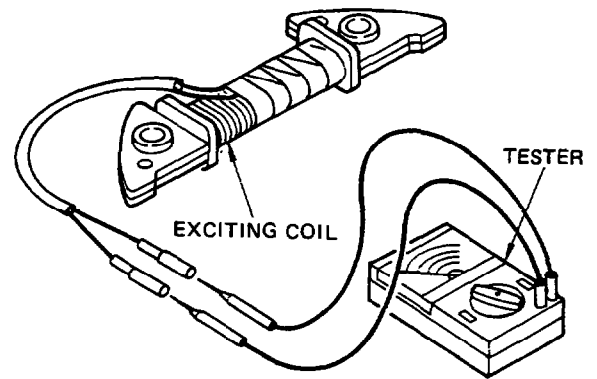


Fig. 9-10

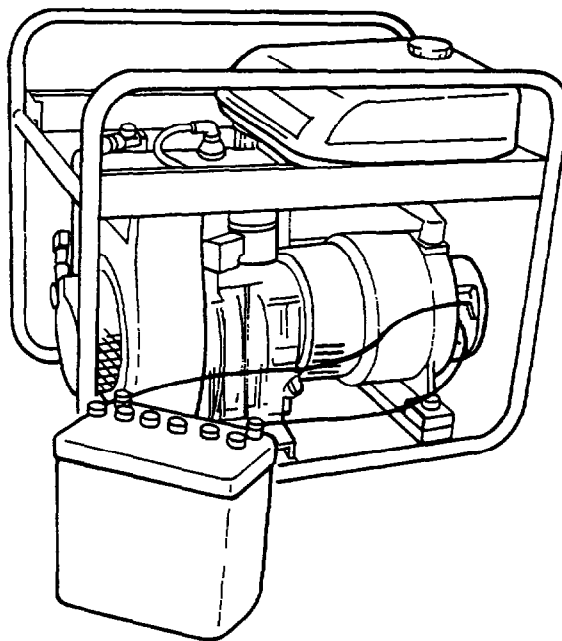


Fig. 9-11

10. DISASSEMBLY and REASSEMBLY

10-1 PREPARATIONS and SUGGESTIONS

- 1) When disassembling the engine, remember well the locations of individual parts 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 by group.
- 3) To prevent missing and 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.) Remove the screws, and suspend the control box front panel with a wire. 4φ screw . . . 6 pcs.	Be careful not to cut the wiring.	(+) screwdriver
		(2) Remove the strainer bracket (See Fig. 10-2.) Remove the strainer bracket bolts on the bottom of the control box. 5φ bolt . . . 2 pcs.		8 mm spanner
		(3) Temporarily fasten the front panel. Temporarily fasten it with two or three screws removed in Step (1).	Be careful not to pinch the wiring.	(+) screwdriver
		(4) Remove the rubber pipe. (See Fig. 10-3.) Turn the fuel cock off, remove the clamp from the strainer on the carburetor side of the fuel pipe, and remove the fuel pipe.	If fuel spills out from the fuel pipe, wipe it off.	Pliers
		(5) Remove the fuel tank bolts. (See Fig. 10-4.) 8φ bolt . . . 4 pcs.		13 mm spanner or box spanner
		(6) Remove the fuel tank.	Be careful not to lose the rubber washers located between the fuel tank and tank mounting side plates.	

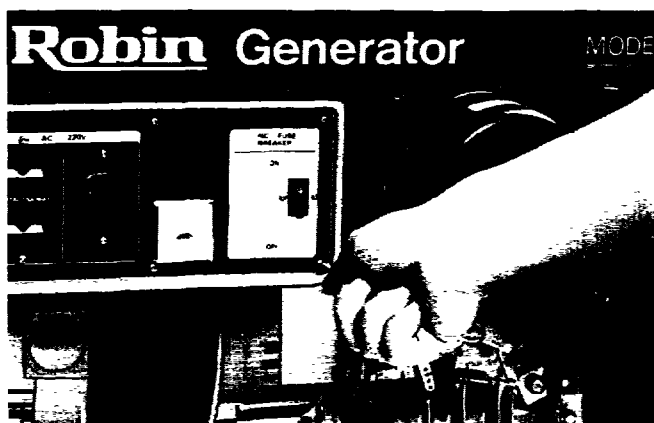


Fig. 10-1

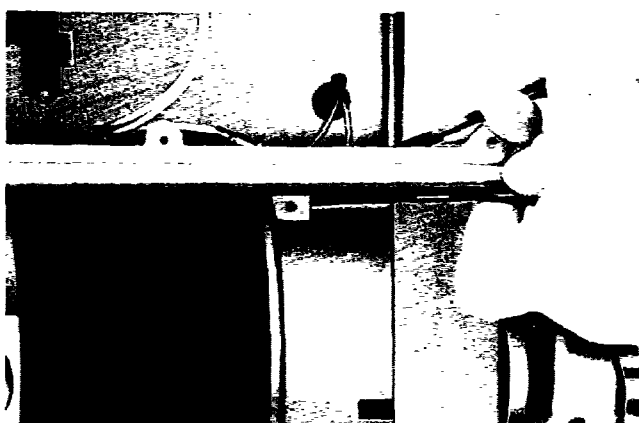


Fig. 10-2

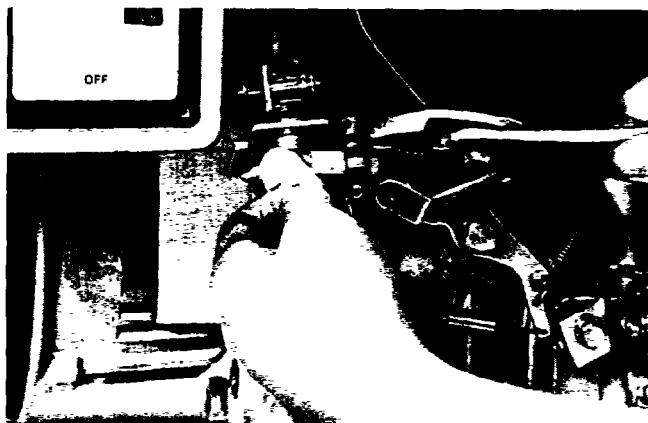


Fig. 10-3



Fig. 10-4

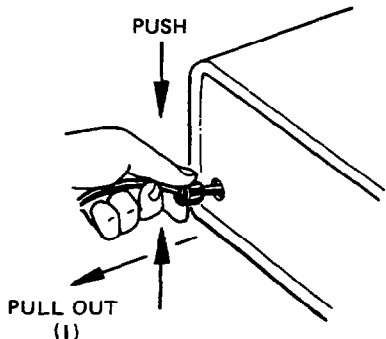
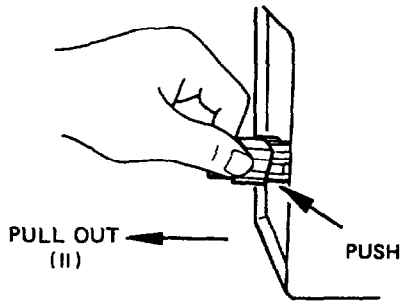
Order	Item	Procedure	Remarks	Tool
2	Control Box	<p>(1) Remove the connector and coupler. Remove the connector and coupler that are connect to the rear of the control box.</p>  <p>(2) Remove the control box bolts and the control box. Remove the bolts from the frame and box stay.</p> 	<p>The connector and bushing are so designed as to lock, so push and pull out as shown in Fig. 10-5.</p> <p>Be careful not to drop the control box.</p>	10 mm spanner

Fig. 10-5

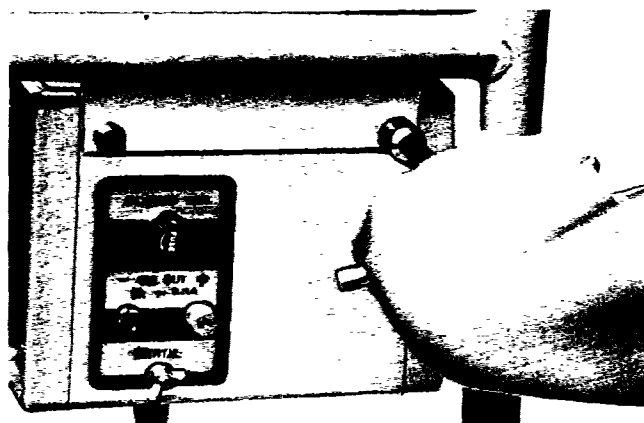


Fig. 10-6

Order	Item	Procedure	Remarks	Tool
3	Frame	(1) Remove the box stay. 6 ϕ bolt . . . 2 pcs.	It is not necessary to remove the air guide.	10 mm spanner
		(2) Remove the side plates, front and rear.	Black special bolts are used.	10 mm spanner or box spanner
		(3) Remove the generator mounting nuts. RGX305, RGX305D: Remove the nuts that fasten the engine and rubber mount and the nuts that fasten the generator and rubber mount. 8 ϕ nut . . . 4 pcs. RGX405, RGX405D, RGX505, RGX505D: Remove the nuts that fasten the engine to the engine base, and the nuts that fasten the rubber mount the generator. (See Fig. 10-7.) 8 ϕ nut . . . 6 pcs.	The bolts are welded to the engine base.	13 mm spanner
		(4) Remove the generator. (See Fig. 10-8.) Lift the generator with a chain block, and remove the frame.	Be careful of the generator balance.	
		(5) Remove the rubber mount. RGX405, RGX405D, RGX505, RGX505D: Remove the nuts that fasten the engine base and rubber mount. Twist the rubber mount and take it off.	Rubber mount is fastened with the nuts welded to the bottom of the frame.	13 mm spanner or box spanner

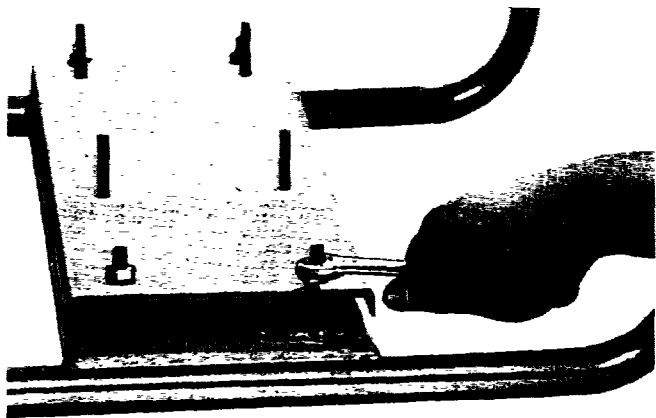


Fig. 10-7

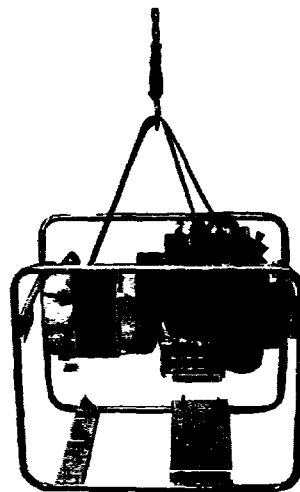


Fig. 10-8

Order	Item	Procedure	Remarks	Tool
4	Brush holder	(1) Remove the brush cover. Remove the brush cover in back of the rear cover. 4 ϕ screw . . . 2 pcs.		(+) screwdriver
		(2) Remove the brush holders. (See Fig. 10-9.) Disconnect the terminals wired to the brushes before removing the brush holders. 5 ϕ 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. *RGX305, RGX305D 6 ϕ bolt . . . 3 pcs. *RGX405, RGX405D, RGX505 RGX505D: 8 ϕ bolt . . . 4 pcs.		10 mm spanner or box spanner 13 mm 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. 10-10.) Lightly tap the rear cover with a plastic hammer, and remove it. *RGX505 - 110V, 120V, RGX505D: Pull out the wire from the rear cover.	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. 10-9

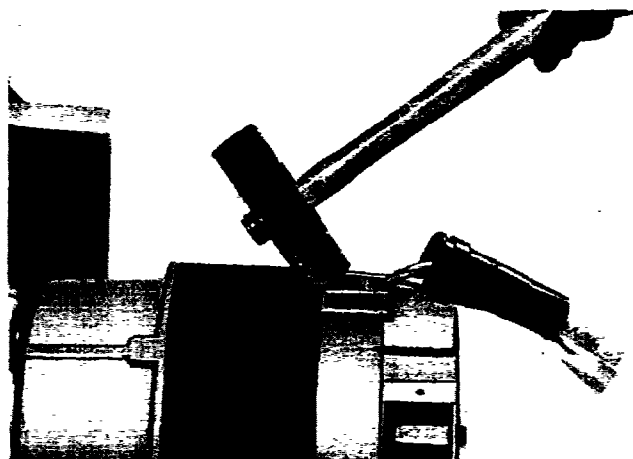


Fig. 10-10

Order	Item	Procedure	Remarks	Tool
6	Stator	(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. 10-11.) If the stator does not come out, insert a screwdriver between the front cover and stator, and twist it. (See Fig. 10-12.)	Never hammer the windings and leads. Be careful not to peel the stator steel sheets.	Plastic hammer or (-) screwdriver
		(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.)	It is not necessary to separate the stator and rear cover except when replacing the stator, rear cover, or diode stack.	

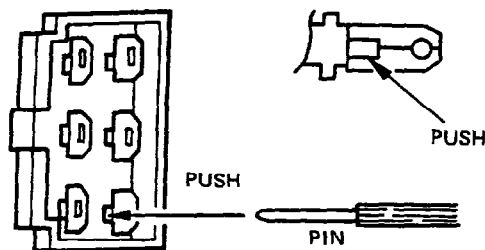


Fig. 10-13

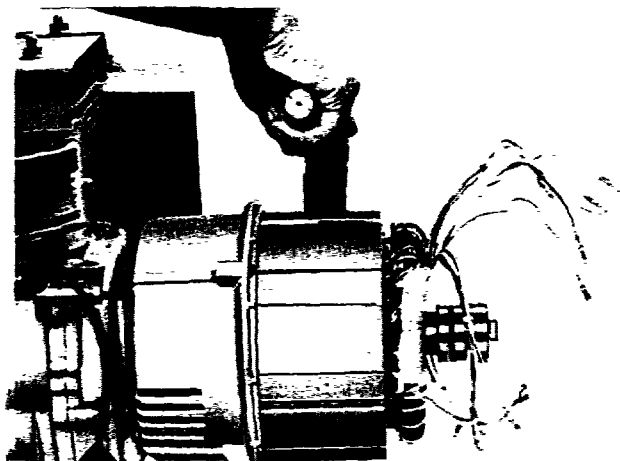


Fig. 10-11

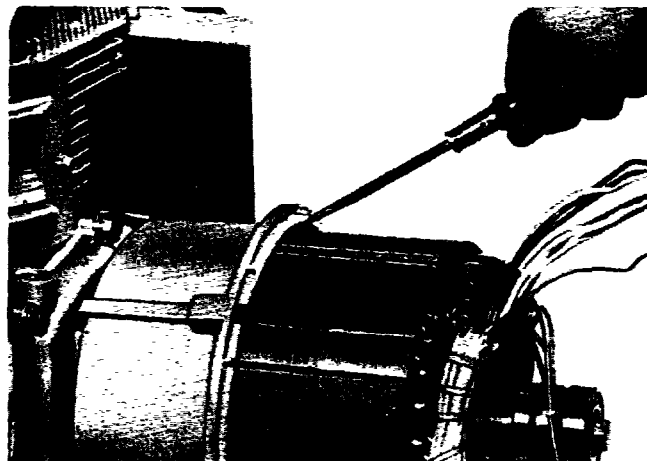


Fig. 10-12

Order	Item	Procedure	Remarks	Tool
7	Rotor	<p>(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.)</p> <p>10ϕ bolt . . . 1 pce.</p>		<p>Hammer Box spanner, or socket wrench 14mm</p>
		<p>(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.)</p>	Never strike the slip rings or windings.	

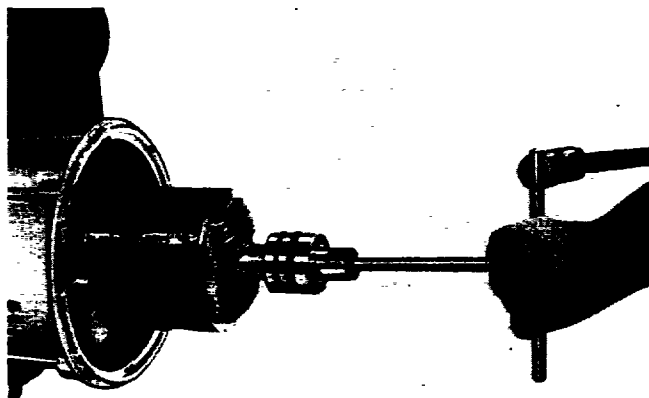


Fig. 10-14

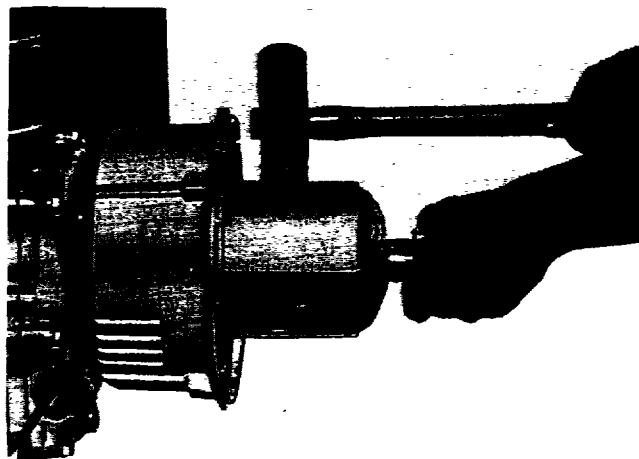
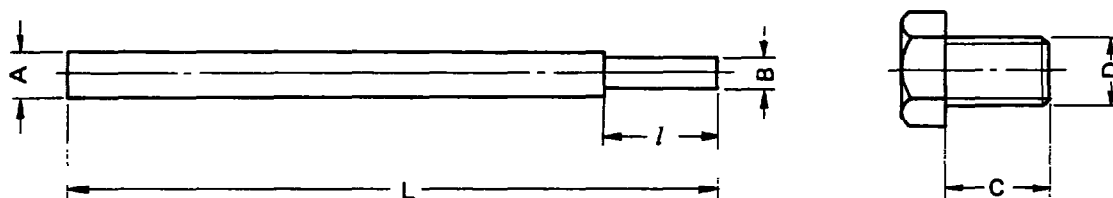


Fig. 10-15

NOTE: In case the rotor cannot pull out, please do the following ways.

1. Prepare the tool in the dimensions of the following for pulling out the rotor.



MODEL	L	l	A	B	C	D	Pitch
RGX305 RGX305D	250mm 9.8"	33mm 1.3"	$\phi 10\text{mm}$ $\phi 0.39\text{"}$	$\phi 8\text{mm}$ $\phi 0.31\text{"}$	20mm 0.79"	12mm 0.47"	1.5mm 0.06"
RGX405 RGX405D	235mm 9.3"	33mm 1.3"	$\phi 10\text{mm}$ $\phi 0.39\text{"}$	$\phi 8\text{mm}$ $\phi 0.31\text{"}$	20mm 0.79"	12mm 0.47"	1.5mm 0.06"
RGX505 RGX505D	266mm 10.5"	33mm 1.3"	$\phi 10\text{mm}$ $\phi 0.39\text{"}$	$\phi 8\text{mm}$ $\phi 0.31\text{"}$	20mm 0.79"	12mm 0.47"	1.5mm 0.06"

Table 10-1

Parts numbers of the rotor puller are as follows:

Parts No.	Parts Name	Description
367 5433 08	SHAFT	RGX305, RGX305
	"	RGX405, RGX405D
	"	RGX505, RGX505D
367 5433 08	BOLT	RGX305, RGX305D, RGX405, RGX405D, RGX505, RGX505D

Table 10-2

2. Remove a throughbolt and insert the shaft of rotor puller into the hole for throughbolt and push it up till the shaft reaches the screw hole of the P.T.O. shaft on the side of engine.
3. As shown in Fig. 10-16, screw up the bolt pushing the rotor puller shaft and remove the rotor.

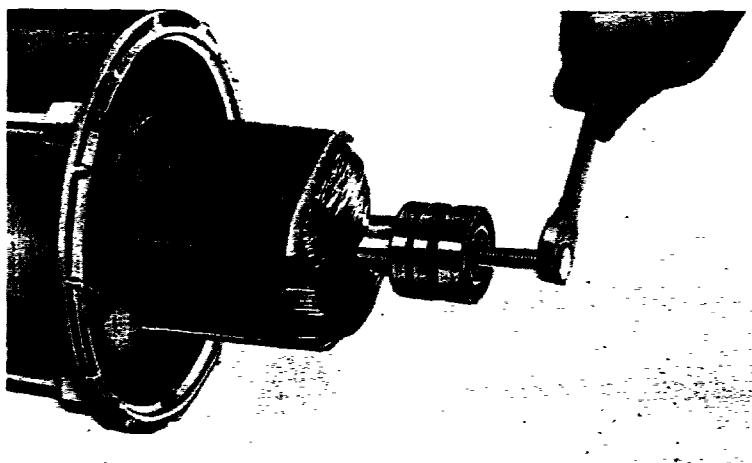


Fig. 10-16

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. 8 ϕ bolt . . . 4 pcs.		13 mm 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.

8 ϕ x 18 mm bolt . . . 4 pcs.

Tightening torque 120 to 140kg-m

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

NOTE: The RGX405, RGX405D and RGX505, RGX505D use the same front cover.

10-3-2 ROTOR

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

- 2) Install the rotor and tighten the through-bolt. (See Fig. 10-18.)

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 Item (2) Rotor, Paragraph 5-2 Functions.

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

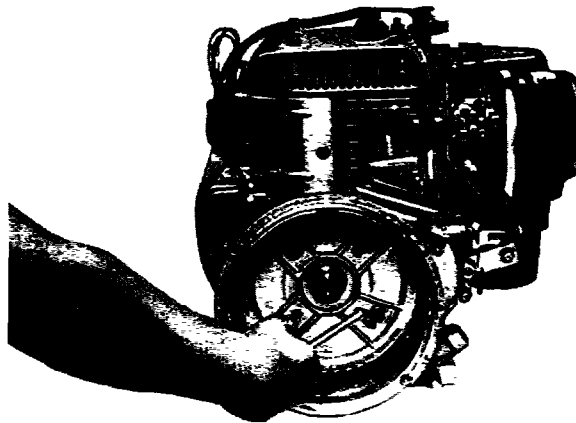


Fig. 10-17

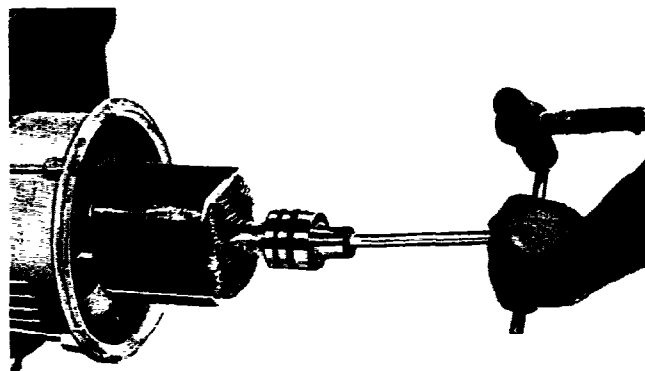
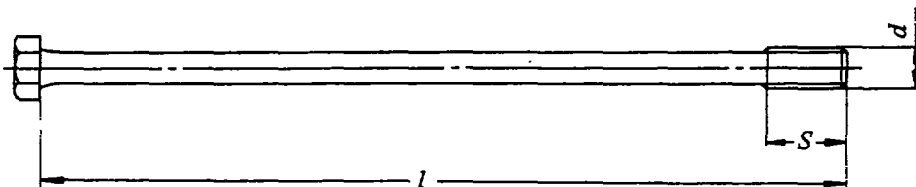


Fig. 10-18



MODEL	<i>d</i>	<i>l</i>	<i>S</i>
RGX305	10 mm	240 mm	25 mm
RGX305D	0.39 inch	9.45 inch	0.98 inch
RGX405	10 mm	230 mm	25 mm
RGX405D	0.39 inch	9.06 inch	0.98 inch
RGX505	10 mm	260 mm	25 mm
RGX505D	0.39 inch	10.24 inch	0.98 inch

Table 10-3

10-3-3 STATOR

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

If it does fit properly, lightly strike the stator core with a plastic hammer as shown in Fig. 10-20.

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.

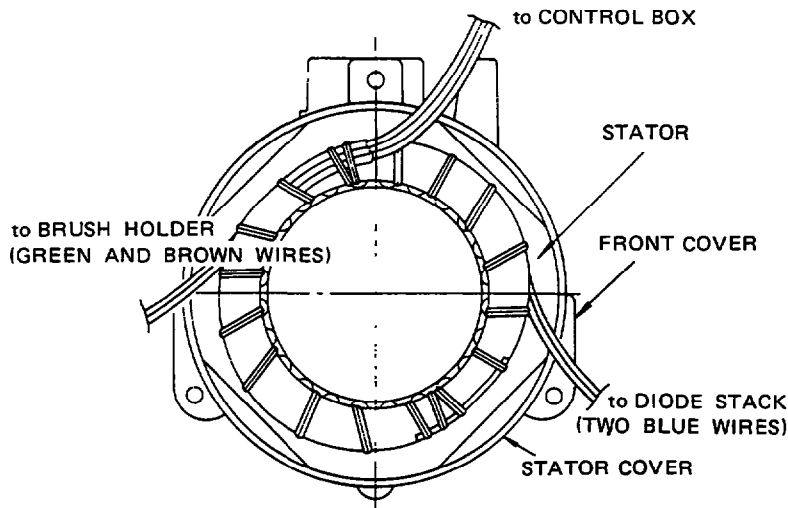


Fig. 10-19

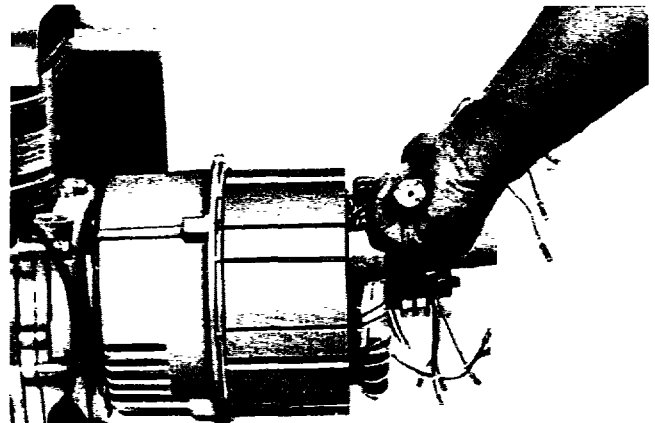


Fig. 10-20

10-3-4 REAR COVER

- 1) Install the diode stack in the rear cover. (See Fig. 10-21.)

4 ϕ x 18 mm screw . . . 1 pc.

- 2) Wire the stator to the diode stack.

The diodes are marked as shown in Fig. 10-22.

Connect the two blue wires to the two points marked \ominus .

Connect the orange wire to the point marked \oplus .

Connect the brown wire to the point marked \ominus .

- 3) Pass all the wires from the stator through the hole in the top of the rear cover.

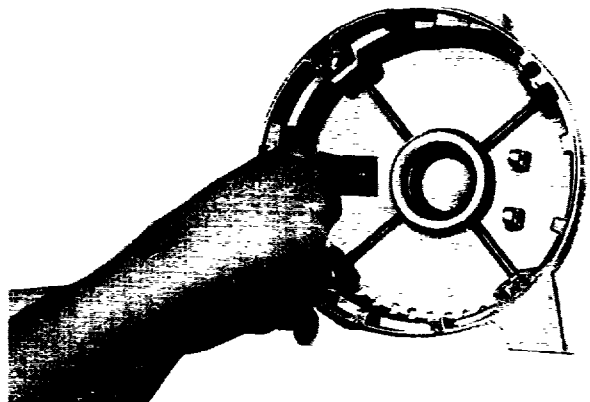


Fig. 10-21

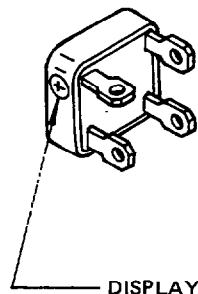


Fig. 10-22

- 4) Install the rear cover to fit the rotor bearing.
Lightly strike the circumference of the rear cover evenly with a plastic hammer. (See Fig. 10-23.)

NOTE: Be careful not to pinch the wires between the stator and rear cover.

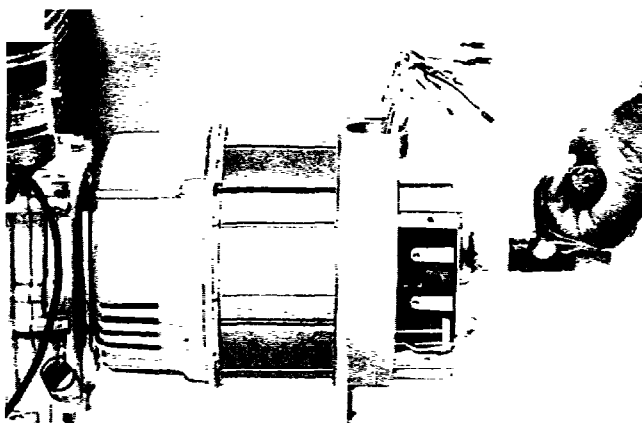
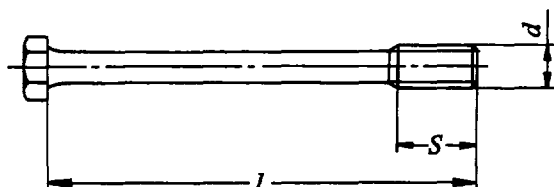


Fig. 10-23

- 5) 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
RGX305	6 mm	130 mm	25 mm
RGX305D	0.24 inch	5.12 inch	0.98 inch
RGX405	8 mm	135 mm	25 mm
RGX405D	0.31 inch	5.31 inch	0.98 inch
RGX505	8 mm	155 mm	35 mm
RGX505D	0.31 inch	6.10 inch	1.38 inch

Table 10-4

- 6) Install the stator cover.

***RGX305, RGX305D**

Fit the stator cover between the stator and cover bolts until it covers all the cover bolts, and fold back the edge.

***RGX405, RGX405D and RGX505, RGX505D**

Fit the stator cover all the entire cover bolts, and fold back the edge.

- 7) 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. 10-24.)



Fig. 10-24

- 8) Insert the wires into the connectors.

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

NOTES:

1. **RGX505 –110V, 120V, RGX505D:**

Connectors are used for terminals (7) through (10) only. The others are pin terminals.

2. Terminals (1) through (6) are for a 2 mm² wire and terminals (7) through (10) for a 0.75 mm² wire.

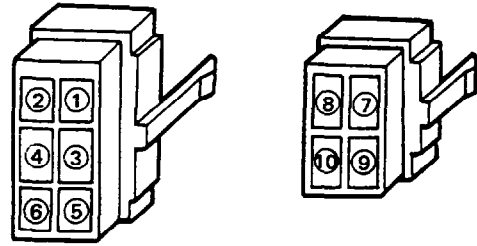


Fig. 10-25

MODEL	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
RGX305, 405 220, 230, 240V	—	—	WHITE	RED	BROWN	ORANGE	WHITE	RED	BROWN	GREEN
RGX505 220, 230, 240V	WHITE	RED	WHITE	RED	BROWN	ORANGE	WHITE	RED	BROWN	GREEN
RGX305D, 405D, RGX305, 405 110, 120V	YELLOW	BRACK	WHITE	RED	BROWN	ORANGE	WHITE	RED	BROWN	GREEN

Table 10-5

10-3-5 BRUSH HOLDER

- 1) Install the brush holders in the rear cover.

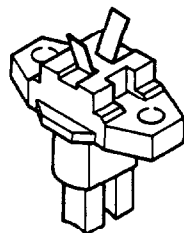
Pass the mounting screws through the brush holders, push the brush holders so that the brushes will be perpendicular to the slip rings, and tighten the screws. (See Fig. 10-26.)

5φ x 18 mm screw . . . 2 pcs.

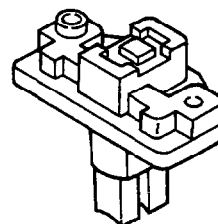


Fig. 10-26

NOTE: There are two kinds of bursh holders.



RGX305
RGX305D



RGX405, RGX405D
RGX505, RGX505D

Fig. 10-27

NOTE: The mounting direction of the brush holders for Models RGX405, RGX405D, RGX505 and RGX 505D is shown in Fig. 10-28

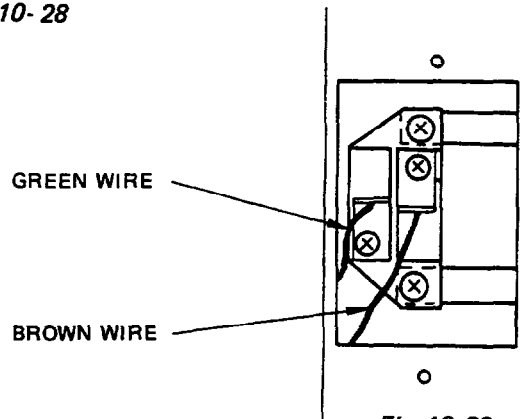


Fig. 10-28

NOTE: If a brush is installed oblique to the slip ring, the brush holder can break when the screw is tightened; or the brush may break when the generator is started.

After installing the brush holders, measure the resistances across the brushes and terminals with a tester if they are from 5 ohms to 7.5 ohms.

If so, the brush holders are correctly mounted.

- 2) Attach the connectors to the brush holders.
Connect the green wire to the stator end and the brown wire to the bearing end. (See Fig. 10-28.)

- 3) Install the brush cover.

RGX305, RGX305D:

4 ϕ x 8 mm screw . . . 2 pcs.

RGX405, RGX405D, RGX505, RGX505D:

5 ϕ x 10 mm screw . . . 2 pcs.

10-3-6 FRAME

- 1) Attach the rubber mounts to the frame.

Tighten the rubber mounts on the nuts welded to the bottom of the frame.

RGX305, RGX305D . . . 4 pcs.

RGX405, RGX405D, RGX505, RGX505D . . . 6 pcs.

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.

- 2) RGX405, RGX405D, RGX505, RGX505D:

Install the engine base. (See Fig. 10-29.)

8 ϕ nuts . . . 4 pcs.

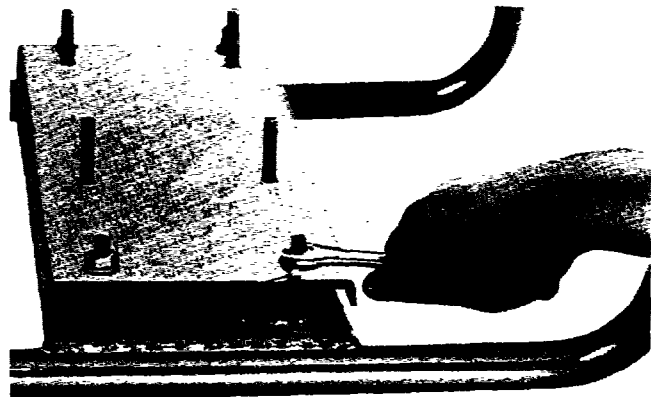


Fig. 10-29

- 3) Install the generator in the frame.
Lift the generator with a chain block, install it in the frame, and tighten the nuts. (See Fig. 10-30.)

RGX305, RGX305D

8 ϕ nuts . . . 4 pcs.

RGX405, RGX405D, RGX505, RGX505D

8 ϕ nuts . . . 6 pcs.

- 4) Attach the side plates to the frame.
Mount the side plate that reads Robin Generator Model name to the front, and the blank side plate to the rear.

NOTE: Use the black bolts for tightening them.

5 ϕ x 13 mm bolts . . . 8 pcs.

- 5) Attach the air guide to the box stay.
5 ϕ x 15 mm bolt . . . 2 pcs.
- 6) Attach the box stay to the side plates.
6 ϕ x 15 mm bolt . . . 2 pcs.

10-3-7 CONTROL BOX

- 1) Fasten the control box to the frame and box stay.
(See Fig. 10-31.)

6 ϕ x 12 mm bolt . . . 4 pcs.

- 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. 10-32.)

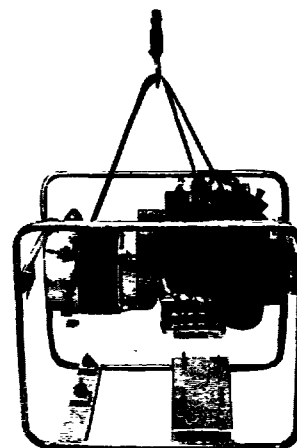


Fig. 10-30

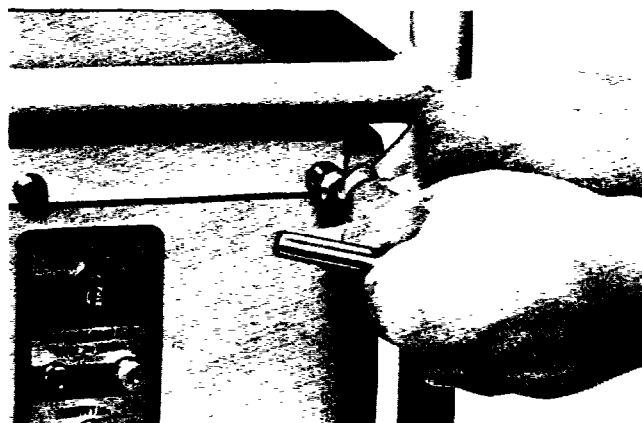


Fig. 10-31

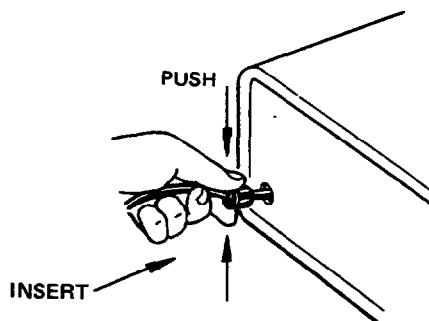


Fig. 10-32

- 3) Connect the connectors to the control box.

10-3-8 FUEL TANK

- 1) Attach the strainer, nut, and banjo to the strainer bracket.
- 2) Remove the front panel from the control box, and mount the strainer bracket.

5 ϕ x 12 mm bolt . . . 2 pcs.

Mount the front panel again.

- 3) Mount the fuel tank on the side plates with rubber washers between the side plates and the fuel tank.

8 ϕ x 18 mm bolt . . . 4 pcs.

- 4) Connect the rubber pipes.

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

NOTE: Keep the strainer in the off position until the pipe has been connected. (See Fig. 10-33.)

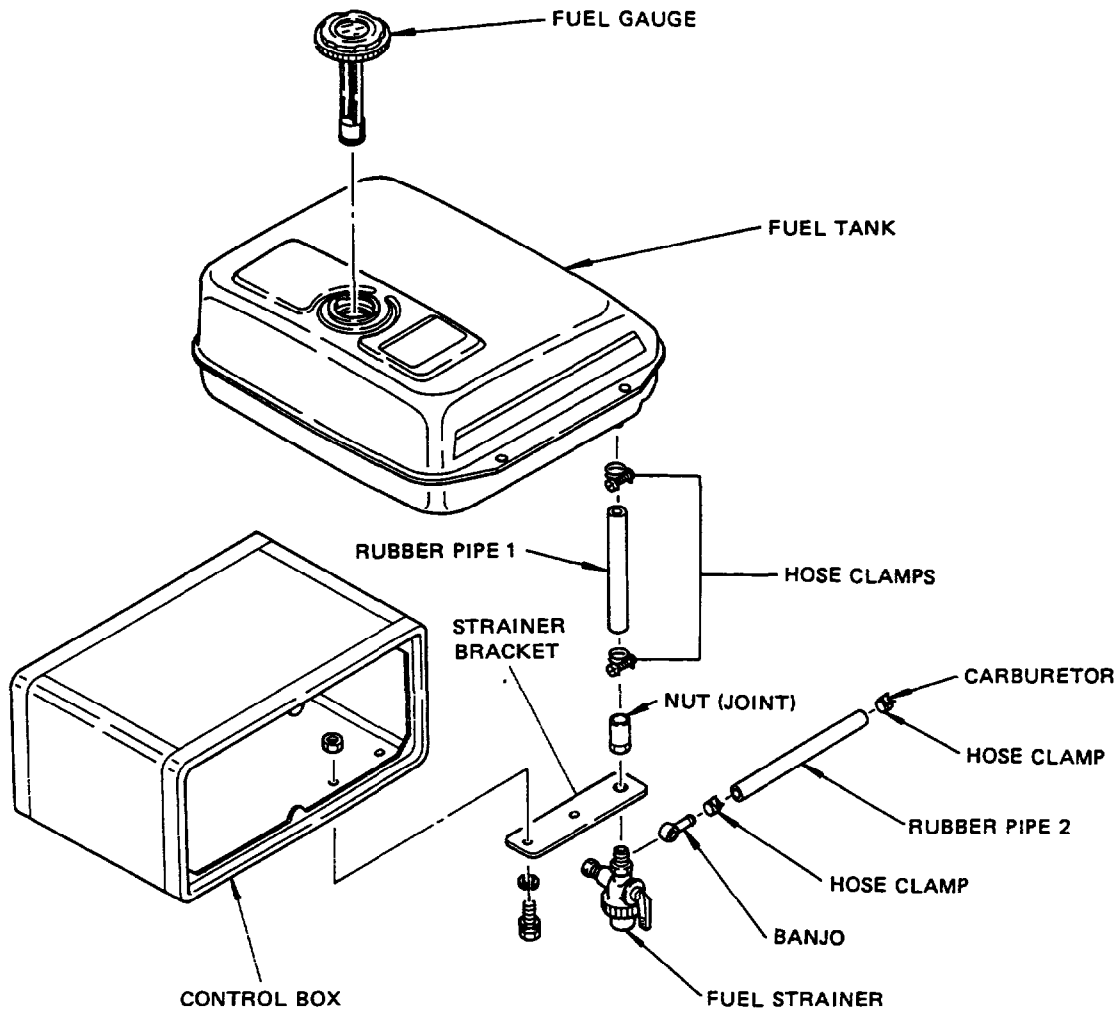


Fig. 10-33

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 top lid off.

10-4-2 DISASSEMBLY

- 1) Remove the control box top lid, 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 as disconnected.

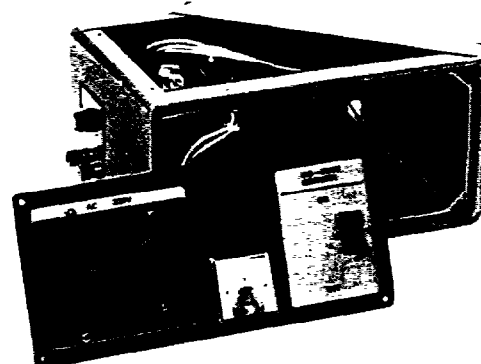


Fig. 10-34

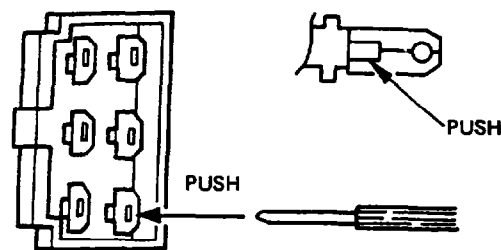


Fig. 10-35

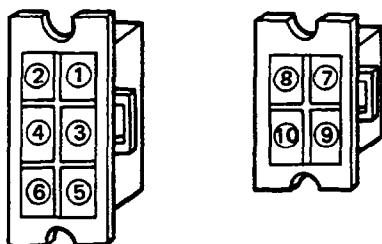


Fig. 10-36

NOTES:

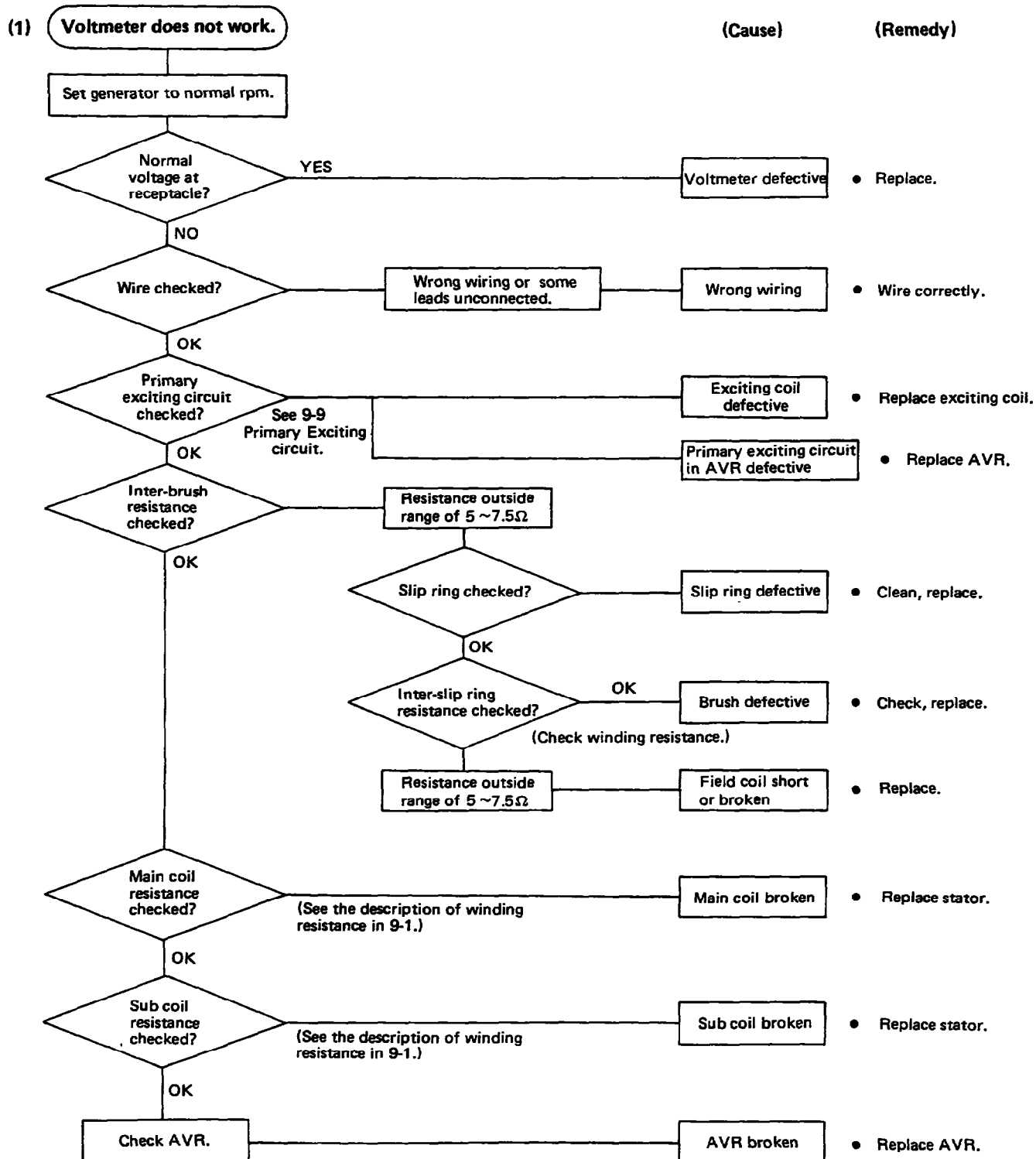
1. RGX505 – 110V, 120V; RGX505D:
Connectors are used for terminals (7) through (10) only. The others are pin terminals.
2. Terminals (1) through (6) are for a 2 mm² wire and terminals (7) through (1) for a 0.75 mm² wire.

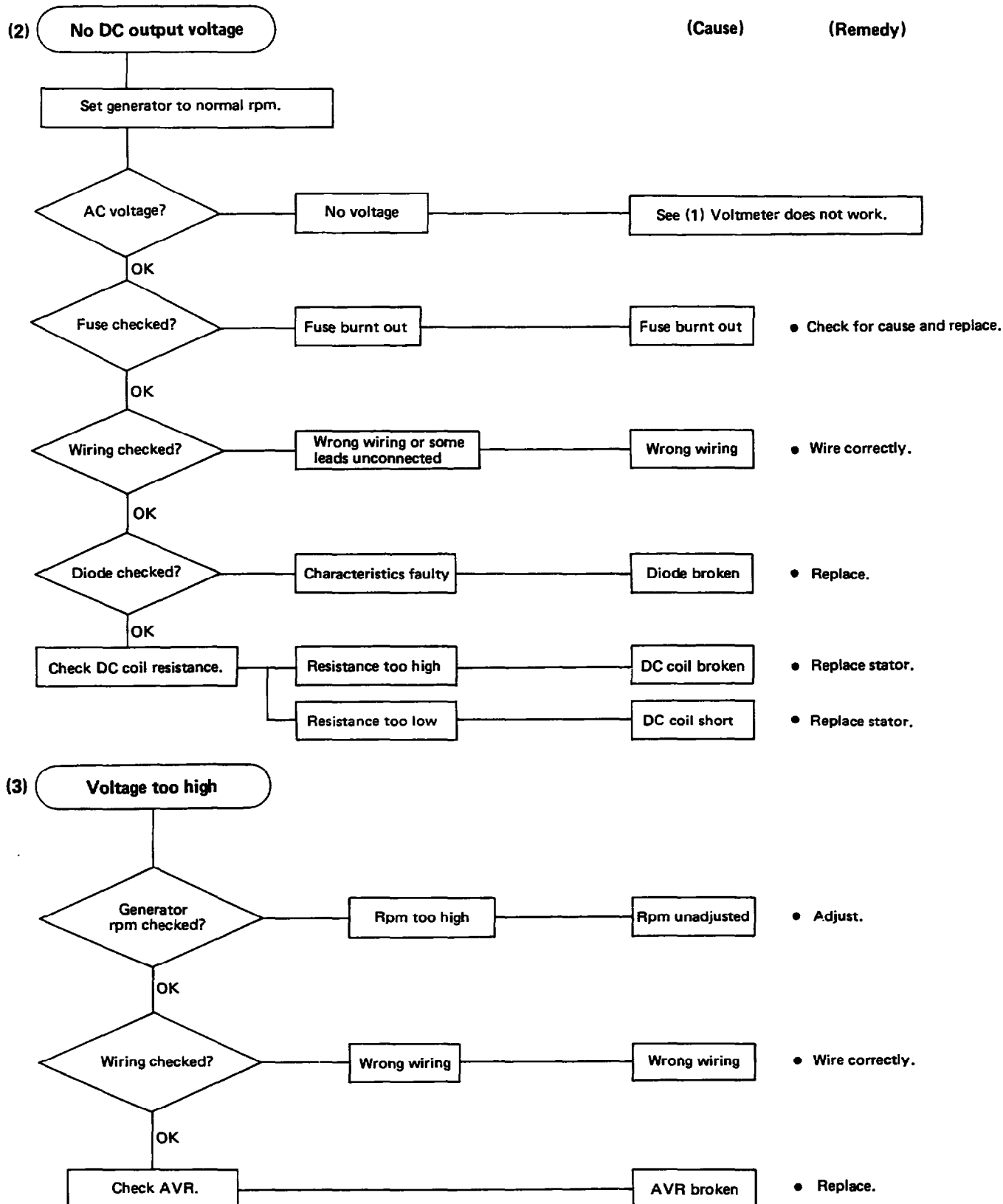
MODEL	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
RGX305, 405 220, 230, 240V	BROWN	ORANGE	WHITE	RED	—	—	BROWN	GREEN	WHITE	RED
RGX505 220, 230, 240V	BROWN	ORANGE	WHITE	RED	WHITE	RED	BROWN	GREEN	WHITE	RED
RGX305D, 405D RGX305, 405 110, 120V	BROWN	ORANGE	WHITE	RED	YELLOW	BLACK	BROWN	GREEN	WHITE	RED

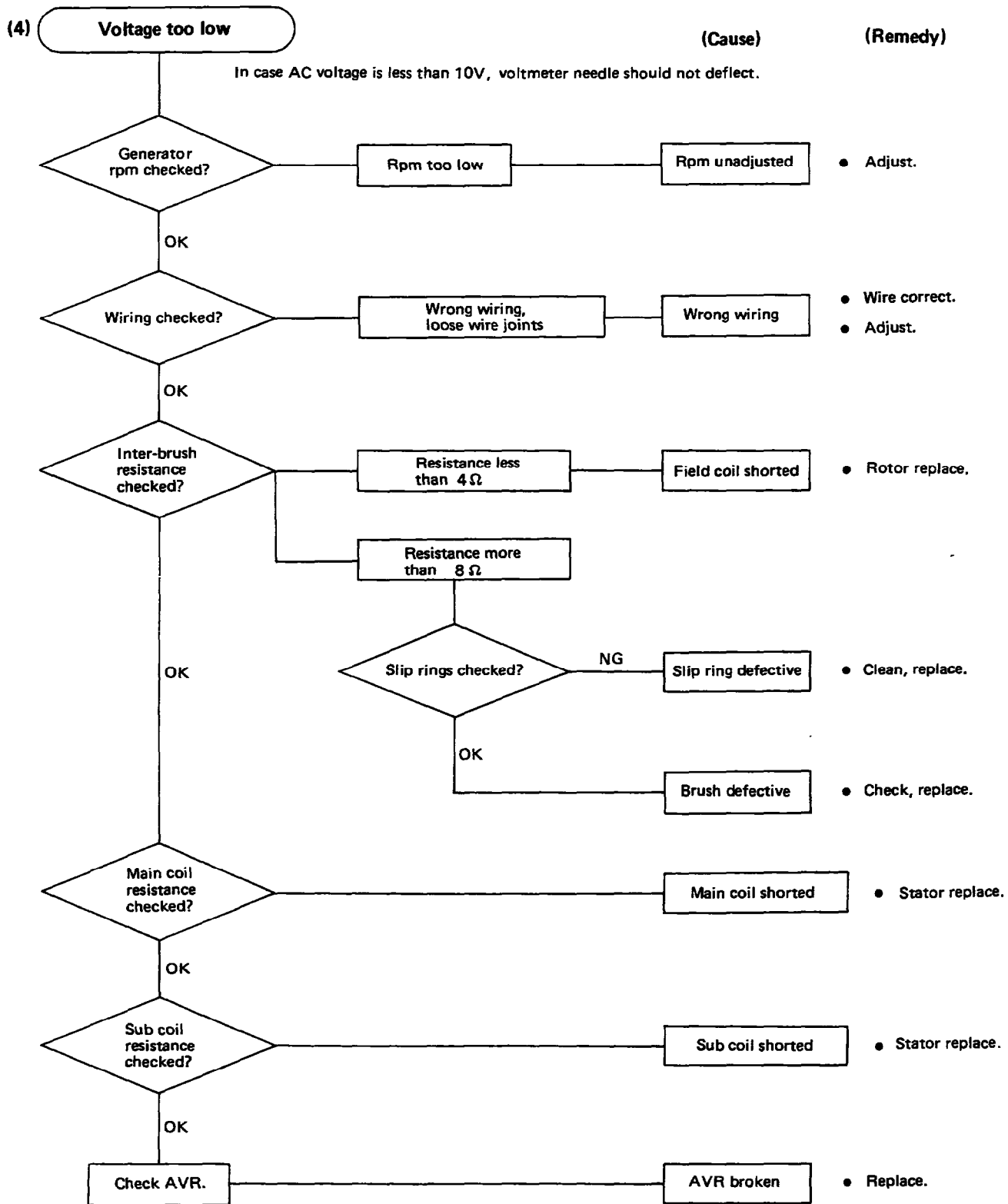
Table 10-6

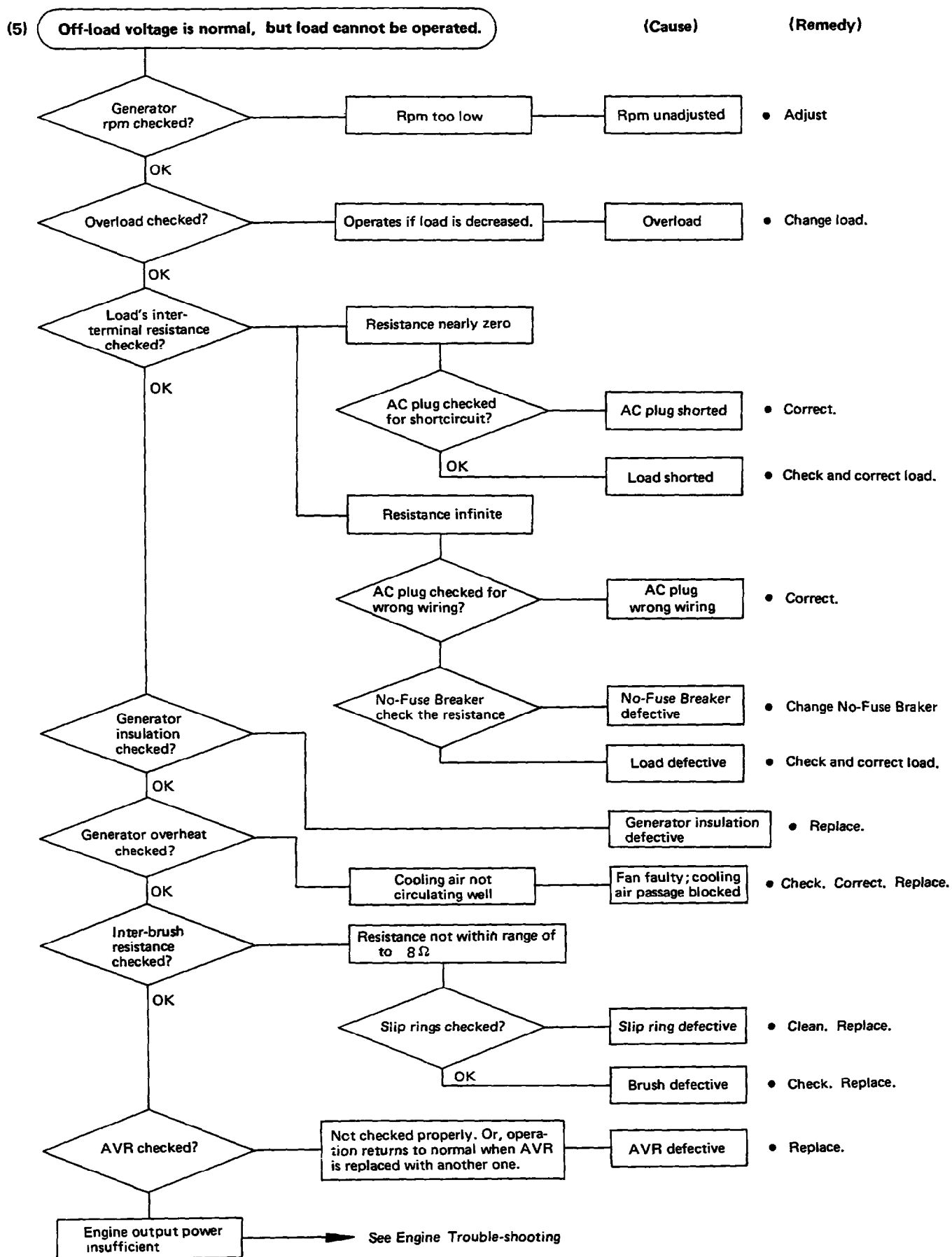
11. TROUBLE-SHOOTING

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









12. OPTIONS

An electric starter, casters, and other parts are available as options for the RGX Series. The use of optional parts may require addition or change of parts. The assembly and disassembly procedures to be followed in using optional parts are described below.

12-1 ELECTRIC STARTER

All generators with an electric starter are maker options because the crankcase requires special additional processing. The engine parts to be changed for the electric starter specifications include the crankcase, ring gear, and starting motor. For these main engine parts, refer to the Robin Gasoline Engine Service Manual. The engine parts and generator parts exclusive to the RGX Series are explained below.

12-1-1 EXCITING COIL

The standard models have two wires for primary exciting, but ones with an electric starter have two additional wires for battery charging for a total of four wires. (Fig. 12-1)

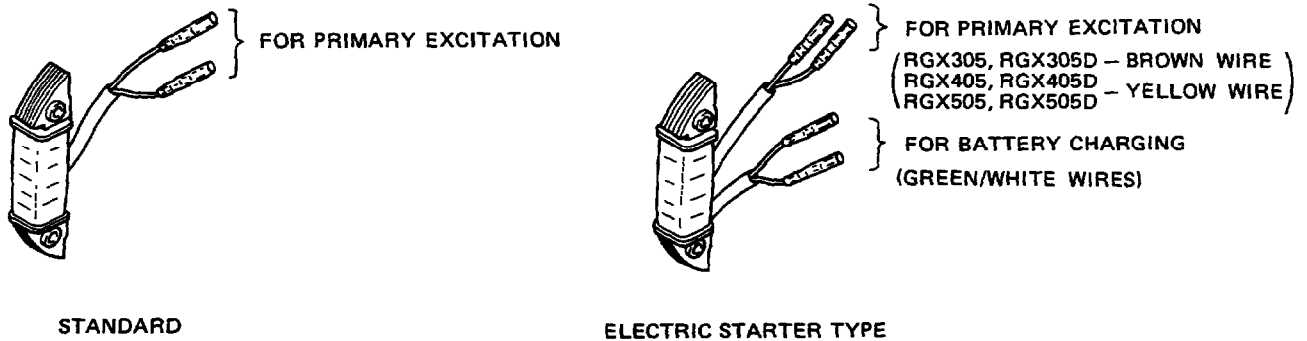


Fig. 12-1

12-1-2 SPEED CONTROL BRACKET

The speed control bracket now has no stop button. Instead, a key switch is provided for stopping the engine. A label is pasted where the stop button was located. (Fig. 12-2)

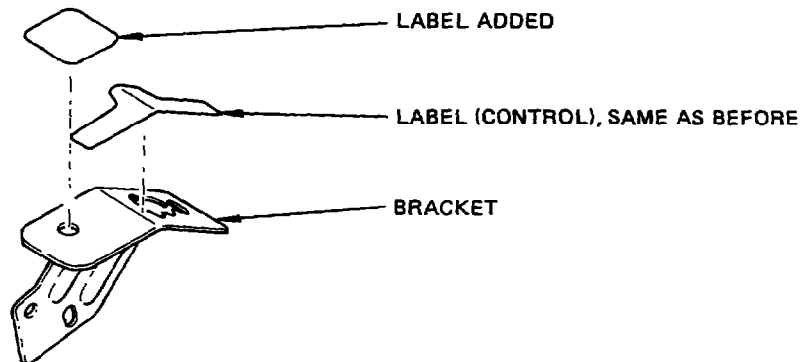


Fig. 12-2

12-1-3 CONTROL BOX (on ENGINE SIDE)

1) RGX305, 305D

A control box such as shown in Fig. 12-3 (1) is installed on the crankcase opposite to the carburetor; and a magnetic switch and diode rectifier are provided. The cylinder head is provided with a bracket and an ignition coil.

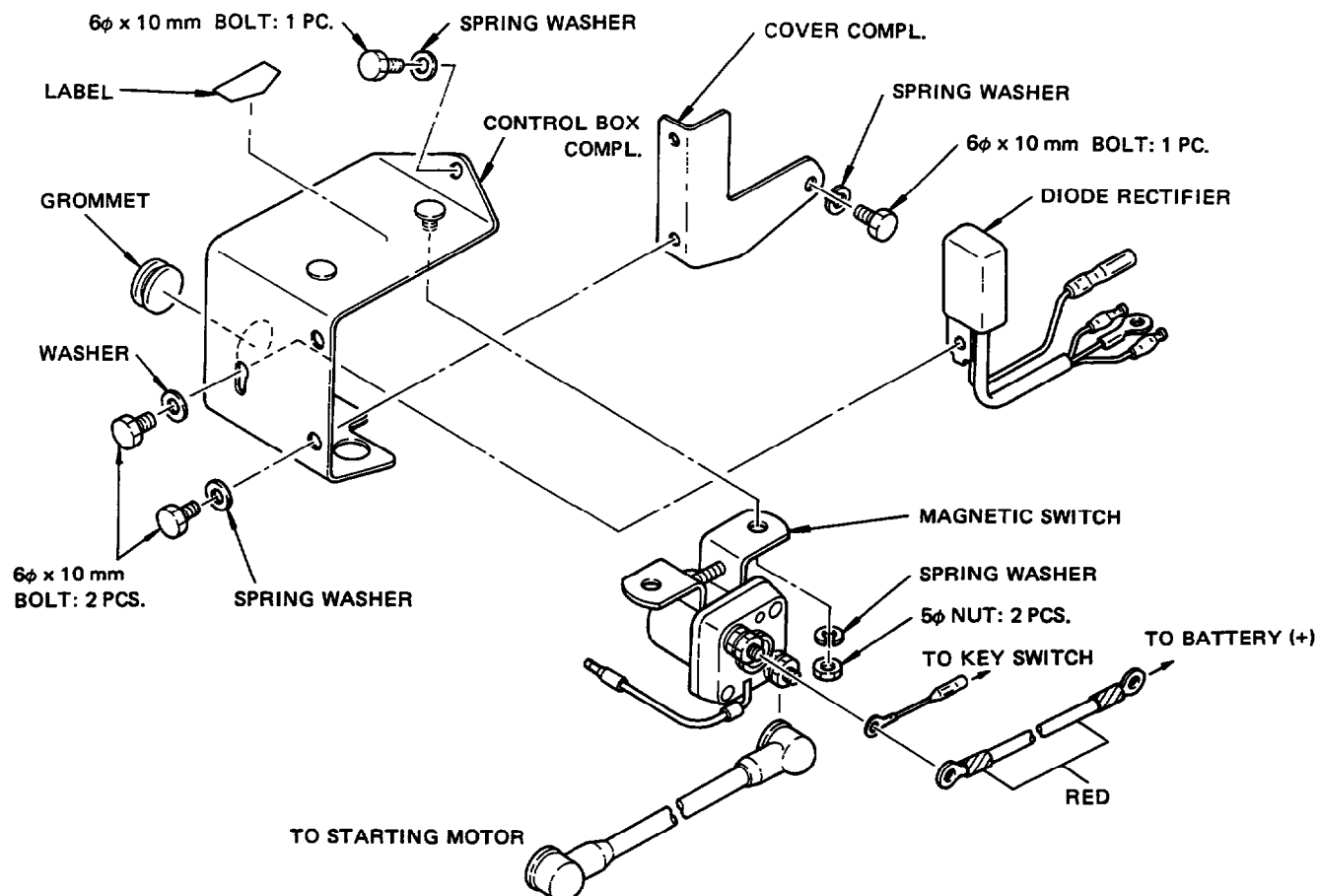


Fig. 12-3 (1)

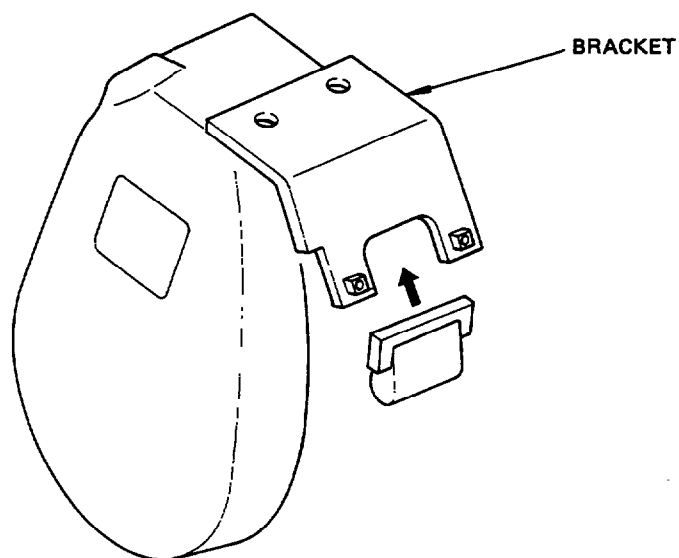


Fig. 12-3 (2)

2) RGX405, RGX405D, RGX505, RGX505D

A control box such as shown in Fig. 12-4 is installed on the crankcase opposite to the carburetor. A magnetic switch and diode rectifier are installed.

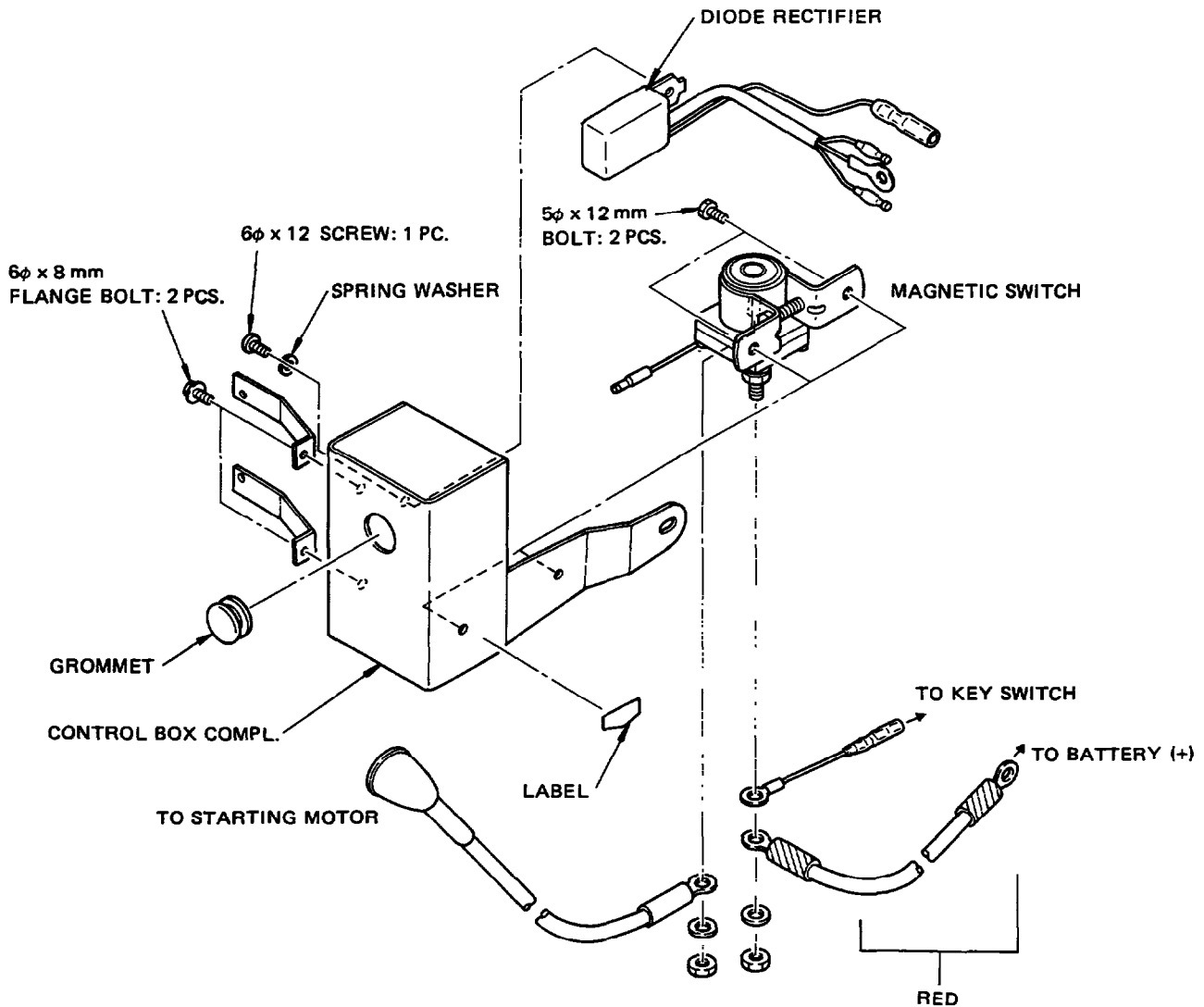


Fig. 12-4

12-1-4 STRAINER BRACKET

The strainer bracket has been changed, and now has a key switch. The key switch is wired to the control box (on the engine side). (Fig. 12-5)

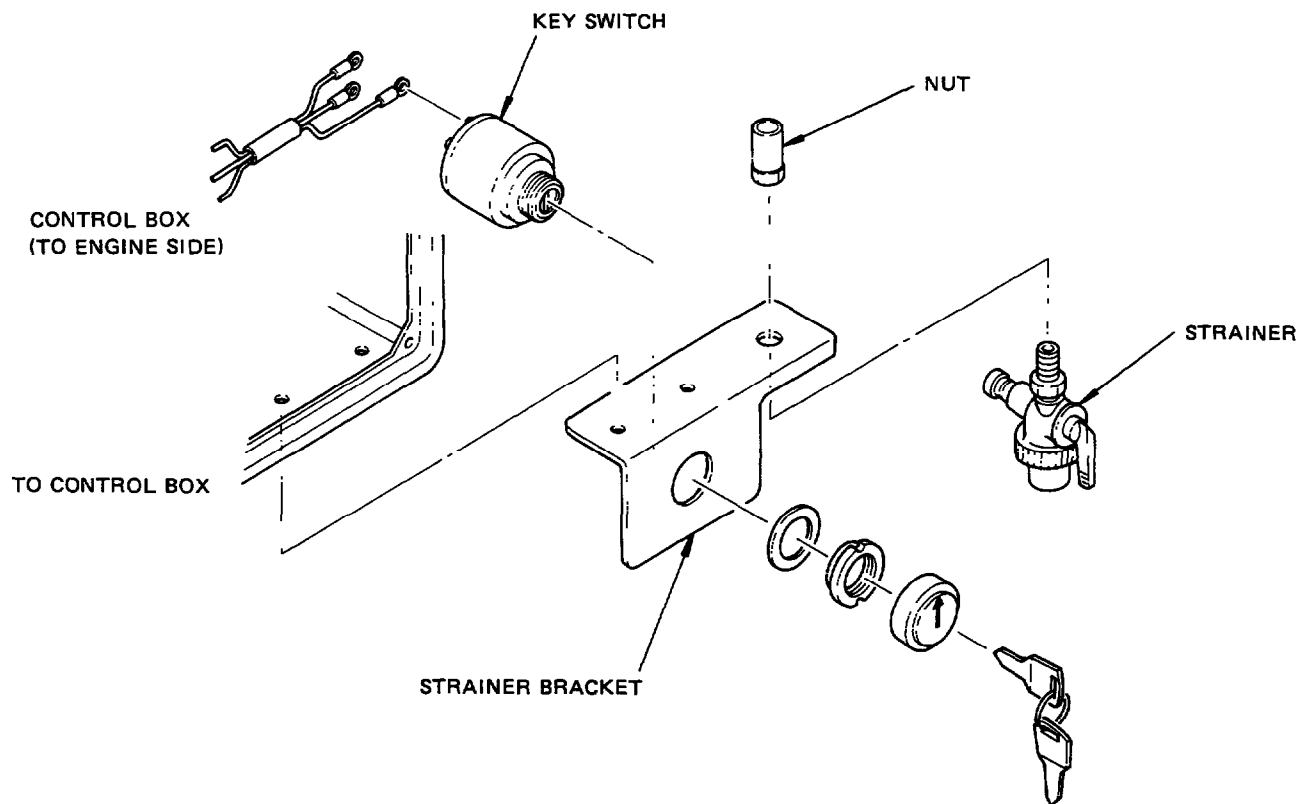


Fig. 12-5

NOTE: Be sure to ground the earth terminal on the key switch to the generator or engine body. If the key switch is not correctly grounded, the engine will not stop.

12-1-5 CLAMP

The wire connecting the key switch to the control box is fastened with the clamp bolted to the main bearing cover. (Fig. 12-6)

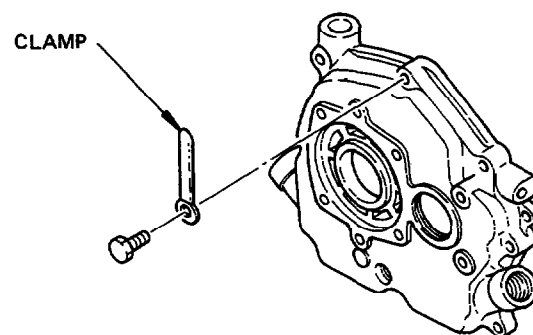
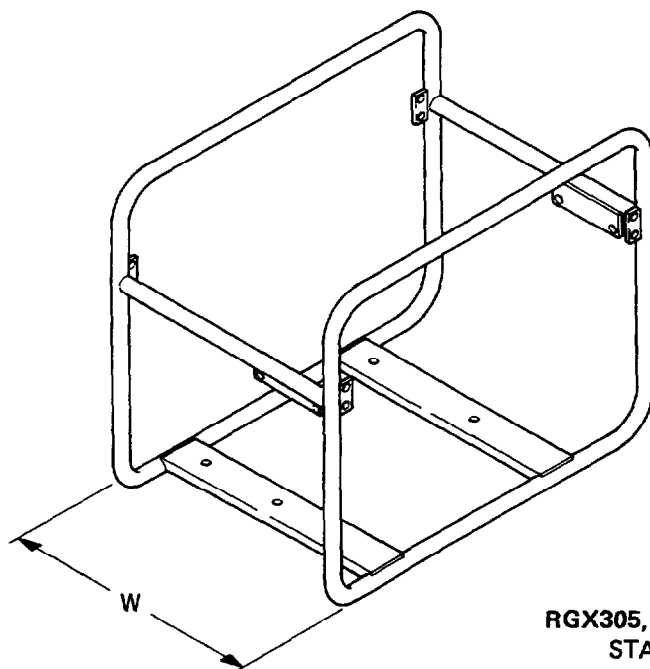


Fig. 12-6

12-1-6 FRAME (RGX305 and RGX305D ONLY)

Only the RGX305 and RGX305D have a frame of different width from before. The frames for the RGX405, RGX405D, RGX505, and RGX505D remain unchanged.



RGX305, 305D

STANDARD

W — 456 mm (18.0 inch)

ELECTRIC START

W — 486 mm (19.1 inch)

Fig. 12-7

12-1-7 CIRCUIT DIAGRAMS

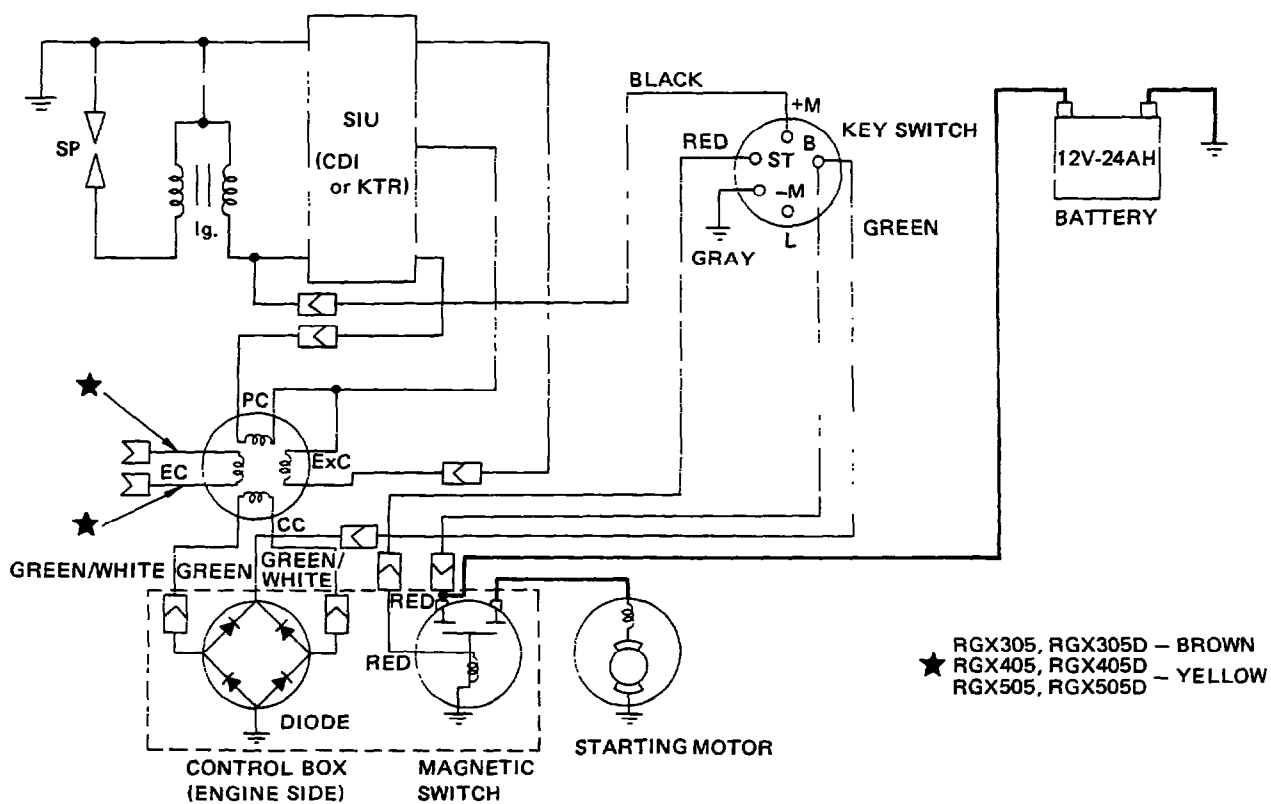


Fig. 12-8

12-2 CASTER

- 1) The caster base is fitted with rubber casters 75 mm in diameter, and the caster base is bolted to the frame.
- 2) The frame must be drilled to open holes for mounting the caster base.
- 3) The RGX 305 and RGX305D have a frame 30 mm wider than the standard frame as mentioned in 12-1-6.
- 4) The RGX405, RGX405D, RGX505, and RGX505D have spacers placed between the frame and caster base.

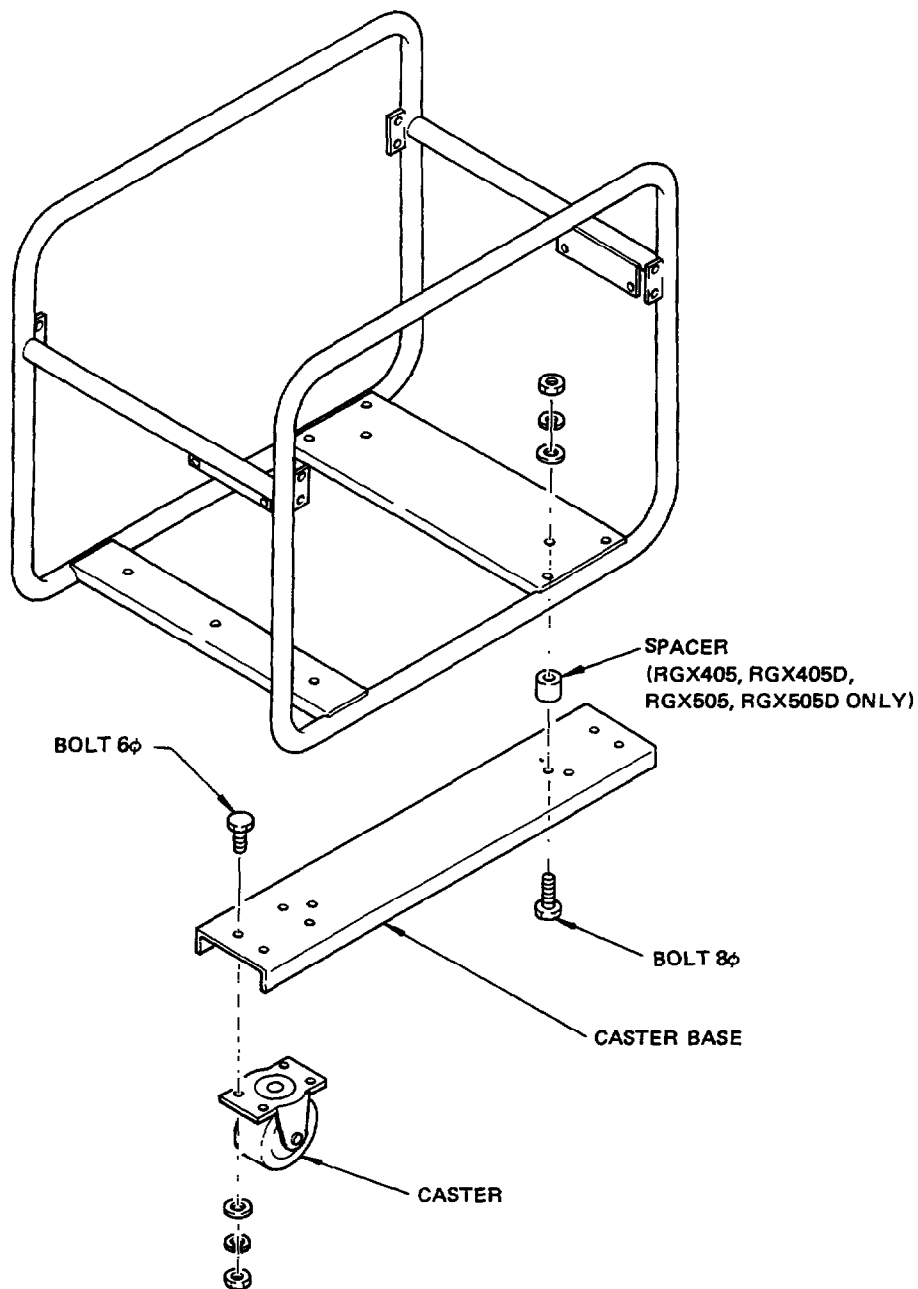


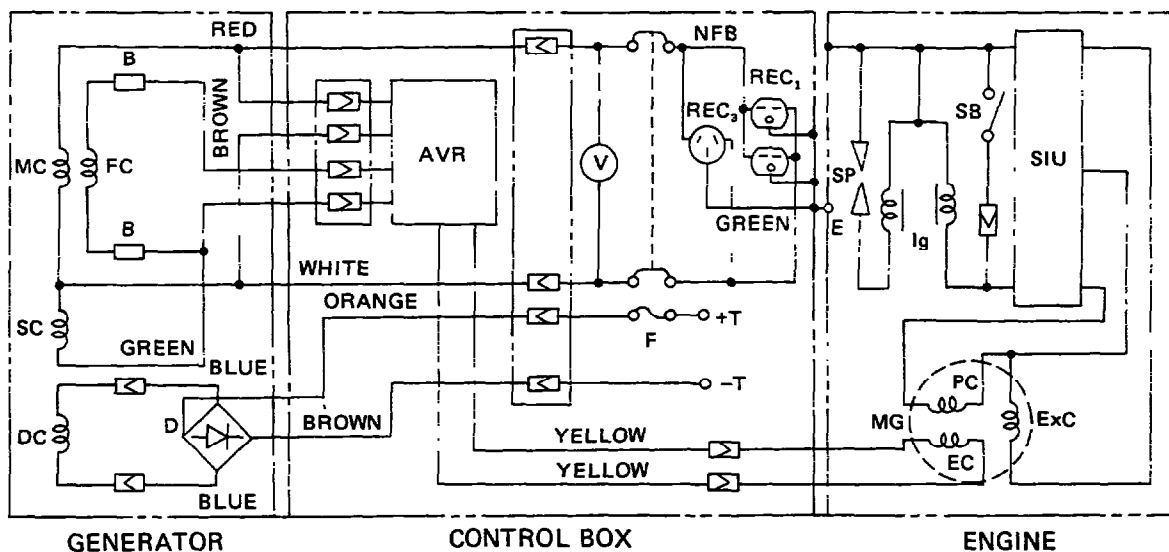
Fig. 12-9

13. CIRCUIT DIAGRAM

RGX305 (220V-230V-240V)

RGX405 (220V-230V-240V)

RGX505 (220V-230V-240V)

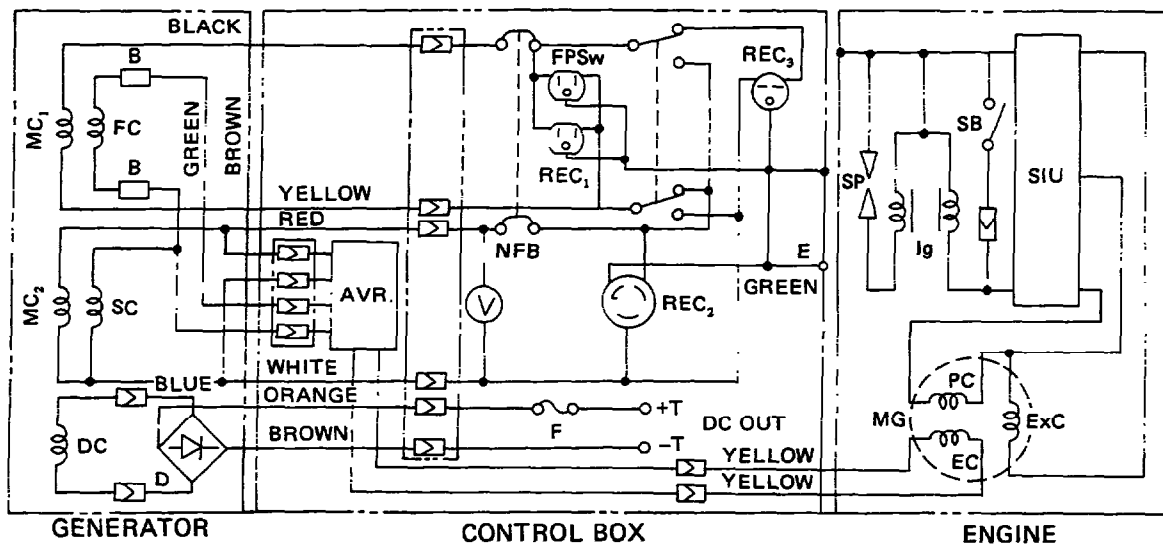


Ⓢ RECEPTACLE is equipped only for RGX505.

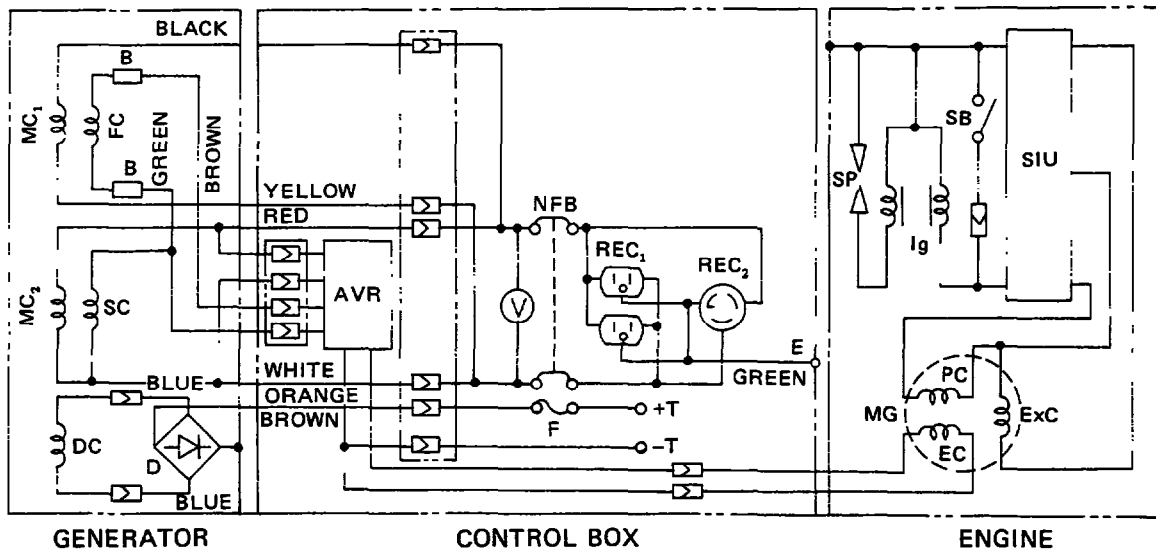
RGX305D (110/220V-120/240V)

RGX405D (110/220V-120/240V)

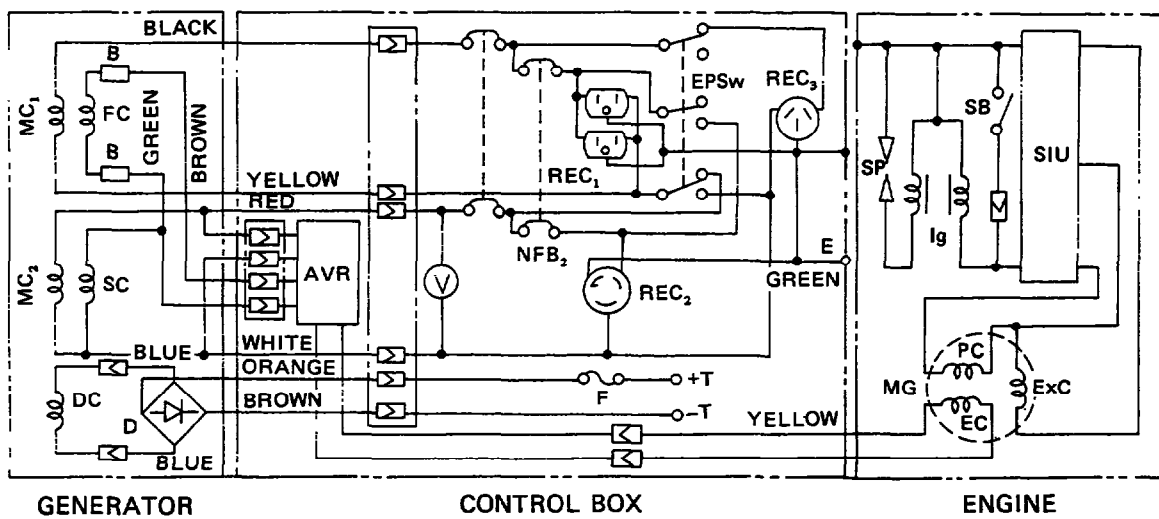
RGX505D (50Hz-120/240V)



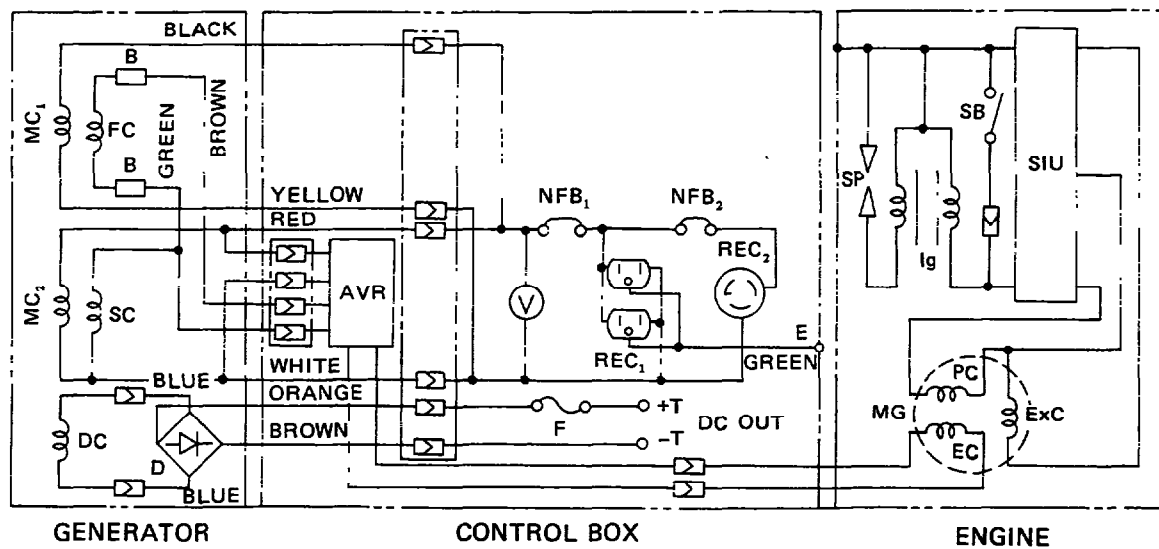
RGX305 (110V-120V)
RGX405 (110-120V)



RGX505D 110/220V
60Hz – 120V/240V



RGX505 (110V-120V)



● SYMBOLS

Symbols	Name of Parts
MC	AC Winding
SC	Auxiliary Winding
DC	DC Winding
FC	Field Winding
B	Brush
AVR	Auto Voltage Regulator
V	Voltage Meter
EPSw	Full Power Switch
D	Diode Stack Assy
F	Fuse
REC ₁	AC Output Receptacle (Total 15A Max)
REC ₂	AC Output Receptacle (110V/120V)

Symbols	Name of Parts
REC ₃	AC Output Receptacle (220V/230V/240V)
T	DC Output Terminal
NFB	No-Fuse Breaker
SP	Spark Plug
Ig	Ignition Coil
EC	Exciting Coil (Charge Coil)
ExC	Excitor Coil
PC	Pulser Coil
MG	Magneto
SB	Stop Button
SIU	Solid State Ignition Unit
E	Earth (Ground) Terminal

ISSUE EMD-GS0005



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