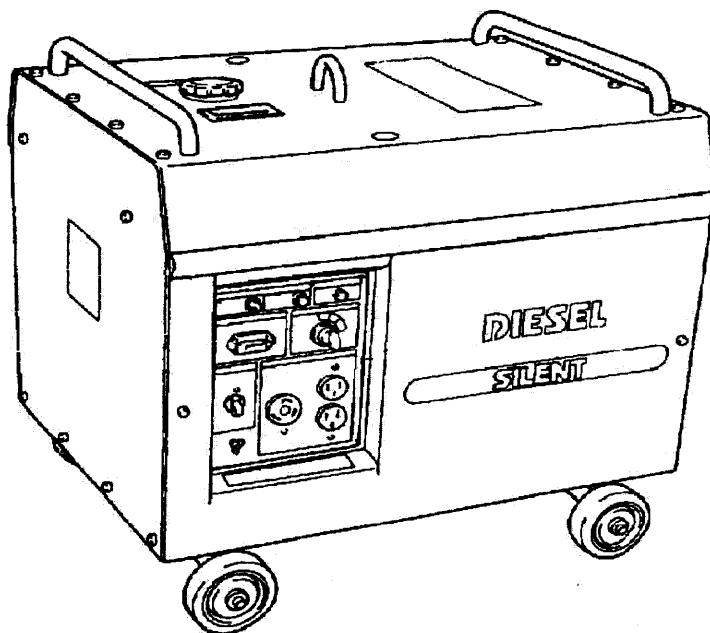




Robin Generator

RGD2500S-II

RGD3300S-II



SERVICE MANUAL

Technical Data & Overhaul Instructions

FUJI HEAVY INDUSTRIES LTD.

CONTENTS

Section	Title	Page
1.	SPECIFICATIONS	1
2.	PERFORMANCE CURVES	2
3.	GENERAL DESCRIPTION	4
4.	CONSTRUCTION	6
5.	MEASURING PROCEDURES	7
5-1	MEASURING INSTRUMENTS	7
5-2	AC OUTPUT MEASURING	9
5-3	MEASURING INSULATION RESISTANCE	9
6.	TROUBLESHOOTING	11
6-1	NO AC OUTPUT	11
6-2	NO DC OUTPUT	13
6-3	CONDENSER	14
6-4	AC CIRCUIT BREAKER	14
6-5	DC CIRCUIT BREAKER	14
6-6	AC RECEPTACLES	15
6-7	HOUR METER	16
6-8	OIL PRESSURE SWITCH	16
6-9	SOLENOID	16
6-10	REGULATOR	16
6-11	MULTI CONTROL UNIT	17
7.	WIRING DIAGRAM	18

NOTE

*1: This Service Manual excludes information for engine.

As for the total servicing information as a generator set, please refer in conjunction with the Robin DY23-2/27-2 Engine Service Manual.

*2: Section of Disassembly and Assembly is being made.

It will be up on this site after completing.

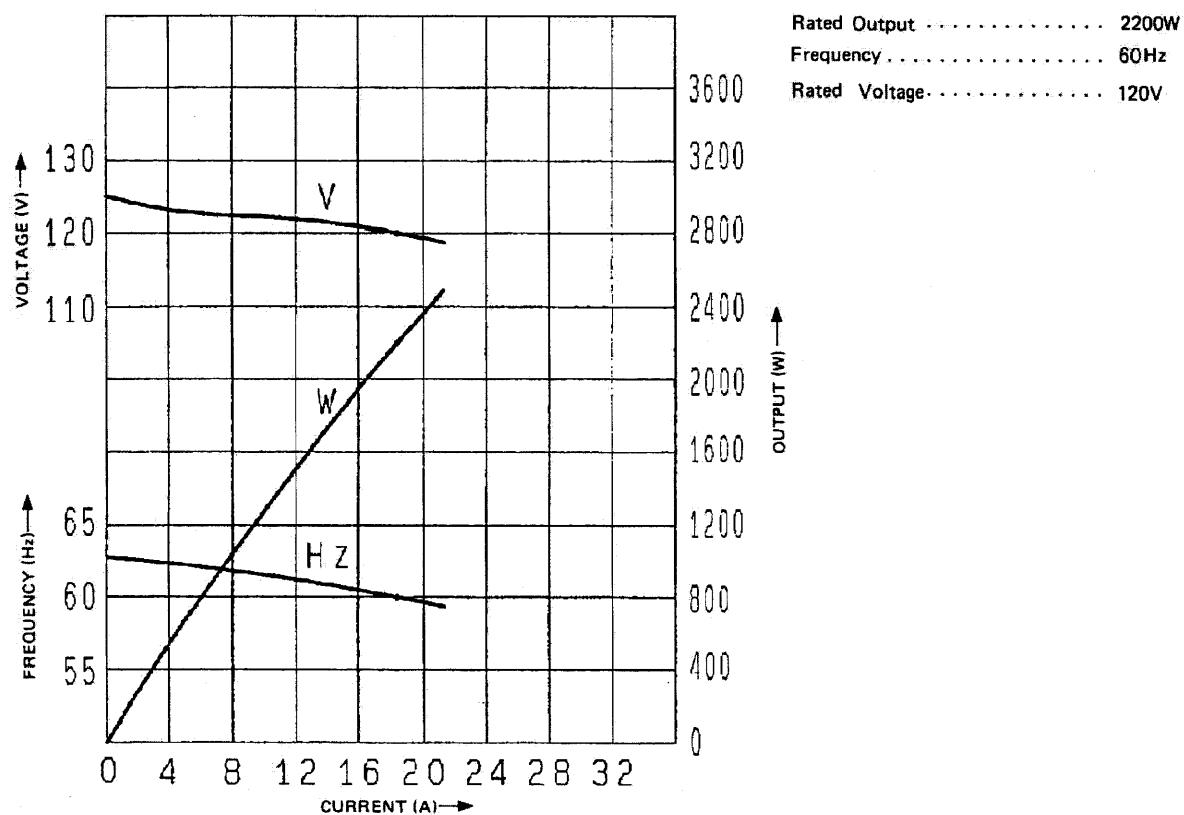
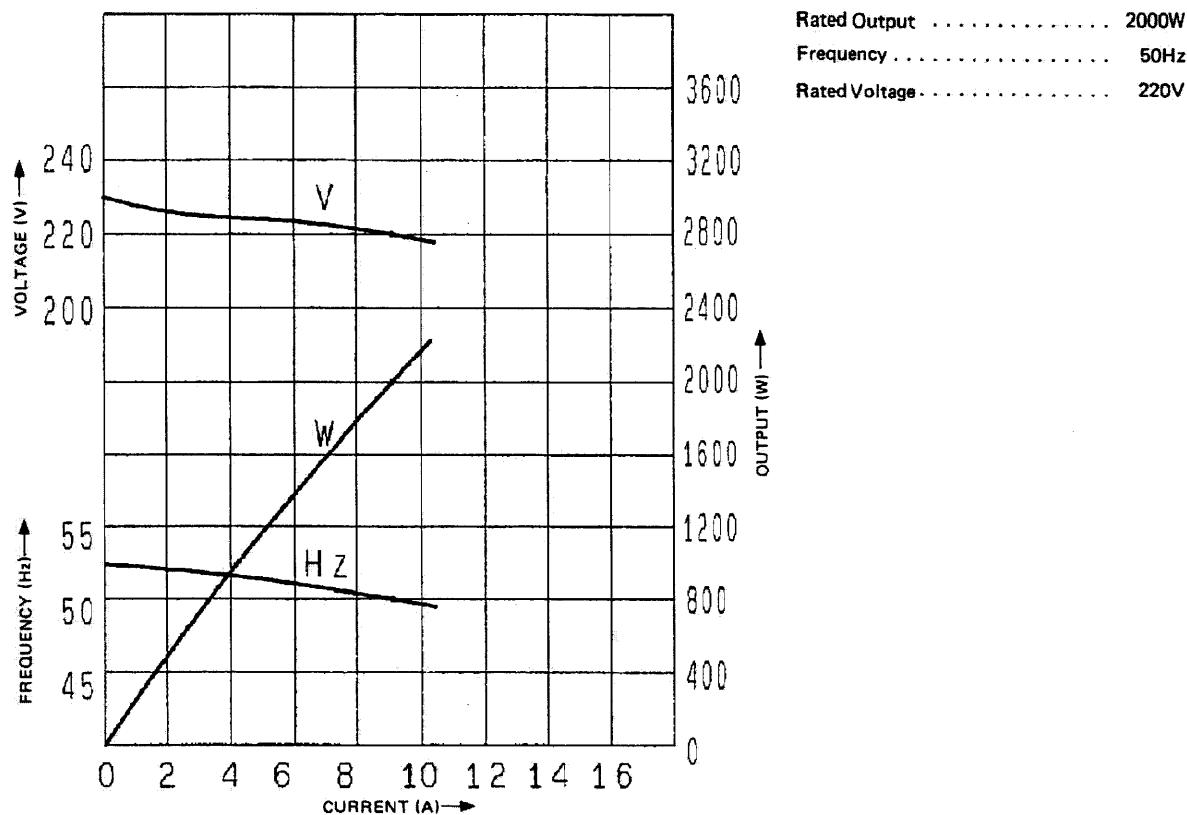
1. SPECIFICATIONS

MODEL		RGD2500S-II		RGD3300S-II				
ALTERNATOR	Type	Brushless, Self-exciting, 2-Poles, Single Phase						
	AC Voltage	50Hz	110V, 220V, 240V, 110/220V					
		60Hz	110V, 120V, 240V, 110/220V, 120/240V					
	Max. Output	50Hz	2,300 W	3,000 W				
		60Hz	2,500 W	3,300 W				
	Rated Output	50Hz	2,000 W	2,700 W				
		60Hz	2,200 W	3,000 W				
	Voltage Regulator	Condenser type						
	Power Factor	1.0						
	DC Output	12V-8.3A						
ENGINE	Model	DY23-2DS		DY27-2DS				
	Type	Air-cooled, 4 cycle, Diesel Engine						
	Displacement	230 mL (14.03 cu. in.) 265 mL (16.17 cu. in.)						
	Fuel	Diesel Light Oil						
	Fuel Tank Capacity	11.5 liters						
	Lubricant	Diesel Engine Lubricating Oil ; API classification "Grade CC or higher"						
	Lubricating Oil Capacity	Upper level : 0.9 liters , Lower level: 0.5 liters						
	Rated Continuous Operation	50Hz	14.0 hours	10.6 hours				
		60Hz	11.9 hours	9.1 hours				
Starting System		Electric Starter						
Dimensions		L	722 mm (28.4 in.)					
		W	538 mm (21.1 in.)					
		H	667 mm (26.2 in.)					
Dry Weight		106 kg (233 lbs)		110 kg (242 lbs)				

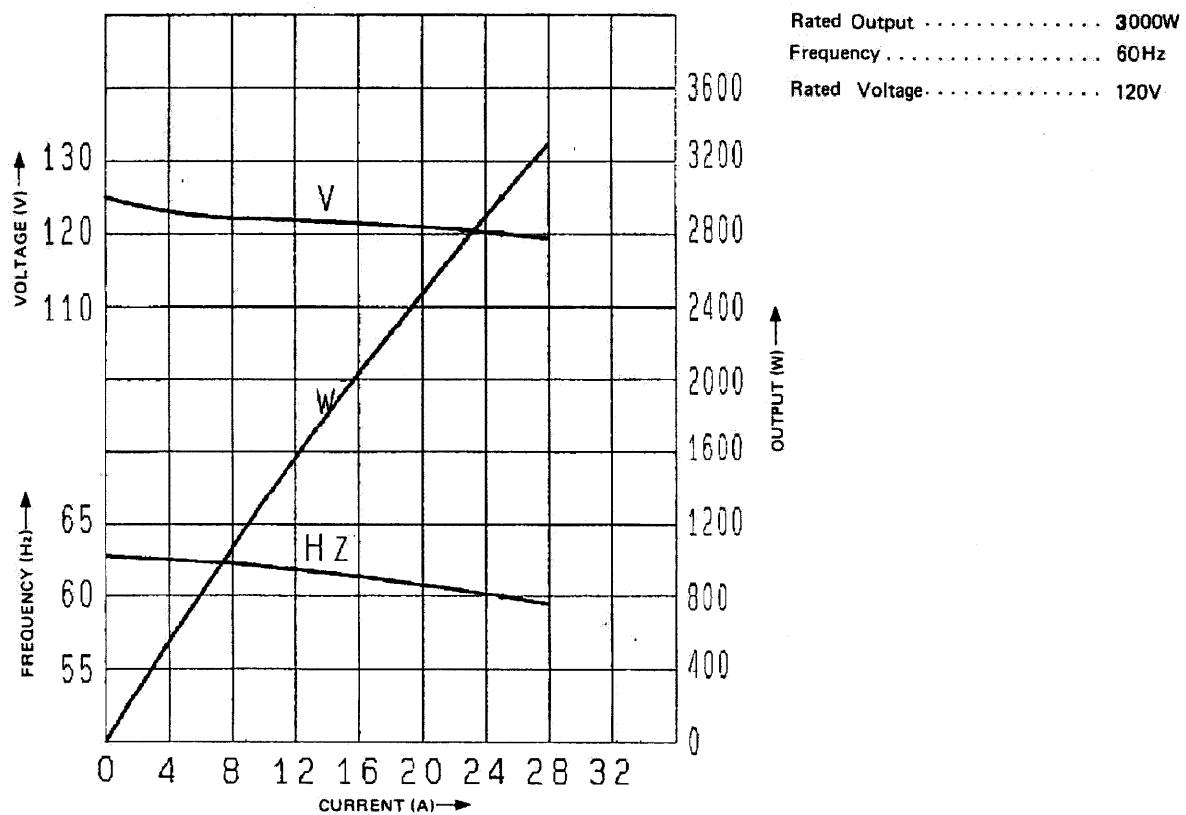
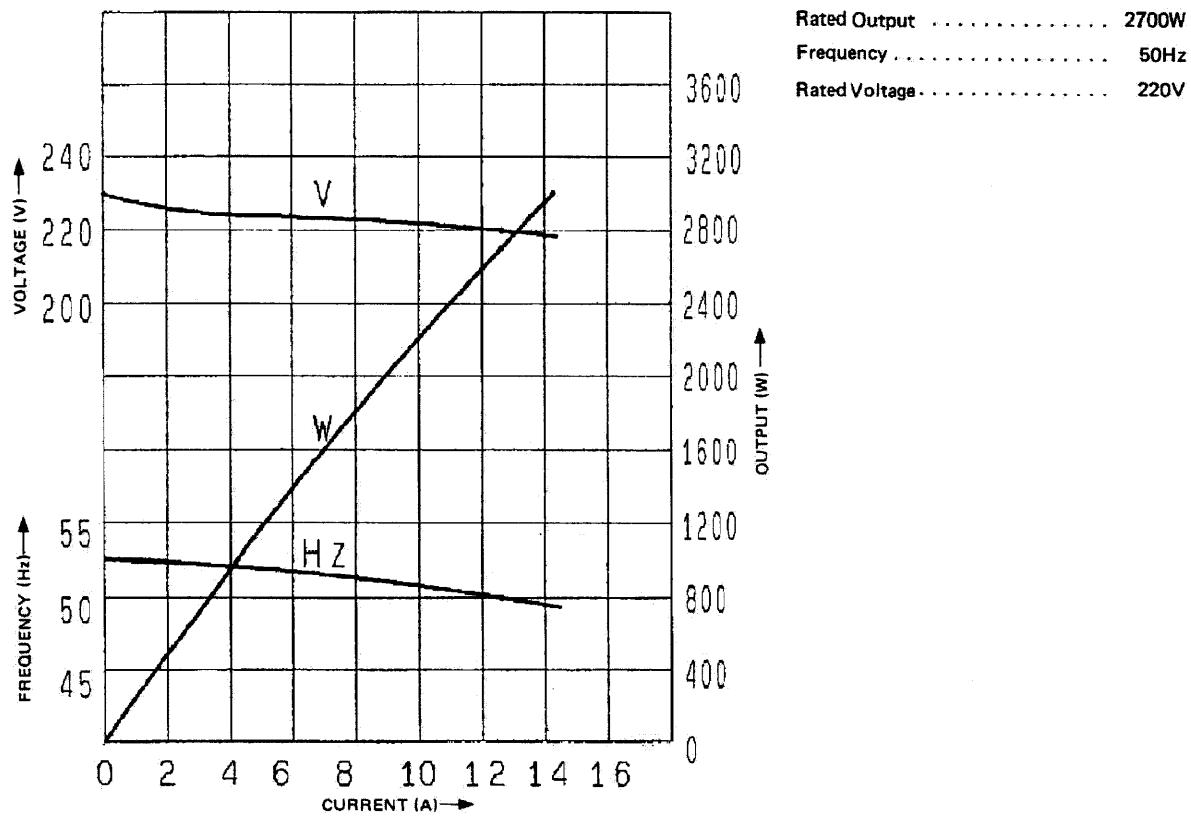
Specifications are subject to change without notice.

2. PERFORMANCE CURVES

2-1 MODEL RGD2500S-II

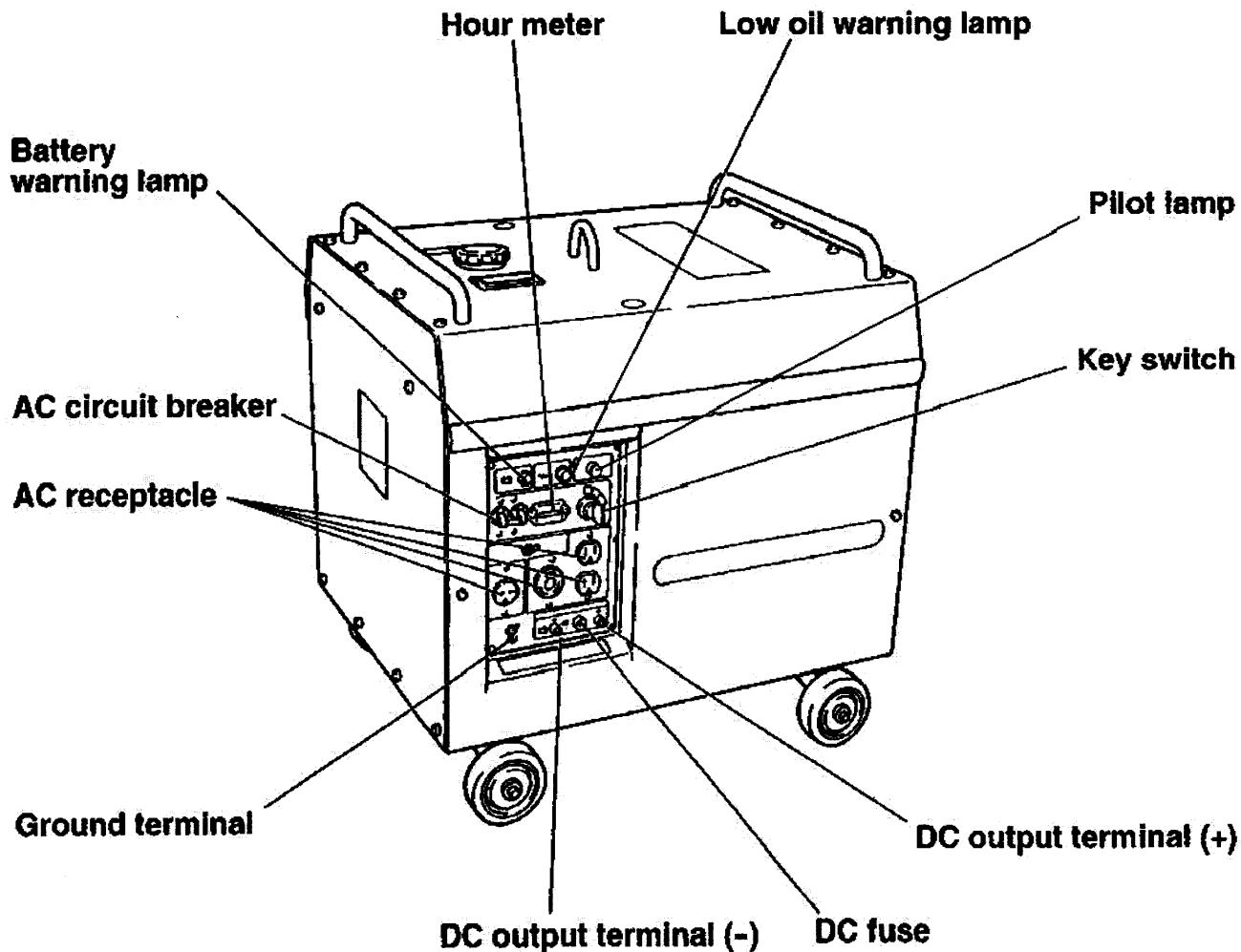


2-2 MODEL RGD3300S-II

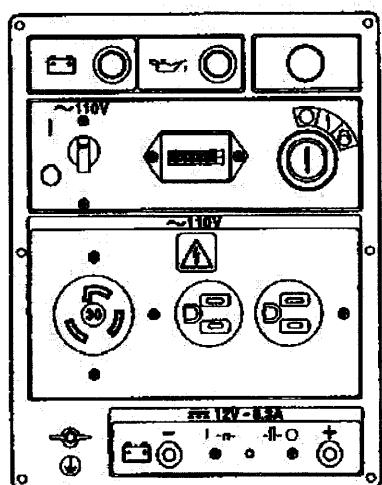


3. GENERAL DESCRIPTION OF THE GENERATOR

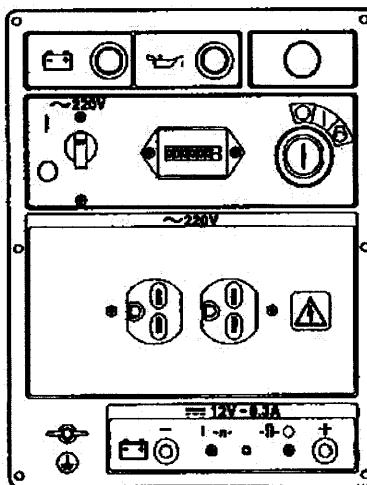
EXTERNAL VIEW 1



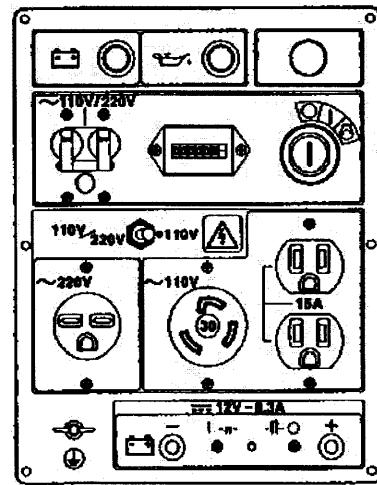
CONTROL PANEL



110V, 120V type

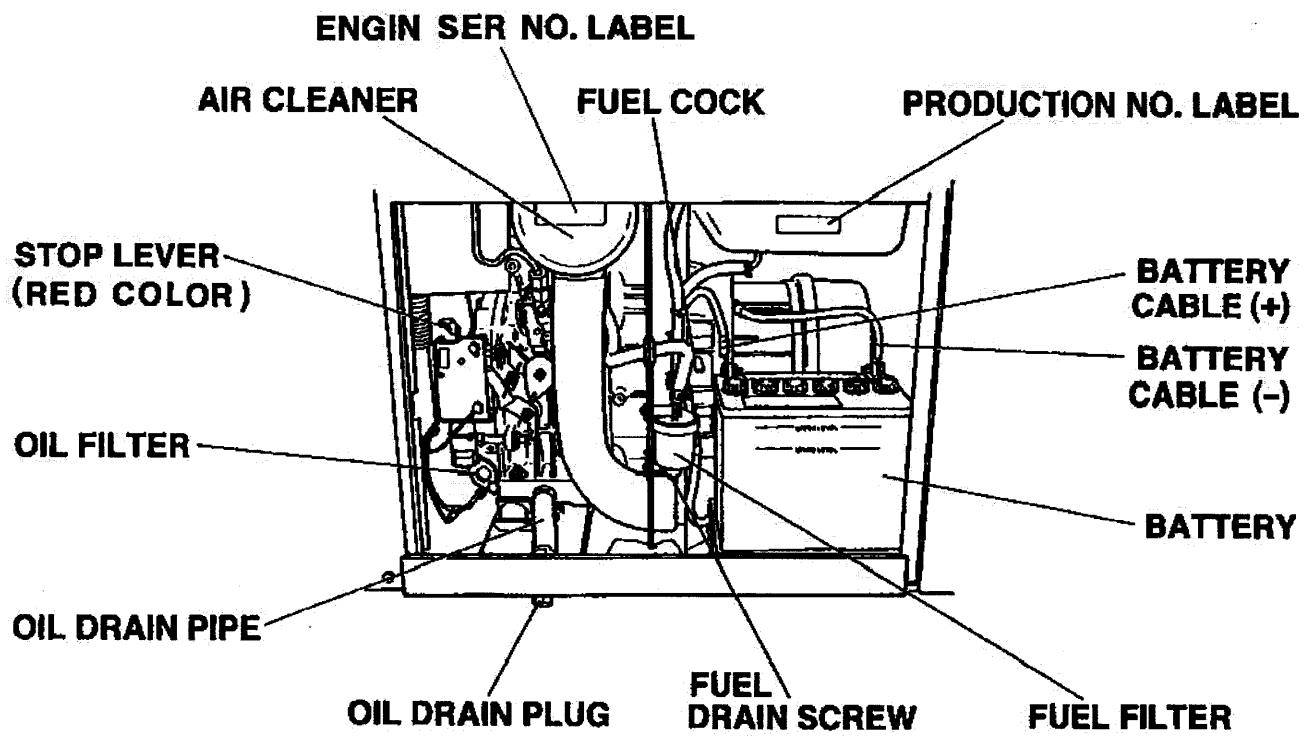
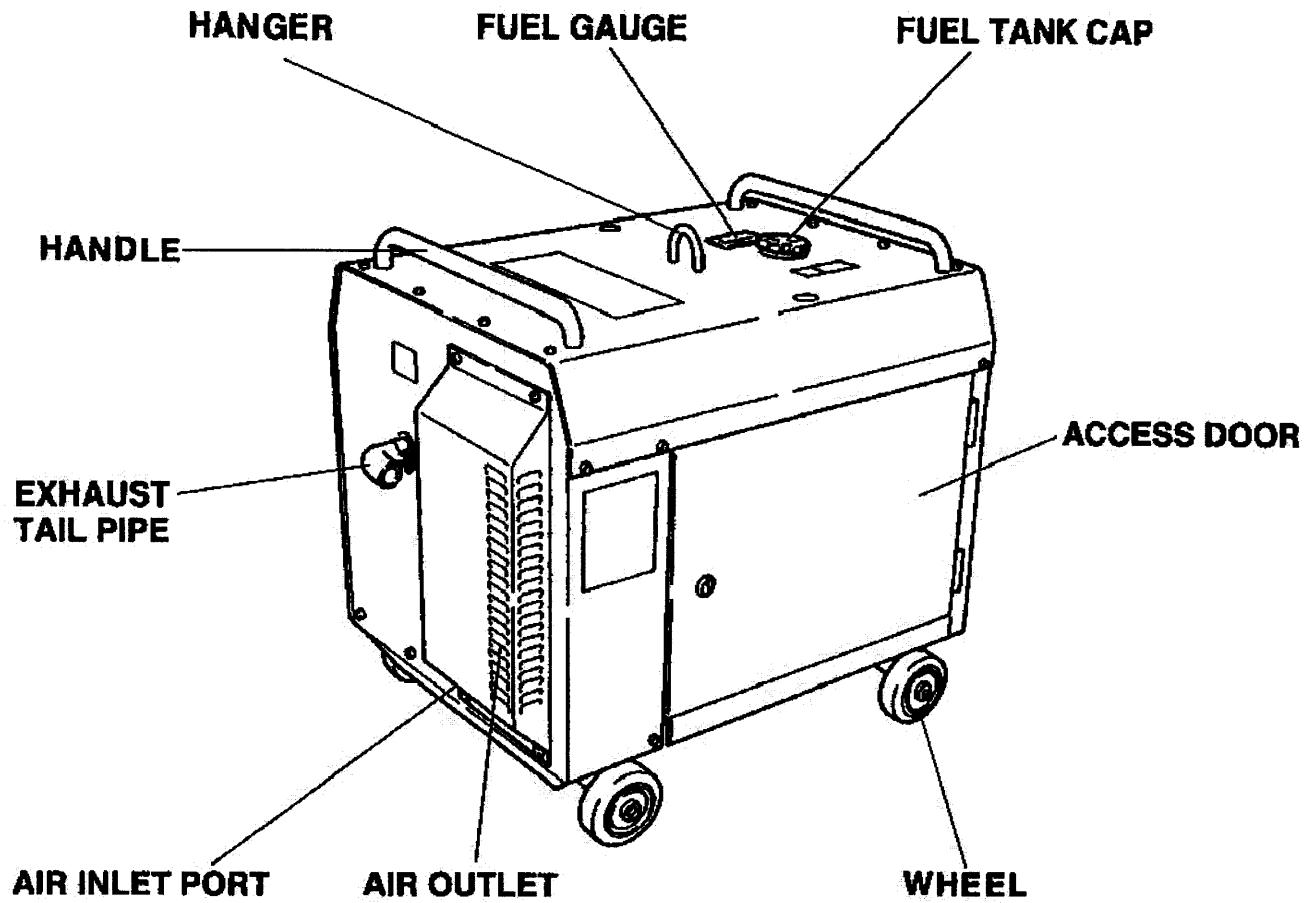


220V, 240V type



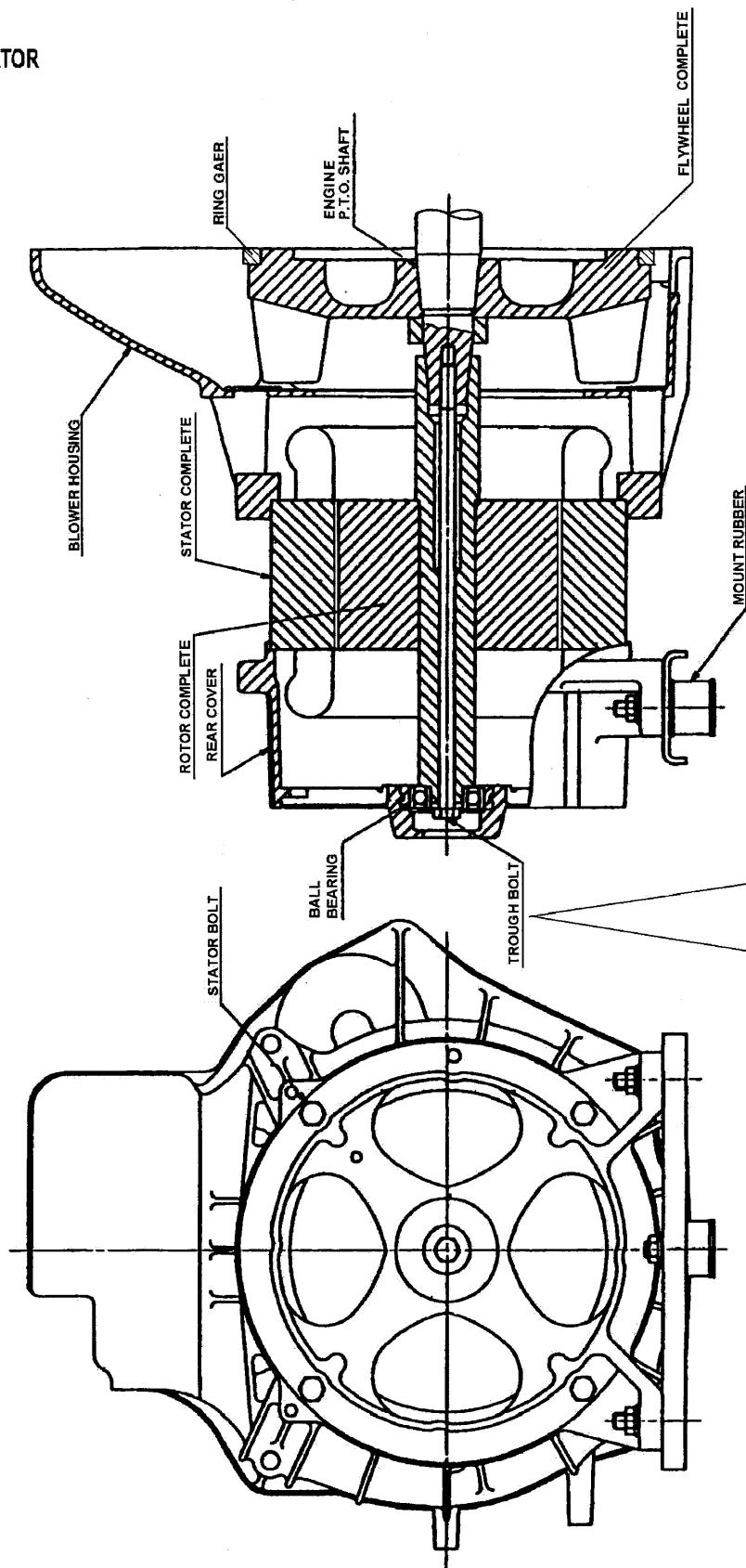
110/120V, 220/240V type

EXTERNAL VIEW 2



4. CONSTRUCTION

GENERATOR



ASSEMBLY (THROUGH BOLT)		Tightening torque : 11.5 ~ 13.5 N·m 11.5 ~ 135 kg·cm 8.3 ~ 9.7 ft·lb
DISASSEMBLY (THROUGH BOLT)		<p>Remove the through bolt.</p> <p>RGD2200S-II M 8 × 225 mm Bolt : 1pc. RGD3000S-II M 8 × 235 mm Bolt : 1pc.</p> <p>NOTE : Since the thread of the through bolt is in reverse direction, turn it clockwise to loosen.</p>

5. MEASURING PROCEDURES

5-1 MEASURING INSTRUMENTS

5-1-1 VOLTMETER

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

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

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

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

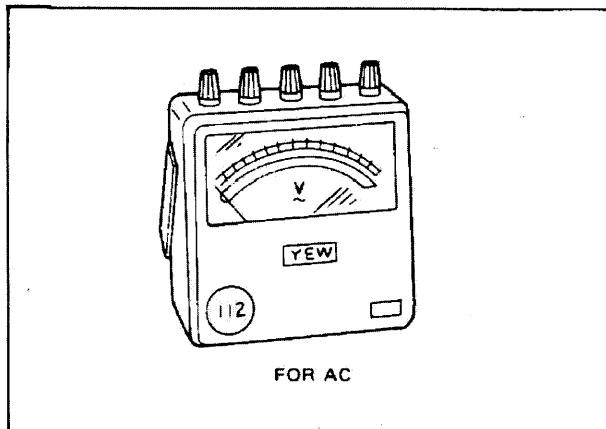


Fig. 5-1

5-1-2 AMMETER

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

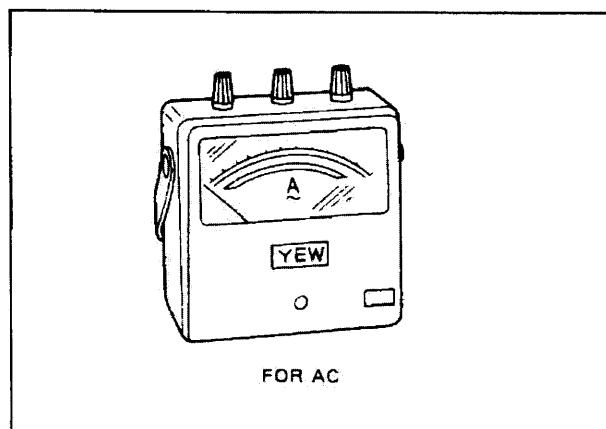


Fig. 5-2

5-1-3 FREQUENCY METER

Frequency range: About 45 to 65Hz

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

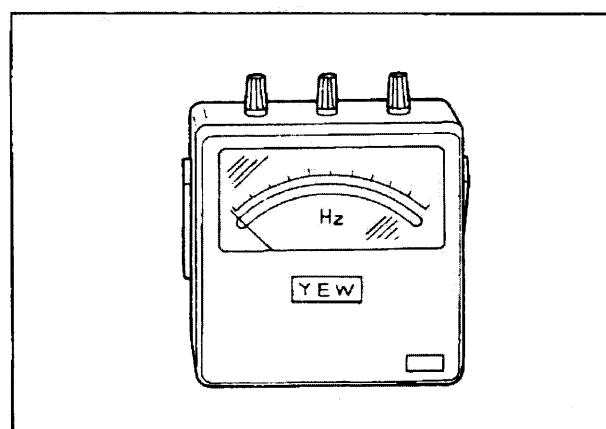


Fig. 5-3

5-1-4 CIRCUIT TESTER

Used for measuring resistance, etc.

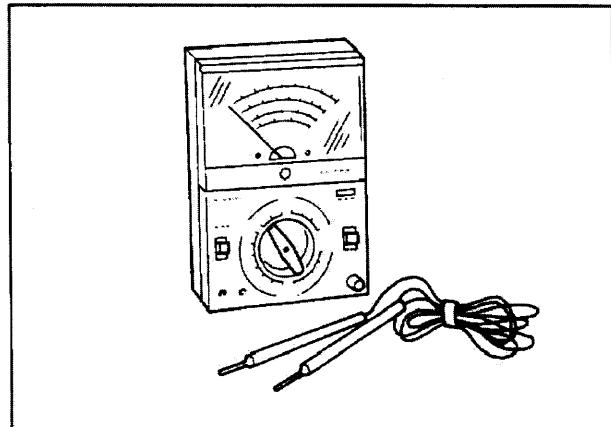


Fig. 5-4

5-1-5 MEGGER TESTER

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

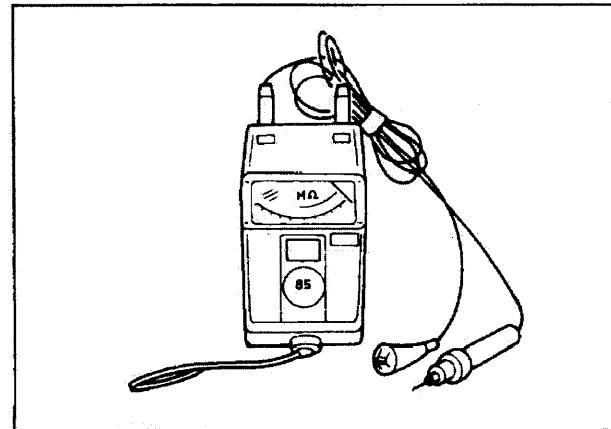


Fig. 5-5

5-1-6 TACHOMETER

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

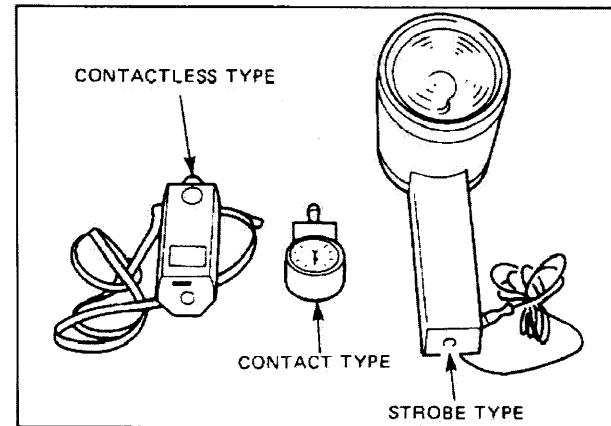
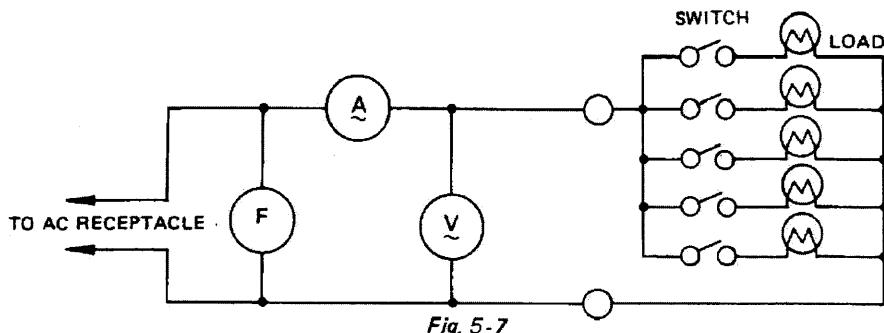


Fig. 5-6

5-2 AC OUTPUT MEASURING



Use a circuit like the one shown in Fig. 5-7 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 5-1 at the rated amperage and rated rpm.

Rated voltage	110V	120V	220V	240V
Voltage range	107 ~ 119V	117 ~ 130V	215 ~ 238	235 ~ 260

Table 5-1

5-3 MEASURING INSULATION RESISTANCE

Connect a megger tester to one of receptacle output terminals and the ground terminal, then measure the insulation resistance. An insulation resistance of 1 megohm or more is normal. (The original insulation resistance at the time of shipment from the factory is 10 megohms or more.)

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

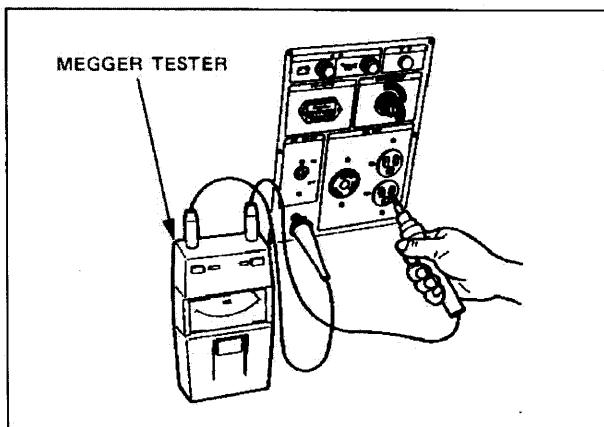


Fig. 5-8

● STATOR

- (1) Measure the insulation resistance between BLACK lead and the core.
- (2) Measure the insulation resistance between BLUE lead and the core.
- (3) Measure the insulation resistance between RED lead and the core.
- (4) Measure the insulation resistance between WHITE lead and the core.

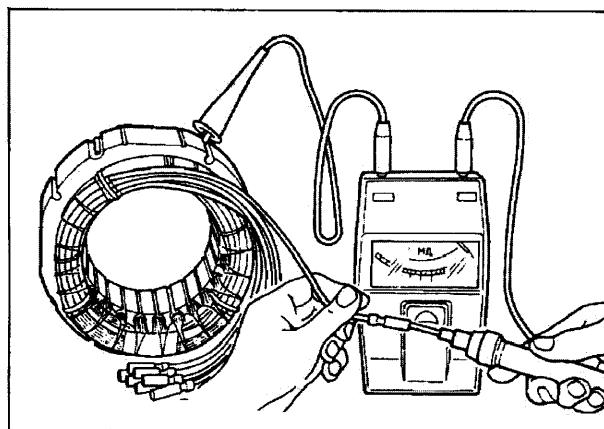


Fig. 5-9

• ROTOR

Measure the insulation across one of the soldered terminals of the rotor and the core.

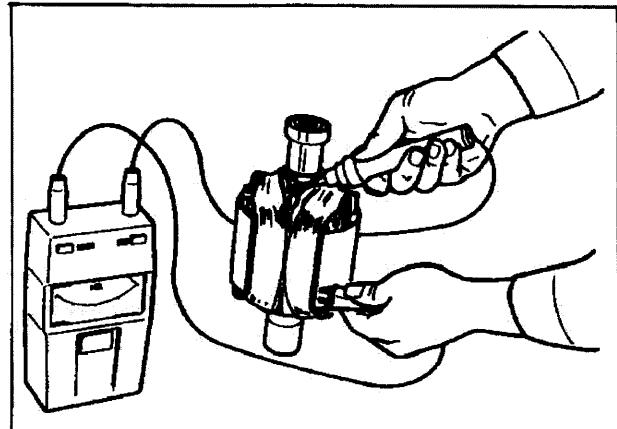


Fig. 5-10

• CONTROL PANEL

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

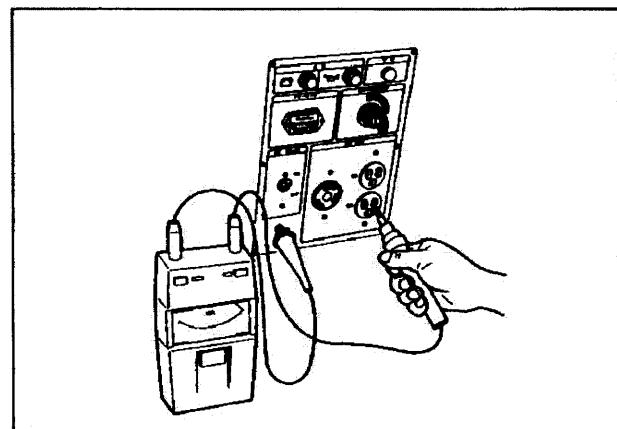


Fig. 5-11

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

6. TROUBLE SHOOTING

6-1 NO AC OUTPUT

6-1-1 CHECKING STATOR

- Remove control panel and disconnect brown, white, black, red, yellow and blue wires at the connectors.
- Measure the resistance between terminals on stator leads. (See Fig. 6-1.)
Refer to Table 6-1 for normal resistance. If stator is faulty, replace with a new one.

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

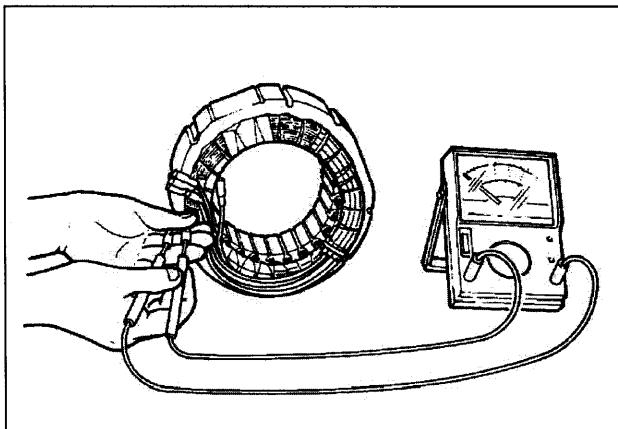


Fig. 6-1

(R × 1 Ω ±10%)

Model	Rated voltage	Frequency	Resistance (Ω)			
			MAIN COIL		CONDENSER COIL	DC COIL
			WHITE-RED	BLACK-BLUE	YELLOW-YELLOW	Brown-Brown
RGD2500S-II	110V / 220V	50Hz	0.97	0.97	2.53	0.27
	240V	50Hz	1.15	1.15	2.53	0.27
	115V / 230V	60Hz	0.72	0.72	1.95	0.22
RGD3300S-II	110V / 220V	50Hz	0.65	0.65	1.36	0.21
	240V	50Hz	0.78	0.78	1.36	0.21
	115V / 230V	60Hz	0.49	0.49	0.97	0.16

Table. 6-1

6-1-2 CHECKING OF ROTOR

(1) CHECKING FIELD COIL

- Measure the resistance of field coil with a circuit tester. (See Fig. 6-2.)

■ NORMAL RESISTANCE

(R × 1Ω 10%)		
Model	RGD2500S-II	RGD3300S-II
Resistance	1.76 Ω	1.99 Ω

Table 6-2

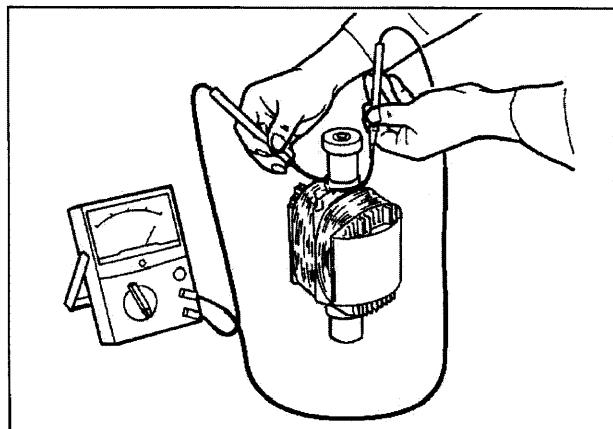


Fig. 6-2

[Remedy]

If the resistance is not normal, replace rotor with a new one.

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

(2) CHECKING SURGE ABSORBER

Measure the surge absorber resistance.

Resistance (Ω)	∞
----------------	---

NOTE : In order to measure the surge absorber, you have to fay the bond and/or remove solder from it.

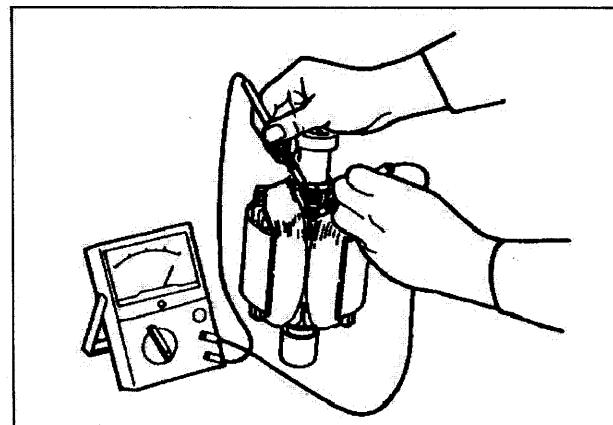


Fig. 6-3

(3) CHECKING DIODE

Measure the diode by itself.

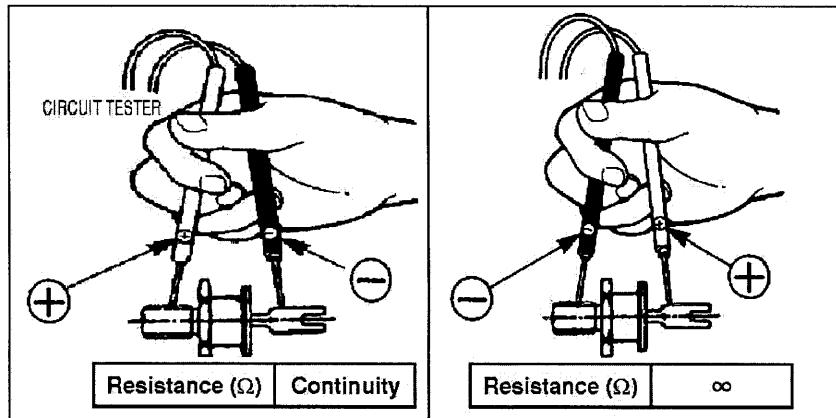


Fig. 6-4

6-2 NO DC OUTPUT DIODE RECTIFIER

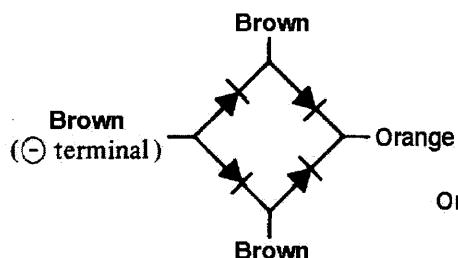


Fig. 6-5

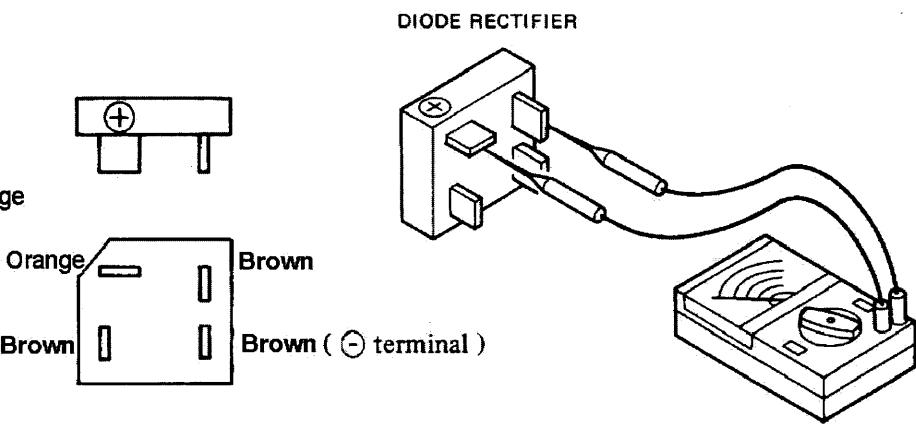


Fig. 6-6

Circuit inside of the diode rectifiers is as shown in Fig. 6-5. Check continuity between each terminal by using a circuit tester as shown in Fig. 6-6. The rectifier is normal when continuity is as follows:

		Apply black (-) needle of the circuit tester			
		Brown	Brown	Orange	Brown (- terminal)
Apply red (+) needle of the circuit tester	Brown	No continuity	No continuity	Continuity	
	Brown	No continuity	No continuity	Continuity	
	Orange	Continuity	Continuity		Continuity
	Brown (- terminal)	No continuity	No continuity	No continuity	

Table 6-3

NOTE 1: In checking the diode, direction of connection is contrary to the ordinary case because of characteristics of the diode and battery incorporated in the tester.

NOTE 2: "Continuity" means forward direction characteristics of the diode, and different from short circuit condition (in which a pointer of the tester goes out of its normal scale), shows resistance to some extent. When results of the checking indicates failure even in one section, replace with a new one.

6-3 CONDENSER

- If an instrument (QC-meter or C-meter) for measuring capacity of condenser is available, check the capacity of condenser. (See Fig. 6-7.)

■ NORMAL CAPACITY OF CONDENSER

Model	RGD2500S-II	RGD3300S-II
Capacity	24 μ F x 1 pce.	20 μ F x 2 pcs.

Table 6-4

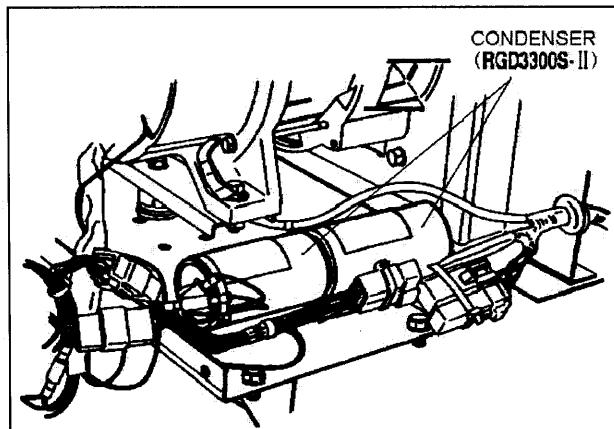


Fig. 6-7

- If such an instrument is unavailable, the condenser can be checked by replacing with a new one. If the generator performs good with new condenser, the cause of trouble is defect in original condenser.

6-4 AC CIRCUIT BREAKER

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

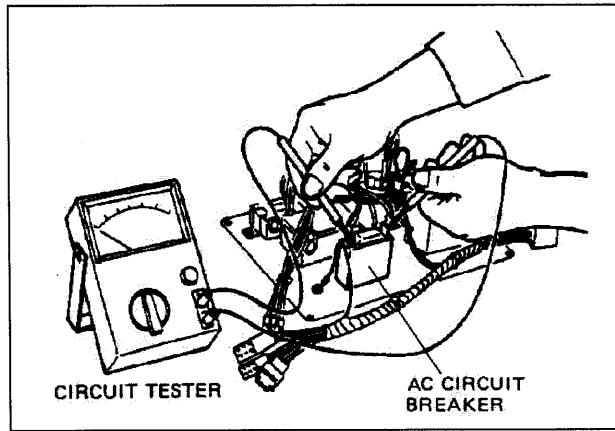


Fig. 6-8

6-5 DC CIRCUIT BREAKER

Make sure that there is continuity between the two terminals of DC circuit breaker when its push button is pressed.

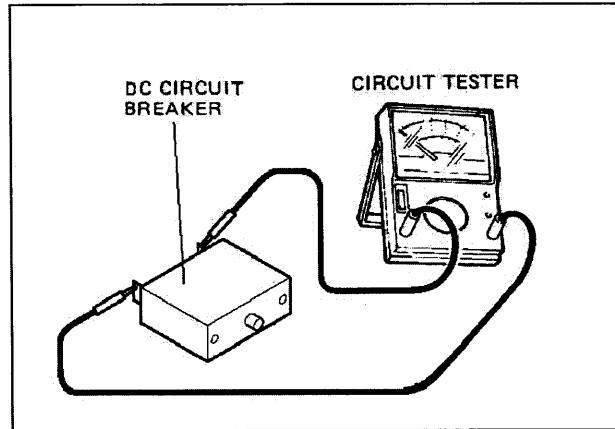


Fig. 6-9

6-6 AC RECEPTACLES

Using a circuit tester, check continuity between the two terminals at the rear of the AC receptacles while the receptacle is mounted on the control panel. When continuity is found between the output terminals of the receptacle with a wire connected across these terminals, the AC receptacle is normal. When the wire is removed and no continuity is found between these terminals, the receptacles are also normal.

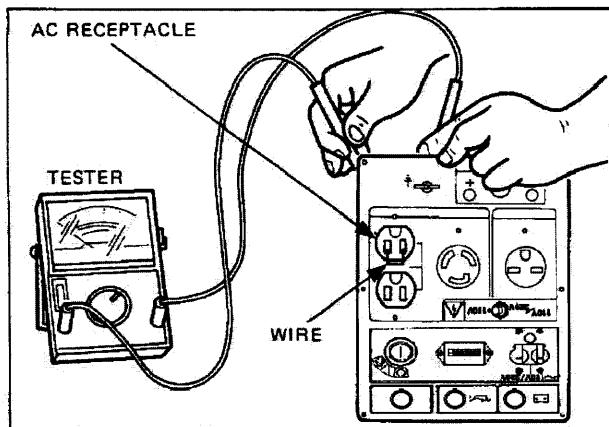


Fig. 6-10A

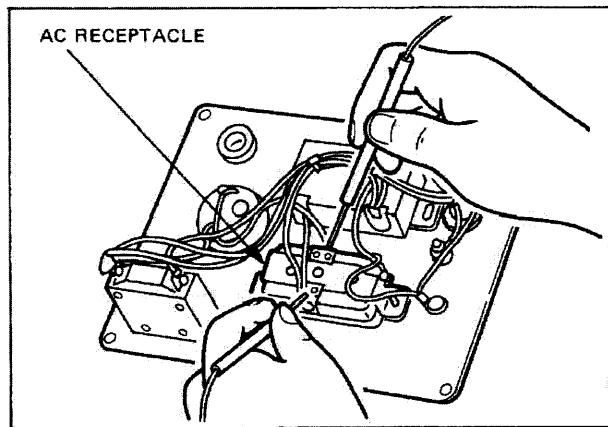


Fig. 6-10B

6-7 HOUR TMETER

Check working of hourmeter while rated voltage is inputted.

Note) Rated voltage has been mentioned on hourmeter.

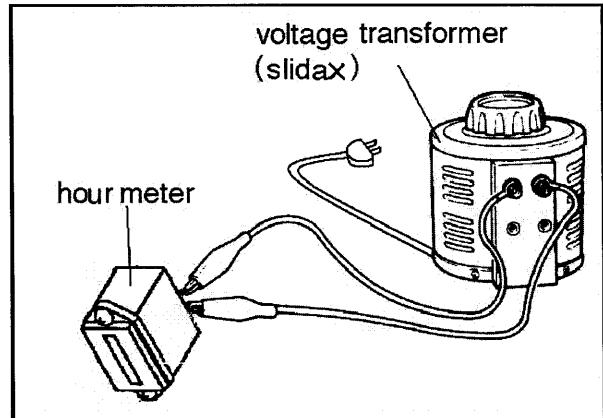


Fig. 6-11

6-8 OIL PRESSURE SWITCH

Switching Pressure : $0.3 \text{ kg/cm}^2 \pm 0.1$

- Inspect the switch action.
- The structure of the oil pressure switch is shown in a right figure. When there is no pressure (no oil), the diaphragm is pressed in by the spring, resulting in the contact being ON. If the oil pressure rises above the switching pressure, the diaphragm is pressed in by the oil pressure which is greater than the spring pressure, resulting in the contact being OFF.

When engine is stopped : 0Ω (continuity)

When engine is running : ∞ (no continuity)

- The switch's structure is complicated, so if its function cannot be recovered even by cleaning, replace the switch with a new one.

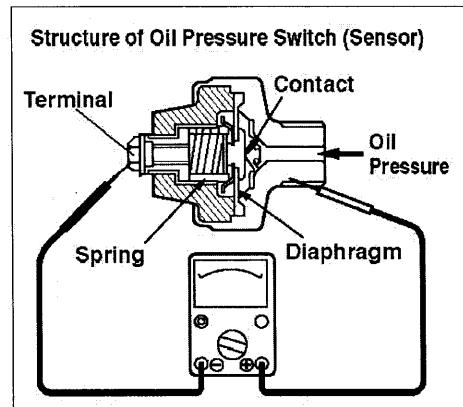


Fig. 6-12

6-9 SOLENOID

- (1) Check oil level. Fill it up to maximum level if necessary.
- (2) Check all wires to be connected properly.
If they possibly have breaks in connection, the sensor will also malfunction.
- (3) Checking the solenoid.
Measure the resistance between two leads from solenoid. (See Fig. 6-13.)

NORMAL RESISTANCE	
3.38 ~ 4.58 Ω	

If the resistance is larger or smaller than the above limits, solenoid is defective.

Replace it with a new one.

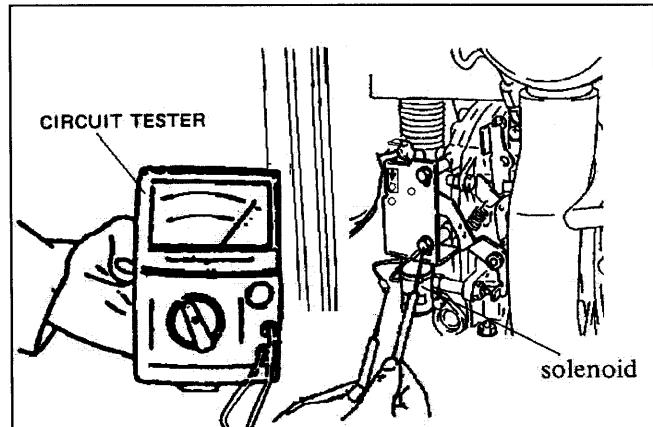
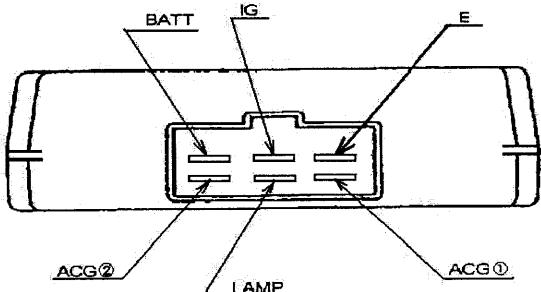


Fig. 6-13

6-10 REGULATOR

Check the resistance between each terminals of regulator with analog circuit tester.

Part Number : 246-71901-01 (regulator)



* Checking table for analogue circuit tester.

Unit : Ohm (Ω)

(+)needle (-) needle	ACG①	ACG②	BATT	E	IG	LAMP
ACG①		20k ~ ∞	∞	20k ~ ∞	∞	20k ~ ∞
ACG②	20k ~ ∞		∞	20k ~ ∞	∞	20k ~ ∞
BATT	∞	∞		∞	∞	
E	100 ~ 50 k	100 ~ 50 k	∞		∞	100 ~ 50 k
IG	2k ~ 250k	2k ~ 250k	∞	500 ~ 200k		1k ~ 300k
LAMP	1k ~ 1M	1k ~ 1M	∞	500 ~ 250k	∞	

Table. 6-5

NOTE : The resistance readings vary depending on the types of circuit testers.

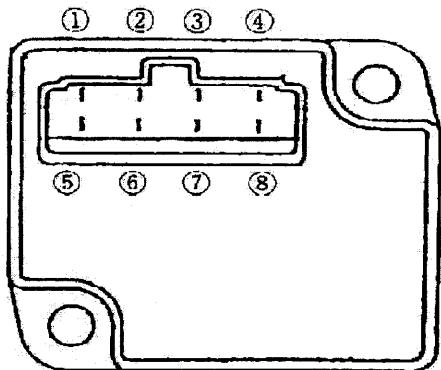
The above table shows an example of the resistance readings measured by an ordinary analogue circuit tester with 1.5 volt battery power source.

It is advisable for you to check the resistance readings using your standard circuit tester and revise the checking table.

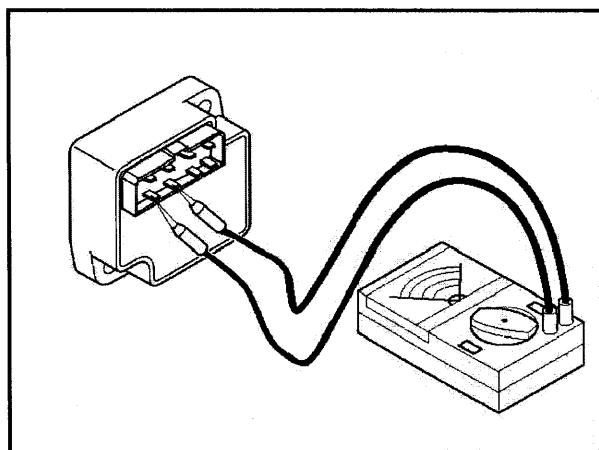
6-11 MULTI CONTROL UNIT

Check the resistance between each terminals of multi controller unit with analog circuit tester.

Terminal number of the MULTI CONTROL UNIT



Checking table for analogue circuit tester.



Unit : Ohm (Ω)

		Tester (+)								
		Pin No.	①	②	③	④	⑤	⑥	⑦	⑧
			IG	+B	E	CHG	ST	OIL	SOL	RELAY
Tester (-)	①	IG		46~78k	13~18k	18~25k	18~25k	1.8~2.2k	∞	28~43k
	②	+B	∞		∞	∞	∞	∞	∞	∞
	③	E	20~33k	20~27k		4~5k	4~5k	20~27k	∞	6.8~8.3k
	④	CHG	24~40k	24~35k	4~5k		7.5~10k	24~35k	∞	10~17k
	⑤	ST	24~40k	24~35k	4~5k	7.5~10k		24~35k	∞	10~17k
	⑥	OIL	1.8~2.2k	49~81k	15~21k	20~28k	20~28k		∞	32~47k
	⑦	SOL	∞	∞	∞	∞	∞	∞		∞
	⑧	RELAY	∞	∞	∞	∞	∞	∞		

Table. 6-6

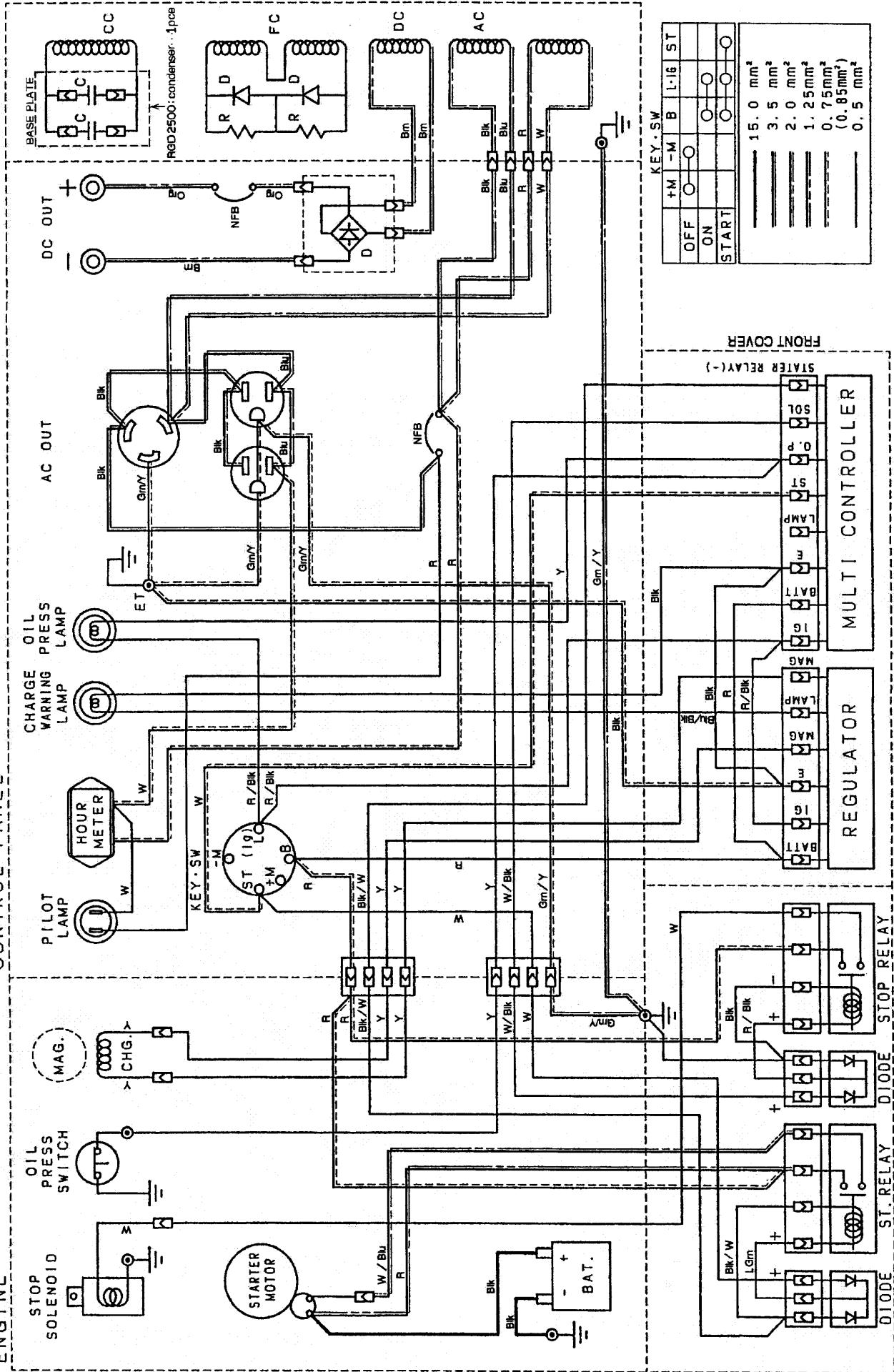
NOTE : The resistance readings vary depending on the types of circuit testers.

The above table shows an example of the resistance readings measured by an ordinary analogue circuit tester with 1.5 volt battery power source.

It is advisable for you to check the resistance readings using your standard circuit tester and revise the checking table.

7. WIRING DIAGRAM

RGD2500S-II / RGD3300S-II (110V, 120V)
ENGINE CONTROL PANEL



NFB : NO-FUSE BREAKER
CC : CONDENSER COIL
FC : FIELD COIL

R/Bk : Red/Black
Y : Yellow
W : White

W/Bk : White/Black
W/Blu : White/Blue

WIRE HARNESS CP

D : DIODE

KEY SW

	OFF	ON	START	ST
+M	○	○	○	○
-M	○	○	○	○
B	○	○	○	○
L-16	○	○	○	○

DC OUT

AC OUT

AC

DC

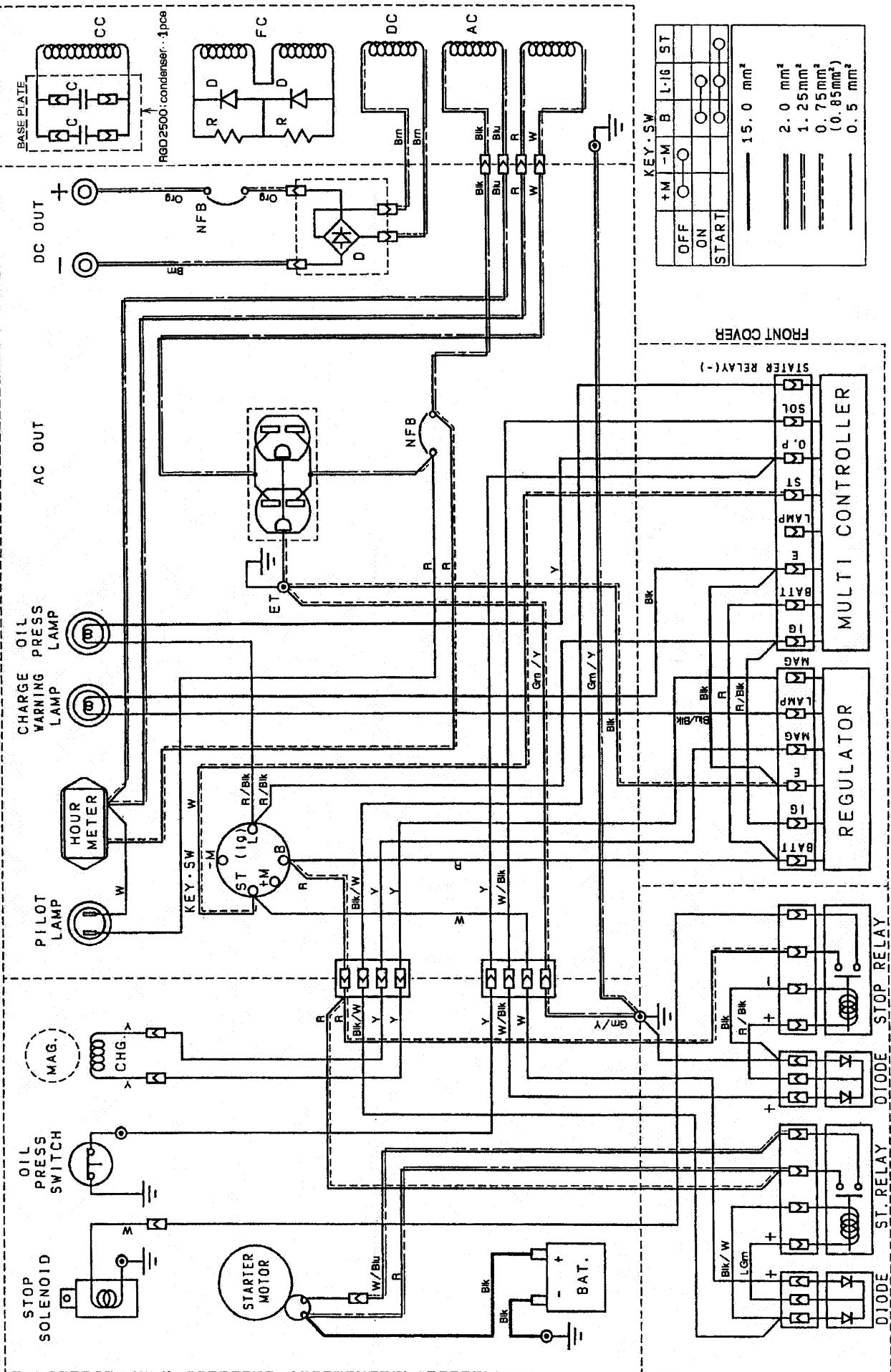
FC

CONDENSER COIL

FIELD COIL

RGD2500S-II / RGD3300S-II (220V, 240V)

CONTROL PANEL ENGINE



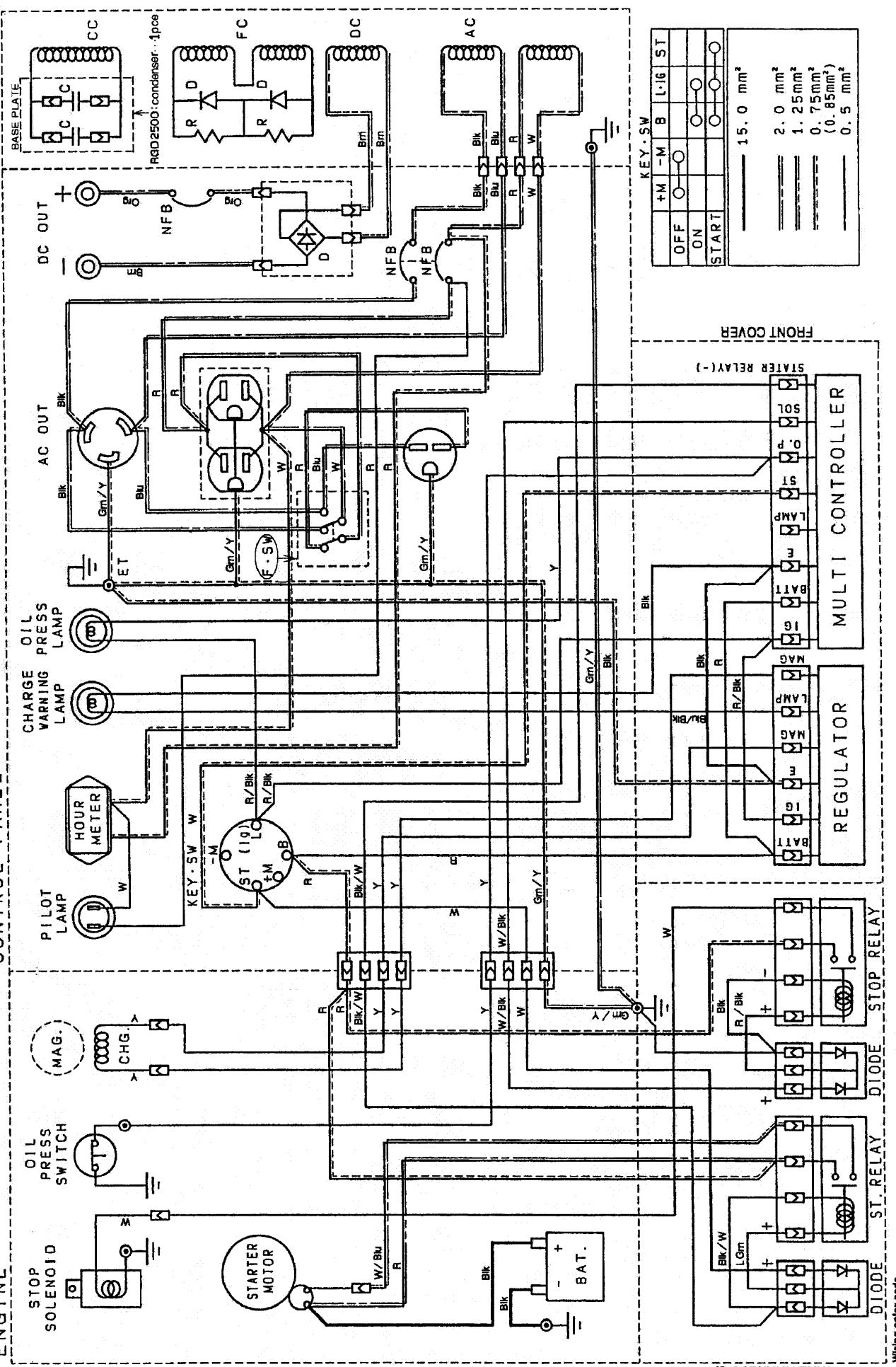
Wiring color code		
3BK	: Black	
3W	: Black/White	
3BLU	: Blue	

L Gm	Light Green	P/Bk:	Red/Black	W/Bk :	White/Black
O rg	Orange	Y	Yellow	W/Bu :	White/ Blue
R	Red	W	White		

D : DIODE
 NFB : NO-FUSE BREAKER
 CC : CONDENSER COIL
 FC : FIELD COIL

RGD2500S-II/RGD3300S-II(110/220V,120/240V)

CONTROL PANEL



WIRE HARNESS CP

Wiring color code

Blk	:	Black
Blk/W	:	Black/White
Blu	:	Blue

NFB : NO-FUSE BREAKER	F. SW : FULL POWER SWITCH
CC : CONDENSER COIL	D : DIODE
FC : FIELD COIL	

- 20 -



SUBARU

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