A Few Words About Safety

SERVICE INFORMATION

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you and/or others. It could also damage this Honda product or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of special tools. Any person who intends to use a replacement part, service procedure, or a tool that is not recommended by Honda must determine the risks to their personal safety and the safe operation of this product.

If you need to replace a part, use Honda Genuine parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of this product. Any error or oversight while servicing this product can result in faulty operation, damage to the product, or injury to others.

⚠WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts-wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practices, we recommend that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

⚠WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles, or face shields anytime you hammer, drill, grind, or work around pressurized air, pressurized liquids, springs, or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have equipment hoisted in the air. Anytime you lift this product with a hoist, make sure that the hoist hook is securely attached to the product.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

Gasoline vapors and hydrogen gasses from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.

- Use only a nonflammable solvent, not gasoline, to clean parts.
- Never store gasoline in an open container.
- Keep all cigarettes, sparks, and flames away from the battery and all fuel-related parts.

INTRODUCTION

This supplement covers the construction, function, and servicing procedures of the Honda ER2500CX SK type generator.

For service information that is not covered in this supplement, please refer to the ER2500CX base shop manual (part number 82Z4100).

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at anytime without notice.

As you read this manual, you will find information that is preceded by a NOTICE symbol. The purpose of this message is to help prevent damage to this Honda product, other property, or the environment.

SAFETY MESSAGES

Your safety and the safety of others are very important. To help you make informed decisions, we have provided safety messages and other safety information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing these products. You must use your own good judgement.

You will find important safety information in a variety of forms, including:

- Safety Labels – on the product.
- Safety Messages – preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION.
  These signal words mean:

⚠DANGER You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠WARNING You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠CAUTION You CAN be HURT if you don't follow instructions.

- Instructions – how to service these products correctly and safely.

SERVICE PUBLICATION OFFICE

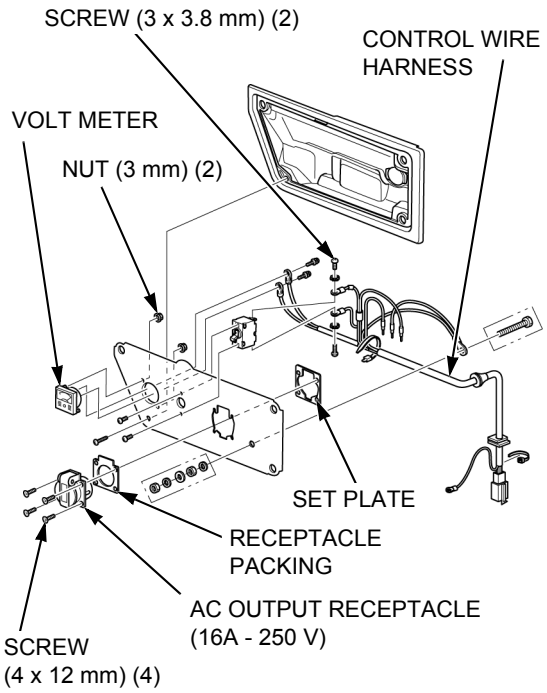
Date of Issue: September 2015

The marked sections contain no changes. They are not covered in this supplement.

SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it will be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use the recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use marine grease (water resistant urea based grease).
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use automatic transmission fluid.
(○ x ○) (○)	Indicates the diameter, length, and quantity of metric bolts used.
page 1-1	Indicates the reference page.

Item	After	Before
Control panel (SK type)		

MEMO

1. SPECIFICATIONS

SPECIFICATIONS

DIMENSIONS AND WEIGHTS

Model	ER2500CX
Type	SK
Description code	ECCC
Overall length	591 mm (23.3 in)
Overall width	432 mm (17.0 in)
Overall height	462 mm (18.2 in)
Dry weight	40.0 kg (88.2 lbs)
Operating weight	51.1 kg (112.7 lbs)

ENGINE

Model	GP160H
Description code	GCASH
Type	4 stroke, overhead valve, single cylinder, inclined by 25°
Displacement	163 cm^3 (9.9 cu-in)
Bore x stroke	68.0 x 45.0 mm (2.68 x 1.77 in)
Compression ratio	8.5 : 1
Ignition system	Transistorized magneto
Ignition timing	B.T.D.C. 25° /1,400 min^{-1} (rpm)
Recommended spark plug	BPR6ES (NGK)/W20EPR-U (DENSO)
Lubrication system	Forced splash
Oil capacity	0.58 Liter (0.61 US qt, 0.51 Imp qt)
Recommended oil	SAE 10W-30 API service classification SE or higher
Cooling system	Forced air
Starting system	Recoil starter
Stopping system	Ignition primary circuit ground
Carburetor	Horizontal type, butterfly valve
Air cleaner	Semi dry type
Governor	Centrifugal weight system
Breather system	Flat valve type
Fuel used	Unleaded gasoline

GENERATOR

Model	ER2500CX
Type	SK
Description code	ECCC
Generator type	Double electrode field rotation type
Excitation	Self–excitation
Voltage regulation system	Transistor AVR (Automatic Voltage Regulator)
Phase	Single phase
Rated output	2.3 kVA
Rated frequency	60 Hz
Rated voltage	220 V
Rated current	10.5 A
Power factor	1.0 Cosθ

CHARACTERISTICS

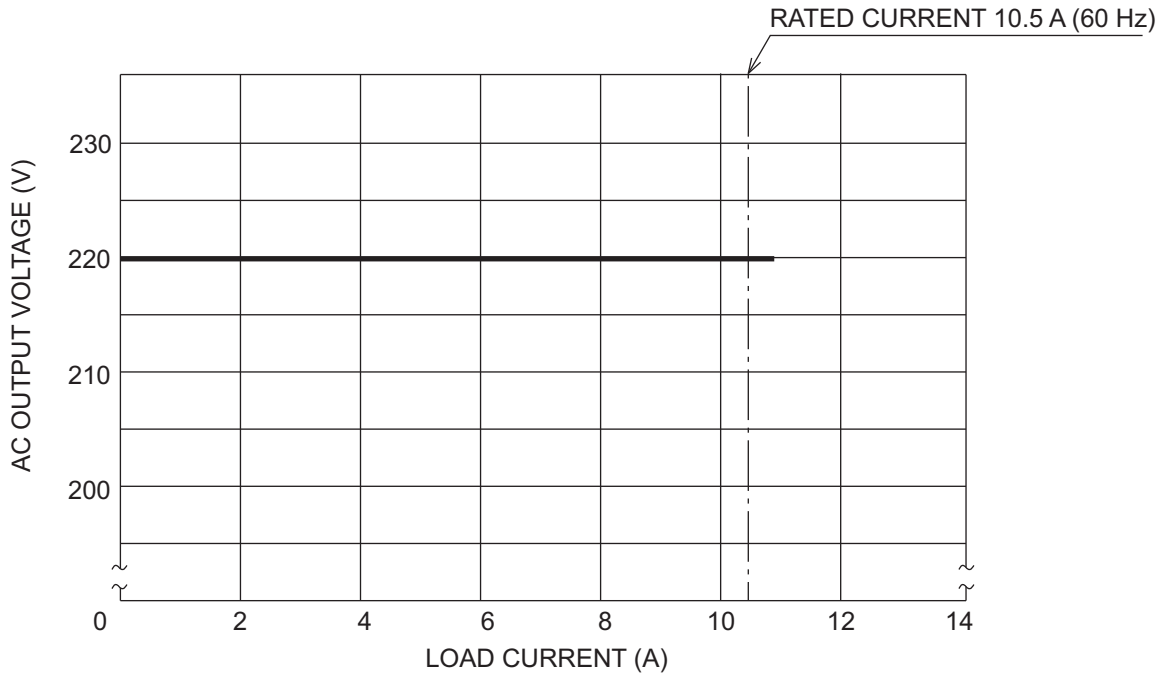
Model		ER2500CX
Type		SK
Voltage variation rate	Momentary	15% max.
	Average	7% max.
	Average time	5 sec. max.
Voltage stability		± 1% within
Frequency variation rate	Momentary	15% max.
	Average	7% max.
	Average time	5 sec. max.
Frequency stability		± 1 Hz within
Insulation resistance		10 MΩ min.
Circuit protector		11 A
Insulation type		Type F
Fuel tank capacity		14.5 ℓ (3.83 US gal, 3.19 Imp gal)
Fuel consumption at rated load		1.56 ℓ (0.412 US gal, 0.343 Imp gal) /Hr.
Max. operating hours at rated load		9.3 Hr.
Guaranteed sound power level (L_{WA}) at rated load		L_{WA} 97 dB

PERFORMANCE CURVES

– The curve shows performance of the generator under average conditions.
– Performance may vary to some degree depending on ambient temperature and humidity.
– The output voltage will be higher than usual when the generator is still cold, immediately after the engine starts.

SK type

AC EXTERNAL CHARACTERISTIC CURVES



MEMO

2. SERVICE INFORMATION

MAINTENANCE STANDARDS

ENGINE

Part	Item	Standard	Service limit
Engine	Engine speed (60 Hz)	3,750 ± 150 min^{-1} (rpm)	–

ELECTRICAL PARTS

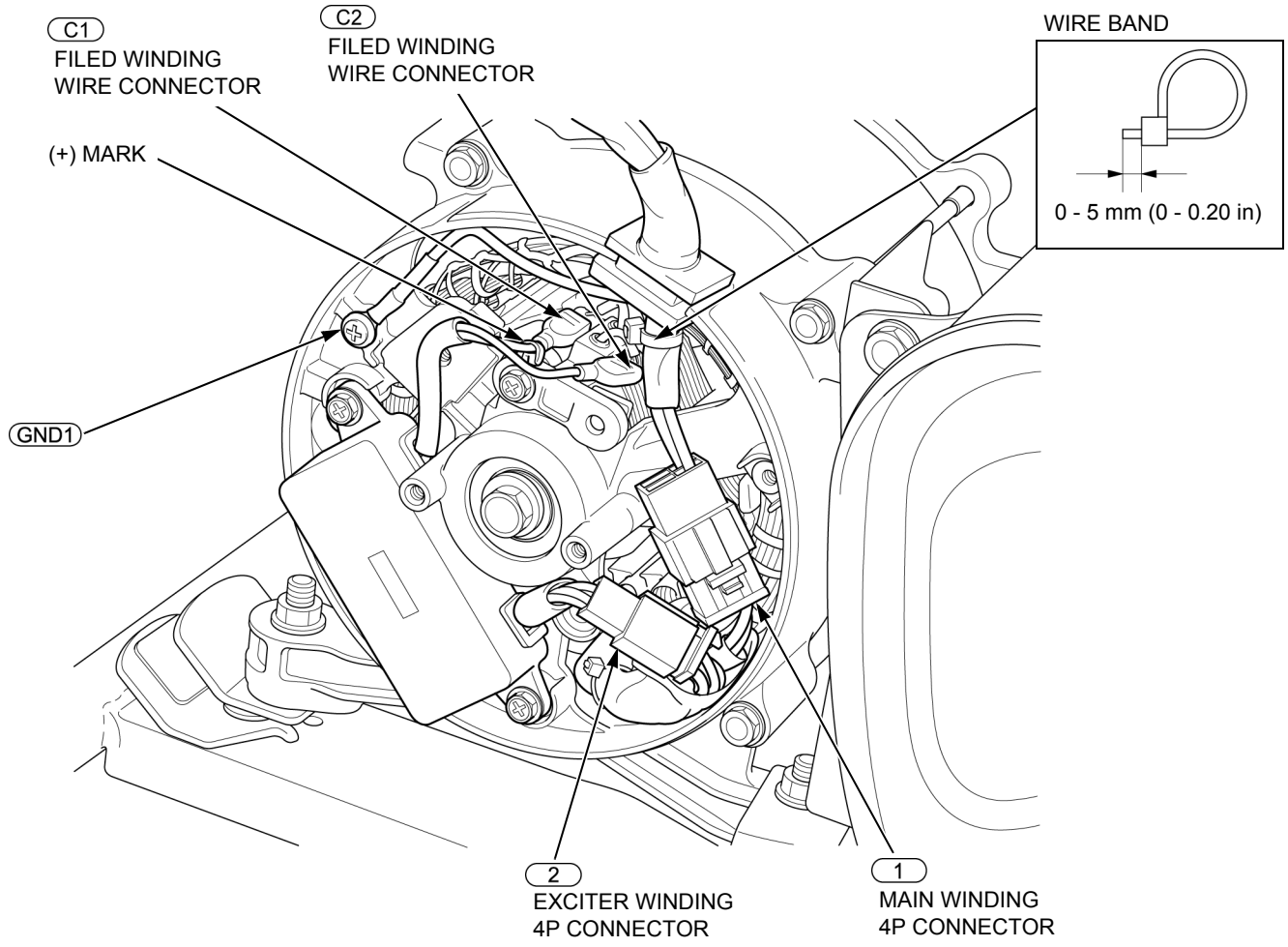
Part		Connector	Terminal number	Standard
Main winding	SK type	(1)	2 – 4	1.2 – 1.6 Ω (at 20 °C/68 °F)
Exciter winding	SK type	(2)	1 – 2	2.5 – 3.2 Ω (at 20 °C/68 °F)

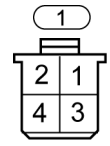
TORQUE VALUES

FRAME

Item	Thread Dia. (mm)	Torque values			Remark
		N·m	kgf·m	lbf·ft	
Volt meter mount nut	M3 nut	0.25	0.03	0.2	
Volt meter terminal screw	M3 screw	0.4	0.04	0.3	
Receptacle mount screw	M4 screw	1.3	0.1	1.0	

HARNESS AND TUBE ROUTING



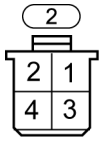


Stator side

Terminal number	Wire color
2	R
4	Bu

Control wire harness side

Terminal number	Wire color
2	R
4	Bu



Stator side

Terminal number	Wire color
1	Y
2	Y
3	Bu
4	Br

AVR side

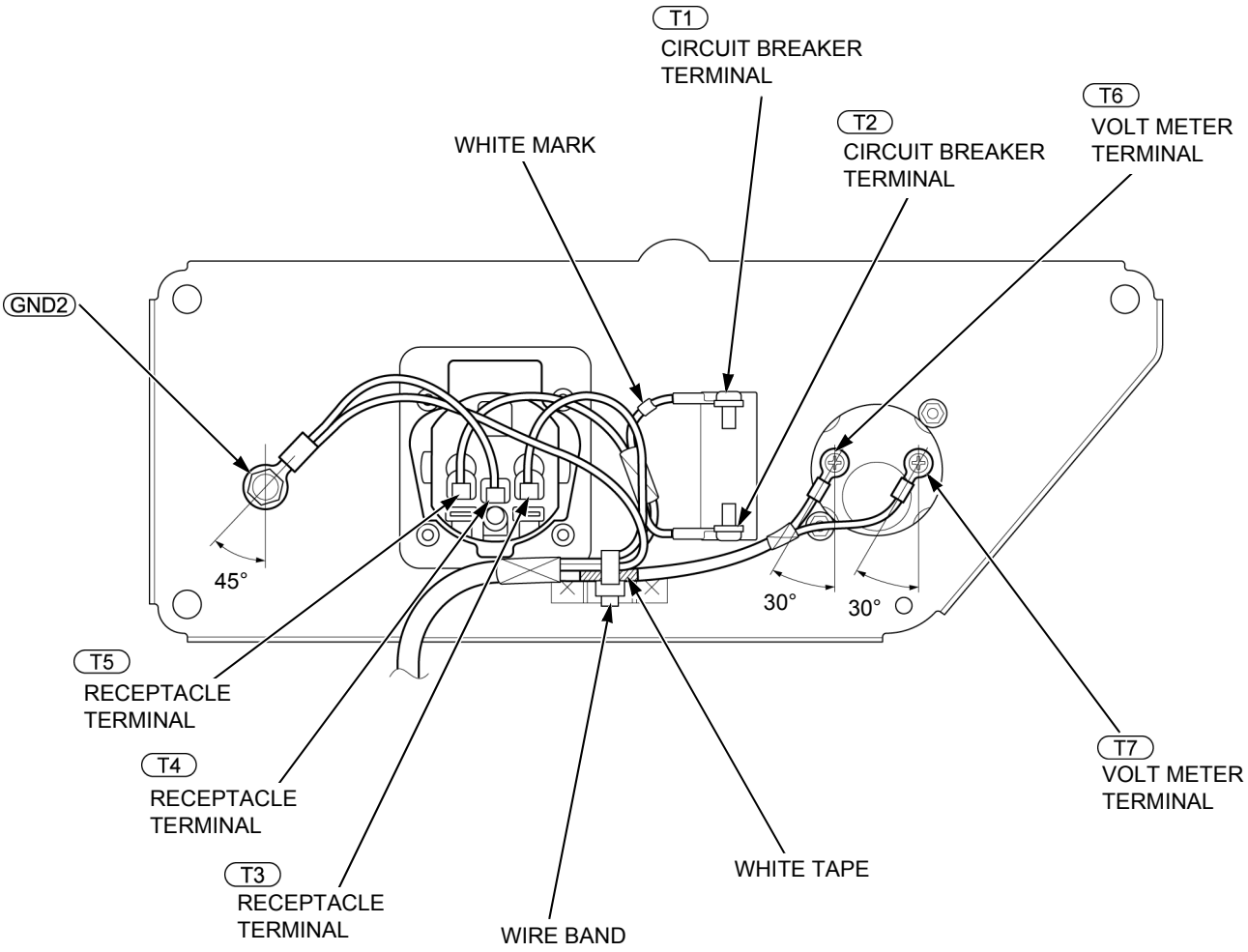
Terminal number	Wire color
1	Y
2	Y
3	Bu
4	Br

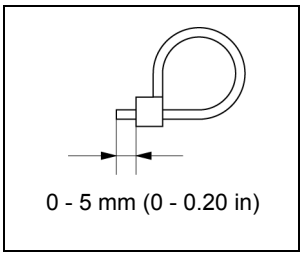
Terminal number	Wire color
C1	Bu
C2	Y

Terminal number	Wire color
GND1	Y/G

Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

SK TYPE





Terminal number	Wire color
T1	R
T2	R
T3	Bu
T4	Y/G
T5	R
T6	Bu
T7	R

Terminal number	Wire color
GND2	Y/G

Bl	Black	Br	Brown
Y	Yellow	O	Orange
Bu	Blue	Lb	Light blue
G	Green	Lg	Light green
R	Red	P	Pink
W	White	Gr	Gray

6. GOVERNOR SYSTEM

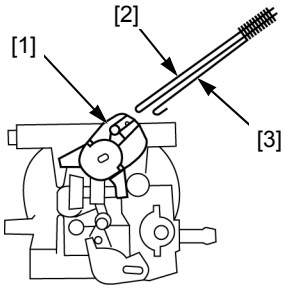
GOVERNOR ARM/CONTROL BASE REMOVAL/INSTALLATION

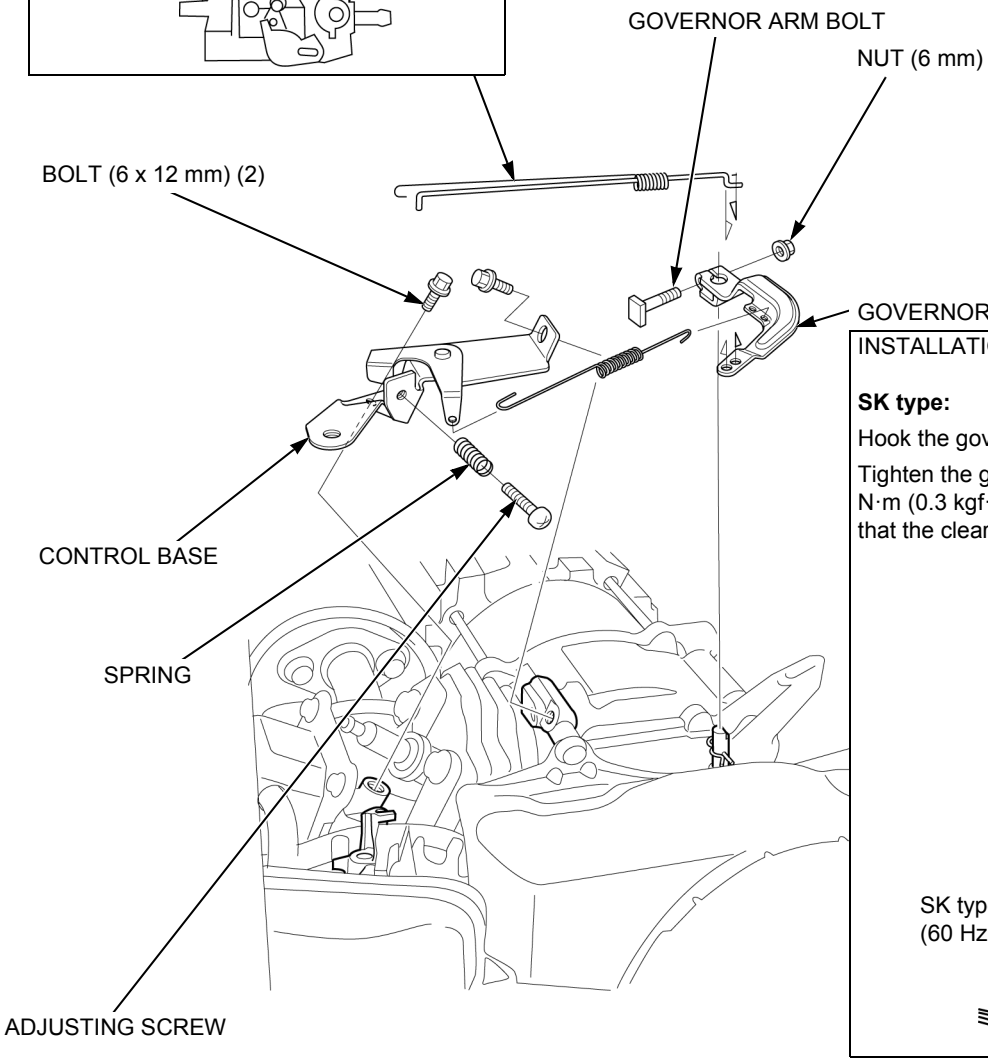
Remove the fuel tank (base manual 82Z4100: page 5-3).

After installation, adjust the no load engine speed (page 6-3).

GOVERNOR ROD/ANTI-SURGE SPRING

REMOVAL/INSTALLATION:
Remove the governor arm to a point where the groove [1] of the throttle arm lines up with the governor rod [2], and then lift the governor rod out of the hole of the throttle arm and unhook the anti-surge spring [3].



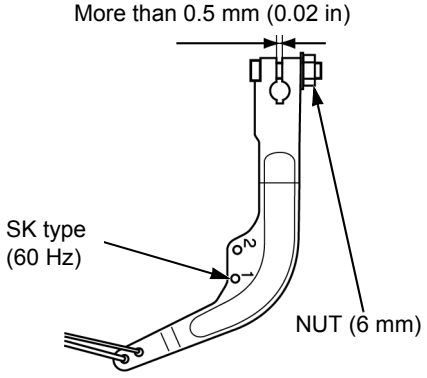


INSTALLATION:

SK type:

Hook the governor spring to the hole marked "1".

Tighten the governor arm nut to more than 3.0 N·m (0.3 kgf·m, 2.2 lbf·ft), and then make sure that the clearance is more than 0.5 mm (0.02 in).



GOVERNOR ADJUSTMENT

Remove the fuel tank (base manual 82Z4100: page 5-3).

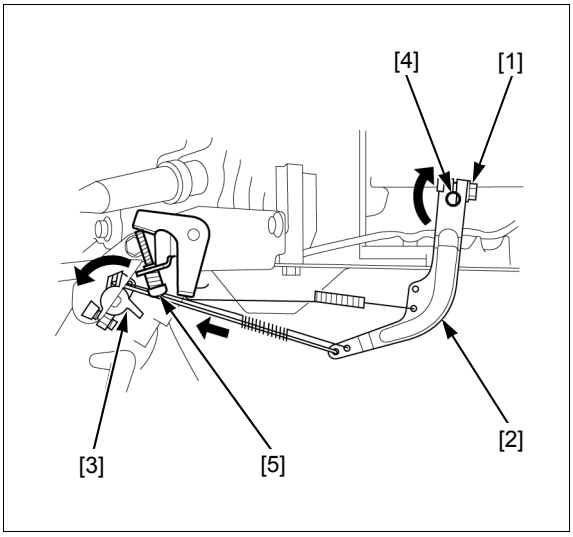
Loosen the 6 mm nut [1] and move the governor arm [2] to fully open the throttle [3].

Rotate the governor arm shaft [4] as far as it will go in the same direction the governor arm moved to open the throttle and tighten 6 mm nut.

Install the fuel tank. Start the engine and allow it to warm up to normal operating temperature.

Check the engine no load maximum speed. Adjust by turning the adjusting screw [5] if necessary.

Engine speed (at no load):
SK type (60 Hz): 3,750 ± 150 min^{-1} (rpm)

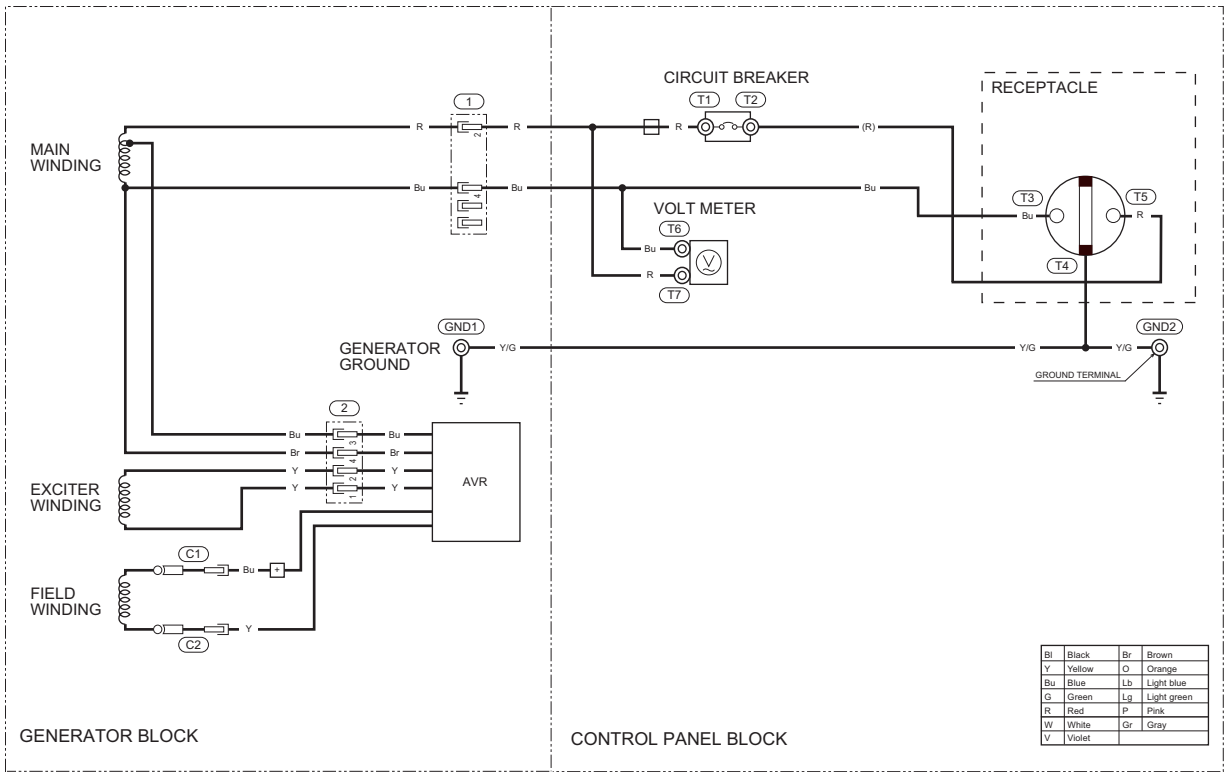


MEMO

7. GENERATOR SYSTEM

GENERATOR SYSTEM TROUBLESHOOTING

SK type:



No AC Output

Before troubleshooting, make sure that the circuit breaker is in the ON position.

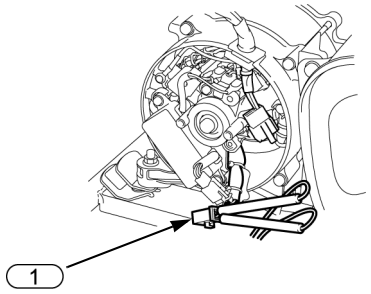
Check the engine speed.
STANDARD:
SK type: 3,750 ± 150 min^{-1} (rpm)

Abnormal → Adjust the governor (page 6-3).

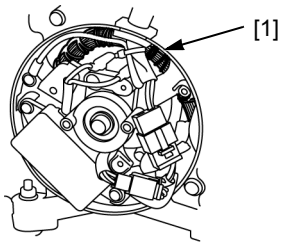
Normal ↓

Start the engine, check the main winding voltage with the main winding 4P connector (1).
Disconnected at standard no load engine speed: Between the terminals of the main winding 4P connector (1).

Type	TERMINAL No. (COLOR)		VOLTAGE (ABOUT)
SK	2 (Red)	4 (Blue)	220 VAC



No or low output → Inspect if the stator winding [1] for discoloration.



Discoloration → Replace the stator.

Normal ↓

Check the stator resistance.
- See the main winding standard resistance on page 7-10.
- See the field winding standard resistance on base manual 82Z4100: page 7-15.
- See the exciter winding standard resistance on page 7-10.

Normal output ↓

Check the receptacle, circuit breaker, and each lead in control panel.

Abnormal → Repair or replace faulty parts.

Normal ↓

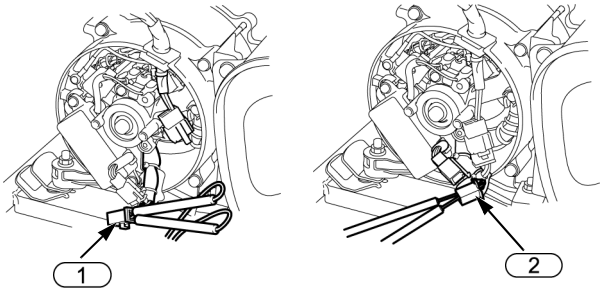
Go to page 7-4

From page 7-3

Disconnect the exciter winding 4P connector (2).

Check for continuity and insulation between the stator windings and the stator core using muitimeter in minimum range.

No continuity or faulty insulation → Replace the stator (base manual 82Z4100: page 7-10).



		Main winding		Exciter winding		Stator core
		Red	Blue	Yellow	Yellow	
Stator core		∞	∞	∞	∞	
Exciter winding	Yellow	∞	∞	Continuity		
	Yellow	∞	∞			
Main winding	Blue	Continuity				
	Red					

- See the main winding standard resistance on page 7-10.
- See the exciter winding standard resistance on page 7-10.

Normal

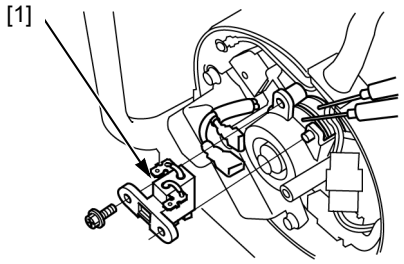
Go to page 7-5

From page 7-4

Disconnect the brush terminals, and remove the brush holder [1]. Clean and inspect the slip rings. Check the rotor resistance at the slip rings.

RESISTANCE: 31 - 39 Ω (20°C/68°F)

Measure the brush length (base manual 82Z4100: page 7-16).



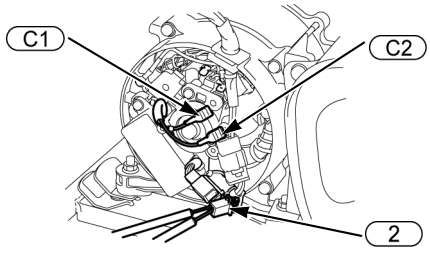
Abnormal resistance → Replace the stator (base manual 82Z4100: page 7-10).

Normal

Disconnect the exciter winding 4P connector (2).
Disconnect the brush terminals ((C1) and (C2)).

Start the engine, measure the voltage between Yellow and Yellow terminals of the exciter winding 4P connector (C2).

STANDARD VOLTAGE: 2 - 3 VAC



No or low voltage → Go to page 7-6

Normal → Go to page 7-6

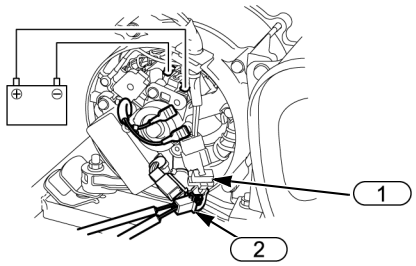
From page 7-5

Normal

From page 7-5

No or low voltage

Disconnect the main winding 4P connector (1).
Connect a known good 12 v battery to the brush terminals.
Run the engine at 3,750 min^{-1} (rpm) and check the following voltages at the test points show below.



WINDING	CONNECTOR	TERMINAL No. (COLOR)		VOLTAGE (Minimum)
Main winding	(1)	2 (Red)	4 (Blue)	94 VAC
Main winding (signal)	(2)	3 (Blue)	4 (Brown)	8 VAC
Exciter winding	(2)	1 (Yellow)	2 (Yellow)	40 VAC

Normal

Assemble the all parts to the generator, start the engine and measure the AC out put voltage after more 30 minutes.
If the generator does not AC output, replace the AVR unit and recheck.

Abnormal

Replace the rotor and recheck.

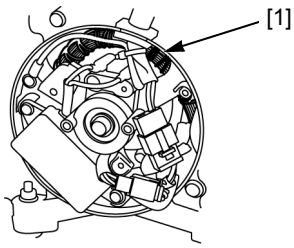
Low or high AC Output

Check the engine speed.
STANDARD:
SK type: 3,750 ± 150 min^{-1} (rpm)

Abnormal → Adjust the governor (page 6-3).

Normal

Inspect the stator winding [1] for discoloration.

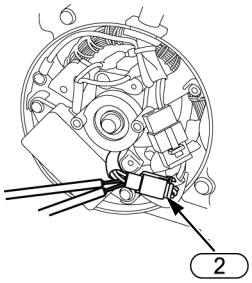


Discolored → Replace the stator (base manual 82Z4100: page 7-10).

Normal

Check the main winding signal voltage at standard no load engine speed: Between Blue and Brown terminals with connector connected of the exciter winding 4P connector (2) .

STANDARD VOLTAGE: 16 – 20 VAC



No or low voltage → Open or short circuit in main winding signal wire harness.
Repair main winding signal wire harness or replace the stator (base manual 82Z4100: page 7-10).

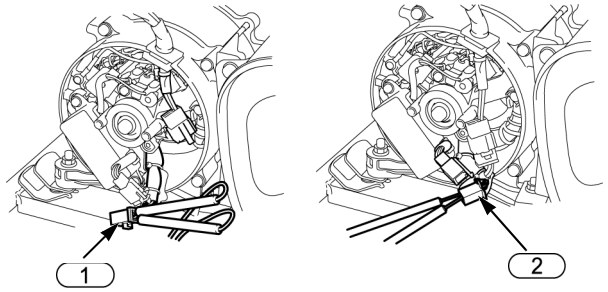
Normal

Go to page 7-8

From page 7-7

Disconnect the following:
- Main winding 4P connector (1).
- Exciter winding 4P connector (2).

Check for continuity and insulation between the stator windings and the stator core using muitimeter in minimum range.



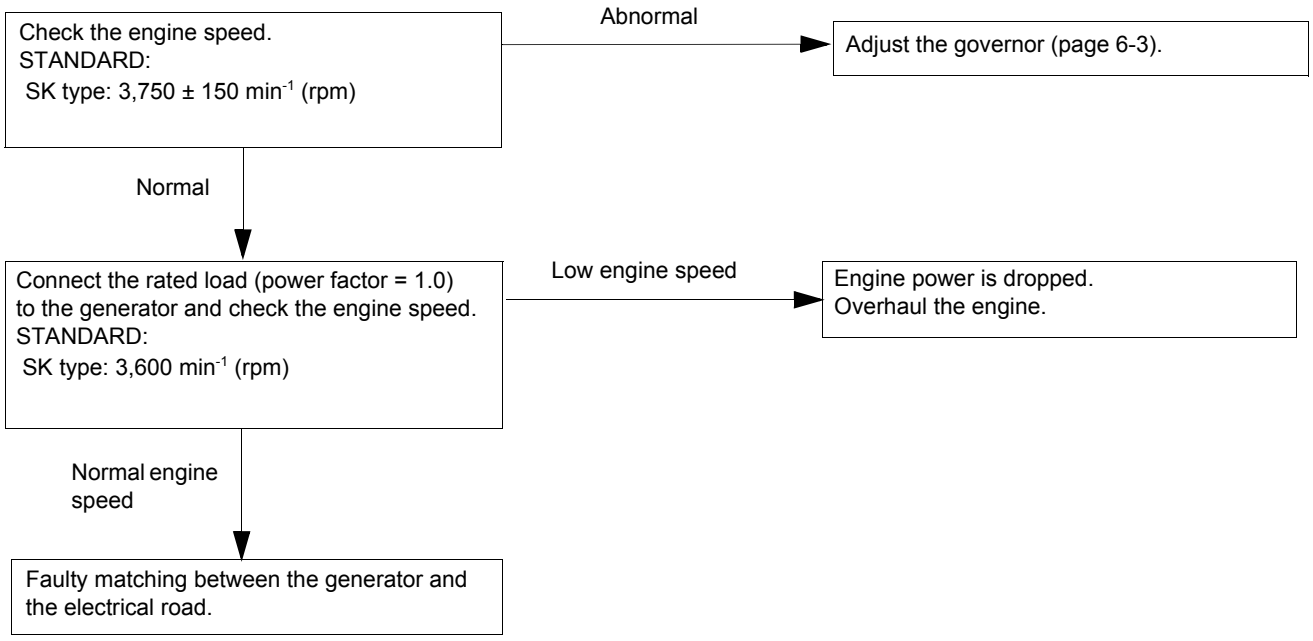
		Main winding		Exciter winding		Stator core
		Red	Blue	Yellow	Yellow	
Stator core		∞	∞	∞	∞	
Exciter winding	Yellow	∞	∞	Continuity		
	Yellow	∞	∞			
Main winding	Blue	Continuity				
	Red					

- See the main winding standard resistance on page 7-10.
- See the exciter winding standard resistance on page 7-10.

No continuity or faulty insulation → Replace the stator (base manual 82Z4100: page 7-10).

Normal → Faulty AVR unit.
Replace the AVR unit (base manual 82Z4100: page 7-10).

Generator will not deliver rated out put

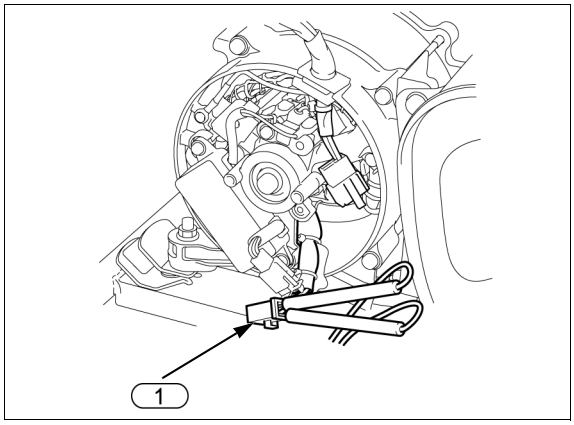


MAIN WINDING INSPECTION

Remove the generator end cover (base manual 82Z4100: page 7-9).

Start the engine and measure the AC voltage between the main winding 4P connector (1) terminals with connector disconnected.

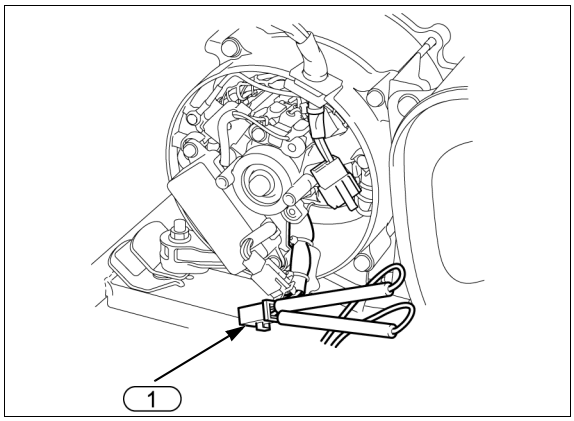
Type	Terminal No. (Color)	Voltage (About)
SK	No.2 (Red) and No.4 (Blue)	220 VAC



If the specified voltage is not obtained, stop the engine and measure the resistance between the main winding 4P connector (1) stator side terminals.

Type	Terminal No. (Color)	Resistance (at 20 °C/ 68 °F)
SK	No.2 (Red) and No.4 (Blue)	1.2 – 1.6 Ω

If the specified resistance is zero or infinity, replace the stator.



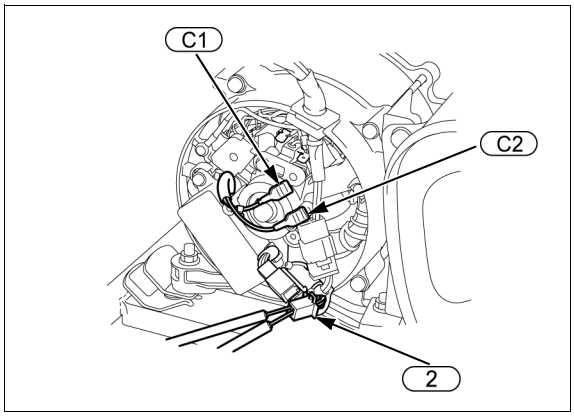
EXCITER WINDING INSPECTION

Remove the generator end cover (base manual 82Z4100: page 7-9).

Disconnect the field winding connector (C1) and field winding connector (C2).

Start the engine and measure the AC voltage between the exciter winding 4P connector (2) No.1 (Yellow) terminal and No.2 (Yellow) terminal with connector disconnected.

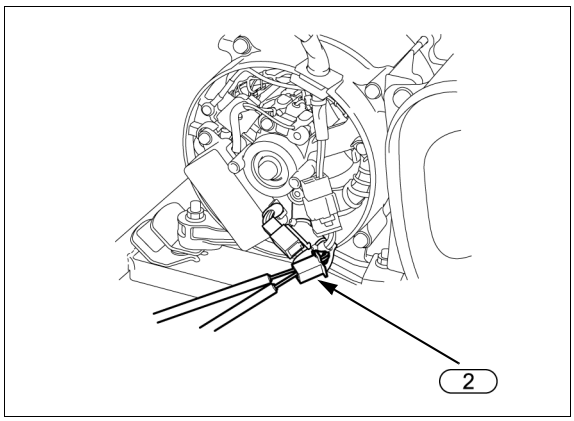
Standard voltage: About 2 – 3 VAC



If the specified voltage is not obtained, stop the engine and measure the resistance between the exciter winding 4P connector (2) stator side No.1 (Yellow) terminal and No.2 (Yellow) terminal.

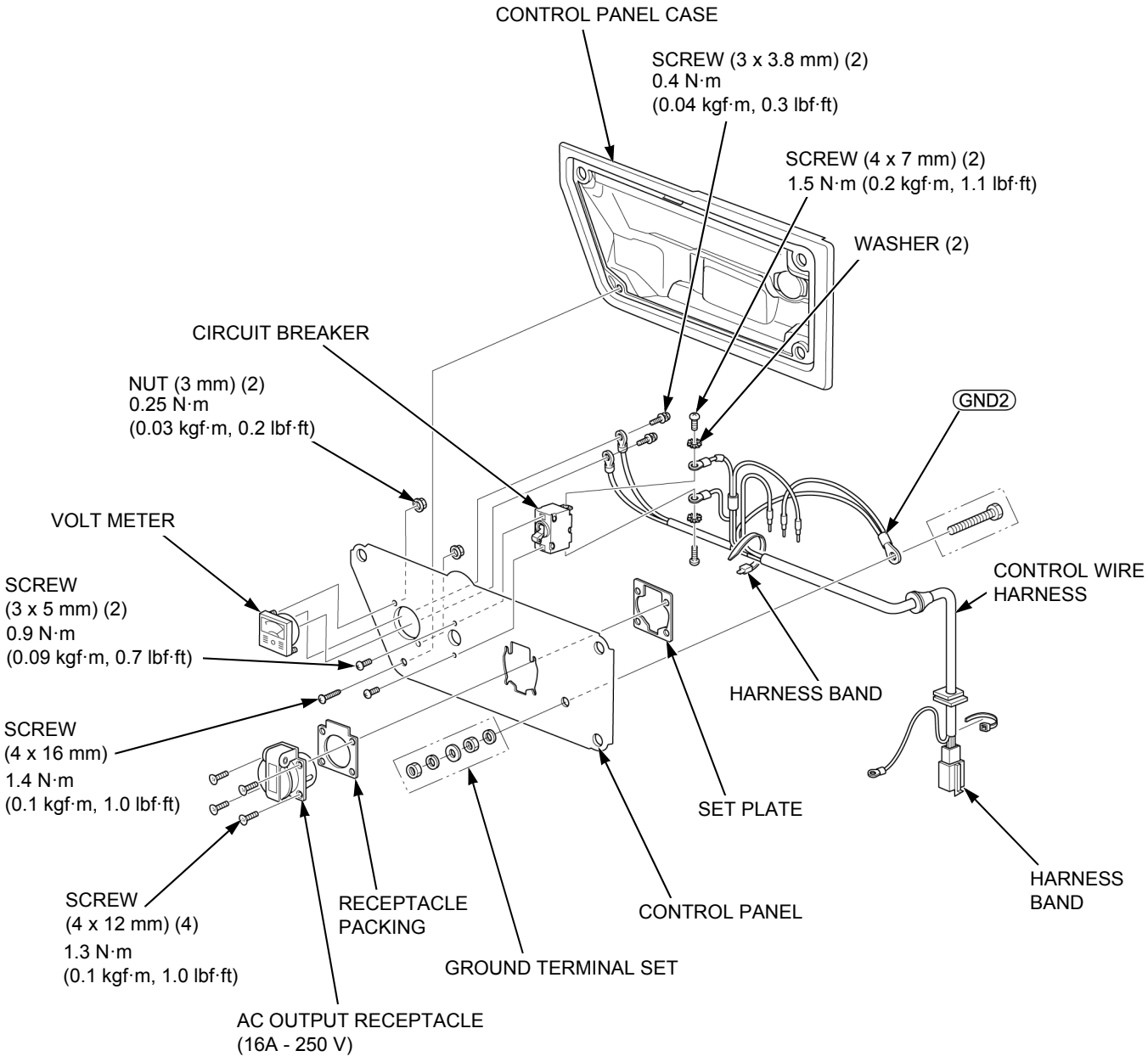
Type	Resistance (at 20 °C/68 °F)
SK	2.5 – 3.2 Ω

If the specified resistance is zero or infinity, replace the stator.



CONTROL PANEL DISASSEMBLY/ASSEMBLY

SK TYPE

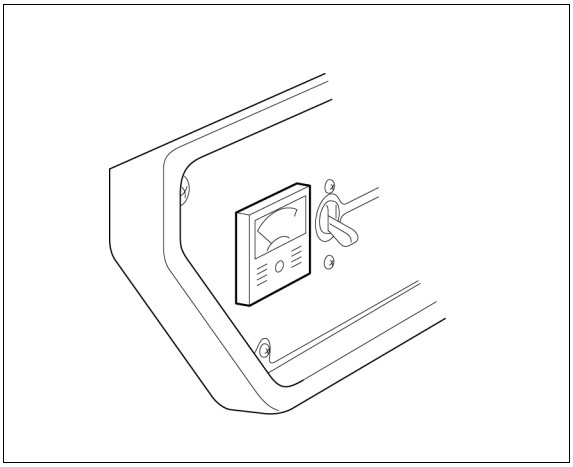


VOLT METER INSPECTION

Out put voltage is normal but volt meter needle does not swing:
Start the engine and check whether there is voltage at the volt meter terminal.

Rated voltage: 220 VAC

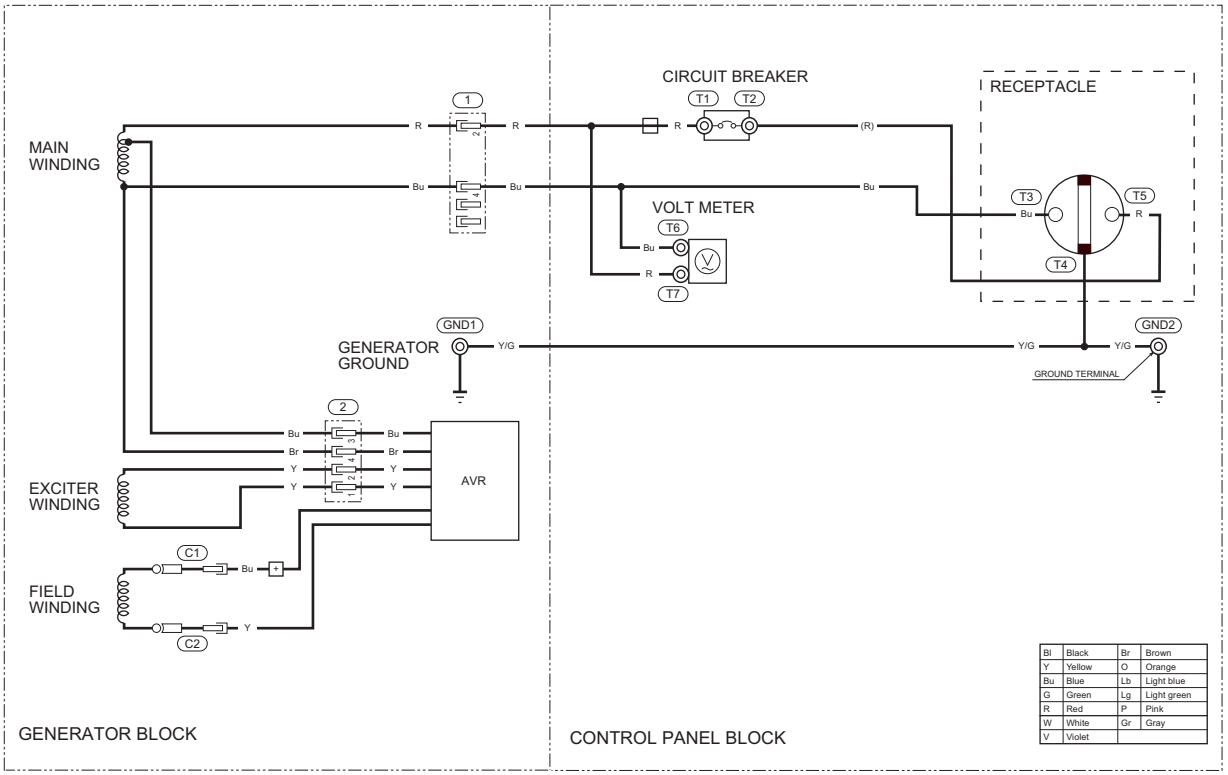
If there is no specified voltage at terminal, replace the volt meter.



MEMO

15. WIRING DIAGRAMS

SK TYPE


CIRCUIT BREAKER
RECEPTACLE
MAIN WINDING
VOLT METER
GENERATOR GROUND
GROUND TERMINAL
EXCITER WINDING
FIELD WINDING
AVR
GENERATOR BLOCK
CONTROL PANEL BLOCK
Bl Black
Br Brown
Y Yellow
O Orange
Bu Blue
Lb Light blue
G Green
Lg Light green
R Red
P Pink
W White
Gr Gray
V Violet