15

ELECTRICAL EQUIPMENT

15. ELECTRICAL EQUIPMENT

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- It is not necessary to check the battery electrolyte or fill with distilled water.
- Remove the battery from the motorcycle for charging. Do not remove the electrolyte cap..
- Do not quick charge the battery. Quick charging should only be done in an emergency..
- Charge the battery according to the charging current and time specified on the battery.
- When charging, check the voltage (open voltage) with an electric tester.
- When replacing the battery, do not use a traditional battery.

SPECIFICATIONS

			SH10DA	SF10DA
Battery	Capacity		12V4AH	12V4AH
	Voltage		13.0_ 13.2V	13.0_ 13.2V
	Charging current	Standard	0.4A/5H	0.4A/5H
		Quick	5A/0.5H	4A/0.5H
Spark plug	(NGK)		BR8HSA	BR8HSA
Spark plug gap			0.6_ 0.7mm	0.6_ 0.7mm
Ignition coil resistance	Primary coil		0.153_ 0.187Ω	0.153_ 0.187Ω
	Secondary coil (with plug cap)		6.99_ 10.21KΩ	6.99_ 10.21KΩ
	Secondary coil (without plug cap)		3.24_ 3.96KΩ	3.24_ 3.96KΩ
Pulser coil resistance (20℃)			80_ 160Ω	80_ 160Ω
Ignition timing			13.5°±2°BTDC/1800rpm	13.5°±2°BTDC/2000rpm

TROUBLESHOOTING

CHARGING SYSTEM

No power
- Dead battery
- Disconnected battery cable
- Fuse burned out
- Faulty ignition switch

Low power
- Weak battery
- Loose battery connection
- Charging system failure
- Faulty regulator/rectifier

Intermittent power
- Loose battery cable connection
- Loose charging system connection
- Loose connection or short circuit in ignition system
- Loose connection or short circuit in lighting system

Charging system failure
- Loose, broken or shorted wire or connector
- Faulty regulator/rectifier
- Faulty A.C. generator

IGNITION SYSTEM

No spark at plug
- Faulty spark plug
- Poorly connected, broken or shorted wire
  - óBetween A.C. generator and CDI unit
  - óBetween CDI unit and ignition coil
  - óBetween CDI unit and ignition switch
  - óBetween ignition coil and spark plug
- Faulty ignition switch
- Faulty ignition coil
- Faulty CDI unit
- Faulty A.C. generator

Engine starts but turns poorly
- Ignition primary circuit
  - óFaulty ignition coil
  - óPoorly connected wire or connector
- Ignition secondary circuit
  - óFaulty ignition coil
  - óFaulty spark plug
  - óPoorly insulated plug cap
- Improper ignition timing
  - óBattery voltage too low (6V max.)
  - óFaulty CDI unit

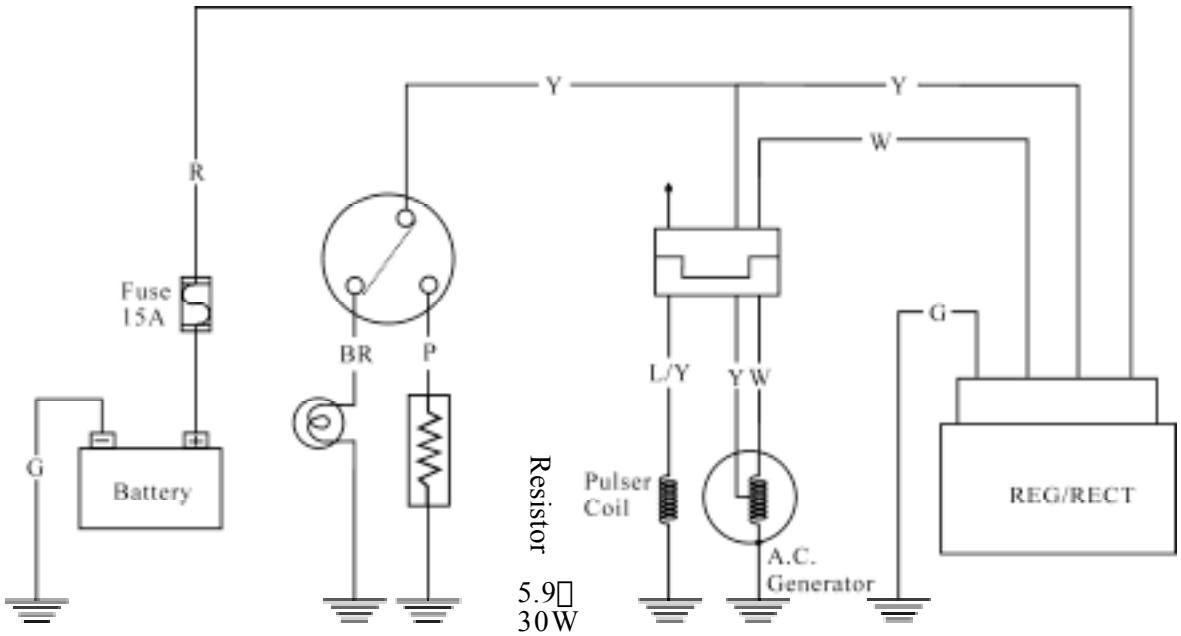
STARTING SYSTEM

Starter motor won‘t turn
- Fuse burned out
- Weak battery
- Faulty ignition switch
- Faulty starter switch
- Faulty front or rear stop switch
- Faulty starter relay
- Poorly connected, broken or shorted wire
- Faulty starter motor

Lack of power
- Weak battery
- Loose wire or connection
- Foreign matter stuck in starter motor or pinion

Starter motor rotates but engine does not start
- Faulty starter pinion
- Starter motor rotates reversely
- Faulty starter clutch
- Weak battery

CHARGING SYSTEM



BATTERY

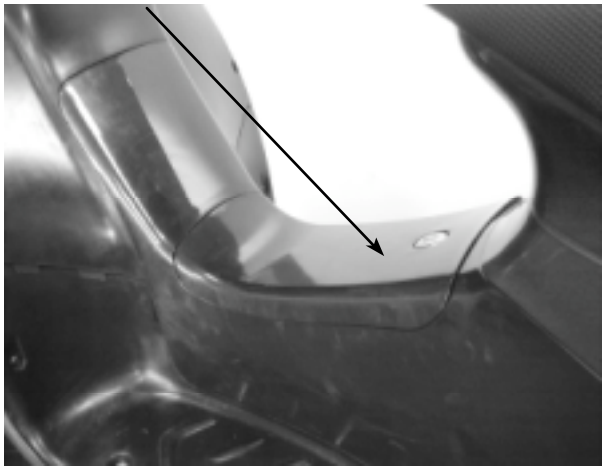
BATTERY REMOVAL

Open the front tool box and remove the bolt.
Remove the front tool box. (⇨2-4)
Disconnect the battery cables.

✱ First disconnect the battery negative (-) cable and then the positive (+) cable.

Remove the bolt and battery bracket.
Remove the battery.
The installation sequence is the reverse of removal.

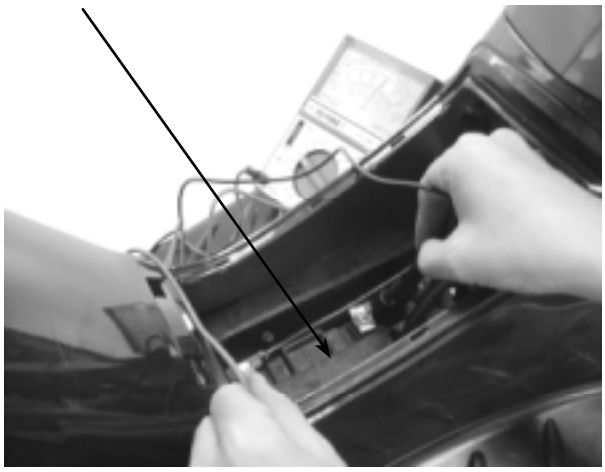
Front Tool Box



BATTERY CHARGING (OPEN CIRCUIT VOLTAGE) INSPECTION

Remove the battery cover and disconnect the battery cables.
Measure the voltage between the battery terminals.
Fully charged : 13.0V_ 13.2V
Undercharged : 12.3V max.

Battery



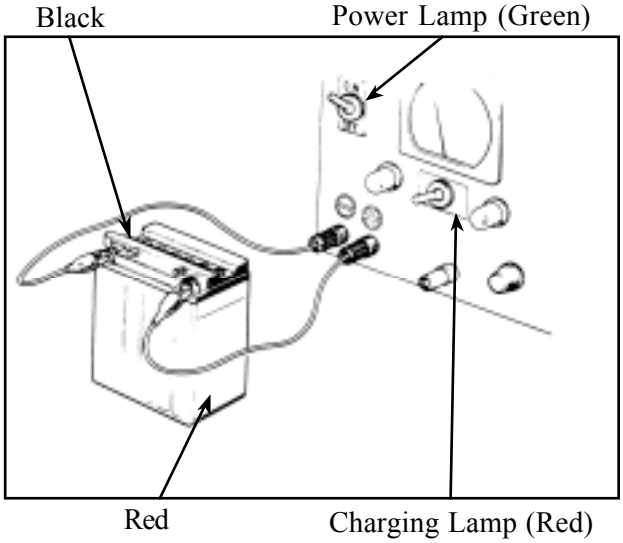
✱ Battery charging inspection must be performed with an electric tester.

CHARGING METHOD

Connect the charger positive (+) cable to the battery positive (+) cable.
Connect the charger negative (-) cable to the battery negative (-) cable.

✱
- Keep flames and sparks away from a charging battery.
- Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks near the battery.
- Charge the battery according to the current specified on the battery surface.

Charging current : Standard : 0.4A
Quick : 4A
Charging time : Standard : 5 hours
Quick : 0.5 hours
After charging Open circuit voltage: 12.8V min.

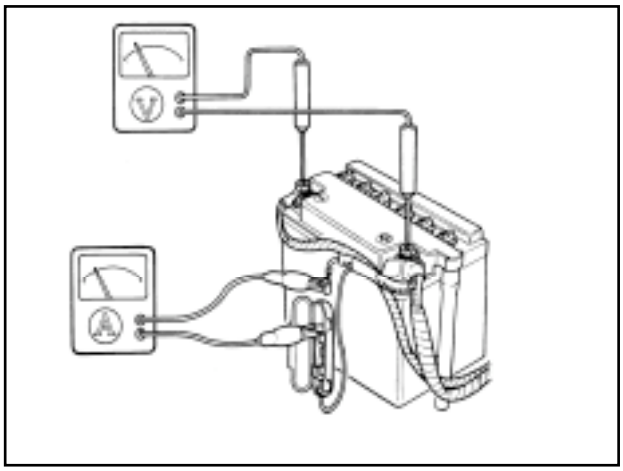


✱
- Quick charging should only be done in an emergency.
- During quick charging, the battery temperature should not exceed 45℃ .
- Measure the voltage 30 minutes after the battery is charged.

PERFORMANCE TEST

Warm up the engine.
Remove the floor mat and battery cover.

✱ Use a fully charged battery to check the charging system output.



Stop the engine and open the fuse box.
Disconnect the wire lead from the fuse terminal. Connect an ammeter between the wire lead and fuse terminal as shown.
Connect the battery positive (+) terminal to the voltmeter positive (+) probe and battery negative (-) terminal to the voltmeter negative (-) probe.
Start the engine, gradually increase engine speed to test the output:

Position / RPM	Day	Night
2500	1.3A min.	1.0A min.
6000	2.0A min.	2.0A min.

Charging Limit Voltage: 14.5±0.5V/8000rpm
If the limit voltage is not within the specified range, check the regulator/ rectifier.

A.C. GENERATOR (CHARGING COIL) INSPECTION

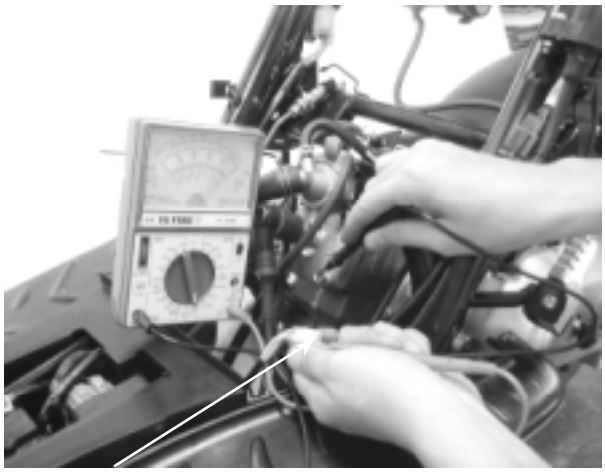
✱ Inspect with the engine installed.

Remove the met-in box, rear carrier and frame body cover. (⇨2-2)
Disconnect the A.C. generator connector.
Measure the resistances between the charging coil terminals (whiteñgreen) and lighting coil terminals (yellowñgreen).

Resistances:

Charging coil	whiteñgreen	0.2_ □	1.2
Lighting coil	yellowñgreen	0.3_ □	1.0

Refer to 8-3 for A.C. generator removal.



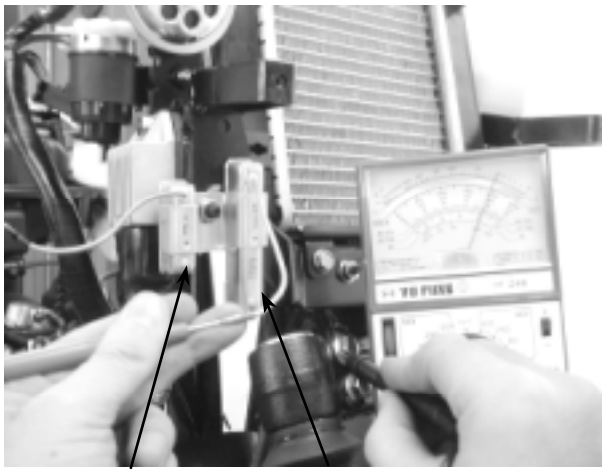
A.C. Generator Connector

RESISTOR INSPECTION

Remove the front upper/lower cover. (⇨2-3)
Measure the resistance between the resistor B pink wire and ground.
Measure the resistance between the resistor A green/black wire and ground.

Resistances:
Resistor A: 9.9Ω 10.5Ω
Resistor B: 5.6Ω 6.2Ω

✱ Faulty resistor is the cause of faulty operation of the auto bystarter.

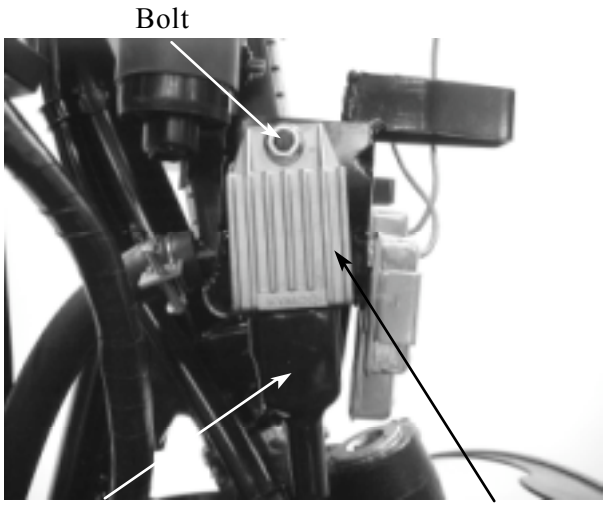

Resister A Resister B

REGULATOR/RECTIFIER INSPECTION

Remove the front upper/lower cover. (⇨2-3)
Disconnect the regulator/rectifier wire coupler and remove the bolt to remove the regulator/rectifier.

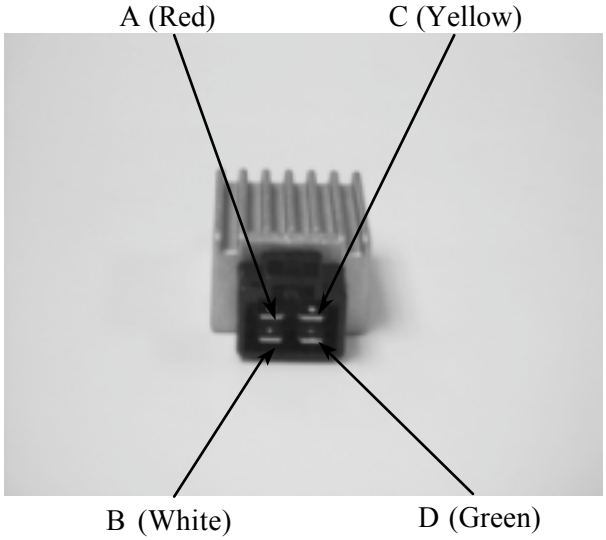
Measure the resistances between the terminals.
Replace the regulator/rectifier if the readings are not within the specifications in the table below.

✱
- Due to the semiconductor in circuit, it is necessary to use a specified tester for accurate testing. Use of an improper tester in an improper range may give false readings.
- Use a Sanwa Electric Tester (07208-0020000) or Kowa Electric Tester (TH-5H). The proper range for testing is listed below.

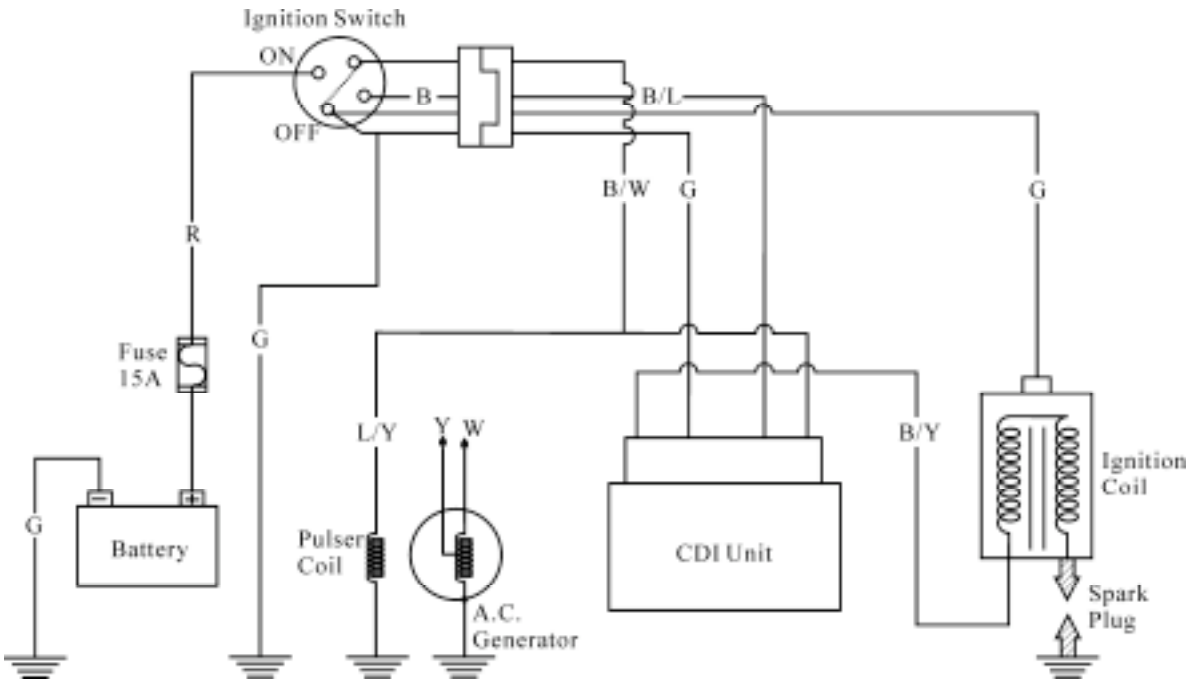


Model	Brand	Range
SP-10D	Sanwa	KΩ
TH-5H	Kowa	100Ω

Probe⊕ / Probe(-)	A (R)	B (W)	C (Y)	D (G)
A (R)		∞	∞	∞
B (W)	3-10KΩ		∞	∞
C (Y)	∞	∞		33-35KΩ
D (G)	∞	∞	33-35KΩ	



IGNITION SYSTEM

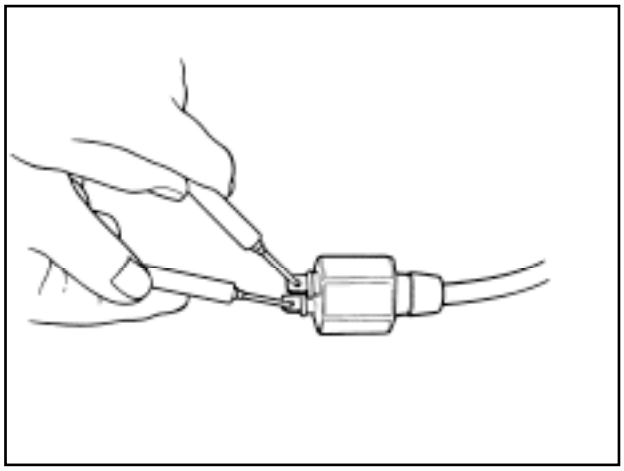


IGNITION COIL INSPECTION

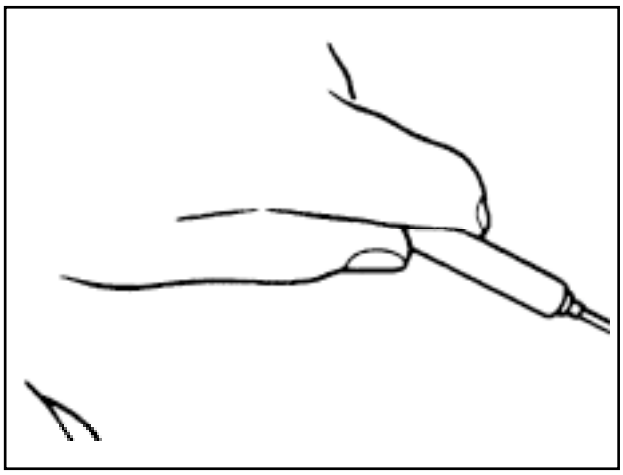
Continuity Test

✱ This test is to inspect the continuity of ignition coil.

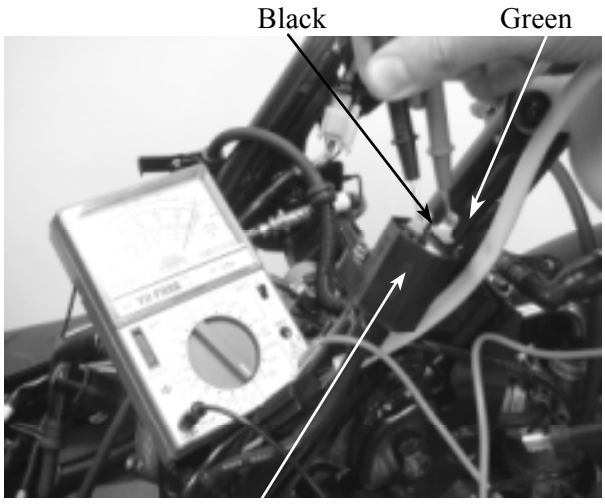
Remove the met-in box. (⇨12-4)
Measure the resistance between the ignition coil primary coil terminals.
Resistance (20℃): 0.153_ 0.187Ω



Measure the secondary coil resistance between the spark plug cap and the primary coil terminal as Figure A shown.
Resistance (20℃) (with plug cap): 6.99_ 10.21KΩ



Measure the secondary coil resistance between the ignition coil terminal and the primary coil terminal as Figure B shown.
Resistance (20℃) (without plug cap): 3.24_ 3.96KΩ



Ignition Coil

Performance Test

Remove the ignition coil.

Ignition Coil

Inspect the ignition coil with an ignition coil tester.

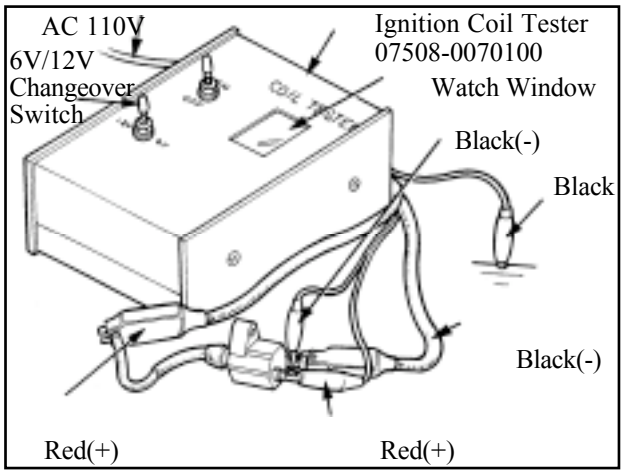
✱ Follow the ignition coil tester manufacturer's instructions.

1. Turn the changeover switch to 12V and connect the ignition coil to the tester.
2. Turn the power switch ON and check the spark from the watch window.

_Good : Normal and continuous spark

_Faulty : Weak or intermittent spark

✱ The test is performed at both conditions that the ignition coil is cold and hot.



A.C. GENERATOR

Exciter Coil/Pulser Coil Inspection

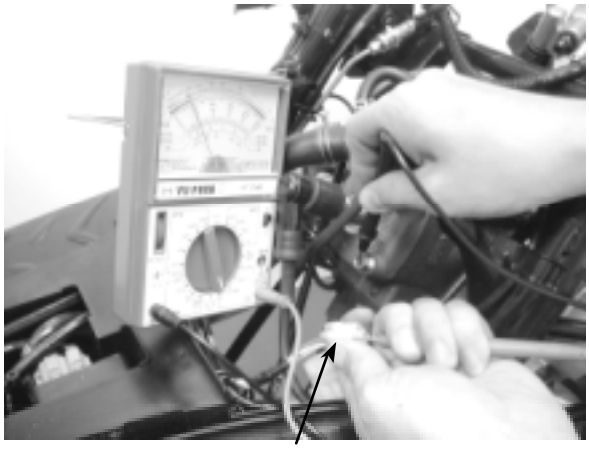
✱ This test is performed with the stator installed in the engine.

Remove the met-in box. (⇨12-4)

Disconnect the A.C. generator wire connector.

Measure the pulser coil resistance between the blue/yellow wire and ground.

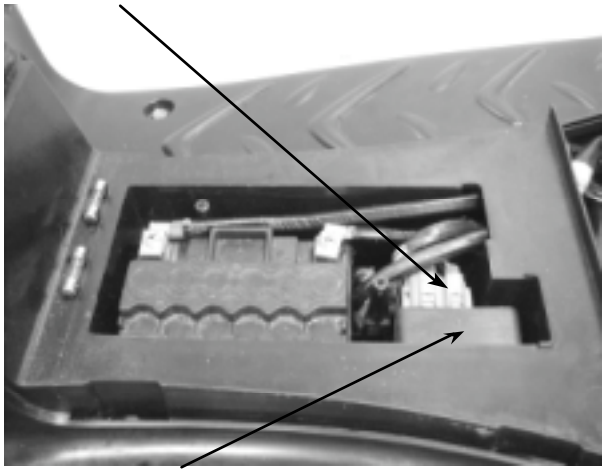
Resistance (20℃): 80_ 160□



Blue/Yellow

CDI UNIT INSPECTION

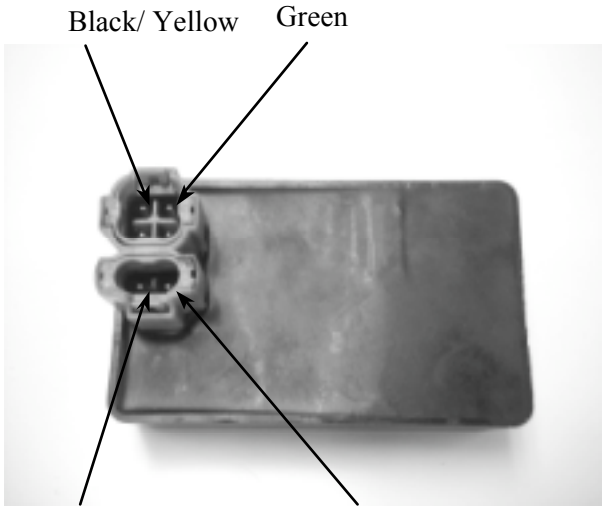
Open the front tool box and remove the bolt.
Remove the front tool box. (⇨2-4)
Disconnect the CDI coupler and remove the CDI unit.



CDI CIRCUIT INSPECTION

Measure the resistance between the terminals.
Replace the CDI unit if the readings are not within the specifications in the table below.

✱
- Due to the semiconductor in circuit, it is necessary to use a specified tester for accurate testing. Use of an improper tester in an improper range may give false readings.
- Use a Sanwa Electric Tester or Kowa Electric Tester (TH-5H).
- In this table, "Needle swings then returns" indicates that there is a charging current applied to a condenser. The needle will then remain at "∞ " unless the condenser is discharged.

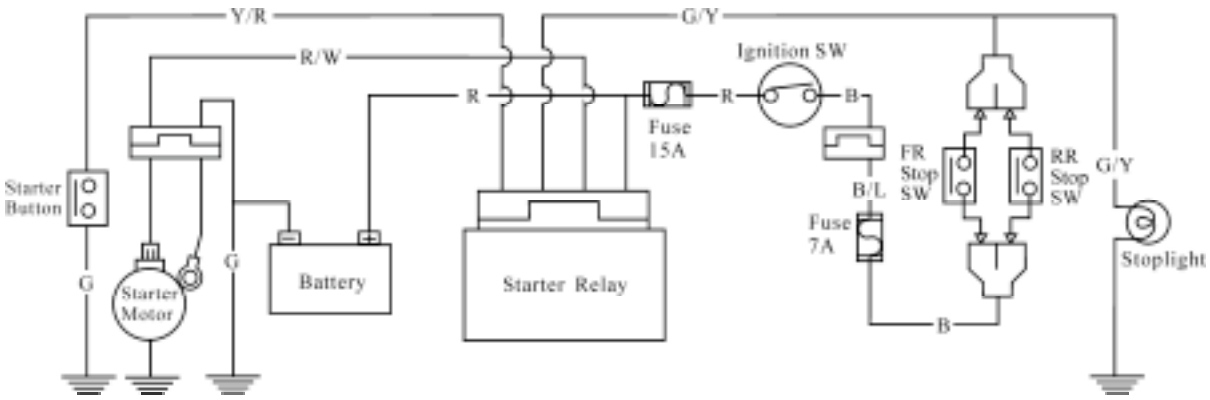


Use the x KΩ range for the Sanwa Tester.
Use the x 100Ω range for the Kowa Tester.

Unit: KΩ

Probe⊕ / (-)Probe	Black/ Blue	Blue/ Yellow	Green	Black/ Yellow
Black/ Blue		∞	1~100	∞
Blue/ Yellow	100~ ∞		1~100	∞
Green	1~∞	∞		∞
Black/ Yellow	1~100	∞	0.1~50	

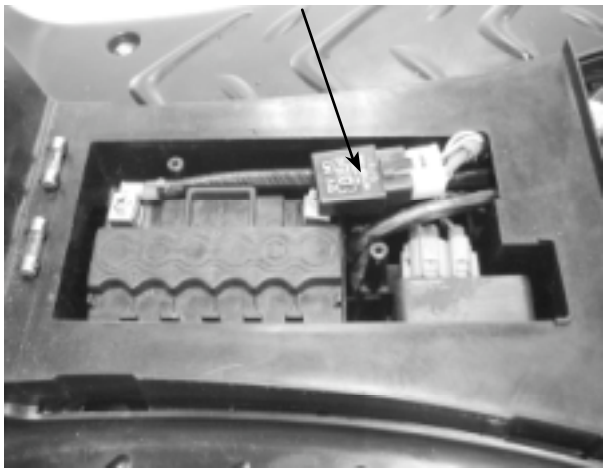
STARTING SYSTEM



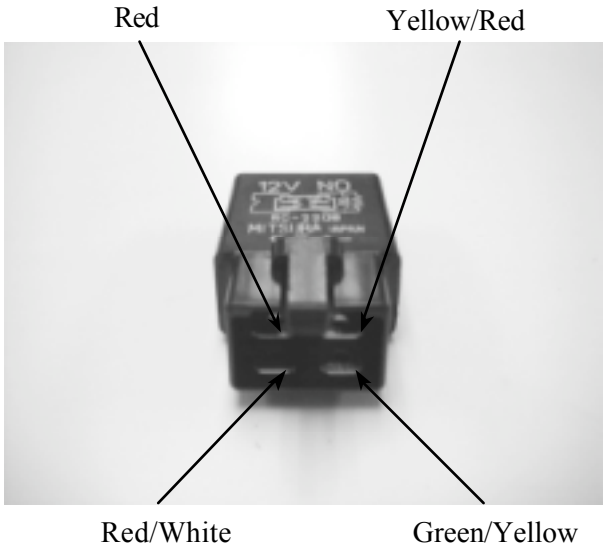
STARTER RELAY INSPECTION

Open the front tool box and remove the bolt. Remove the front tool box. (⇨2-4)
Disconnect the starter relay coupler and then remove the starter relay.

Starter Relay

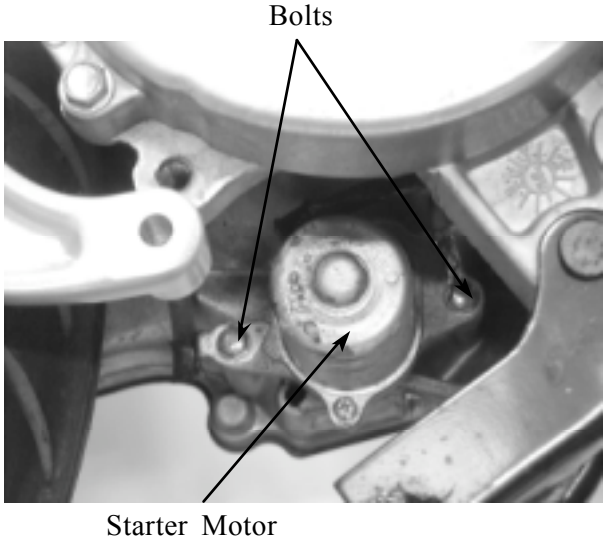


Connect the starter relay green/yellow terminal to the 12V battery positive (+) terminal and the relay yellow/red terminal to the battery negative (-) terminal. Check for continuity between the starter relay red and red/white terminals. The relay is normal if there is continuity.



STARTER MOTOR REMOVAL

Disconnect the starter motor cable.
Remove the two bolts attaching the starter motor and remove the starter motor.
The installation sequence is the reverse of removal.



STARTER MOTOR INSPECTION

Connect a battery across the starter motor and check for its operation.

✱
1. Do not turn the starter motor for a long time.
2. This inspection should be done with a fully charged battery.