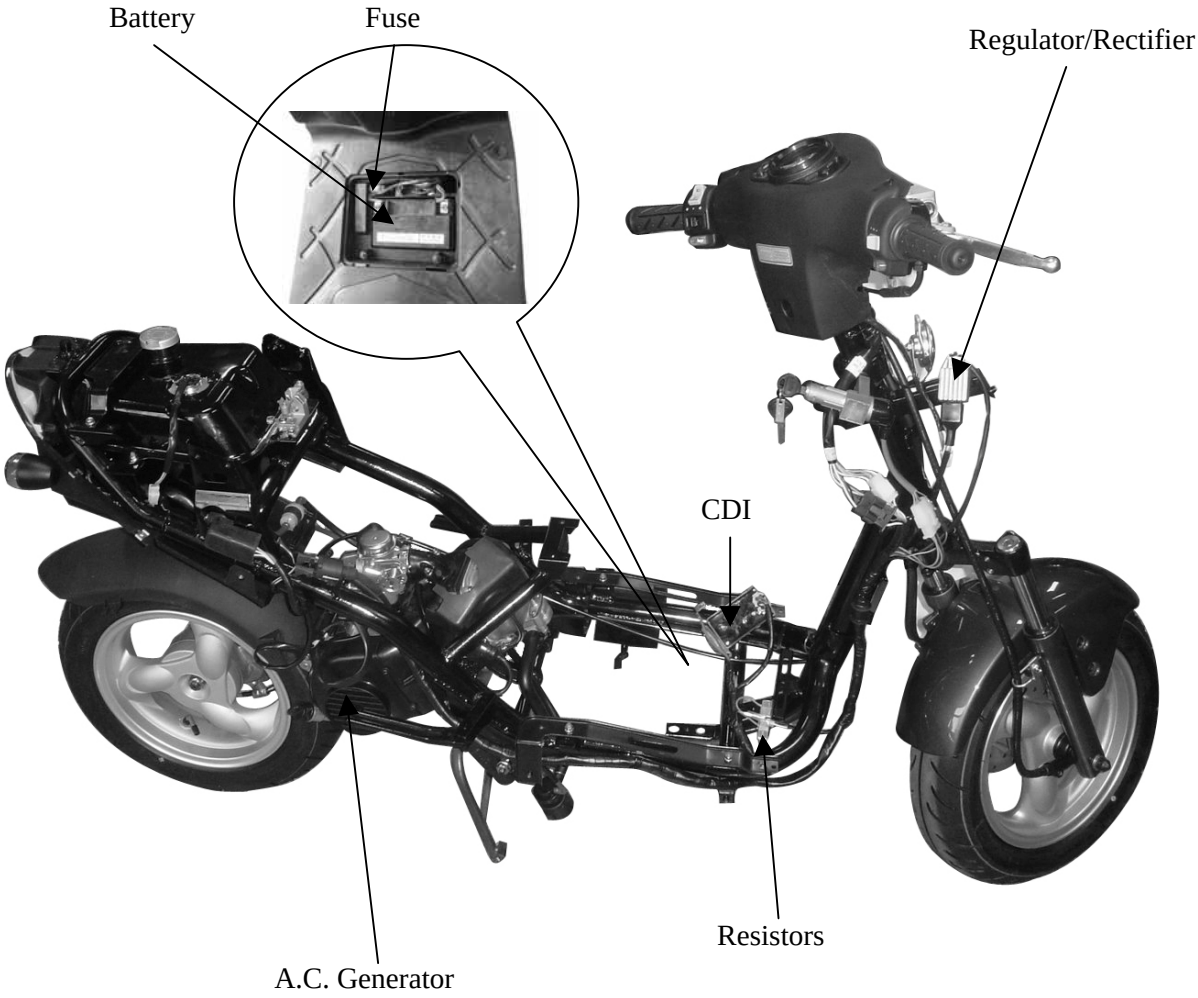
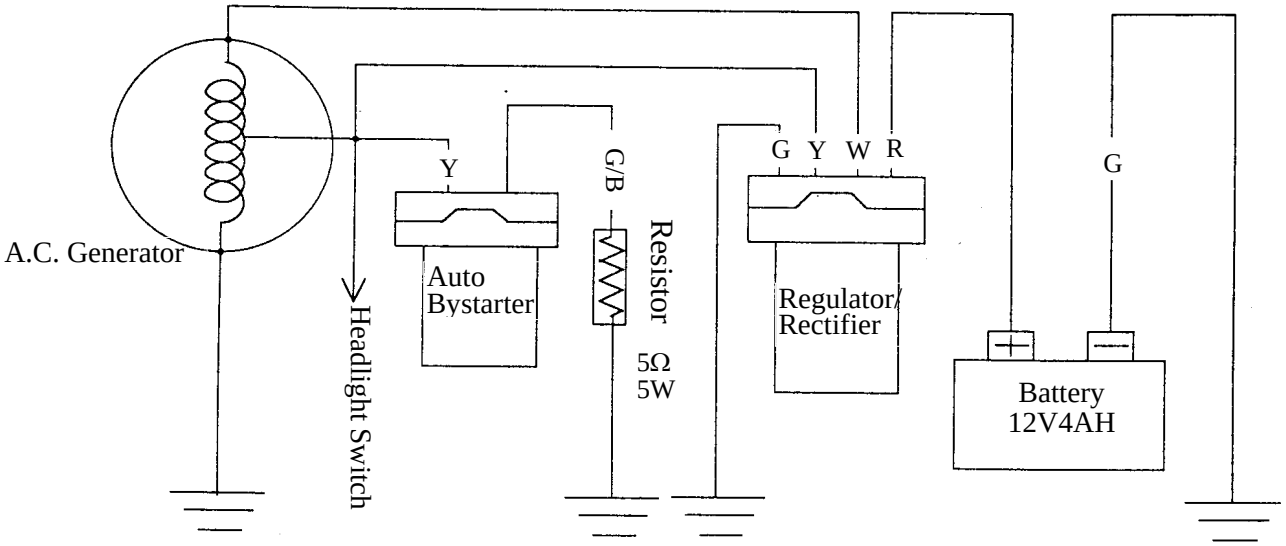

Battery
Fuse
Regulator/Rectifier
CDI
A.C. Generator
Resistors


A.C. Generator
Y
Auto
Bystarter
G/B
Resistor
5Ω
5W
Headlight Switch
G Y W R
Regulator/
Rectifier
G
Battery
12V4AH

14

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

The battery electrolyte (sulfuric acid) is poisonous and may seriously damage the skin and eyes. Avoid contact with skin, eyes, or clothing. In case of contact, flush with water and get prompt medical attention

- The battery can be charged and discharged repeatedly. If a discharged battery is not used for a long time, its service life will be shortened. Generally, the capacity of a battery will decrease after it is used for 2～3 years. A capacity-decreased battery will resume its voltage after it is recharged but its voltage decreases suddenly and then increases when a load is added.
- When a battery is overcharged, some symptoms can be found. If there is a short circuit inside the battery, no voltage is produced on the battery terminals. If the rectifier won‘t operate, the voltage will become too high and shorten the battery service life.
- If a battery is not used for a long time, it will discharge by itself and should be recharged every 3 months.
- A new battery filled with electrolyte will generate voltage within a certain time and it should be recharged when the capacity is insufficient. Recharging a new battery will prolong its service life.
- Inspect the charging system according to the sequence specified in the Troubleshooting.
- Do not disconnect and soon reconnect the power of any electrical equipment because the electronic parts in the regulator/rectifier will be damaged. Turn off the ignition switch before operation.
- It is not necessary to check the MF battery electrolyte or fill with distilled water.
- Check the load of the whole charging system.
- Do not quick charge the battery. Quick charging should only be done in an emergency.
- Remove the battery from the motorcycle for charging.
- When replacing the battery, do not use a traditional battery.
- When charging, check the voltage with an voltmeter.

SPECIFICATIONS

Item			Standard	
Battery	Capacity/Model		12V–4AH	
	Voltage (20℃)	Fully charged	13.1V	
		Undercharged	12.3V	
	Charging current		STD: 0.4A Quick: 4.0A	
	Charging time		STD: 5～10hr Quick: 30min	
A.C. Generator	Capacity		0.144KW/5000rpm	
	Lighting coil resistance (20℃)		Yellow～Green	0.1～1.0Ω
	Charging coil resistance (20℃)		White～Green	0.2～1.2Ω
Regulator/Rectifier	Type		Single-phase half-wave SCR	
	Limit voltage	Lighting	13.1～13.9V/5000rpm (Electric tester, tachometer)	
			13.1±0.5V	
		Charging	14.5±0.5V/5000rpm	
Resistor	Resistance (20℃)		5W12Ω	
	Resistance (20℃)		30W7.5Ω	

TORQUE VALUES

Pulser coil bolt	0.45~0.6kgf-m
Stator bolt	0.8~1.2kgf-m
Flywheel nut	3.5~4.5kgf-m
Cooling fan bolt	0.8~1.2kgf-m

SPECIAL TOOLS

Universal holder
Flywheel puller

TESTING INSTRUMENTS

Kowa electric tester
Sanwa electric tester

TROUBLESHOOTING

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 lighting system

Charging system failure

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

BATTERY

REMOVAL

Remove the battery cover screws on the floor board.
Open the battery cover and remove the battery by removing the bolt and band.
First disconnect the battery negative (-) cable and then the positive (+) cable.

> When disconnecting the battery positive (+) cable, do not touch the frame with tool; otherwise it will cause short circuit and sparks to fire the fuel.

The installation sequence is the reverse of removal.

> First connect the positive (+) cable and the negative (-) cable to avoid short circuit.

BATTERY VOLTAGE (OPEN CIRCUIT VOLTAGE) INSPECTION

Remove the floor board.
Open the battery cover and disconnect the battery cables.
Measure the voltage between the battery terminals.
Fully charged : 13.1V
Undercharged : 12.3V max.

> Battery charging inspection must be performed with a voltmeter.

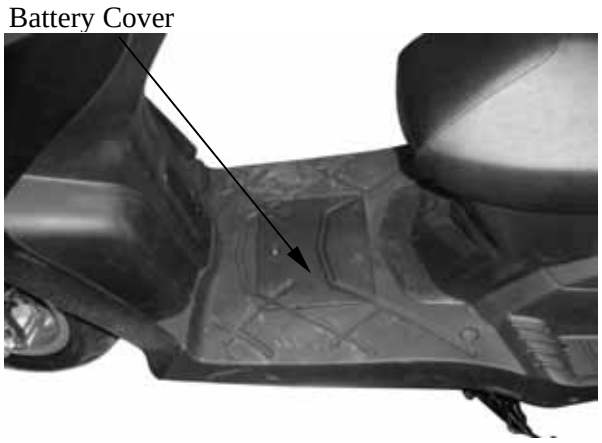
CHARGING

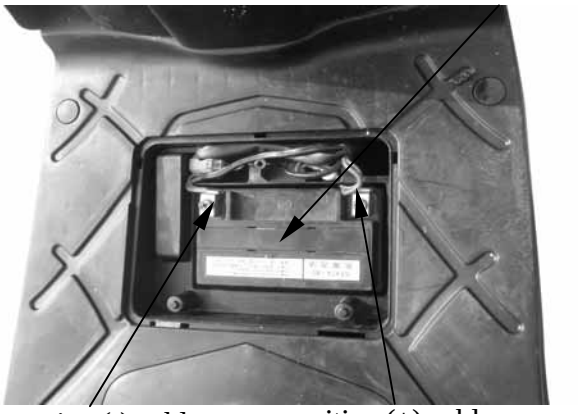
Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (-) cable to the battery negative (-) terminal.

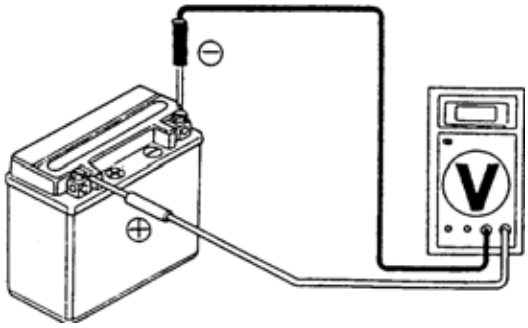
> • Keep flames and sparks away from a charging battery.
> • Turn power ON/OFF at the charger, not at the battery terminals to prevent sparks near the battery to avoid explosion.
> • Charge the battery according to the

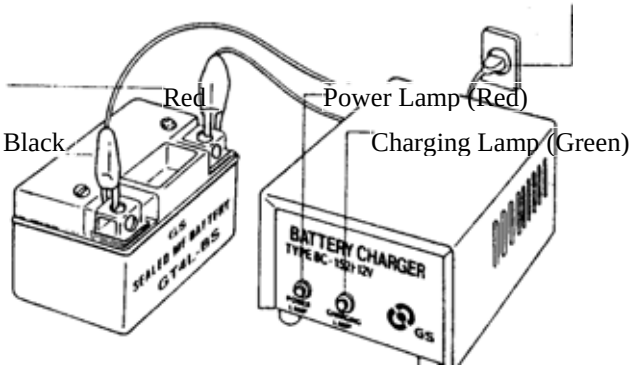
> • Quick charging should only be done in an emergency.
> • Measure the voltage 30 minutes after the battery is charged.

Charging current: Standard : 0.4A
Quick : 4A
Charging time : Standard : 5～10 hours
Quick : 30 minutes
After charging: Open circuit voltage: 12.8V min.
Note: The battery temperature should not exceed 45℃ during charging.









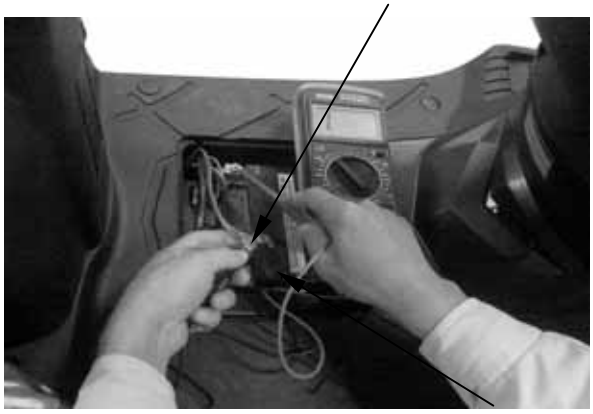
CHARGING SYSTEM

SHORT CIRCUIT TEST

Disconnect the ground wire from the battery and connect an ammeter across the battery negative (-) terminal and the ground wire.
Turn the ignition switch OFF and check for short circuit.

✳ Connect the electric tester positive (+) terminal to ground wire and the tester negative (-) terminal to the battery negative (-) terminal.

If any abnormality is found, check the ignition switch and wire harness for short circuit .

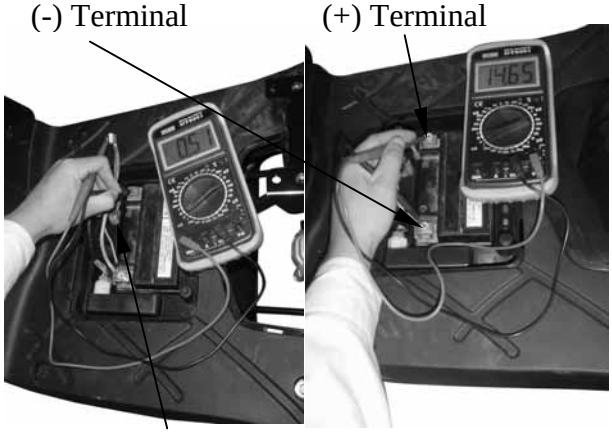


CURRENT TEST

This inspection must be performed with an electric tester when the battery is fully charged.
Warm up the engine for inspection.
Connect the electric tester across the battery terminals. Disconnect the fuse and connect an ammeter between the fuse terminals.
Attach a tachometer to the engine.
Start the engine and gradually increase the engine speed to measure the limit voltage and current.

Limit Voltage/Current: 14～15V/0.5A max.
(5000rpm max.)

If the limit voltage is not within the specified range, check the regulator/rectifier. (⇨14-5)



LIGHTING SYSTEM LIMIT VOLTAGE INSPECTION

Remove the handlebar front cover. (⇨2-2)

✳ Measure the voltage with the electric tester in the AC range.

Limit Voltage: 12～14V/ (5000rpm max.)

If the limit voltage is not within the specified range, check the regulator/rectifier. (⇨14-5)

✳ Perform this test with a fully charged battery.

REGULATOR/RECTIFIER

MAIN HARNESS CIRCUIT INSPECTION

Remove the front covers. (⇨2-2)
Remove the regulator/rectifier 4P coupler and check for continuity between the wire harness terminals according to the following :

Item (Wire Color)	Judgment
Between battery (red) and engine ground	Battery has voltage
Between ground (green) and engine ground	Continuity exists
Between lighting wire (yellow) and engine ground (Remove the resistor coupler and auto bystarter coupler and turn the lighting switch OFF for inspection)	A.C. generator stator has resistance
Between charging coil (white) and engine ground	A.C. generator stator has resistance

Regulator/Rectifier

REGULATOR/RECTIFIER INSPECTION

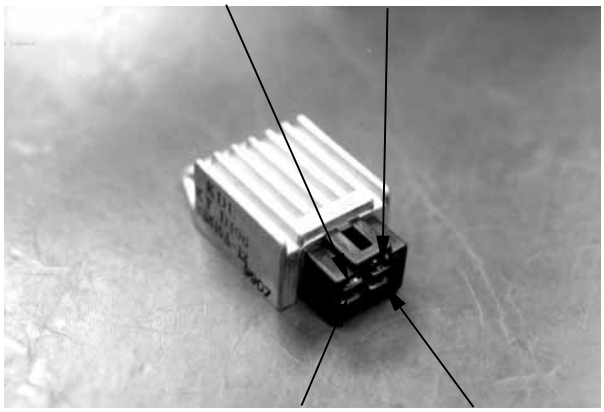
If the main harness terminals are normal, check the regulator/rectifier coupler for loose connection and measure the resistances between the regulator/rectifier terminals.

✳

- Do not touch the tester probes with your finger because human body has resistance.
- Use the following specified testers for accurate testing. Use of an improper tester in an improper range may give false readings.
  – Kowa Electric Tester
  – Sanwa Electric Tester
  – Kowa Electric Tester TH-5H
- Proper range for testing:
  – Use XKΩ range for Sanwa Tester
  – Use X100Ω range for Kowa Tester
- If the dry battery in the tester is weak, the readings will be incorrect. In this case, check the dry battery.
- The Kowa tester readings are 100 times the actual values. Be careful during testing.

Replace the regulator/rectifier if the readings are not within the specifications in the table.

Red Yellow



White Green

Probe⊕ / Probe(-)	White	Yellow	Red	Green
White		∞	3K-50K	∞
Yellow	∞		∞	5K-100K
Red	∞	∞		∞
Green	∞	5K-50K	∞	

A.C. GENERATOR CHARGING COIL

✳ The inspection of A.C. generator charging coil can be made with the engine installed.

INSPECTION

Disconnect the A.C. generator 2P connector. Measure the resistance between the A.C. generator white wire and engine ground with an electric tester.

Standard: 0.2～1.2Ω(at 20℃)

Replace the A.C. generator charging coil if the reading is not within the specifications.

Charging Coil Wire

A.C. GENERATOR LIGHTING COIL

✳ The inspection of A.C. generator lighting coil can be made with the engine installed.

INSPECTION

Disconnect the A.C. generator 2P connector. Measure the resistance between the A.C. generator yellow wire and engine ground with an electric tester.

Standard: 0.1～1.0Ω (20℃)

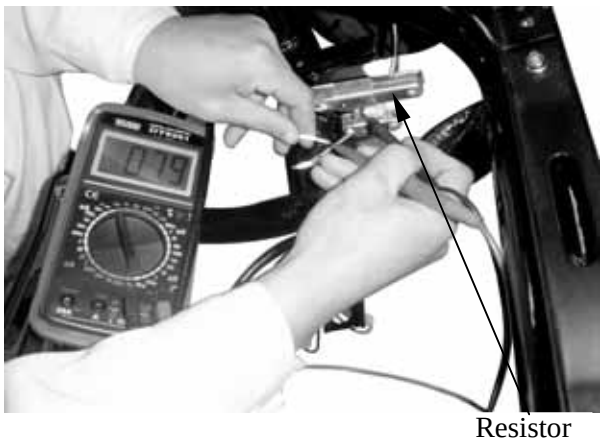
Replace the A.C. generator lighting coil if the reading is not within the specifications.

Lighting Coil Wire

RESISTOR INSPECTION

Remove the front covers. (⇨2-2)
Measure the resistance between the resistor lead and engine ground.

Resistances: 5W12Ω: 11～13Ω
30W7.5Ω: 6～8Ω

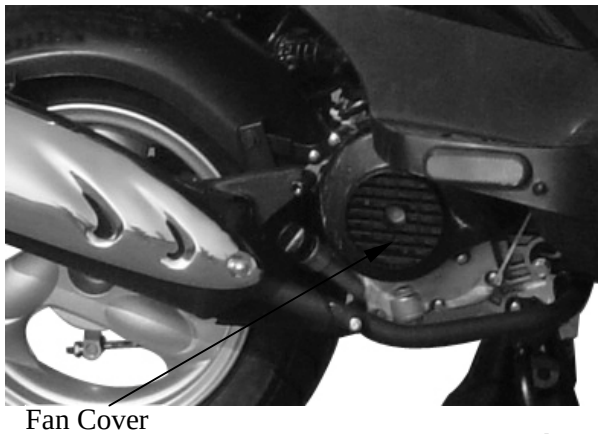


Resistor

A.C. GENERATOR

REMOVAL

Remove the right side cover. (⇨2-4)
Remove the four bolts attaching the cooling fan cover to remove the fan cover.



Fan Cover

Remove the cooling fan by removing the four cooling fan attaching bolts.

Hold the flywheel with an universal holder.
Remove the flywheel nut.

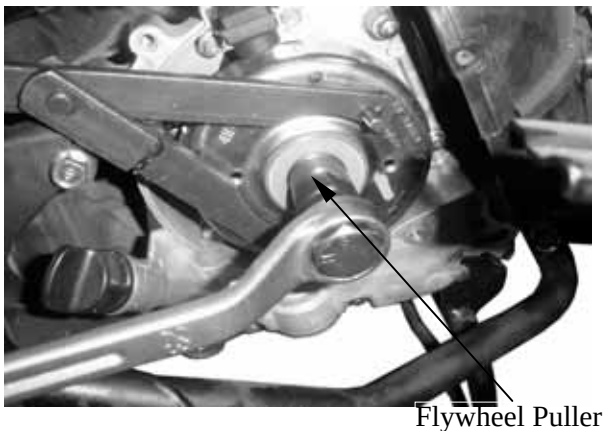
Special

Universal Holder

Remove the A.C. generator flywheel using the flywheel puller.
Remove the woodruff key.

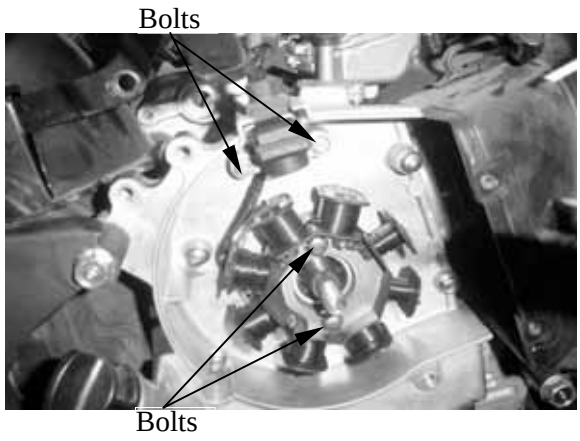
Special

Flywheel Puller

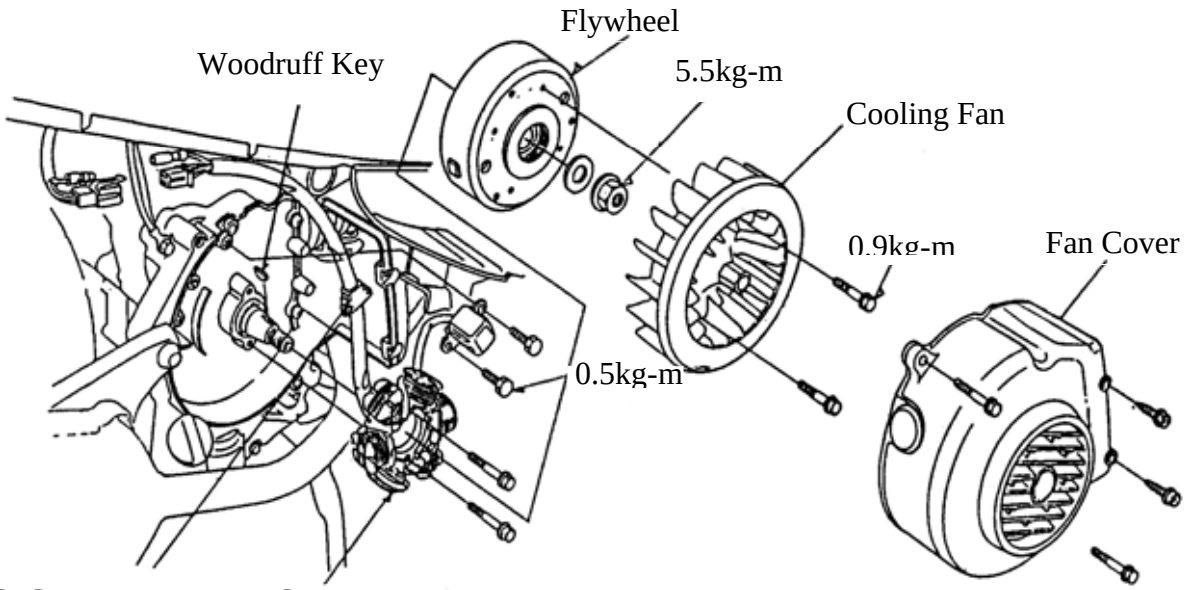


Remove the A.C. generator wire connector.

Remove the A.C. generator wire set plate.
Remove the pulser coil bolts.
Remove the A.C. generator wire rubber sleeve and pulser coil from the right crankcase.
Remove the two bolts and A.C. generator stator.



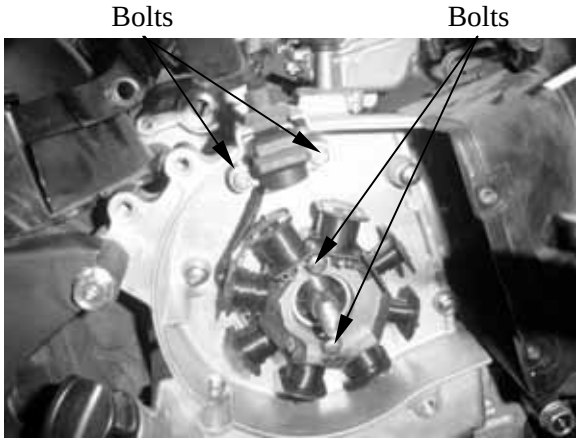
A.C. GNERATOR INSTALLATION



Install the A.C. generator stator and pulser coil onto the right crankcase.
Tighten the stator and pulser coil bolts.

Torques: Pulser Coil : 0.45~0.6kgf-m
Stator : 0.8~1.2kgf-m

Install the A.C. generator wire rubber sleeve and A.C. generator wire set plate.



Connect the A.C. generator wire connector.

A.C. Generator Wire Connector

Clean the taper hole in the flywheel off any burrs and dirt.
Install the woodruff key in the crankshaft keyway.

Woodruff Key

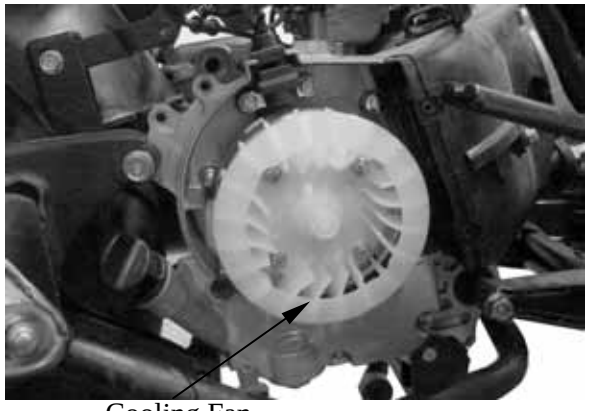
Install the flywheel onto the crankshaft with the flywheel hole aligned with the crankshaft woodruff key.

✳ The inside of the flywheel is magnetic. Make sure that there is no bolt or nut before installation.

Hold the flywheel with the universal holder and tighten the flywheel nut.
Torque: 3.5~4.5kgf-m

Universal Holder

Special
Universal Holder
Install the cooling fan.
Torque: 0.8~1.2kgf-m



Cooling Fan

Install the fan cover.
Install the right side cover. (⇨2-4)