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- **Service Information**
- **General**



Warning

- Do not smoke and do keep flames away from a charging battery.
- The gas produced by a battery will explode if a flame or spark is brought near.
- The battery electrolyte contains Sulfuric acid. Protect your eyes, skin, and clothing. In case of contact, flush thoroughly with water, and consult a doctor if electrolyte gets in your eyes.



Caution

- Connection/disconnection of couplers/terminals while current is existing may cause excess voltage and failure of electrical components. Turn an ignition key OFF prior to starting work.
- The motorcycle is equipped with a maintenance free (MF) battery. The MF battery requires different type of charging system and thus it is not compatible with conventional batteries.
- Remove the battery from the frame when charging. Do not remove electrolyte caps.

Note: **Replace the battery after using for certain period or if it is losing its performance.**

- Turn the ignition switch OFF before disconnecting any electrical components.
- Disconnect the battery (-) cable if the battery is to be stored without removing from the motorcycle.
- Quick charging should be an emergency procedure, as it reduces the battery life.
- The battery performance may be reduced by leaving it flat or repeating full charging / full discharging. Normally, the performance drops after 2 to 3 years in conventional use. The reduced performance battery may recover its voltage with extra charging. However, it cannot sustain the electrical load and flattens easily.
- The battery may appear to be overcharged if there is a short circuit in one of the cells and it deactivates the regulator, resulting in excess charging voltage and consuming electrolyte.
- The new MF battery may not perform properly after filling electrolyte. The extra charging is required in the following cases.
 - Terminal voltage (10min after filling electrolyte) is less than 12.4 volts → normal charging until the voltage reaches 12.8V.
 - Electrolyte temperature below 0°C → charge for 2 to 3 hours @ standard charging current.
- Use the troubleshooting chart (14-3) to inspect the charging system.
- Refer to (14-0) for system location.
- Alternator can be serviced without dismounting it from the frame.

- **Specification**

Item		Standard	
Alternator	Type	Tri-phase AC	
	Output	0.188kW / 5,000rpm	
	Charging coil resistance (20°C)	0.1 – 1.0Ω	
Regulator / Rectifier	Type	Cylister	
	Regulated voltage	13.6 – 14.8 V / 5,000rpm	
Battery	Capacity	12 V – 4 Ah	
	Charging current	Standard	0.5 A / 5-10h
		Quick	5.0 A / 0.5h
	Leak current		0.1mA or less
	Voltage (20°C)	Fully charged	12.8 V or above
Partially charged		12.3 V or less	

- **Torque Settings**

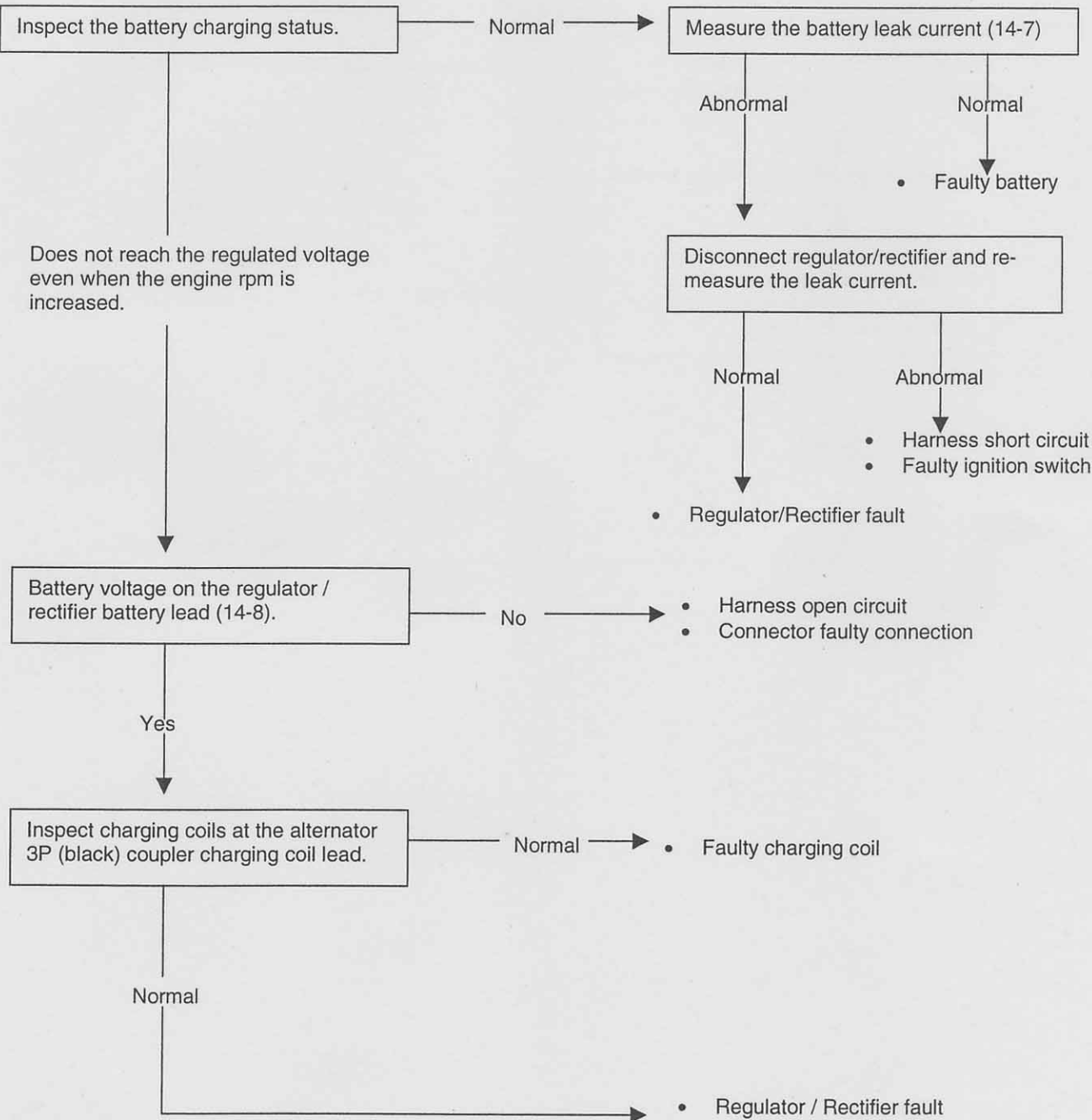
Stator socket bolt	10N.m (1.0kgf-m)
Flywheel bolt	74N.m (7.5kgf-m) apply oil to the thread and the seat
Pulse generator socket bolt	5N.m (0.5kgf-m) apply screw locker

- **Special tools:**

Flywheel holder	07725-0030000
Flywheel puller	07733-0020001

• Troubleshooting

Battery undercharged (need greater rpm to read the regulated voltage)



Battery overcharged (Regulated voltage exceeds standard)

Inspect the battery charging status.

Normal →

- Faulty battery

↓ Regulated voltage exceeds standard

Check the conduction between the regulator/rectifier connector earth and the body earth line (14-8).

Abnormal →

- Wire harness open circuit
- Faulty connector connection

↓ Normal

→

- Regulator / Rectifier fault
- Faulty connector connection

- Battery
- Removal

Note: Turn the ignition switch OFF.

Remove the left side cover (2-2).
 Remove terminal covers.
 Unscrew a terminal bolt to disconnect (-) cable from the battery.
 Unscrew a terminal bolt to disconnect (+) cable from the battery.
 Unscrew battery holder bolts to remove the holder.
 Remove the battery.

- Installation

Follow the removal procedure in reverse order.

Note:
 Apply clean grease to the terminals after installing.

- Inspection

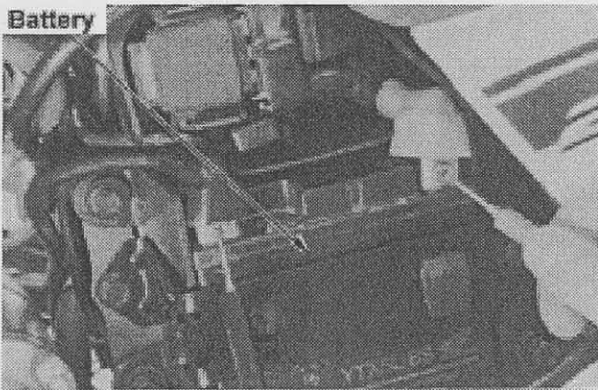
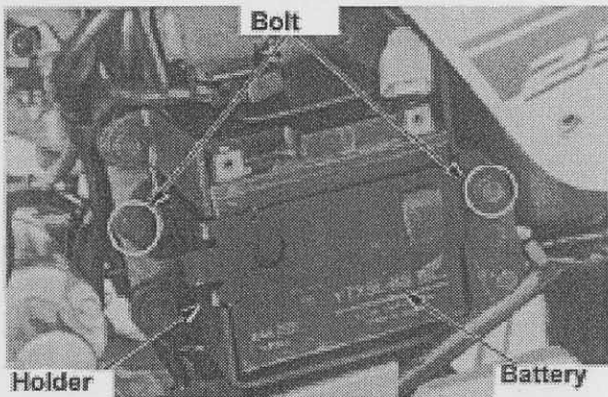
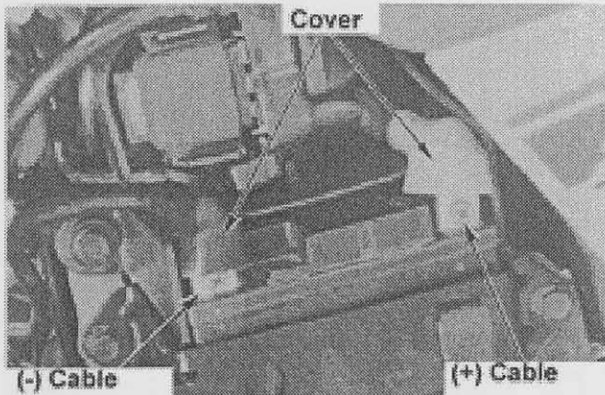
Measure the terminal voltage to find out charging status.
 Fully charged: 12.8V or above
 Partially charged: 12.3V or less
 Charge the battery if it is partially charged.

Note:
 When measuring the voltage after recharging, allow 30 minutes after charging as the voltage fluctuates immediately after charging.

- Battery charging

Note:
 Do not smoke and keep flames away from a charging battery. The gas produced by a battery will explode if a flame or spark is brought near.

Charge the battery by referring to the current and time labeled on the battery.
 Remove the battery from the motorcycle.



Connect (+) cable of the battery charger to the (+) terminal of the battery, and (-) cable to the (-) terminal.

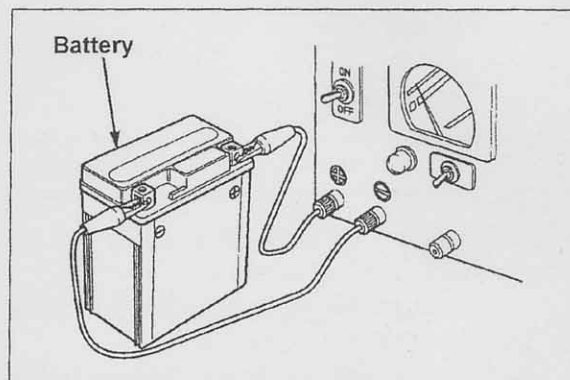
Charging current/time:

Standard: 0.5A/5~10h

Quick: 5.0A/0.5h



- Do not allow electrolyte to exceed 45°C. Reduce current if necessary.
- Quick charge is only for emergency, as it reduces the battery life and may damage the battery.



• Battery Case

Remove the battery (14-5).

Remove a starter relay switch (16-13).

Unscrew bolts to remove the battery case.

Follow the above procedure in reverse order for installation.

Note:

Refer to routing diagram for routing wires and harnesses (1-21).

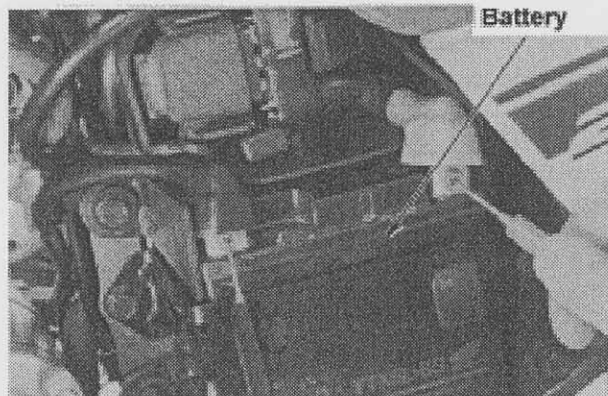
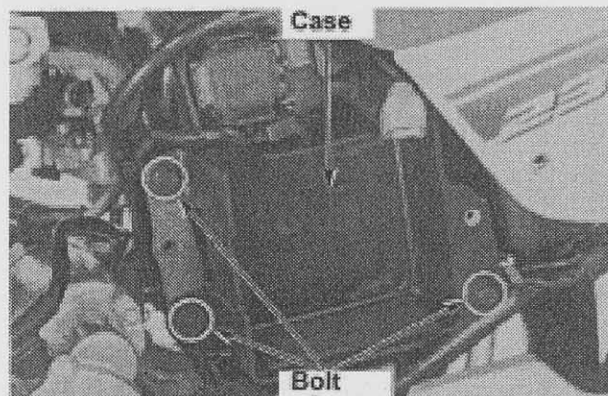
• Charging System

• Charging status inspection

Remove the battery (14-5) and install fully charged battery. Warm up the engine and connect a voltmeter between the terminals.



- Do not short circuit while measuring.
- Check the ignition switch is OFF before connecting / disconnecting the battery terminals.
- Inspect with fully-charged battery.



Install an engine tachometer.

Start the engine and turn the headlamp Lo.

Gradually increase rpm and measure the terminal voltage at 5,000rpm.

Regulated voltage: 13.6 ~ 14.8 V / 5,000rpm

Note:

The rpm where the voltage starts increasing may vary with the alternator temperature and electricity lead.

If the battery easily gets flat while charging status is fine, the battery is considered to have reached its life.

The following cases may indicate the charging system fault.

- 1) Cannot achieve regulated voltage even in high rpm (14-3).
 - Wire harness in the charging system has open/short circuit, or coupler connection is faulty.
 - Alternator open/short circuit.
 - Faulty regulator/rectifier.
- 2) Regulated voltage well exceeds standard (14-4).
 - Faulty battery
 - Regulator / rectifier fault
 - Regulator / rectifier ground earth fault

• **Leak Test**

Turn the ignition OFF and disconnect (-) lead from the battery terminal.

Connect a galvanometer between the battery (-) terminal and (-) lead.

Leave the ignition OFF and measure the leak current.

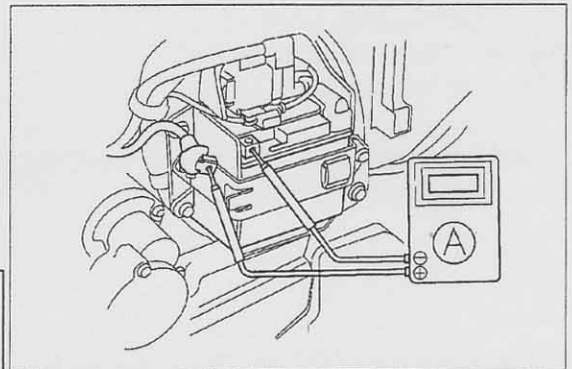
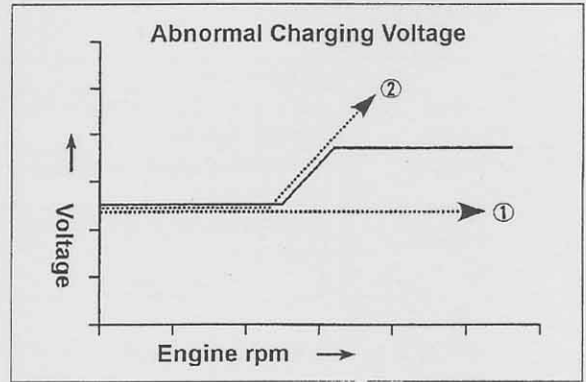
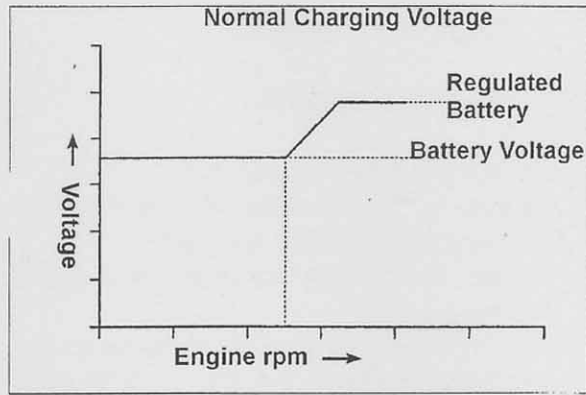


- Start from big range first, to prevent blowing the fuse of the galvanometer.
- Do not turn the ignition ON while measuring.

Leak current: 0.1mA or less

If the leak current is beyond the limit, there is a short circuit.

Disconnect couplers / connectors one by one while measuring to find out the short circuit.



- **Regulator / Rectifier**

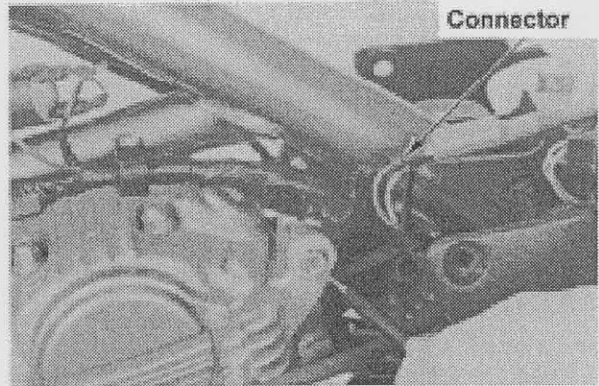
- **System Inspection**

Remove the fuel tank (2-10).

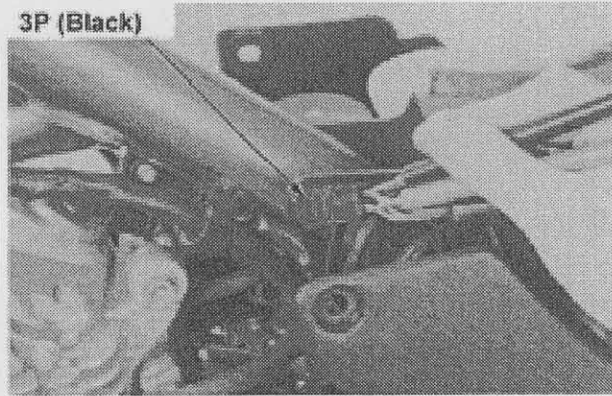
Disconnect an alternator 3P (black) coupler and regulator/rectifier connector.

Inspect the coupler/connector for loose fit and damage.

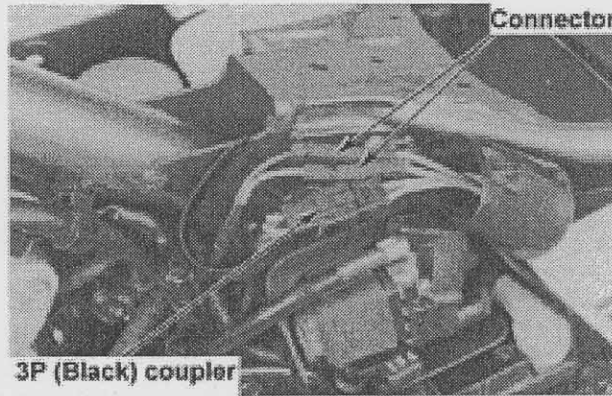
Measure the following items between the alternator, regulator/rectifier wire harness end coupler, and connector.



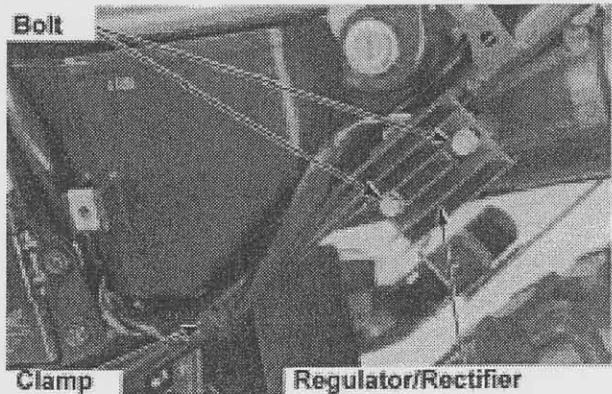
3P (Black)



Connector



Bolt



Clamp

Regulator/Rectifier

Item	Judgement
Battery lead (Red/White)	Battery voltage between Red/White (+) and Green (-)
Ground Earth (Green)	Conduction between Green and body earth.
Charging Coil (Yellow)	Resistance between Yellow terminals 0.1 ~ 1.0 Ω (20°C)

If the charging coil leads are faulty, inspect the alternator.

- **Removal / Installation**

Remove the side cover (2-2)

Remove the fuel tank (2-10)

Remove the rear cowl (2-3)

Disconnect alternator 3P (black) coupler and regulator/rectifier connector.

Detach the wire harness from the clamp.
Unscrew bolts to remove the regulate/rectifier.

Follow the above procedure in reverse order to install.

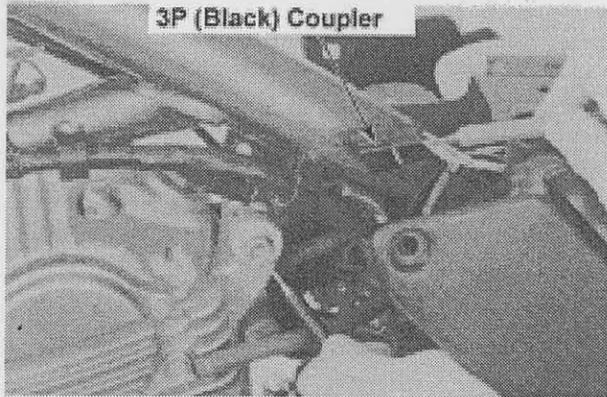
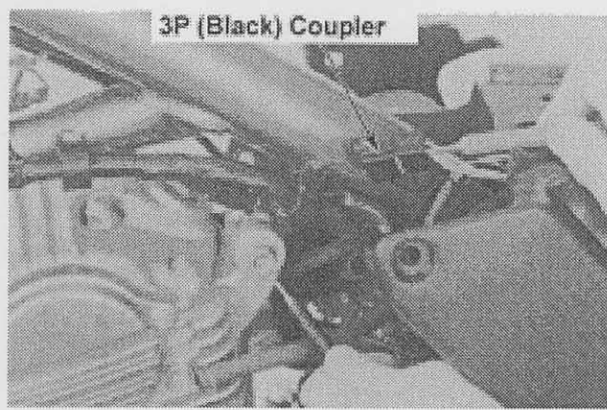
- Alternator
- Inspection

Note:
The alternator need not be removed from the frame.

Remove the battery case (14-6).
Disconnect alternator 3P (black) coupler.
Measure the resistance between the yellow terminals of the coupler on engine end.

Standard: 0.1 ~ 1.0Ω (20°C)

Replace the stator if the resistance is out of the above range.
Check there is no conduction between the yellow terminal on the engine end coupler and the body earth.
Replace the stator if the conduction exists.



- **Left crankcase cover removal**

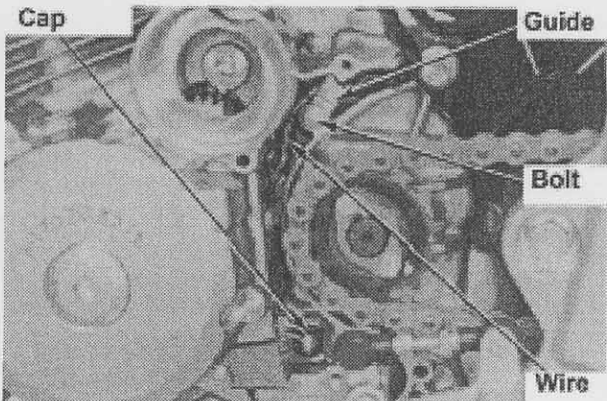
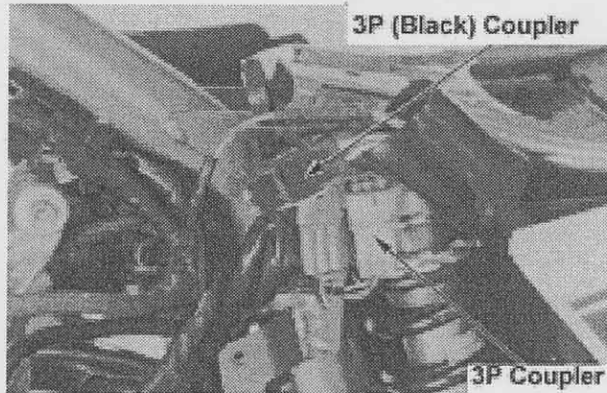
Note:
Refer to Sec. 16 for flywheel removal / installation.

Remove left side cover (2-2).
Remove skid plate (2-5).
Remove drive sprocket cover (6-2).
Remove battery case (14-6).

Disconnect a pulse generator / neutral switch 3P coupler and alternator 3P (black) coupler.

Remove a neutral switch cap and disconnect wire from the neutral switch.

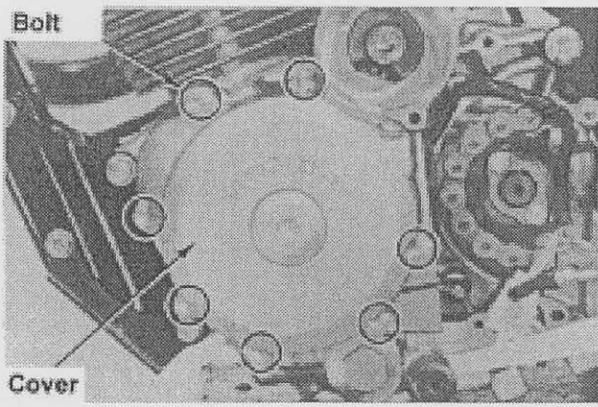
Unscrew a bolt to remove a cable guide.



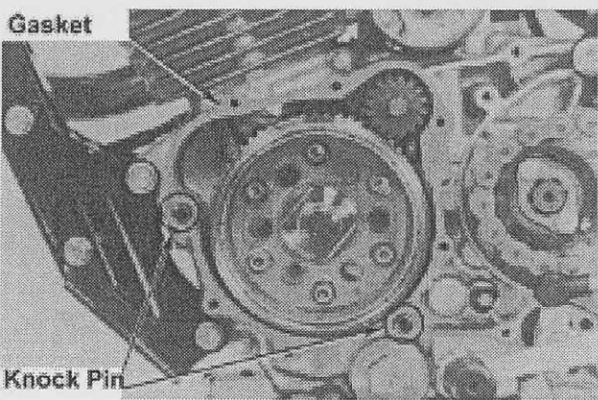
Place an oil pan under the left crankcase cover.

Remove a starter reduction gear cover (16-5).

Unscrew left crankcase cover bolts to remove the cover.

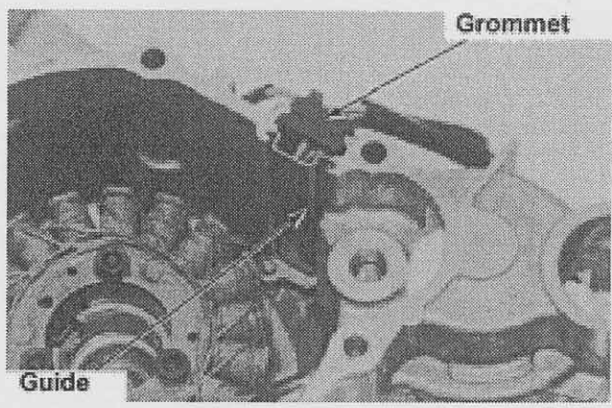


Remove a gasket and knock pins.
Remove / install flywheel and starter clutch.

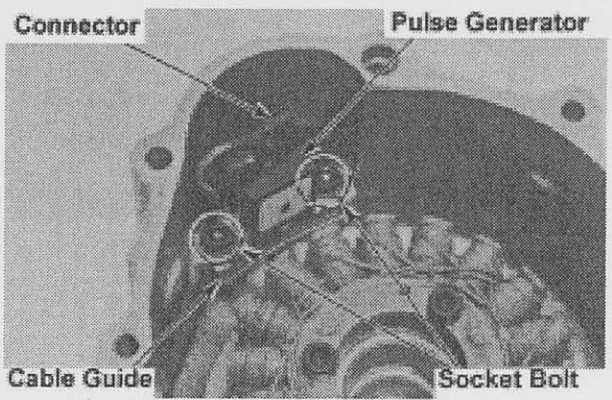


• **Stator and pulse generator removal**

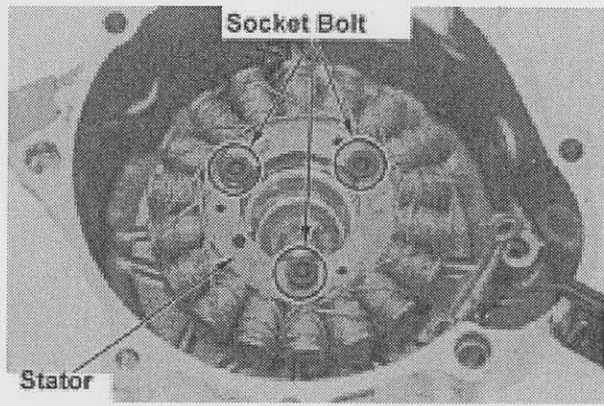
Remove the cable guide and a stator grommet from a left crankcase cover.
Disconnect the connector.



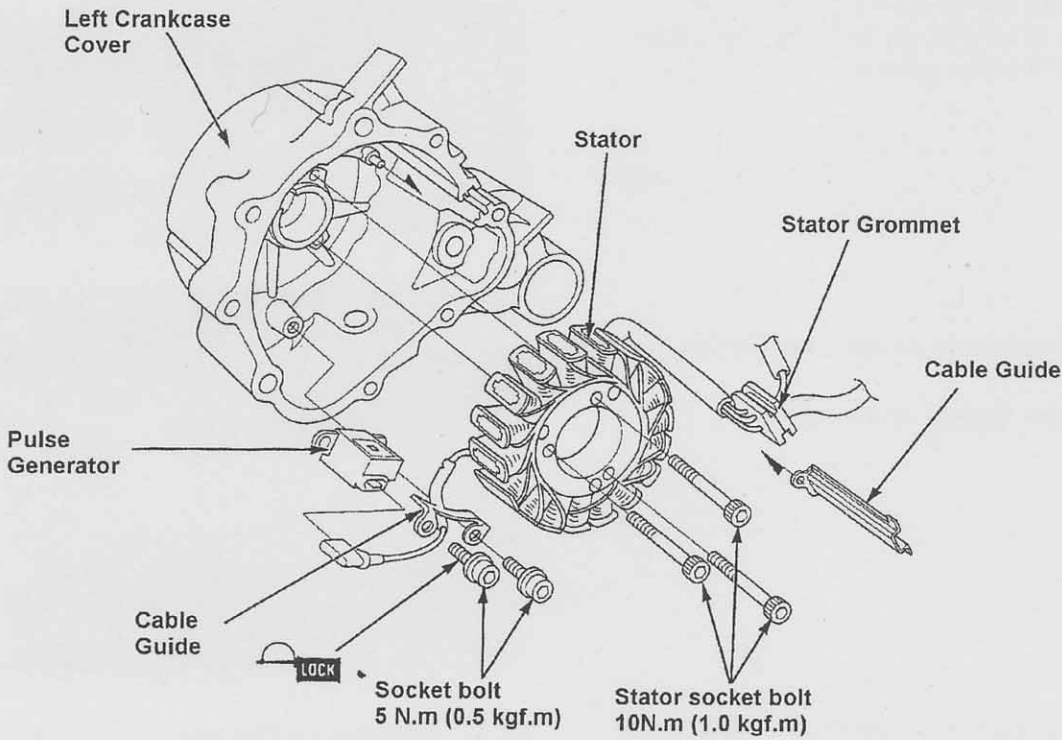
Disconnect the connector.
Unscrew the pulse generator socket bolts and remove a cable guide and the pulse generator.



Unscrew socket bolts and remove the stator.

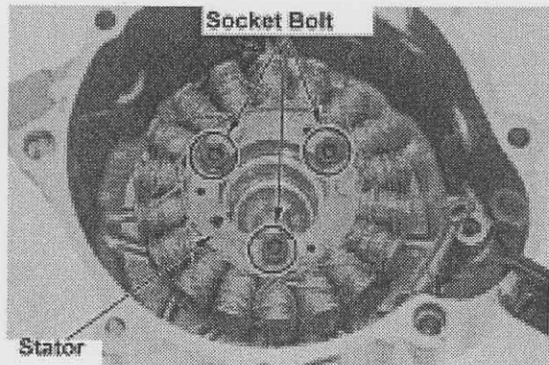


• Stator and pulse generator installation



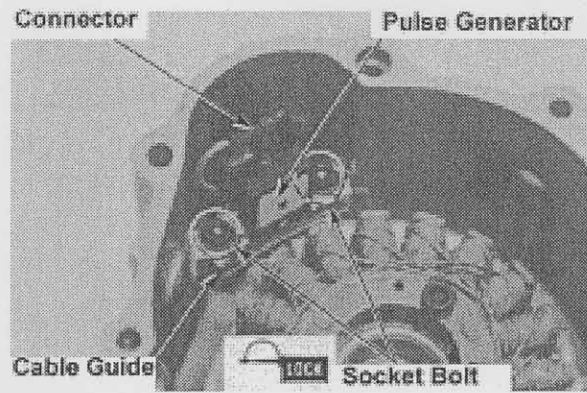
Install the stator to the left crankcase cover. Do not catch the cables between them. Screw the stator socket bolt.

Torque: 10N.m (1.0kgf-m)

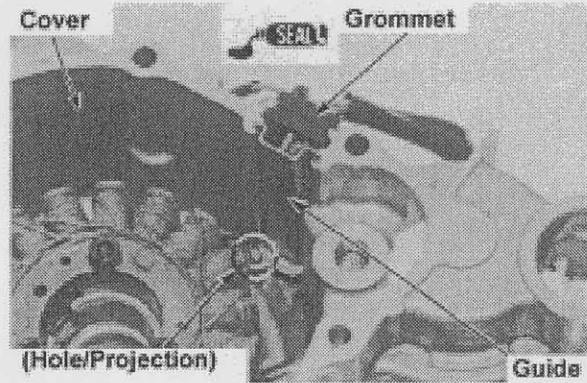


Connect the pulse generator connector.
Clean the pulse generator socket bolt and apply screw locker.
Install the pulse generator and cable guide.
Tighten the bolts.

Torque: 5N.m (0.5kgf-m)

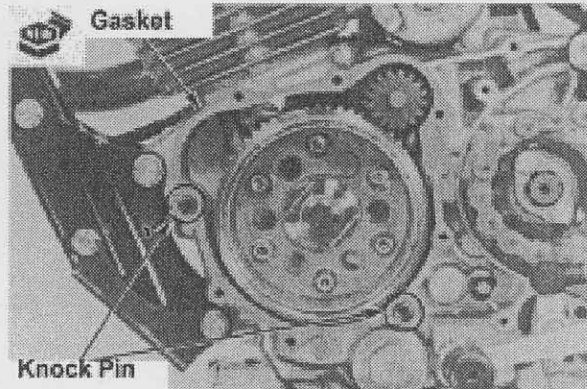


Apply sealant to the stator grommet half-round part and install it to the left crankcase cover.
Set the hole on the cable guide to the projection on the cover to install the cable guide to the cover groove.

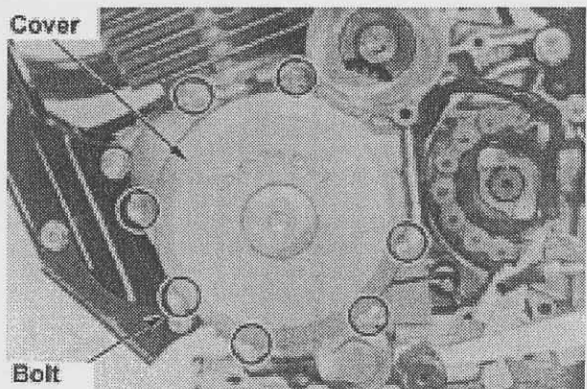


- **Left crankcase cover installation**

Install a new gasket and knock pins.



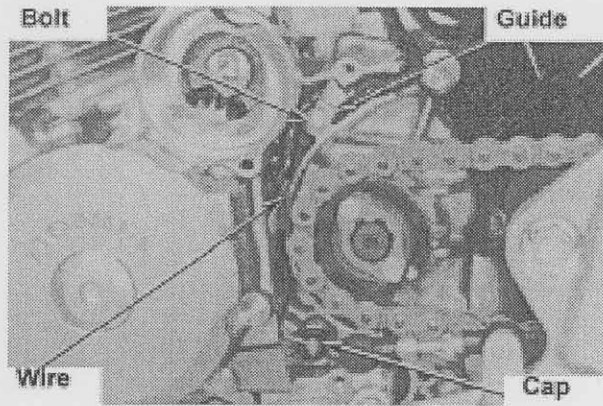
Set the left crankcase cover and tighten the bolts.



Connect the wire to neutral switch and install a neutral switch cap.

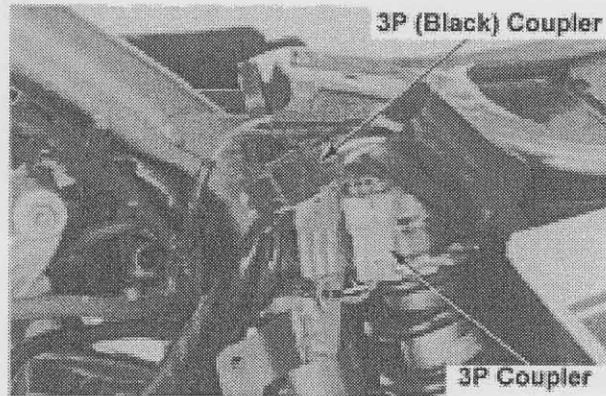
Install the cable guide and tighten the bolt.

Note:
Refer to the routing diagram to route the neutral switch wire (1-21).



Connect alternator 3P (black) coupler.
Connect pulse generator / neutral switch 3P coupler.

Note:
Refer to the routing diagram to place the wires/harnesses.



Install the following items:

- Battery case (14-6)
- Drive sprocket cover (6-6)
- Left side cover (2-2)
- Skid plate (2-5)

Check engine oil level (3-15) and add oil if necessary.