

## **18. STARTING SYSTEM**

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# **18**

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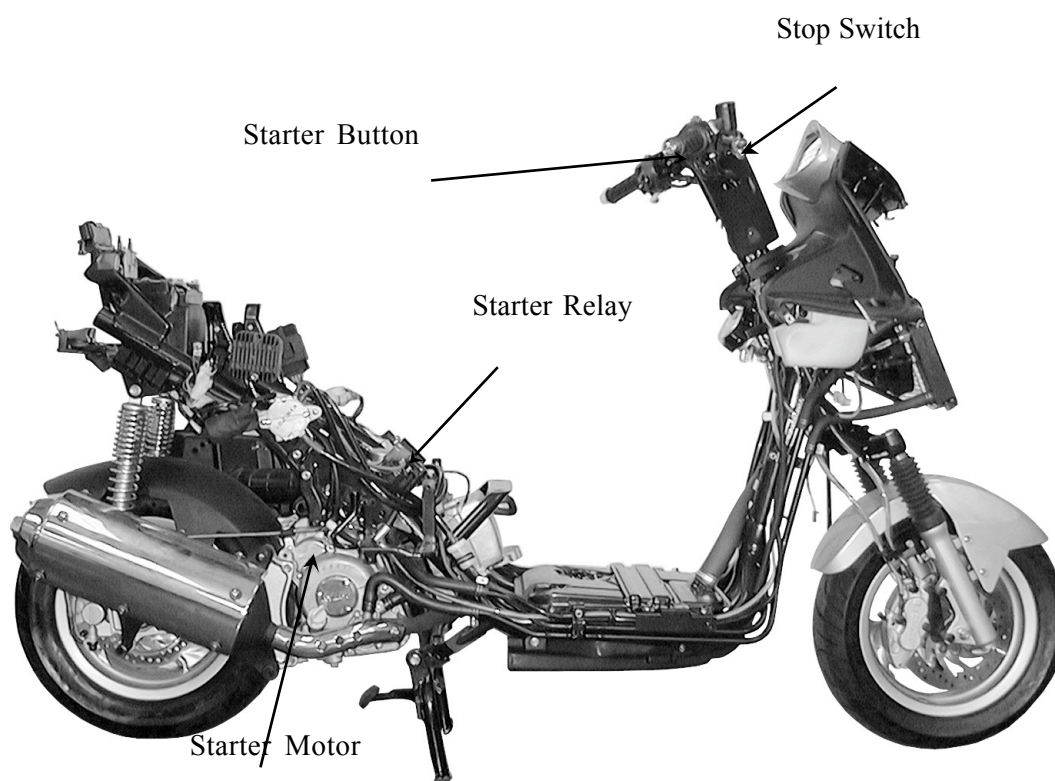
### **STARTING SYSTEM**

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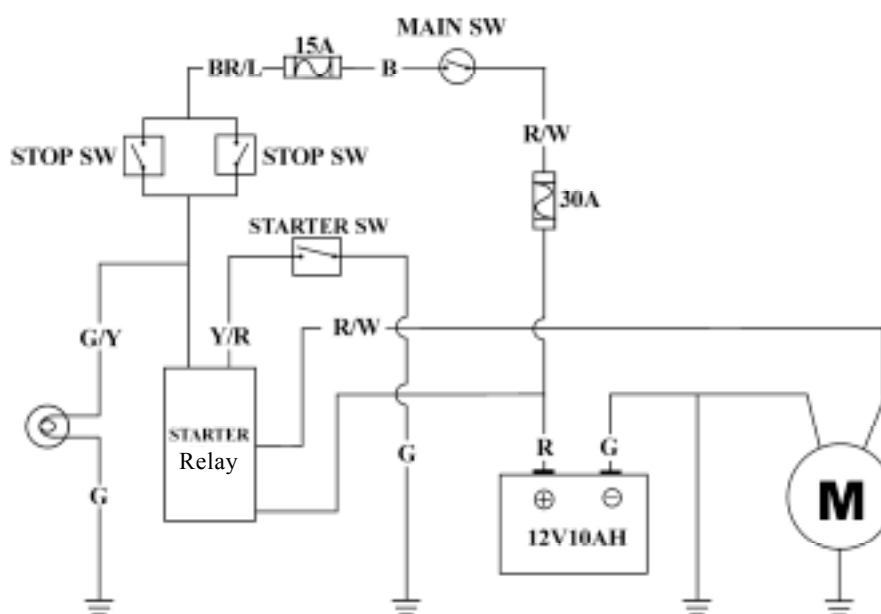
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## 18. STARTING SYSTEM

### STARTING SYSTEM LAYOUT



### STARTING CIRCUIT



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## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- The removal of starter motor can be accomplished with the engine installed.
- For the starter clutch removal, refer to page 10-3.
- After the starter clutch is installed, be sure to add the engine oil and coolant and then bleed air from the cooling system.

### SPECIFICATIONS

Item	Standard (mm)	Service Limit (mm)
Starter motor brush length	12.5mm	8.5mm

### TORQUE VALUES

Starter motor mounting bolt	6.7_	10.8N-m
Starter motor case screw	2.9_	4.9N-m
Starter clutch bolt	9.8_	13.7N-m

### SPECIAL TOOLS

Flywheel holder  
 Flywheel puller

## TROUBLESHOOTING

### Starter motor won't turn

- Fuse burned out
- Weak battery
- Faulty ignition switch
- Faulty starter clutch
- 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 gear

### Starter motor rotates but engine does not start

- Faulty starter pinion
- Starter motor rotates reversely
- Weak battery

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### STARTER MOTOR

#### REMOVAL

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- Before removing the starter motor, turn the ignition switch OFF and remove the battery ground. Then, turn on the ignition switch and push the starter button to see if the starter motor operates properly.

Remove the seat, met-in box and frame center cover. (⇒2-3)  
Remove the waterproof rubber jacket and disconnect the starter motor cable.  
Remove the two starter motor mounting bolts and the motor.

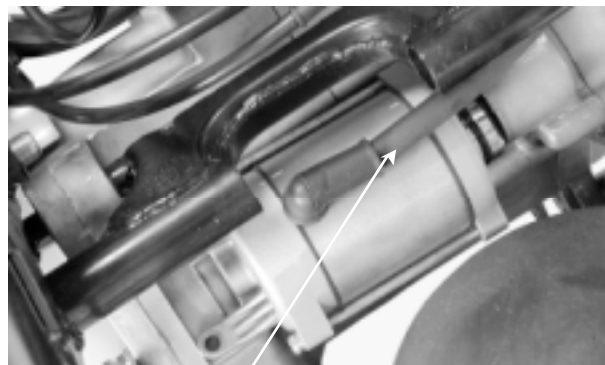
#### DISASSEMBLY

Remove the two starter motor case screws, front cover, rear cover, motor case and other parts.

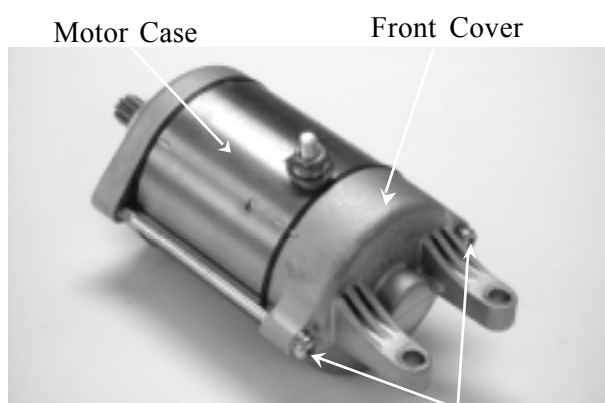
#### INSPECTION

Inspect the removed parts for wear, damage or discoloration. Replace if necessary.  
Clean the commutator if there is metal powder between the segments.

Check for continuity between pairs of the commutator segments and there should be continuity.  
Also, make a continuity check between individual commutator segments and the armature shaft. There should be no continuity.



Starter Motor Cable



Case Screws



Commutator



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### STARTER MOTOR CASE CONTINUITY CHECK

Check to confirm that there is no continuity between the starter motor wire terminal and the motor front cover.

Also check for the continuity between the wire terminal and each brush.

Replace if necessary.



Wire Terminal

Measure the length of the brushes.

**Service Limit:** 8.5mm replace if below



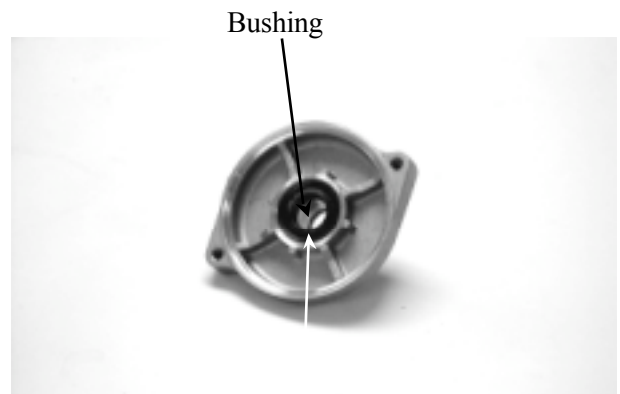
Check for continuity between the brushes. If there is continuity, replace with new ones.



Check if the needle bearing in the front cover turns freely and has no excessive play.

Replace if necessary.

Check the dust seal for wear or damage.



Dust Seal

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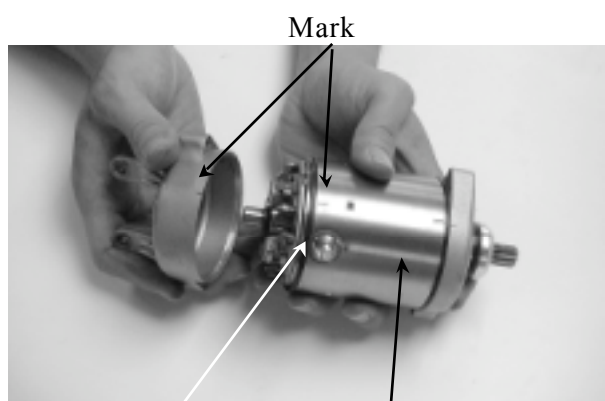
### ASSEMBLY

Apply grease to the dust seal in the front cover.  
Install the brushes onto the brush holders.  
Apply a thin coat of grease to the two ends of the armature shaft.  
Insert the commutator into the front cover.



Motor Case

Install a new O-ring to the front cover.  
Install the starter motor case, aligning the tab on the motor case with the groove on the front cover.  
Tighten the starter motor case screws.

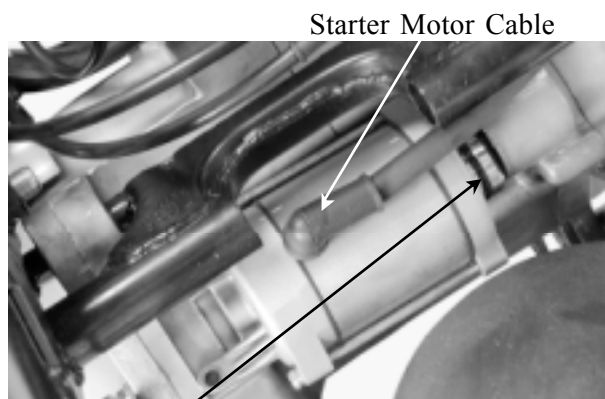


O-ring

Motor Case

### INSTALLATION

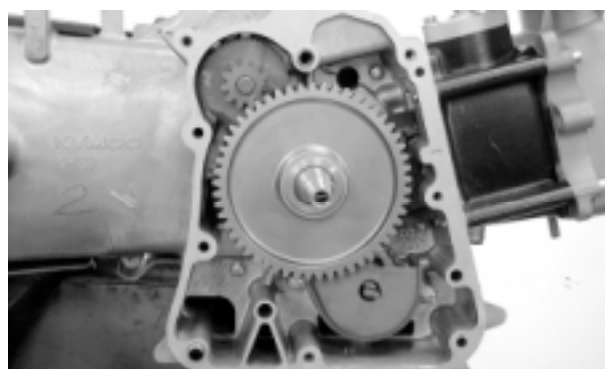
Connect the starter motor cable.  
Check the O-ring for wear or damage and replace if necessary.  
Apply grease to the O-ring and install it to the starter motor.  
Tighten the two mounting bolts.



O-ring

### STARTER CLUTCH INSPECTION

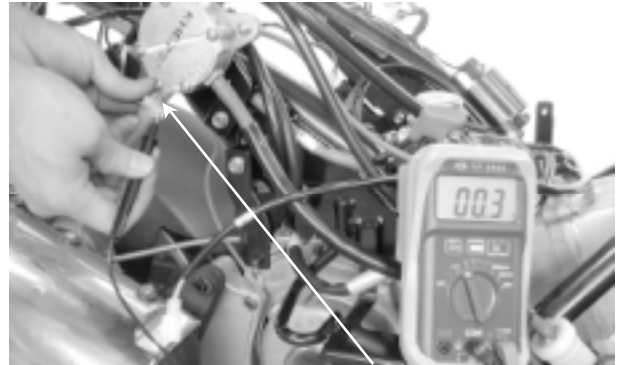
Refer to pages 10-4 and 10-5 for the starter clutch removal, inspection and installation.



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### STARTER RELAY INSPECTION

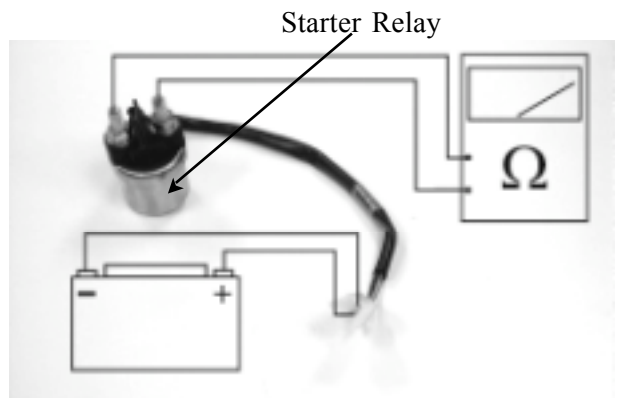
Disconnect the starter relay wire connector.  
Check for continuity between the yellow/red wire terminal and ground.  
There should be continuity when the starter button is depressed.  
If there is no continuity, check the starter button for continuity and inspect the wire.



Yellow/Red Wire

### OPERATION TEST

Connect the electric tester to the starter relay larger terminals that connect to the battery positive cable and the starter motor cable.  
Connect a fully charged battery across the starter relay yellow/red and green/yellow wire terminals.  
Check for continuity between the starter relay large terminals. The relay is normal if there is continuity.



Starter Relay