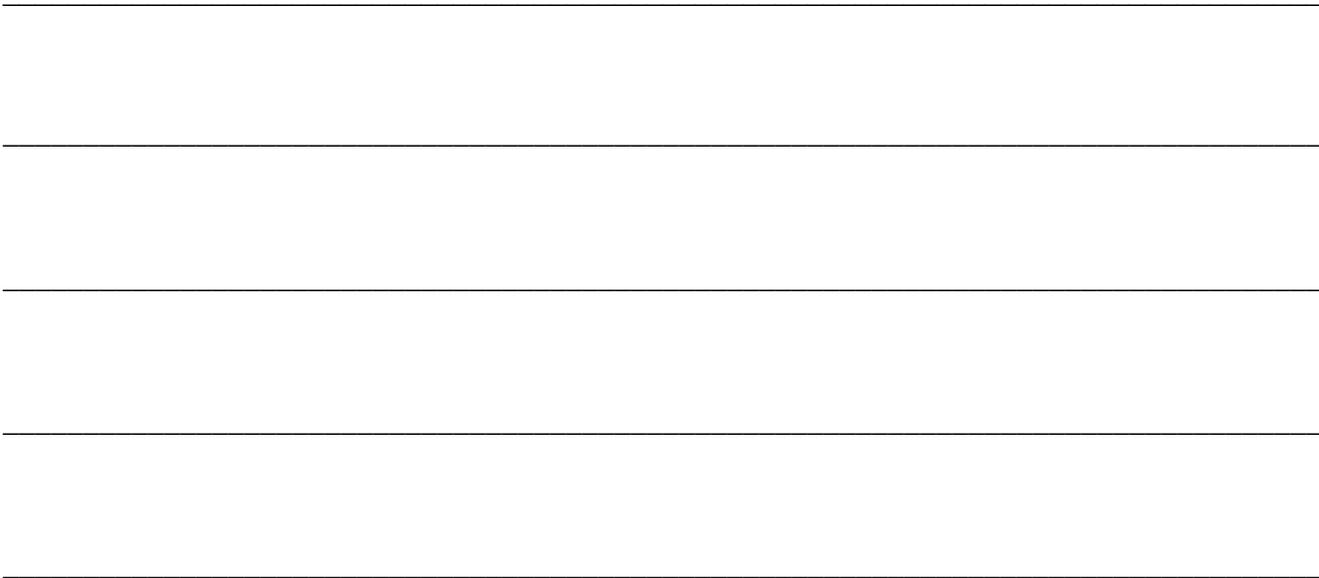


# 18. STARTING SYSTEM

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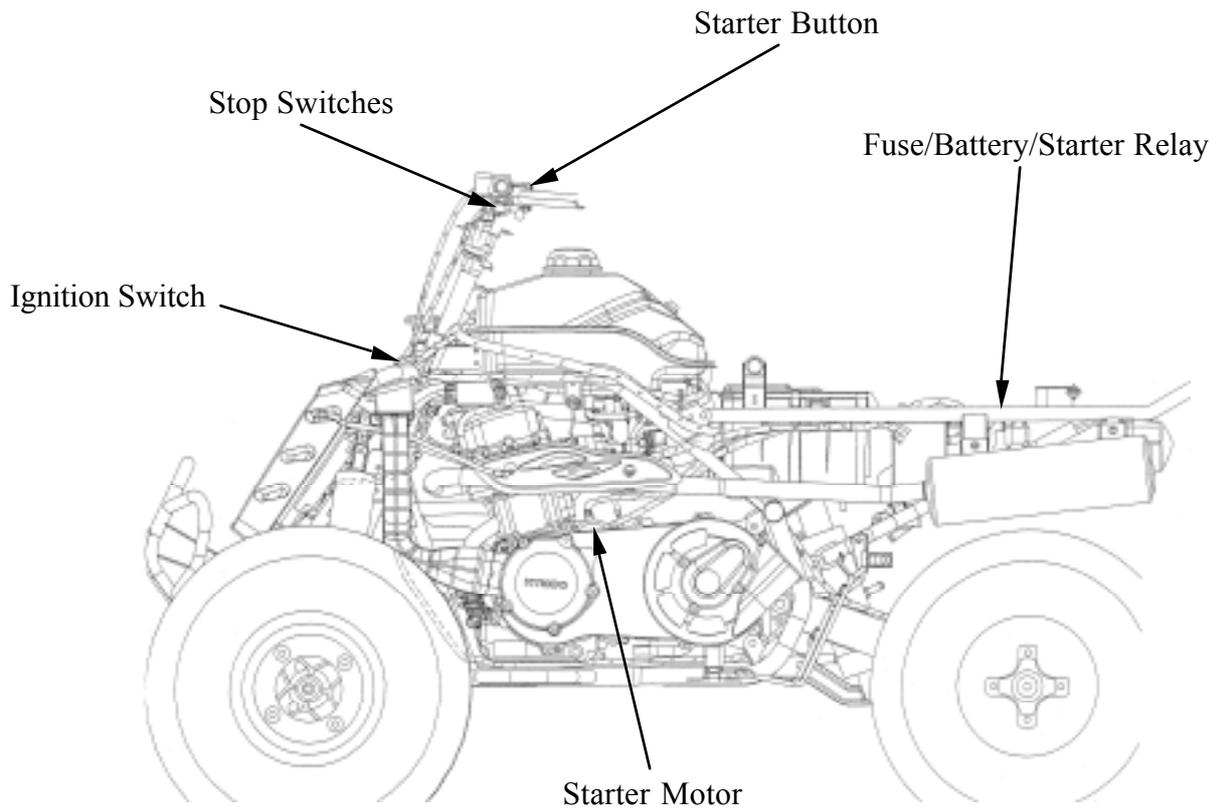
## STARTING SYSTEM

**18**

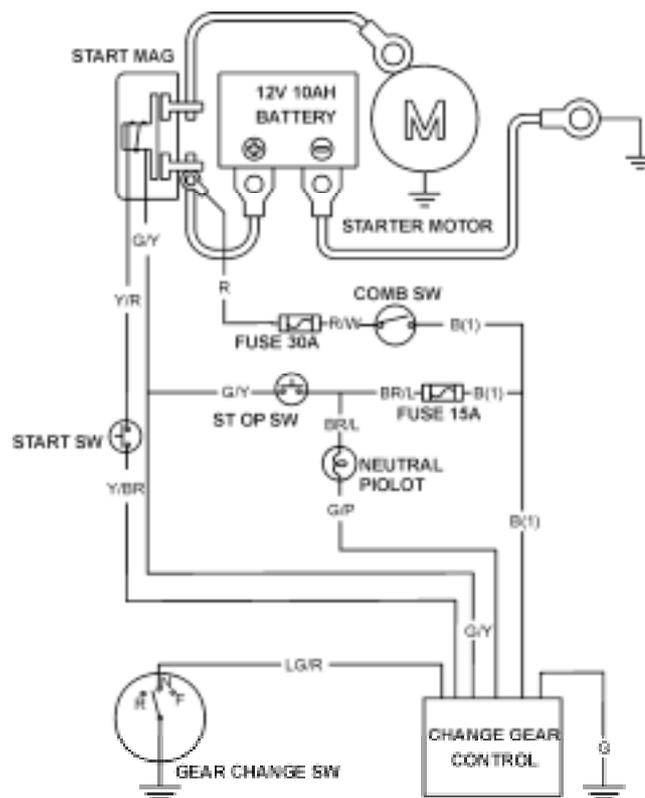
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# 18. STARTING SYSTEM



## STARTING CIRCUIT



# 18. STARTING SYSTEM

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## SERVICE INFORMATION

### GENERAL INSTRUCTIONS

- The removal of starter motor can be accomplished with the engine installed.

## 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
- Faulty change gear control unit

### **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 clutch
- Starter motor rotates reversely
- Weak battery

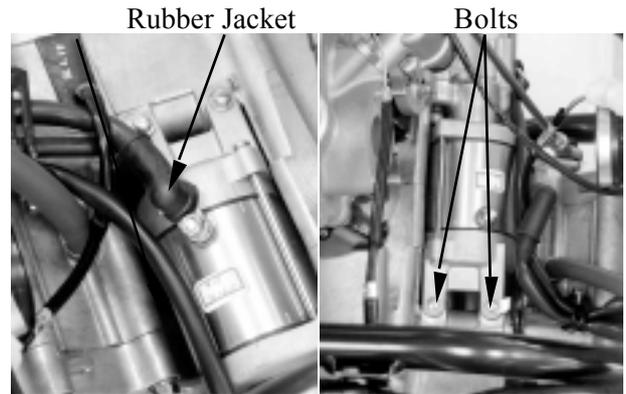
# 18. STARTING SYSTEM

## STARTER MOTOR

### REMOVAL

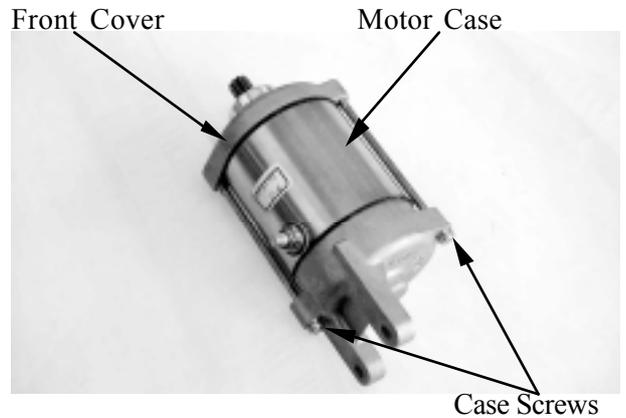
⚠ Before removing the starter motor, turn the ignition switch OFF and remove the battery ground. Then, turn on the ignition switch and push the starter button to see if the starter motor operates properly.

Remove the waterproof rubber jacket and remove nut to disconnect the starter motor cable connector.  
 Remove the two starter motor mounting bolts and the motor.



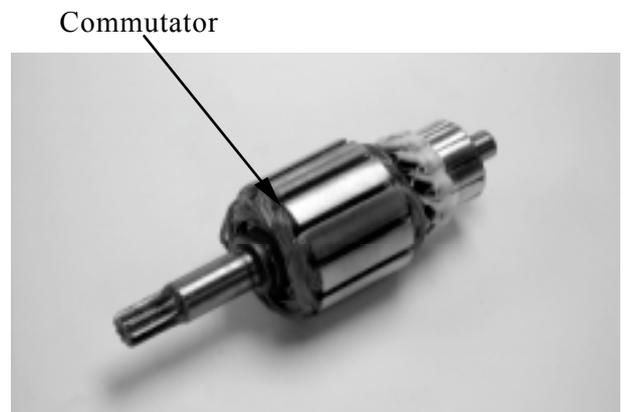
### DISASSEMBLY

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

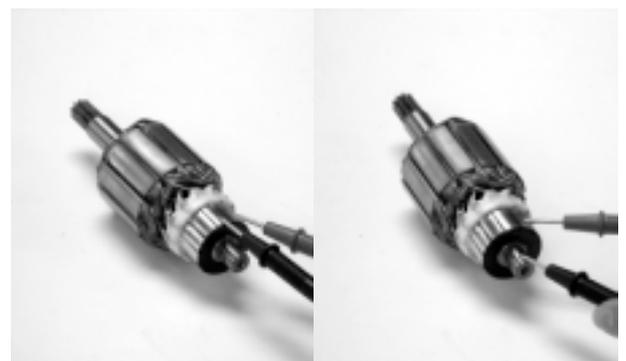


### INSPECTION

Inspect the removed parts for wear, damage or discoloration and 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.



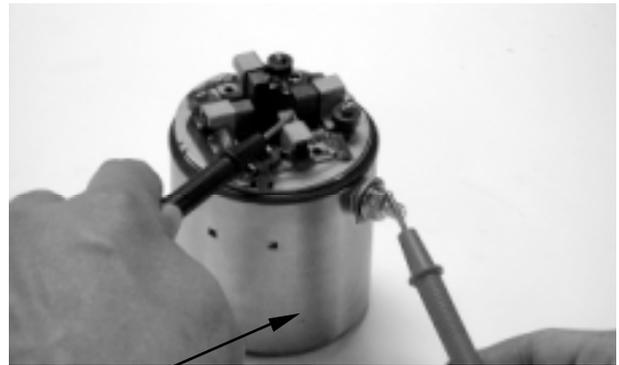
## 18. STARTING SYSTEM

### 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.

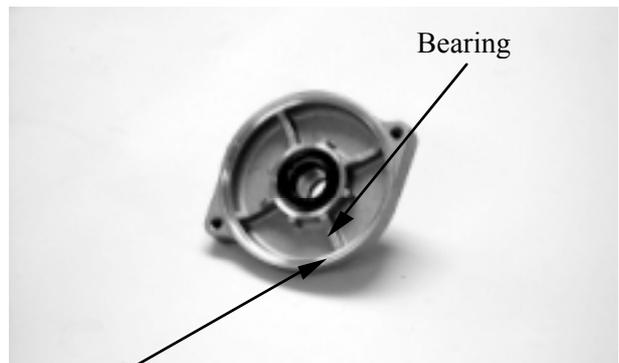
**Service Limit:** 8.5mm replace if below



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

Bearing

# 18. STARTING SYSTEM

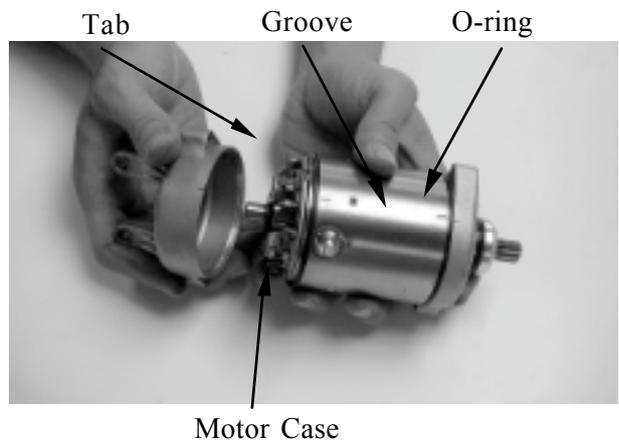
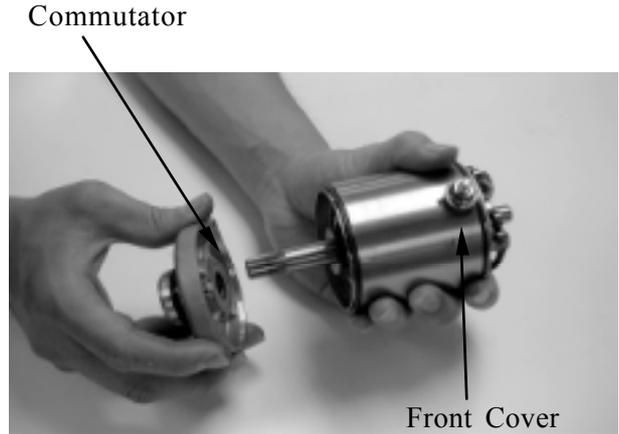
## ASSEMBLY

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.

- **Ⓢ** Be careful not to damage the brush and armature shaft mating surfaces.
- **Ⓢ** When installing the commutator, the armature shaft should not damage the dust seal lip.

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.

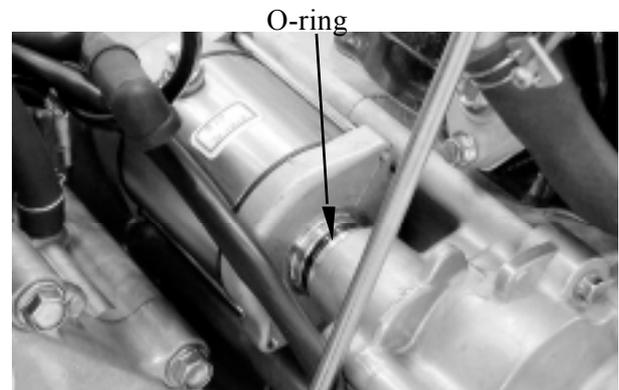
- **Ⓢ** When assembling the front cover and motor case, slightly press down the armature shaft to assemble them.



## STARTER MOTOR INSTALLATION

Connect the starter motor cable connector and properly install the waterproof rubber jacket.  
Check the O-ring for wear or damage and replace if necessary.  
Apply grease to the O-ring and install the starter motor.  
Tighten the two mounting bolts.  
**Torque:** 0.8\_ 1.2kgf-m

- **Ⓢ** The starter motor cable connector must be installed properly.



## 18. STARTING SYSTEM

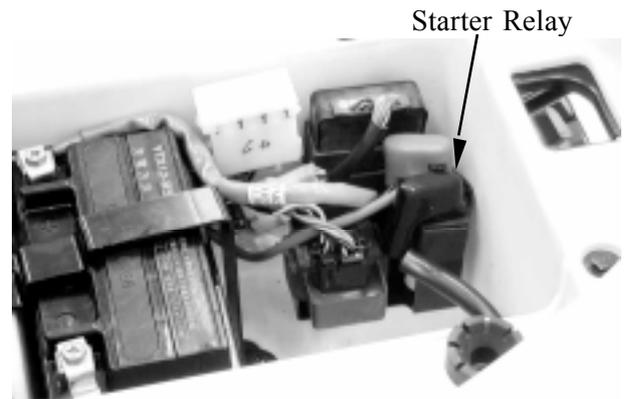
### STARTER RELAY

#### INSPECTION

Remove the seat. (Refer to the chapter 2)  
Turn the ignition switch ON and the starter relay is normal if you hear a click when the starter button is depressed.

If there is no click sound:

- Inspect the starter relay voltage
- Inspect the starter relay ground circuit
- Check for continuity between the starter relay yellow/red and green/red wire terminals



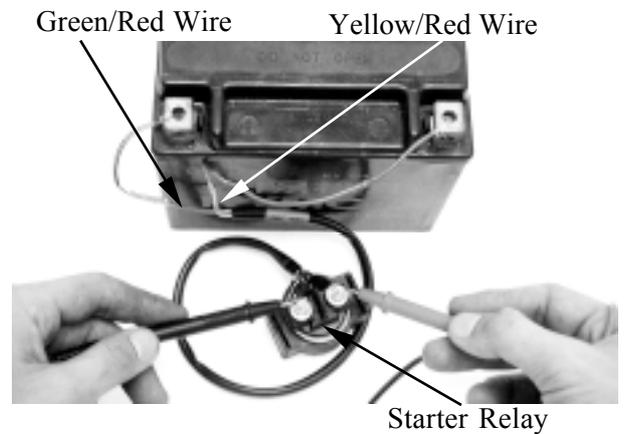
### STARTER RELAY VOLTAGE

#### INSPECTION

Connect a 12V battery across the starter relay yellow/red and green/red wire terminals.

Connect an electric tester between the starter relay large terminals and check for continuity between the two terminals.

The relay is normal if there is continuity.  
Replace the starter relay with a new one if there is no continuity.



## 18. STARTING SYSTEM

### STARTER CLUTCH

#### REMOVAL

Remove the right crankcase cover. (Refer to the “WATER PUMP SHAFT REMOVAL” section in the chapter 12)

Remove the flywheel. (Refer to the “A.C. GENERATOR/FLYWHEEL REMOVAL” section in the chapter 16)

Inspect the starter one-way clutch for wear or damage.

Remove the starter driven gear.



Starter Relay

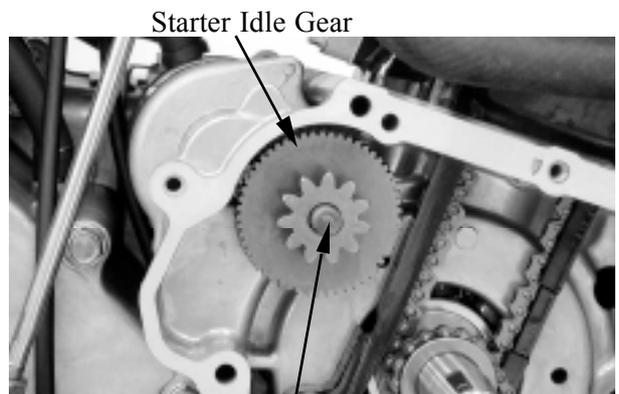


Starter Driven Gear

Inspect the starter driven gear for wear or damage.



Remove the starter idle gear and shaft.

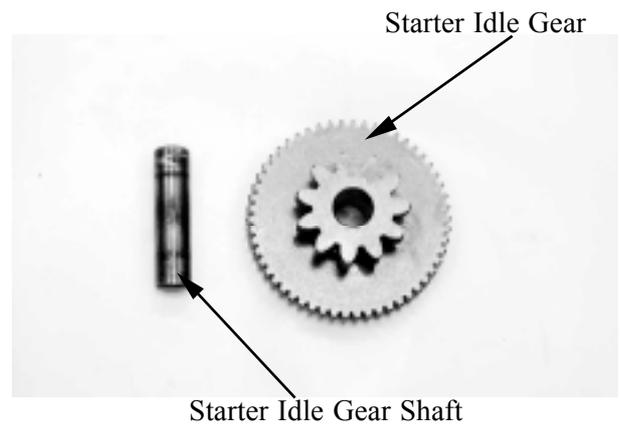


Starter Idle Gear

Starter Idle Gear Shaft

## 18. STARTING SYSTEM

Inspect the starter idle gear and shaft for wear or damage.



### INSTALLATION

Reverse the “REMOVAL” procedures.

Install the starter idle gear and shaft.

Install the starter driven gear.

Install flywheel and right crankcase cover.

(Refer to the “A.C.

GENERATOR/FLYWHEEL

INSTALLATION” section in the chapter

16)