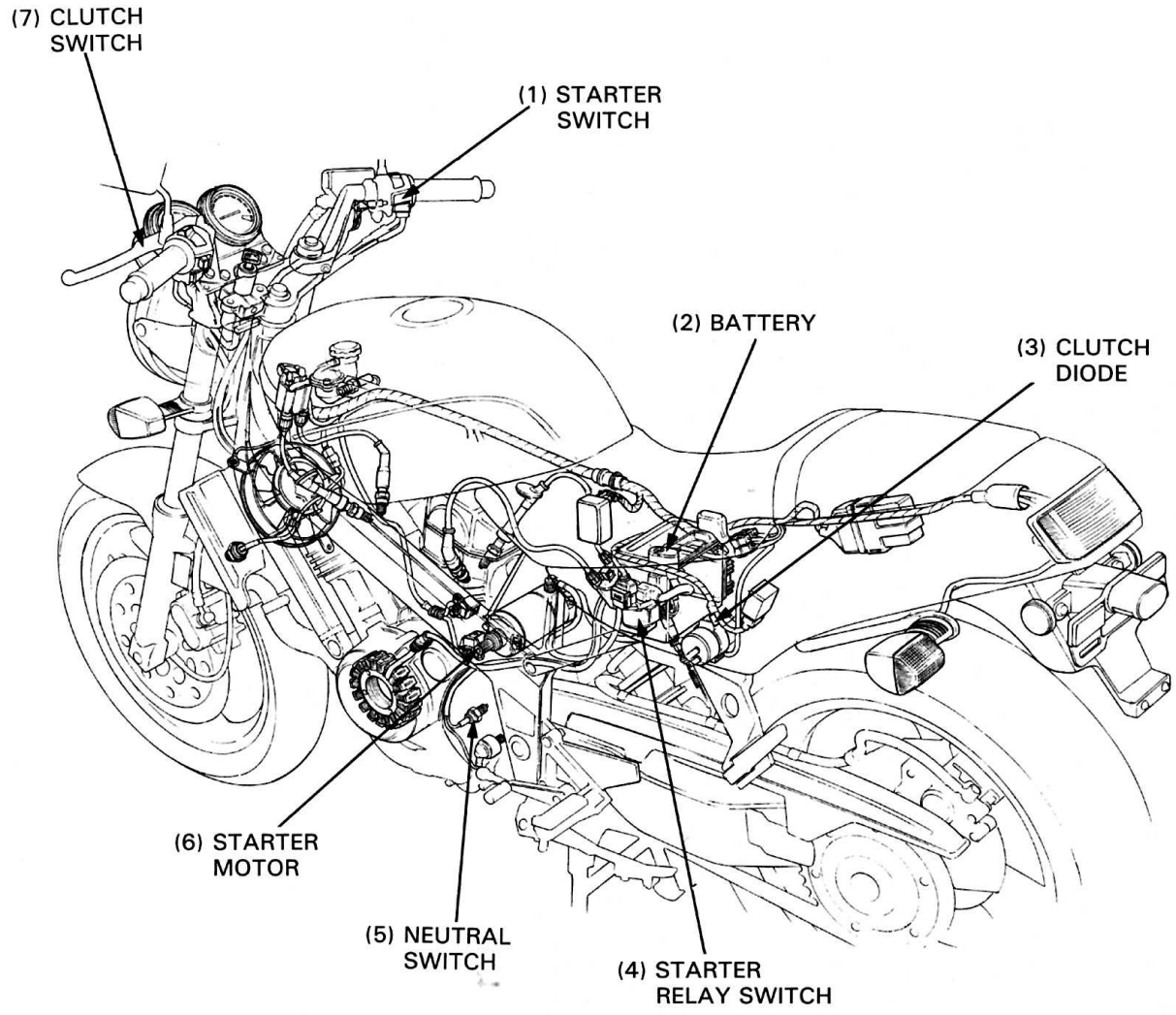
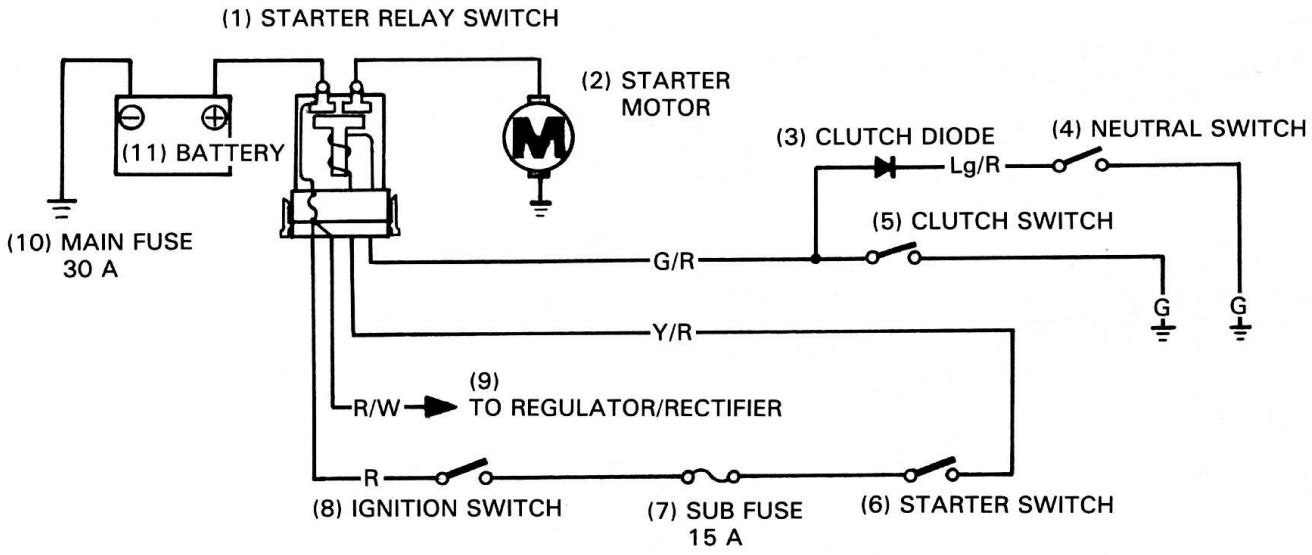

(7) CLUTCH SWITCH
(1) STARTER SWITCH
(2) BATTERY
(3) CLUTCH DIODE
(6) STARTER MOTOR
(5) NEUTRAL SWITCH
(4) STARTER RELAY SWITCH


(1) STARTER RELAY SWITCH
(2) STARTER MOTOR
(11) BATTERY
(3) CLUTCH DIODE
Lg/R
(4) NEUTRAL SWITCH
(5) CLUTCH SWITCH
(10) MAIN FUSE 30 A
G/R
G
G
Y/R
(9) TO REGULATOR/RECTIFIER
R/W
R
(8) IGNITION SWITCH
(7) SUB FUSE 15 A
(6) STARTER SWITCH

17. ELECTRIC STARTER

SERVICE INFORMATION	17-1	STARTER RELAY SWITCH	17-6
TROUBLESHOOTING	17-1	CLUTCH DIODE	17-7
STARTER MOTOR	17-3		

SERVICE INFORMATION

GENERAL

- The starter motor and pulse generator can be removed with the engine in the frame.
- To inspect the pulse generator, refer to Section 16.
- Refer to section 8 for starter clutch removal and installation.

SPECIFICATION

Unit: mm (in)

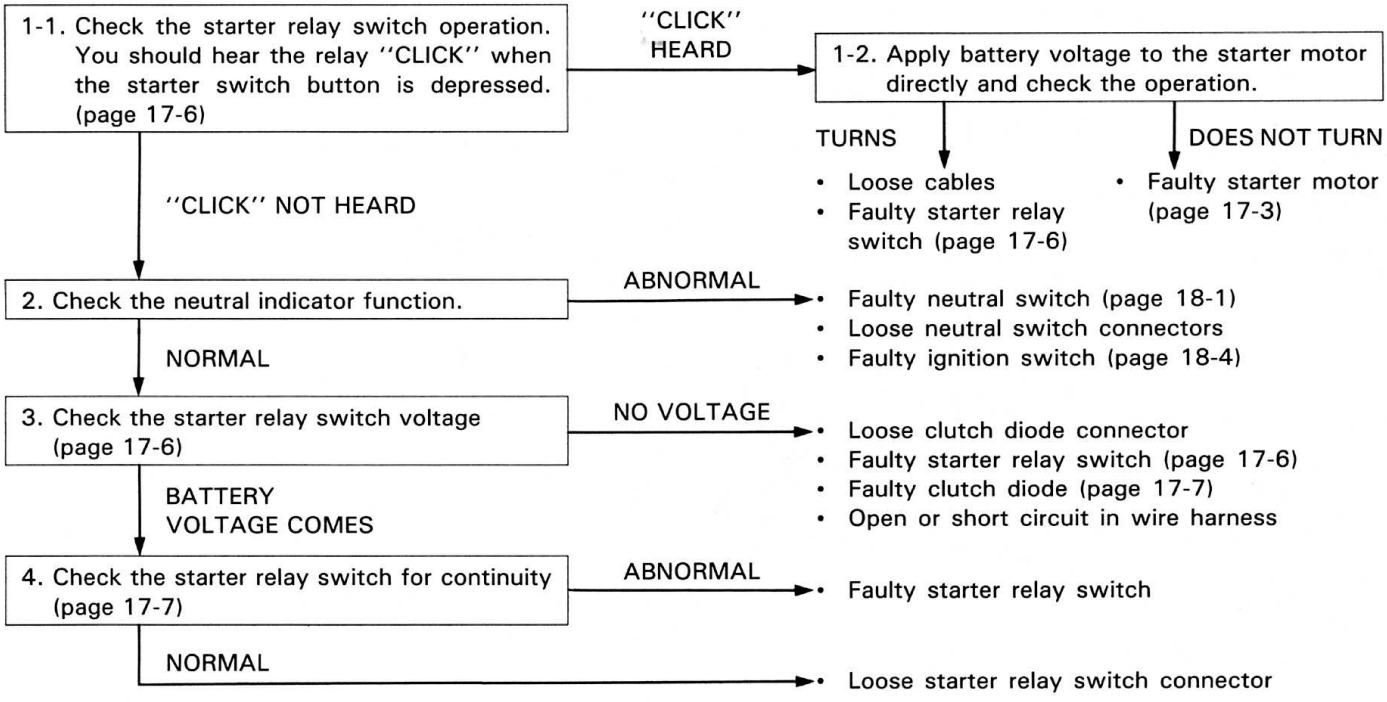
ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.5 (0.49)	6.5 (0.26)

TROUBLESHOOTING

NOTE

- The starter motor should turn when the transmission is in neutral and the clutch is disengaged.
- Check for the following before troubleshooting the system.
  - Blown main (30A) or sub (10A) fuse.
  - Loose battery and starter motor cables.
  - Discharged battery.

Starter motor does not turn



Starter motor turns engine slowly
- Low specific gravity
- Excessive resistance in circuit
- Binding in starter motor

Starter motor turns, but engine does not turn
- Faulty starter clutch
- Faulty starter motor gears

Starter motor and engine turns, but engine does not start
- Faulty ignition system
- Engine problems
  - — Low compression
  - — Fouled spark plugs

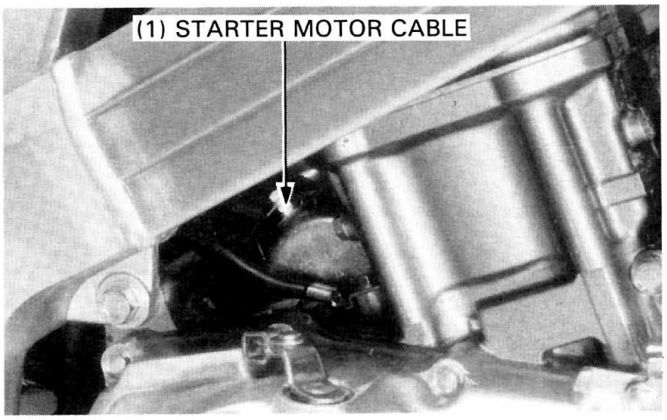
STARTER MOTOR

REMOVAL

⚠ WARNING

- ***With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.***

Remove the rubber cap and disconnect the starter motor cable.
Remove the motor mounting bolts.
Remove the motor from the left side.

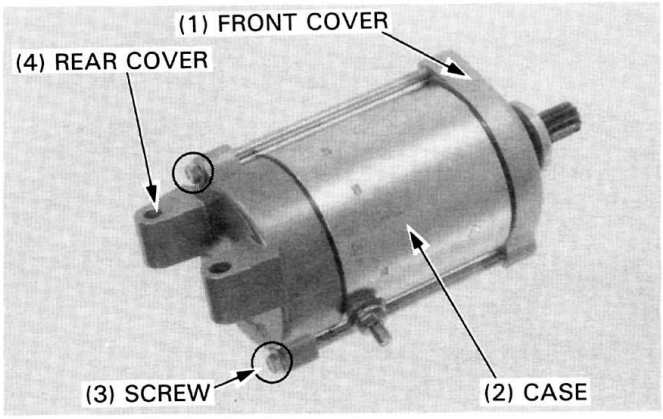


DISASSEMBLY

Remove the following components:
— motor case screws.
— front and rear covers.
— armature.

NOTE

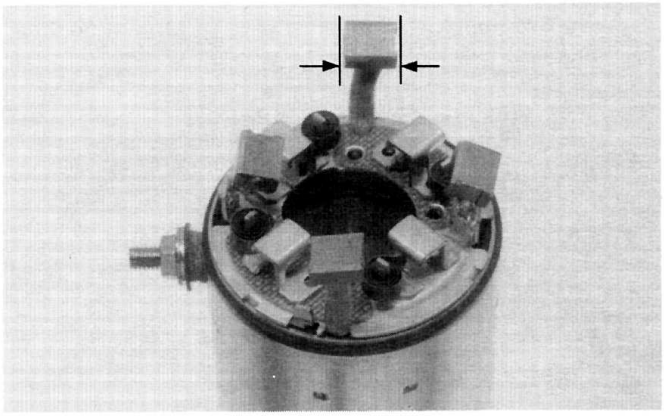
- Record the location and number of shims.



INSPECTION

Measure each brush length.

SERVICE LIMIT: 6.5 mm (0.26 in)

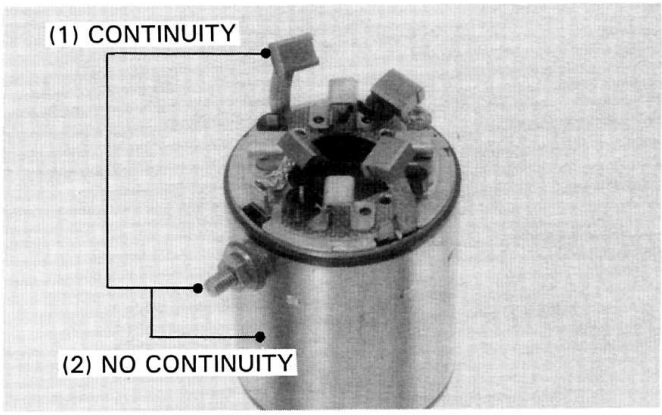


Check for continuity from the cable terminal to the motor case and from the cable terminal to the brush wire (black).

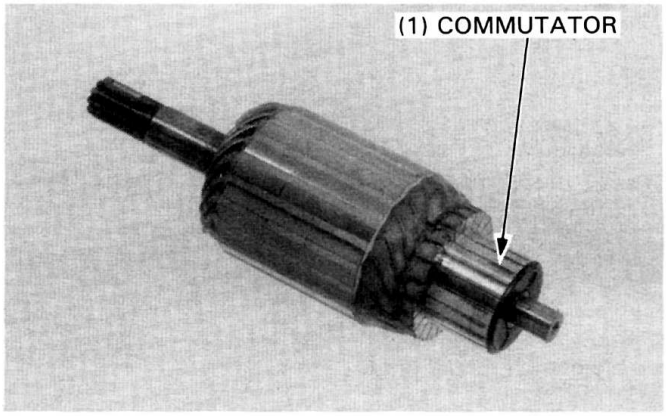
CABLE TERMINAL-MOTOR CASE
NO CONTINUITY: NORMAL

CABLE TERMINAL-BRUSH (BLACK WIRE)
CONTINUITY: NORMAL

Disassemble the brush holder if necessary.

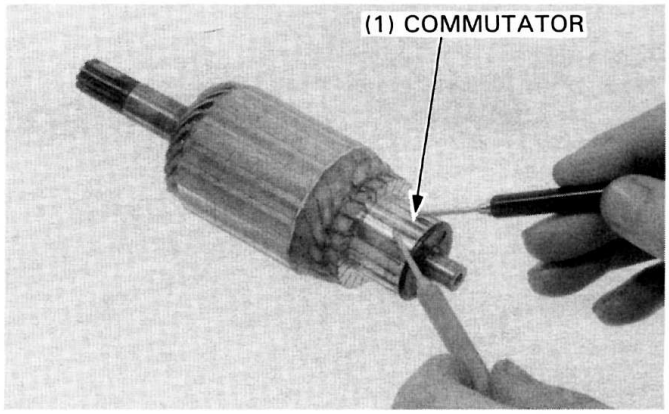


Inspect the commutator bars for discoloration.
Bars discolored in pairs indicate grounded armature coils.



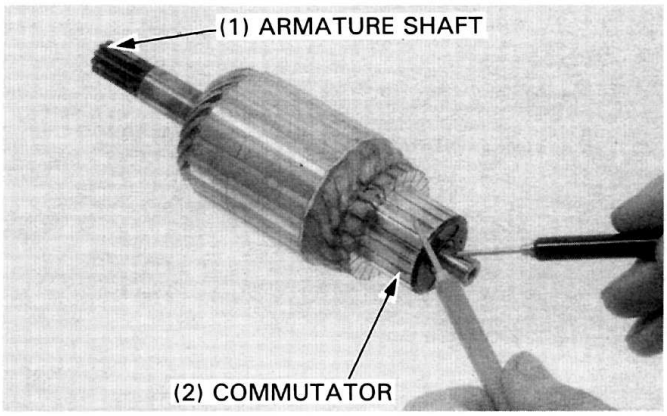
Check for continuity between pairs of commutator bars.

There should be continuity.

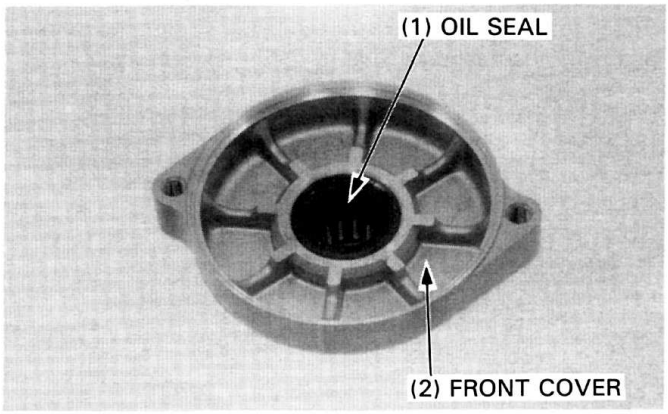


Check for continuity between individual commutator bars and the armature shaft.

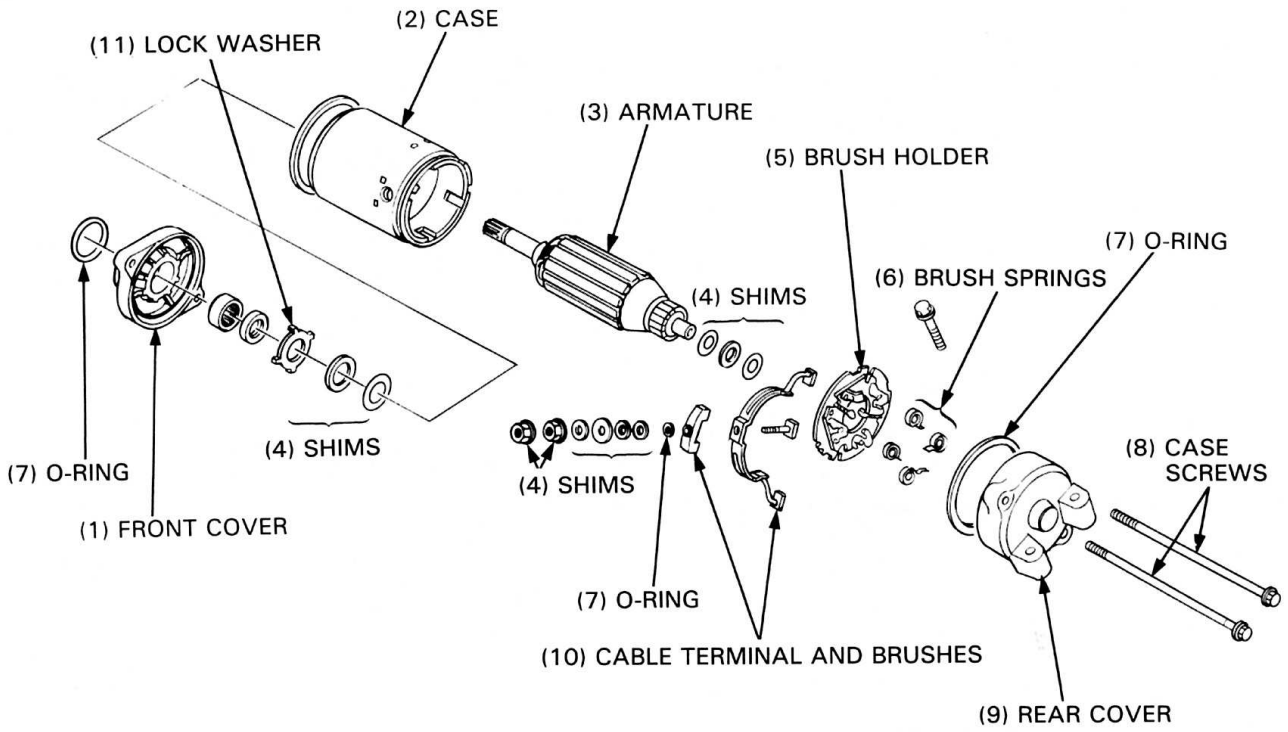
There should be no continuity.



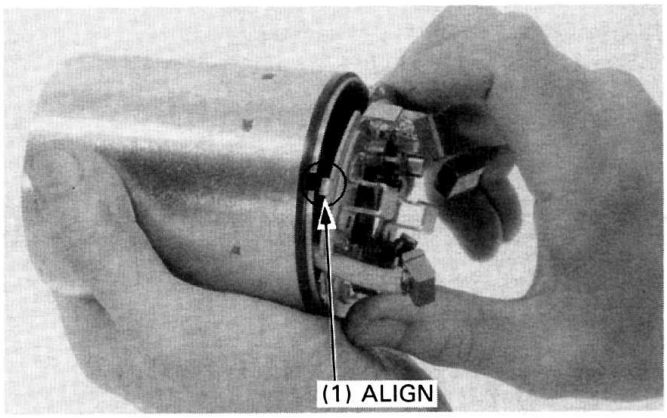
Check the front cover oil seal for wear or fatigue.



ASSEMBLY

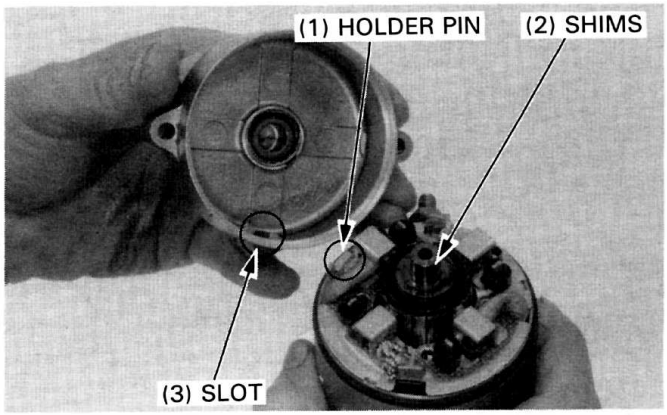


Set the brushes on the brush holder.
Align the starter motor case notch with the brush holder tab.



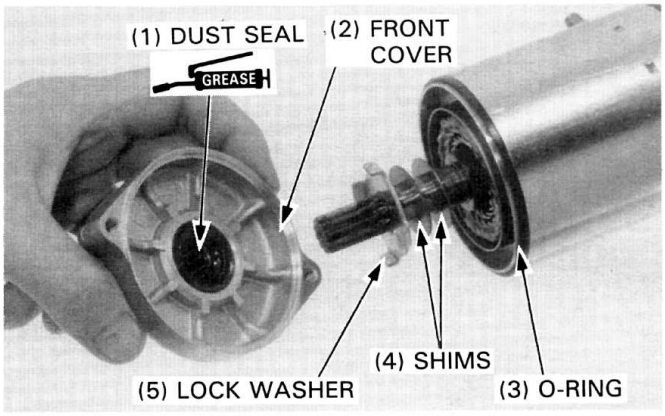
Install the armature in the case.
Set the brush springs.

Install the rear shims in the same location and number as before disassembly.
Install the O-ring on the case.
Install the rear cover, aligning its slot with the brush holder pin.



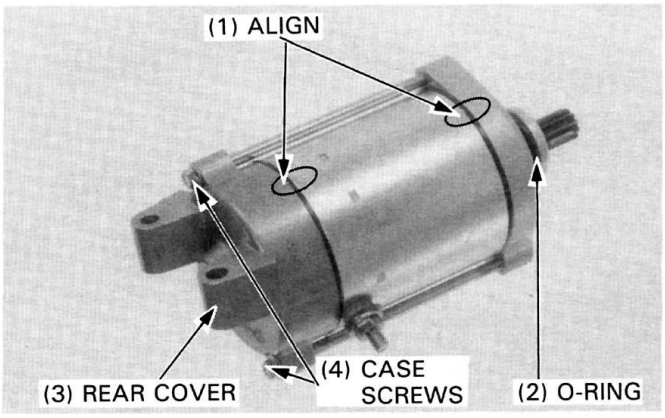
Install the front shims in the same location and number as before disassembly.

Install the O-ring on the case.
Install the lock washer, aligning its tabs with the slots of the front cover.
Apply grease to the dust seal and install the front cover.



Align index marks of the front cover, case and rear cover as shown.

Install and tighten the starter motor case screws and apply oil to the O-ring and install it on the front cover.



INSTALLATION

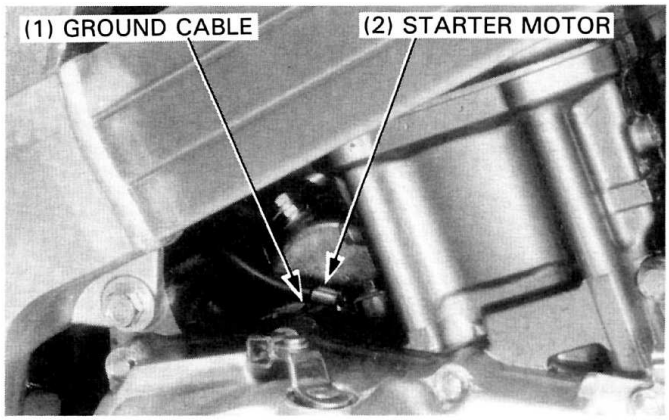
Install the starter motor in the engine.
Install and tighten the motor mounting bolts securely.

NOTE

- Install the ground cable with one mounting bolt as shown.

Connect the motor cable to the motor terminal and install the rubber cap over the terminal.

Connect the battery negative cable.



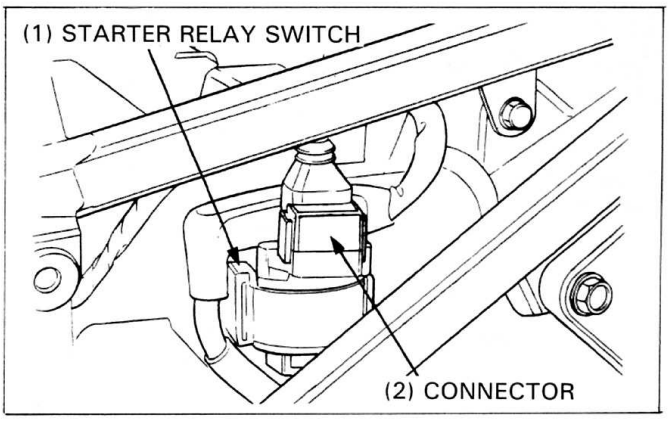
STARTER RELAY SWITCH

OPERATION INSPECTION

Depress the starter switch button with the ignition switch ON. The coil is normal if the starter relay switch clicks.

VOLTAGE INSPECTION

If you don't hear the switch "CLICK", disconnect the switch connector.
Shift the transmission into neutral and turn the ignition switch ON.
Measure the voltage between the Yellow/Red (+) and Green/Red (−) wires of the relay connector as you press the starter. The tester should show battery voltage. If it does not, make the following continuity inspection.

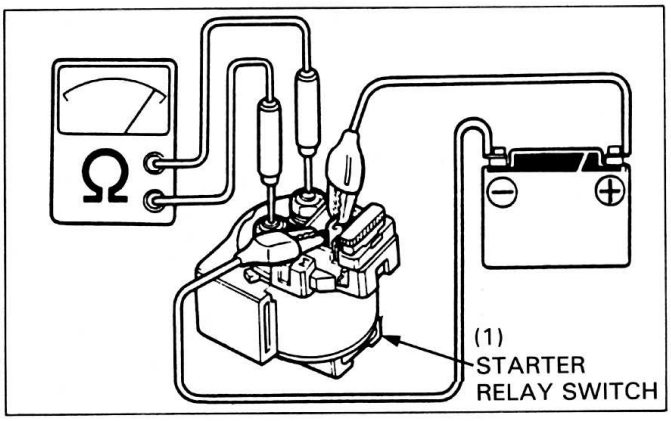


CONTINUITY INSPECTION

Remove the starter relay switch.
Connect an ohmmeter to the switch large terminals.

Connect a fully charged 12 V battery positive wire to the starter relay switch Yellow/Red wire terminal, and the battery negative wire to the Green/Red wire terminal.

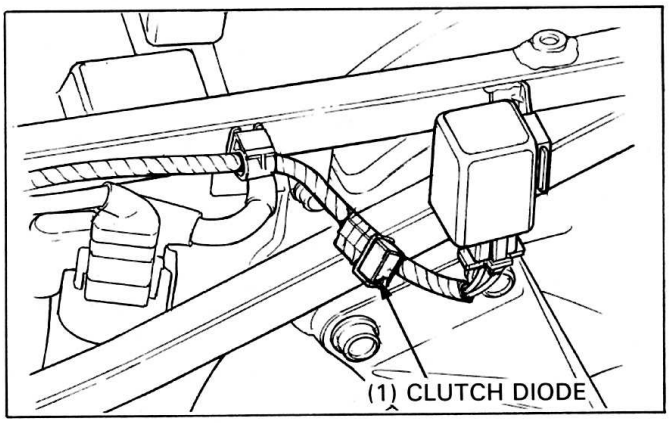
There should be continuity while the battery is connected to the terminals, and no continuity when the battery is disconnected.



CLUTCH DIODE

REMOVAL

Remove the rear cowling (page 13-25).
Remove the clutch diode from the wire harness.



INSPECTION

Check for continuity with an ohmmeter.

Connect the positive probe to the (+) terminal and the negative probe to the (−) terminal of the diode.

There should be continuity, then reverse the probes, there should be no continuity.

NOTE

- The test results shown above are for a positive ground ohmmeter and the opposite results will be obtained when a negative ground ohmmeter is used.