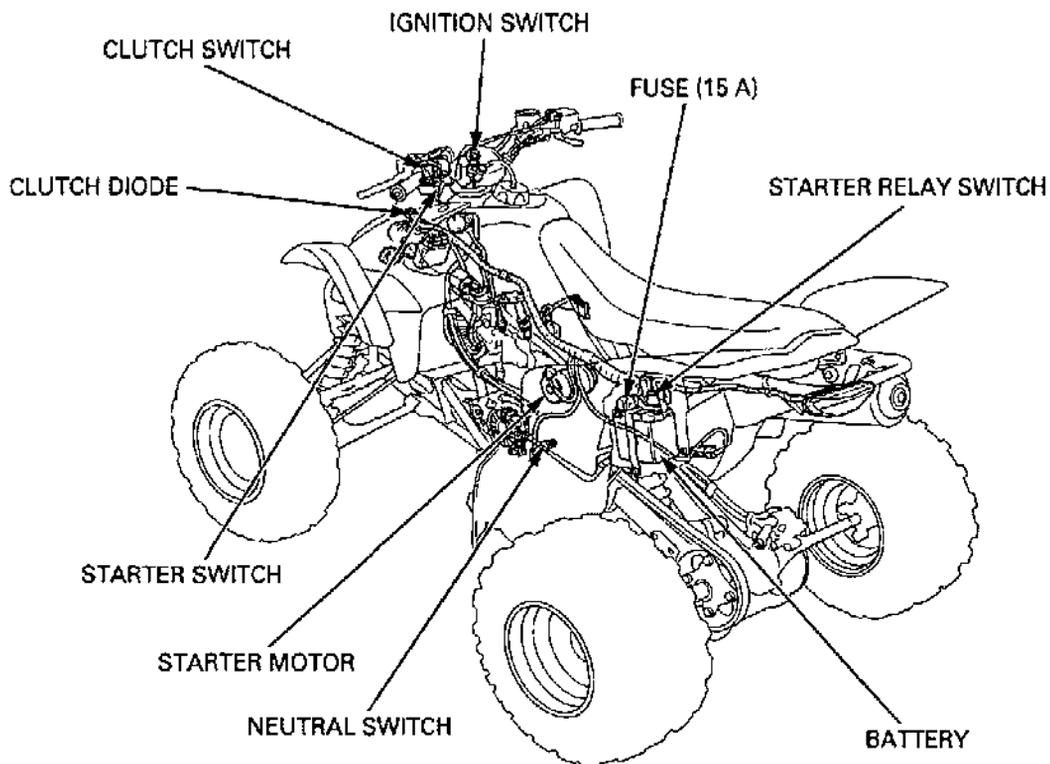


23. ELECTRIC STARTER (TRX450ER)

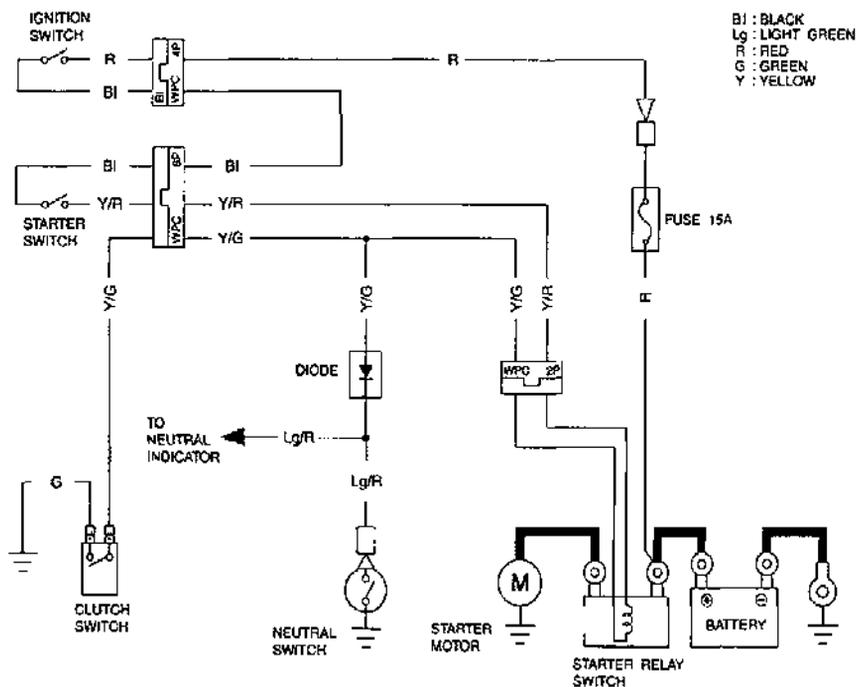
COMPONENT LOCATION	23-2	STARTER MOTOR	23-6
SYSTEM DIAGRAM	23-2	STARTER RELAY SWITCH	23-13
SERVICE INFORMATION	23-3	CLUTCH DIODE	23-14
TROUBLESHOOTING	23-4		

ELECTRIC STARTER (TRX450ER)

COMPONENT LOCATION



SYSTEM DIAGRAM



SERVICE INFORMATION

GENERAL

- Always turn the ignition switch to OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.
- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting (page 23-4).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- For starter clutch service, See page 14-15.
- See section 24 for following component inspections:
 - ignition switch (page 24-7)
 - starter switch (page 24-7)
 - neutral switch (page 24-10)
 - clutch switch (page 24-8)

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	10.25 (0.404)	6.75 (0.266)

TROUBLESHOOTING

NOTE:

- The starter motor should operate when the transmission is in neutral or when the transmission is into gear and the clutch lever is squeezed.

Starter Motor Does Not Turn

1. Fuse Inspection

Check for blown main fuse (15 A).

Is the fuse blown?

YES – Replace the fuse.

NO – GO TO STEP 2.

2. Battery Inspection

Check that the battery is fully charged and in good condition.

Is the battery in good condition?

YES – GO TO STEP 3.

NO – Charge the battery (page 21-7).

3. Starter Relay Switch Operation Inspection

Check the operation of the starter relay switch (page 23-13).

Does the starter relay switch click?

YES – GO TO STEP 4.

NO – GO TO STEP 5.

4. Starter Motor Inspection

Turn the ignition switch to OFF.

Apply battery voltage to the starter motor directly.

Does the starter motor turn?

YES –

- Poorly connected starter motor cable.
- Faulty starter relay switch (page 23-13).

NO – Faulty starter motor (page 23-6).

5. Relay Coil Ground Line Inspection

Turn the ignition switch to OFF.

Check the ground line of the starter relay switch (page 23-13).

Is the ground line normal?

NO –

- Faulty clutch switch (page 24-8).
- Faulty neutral switch (page 24-10).
- Faulty diode (page 23-14).
- Loose or poor contact of the related connector terminal.
- Open circuit in the wire harness.

YES – GO TO STEP 6.

6. Relay Coil Power Input Line Inspection

Check the power input line of the starter relay switch (page 23-13).

Is the power input line normal?

NO –

- Faulty ignition switch (page 24-7).
- Faulty starter switch (page 24-7).
- Loose or poor contact of the related connector terminal.
- Open circuit in the wire harness.

YES – GO TO STEP 7.

7. Starter Relay Switch Inspection

Check the function of the starter relay switch (page 23-13).

Does the starter relay switch function properly?

NO – Faulty starter relay switch.

YES – Loose or poor contact of the starter relay switch connector terminal.

Starter Motor Turns Slowly

- Low battery voltage
- Poorly connected battery cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poorly connected ground cable terminal

Starter Motor Turns, but Engine Does Not Start

- Faulty starter clutch or starter gear train (page 14-15)
- Faulty ignition system (page 22-6)

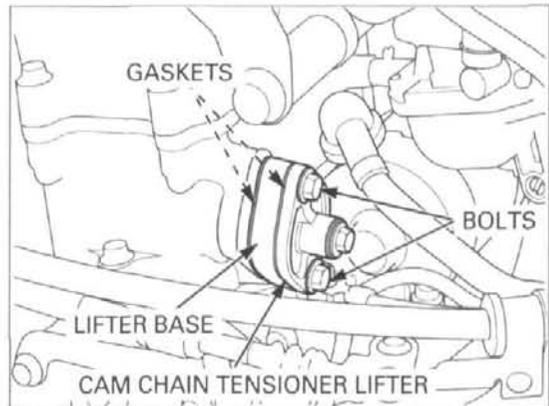
Starter Relay Switch Clicks, but Engine Does Not Turn Over

- Crankshaft does not turn due to engine problems

STARTER MOTOR

REMOVAL

Remove the bolts, cam chain tensioner lifter, lifter base and gaskets.



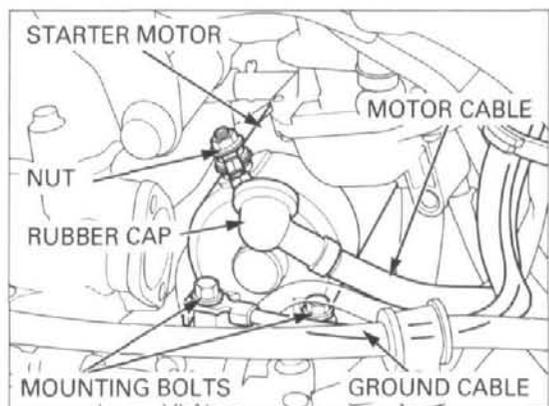
Remove the negative cable at the battery before servicing the starter motor.

Remove the rubber cap from the starter motor terminal.

Remove the nut and disconnect the starter motor cable.

Remove the mounting bolts and ground cable.

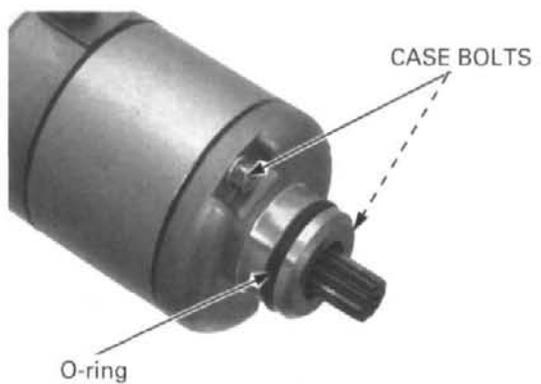
Remove the starter motor from the crankcase.



DISASSEMBLY/INSPECTION

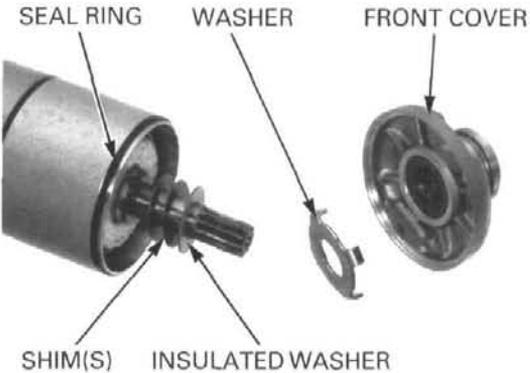
Remove the following:

- O-ring
- two motor case bolts (with the O-rings)

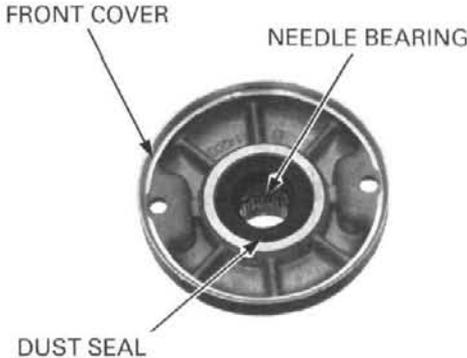


ELECTRIC STARTER (TRX450ER)

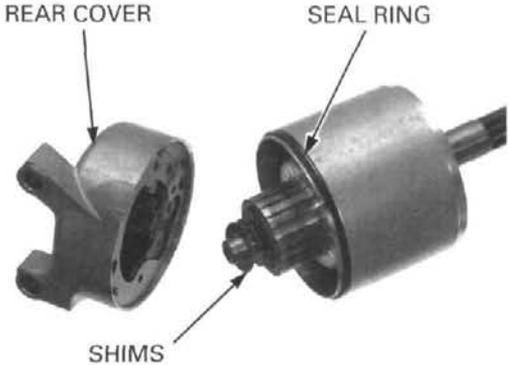
- Record the location and number of shims:
- front cover
 - washer
 - insulated washer
 - shims
 - seal ring



Check the dust seal and needle bearing for wear of damage.
 Replace the front cover if necessary.



- Record the location and number of shims:
- Remove the following:
- rear cover
 - shims
 - seal ring



- armature



ELECTRIC STARTER (TRX450ER)

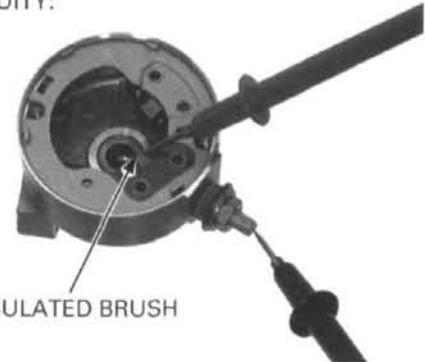
Check the bushing in the rear cover for wear or damage.

BUSHING



Check for continuity between the insulated brush and cable terminal.
There should be continuity.

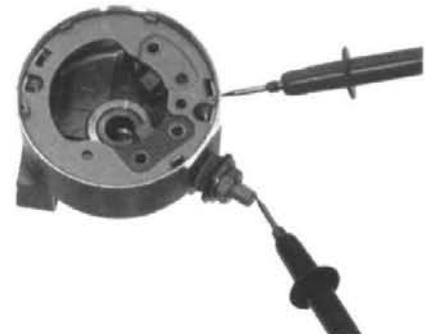
CONTINUITY:



INSULATED BRUSH

Check for continuity between the cable terminal and rear cover.
There should be no continuity.

NO CONTINUITY:



Do not use emery or sand paper on the commutator.

Check the commutator bars of the armature for discoloration.

COMMUTATOR BARS



Check for continuity between pairs of commutator bars.
There should be continuity.

CONTINUITY:



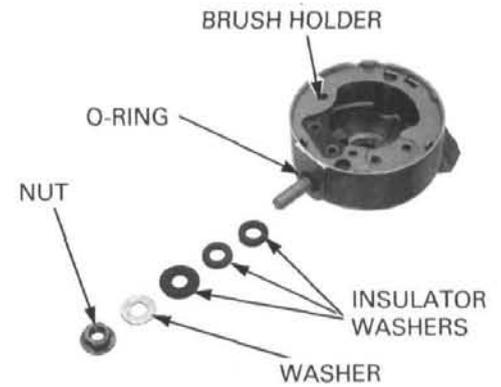
Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.

NO CONTINUITY:



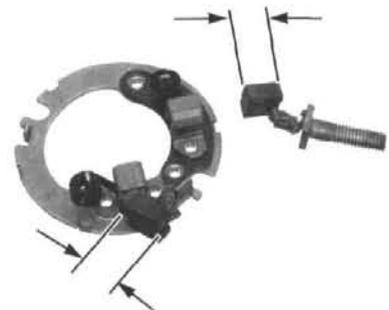
Remove the following:

- nut
- washer
- insulator washers
- brush holder
- O-ring
- brushes



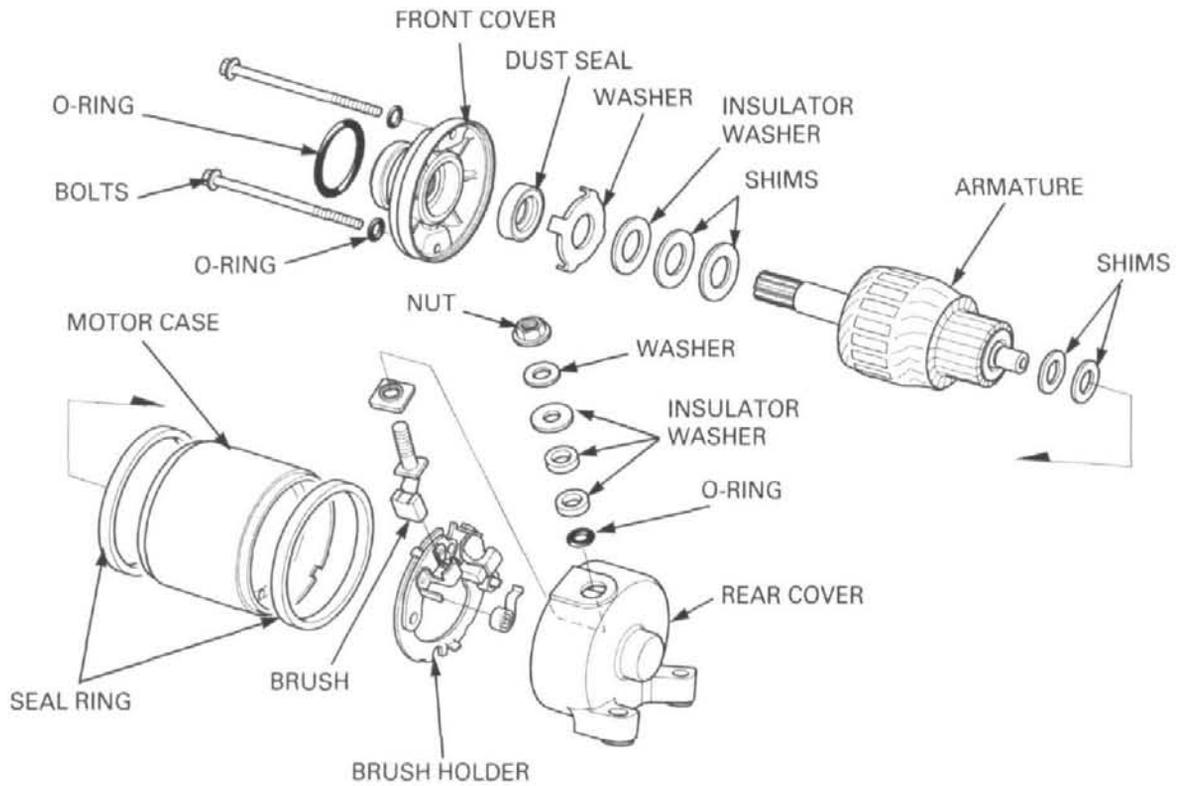
Measure the brush length.

SERVICE LIMIT: 6.75 mm (0.266 in)



ELECTRIC STARTER (TRX450ER)

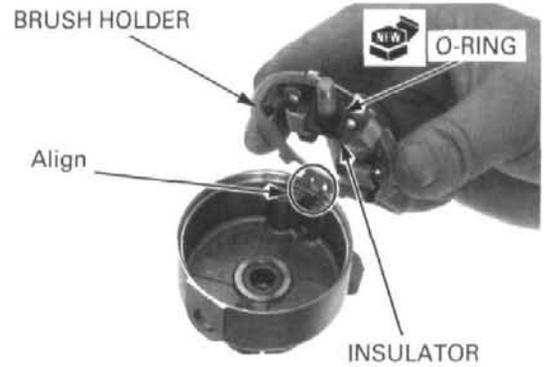
ASSEMBLY



Install the brushes into the brush holder.

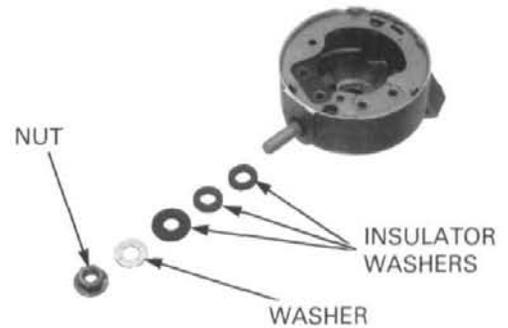
Be careful not to damage the O-ring.

Install the insulator and a new O-ring onto the cable terminal, and the brush holder into the rear cover. Align the holder tab with the case groove.



Install the following and tighten the nut:

- insulator washers
- washer
- nut



NOTICE

The coil may be damaged if the magnet pulls the armature against the case.

With the commutator bar facing the groove in the motor case, install the armature while holding the armature tightly to keep the magnet of the case from pulling the armature against it.

Install the same number of shims in the same locations as noted during disassembly.

Install a new seal ring onto the motor case.

Apply thin coat of grease to the armature shaft end. Install the rear cover while pushing the brushes into the brush holder and aligning the brush holder tab with the case groove (index marks).

Install the same number of shims in the same locations as noted during disassembly.

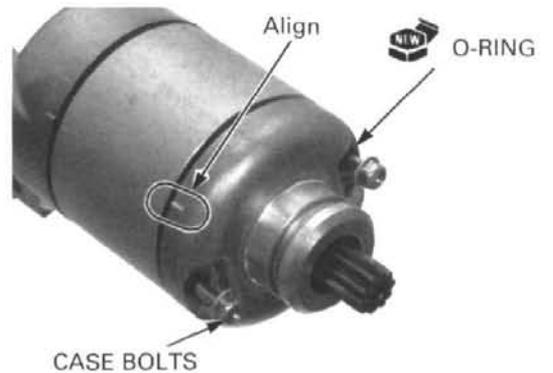
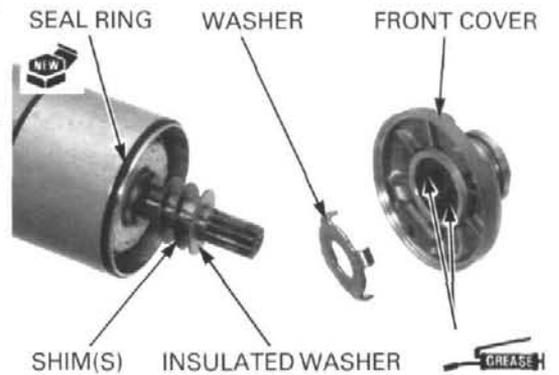
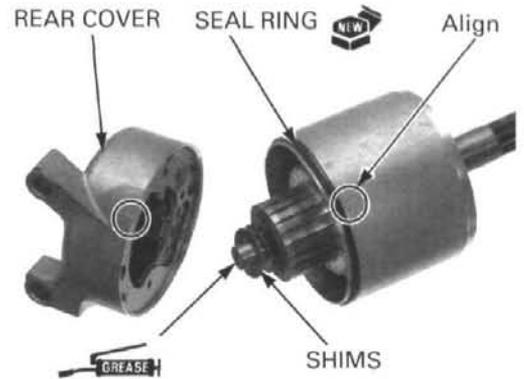
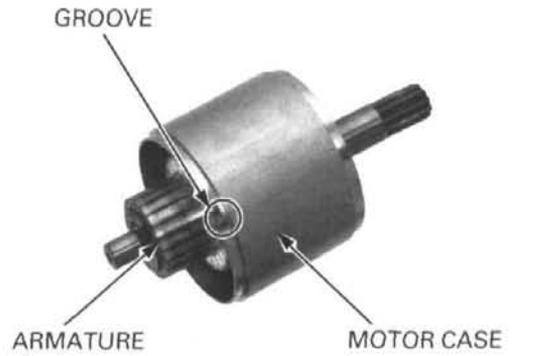
Install a new seal ring onto the motor case.

Apply grease to the oil seal lip and needle bearing in the front cover.

Install the front cover, being careful not to damage the oil seal lip.

Align the index marks on the front cover and case.

Install the motor case bolts with the new O-rings. Tighten the bolts.



ELECTRIC STARTER (TRX450ER)

Coat a new O-ring with oil and install it into the starter motor groove.



INSTALLATION

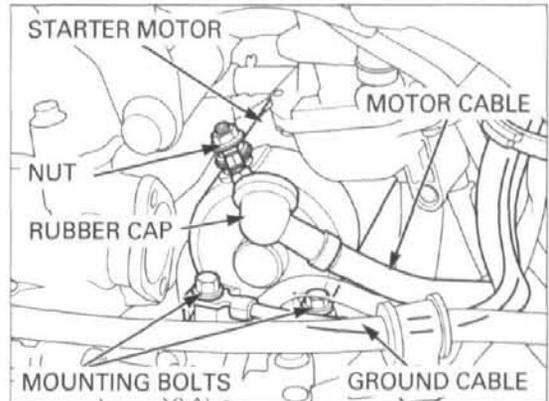
Install the starter motor onto the crankcase.

Install the ground cable and mounting bolts.

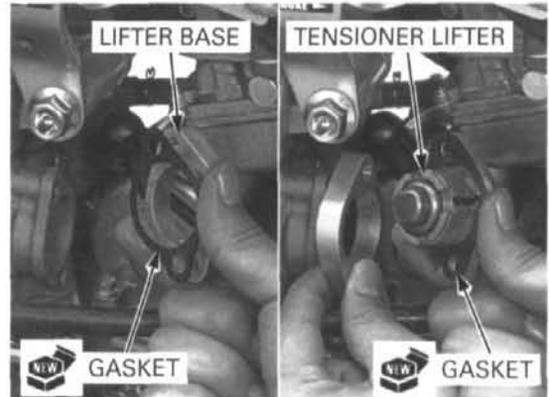
Install the starter motor cable and terminal nut onto the motor terminal.

Tighten the nut securely.

Install the rubber cap over the motor terminal properly.

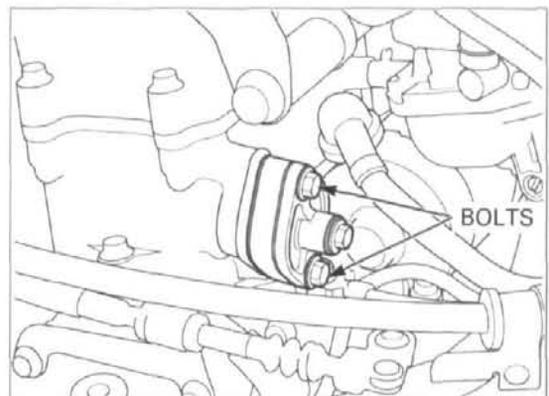


Install the cam chain tensioner lifter with the lifter base, new gaskets.



Install the bolts and tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



STARTER RELAY SWITCH

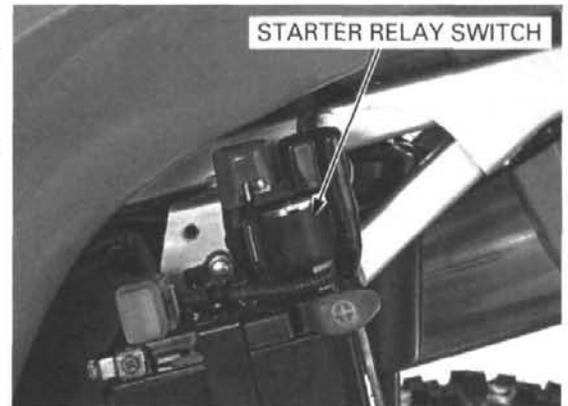
OPERATION INSPECTION

Shift the transmission into neutral.

Turn the ignition switch to ON and push the starter switch.

The coil is normal if the starter relay switch clicks.

If you don't hear the switch click, and inspect the relay switch circuits (page 23-13).



CIRCUIT INSPECTION

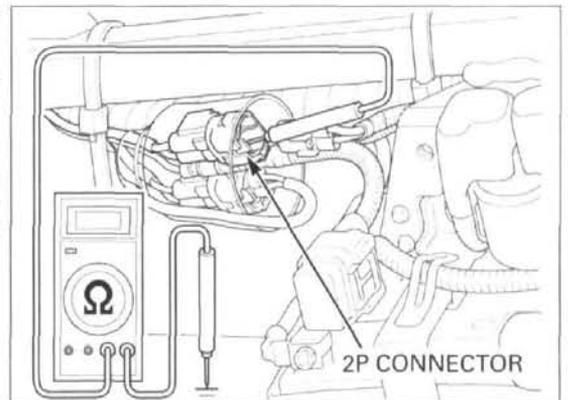
Release the connector boot from the clamp remove it off of the connectors.

GROUND LINE

Disconnect the starter relay switch 2P natural connector.

Check for continuity between the Yellow/green wire harness side connector terminal and ground.

If there is continuity when the transmission is in neutral or when the transmission is in gear and the clutch lever is squeezed, the ground circuit is normal. (In neutral, there is a slight resistance due to the diode)

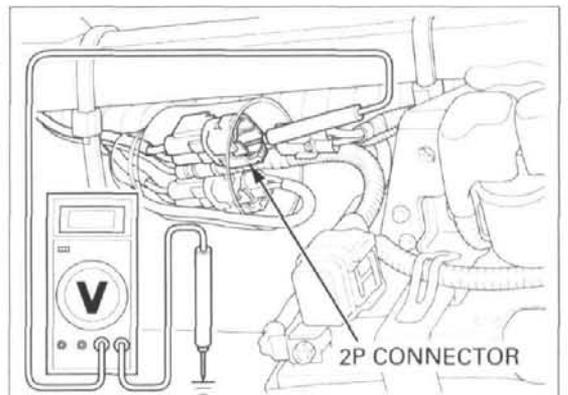


POWER INPUT LINE

Turn the ignition switch to ON.

Measure the voltage between the Yellow/red wire terminal (+) of the wire harness side connector and ground (-).

If the battery voltage appears only when the starter switch is pushed, the circuit is normal.

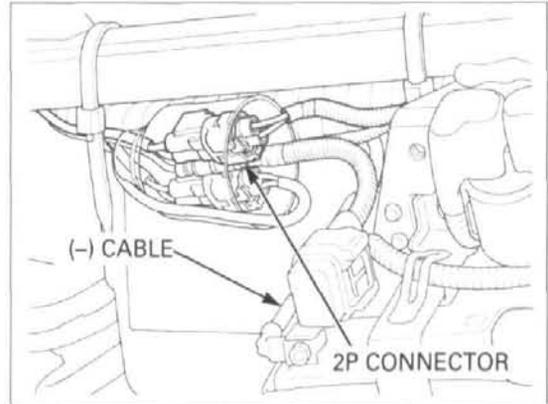


ELECTRIC STARTER (TRX450ER)

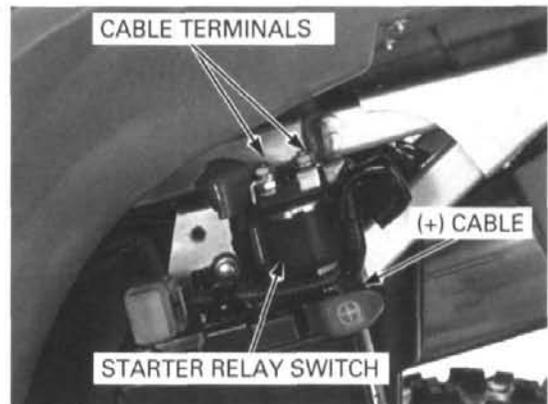
FUNCTION INSPECTION

Disconnect the battery negative (-) cable by removing the terminal bolt.

Disconnect the starter relay switch 2P natural connector.

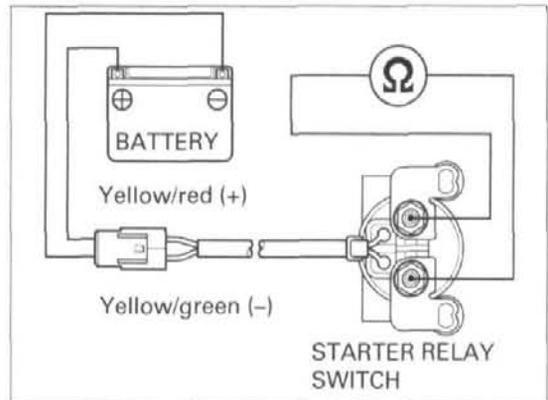


Disconnect the battery positive (+) cable and starter motor cable from the starter relay switch .



Connect a fully charged 12 V battery positive (+) terminal to the Yellow/red wire terminal and negative (-) terminal to the Yellow/green wire terminal of the starter relay switch.

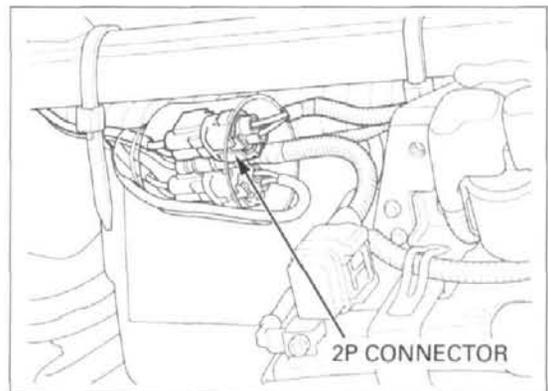
There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected.



CLUTCH DIODE

INSPECTION

Disconnect the starter relay switch 2P natural connector.

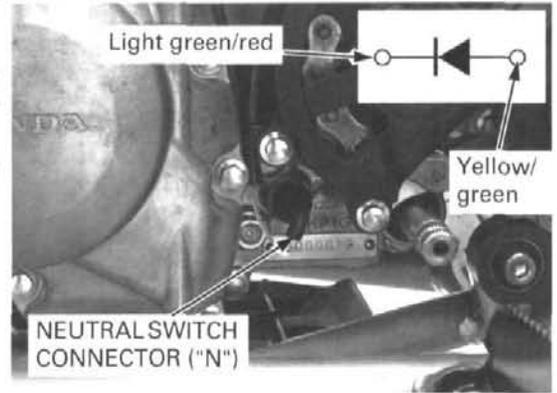


ELECTRIC STARTER (TRX450ER)

Disconnect the neutral switch connector (page 24-10).

Check for continuity between the Yellow/green wire harness side connector and Light green/red wire harness side connector.

When there is continuity, a small resistance value will register.



If there is continuity in one direction, the diode is normal.

