

19. STARTER SYSTEM

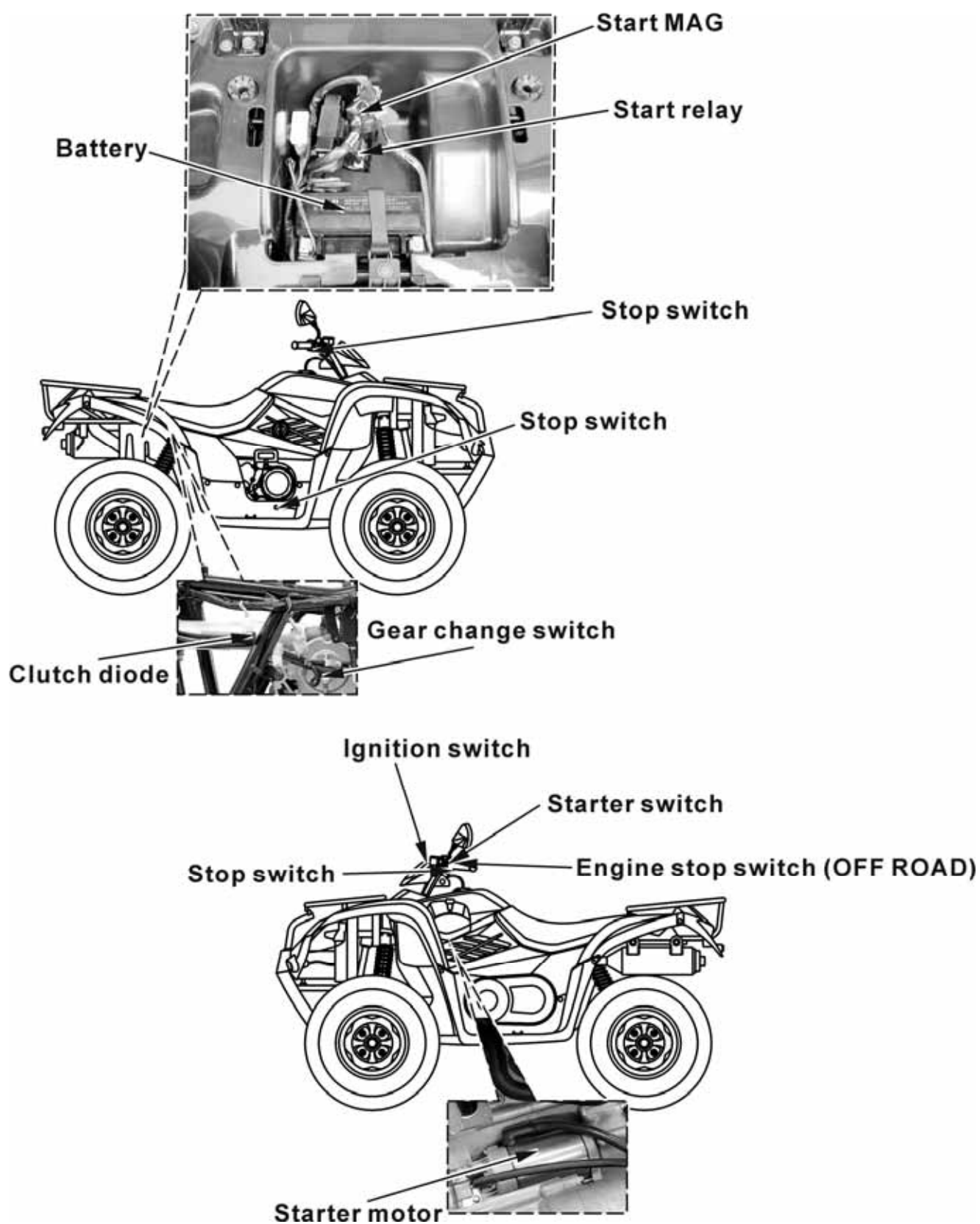
STARTER SYSTEM

19

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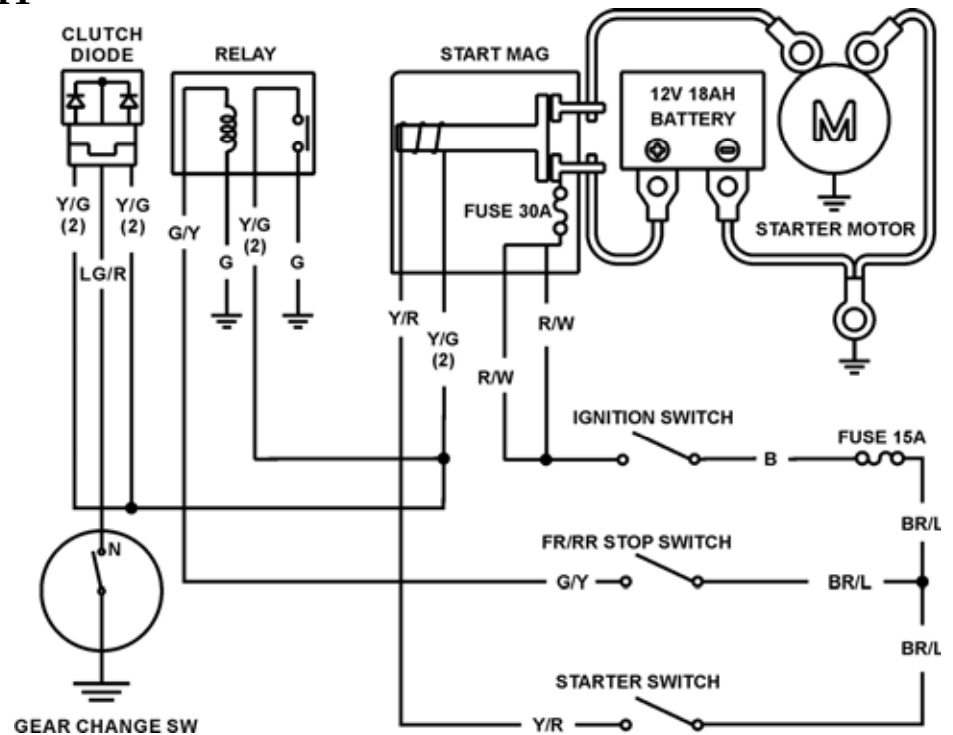
STARTING SYSTEM LAYOUT



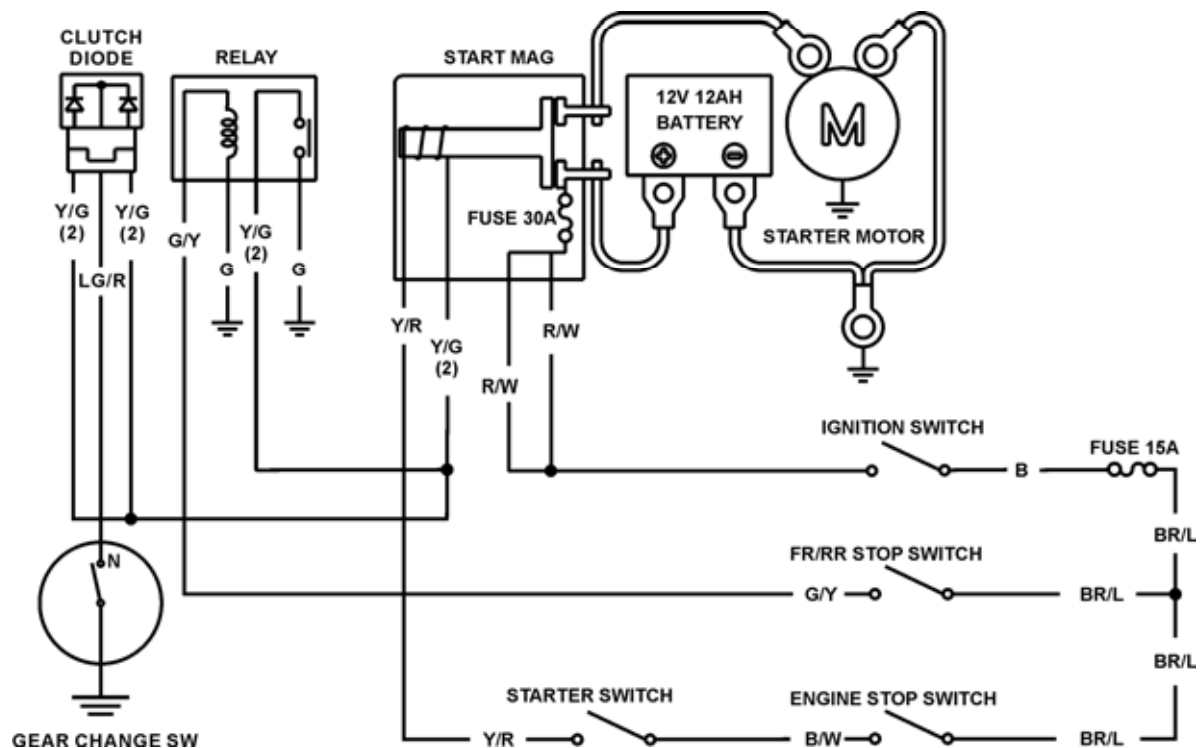
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STARTING CIRCUIT

(ON ROAD)



(OFF ROAD)



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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 flow chart (page 19-2).
- 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.
- See section 20 for following components:
 - Ignition switch
 - Starter switch
 - Brake light switch

SPECIAL TOOL

Flywheel puller A120E00060

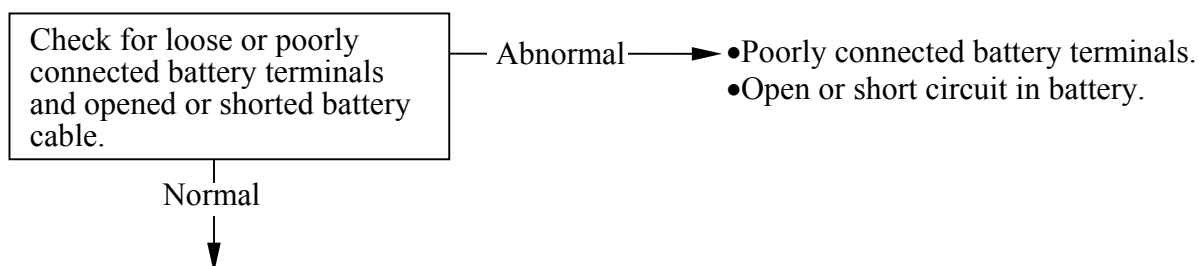
TORQUE

Starter pulley nut 5.5 kgf-m (55 N-m, 40 lbf-ft)

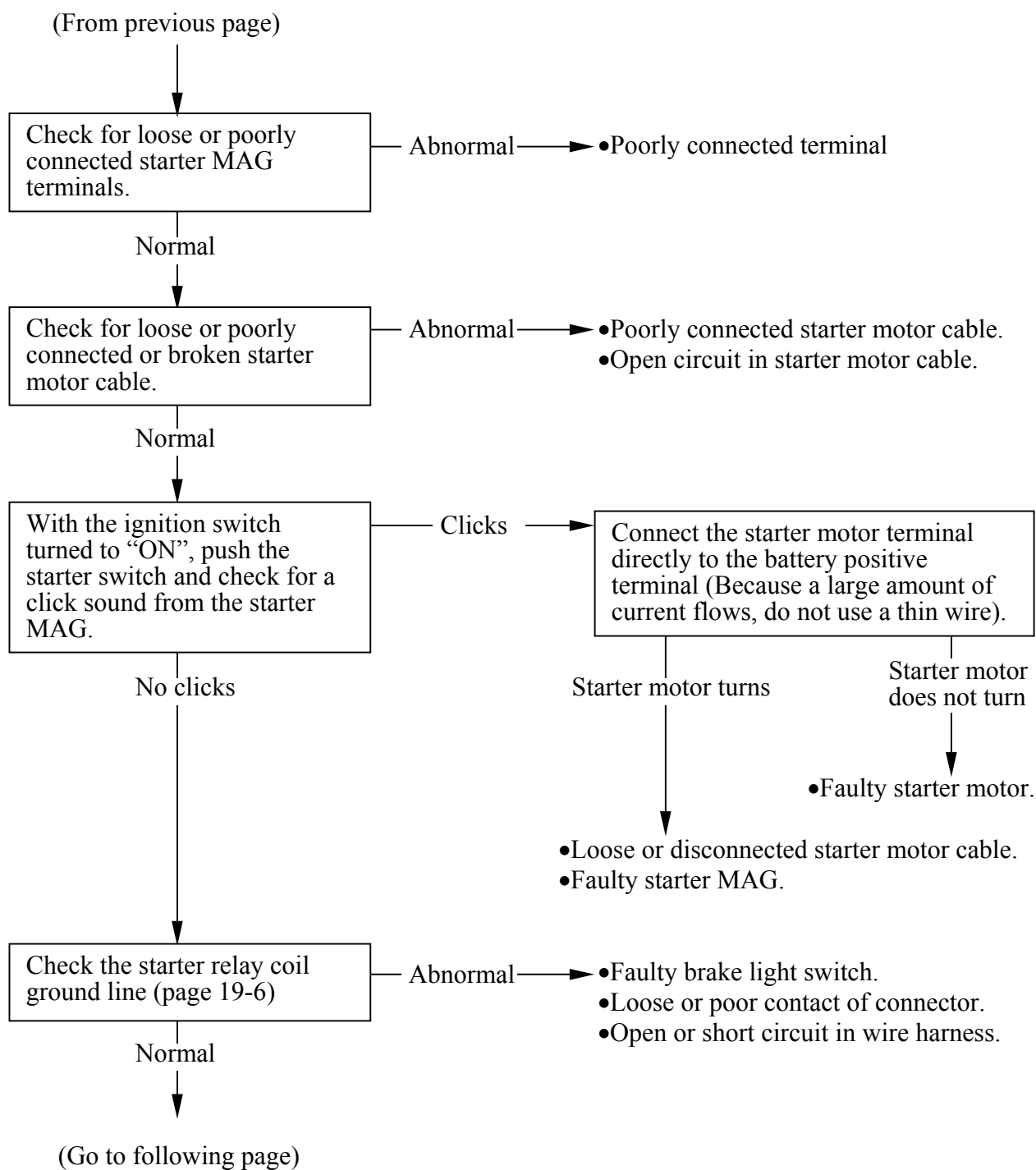
TROUBLESHOOTING

- Check for the following before troubleshooting:
 - Blown main fuse (30A) and sub fuse (15 A)
 - Loose battery and starter motor cable
 - Discharged battery
- The starter motor can turn with the following conditions:
 - Ignition switch ON
 - Engine stop switch in RUN (OFF ROAD)
 - Rear brake lever fully squeezed
 - Starter switch pushed

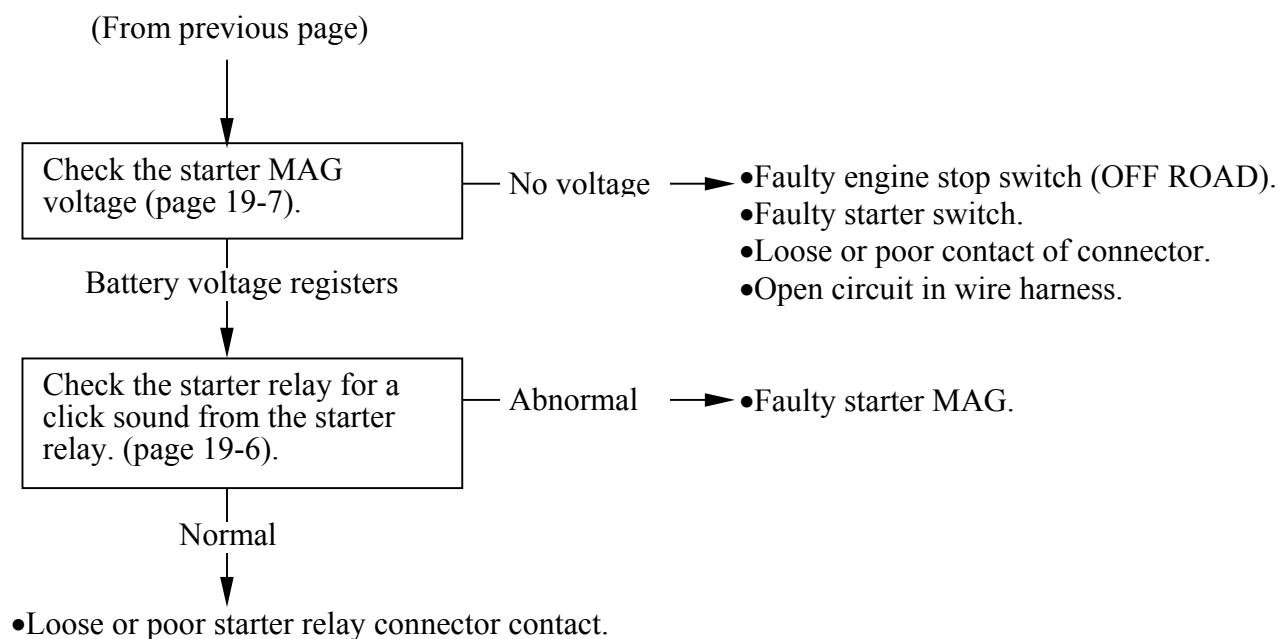
Starter motor will not turn



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STARTER MOTOR

INSPECTION

Disconnect the starter motor cable from the starter MAG.
 Turn the ignition switch to “ON”.
 Connect the starter motor cable directly to the battery positive terminal.
 If the starter motor does not turn, the starter motor is faulty.

Starter Motor Cable



REMOVAL

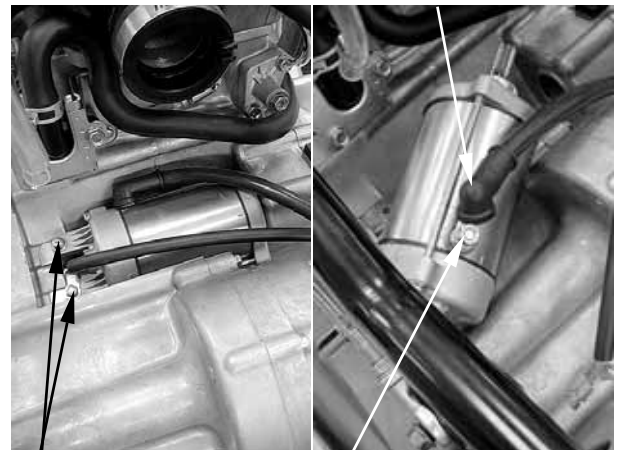
Remove the carburetor (refer to the “**CARBURETOR REMOVAL/CHOKE INSPECTION/INSTALLATION**” section in the chapter 5).

Turn the ignition switch turned to “OFF”

Remove the two mounting bolts and starter motor.

Release the rubber cap and remove the terminal nut to disconnect the starter motor cable from the starter motor.

Rubber Cap



Bolts

Nut

INSTALLATION

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

Connect the starter motor cable to motor terminal with the terminal nut and tighten it.

Install the starter motor into the crankcase.

Install the two mounting bolts and tighten them securely.

O-ring



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STARTER RELAY SWITCH/STARTER MAG

INSPECTION

Turn the ignition switch to “ON”.

Squeeze the brake lever or pedal fully.

The coil is normal if the starter relay switch clicks.

Squeeze and hold the brake lever or pedal fully then push the starter switch.

The coil is normal if the starter MAG switch clicks.

If you do not hear the switch click. Inspect the relay switch and starter MAG using the procedure below.

GROUND LINE INSPECTION

Disconnect the starter relay switch connector. Check for continuity between the Green wire terminal and ground.

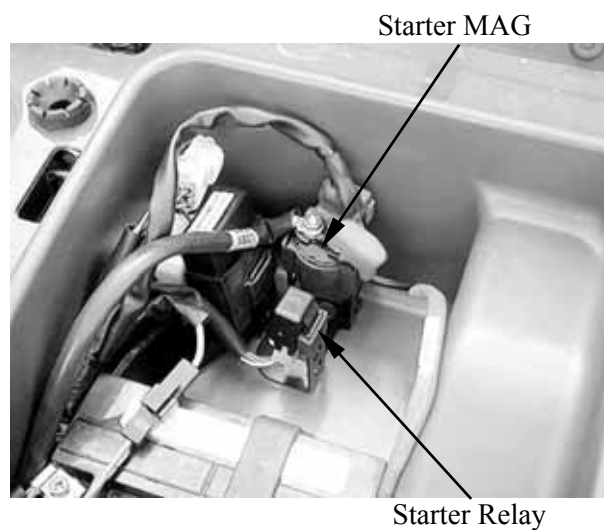
There should be continuity.

VOLTAGE INSPECTION

Connect the starter MAG connector. Turn the ignition switch ON.

Measure the starter MAG Yellow/Red wire terminal and ground.

If the battery voltage appears only when the rear brake lever is squeezed fully (or the gear change switch in neutral) and starter switch is pushed, the circuit is normal.



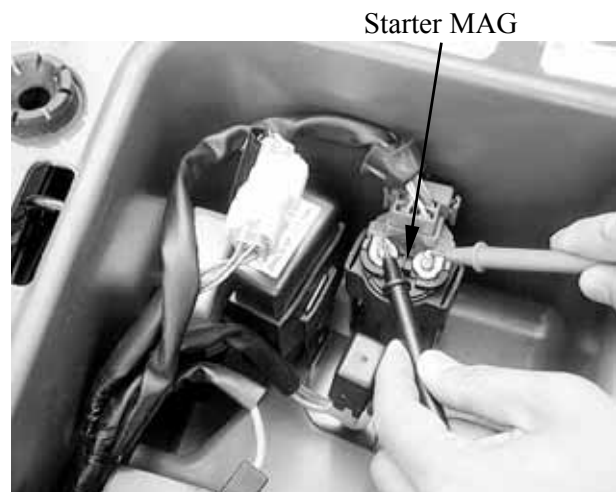
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CONTINUTY INSPECTION

Disconnect the starter MAG switch connector and cables.

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

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



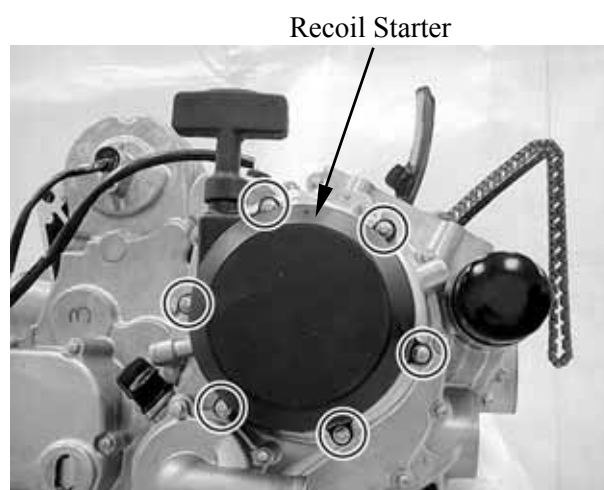
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RECOIL STARTER REMOVAL/INSPECTION/ INSTALLATION

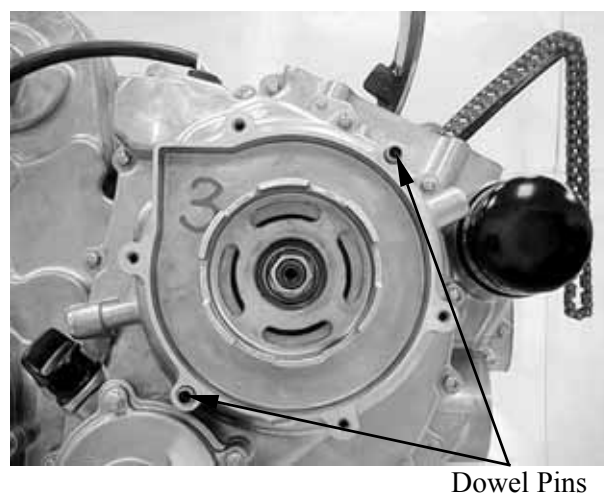
* The recoil starter can not start the engine when the battery is removal.

REMOVAL

Remove the six bolts, then remove the recoil starter assembly.

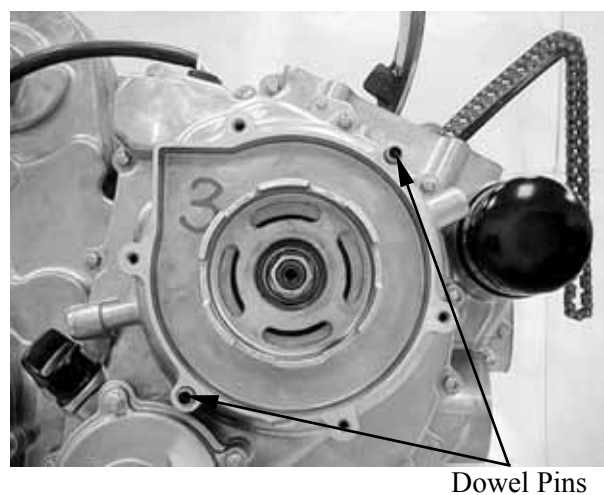


Remove the two dowel pins.



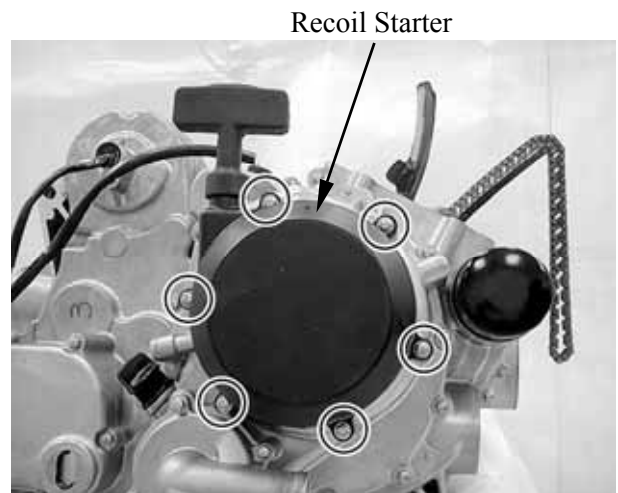
INSTALLATION

Install the dowel pins.



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Install the recoil starter assembly.
Install and tighten the six bolts diagonally.



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RECOIL STARTER HANDLE REPLACE

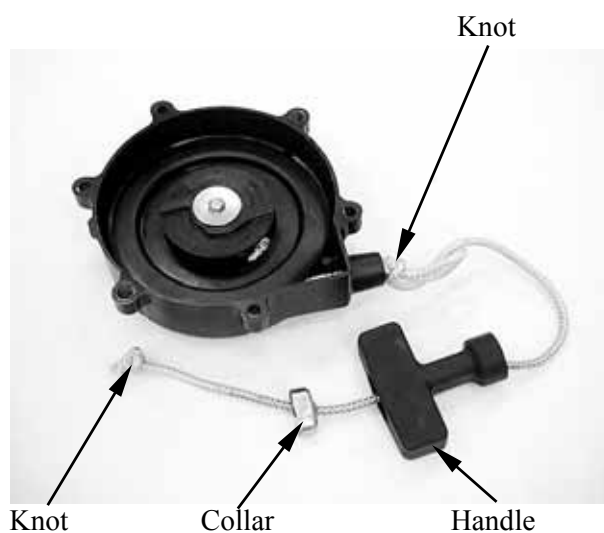
Remove the recoil starter assembly (refer to the “**RECOIL STARTER REMOVAL/INSPECTION/INSTALLATION**” section in this chapter).

Remove the cap on the handle.



Replace the handle.

Before untying the knot above the starter handle, make a knot in the rope so that the rope is not pulled into the housing.



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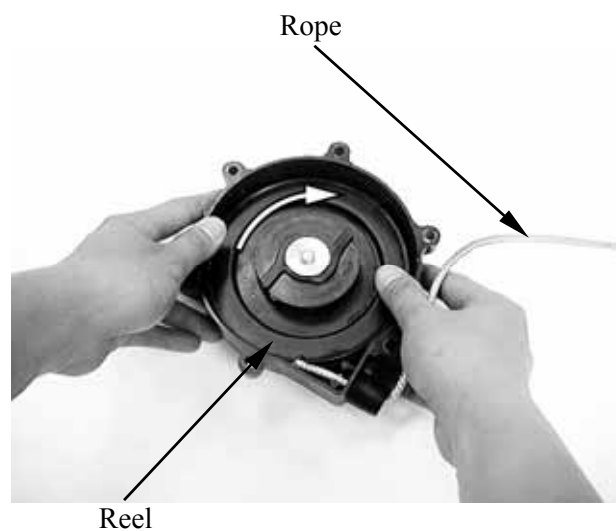
RECOIL STARTER DISASSEMBLY/INSPECTION/ ASSEMBLY

DISASSEMBLY

Remove the recoil starter assembly (refer to the “**RECOIL STARTER REMOVAL/INSPECTION/INSTALLATION**” section in this chapter).

Remove the handle (refer to the “**RECOIL STARTER HANDLE REPLACE**” section in this chapter).

Untying the knot, then turn the reel clockwise with the rope slowly.



Remove the bolt and then remove the washer, friction plate and pawl spring.

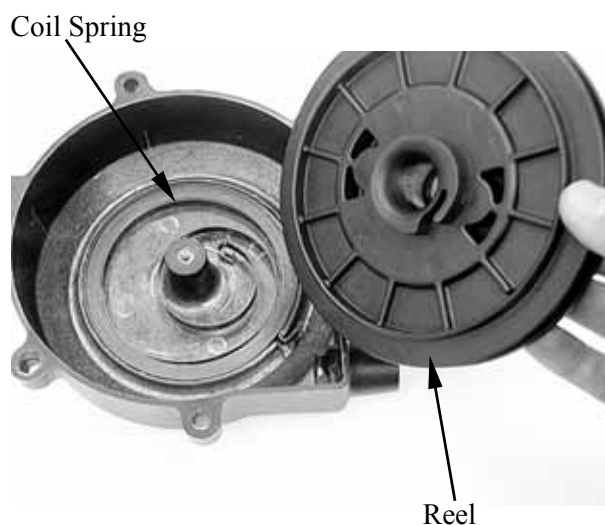


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Remove the reel, then remove the coil spring.

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Wear hand and eye protection when removing the reel, since the spring may quickly unwind and cause an injury.



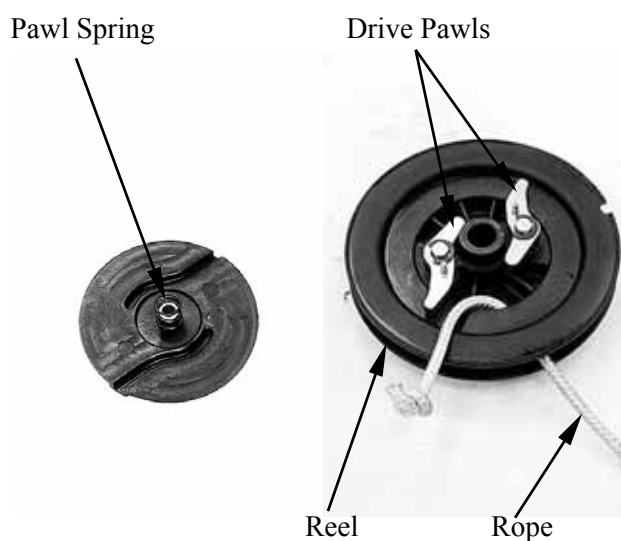
INSPECTION

Pull the rope and check that the ratchet is pushed out.



Inspect the rope, reel and drive pawl for wear or damage.

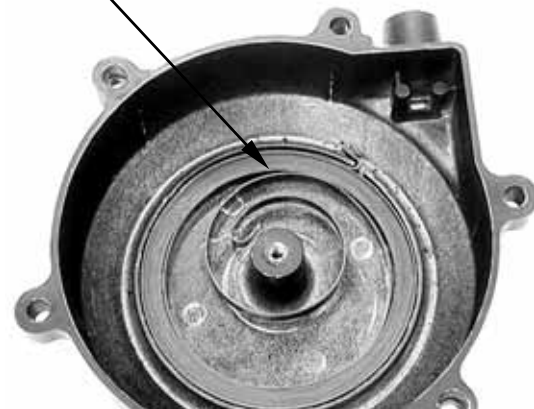
Inspect the pawl spring for fatigue.



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Inspect the coil spring for fatigue.

Coil Spring

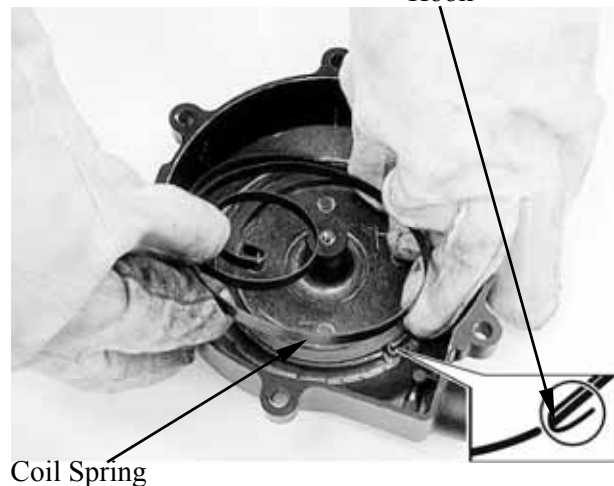


ASSEMBLY

Apply molybdenum disulfide grease to the coil spring, then install the coil spring.

- Wear hand and eye protection when installing the spring, since the spring may quickly unwind and cause injury.
- Mesh the spring hook with the housing slit, then wind the housing to make the diameter of the spring smaller and the spring will be into the housing.

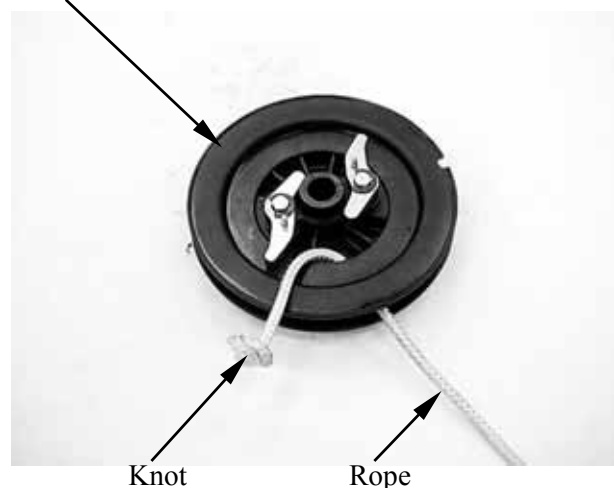
Hook



Coil Spring

Pass the rope through the reel and make a knot above the reel.

Reel



Knot

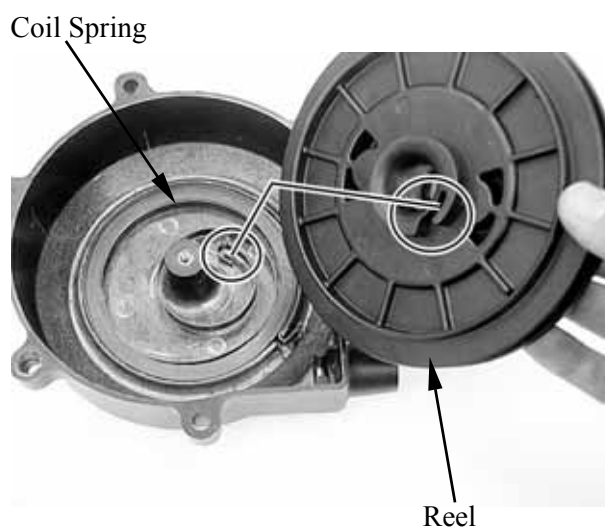
Rope

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Install the reel.

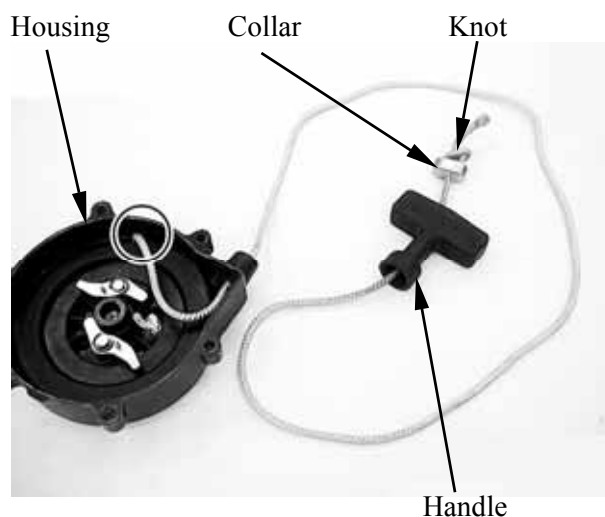
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- Wear hand and eye protection when installing the reel, since the spring may quickly unwind and cause an injury.
- Engage the part of the reel with coil spring end.



Hook the rope onto the hook part of the reel, then pass the rope through the recoil starter housing, handle and collar.

Make a knot above the collar.



Hook the rope onto the hook part of the reel, turn the reel counterclockwise three or four times with the rope.

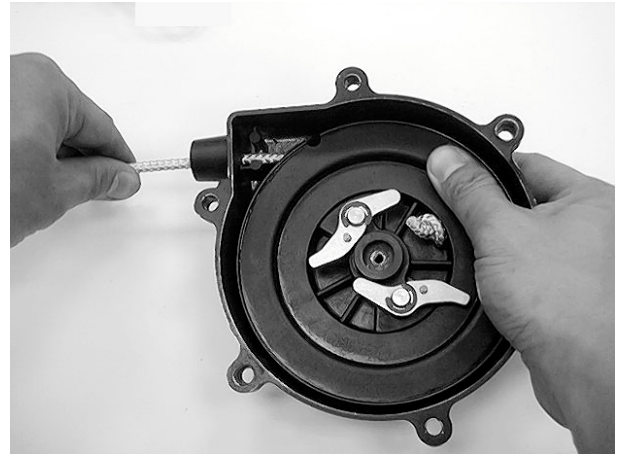
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- Wear hand and eye protection when assembling the recoil starter, since the spring may quickly unwind and cause an injury.



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Unhook the rope, then turn the reel clockwise with the rope slowly.



Apply molybdenum disulfide grease to the washer and friction plate.

Apply Grease



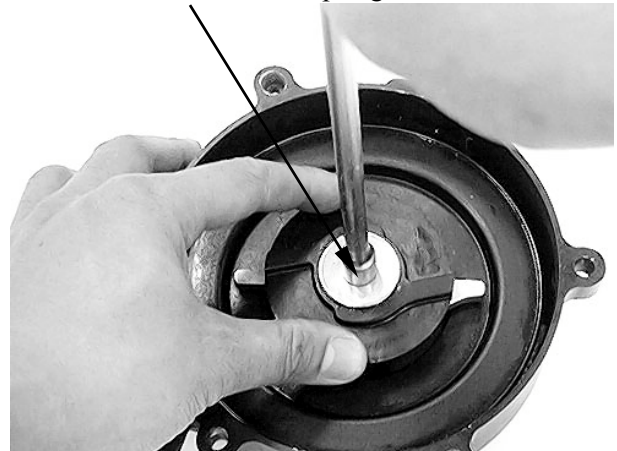
Apply Grease



Spring

Install the pawl spring, friction plate/washer. Install and tighten the new bolt securely.

Bolt/Washer/Plate/Spring



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Pull the rope and check that the ratchet is pushed out.



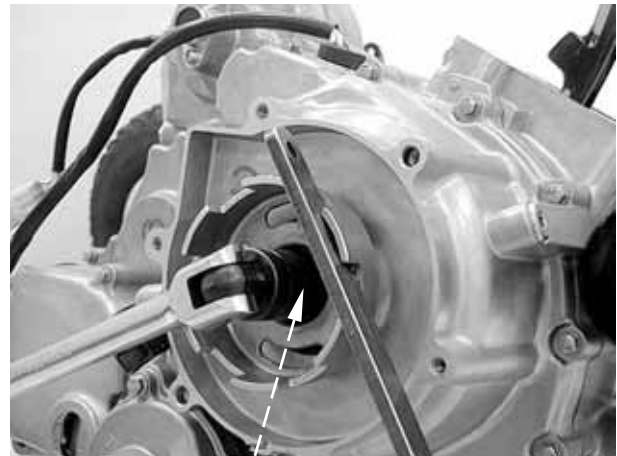
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STARTER PULLEY REMOVAL/INSPECTION/ INSTALLATION

REMOVAL

Remove the recoil starter assembly (refer to the “**RECOIL STARTER REMOVAL/INSPECTION/INSTALLATION**” section in this chapter).

Remove the starter pulley nut by using a suitable bar.



Nut/Washer

INSPECTION

Inspect the starter pulley for cracks or pitting.
Inspect the O-ring for wear or damage.



O-ring

Inspect the oil stop ring for crack or damage.

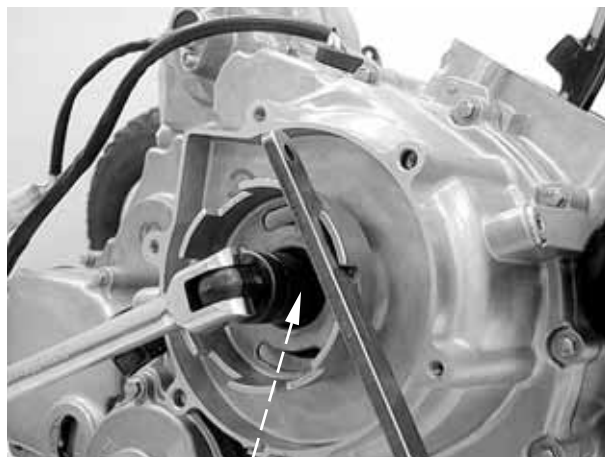


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INSTALLATION

Install the starter pulley and washer.
Install and tighten the nut to the specified torque by using suitable bar.

Torque: 5.5 kgf-m (55 N-m, 40 lbf-ft)



Nut/Washer

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STARTER CLUTCH REMOVAL/INSPECTION/ INSTALLATION

REMOVAL

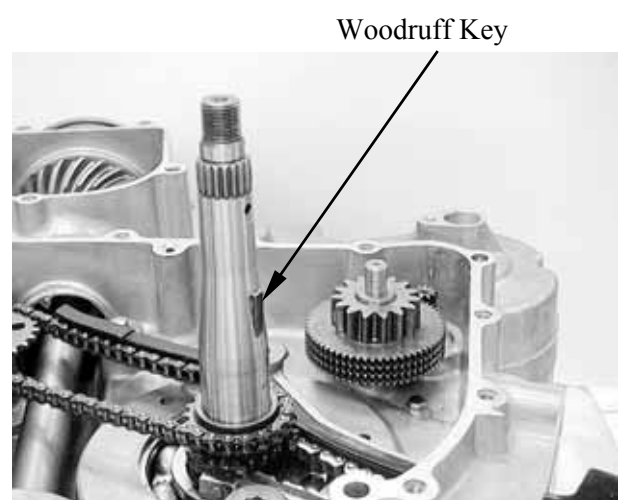
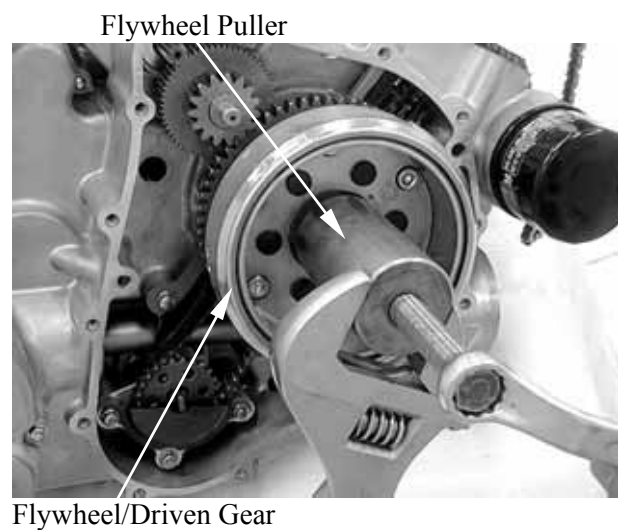
Remove the right crankcase cover (refer to the “**ALTERNATOR STATOR REMOVAL/INSPECTION/INSTALLATION**” section in the chapter 17).

Remove the flywheel/driven gear by using the special tool.

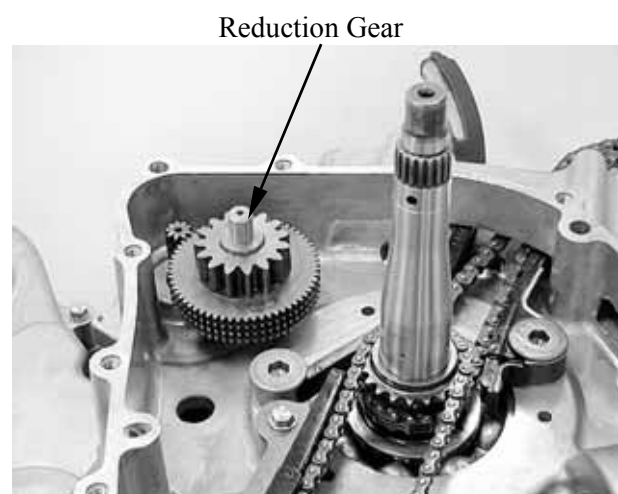
Special tool:

Flywheel puller A120E00060

Remove the woodruff key.



Remove the reduction gear.



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INSPECTION

Check the operation of the sprag clutch by turning the driven gear. You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise.

Remove the starter driven gear by turning the driven gear.



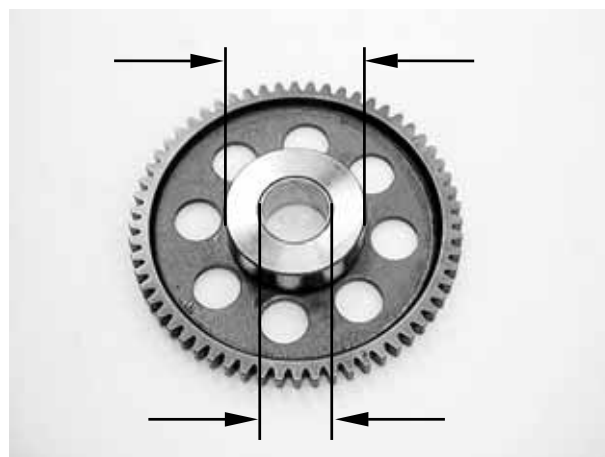
Check the starter driven gear teeth for wear or damage.

Measure the starter driven gear boss O.D..

Service limit: 57.7 mm (2.272 in)

Measure the starter driven gear bushing I.D..

Service limit: 27.1 mm (1.084 in)



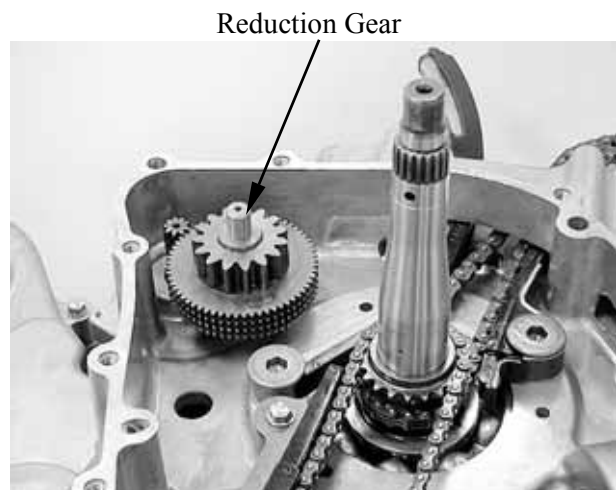
Check the starter reduction gear teeth and shaft for wear or damage.



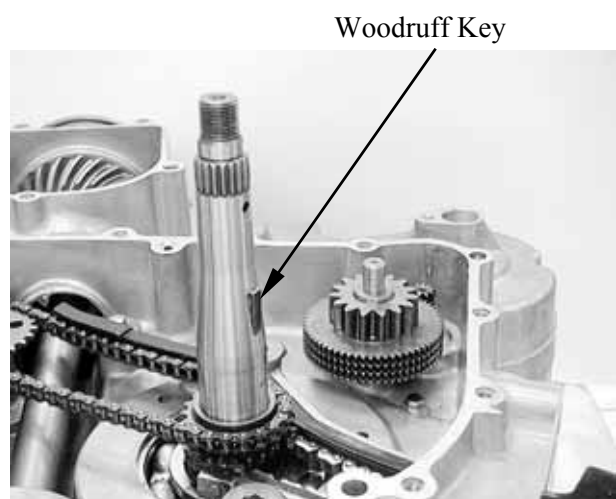
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INSTALLATION

Apply oil to the starter reduction gear.
Install the starter reduction gear to the right crankcase.



Install the woodruff key in the crankshaft key groove.



Apply molybdenum oil solution to the starter driven gear bushing.
Install the starter driven gear by turning the driven gear clockwise.



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Clean any oil from the tapered portion of the flywheel I.D.

Install the flywheel/driven gear onto the crankshaft, aligning the key way with woodruff key.

