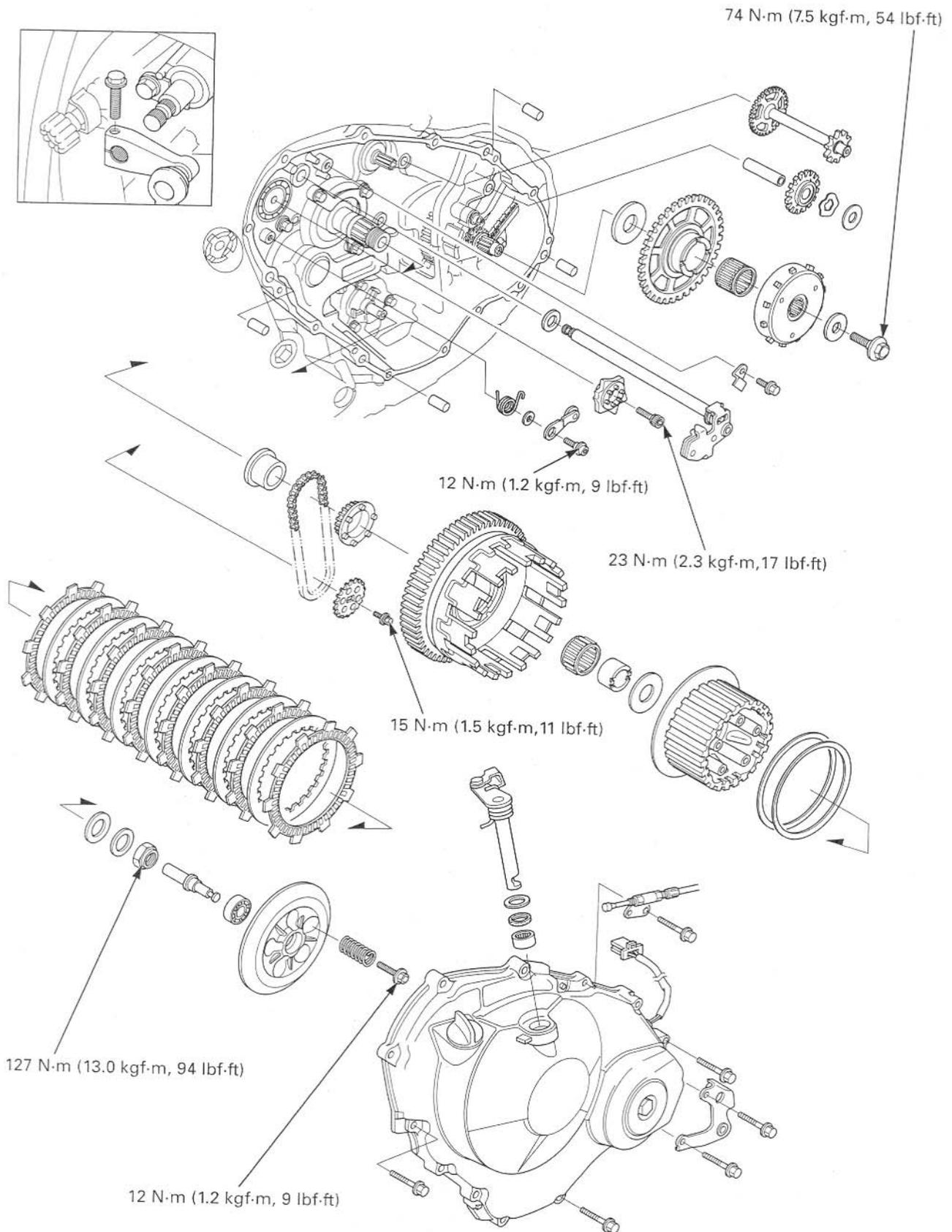


10. CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

| | | | |
|-----------------------------------|------|--|-------|
| COMPONENT LOCATION | 10-2 | CLUTCH..... | 10-7 |
| SERVICE INFORMATION | 10-3 | STARTER CLUTCH | 10-17 |
| TROUBLESHOOTING | 10-4 | GEARSHIFT LINKAGE | 10-22 |
| RIGHT CRANKCASE COVER REMOVAL.... | 10-5 | RIGHT CRANKCASE COVER INSTALLATION..... | 10-24 |

CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE COMPONENT LOCATION



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, starter clutch and gearshift linkage. All service can be done with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the engine oil level before servicing the clutch system.

SPECIFICATIONS

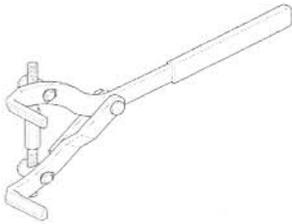
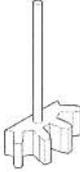
Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT |
|---|--------------------|-----------------------------------|-----------------|
| Clutch lever free play | | 10 – 20 (3/8 – 13/16) | – |
| Clutch | Spring free length | 46.5 (1.83) | 45.2 (1.78) |
| | Disc thickness | 2.92 – 3.08 (0.115 – 0.121) | 2.6 (0.10) |
| | Plate warpage | – | 0.30 (0.012) |
| Clutch outer guide A (Without ID mark) | I.D. | 24.993 – 25.003 (0.9840 – 0.9844) | 25.013 (0.9848) |
| | O.D. | 35.004 – 35.012 (1.3781 – 1.3784) | 34.994 (1.3777) |
| Clutch outer guide B (With ID mark) | I.D. | 24.993 – 25.003 (0.9840 – 0.9844) | 25.013 (0.9848) |
| | O.D. | 34.996 – 35.004 (1.3778 – 1.3781) | 34.986 (1.3774) |
| Primary driven gear I.D. | A | 41.008 – 41.016 (1.6145 – 1.6148) | 41.026 (1.6152) |
| | B | 41.000 – 41.008 (1.6142 – 1.6145) | 41.018 (1.6149) |
| Oil pump drive sprocket guide | I.D. | 25.000 – 25.021 (0.9843 – 0.9851) | 25.031 (0.9855) |
| | O.D. | 34.950 – 34.975 (1.3760 – 1.3770) | 34.940 (1.3756) |
| Oil pump drive sprocket I.D. | | 35.025 – 35.145 (1.3789 – 1.3837) | 35.155 (1.3841) |
| Mainshaft O.D. at clutch outer guide | | 24.980 – 24.990 (0.9835 – 0.9839) | 24.960 (0.9827) |
| Mainshaft O.D. at oil pump drive sprocket guide | | 24.980 – 24.990 (0.9835 – 0.9839) | 24.960 (0.9827) |
| Starter driven gear boss O.D. | | 45.657 – 45.673 (1.7975 – 1.7981) | 45.642 (1.7969) |

TORQUE VALUES

| | | |
|-------------------------------------|---------------------------------|---|
| Clutch center lock nut | 127 N·m (13.0 kgf·m, 94 lbf·ft) | Apply oil to the thread Stake the nut |
| Clutch spring bolt | 12 N·m (1.2 kgf·m, 9 lbf·ft) | |
| Oil pump driven sprocket bolt | 15 N·m (1.5 kgf·m, 11 lbf·ft) | Apply a locking agent to the threads |
| Shift drum center socket bolt | 23 N·m (2.3 kgf·m, 17 lbf·ft) | Apply a locking agent to the threads |
| Shift drum stopper arm pivot bolt | 12 N·m (1.2 kgf·m, 9 lbf·ft) | |
| Gearshift spindle return spring pin | 22 N·m (2.2 kgf·m, 16 lbf·ft) | |
| Starter clutch outer special bolt | 74 N·m (7.5 kgf·m, 54 lbf·ft) | Apply oil to the threads and flange surface |

TOOLS

| | |
|---|--|
| <p>Clutch center holder 07724-0050002</p>  <p>or equivalent commercially available in U.S.A.</p> | <p>Gear holder, M2.5 07724-0010100</p>  |
|---|--|

CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

TROUBLESHOOTING

Clutch lever too hard to pull in

- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating

- Worn clutch disc
- Weak clutch springs
- Engine oil mixed with molybdenum or graphite additive

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Clutch plate warped
- Loose clutch center lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

Hard to shift

- Improper clutch operation
- Improper oil viscosity
- Bent shift fork
- Bent shift fork shaft (page 12-9)
- Bent fork claw (page 12-9)
- Damaged gearshift cam (page 12-9)
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

Transmission jumps out of gear

- Worn shift drum stopper arm
- Weak or broken shift drum stopper arm return spring
- Loose stopper plate bolt
- Bent shift fork shaft
- Damaged gearshift cam (page 12-9)
- Damaged or bent shift forks (page 12-9)
- Worn gear engagement dogs or slots (page 12-9)

Gearshift pedal will not return

- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

Engine does not turn

- Faulty starter clutch
- Damaged reduction gear/shaft
- Damaged idle gear/shaft

RIGHT CRANKCASE COVER REMOVAL

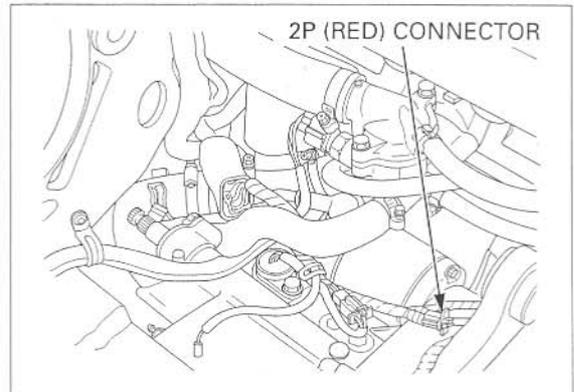
Remove the following:

- Lower cowls (page 3-6)
- Middle cowls (page 3-7)
- Radiator reserve tank (page 7-17)

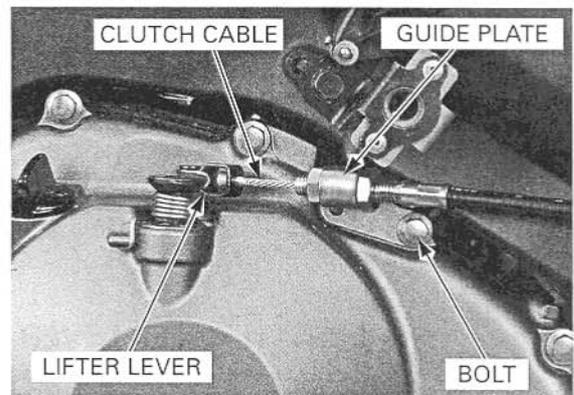
Drain the engine oil (page 4-16).

Lift and support the fuel tank (page 6-61).

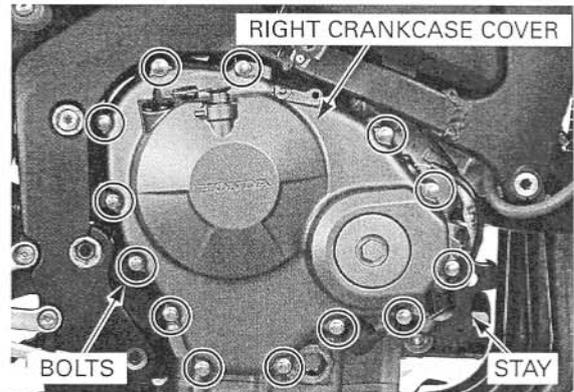
Disconnect the ignition pulse generator 2P (Red) connector.



Remove the bolt and clutch cable guide plate, then disconnect the clutch cable end from the clutch lifter lever.



Remove the right crankcase cover bolts and radiator reserve tank mounting stay.

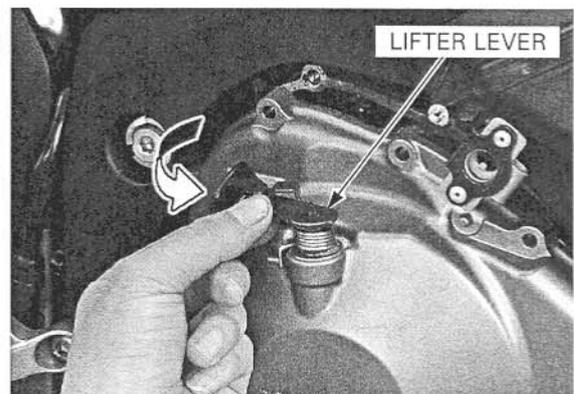


The lifter lever spindle is engaged with the clutch lifter piece inside of the right crankcase cover.

Remove the right crankcase cover while turning the clutch lifter lever counterclockwise to disengage the lifter lever spindle from the lifter piece.

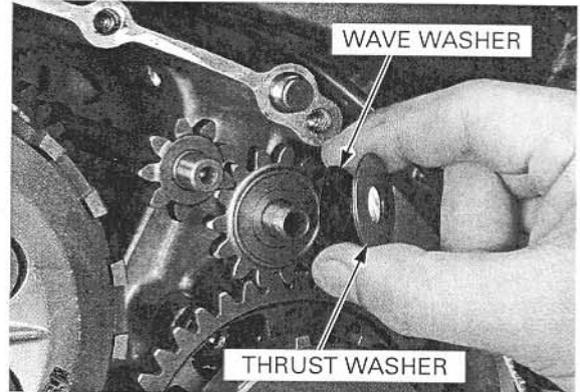
NOTE:

Be careful not to drop the thrust/wave washers into the crankcase when removing the right crankcase cover.



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Be careful not to drop the thrust/wave washers into the crankcase. Remove the thrust washer and wave washer from the starter idle gear.

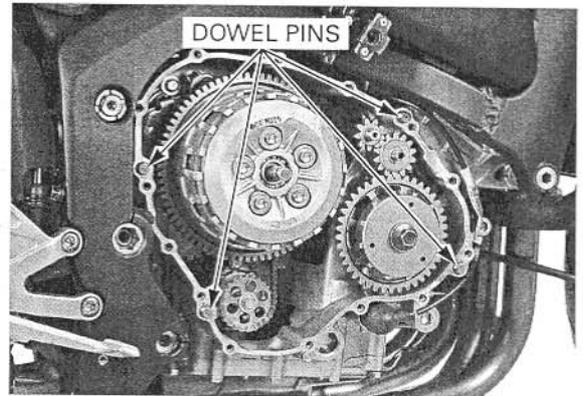


Remove the four dowel pins.

Clean off any sealant from the right crankcase cover mating surfaces.

NOTE:

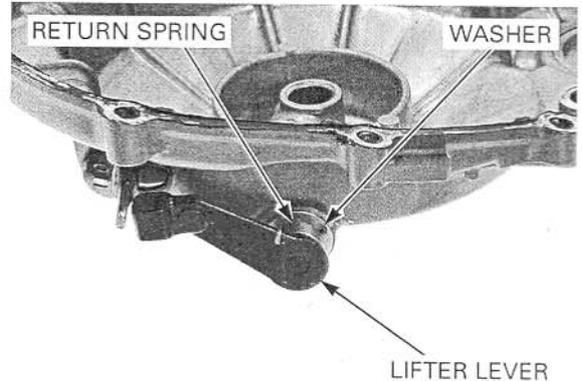
Do not turn the crankshaft counterclockwise after removing the right crankcase cover to prevent the starter reduction gear from damage.



CLUTCH LIFTER LEVER

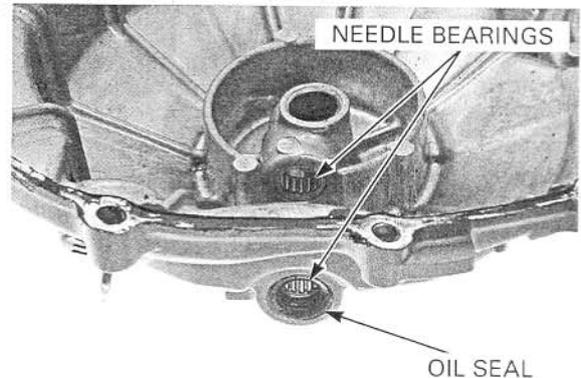
Remove the clutch lifter lever, return spring and washer from the right crankcase cover.

Check the lifter lever spindle for wear or damage. Check the return spring for fatigue or damage.



Check the lifter lever oil seal and needle bearings for wear or damage.

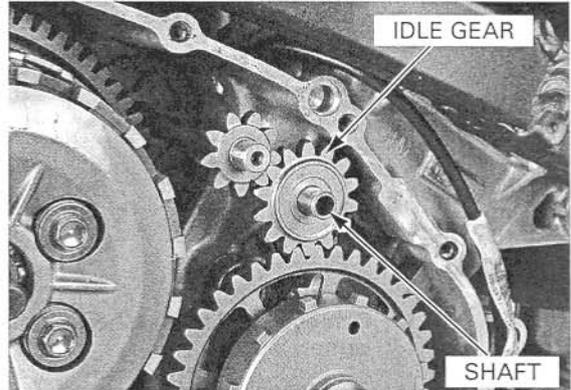
Install the clutch lifter lever with the washer and spring in the reverse order of removal.



CLUTCH

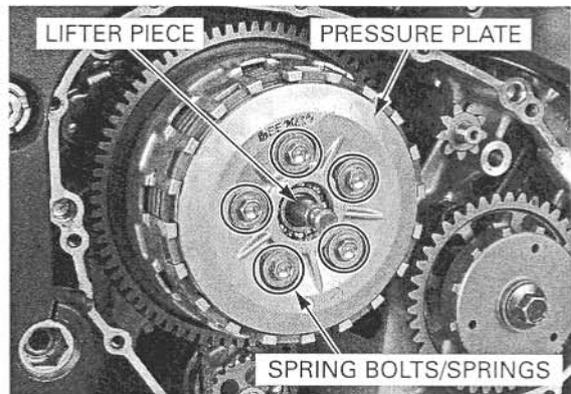
REMOVAL

Remove the right crankcase cover (page 10-5).
Remove the starter idle gear and shaft.



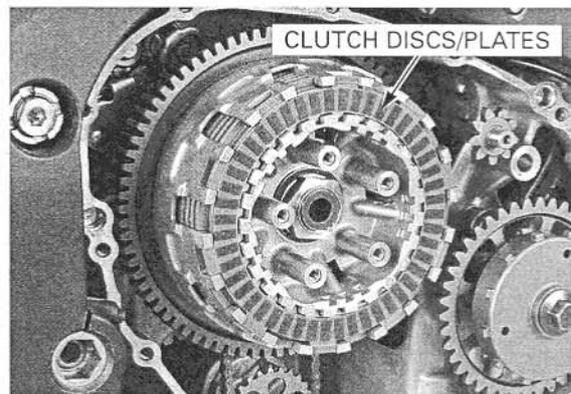
Remove the clutch spring bolts, springs in a criss-cross pattern in two to three steps, then remove the pressure plate.

Remove the clutch lifter piece from the lifter bearing.

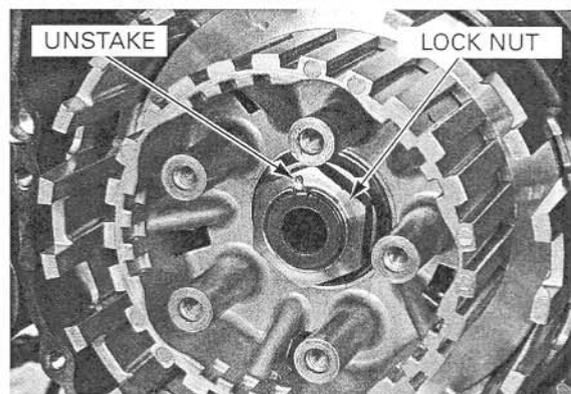


Remove the following:

- Clutch disc A
- Six clutch discs
- Seven clutch plates
- Clutch disc B
- Friction spring
- Spring seat



Unstake the clutch center lock nut.



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

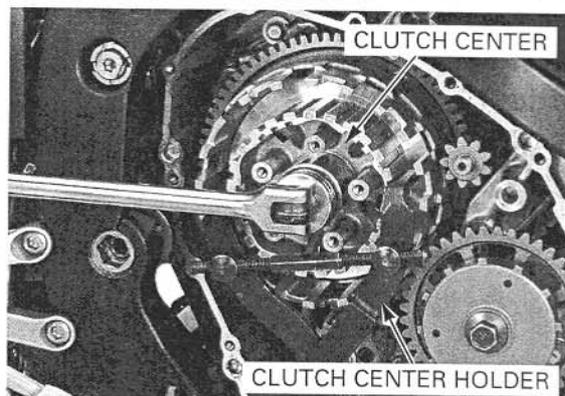
Hold the clutch center with the special tool and remove the clutch center lock nut.

TOOL:

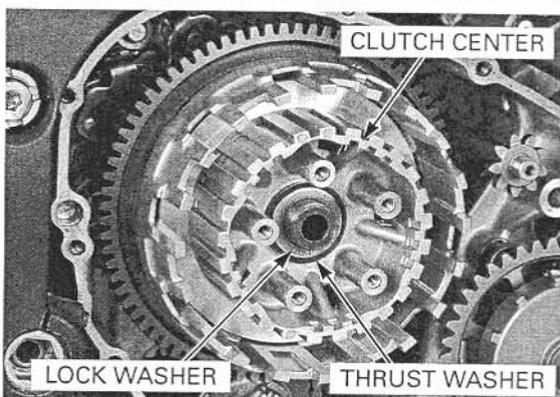
Clutch center holder

07724-0050002 or equivalent commercially available in U.S.A.

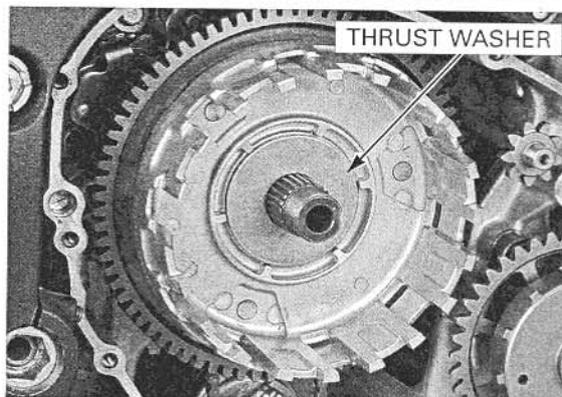
Discard the lock nut.



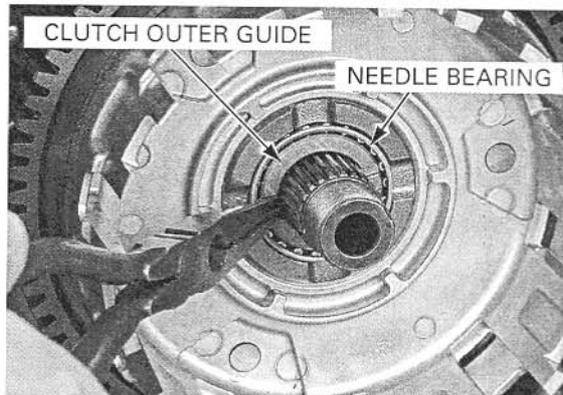
Remove the lock washer, thrust washer and clutch center.



Remove the thrust washer.

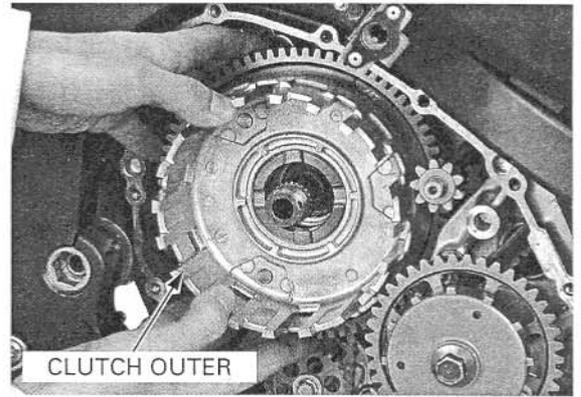


Remove the clutch outer guide and needle bearing.

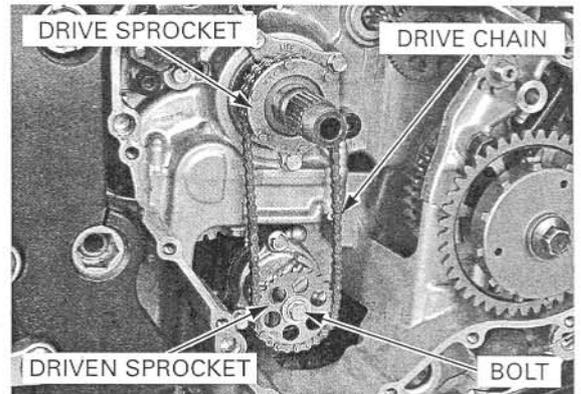


CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

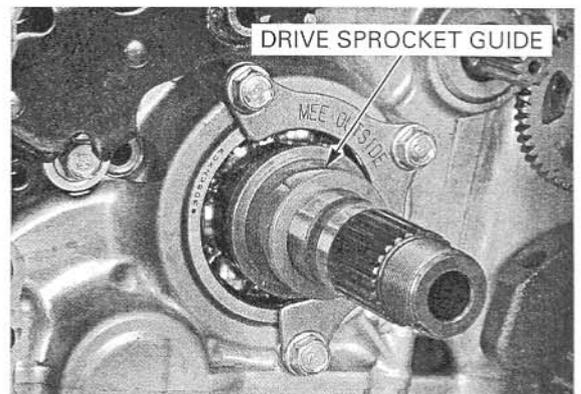
Remove the clutch outer.



Remove the oil pump driven sprocket bolt.
Remove the oil pump drive/driven sprocket and drive chain as an assembly.



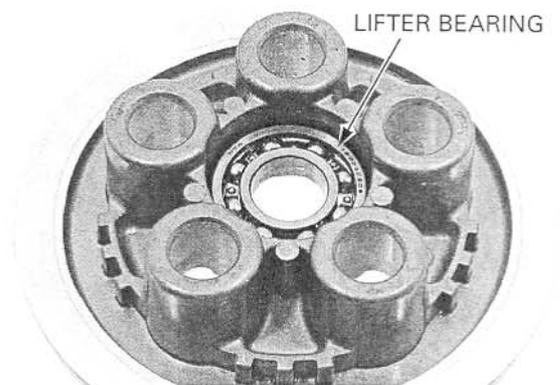
Remove the oil pump drive sprocket guide.



INSPECTION

Clutch lifter bearing

Turn the inner race of the lifter bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary, replace the bearing.



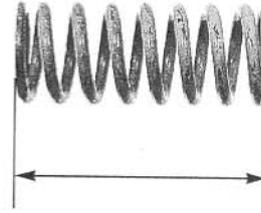
CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Clutch spring

Replace the clutch springs as a set.

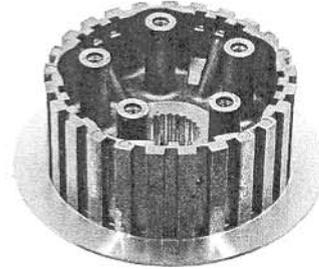
Measure the clutch spring free length.

SERVICE LIMIT: 45.2 mm (1.78 in)



Clutch center

Check the grooves of the clutch center for damage or wear caused by the clutch plates. Replace it if necessary.



Clutch lifter piece

Check the clutch lifter piece for damage or abnormal wear.



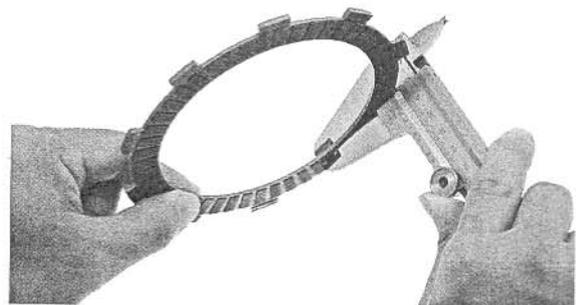
Clutch disc

Replace the clutch discs and plates as a set.

Replace the clutch discs if they show signs of scoring or discoloration.

Measure the disc thickness of each disc.

SERVICE LIMIT: 2.6 mm (0.10 in)



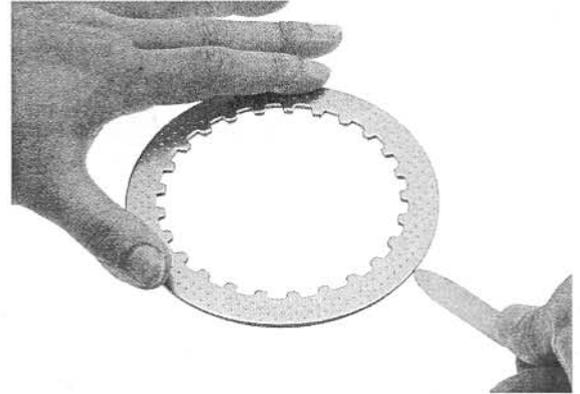
CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Clutch plate

Replace the clutch discs and plates as a set.

Check the plates for discoloration.
Check the plate warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.30 mm (0.012 in)



Friction spring/spring seat

Check the friction spring and spring seat for deformation, warpage or damage; replace as necessary.

- A damaged or warped spring seat will cause the friction spring to be pressed unevenly.
- A damaged friction spring also causes the weak contact between the discs and plates or uneven disc/plate contact.



SPRING SEAT



FRICITION SPRING

Clutch outer/primary driven gear

Check the slots of the clutch outer for damage or wear caused by the clutch discs.

Check the primary driven gear for abnormal wear or damage.

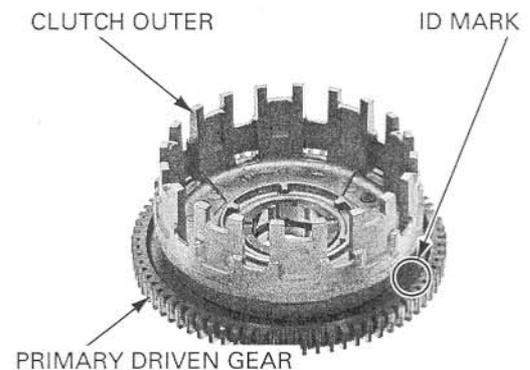
Measure the I.D. of the primary driven gear.

SERVICE LIMITS:

- A: 41.026 mm (1.6152 in)
- B: 41.018 mm (1.6149 in)

Replace the clutch outer assembly if necessary.

When the clutch outer assembly is replaced, be sure to select the needle bearing according to the selective fit table (page 10-12).



Clutch outer guide/needle bearing

Measure the O.D. and I.D. of the clutch outer guide.

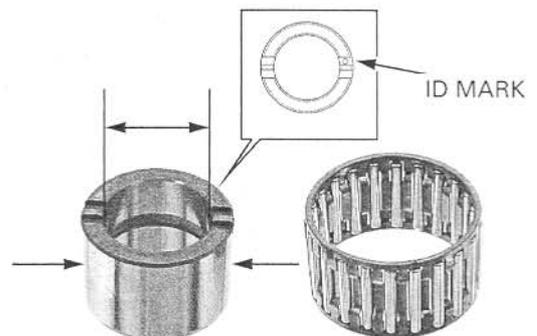
SERVICE LIMITS:

- A (without ID mark):
 - O.D.: 34.994 mm (1.3777 in)
 - I.D.: 25.013 mm (0.9848 in)
- B (with ID mark):
 - O.D.: 34.986 mm (1.3774 in)
 - I.D.: 25.013 mm (0.9848 in)

Check the needle bearing turns smoothly and quietly.

Replace the bearing if necessary.

When the clutch outer guide or needle bearing is replaced, be sure to select the needle bearing according to the selective fit table (page 10-12).



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

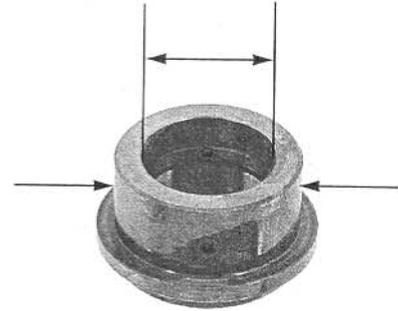
Oil pump drive sprocket guide

Measure the O.D. and I.D. of the oil pump drive sprocket guide.

SERVICE LIMITS:

O.D.: 34.940 mm (1.3756 in)

I.D.: 25.031 mm (0.9855 in)



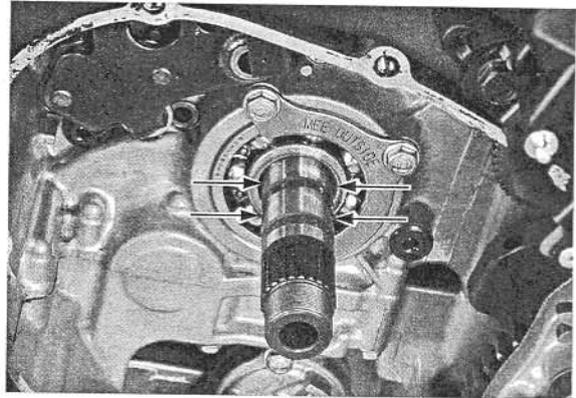
Mainshaft

Measure the mainshaft O.D. at clutch outer guide and oil pump drive sprocket guide sliding surfaces.

SERVICE LIMITS:

Oil pump drive sprocket
guide position: 24.960 mm (0.9827 in)

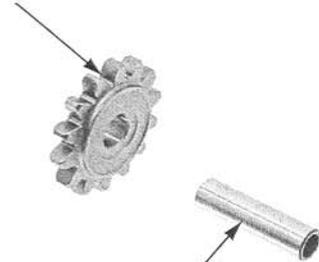
Clutch outer guide position: 24.960 mm (0.9827 in)



Starter idle gear/idle gear shaft

Check the starter idle gear and shaft for wear or damage, replace them if necessary.

STARTER IDLE GEAR



STARTER IDLE GEAR SHAFT

NEEDLE BEARING SELECTION

The primary driven gear has I.D. code letter as shown.

The clutch outer guide has O.D. code letter as shown.

Cross-reference the primary driven gear and clutch outer guide codes to determine the replacement needle bearing.

Refer to the selection table below for bearing selection.

NEEDLE BEARING

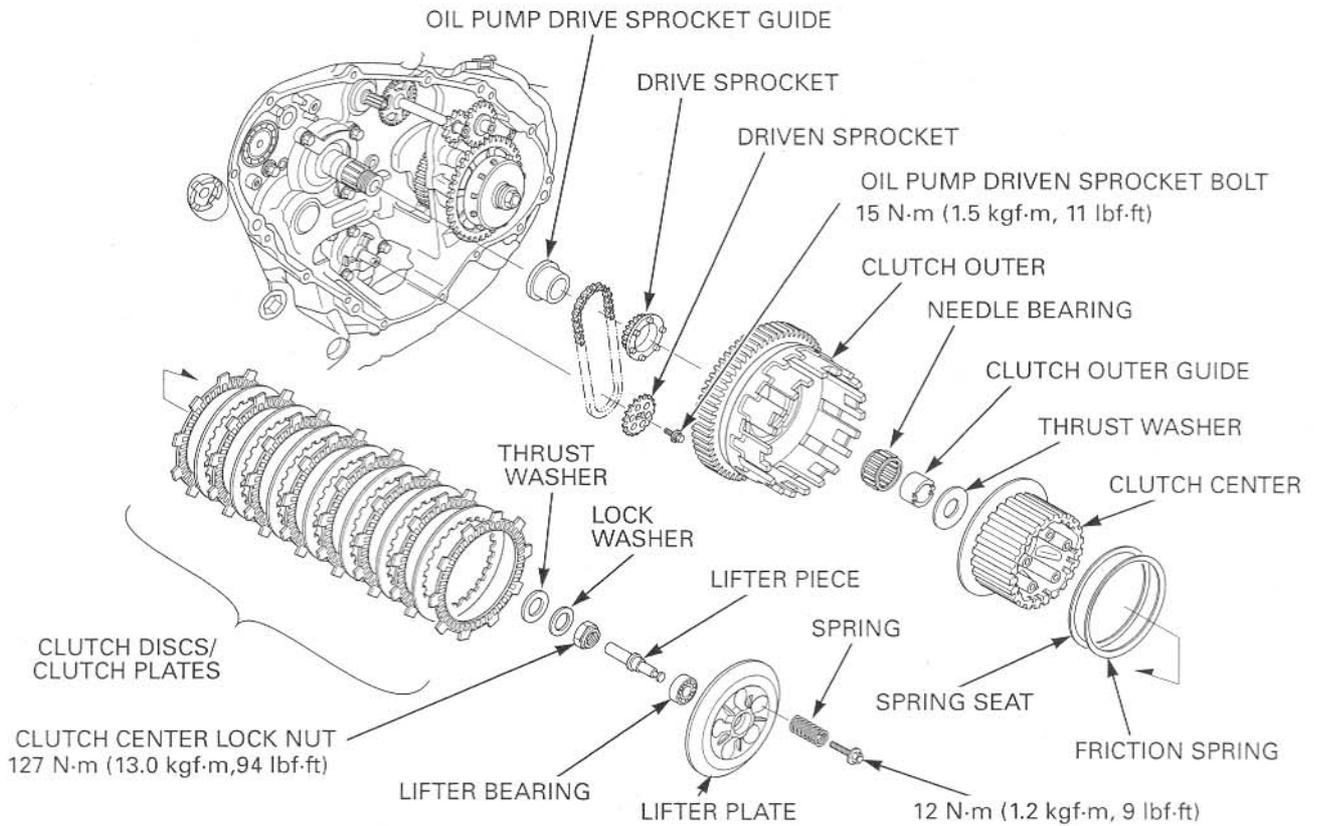


CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

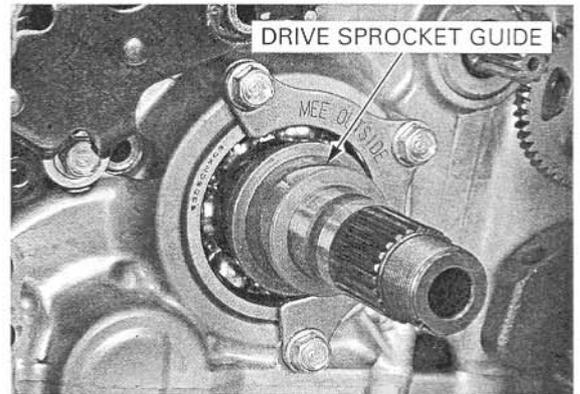
NEEDLE BEARING SELECTION TABLE:

| | | | CLUTCH OUTER GUIDE ID MARK | |
|-----------------------------------|---|--|--|--|
| | | | GUIDE A (Without ID mark) | GUIDE B (With ID mark) |
| | | | 35.004 – 35.012 mm (1.3781 – 1.3784 in) | 34.996 – 35.004 mm (1.3778 – 1.3781 in) |
| PRIMARY DRIVEN GEAR ID MARK | A | 41.008 – 41.016 mm (1.6145 – 1.6148 in) | NEEDLE BEARING B | NEEDLE BEARING A |
| | B | 41.000 – 41.008 mm (1.6142 – 1.6145 in) | NEEDLE BEARING C | NEEDLE BEARING B |

INSTALLATION



Install the oil pump drive sprocket guide.



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

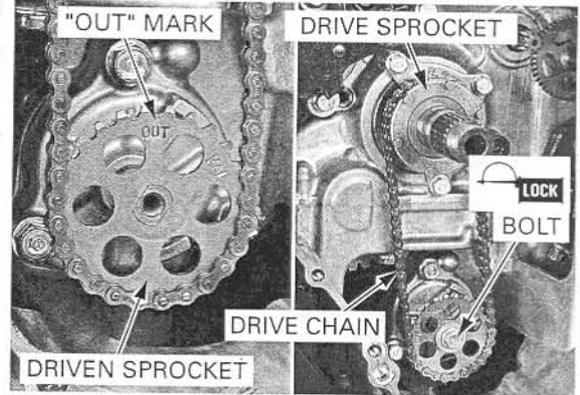
Install the oil pump driven sprocket with its "OUT" mark facing out.

Install the oil pump drive/driven sprocket and drive chain as an assembly.

Apply a locking agent to the threads of the oil pump driven sprocket bolt.

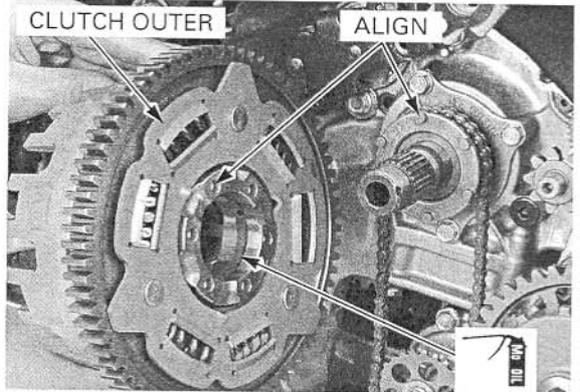
Install the oil pump driven sprocket bolt, washer and tighten the bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



Apply molybdenum oil solution to the clutch outer sliding surface.

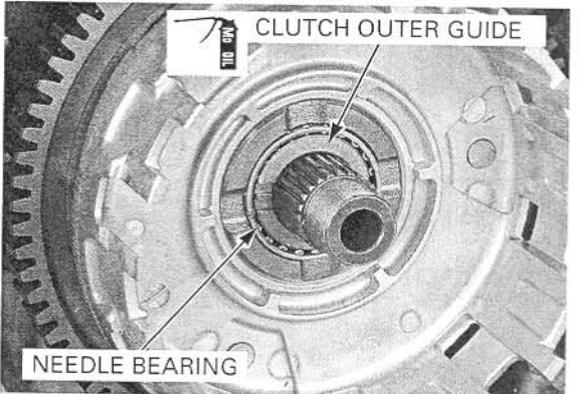
Install the clutch outer while aligning the tabs of the oil pump drive sprocket with holes of the clutch outer.



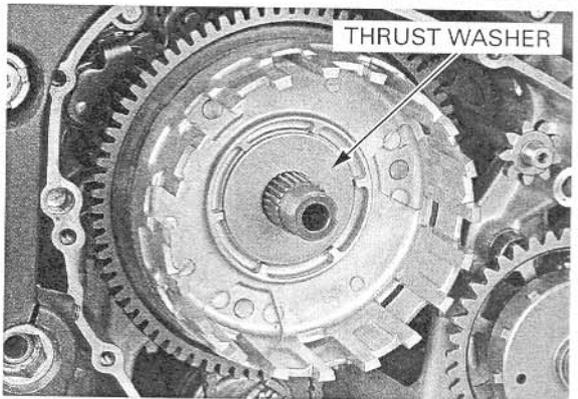
Apply molybdenum oil solution to the clutch outer guide sliding surface.

Install the clutch outer guide with its grooves facing out.

Install the clutch outer guide and needle bearing onto the mainshaft (Refer to the needle bearing selection: page 10-13).



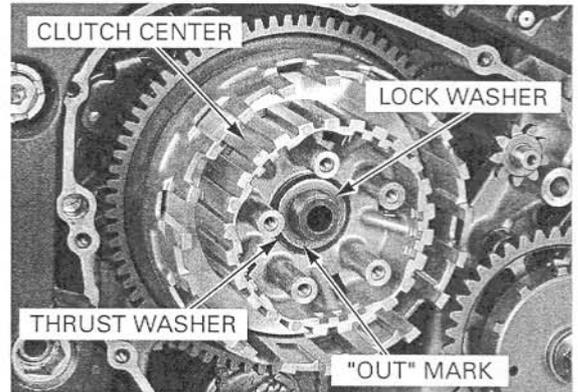
Install the thrust washer.



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Install the clutch center and thrust washer.

Install the lock washer with its "OUT" mark facing out.



Apply oil to the threads and seating surface of a new clutch center lock nut, then install it onto the mainshaft.

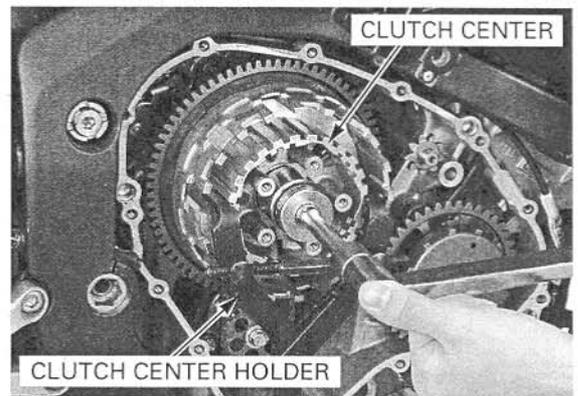
Hold the clutch center with the special tool and tighten the lock nut to the specified torque.

TOOL:

Clutch center holder

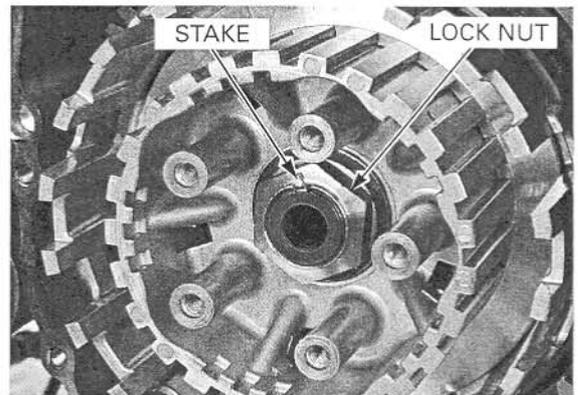
07724-0050002 or equivalent commercially available in U.S.A.

TORQUE: 127 N·m (13.0 kgf·m, 94 lbf·ft)

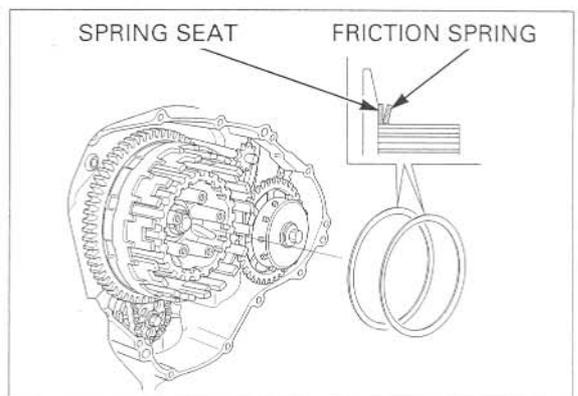


Be careful not to damage the mainshaft threads.

Stake the lock nut into the mainshaft groove with a punch.



Install the spring seat and friction spring onto the clutch center as shown.



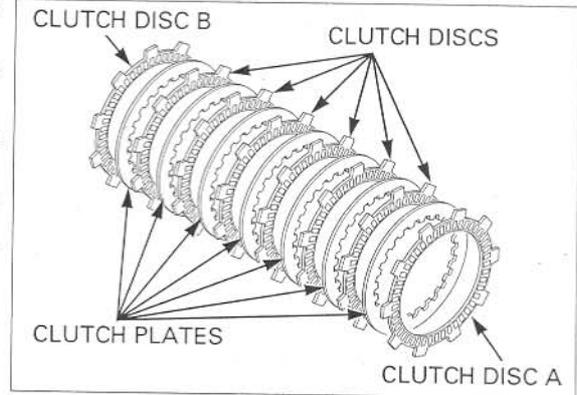
CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Coat the clutch discs and plates with clean engine oil.

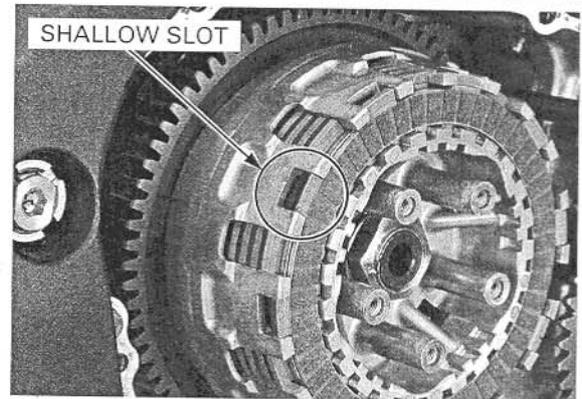
Install the clutch disc B (larger I.D. disc) into the clutch outer.

Stack the six clutch discs, seven plates and clutch disc A alternately.

- Clutch disc A has dark specks on the pads and green paint on the tab.
- Clutch disc B has a larger I.D. than the other discs.

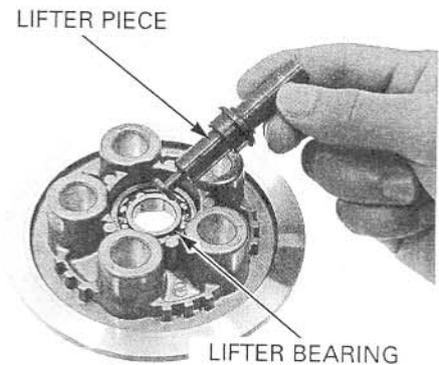


Install the tabs of outside clutch disc A into the shallow slots of the clutch outer.



Install the lifter bearing into the pressure plate.

Install the clutch lifter piece into the lifter bearing.

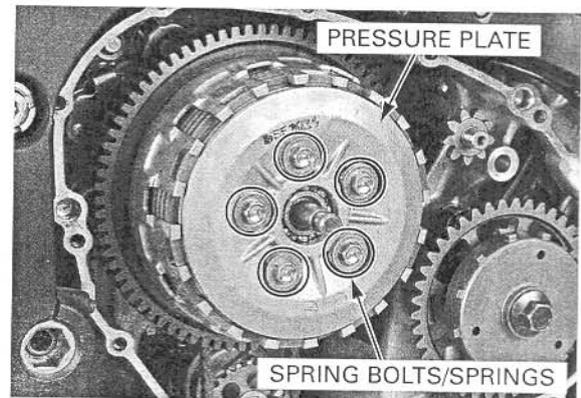


Install the pressure plate.

Install the clutch springs and spring bolts.

Tighten the bolts to the specified torque in a criss-cross pattern in two to three steps.

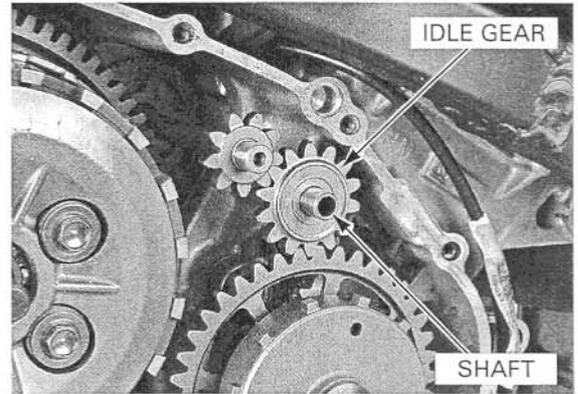
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Install the starter idle gear and shaft.

Install the right crankcase cover (page 10-24).

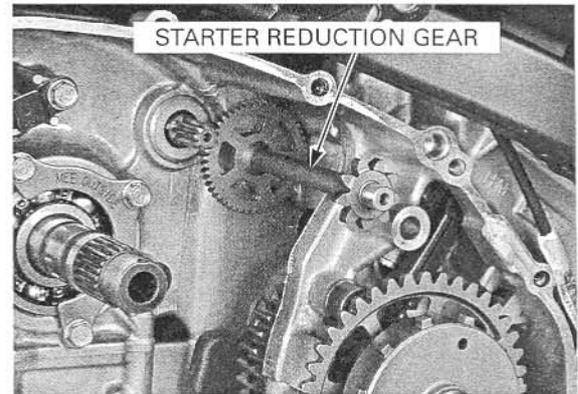


STARTER CLUTCH

REMOVAL

Remove the clutch (page 10-7).

Remove the starter reduction gear from the crankcase.



Temporarily install the following:

- Starter idle gear
- Starter idle gear shaft

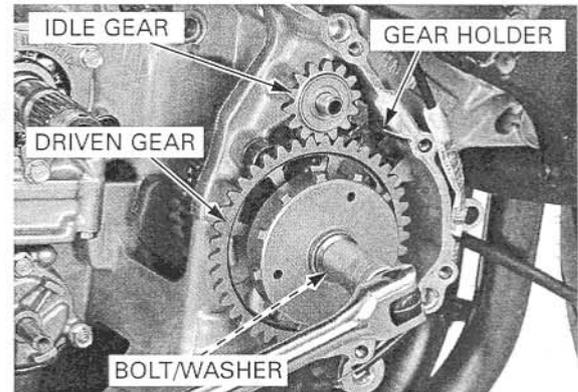
Insert the gear holder between the starter idle gear and driven gear as shown.

TOOL:

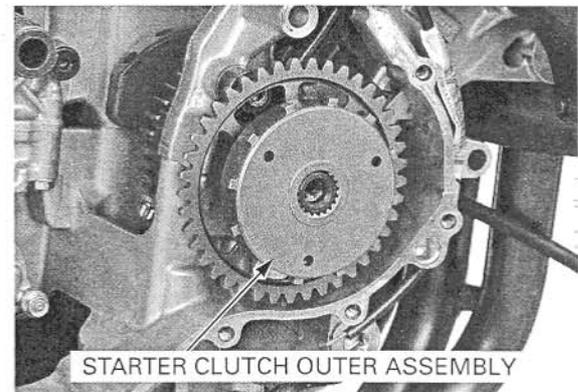
Gear holder, M2.5 **07724-0010100**

Remove the starter clutch outer special bolt and washer.

Remove the temporarily installed parts.

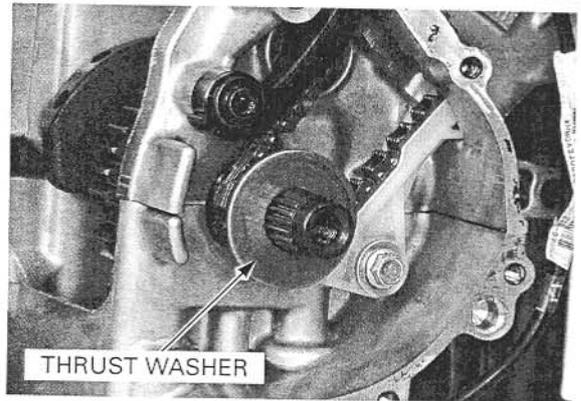


Remove the starter clutch outer assembly.



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Remove the thrust washer.



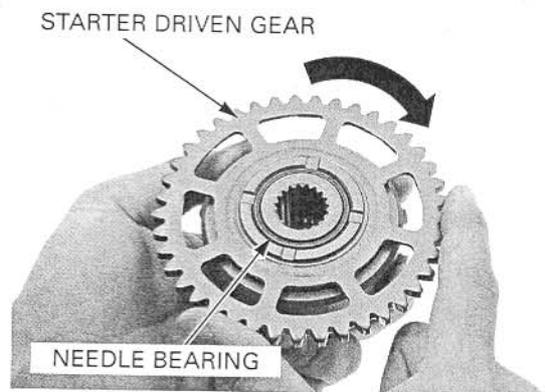
INSPECTION

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

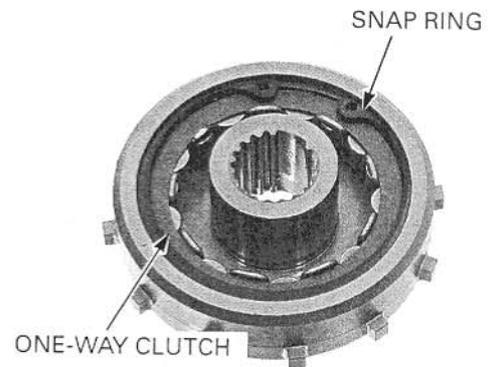
DISASSEMBLY

Remove the starter driven gear by turning it counterclockwise.

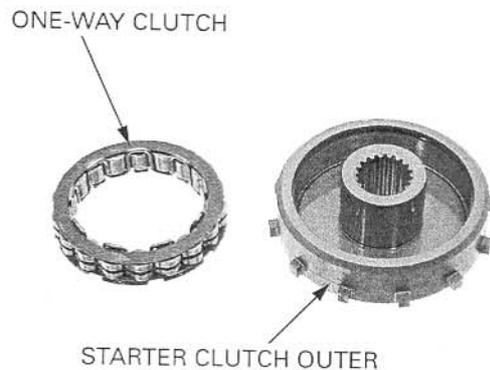
Remove the needle bearing.



Remove the snap ring and one-way clutch.



Check the starter clutch outer inner surface and one-way clutch for abnormal wear or damage and replace them if necessary.

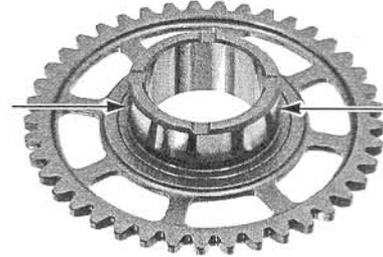


CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Check the starter driven gear for abnormal wear or damage.

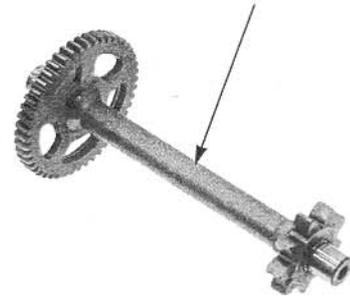
Measure the starter driven gear boss O.D.

SERVICE LIMIT: 45.642 mm (1.7969 in)



Check the starter reduction gear for wear or damage and replace it if necessary.

STARTER REDUCTION GEAR



ASSEMBLY

STARTER DRIVEN GEAR

ONE-WAY CLUTCH

NEEDLE BEARING

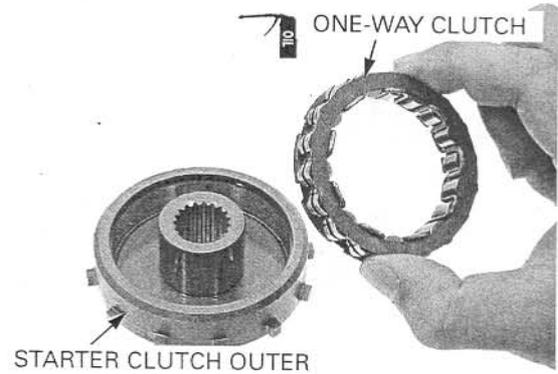
SNAP RING

STARTER CLUTCH OUTER

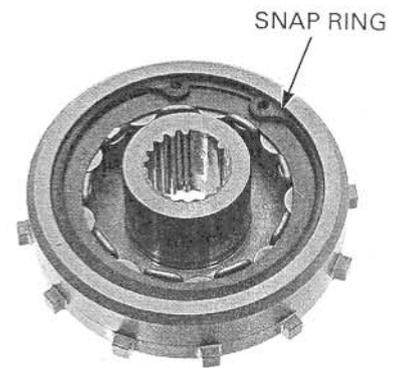
74 N·m (7.5 kgf·m, 54 lbf·ft)

CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Apply oil to the one-way clutch.
Install the one-way clutch into the starter clutch outer.

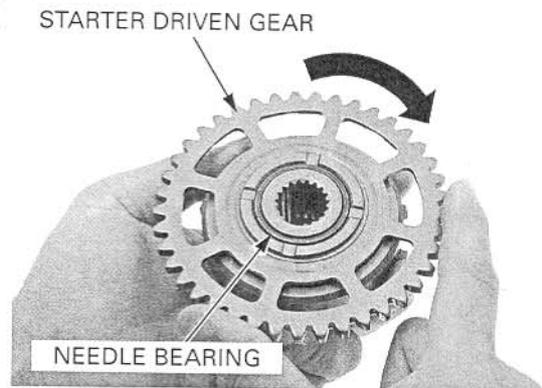


Install the snap ring into the starter clutch outer groove securely.



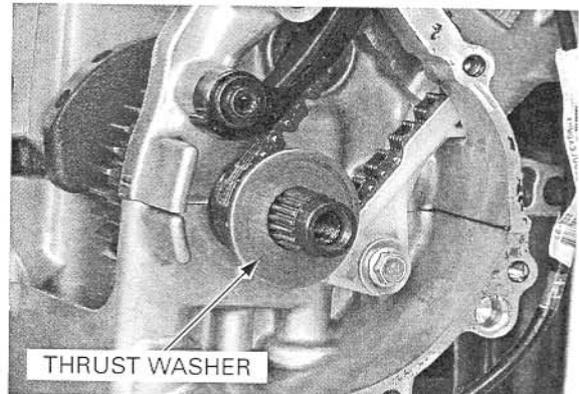
Install the starter driven gear and needle bearing into the starter clutch outer while turning the starter driven gear clockwise.

Recheck the one-way clutch operation (page 10-18).



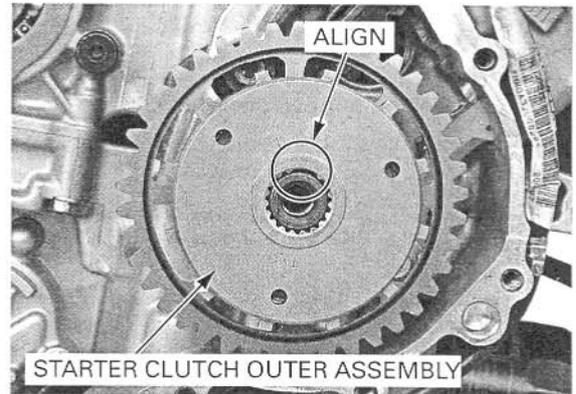
INSTALLATION

Install the thrust washer into the crankshaft.



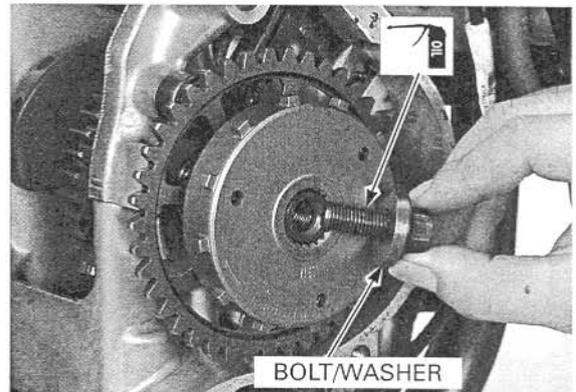
CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Install the starter clutch outer assembly into the crankshaft while aligning the tab of the crankshaft with the wide groove of the starter clutch assembly.



Apply oil to the starter clutch outer special bolt threads and seating surface.

Install the washer and starter clutch outer special bolt.



Temporarily install the following:

- Oil pump drive gear guide
- Oil pump drive gear
- Clutch outer
- Clutch outer guide
- Clutch outer needle bearing

Be careful not to drop the gear holder into the crankcase.

Attach the gear holder between the primary drive gear and driven gear.

TOOL:

Gear holder, M2.5 07724-0010100

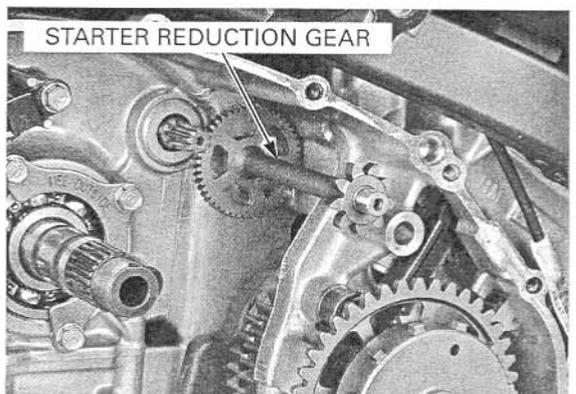
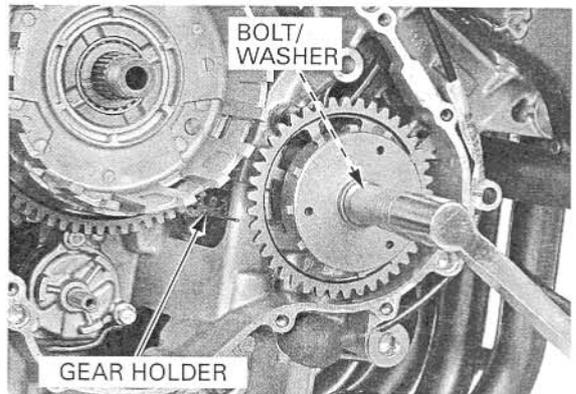
Tighten the starter clutch special bolt to the specified torque.

TORQUE: 74 N·m (7.5 kgf·m, 54 lbf·ft)

Remove the temporarily installed parts.

Install the starter reduction gear into the crankcase.

Install the clutch (page 10-13).



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

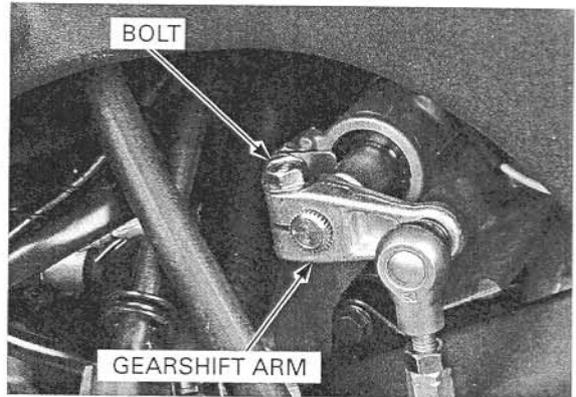
GEARSHIFT LINKAGE

REMOVAL

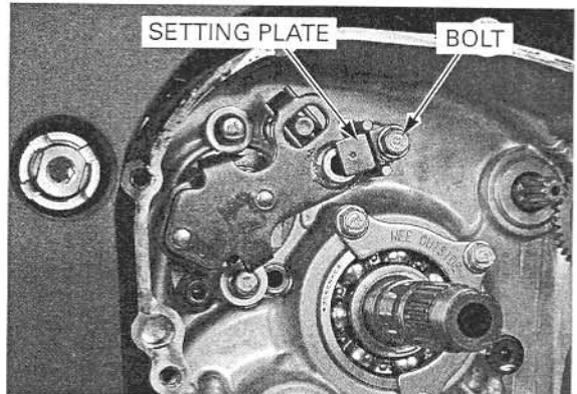
Remove the following:

- Right crankcase cover (page 10-5)
- Clutch (page 10-7)

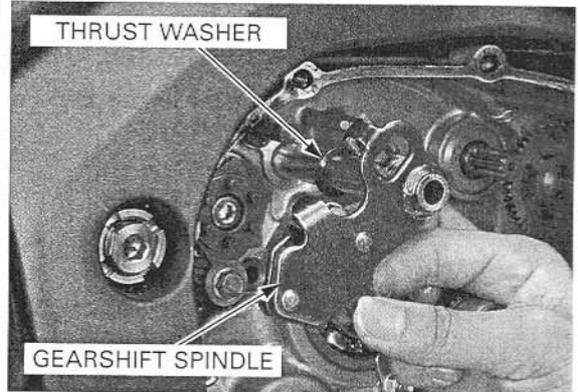
Remove the pinch bolt and disconnect the gear shift arm from the gear shift spindle.



Remove the bolt and setting plate.

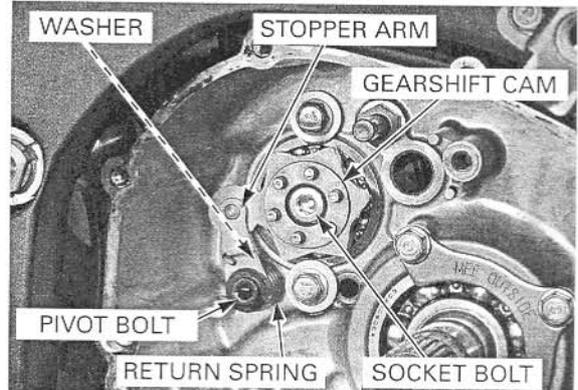


Pull the gearshift spindle assembly and thrust washer out of the crankcase.



Remove the following:

- Stopper arm pivot bolt
- Stopper arm
- Return spring
- Washer
- Shift drum center socket bolt
- Gearshift cam
- Dowel pin

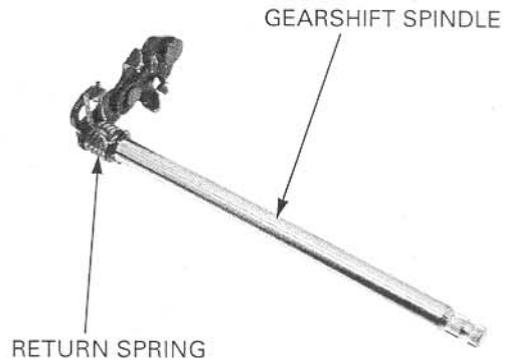


CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

INSPECTION

Check the gearshift spindle for wear, damage or bending.

Check the return spring for fatigue or damage.



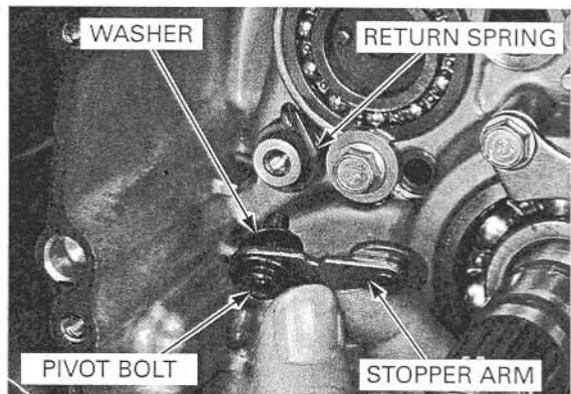
INSTALLATION

Install the following:

- Washer
- Return spring
- Stopper arm
- Pivot bolt

Tighten the stopper arm pivot bolt to the specified torque.

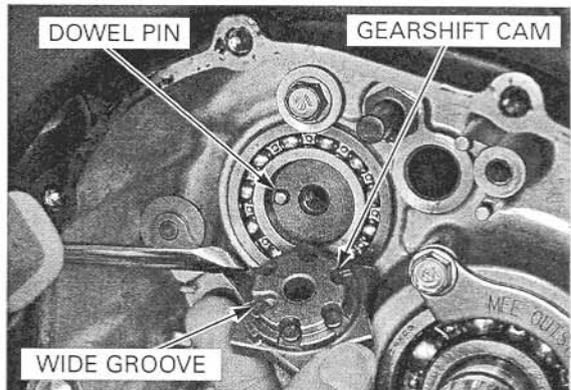
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)



Install the dowel pin onto the shift drum.

Align the dowel pin on the shift drum with the wide groove on the gearshift cam.

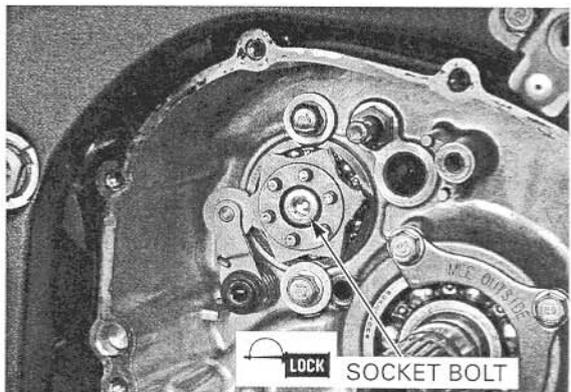
Install the gearshift cam while holding the stopper arm using a screwdriver as shown.



Apply a locking agent to the shift drum center socket bolt threads.

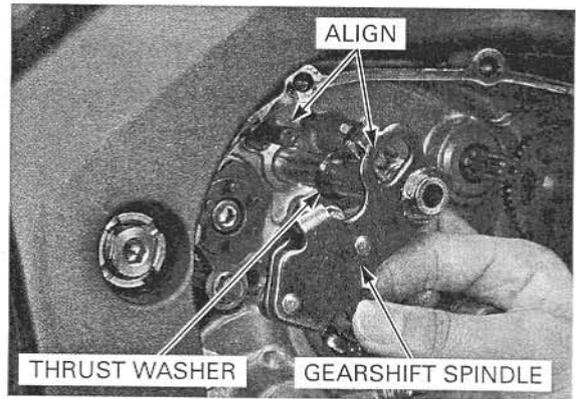
Tighten the socket bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

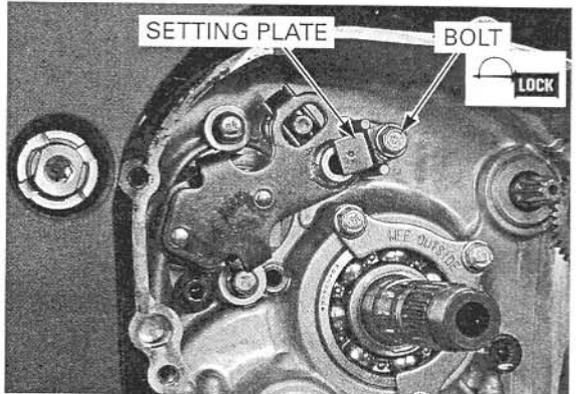


CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Install the thrust washer and gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.

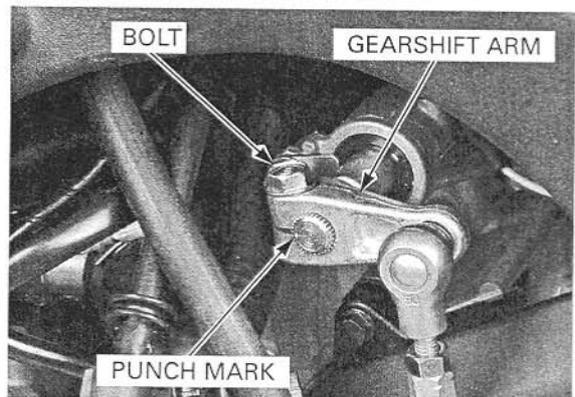


Apply a locking agent to the thread, install the setting plate and bolt. Tighten the bolt.



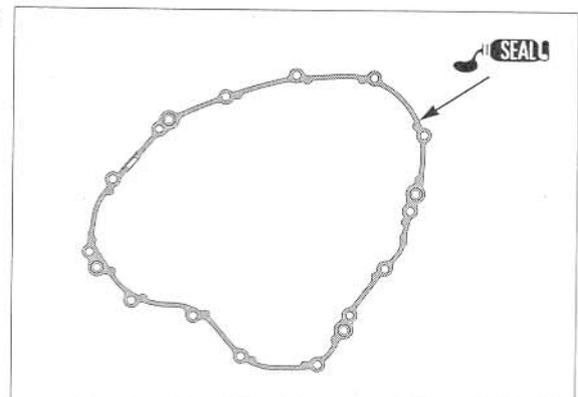
Install the gearshift arm to the gearshift spindle, aligning the arm slit with the punch mark on the gearshift spindle. Install and tighten the pinch bolt.

Install the clutch (page 10-13).



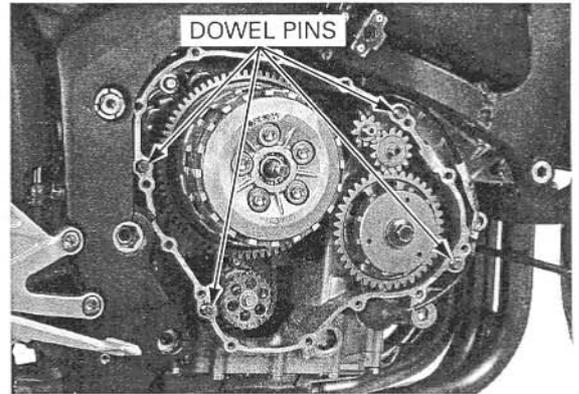
RIGHT CRANKCASE COVER INSTALLATION

Apply sealant to the mating surface of the right crankcase cover.

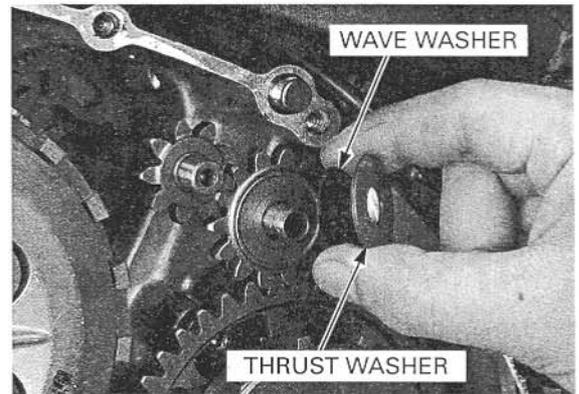


CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

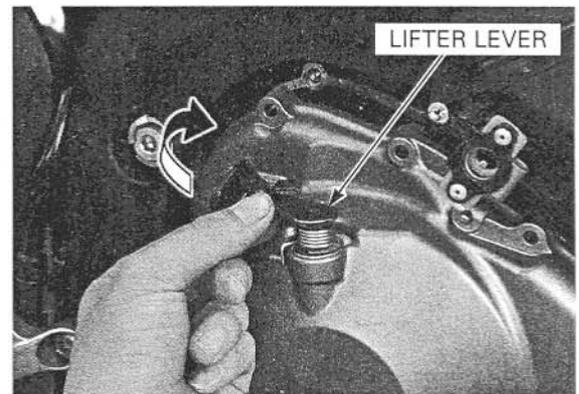
Install the four dowel pins.



Install the wave washer and thrust washer onto the starter idle gear.

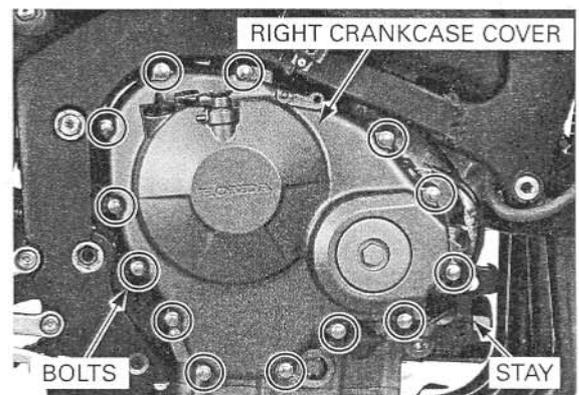


Install the right crankcase cover while turning the lifter lever clockwise to engage the lifter lever spindle groove with the lifter piece flange.



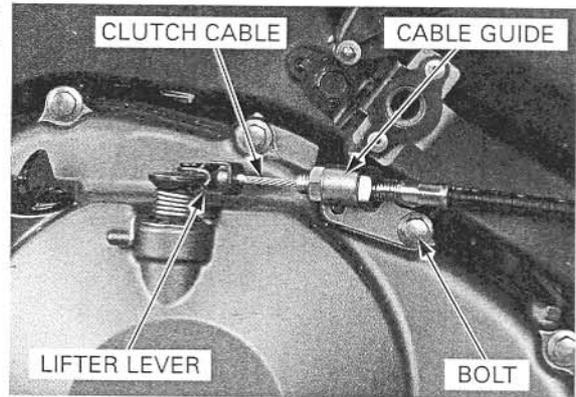
Install the radiator reserve tank stay and right crankcase cover bolts.

Tighten the right crankcase cover bolts crisscross pattern in two to three steps.



CLUTCH/STARTER CLUTCH/GEARSHIFT LINKAGE

Connect the clutch cable end to the clutch lifter lever, then install the clutch cable guide plate with the bolt.



Connect the ignition pulse generator 2P (Red) connector.

Add the recommended engine oil (page 4-16).

Install the following:

- Radiator reserve tank (page 7-18)
- Middle cowls (page 3-8)
- Lower cowls (page 3-6)

Adjust the clutch lever free play (page 4-28).

