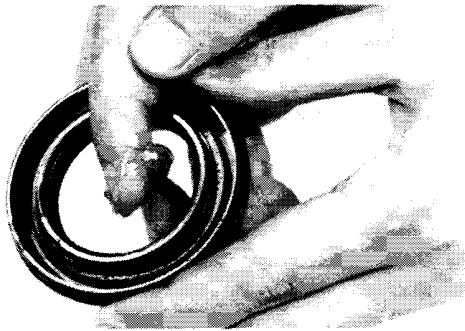


## ENGINE ASSEMBLY AND ADJUSTMENT CRANKSHAFT

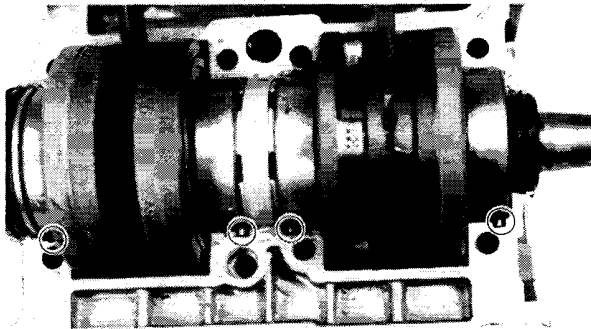
1. Install:
  - Circlip ①  
On the clutch side.



2. Apply:  
To oil seal lips and bearing.



**Light Weight Lithium Base Grease**



3. Install:
  - Crankshaft

**NOTE:** \_\_\_\_\_

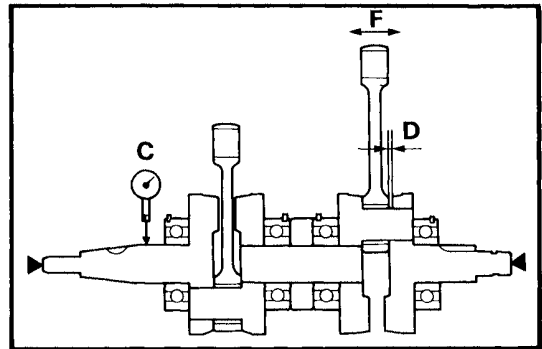
Align the bearing knock pin with the pin slot in the crankcase lower half.

\_\_\_\_\_



### CRANKSHAFT/PISTON

- |                     |                      |
|---------------------|----------------------|
| ① Oil seal          | ⑩ Bearing            |
| ② Bearing           | ⑪ Circlip            |
| ③ Woodruff key      | ⑫ Oil seal           |
| ④ Crank (Left)      | ⑬ Piston pin bearing |
| ⑤ Washer            | ⑭ Piston pin clip    |
| ⑥ Connecting rod    | ⑮ Piston pin         |
| ⑦ Crank pin bearing | ⑯ Piston pin clip    |
| ⑧ Washer            | ⑰ Piston             |
| ⑨ Crank (Right)     | ⑱ Piston ring set    |



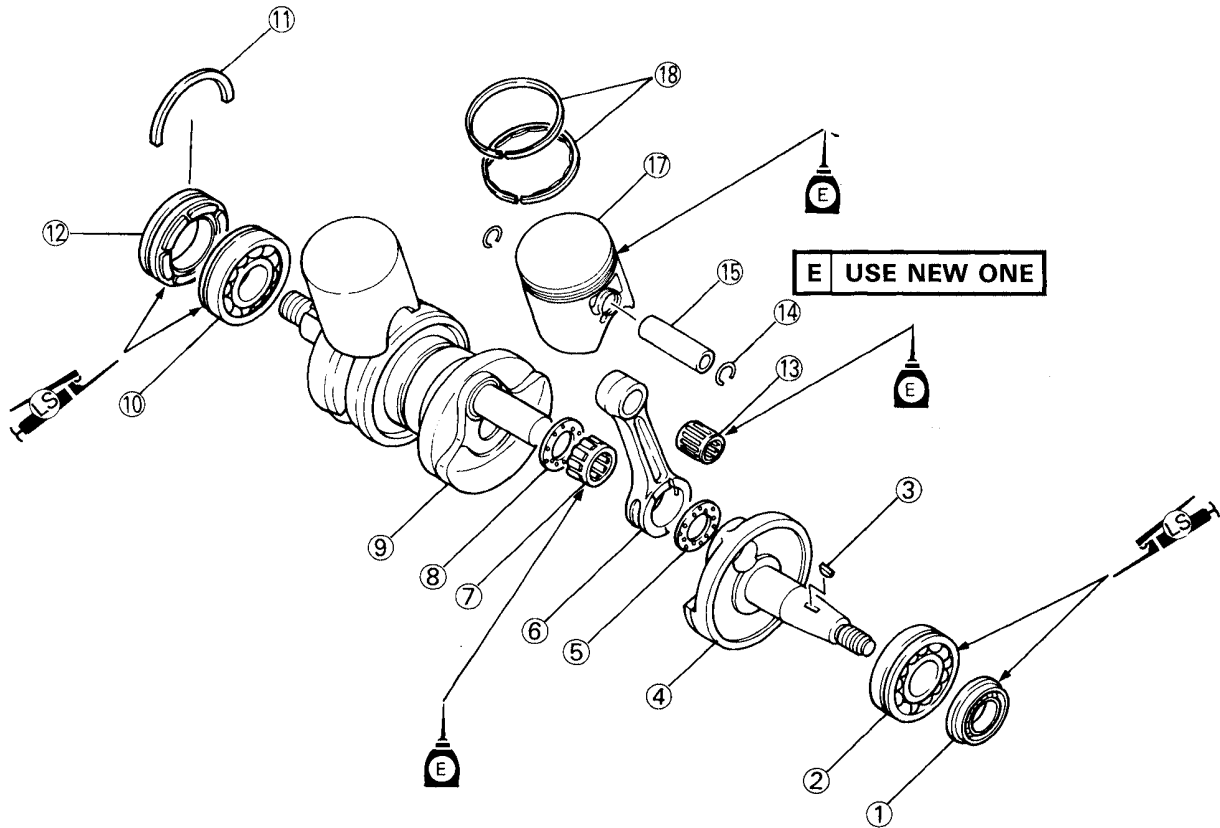
**A PISTON TO CYLINDER CLEARANCE:**  
0.060 ~ 0.065 mm (0.0024 ~ 0.0026 in)

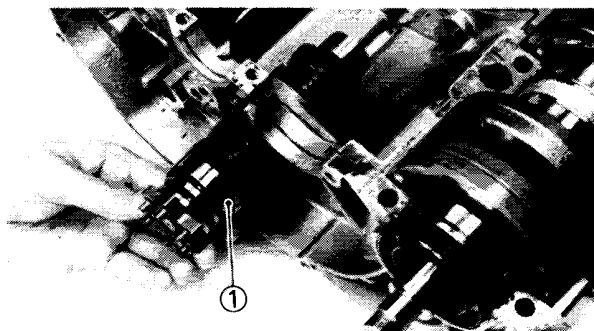
**B END GAP (INSTALLED):**  
TOP RING  
0.30 ~ 0.45 mm (0.012 ~ 0.018 in)  
2nd RING  
0.30 ~ 0.45 mm (0.012 ~ 0.018 in)

**D SIDE CLEARANCE:**  
TOP RING  
0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)  
2nd RING  
0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)

**C CRANKSHAFT:**

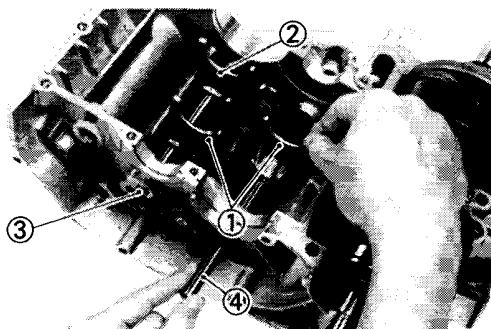
RUNOUT LIMIT "C":  
0.05 mm (0.002 in)  
BIG END SIDE CLEARANCE "D":  
0.25 ~ 0.75 mm (0.01 ~ 0.03 in)  
SMALL END FREE PLAY "F":  
0.36 ~ 0.98 mm (0.0142 ~ 0.0386 in)



**SHIFTER**

1. Install:

- Shift cam (1)

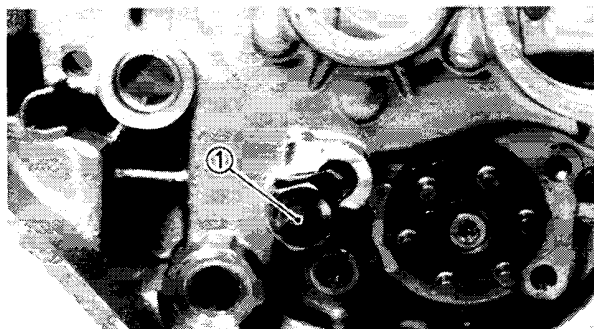


2. Install:

- Shift forks #1 (1)
- Shift fork #2 (2)
- Guide bar #1 (Longer) (3)
- Guide bar #2 (Shorter) (4)

**NOTE:**

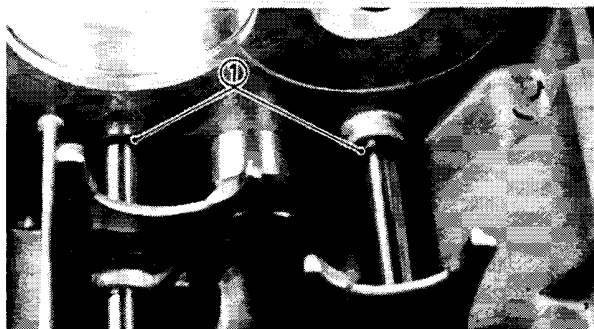
Each shift fork is identified by a number cast on its side.



3. Install:

- Bolt (1)

4. Bend the lock washer tab along the nut flats.

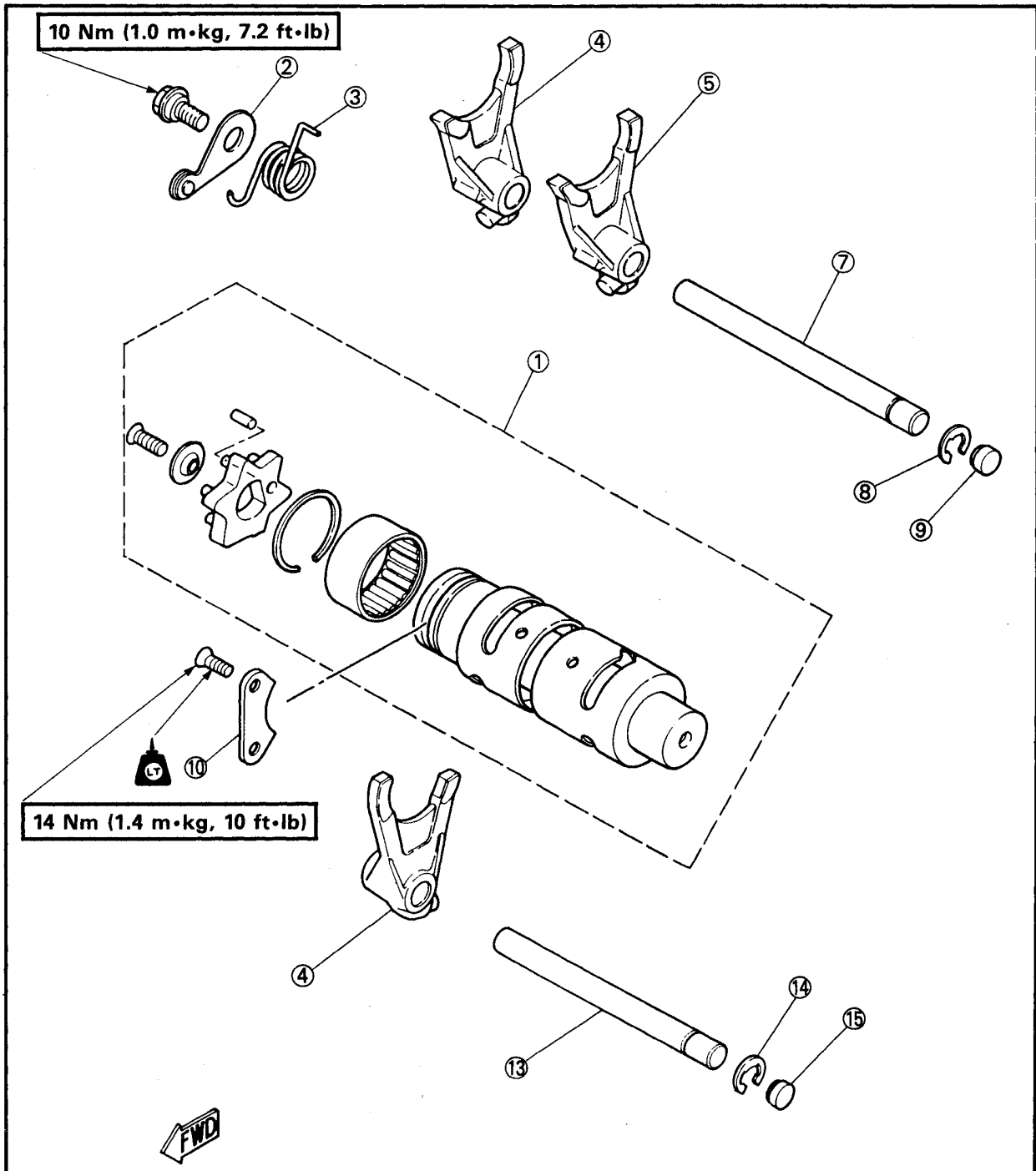


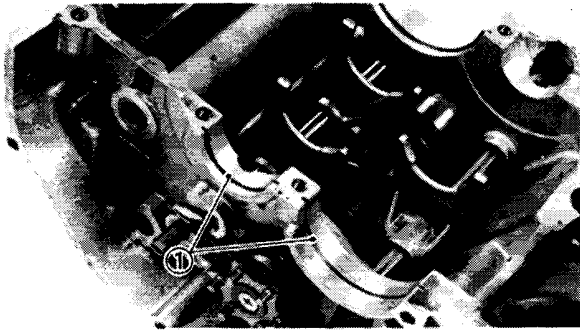
5. Install:

- Circlips (1) (Guide bar)

## SHIFTER

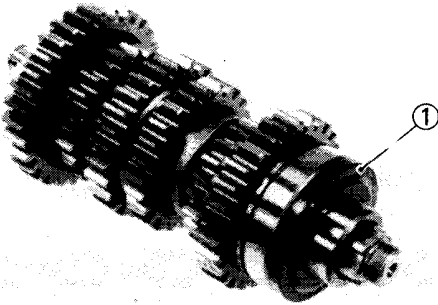
- ① Shift cam
- ② Stopper lever
- ③ Spring
- ④ Shift fork #1
- ⑤ Shift fork #2
- ⑥ Guide bar
- ⑦ Circlip
- ⑧ Plug
- ⑨ Cam stopper plate
- ⑩ Guide bar
- ⑪ Circlip
- ⑫ Plug



**TRANSMISSION**

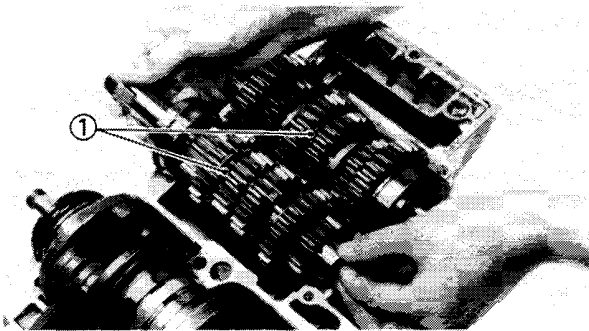
## 1. Install:

- Circlips ①



## 2. Install:

- Oil seal ①  
To drive axle.



## 3. Install:

- Transmission assembly ①

**NOTE:**

- Be sure axle circlips are fitted to bearings and circlips have been positioned in circlip grooves.
- Transmission installation is easier if shift cam is rotated to neutral position.

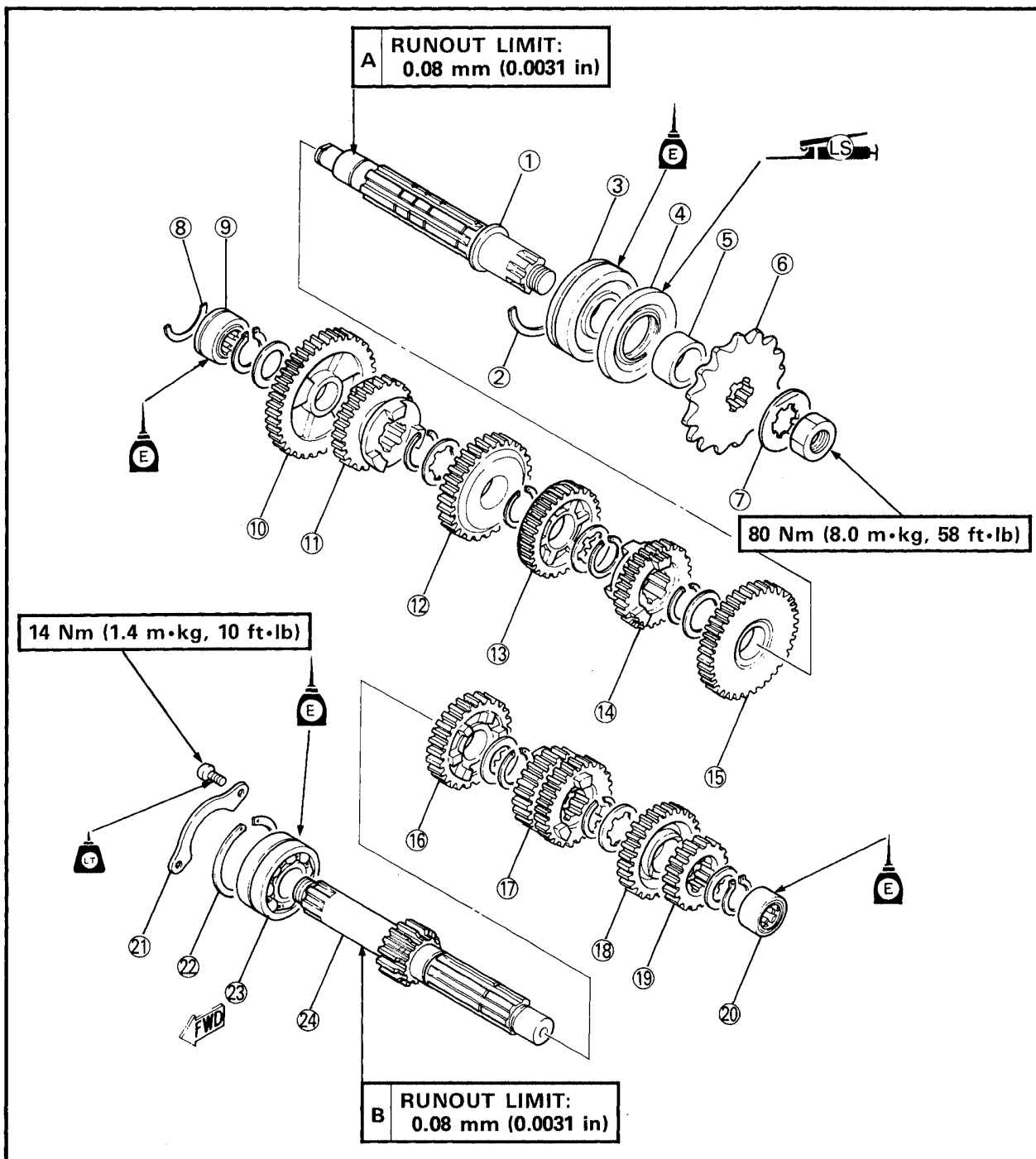
## 4. Check:

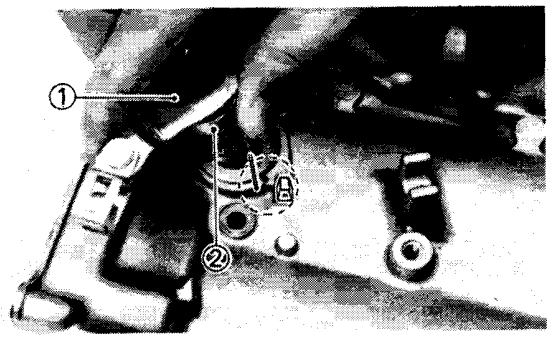
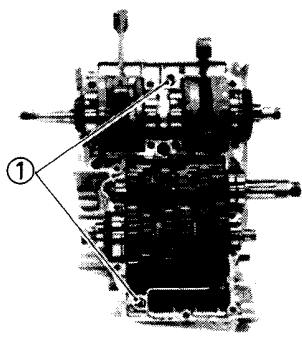
- Shifter operation.  
Unsmooth operation → Repair.
- Transmission operation  
Unsmooth operation → Repair.



### TRANSMISSION

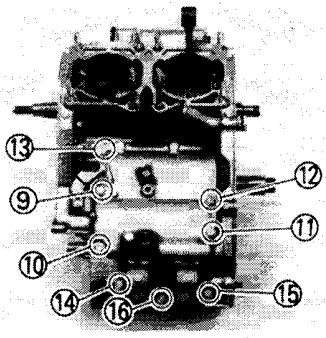
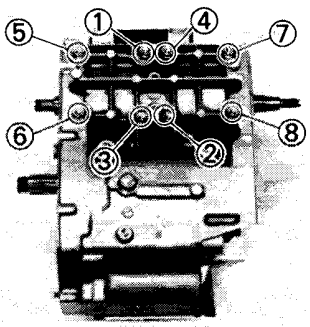
- |                  |                   |                           |
|------------------|-------------------|---------------------------|
| ① Drive axle     | ⑨ Bearing         | ⑰ 3rd and 4th pinion gear |
| ② Circlip        | ⑩ 1st wheel gear  | ⑱ 6th pinion gear         |
| ③ Bearing        | ⑪ 5th wheel gear  | ⑲ 2nd pinion gear         |
| ④ Oil seal       | ⑫ 3rd wheel gear  | ⑳ Bearing                 |
| ⑤ Collar         | ⑬ 4th wheel gear  | ㉑ Bearing stopper plate   |
| ⑥ Drive sprocket | ⑭ 6th wheel gear  | ㉒ Circlip                 |
| ⑦ Lock washer    | ⑮ 2nd wheel gear  | ㉓ Bearing                 |
| ⑧ Circlip        | ⑯ 5th pinion gear | ㉔ Main axle               |






**CRANKCASE**

1. Apply:
  - Yamabond No.4® (ACC-11001-30-00)  
To the mating surfaces of both case halves.
2. Install:
  - Dowel pins ①
3. Install:
  - Clutch push lever ①
4. Set the push lever axle spring ② to its position.
5. Install:
  - Upper crankcase
6. Tighten:
  - Bolts (Crankcase)




**Securing bolts tightening steps:**


- Temporarily tighten ① to ⑧ and next ⑨ to ⑯, in that order.
- Tighten ⑨ to ⑯.

 **5 Nm (0.5 m•kg, 3.6 ft•lb)**


- Tighten ① to ⑧.

 **10 Nm (1.0 m•kg, 7.2 ft•lb)**

- Tighten ① to ⑧.

 **25 Nm (2.5 m•kg, 18 ft•lb)**

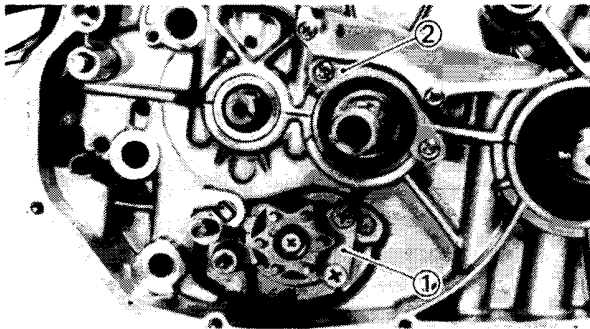
- Tighten ⑨ to ⑯.

 **10 Nm (1.0 m•kg, 7.2 ft•lb)**


**NOTE:** \_\_\_\_\_  
Be sure to secure wire holder clamps together.




5. Apply:
  - 2-stroke oil  
To the crank pin, bearing and oil delivery hole.
6. Check: ✓
  - Crankshaft and transmission operation  
Unsmooth operation → Repair.

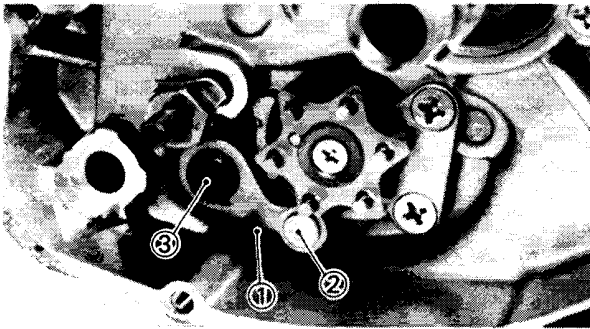


7. Install:
  - Cam stopper plate ①
  - Bearing stopper plate ②
8. Tighten:
  - Screws (cam stopper plate).

	<p><b>Screws (Cam Stopper Plate):</b>  <b>14 Nm (1.4 m•kg, 10 ft•lb)</b>  <b>LOCTITE®</b></p>
---	---


- Screws (Bearing stopper plate)

	<p><b>Screws (Bearing Stopper Plate):</b>  <b>14 Nm (1.4 m•kg, 10 ft•lb)</b>  <b>LOCTITE®</b></p>
---	---

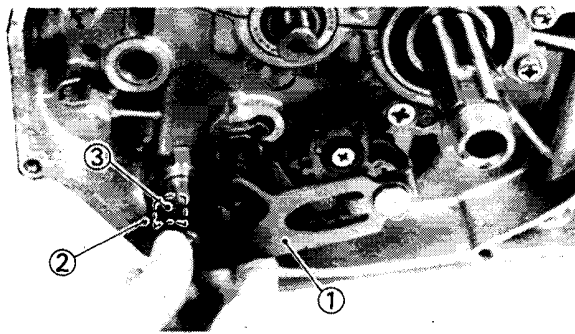


## CHANGE SHAFT

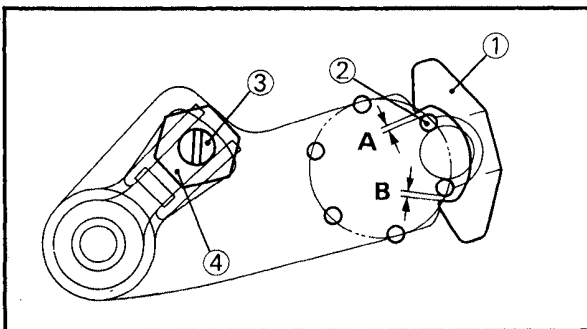
1. Install:
  - Spring ①
  - Stopper lever ②
  - Securing bolt ③
2. Set the stopper lever and torsion spring as properly position.
3. Tighten:
  - Securing bolt ③

	<p><b>Securing Bolt:</b>  <b>10 Nm (1.0 m•kg, 7.2 ft•lb)</b>  <b>LOCTITE®</b></p>
---	---





4. Install:
  - Change lever ①
  - Spring ②
  - Collar ③
5. Check:
  - Change operation
  - Unsmooth operation → Repair.



6. Check
  - Change lever position
  - Gap (A) and (B) are not equal → Adjust.

**Change lever position adjustment steps:**

- Straighten the lock washer tab.
- Loosen the lock nut ④.
- Turn the adjuster ③ in or out until gap (A) and (B) are equal.
- Tighten the lock nut.

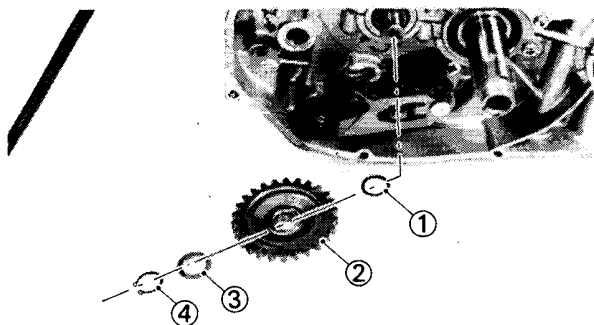


**Lock Nut:**

30 Nm (3.0 m•kg, 22 ft•lb)

- Bend the lock washer tab.

- ① Change lever
- ② Segment



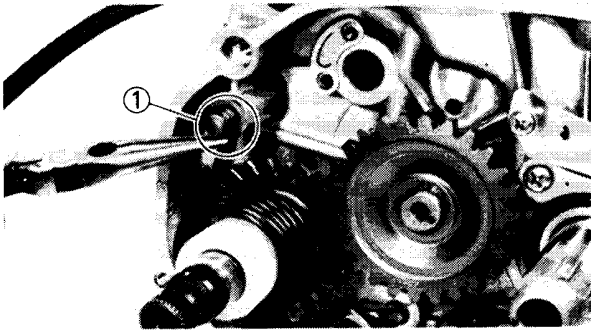
**KICK AXLE**

1. Install:
  - Plain washer ①
  - Kick idle gear ②
  - Washer ③
  - Circlip ④

2. Install:
  - Kick axle assembly ①
  - Rotate the shaft clockwise.

**NOTE:**

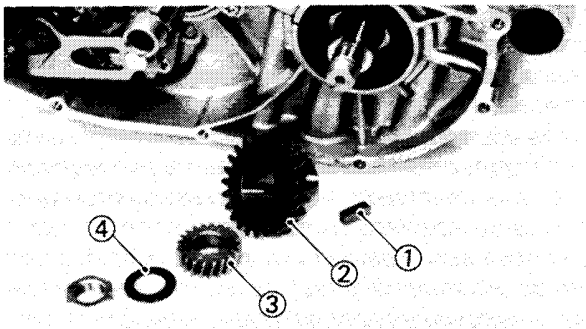
- Make sure that the kick stopper is stopped at the projection of the crankcase.
- Make sure that the spring is engaged with the crankcase hole.



3. Set the kick spring ① to the spring hook.

4. Check:

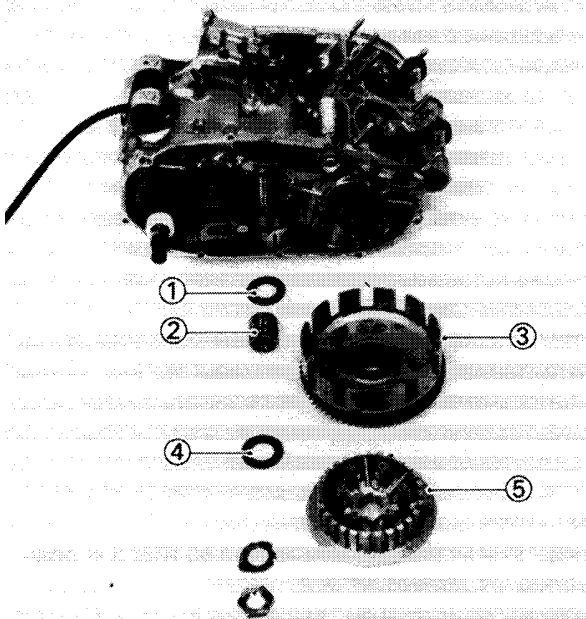
- Kick axle operation
- Unsmooth operation → Repair.



## CLUTCH AND PRIMARY DRIVE GEAR

1. Install:

- Key ①
- Primary drive gear ②
- Water pump drive gear ③
- Conical washer ④
- Nut (Primary drive gear)

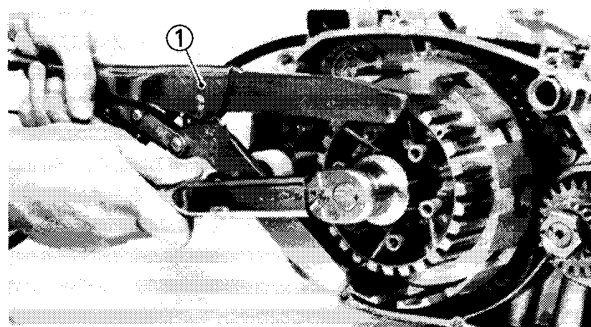


2. Install:

- Thrust plate ①
- Spacer ②
- Clutch housing ③
- Thrust plate ④
- Clutch boss ⑤

3. Install:

- Lock washer
- Nut (Clutch boss)

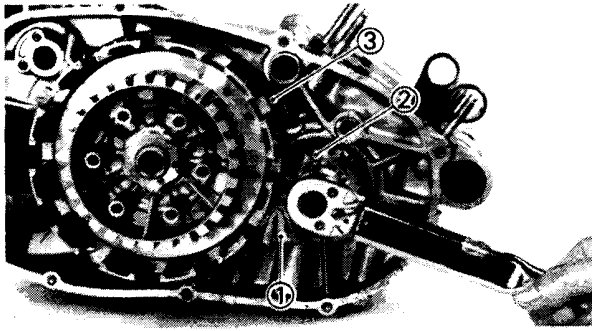


4. Tighten:

- Nut (Clutch boss)
- Use the Universal Clutch Holder ① (YM-91042).



**Nut (Clutch Boss):**  
90 Nm (9.0 m·kg, 65 ft·lb)

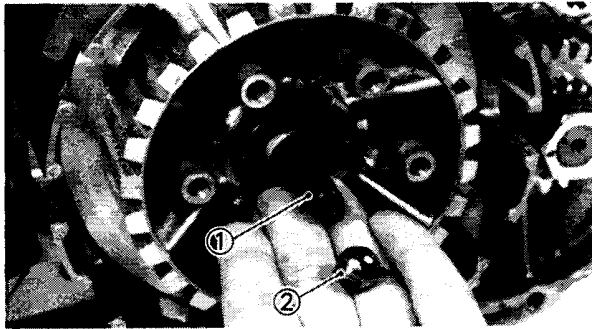


5. Tighten:
- Nut (Primary drive gear)

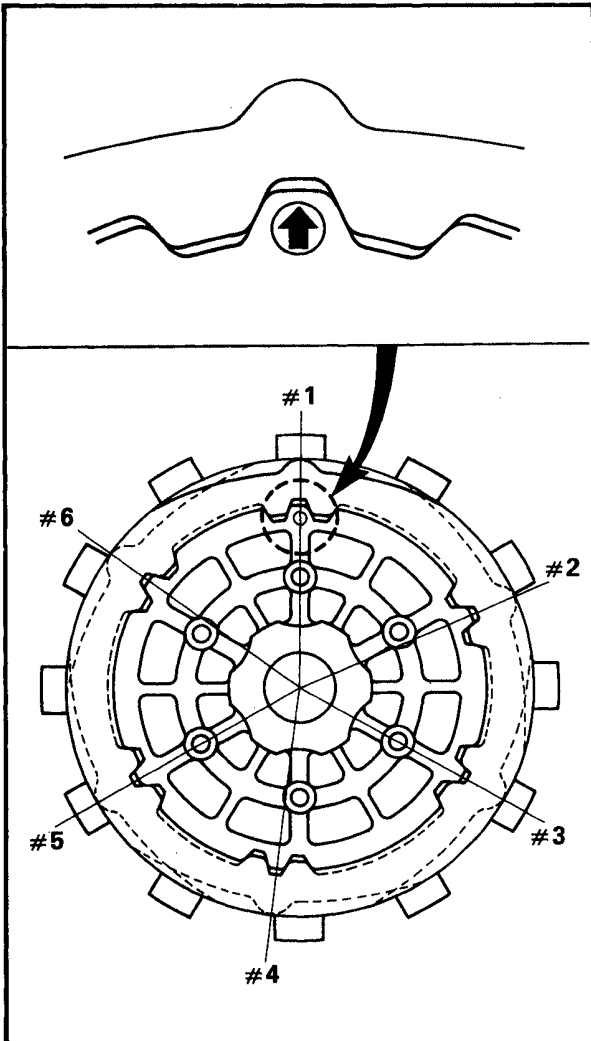
Place the folded rag ① between the teeth of the drive gear ② and driven gear ③ to lock them.



**Nut (Primary Drive Gear):**  
65 Nm (6.5 m•kg, 47 ft•lb)



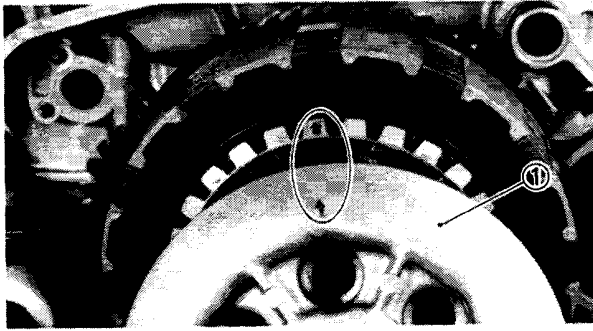
6. Bend the lock washer tab along the nut flats.  
7. Install:
- Push rod #2 ①
  - Ball ②
- Apply lithium soap base grease.



8. Install:
- Cushion rings
  - Friction plates
  - Clutch plates
- Apply 10W30 motor oil.

**NOTE:**

- In order to reduce noise caused by the clutch plates and clutch boss, each clutch plate is cut away at part of the edge (#1). This permits the clutch plate to move outward due to centrifugal force.
- Align one of the plate cutaways so that it is positioned as shown at #2.
- Install a friction plate. Next install a clutch plate with cutaway offset approximately 60° from previous plate cutaway.
- Continue this procedure in a clockwise direction until all clutch plates are installed.

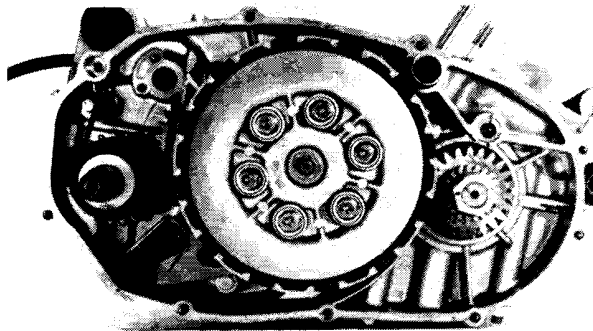


9. Install:
- Push rod # 1

10. Install:
- Clutch pressure plate ①

**NOTE:**

Align the punched mark on the clutch boss with the arrow mark on the clutch pressure plate.



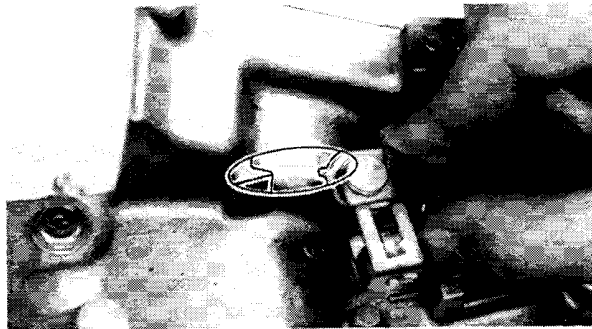
11. Install:
- Clutch springs
  - Clutch spring holding screws



**Clutch Spring Holding Screws:  
10 Nm (1.0 m·kg, 7.2 ft·lb)**

12. Adjust:
- Clutch mechanism free play  
Refer to "CHAPTER 2. CLUTCH ADJUSTMENT" section.

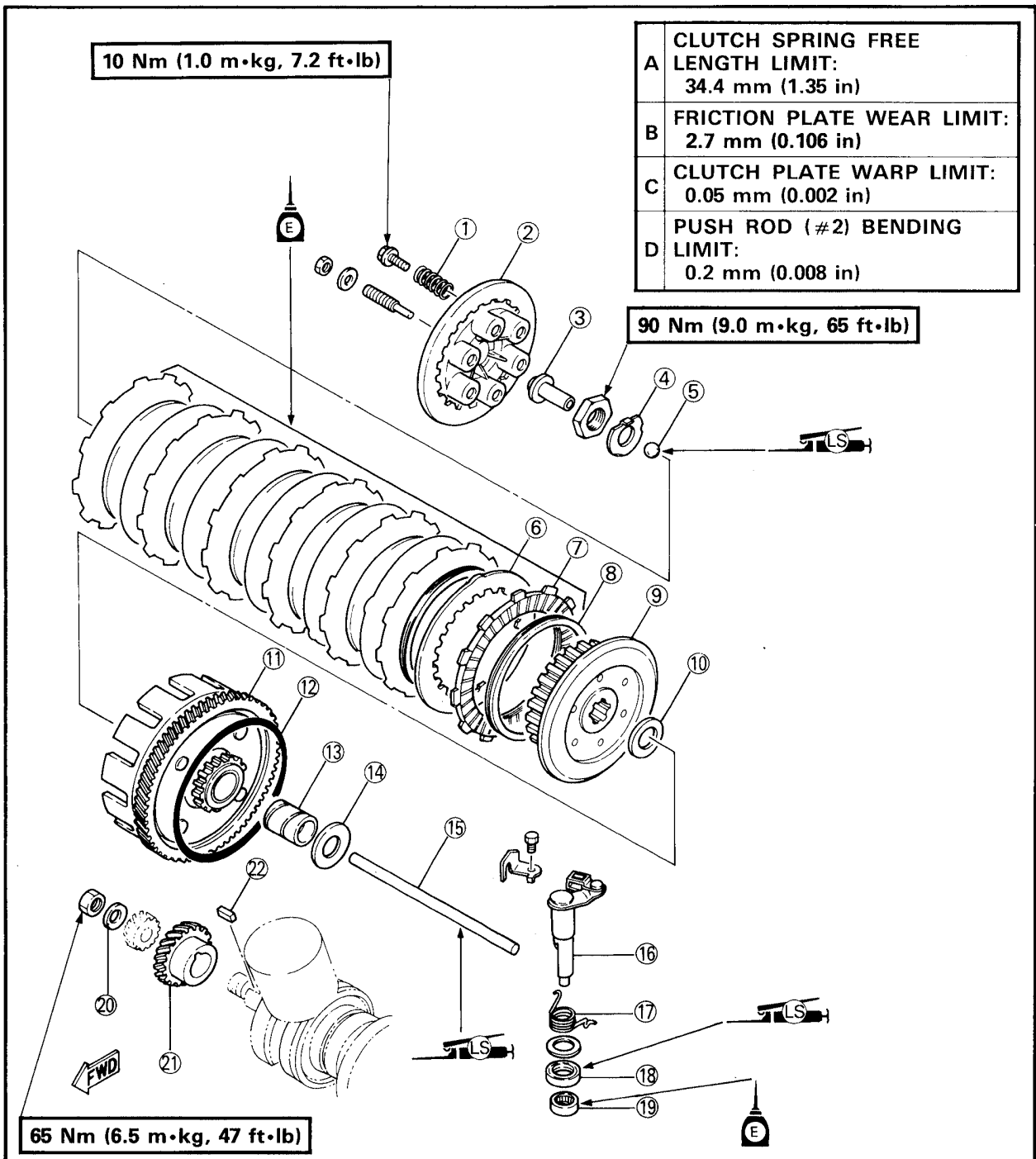
13. Inspect:
- Clutch align marks

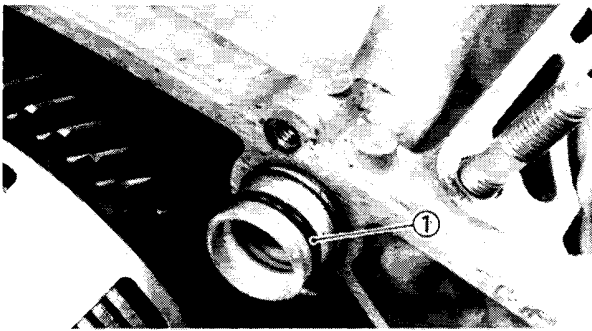




CLUTCH/PUSH LEVER/PRIMARY DRIVE GEAR

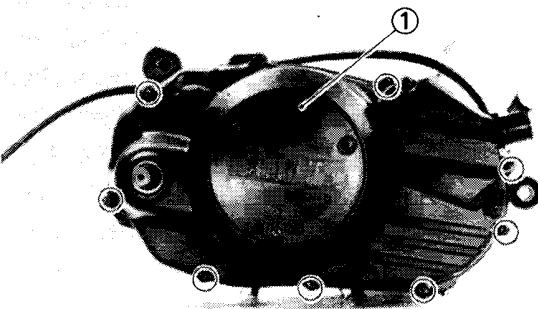
- |                         |                          |                          |
|-------------------------|--------------------------|--------------------------|
| ① Clutch spring         | ⑨ Clutch boss            | ⑰ Push lever axle spring |
| ② Clutch pressure plate | ⑩ Thrust plate           | ⑱ Oil seal               |
| ③ Push rod (#1)         | ⑪ Clutch housing         | ⑲ Bearing                |
| ④ Lock washer           | ⑫ O-ring                 | ⑳ Conical spring washer  |
| ⑤ Ball                  | ⑬ Spacer                 | ㉑ Primary drive gear     |
| ⑥ Clutch plate          | ⑭ Thrust plate           | ㉒ Key                    |
| ⑦ Friction plate        | ⑮ Push rod (#2)          |                          |
| ⑧ Cushion ring          | ⑯ Clutch push lever axle |                          |





## CRANKCASE COVER (RIGHT)

1. Apply:
  - Light weight lithium soap base grease.  
To radiator hose joint O-ring ①.



2. Install:
  - Dowel pin
  - Crankcase cover (Right) ①

**NOTE:** \_\_\_\_\_

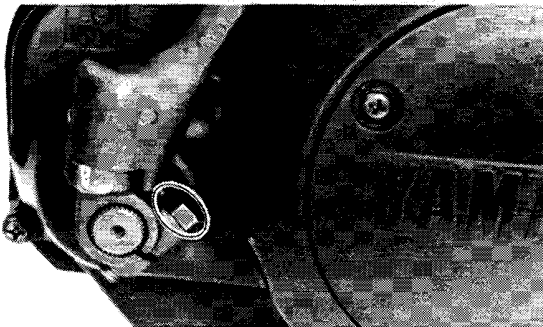
Tighten the crankcase cover holding screws in stage, using a crisscross pattern.



**Screws (Crank Case Cover):**  
**7 Nm (0.7 m•kg, 5.1 ft•lb)**

## KICK CRANK

1. Install:
  - Kick crank



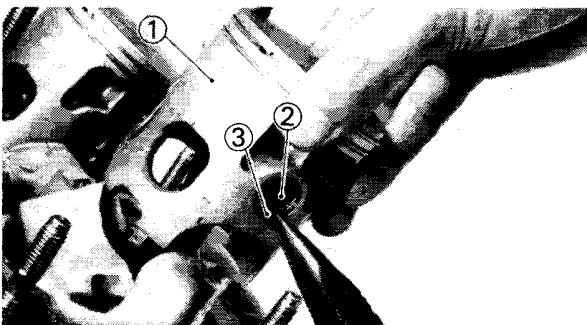
**Bolt (Kick Crank):**  
**25 Nm (2.5 m•kg, 18 ft•lb)**

**NOTE:** \_\_\_\_\_

Install the kick crank so that it does not contact the case.

## PISTON PIN AND PISTON

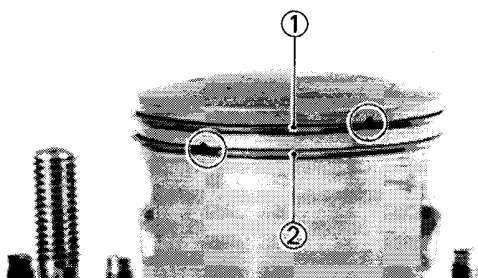
1. Apply:
  - 2-stroke oil  
To the piston pin, bearing, piston ring grooves and piston skirt areas.



2. Install:
  - Small end bearing
  - Piston ①
  - Piston pin ②
  - Piston pin clip ③

**NOTE:**

- The arrow on the piston must point to the front of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the pin clip and material into the crankcase.
- Always use a new piston pin clip.

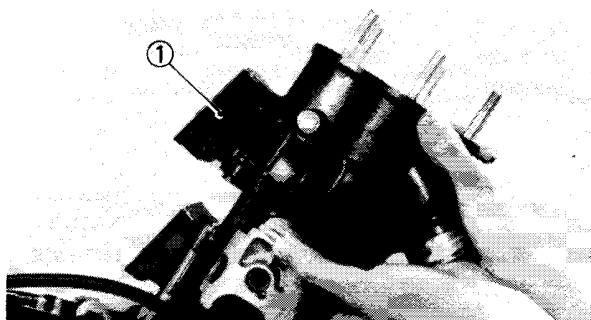
**CYLINDER**

1. Install:
  - Dowel pins
  - Cylinder gasket (New gasket)
2. Offset the piston ring end gaps as shown.

- ① 1st ring
- ② 2nd ring

**NOTE:**

- Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.
- Before installing the cylinder, apply a liberal coating of 2-stroke to the piston rings.

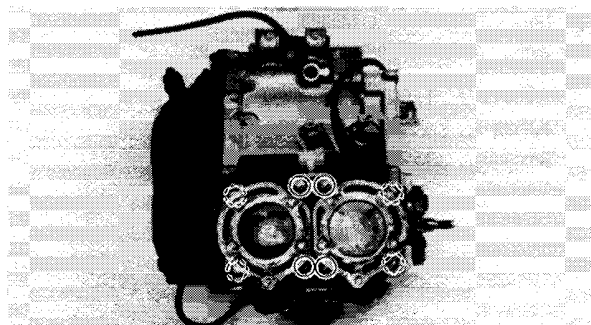


3. Install:

- Cylinders ①

**NOTE:**

Install the cylinder with one hand while compressing the piston rings with the other hand.

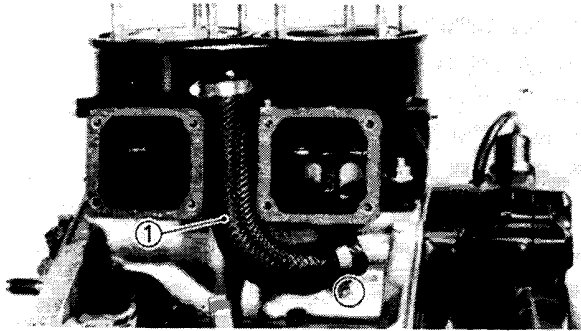


4. Tighten:

- Nuts (Cylinder)

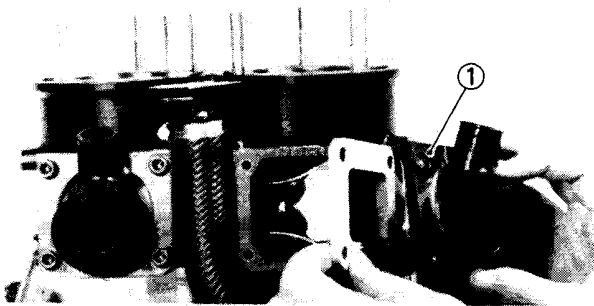


**Nuts (Cylinder):**  
28 Nm (2.8 m•kg, 20 ft•lb)




## RADIATOR HOSE

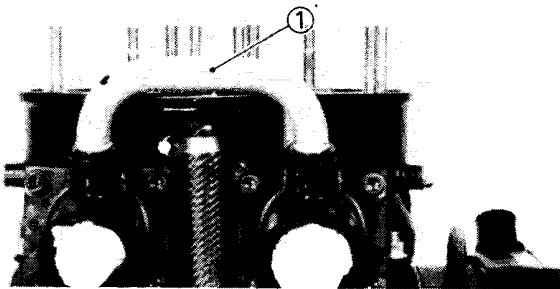
1. Install:
  - Radiator hose ①



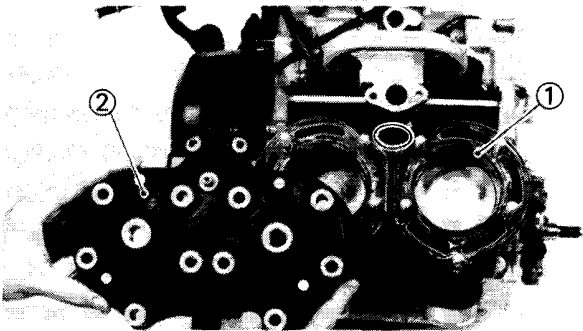
## REED VALVE ASSEMBLY

1. Install:
  - Reed valve assembly
  - Carburetor joint ①
2. Tighten:
  - Bolts (Carburetor joint)

	<b>Bolts (Carburetor Joint):</b> 10 Nm (1.0 m•kg, 7.2 ft•lb)
---	---



3. Install:
  - Pipe ①



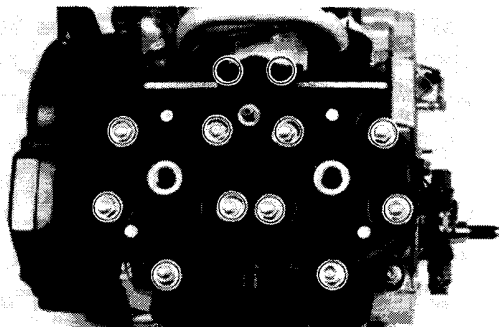
## CYLINDER HEAD


1. Install:
  - Cylinder head gasket ① (New gasket)
  - Cylinder head ②

**NOTE:** \_\_\_\_\_  
 The "UP" mark on the gasket must point to the upward of the engine.

2. Tighten:
  - Nuts (Cylinder head)
  - Bolts (Joint)

**NOTE:** \_\_\_\_\_  
 The bolts should be tightened in the order of numbers and in two steps.



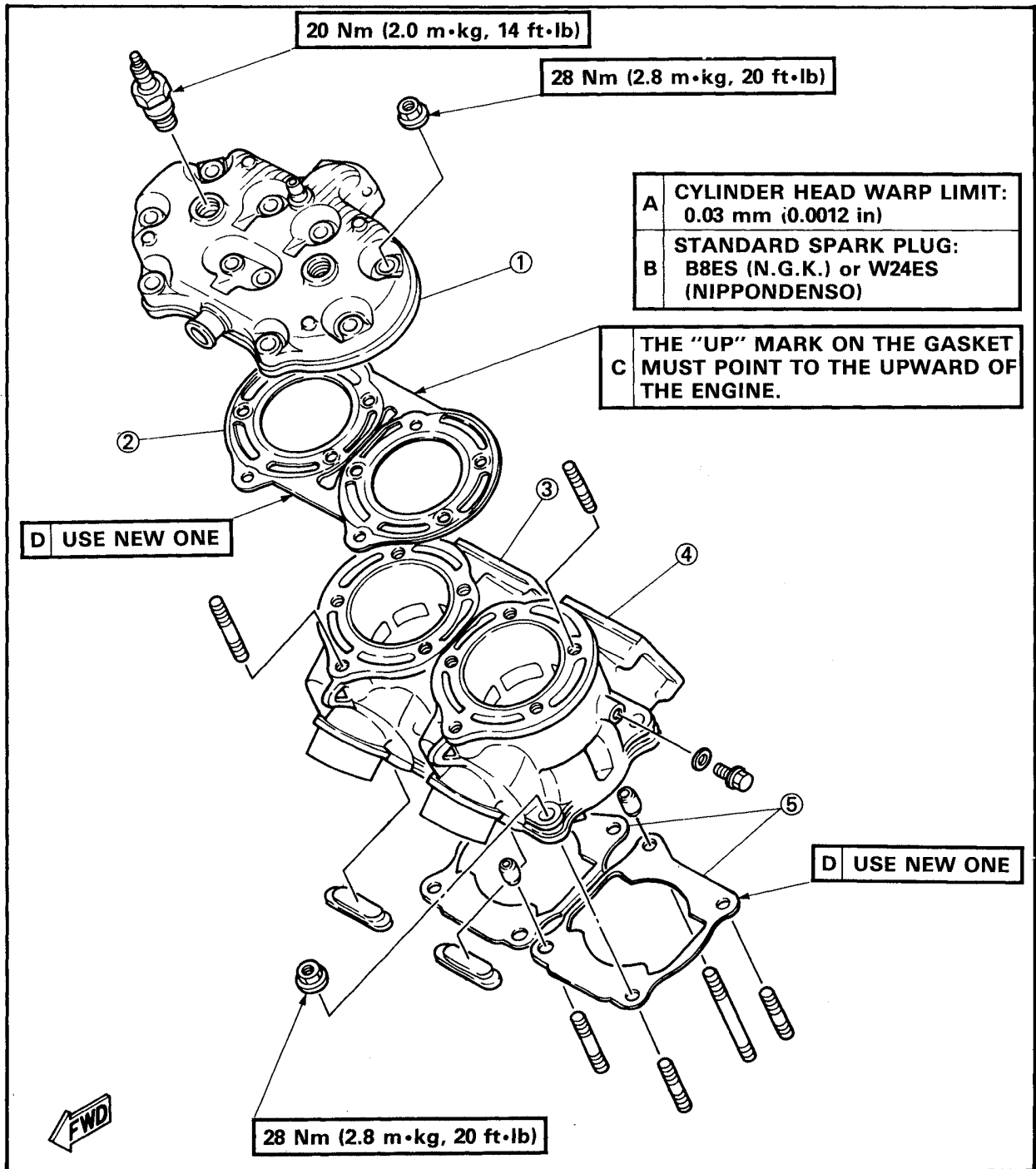
	<b>Nuts (Cylinder Head):</b> 28 Nm (2.8 m•kg, 20 ft•lb)
	<b>Bolts (Joint):</b> 12 Nm (1.2 m•kg, 8 ft•lb)

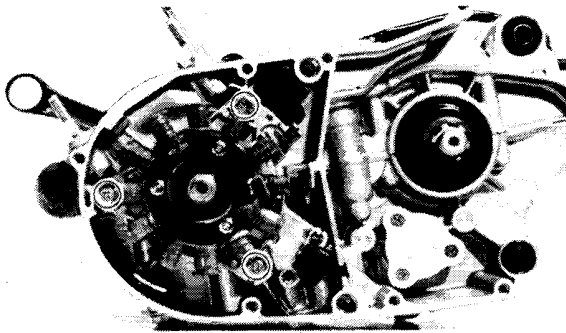




CYLINDER/CYLINDER HEAD

- ① Cylinder head
- ② Cylinder head gasket
- ③ Cylinder (Right)
- ④ Cylinder (Left)
- ⑤ Cylinder gaskets





### CDI MAGNETO

1. Install:
  - Woodruff key
  - Stator assembly
2. Tighten:
  - Screws (Stator assembly)

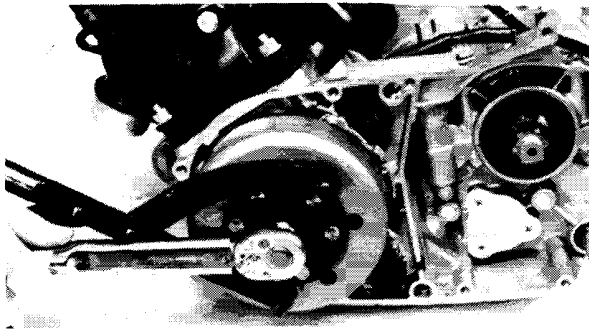


**Screws (Stator Assembly):**  
10 Nm (1.0 m•kg, 7.2 ft•lb)

3. Install:
  - CDI magneto
  - Plain washer
  - Nut (CDI magneto)

### NOTE:

When installing the CDI magneto, make sure the woodruff key is properly seated in the key way of the crankshaft.



4. Tighten:
  - Nut (CDI magneto)

Use the Rotor Holding Tool (YU-01235) to lock the magneto.



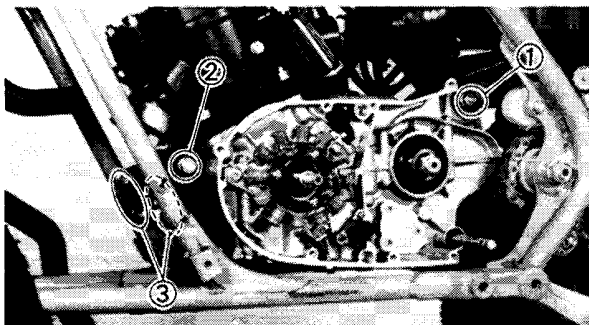
**Nut (CDI Magneto):**  
80 Nm (8.0 m•kg, 58 ft•lb)

### REMounting ENGINE

When remounting the engine, reverse the removal procedure.

Note the following points.

1. Tighten:
  - Engine mounting bolts



#### Engine mounting bolts tightening steps:

- Tighten the engine mounting bolt (Rear) ①.

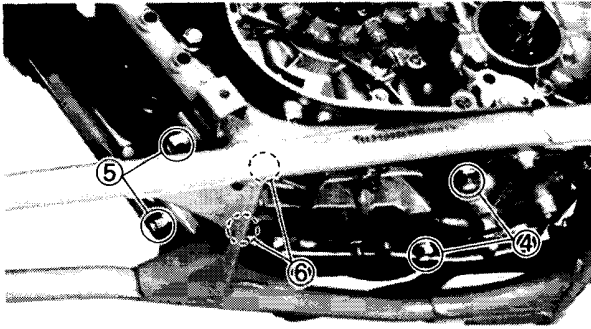


**Bolt (Engine Mounting-Rear) ①:**  
45 Nm (4.5 m•kg, 32 ft•lb)

- Tighten the engine mounting bolt (Front) ②.



**Bolt (Engine Mounting-Front) ②:**  
45 Nm (4.5 m•kg, 32 ft•lb)



• Tighten the front stay securing bolts ③.



**Bolts (Engine Stay) ③:**  
30 Nm (3.0 m•kg, 22 ft•lb)

• Tighten the tension rod securing bolts ④ to the engine.



**Bolts (Tension Rod) ④:**  
25 Nm (2.5 m•kg, 18 ft•lb)

• Tighten the tension rod stay securing bolts ⑤ to the frame.

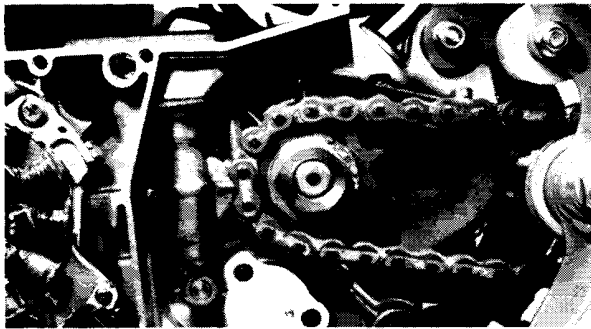


**Bolts (Tension Rod Stay) ⑤:**  
45 Nm (4.5 m•kg, 32 ft•lb)

• Tighten the tension rod securing bolts ⑥ to the tension rod stay.



**Bolts (Tension Rod-Tension Rod Stay) ⑥:**  
45 Nm (4.5 m•kg, 32 ft•lb)



2. Install:

- Drive chain
- Drive sprocket
- Lock washer (New)
- Nut

3. Tighten:

- Nut (Drive sprocket)



**Nut (Drive Sprocket):**  
80 Nm (8.0 m•kg, 58 ft•lb)

4. Bend the lock washer tab along the nut flats.

5. Install:

- Crankcase cover (Left)



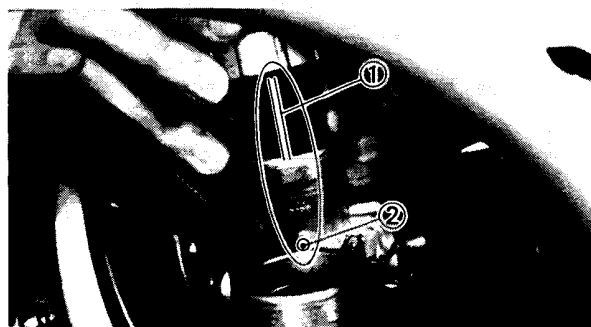
**Screws (Crankcase Cover-Left):**  
7 Nm (0.7 m•kg, 5.1 ft•lb)

6. Install:

- Carburetor

**NOTE:**

When installing the throttle valve into the carburetor, align the groove ① of the throttle valve with the projection ② of the carburetor.

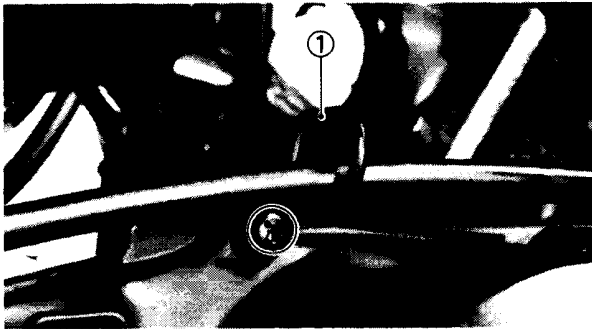




7. Adjust:

- Clutch cable free play.

Refer to "CHAPTER 2 — CLUTCH ADJUSTMENT" section.



8. Tighten:

- Bolts (Rear brake master cylinder)
- Cable guide ①



**Bolts (Rear Brake Master Cylinder):**

**20 Nm (2.0 m•kg, 14 ft•lb)**

9. Adjust:

- Drive chain slack

Refer to "CHAPTER 2 — DRIVE CHAIN" section (2-21).

10. Apply:

- High-melting-point grease

To the O-rings (Exhaust pipe).

11. Install:

- Exhaust pipes

Use general spring remover.



**Exhaust Pipe Stay:**

**25 Nm (2.5 m•kg, 18 ft•lb)**

**Silencer:**

**35 Nm (3.5 m•kg, 25 ft•lb)**

12. Apply:

- Transmission oil

Refer to "CHAPTER 2 — TRANSMISSION OIL LEVEL MEASUREMENT" section.

- Coolant

Refer to "CHAPTER 2 — COOLANT LEVEL INSPECTION" section.

13. Inspect:

- Oil leakage
- Coolant leakage

