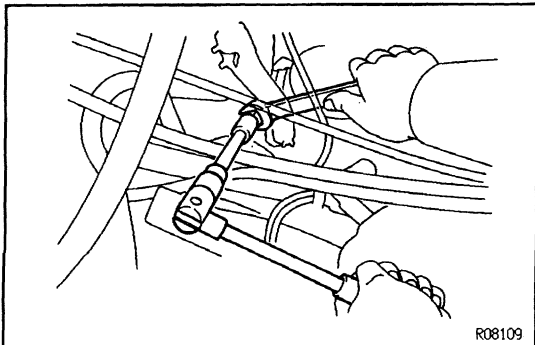
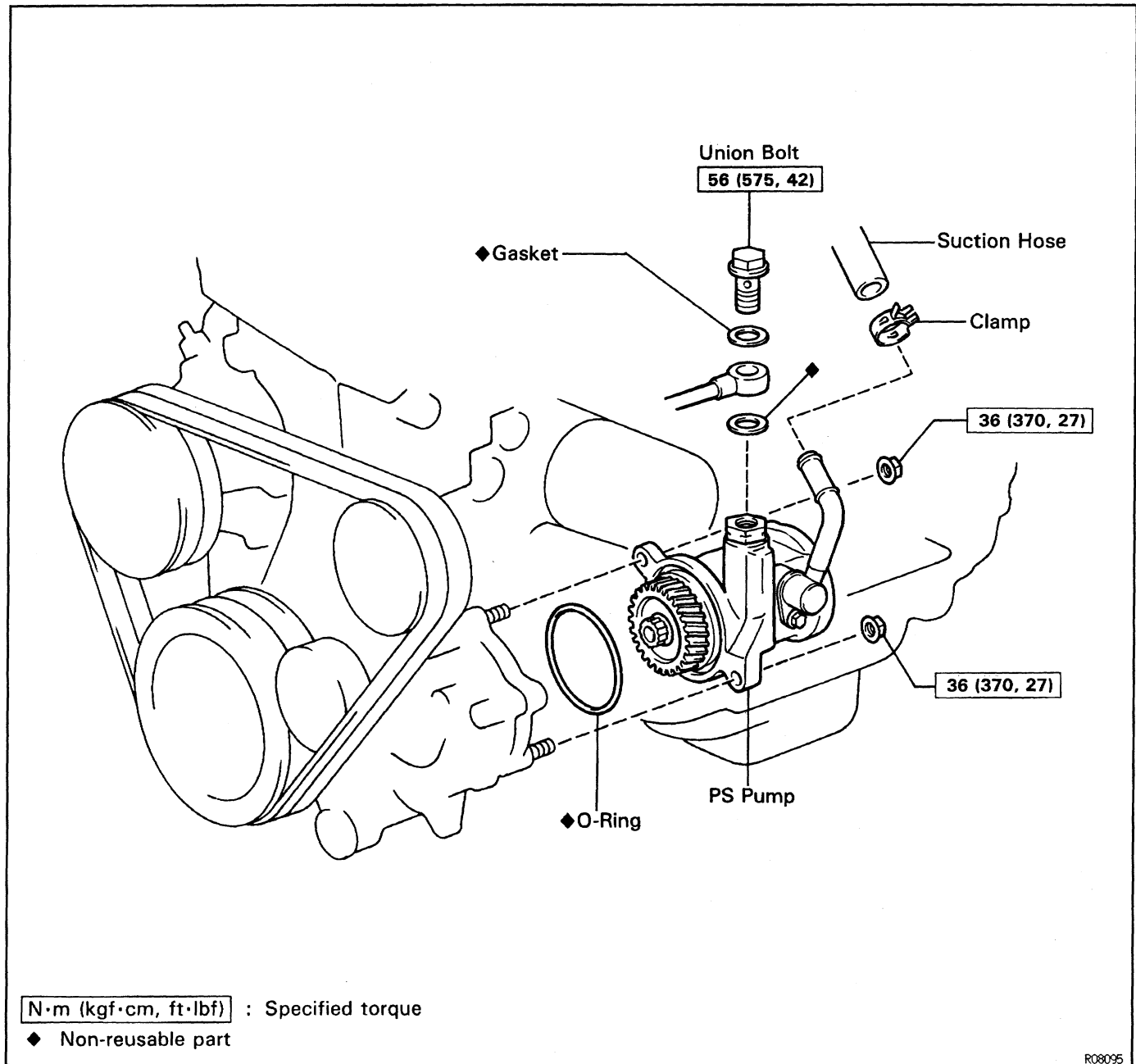


POWER STEERING PUMP

POWER STEERING PUMP REMOVAL AND INSTALLATION

Remove and install the parts, as shown.



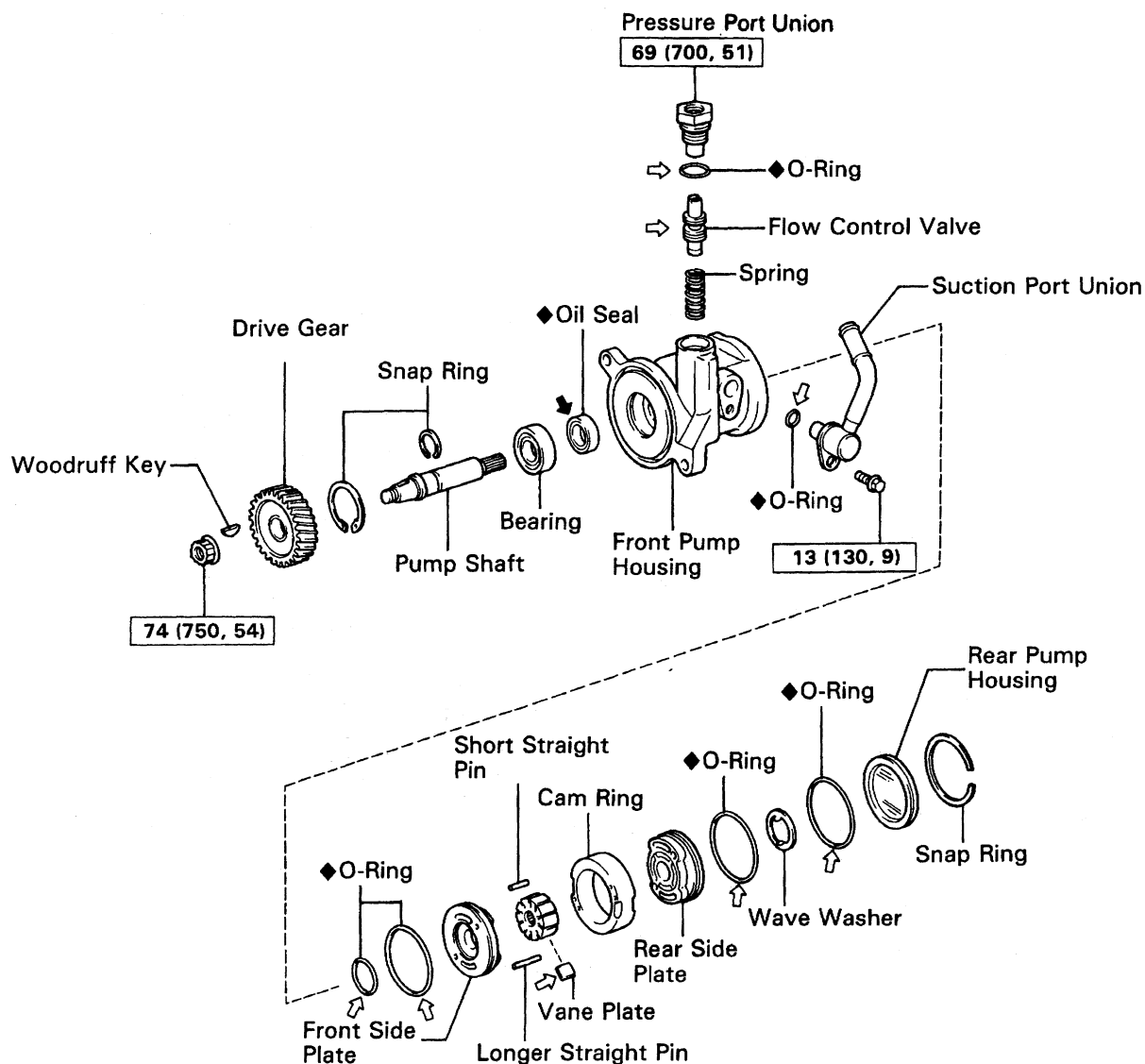
MAIN POINT OF REMOVAL AND INSTALLATION

1. DISCONNECT AND CONNECT PRESSURE TUBE

(a) Disconnect and connect pressure tube from/to the PS pump.

Torque: 56 N-m (575 kgf-cm, 42 ft-lbf)

COMPONENTS



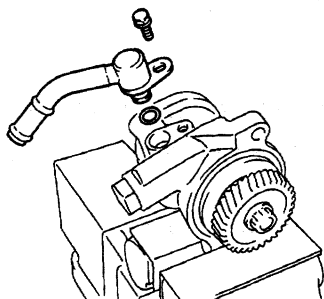
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

→ Apply Molybdenum Disulphide Lithium Base Grease

⇐ Apply Power Steering Fluid

R08053



R08065

POWER STEERING PUMP DISASSEMBLY

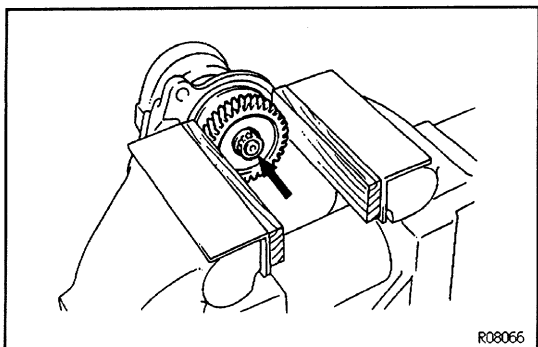
1. CLAMP PS PUMP IN VISE

NOTICE: Do not tighten the vise too tight.

2. REMOVE SUCTION PORT UNION

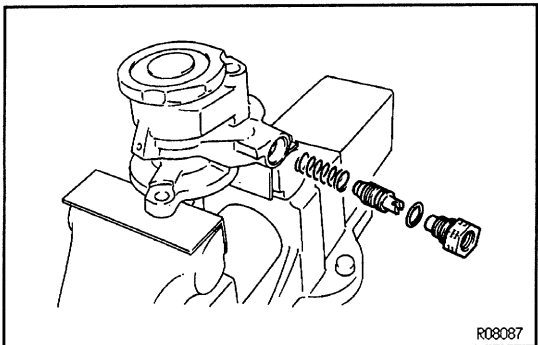
(a) Remove the bolt and union.

(b) Remove the O-ring from the suction port union.



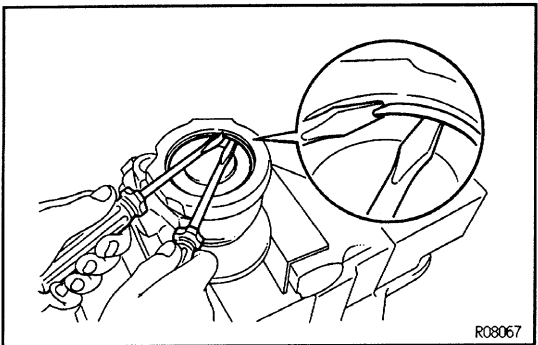
3. REMOVE DRIVE GEAR

- (a) Using soft jaws on a vise clamp the gear in the vise.
NOTICE: Do not tighten the vise too tight.
- (b) Remove the gear lock nut.
- (c) Remove the drive gear and woodruff key.



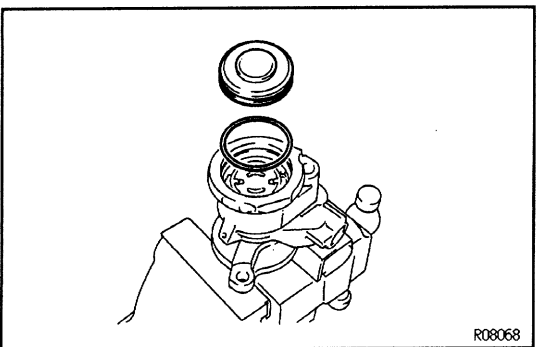
4. REMOVE PRESSURE PORT UNION, SPRING AND FLOW CONTROL VALVE

- (a) Remove the pressure port union, spring and flow control valve.
- (b) Remove the O-ring from the pressure port union.

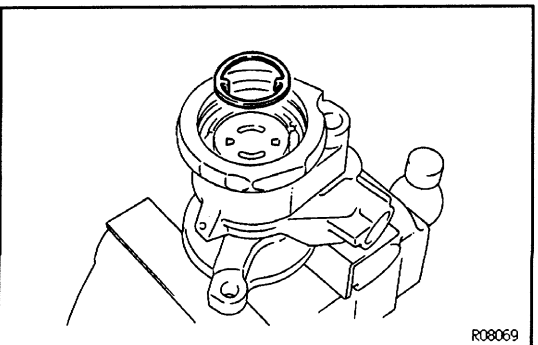


5. REMOVE REAR PUMP HOUSING

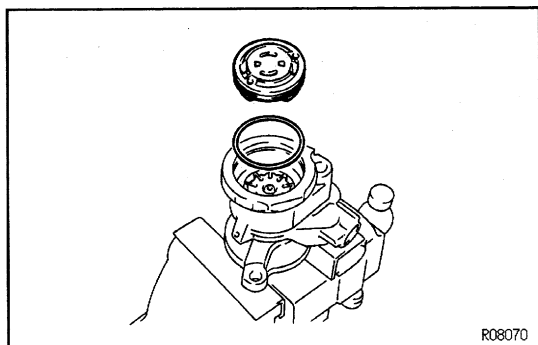
- (a) Using 2 screwdrivers, remove the snap ring.



- (b) Remove the rear pump housing.
- (c) Remove the O-ring from the rear pump housing.

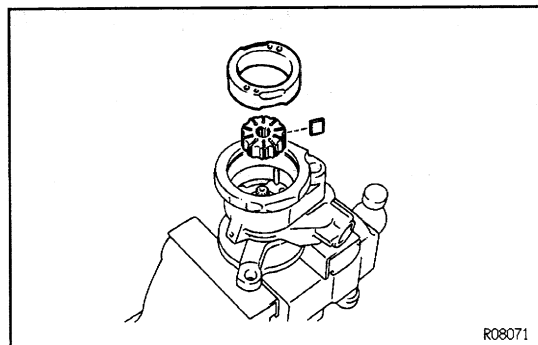


- (d) Remove the wave washer from the rear side plate.



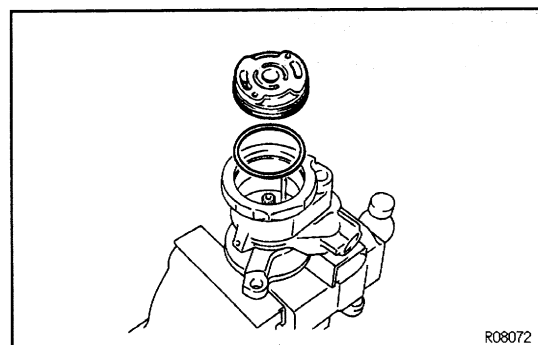
(e) Remove the rear side plate.

(f) Remove the O-ring from the rear side plate.



6. REMOVE CAM RING, ROTOR AND VANE PLATES

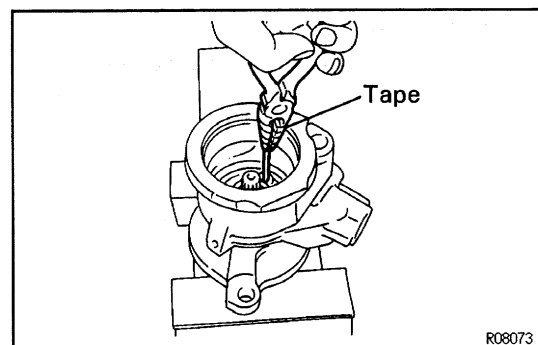
NOTICE: Be careful not to scratch the cam ring, rotor or vane plates.



7. REMOVE FRONT SIDE PLATE

(a) Remove the front side plate.

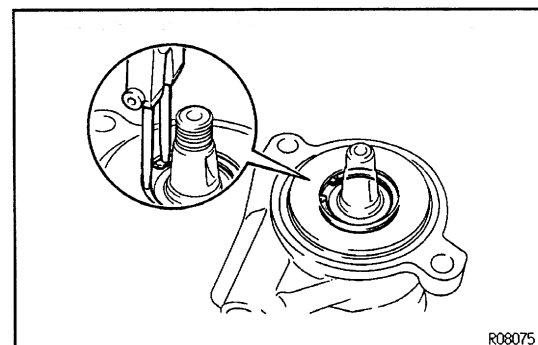
(b) Remove the O-ring from the front side plate.



8. REMOVE STRAIGHT PIN

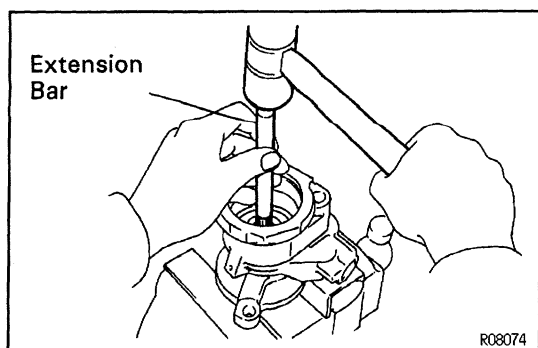
Using needle-nose pliers, remove longer straight pin.

HINT: Tape the needle-nose pliers tip before use.

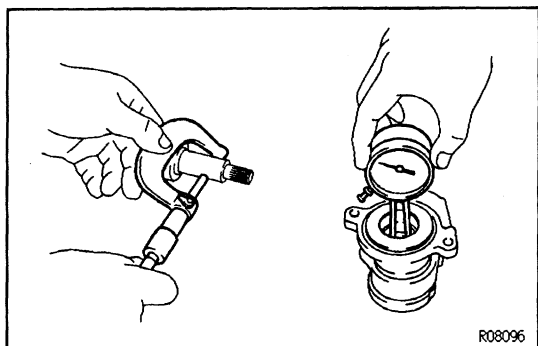


9. REMOVE PUMP SHAFT

(a) Using snap ring pliers, remove the snap ring.



- (b) Using a brass bar and hammer, tap out the pump shaft from the front pump housing.



POWER STEERING PUMP INSPECTION AND REPLACEMENT

1. MEASURE OIL CLEARANCE OF SHAFT AND BUSHING

Using a micrometer and calipers, measure the oil clearance.

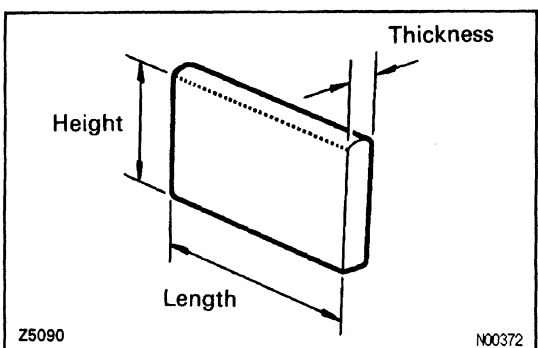
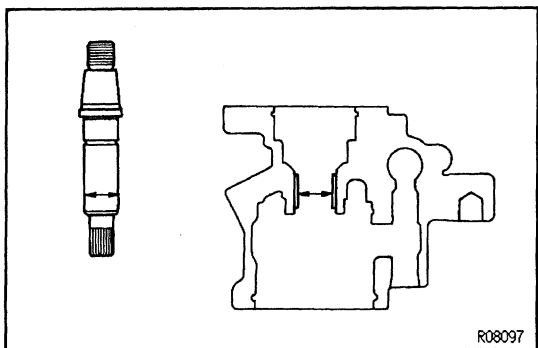
Standard clearance:

0.03–0.05 mm (0.0012–0.0020 in.)

Maximum clearance:

0.07 mm (0.0028 in.)

If more than maximum, replace the entire power steering pump.



2. INSPECT ROTOR AND VANE PLATES

- (a) Using a micrometer, measure the height, thickness and length of the vane plates.

Minimum height:

8.6 mm (0.339 in.)

Minimum thickness:

1.397 mm (0.055 in.)

Minimum length:

14.991 mm (0.590 in.)

- (b) Using a feeler gauge, measure the clearance between the rotor groove and vane plate.

Maximum clearance:

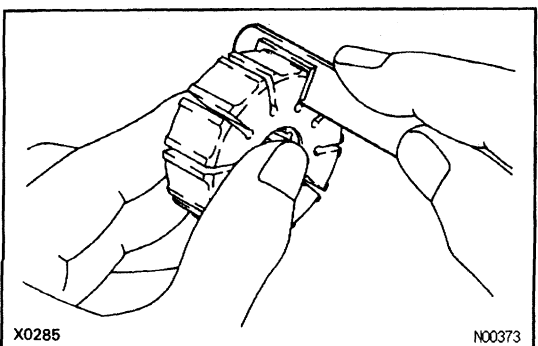
0.033 mm (0.0013 in.)

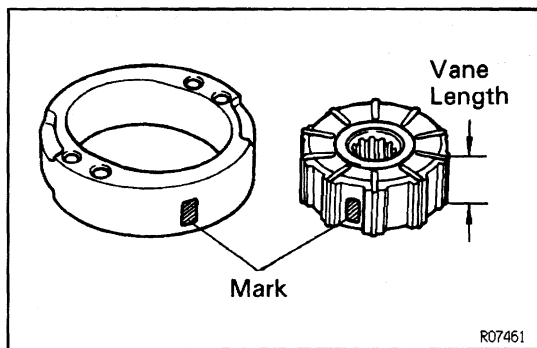
If more than maximum, replace the plate and/or rotor with one having the mark equivalent to the mark stamped on the cam ring.

Inscribed mark:

Vane pump rotor: 1, 2 or None

Cam ring: 2, 3 or 4

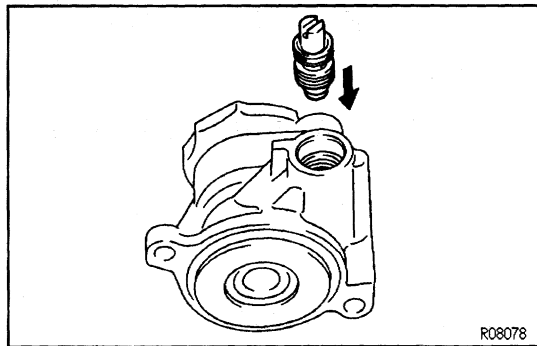




HINT: There are 3 vane lengths for the following rotor and cam ring marks.

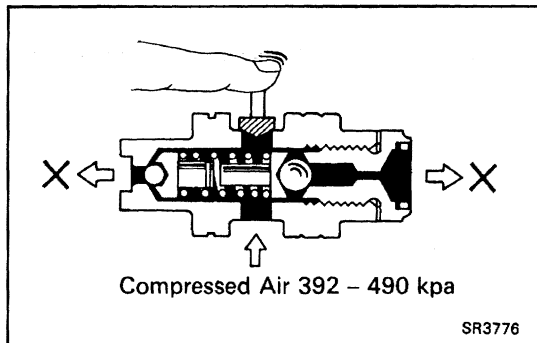
Rotor mark	Cam Ring Mark	Vane length mm (in.)
None	2	14.995 - 14.997 (0.59035 - 0.59043)
1	3	14.993 - 14.995 (0.59027 - 0.59035)
2	4	14.991 - 14.993 (0.59020 - 0.59027)

V06457

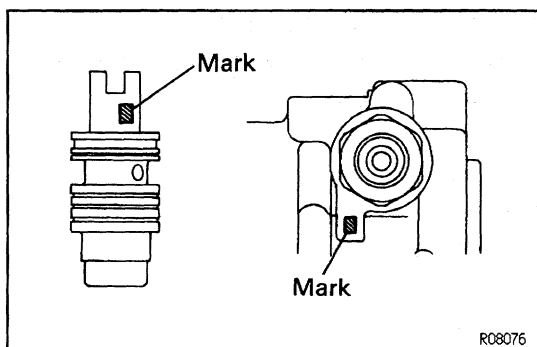


3. INSPECT FLOW CONTROL VALVE

(a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.



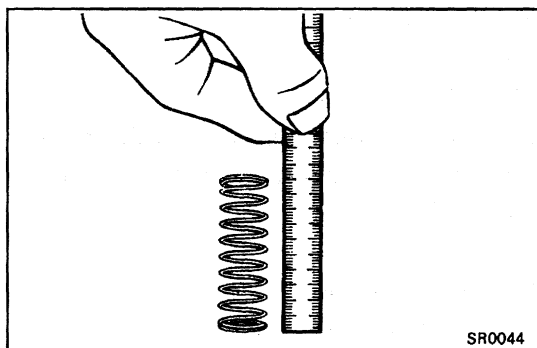
(b) Check the flow control valve for leakage. Close one of the holes and apply compressed air [392-490 kPa (4 -5 kgf/cm, 57-71 psi)] into the opposite side, and confirm that air does not come out from the end hole.



If necessary, replace the valve with one having the same letter as inscribed on the front housing.

Inscribed mark:

A,B,C,D,E or F



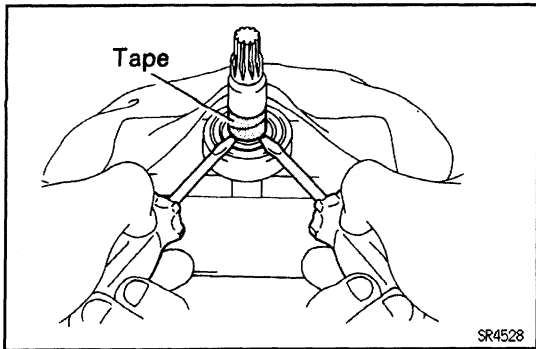
4. INSPECT FLOW CONTROL SPRING

Using a scale, measure the free length of the spring.

Spring length:

35-37 mm (1.38-1.46 in.)

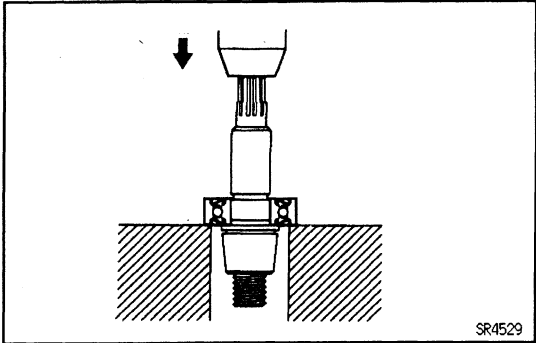
If not within specification, replace the spring.



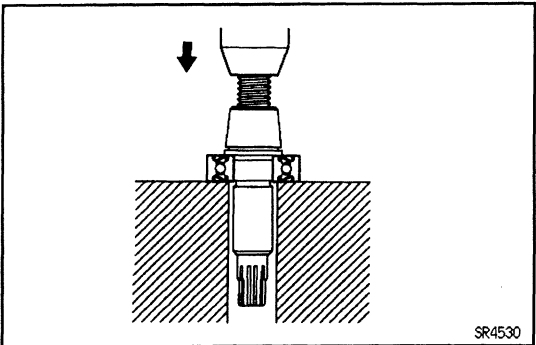
5. IF NECESSARY, REPLACE BEARING

- (a) Using 2 screwdrivers, remove the snap ring.

NOTICE: To prevent pump shaft damage, wind tape on the pump shaft.



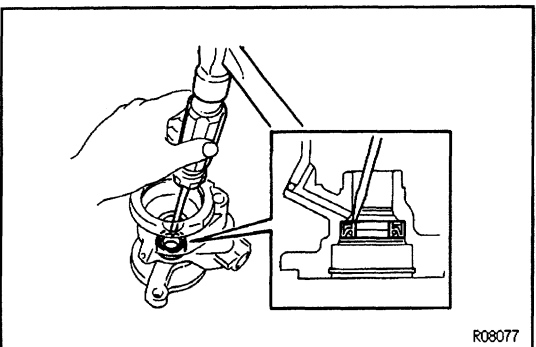
- (b) Using a press, press out the bearing.



- (c) Using a press, press in a new bearing.

NOTICE: Be careful not to scratch the rotor shaft contact surface with oil seal.

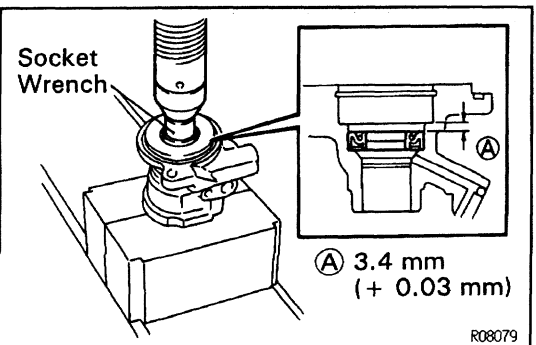
- (d) Install the snap ring.



6. IF NECESSARY, REPLACE OIL SEAL

- (a) Using a screwdriver and hammer, remove the oil seal.

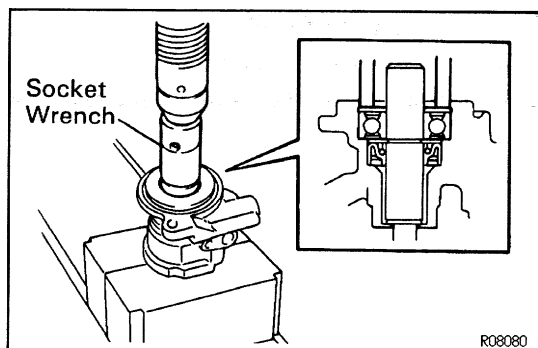
NOTICE: Be careful not to scratch the housing with the screwdriver.



- (b) Apply power steering fluid to the lip and outside of a new oil seal.

- (c) Using a socket wrench (23 mm) and a press, press in the oil seal to the front housing.

NOTICE: Be careful not to scratch the frictional surface of the front housing.



POWER STEERING PUMP ASSEMBLY ^{SRPMF-01}

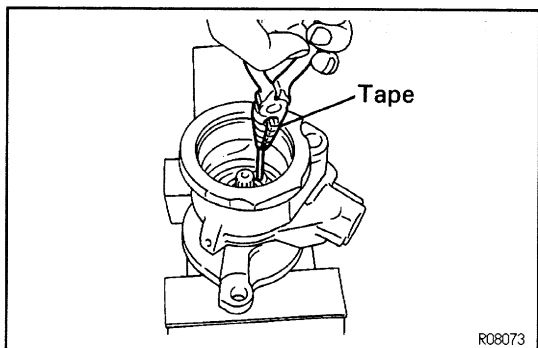
1. COAT POWER STEERING FLUID ON EACH PART

2. INSTALL PUMP SHAFT WITH BEARING

(a) Using socket wrench (29 mm) and a press, press in the pump shaft to the front housing.

NOTICE: Be careful not to scratch the oil seal lip and the rotor frictional surface.

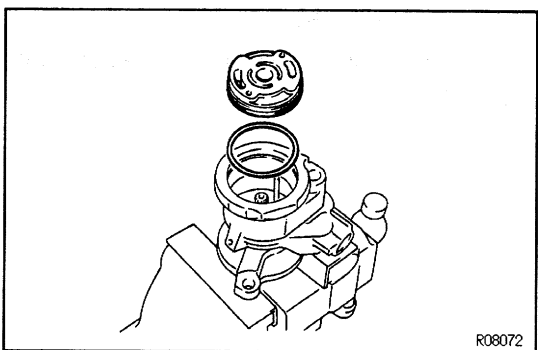
(b) Using snap ring pliers, install the snap ring.



3. INSTALL STRAIGHT PIN

Using needle-nose pliers, install the longer straight pin.

HINT: Tape the needle-nose pliers tip before use.

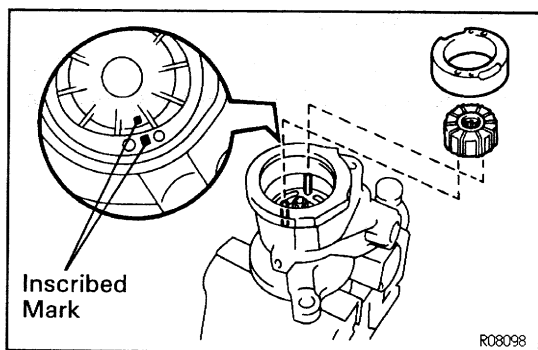


4. INSTALL FRONT SIDE PLATE

(a) Coat a new O-ring with power steering fluid.

(b) Install the O-ring to the front side plate.

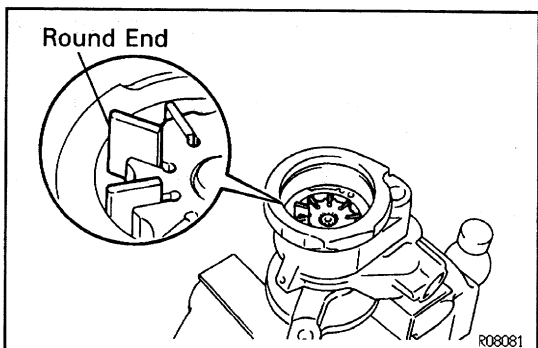
(c) Align the hole of the front side plate and longer straight pin.



5. INSTALL CAM RING AND PUMP ROTOR

(a) Install the short straight pin to the front housing.

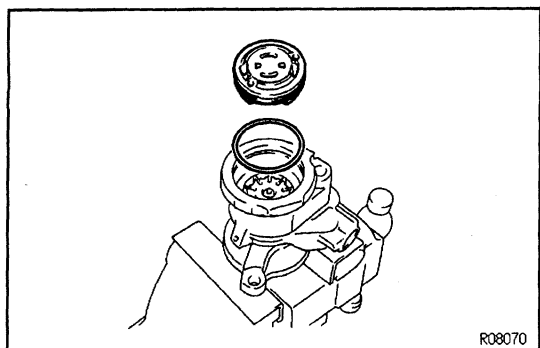
(b) Install the cam ring and rotor with the inscribed mark facing upper side.



6. INSTALL VANE PLATES

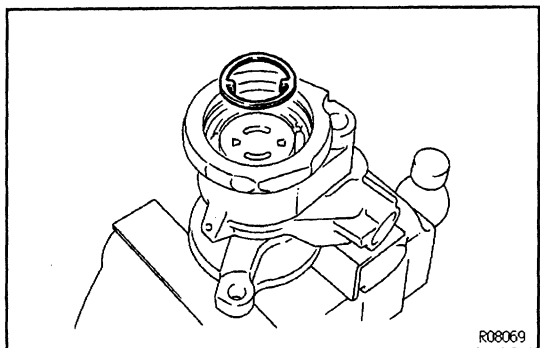
(a) Coat the 10 vane plates with the power steering fluid.

(b) Install the 10 vane plates with the round end facing outward.



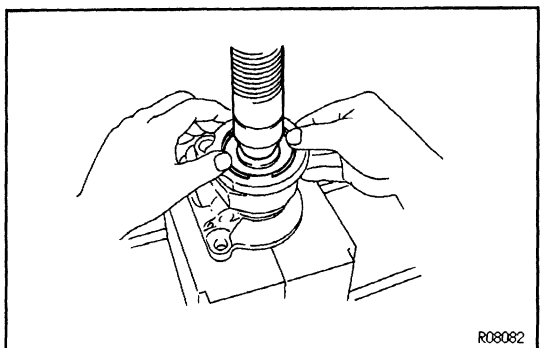
7. INSTALL REAR SIDE PLATE

- Coat a new O-ring with power steering fluid.
- Install the O-ring to the rear side plate.
- Align the holes of the rear plate with the pins, and install the rear side plate.

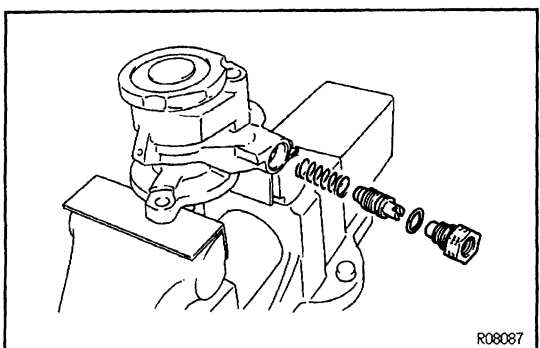


8. INSTALL REAR HOUSING

- Install the wave washer on the rear side plate.
NOTICE: When installing the wave washer, verify that the 2 protrusions on it mate with the grooves in the rear plate.



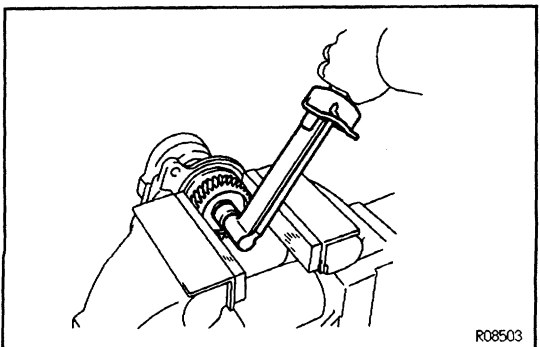
- Install the rear housing, using a press, apply just enough pressure to compress the wave washer, and install a snap ring.



9. INSTALL FLOW CONTROL VALVE, SPRING AND PRESSURE PORT UNION

- Coat a new O-ring with power steering fluid.
- Install the O-ring to the pressure port union.
- Install the flow control valve and the spring.
- Install the pressure port union.

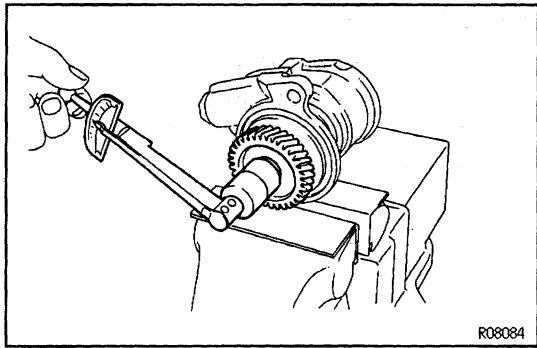
Torque: 69 N-m (700 kgf-cm, 51 ft-lbf)



10. INSTALL DRIVE GEAR

- Using soft jaws on a vise, clamp the gear in the vise.
- Torque the drive gear set bolt.

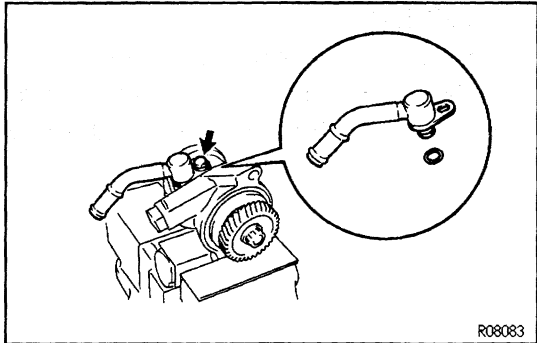
Torque: 74 N-m (750 kgf-cm, 54 ft-lbf)

**11. CHECK ROTOR SHAFT ROTATION CONDITION**

- (a) Check that the rotor shaft rotates smoothly without abnormal noise.
- (b) Temporarily install the bolt and check the rotating torque.

Rotation torque:

0.3 N-m (2.8 kgf-cm, 2.4 in.-lbf)

**12. INSTALL SUCTION PORT UNION**

- (a) Coat a new O-ring with power steering fluid.
- (b) Install the O-ring in the suction port union.
- (c) Push in the union, install and torque the bolt.

Torque: 13 N-m (130 kgf-cm, 9 ft-lbf)