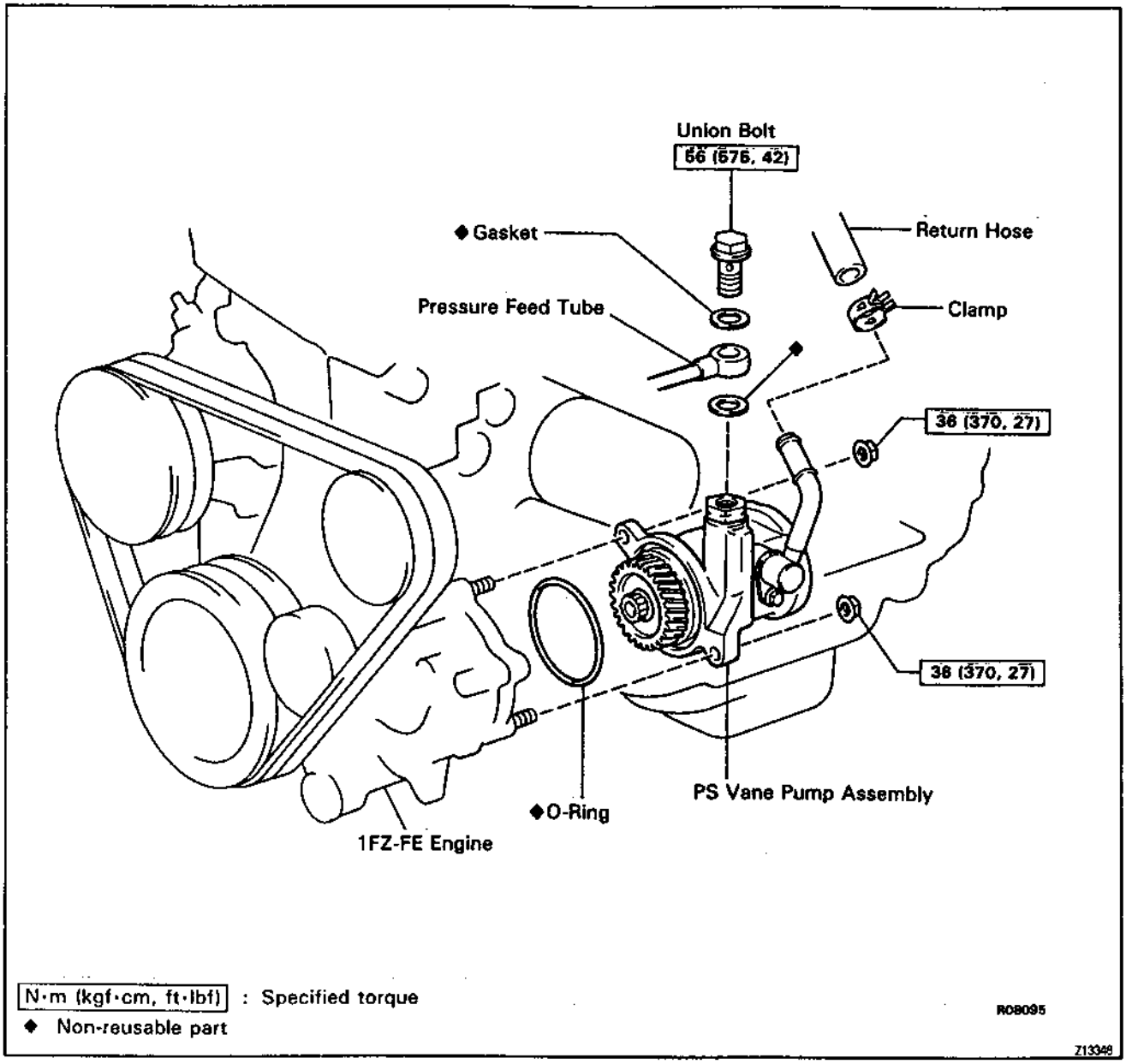
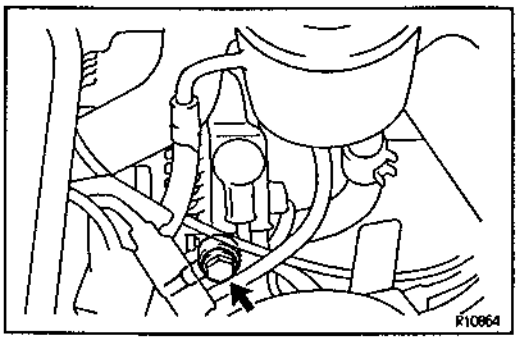
Power Steering Pump

COMPONENTS





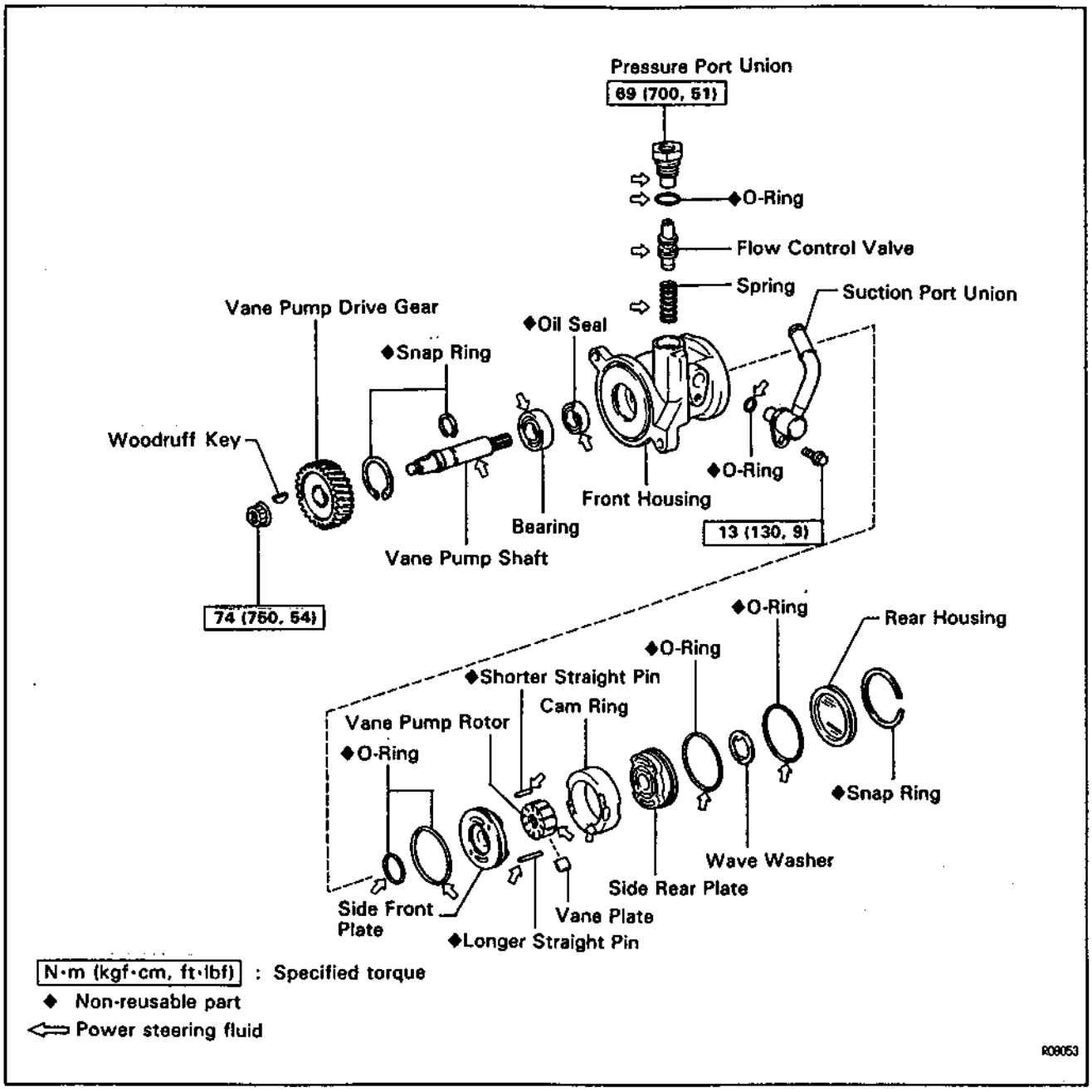
MAIN POINT OF REMOVAL AND INSTALLATION

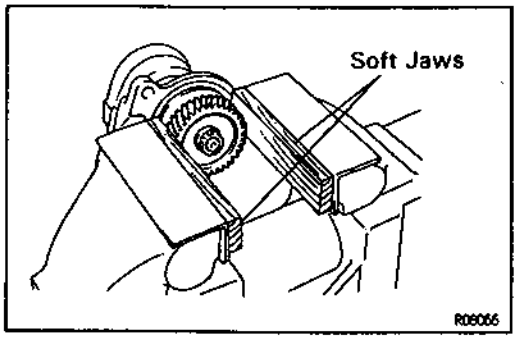
DISCONNECT AND CONNECT PRESSURE TUBE

Torque the union bolt with a new gasket on each side of the tube.

Torque: 36 N–m (370 kgf–cm, 27 ft–lbf)

COMPONENTS


Pressure Port Union
69 (700, 51)
◆O-Ring
Flow Control Valve
Spring
Suction Port Union
Vane Pump Drive Gear
◆Oil Seal
◆Snap Ring
Woodruff Key
◆O-Ring
Front Housing
Bearing
13 (130, 9)
Vane Pump Shaft
74 (750, 54)
◆O-Ring
Rear Housing
◆O-Ring
◆Shorter Straight Pin
Cam Ring
Vane Pump Rotor
◆O-Ring
◆Snap Ring
Wave Washer
Side Rear Plate
Side Front Plate
Vane Plate
◆Longer Straight Pin
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part
⇦ Power steering fluid
R08053



POWER STEERING PUMP DISASSEMBLY

NOTICE: When using a vise, do not over–tighten it.

1. REMOVE SUCTION PORT UNION

(a) Remove the pressure port union.

(b) Remove the O–ring from the pressure port union.

2. REMOVE VANE PUMP DRIVE GEAR

(a) Using soft jaws on a vise, clamp the gear in the vise.

NOTICE: Be careful not to damage the gear.

(b) Remove the gear set unit.

(c) Remove the woodruff key from the vane pump shaft.

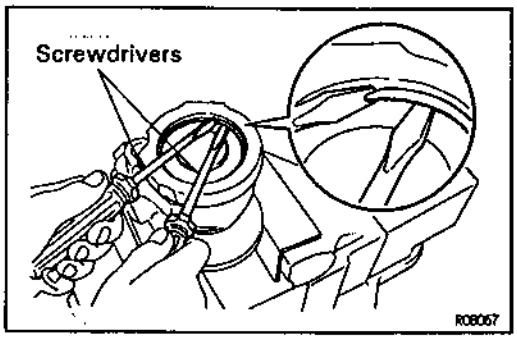
3. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

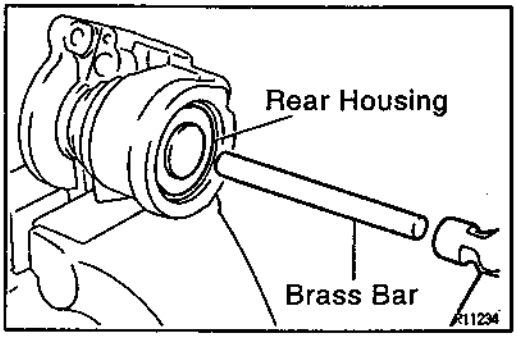
(c) Remove the O–ring from the union.

4. REMOVE REAR HOUSING AND WAVE WASHER

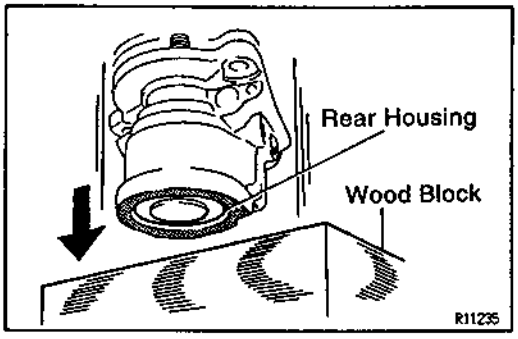
(a) Using two screwdrivers, remove the snap ring.

NOTICE: Take care not to damage the housing.





(b) Using a brass bar and hammer, tap the housing so that the spring force of the wave washer pushes the housing forward.



(c) Gently tap the PS pump assembly on a wood block and remove the housing and washer.

(c) Remove the O–ring from the housing.

5. REMOVE SIDE REAR PLATE

(a) Gently tap the PS pump assembly on a wood block shaft and re–move the rear plate.

(b) Remove the O–ring from the plate.

6. REMOVE CAM RING, VANE PUMP ROTOR AND 10 VANE PLATES

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

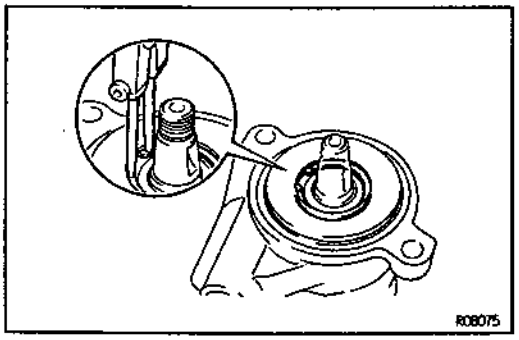
7. REMOVE SHORTER STRAIGHT PIN

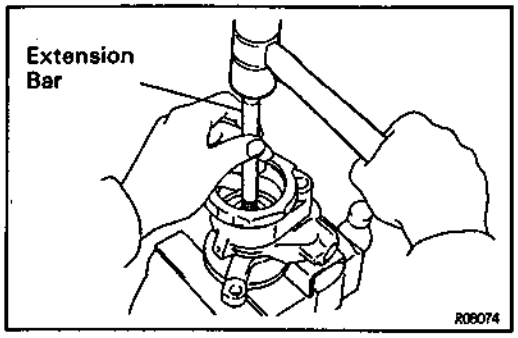
Remove the pin from the side front plate.

(a) Remove the pump shaft with the cam ring,vane plates from the front housing.

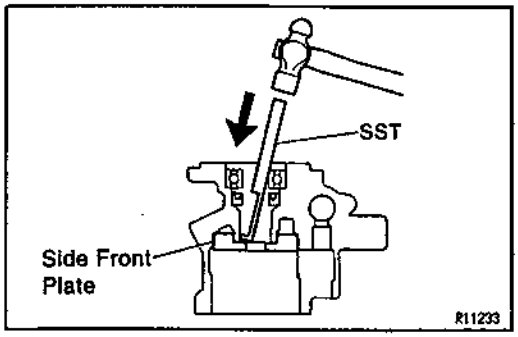
8. REMOVE VANE PUMP SHAFT WITH BEARING

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





(b) Using an extension bar and hammer, tap out the shaft with the bearing.



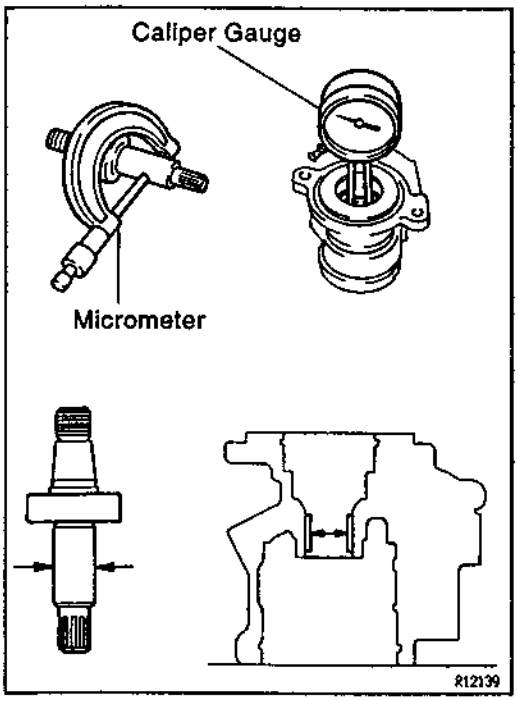
9. REMOVE SIDE FRONT PLATE

(a) Using SST, tap out the plate
SST 09631 – 10030.

(b) Remove the two O–rings from the front plate.

10. REMOVE LONGER STRAIGHT PIN

Using pliers, remove the pin from the front houding.



POWER STEERING PUMP INSPECTION AND REPLACEMENT

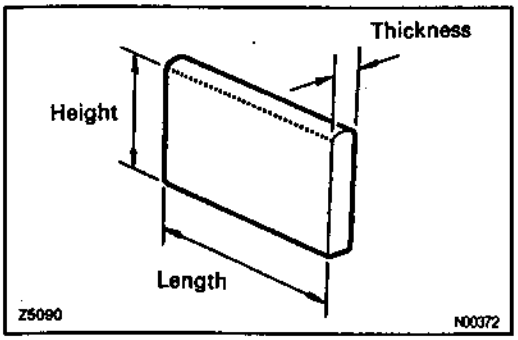
1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

Using a micrometer and caliper gauge, 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 PS pump.



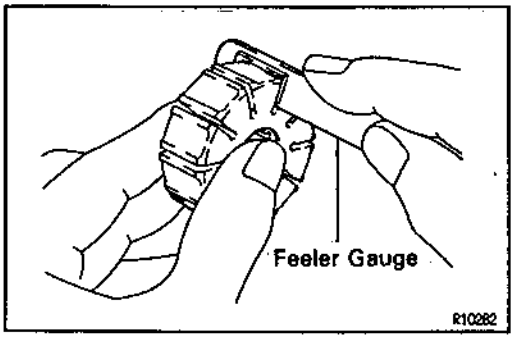
2. INSPECT VANE PUMP ROTOR AND 10 VANE PLATES

(a) Using a micrometer, measure the height, thickness and length of the plate.

Minimum height: 8.6 mm (0.339 in.)

Minimum thickness: 1.397 mm (0.05500 in.)

Minimum length: 14.991 mm (0.59016 in.)



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

Maximum clearance:

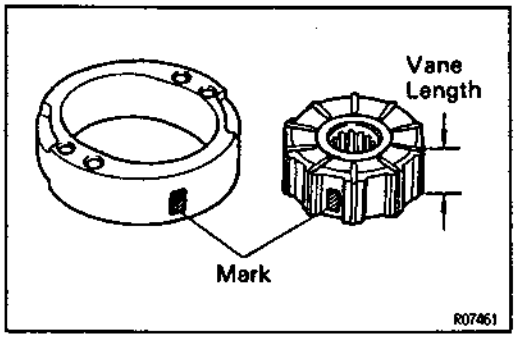
0.033 mm (0.00130 in.)

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:

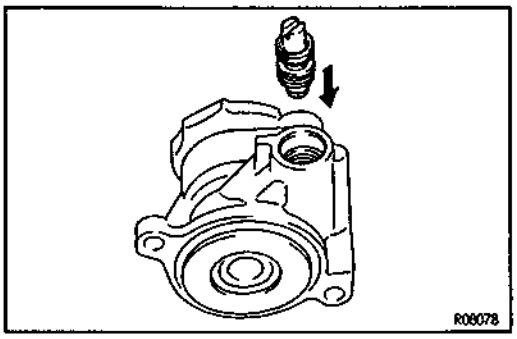
Vane pump rotor: 1,2 or None

Cam ring: 2,3 or 4



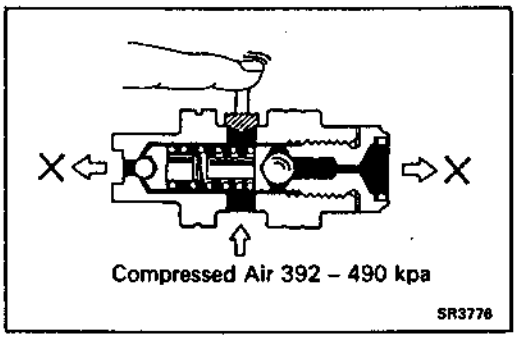
HINT: There are 3 vane lengths for the following rotor and cam ring marks.

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)



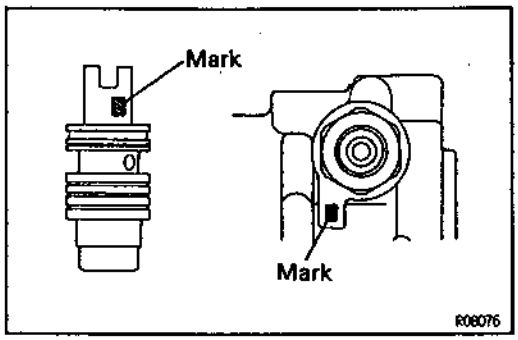
3. INSPECT FLOW CONTROL VALVE

(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.

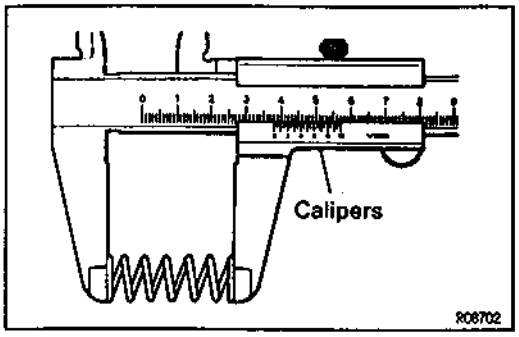
Close one of the holes and apply compressed air [392 –490 kPa (4 – 5 kgf/cm^2, 57 – 71 psi)] into the opposite side, and confirm that air does not come out from the end hole.



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

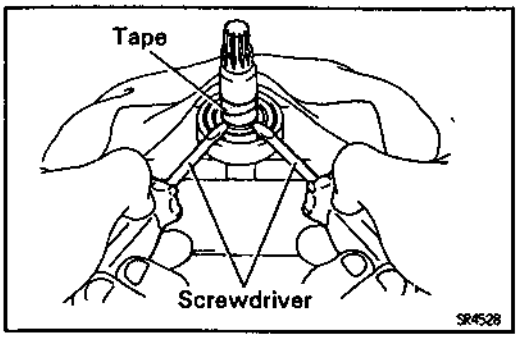
5. IF NECESSARY, REPLACE OIL SEAL



4. INSPECT FLOW CONTROL SPRING

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

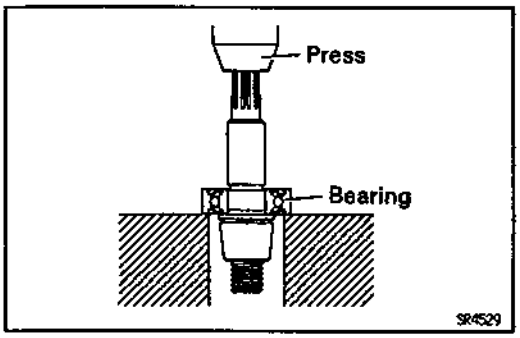
Free length: 35 – 37 mm (1.38 – 1.46 in.)



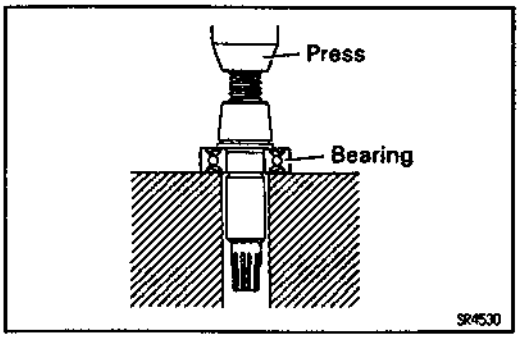
5. IF NECESSARY, REPLACE BEARING

(a) Using 2 screwdrivers, remove the snap ring from the vane pump shaft.

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



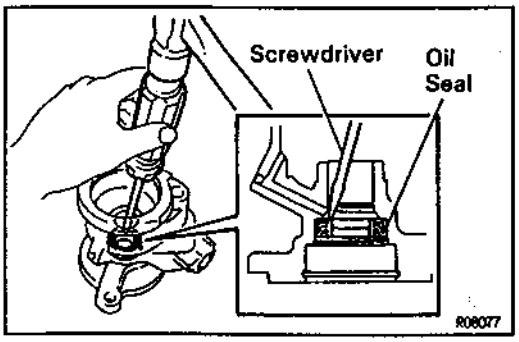
(b) Using a press, press out the bearing.



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

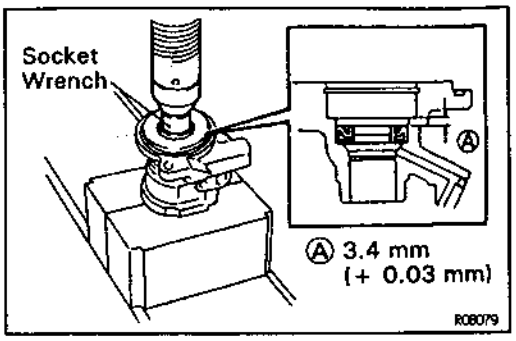
NOTICE: Be careful not to damage the shaft.

(d) Install a new snap ring to the shaft.



6. IF NECESSARY, REPLACE OIL SEAL

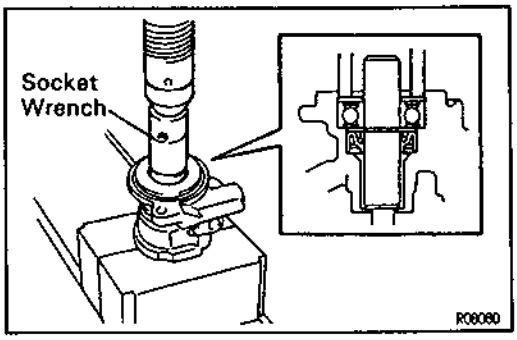
(a) Using a screwdriver and hammer, tap out the oil seal from the front housing.



(b) Coat a new oil seal lip with power steering fluid.
(c) Using a socket wrench (23 mm), press in the oil seal as shown in the illustration.

NOTICE:

- **Make sure you install the oil seal facing the correct direction.**
- **Be carefull not to damage the front housing.**



POWER STEERING PUMP ASSEMBLY

NOTICE: When using a vise, do not over–tighten it.

1. COAT WITH POWER STEERING FLUID

(See page SR–25)

2. INSTALL VANE PUMP SHAFT WITH BEARING

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

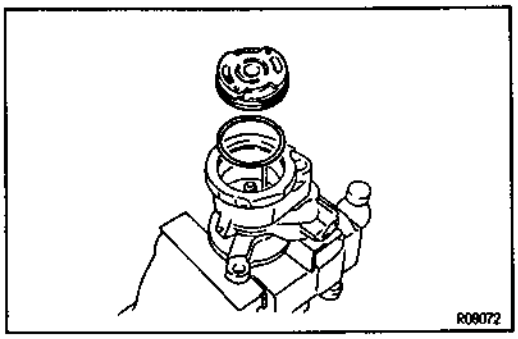
Notice: Be careful not to damage the oil seal lip.

(b) Using sanp ring pliers, install a new snap ring to the front housing.

3. INSTALL LONGER STRAIGHT PIN

Install a new pin to the front housing.

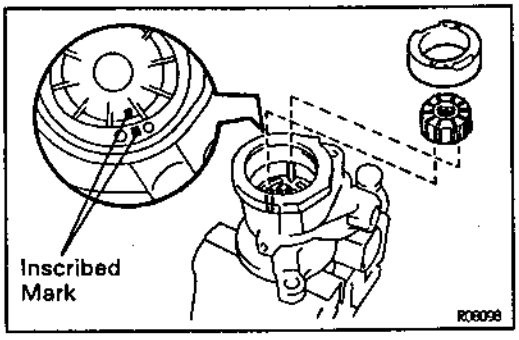
Notice: Be careful not to damage the pin.



4. INSTALL SIDE FRONT PLATE

(a) Coat a new O–ring with power steering fluid.
(b) Install the O–ring to the plate.
(c) Align the hole of the plate and longer straight pin.

NOTICE: Make sure you install the plate facing the correct direction.



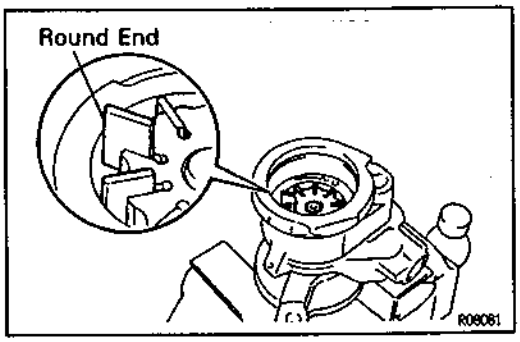
5. INSTALL SHORTER STRAIGHT PIN

Install a new pin to the side front plate.

Notice: Be careful not to damage the pin.

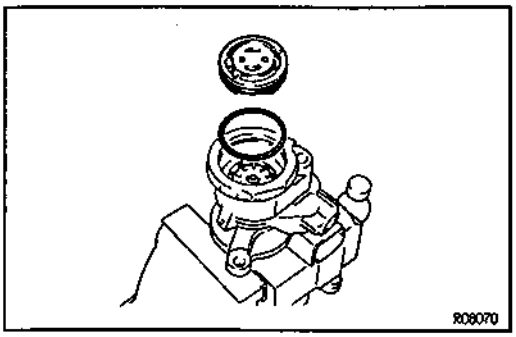
6. INSTALL CAM RING AND VANE PUMP ROTOR

Install the ring and rotor with the inscribed marks facing outward.



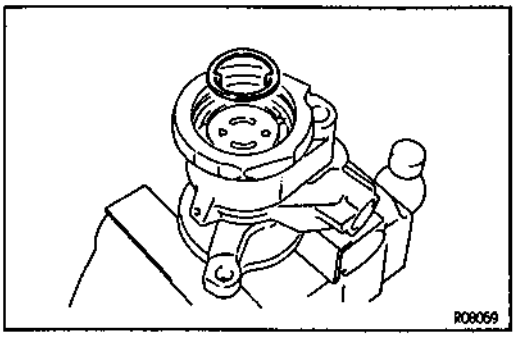
7. INSTALL CAM RING AND VANE PLATES

Install the ten vane plates with the round end facing out–ward.



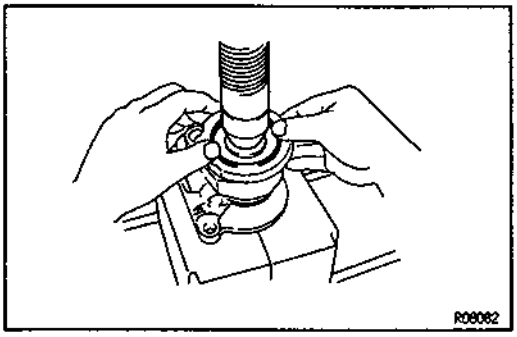
8. INSTALL SIDE REAR PLATE

(a) Coat a new O–ring with power steering fluid.
(b) Install the O–ring to the plate.
(c) Align the holes of the plate with the straight pins.



9. INSTALL WAVE WASHER

Install the washer so that its protrusions fit into the slots in the side rear plate.



10. INSTALL REAR HOUSING

(a) Coat a new O–ring with power steering fluid.
(b) Install a new O–ring to the housing.
(c) Using a press, apply just enough pressure to compress the wave washer, and install a new snap ring to the front housing.

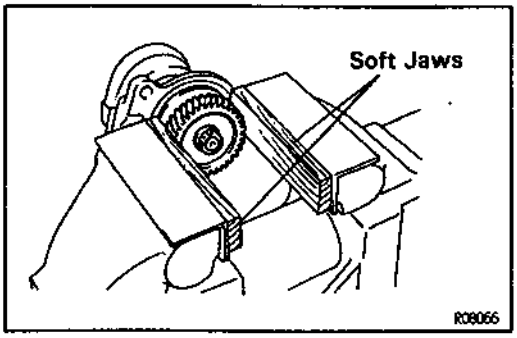
11. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

(a) Install the valve facing the correct direction.

(See page SR–25)

(b) Coat a new O–ring with power steering fluid.
(c) Install the O–ring to the union.
(d) Torque the union.

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



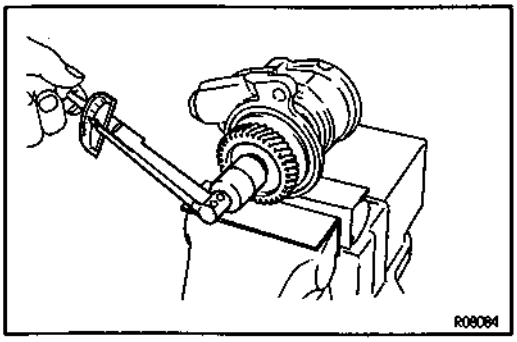
12. INSTALL VANE PUMP DRIVE GEAR

(a) Using soft jaws on a vise, clamp the gear in the vise.

NOTICE: Be careful not to damage the gear.

(b) Torque the gear set bolt.

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



13. MEASURE POWER STEERING PUMP ROTATING TORQUE

(a) Check that the pump rotates smoothly without abnormal noise.
(b) Using a troque wrench, check the pump rotating torque.

Rotating torque:
0.3 N–m (2.8 kgf–cm, 2.4 in.–lbf)

14. INSTALL SUCTION PORT UNION

(b) Coat a new O–ring with power steering fluid.
(c) Install the O–ring to the union.
(d) Torque the bolt.

Torque: 13 N–m (130 kgf–cm, 9 ft–lbf)