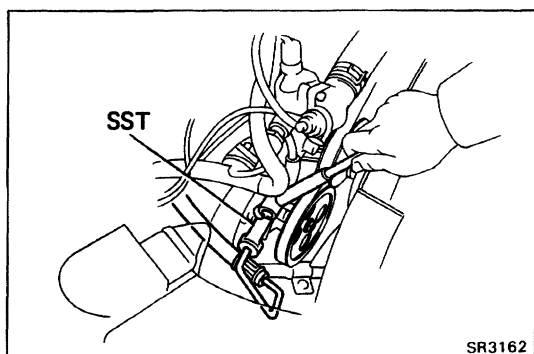
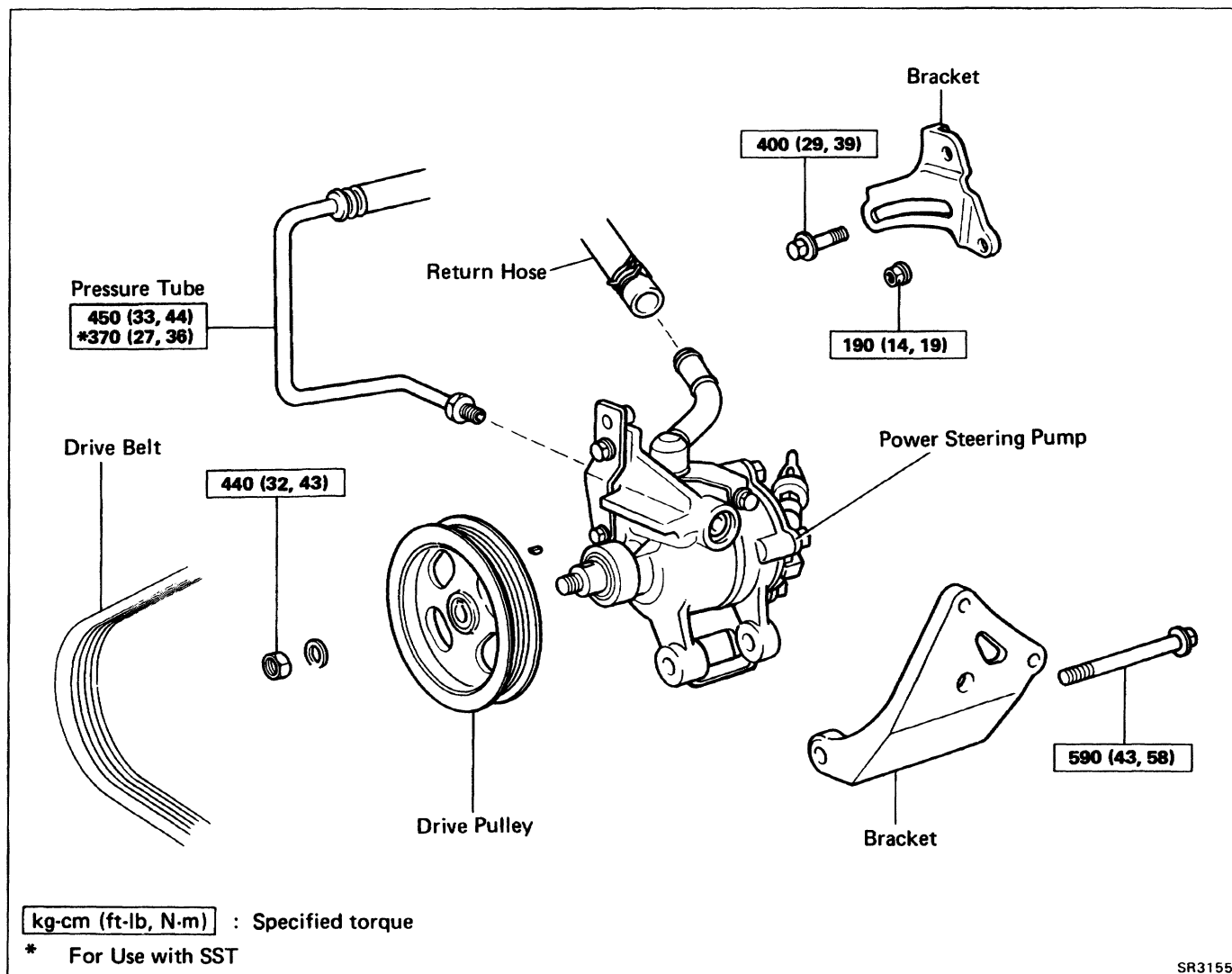


Power Steering Pump REMOVAL AND INSTALLATION OF POWER STEERING PUMP

Remove and install the parts as shown.



(MAIN POINT OF REMOVAL AND INSTALLATION)

1. DISCONNECT AND CONNECT PRESSURE TUBE

Using SST, disconnect and connect the pressure tube from /to the PS pump.

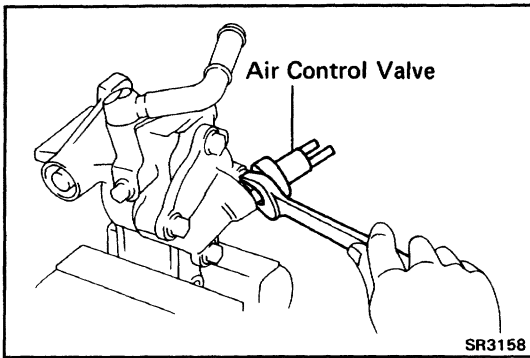
SST 09631-22020

Torque: 370 kg-cm (27 ft-lb, 36 N-m)

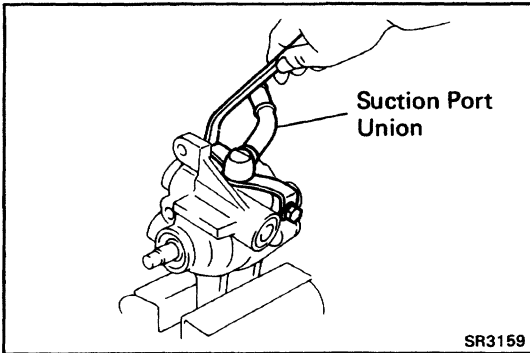
HINT: Use a torque wrench with a fulcrum length of 30 cm (1.18 in.).

2. ADJUST DRIVE BELT TENSION AFTER PS PUMP INSTALLED

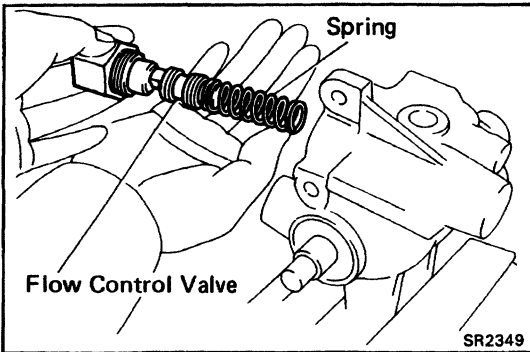
(See page [SR-21](#))

3. REMOVE AIR CONTROL VALVE**4. REMOVE SUCTION PORT UNION**

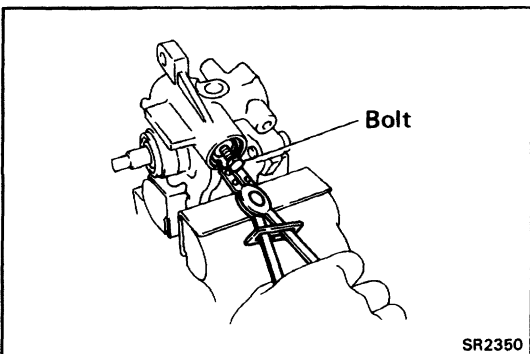
Remove the two bolts and pull out the union with O-ring.

**5. REMOVE FLOW CONTROL VALVE AND SPRING**

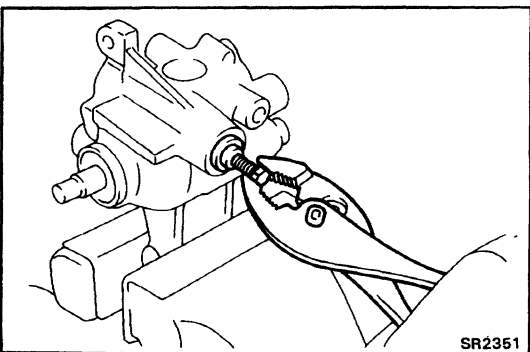
- (a) Remove the pressure port union.
- (b) Remove the O-rings from the union and housing.
- (c) Remove the flow control valve and spring.

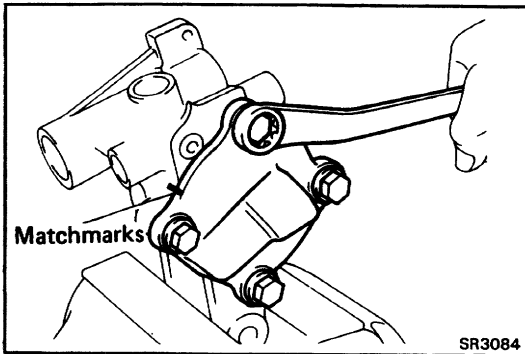
**6. REMOVE FLOW CONTROL SPRING SEAT**

- (a) Temporarily install a bolt to the spring seat.
- (b) Push the bolt and remove the snap ring with snap ring pliers.



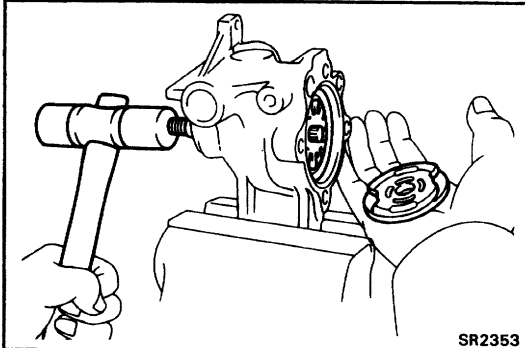
- (c) Pull out the bolt and remove the spring seat.
- (d) Remove the O-ring from the spring seat.





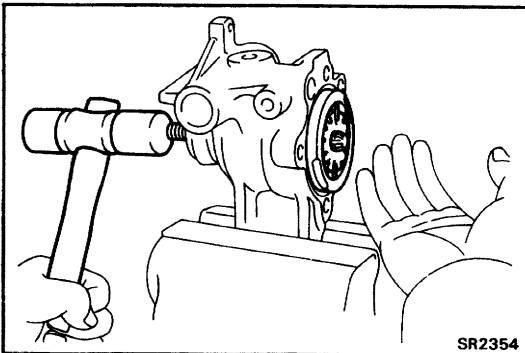
7. REMOVE REAR HOUSING

- Place matchmarks on the front and rear housings.
- Remove the four bolts and rear housing.
- Remove the O-rings.



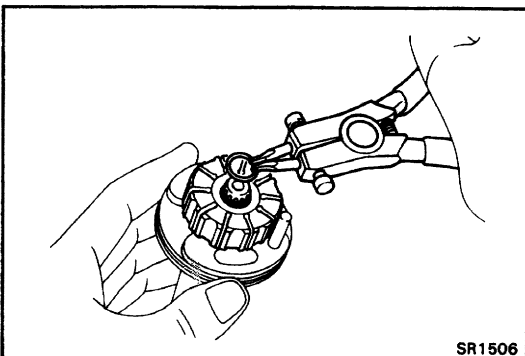
8. REMOVE REAR SIDE PLATE

- Using a plastic hammer, tap the rotor shaft.
- Remove the rear side plate.
- Remove the two O-rings.



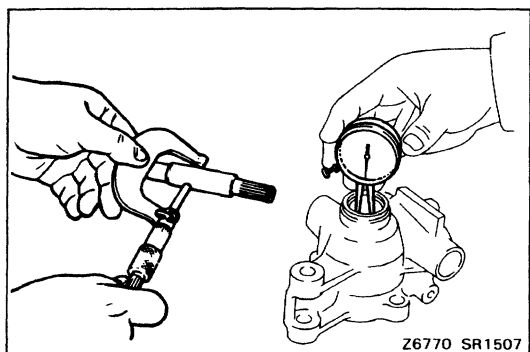
9. REMOVE ROTOR SHAFT WITH VANE PLATES, CAM RING AND STRAIGHT PIN

- Using a plastic hammer, tap out the rotor shaft assembly.
- NOTICE: Be careful not to scratch the parts.**
- Remove the longer straight pin from the front housing.
 - Remove the 4-ring and the wave washer.



10. DISASSEMBLE ROTOR SHAFT ASSEMBLY

- Remove the cam ring and vane plates.
 - Using snap ring pliers, remove the snap ring.
 - Remove the rotor and plate from the rotor shaft.
- NOTICE: Be careful not to scratch the rotor.**
- Remove the O-ring from the front side plate.
 - Remove the straight pin from the front side plate.



Z6770 SR1507

INSPECTION AND REPAIR OF POWER STEERING PUMP

1. INSPECT OIL CLEARANCE BETWEEN ROTOR SHAFT AND BUSHING

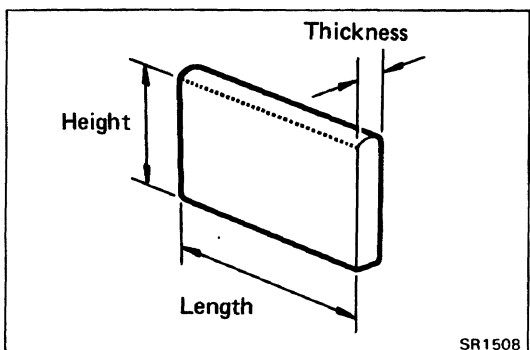
Using a micrometer and calipers, measure the oil clearance.

Standard clearance: 0.01 – 0.03 mm

(0.0004 – 0.0012 in.)

Maximum clearance: 0.07 mm (0.0028 in.)

If the clearance is greater than maximum, replace the entire PS pump.



SR1508

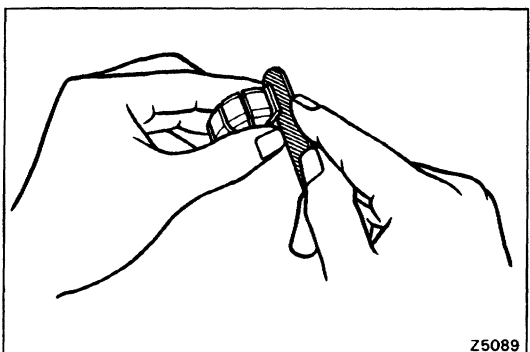
2. INSPECT ROTOR AND VANE PLATES

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

Minimum height: 8.1 mm (0.319 in.)

Minimum thickness: 1.797 mm (0.0707 in.)

Minimum length: 14.988 mm (0.5901 in.)



Z5089

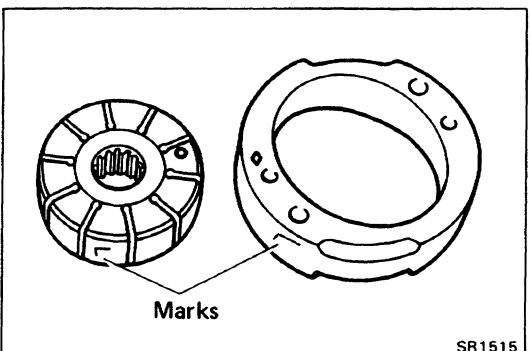
(b) Using a feeler gauge, measure the clearance between the rotor and vane plate.

Maximum clearance: 0.03 mm (0.0012 in.)

If the clearance is greater than maximum, replace the vane plate and/or rotor with one stamped with the same mark of the cam ring.

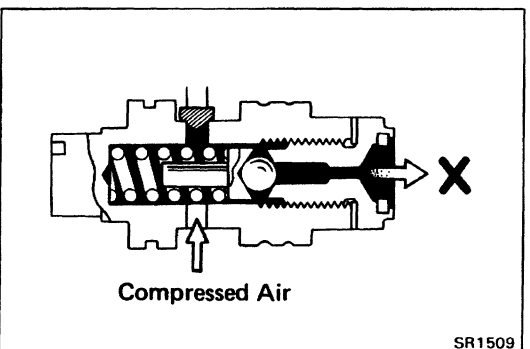
Inscribed mark: 1, 2, 3, 4 or None

HINT: There are five vane plate lengths with the following rotor and cam ring marks:



SR1515

Rotor and cam ring number	Vane length	mm (in.)
None	14.996 – 14.998	10.5904 – 0.5905E
1	14.994 – 14.996	(0.5903 – 0.5904)
2	14.992 – 14.994	10.5902 – 0.5903)
3	14.990 – 14.992	(0.59016 – 0.59024)
4	14.988 – 14.990	(0.5901 – 0.5902)



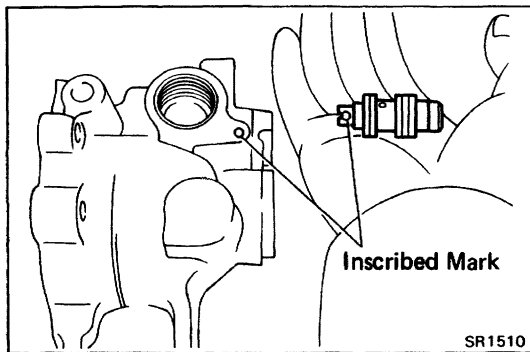
SR1509

3. INSPECT FLOW CONTROL VALVE

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

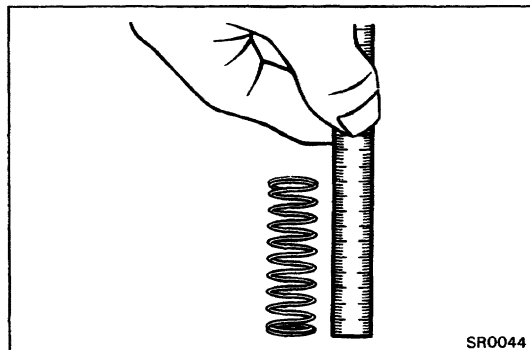
(b) Check the flow control valve for leakage.

Close one of the holes and apply compressed air [4 or 5 kg/cm² (57 or 71 psi, 392 or 490 kPa)] into the opposite side, and confirm that air does not come out of the end hole.



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

Inscribed mark: A, B, C, D, E or F

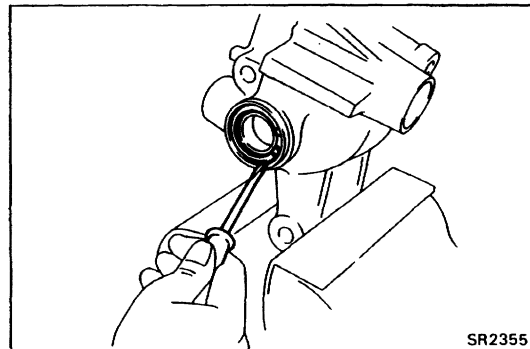


4. INSPECT FLOW CONTROL VALVE SPRING

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

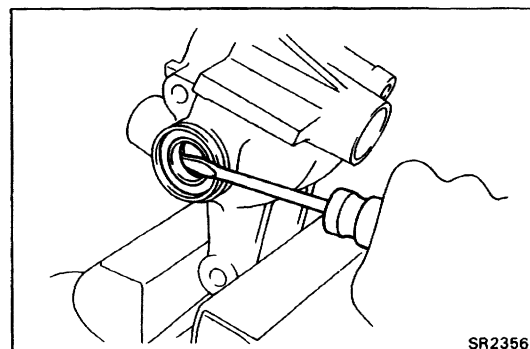
Free length: 37 – 39 mm 11.46 – 1.54 in.)

If the free length is not within specification, replace the spring.

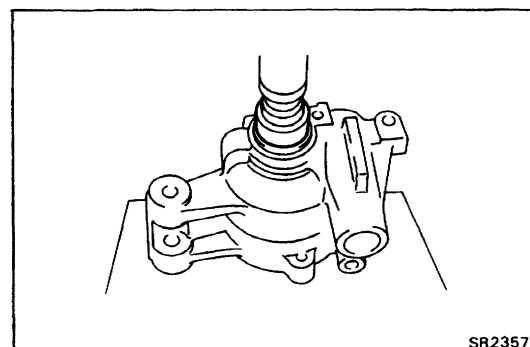


5. REPLACEMENT OF OIL SEAL

(a) Using a screwdriver, pry out the snap ring.

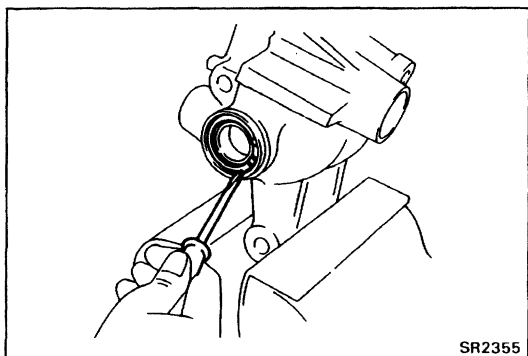


(b) Using a screwdriver, pry out the oil seal.



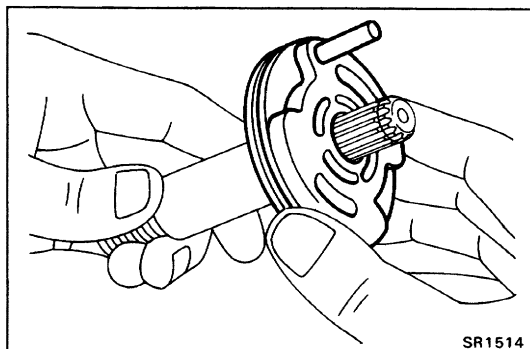
(c) Using a 22 mm socket wrench, press in a new oil seal.

(d) Coat the oil seal lip with MP grease.

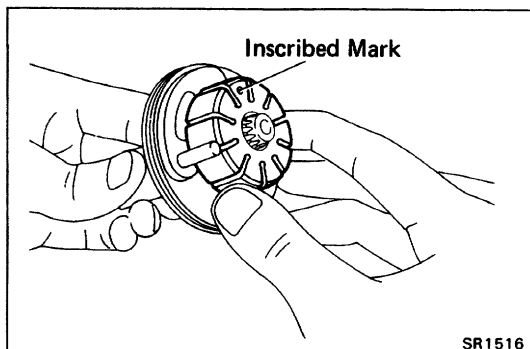


SR2355

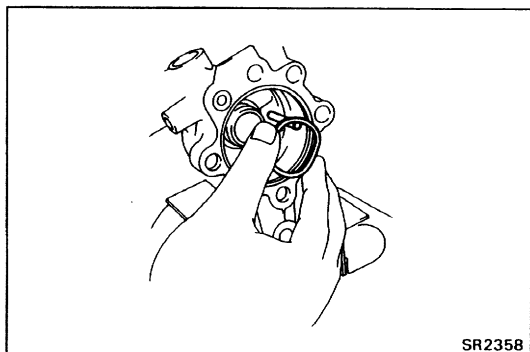
(e) Using a screwdriver, install the snap ring.



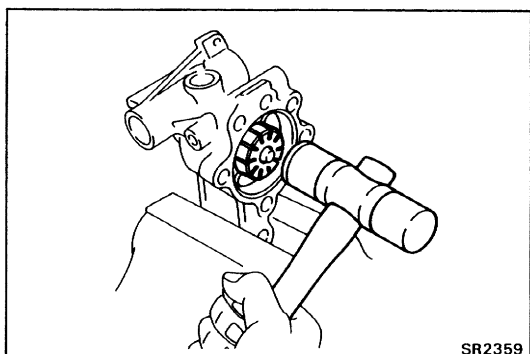
SR1514



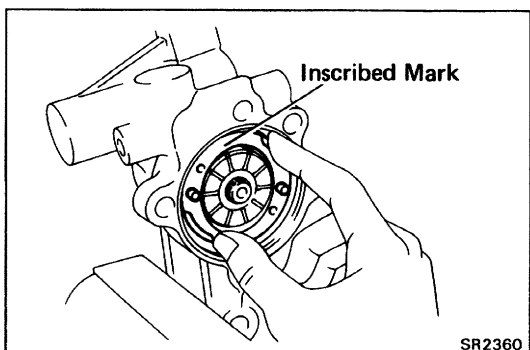
SR1516



SR2358



SR2359



SR2360

ASSEMBLY OF POWER STEERING PUMP

(See page [SR-26](#))

HINT: Coat all sliding surfaces with fluid before assembling.

1. ASSEMBLE ROTOR, FRONT SIDE PLATE AND SHAFT

- (a) Install the shorter straight pin to the front side plate.
- (b) Place the front side plate on the rotor shaft.

- (c) Place the rotor on the shaft with the inscribed mark facing upward, and secure them with the snap ring.

2. INSTALL ROTOR ASSEMBLY TO FRONT HOUSING

- (a) Install a new O-ring in the groove of the front side plate.
- (b) Install two new O-rings in the inside groove of the front housing.
- (c) Install the wave washer and long straight pin in the front housing.

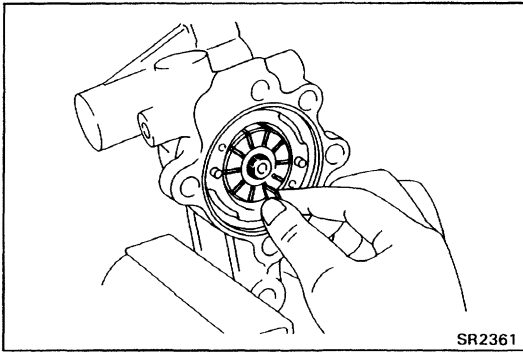
- (d) Using a plastic hammer, tap in the rotor assembly.
NOTICE: Be careful not to damage the oil seal and O-rings.

3. INSTALL CAM RING

- (a) Install the straight pin.
- (b) Insert the cam ring, with the inscribed mark facing outward.

4. INSTALL VANE PLATES

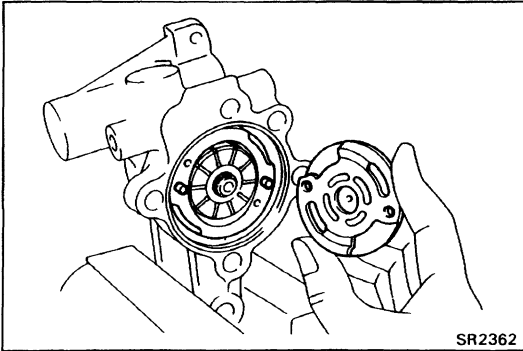
Install the vane plates with the round end facing outward.



SR2361

5. INSTALL REAR SIDE PLATE

- (a) Install two new O-rings into the groove of the side plate.
- (b) Align the hole of the side plate with the pins, and install the side plate.

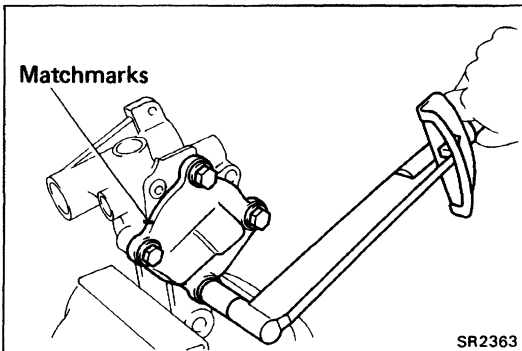


SR2362

6. INSTALL REAR HOUSING

- (a) Align the matchmarks on the housings and install a new O-ring and the rear housing with the four bolts.
- (b) Torque the four bolts.

Torque: 470 kg-cm (34 ft-lb, 46 N-m)

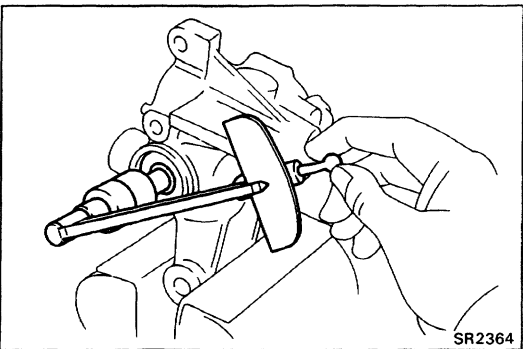


SR2363

7. CHECK ROTOR SHAFT ROTATION CONDITION

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

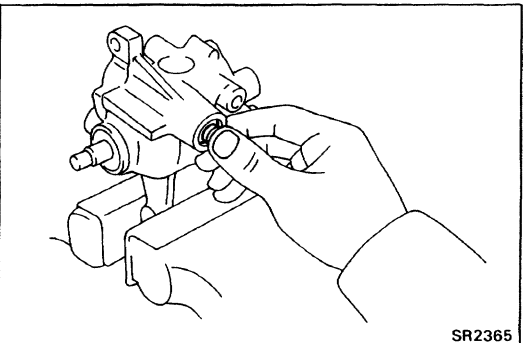
Rotating torque: 2.8 kg-cm (2.4 in.-lb, 0.3 N-m) or less



SR2364

8. INSTALL FLOW CONTROL SPRING SEAT

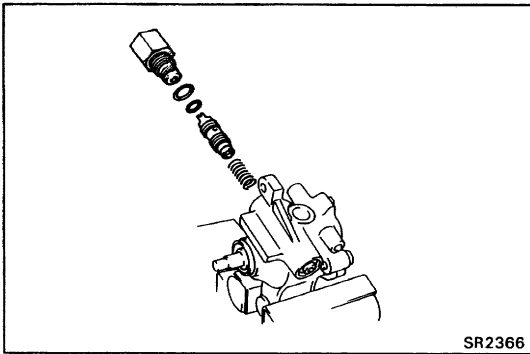
- (a) Install a new O-ring in the spring seat.
- (b) Install the spring seat and, using snap ring pliers, install the snap ring.



SR2365

9. INSTALL FLOW CONTROL VALVE AND SPRING

Install the spring and valve into the housing.



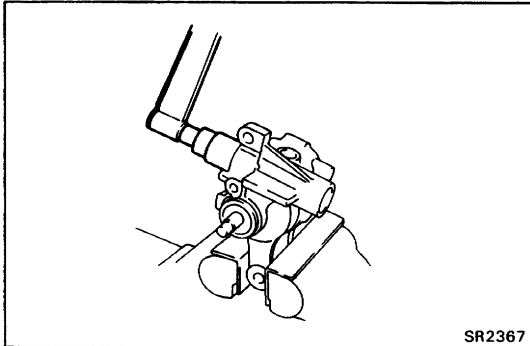
SR2366

10. INSTALL PRESSURE PORT UNION

(a) Install two new O-rings in the groove of the pressure port union.

(b) Install and torque the union.

Torque: 700 kg-cm (51 ft-lb, 69 N - m)



SR2367

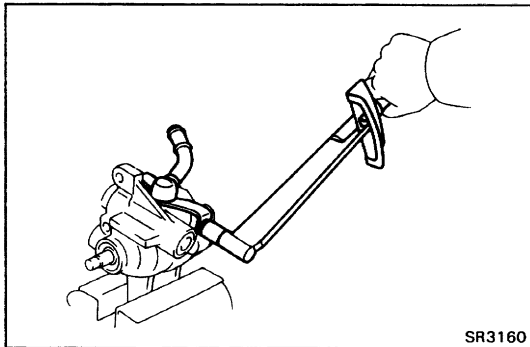
11. INSTALL SUCTION PORT UNION

(a) Install a new 4-ring in the union.

(b) Push in the union, and install the two bolts.

(c) Torque the two bolts.

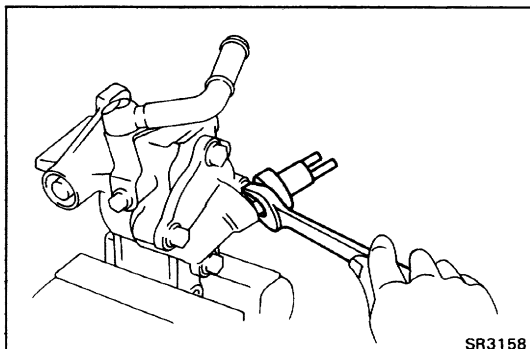
Torque: 130 kg-cm (9 ft-lb, 13 N-m)



SR3160

12. INSTALL AIR CONTROL VALVE

Torque: 370 kg-cm (27 ft-lb, 36 N-m)



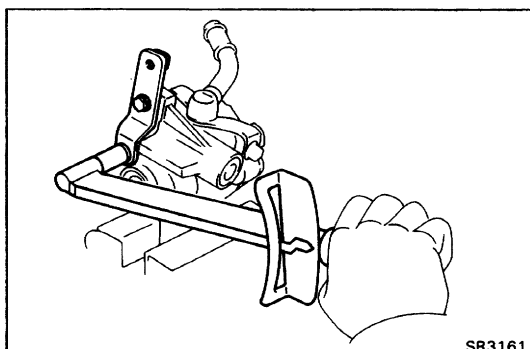
SR3158

13. INSTALL DRIVE BELT ADJUST STAY

Install and torque the two bolts.

Torque: 10 mm bolt 185 kg-cm (13 ft-lb, 18 N-m)

12 mm bolt 420 kg-cm (30 ft-lb, 41 N-m)



SR3161