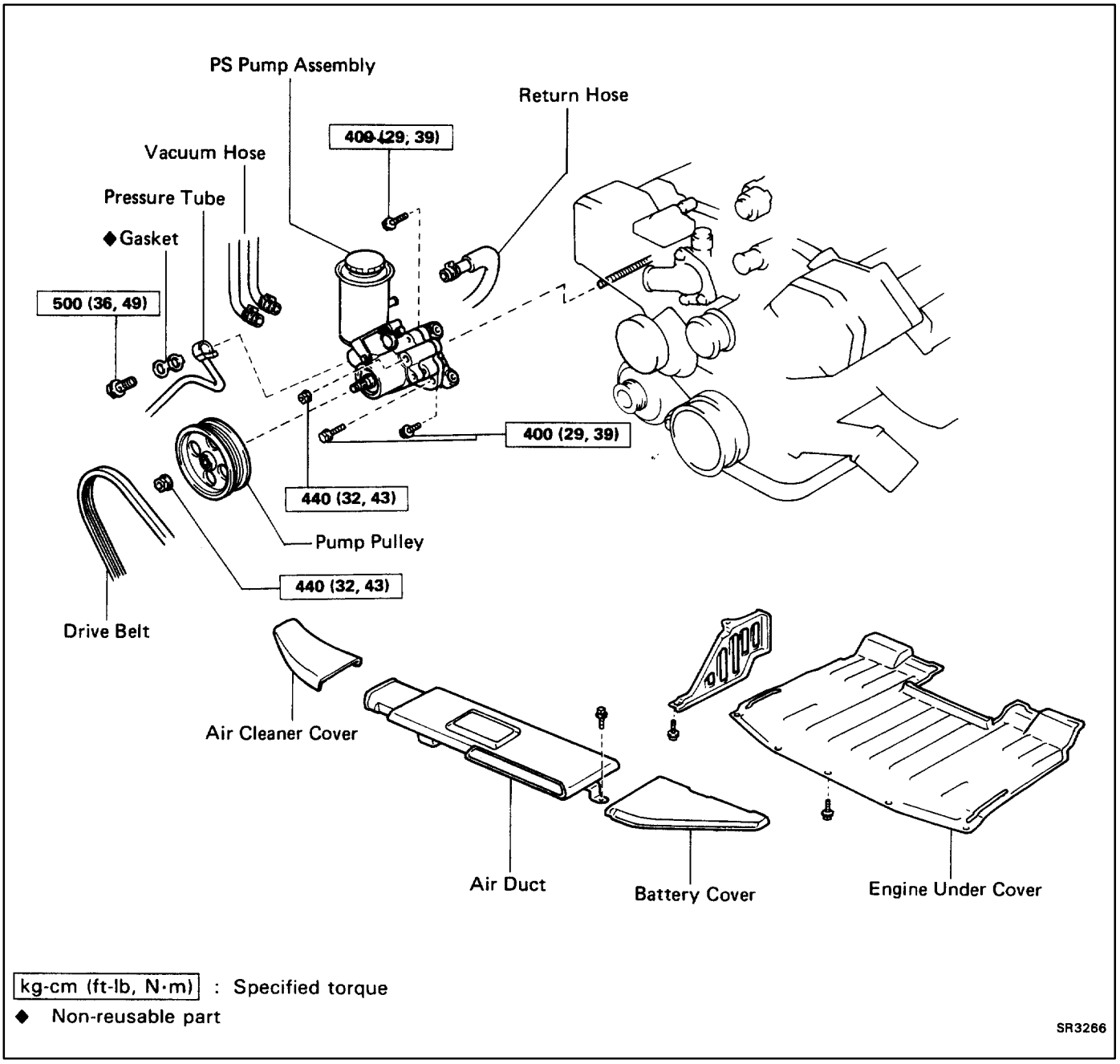
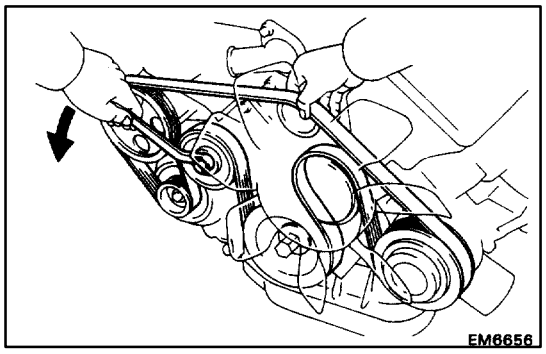
Power Steering Pump

REMOVAL AND INSTALLATION OF POWER STEERING PUMP

Remove and install the parts as shown.

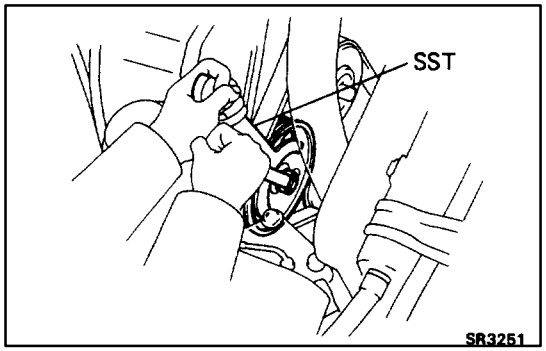




(MAIN POINTS OF REMOVAL AND INSTALLATION)

1. REMOVE DRIVE BELT

Loosen the drive belt tension by turning the drive belt tensioner counterclockwise, and remove the drive belt.

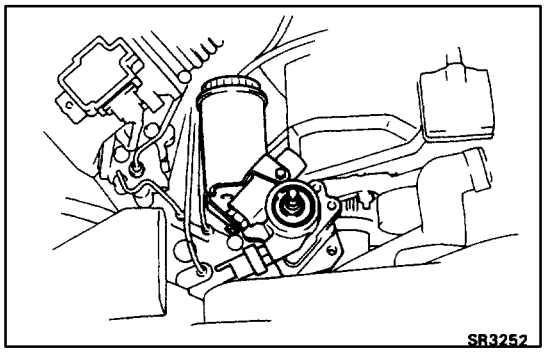


2. REMOVE PUMP PULLEY

(a) Using SST, remove the pulley set nut.

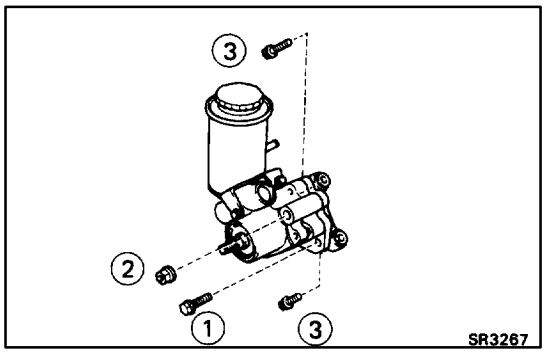
SST 09278–54012

(b) Remove the pulley.



3. REMOVE PUMP ASSEMBLY

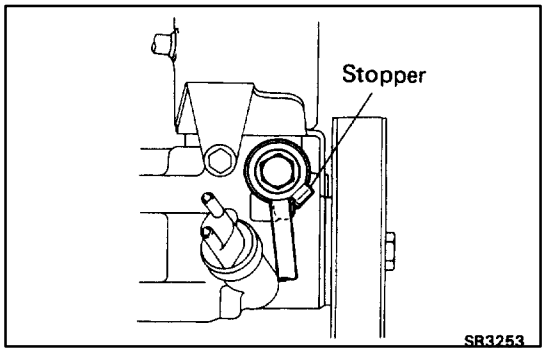
Face the pump assembly in the direction shown, then remove it.



4. INSTALL PUMP ASSEMBLY

Torque the bolts and nut on the pump assembly in the order shown.

Torque: Bolt 400 kg–cm (29 ft–lb, 39 N·m)
Nut 440 kg–cm (32 ft–lb, 43 N·m)



5. CONNECT PRESSURE TUBE

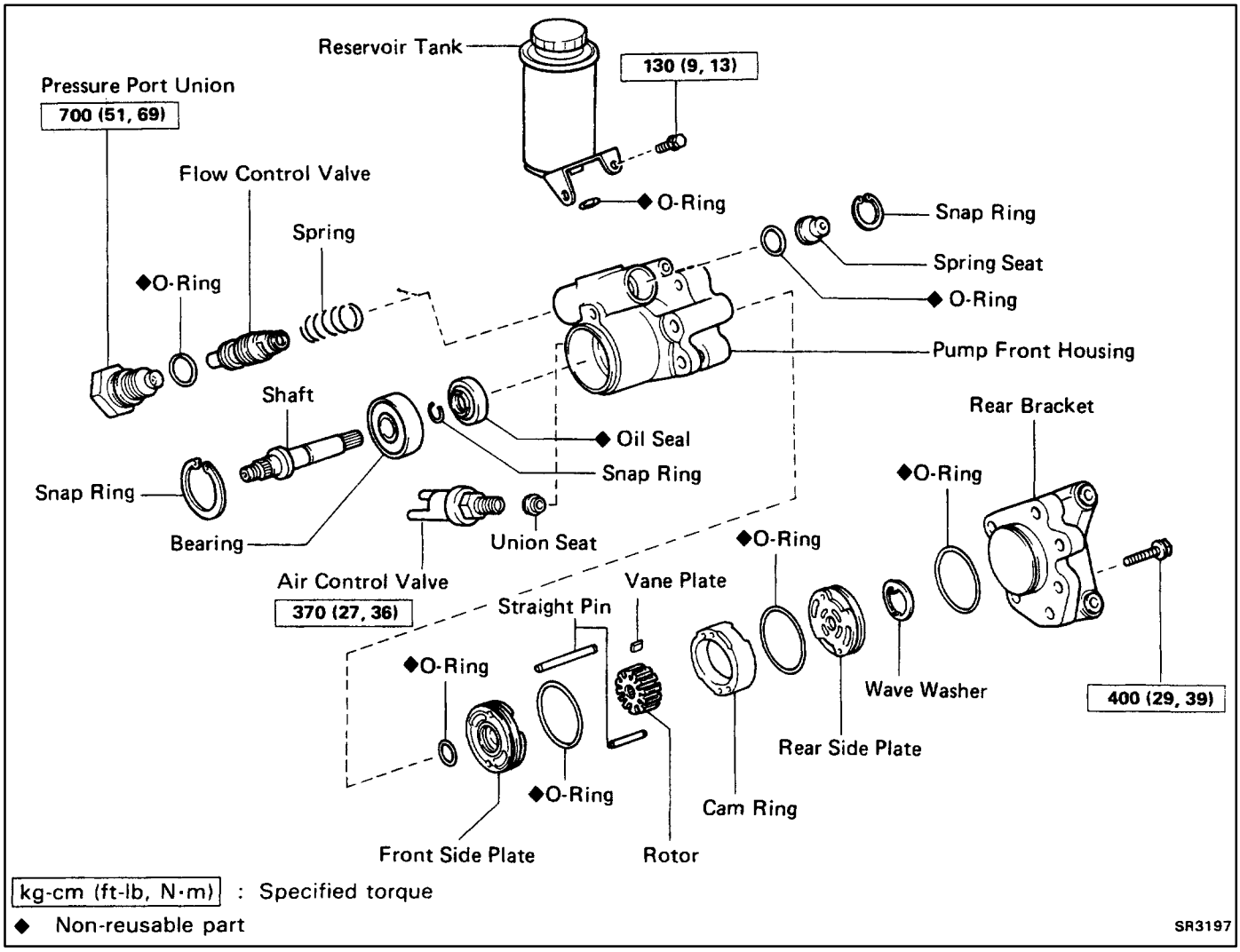
Make sure the stopper is touching the pump housing as shown, then torque the union bolt.

Torque: 500 kg–cm (36 ft–lb, 49 N·m)

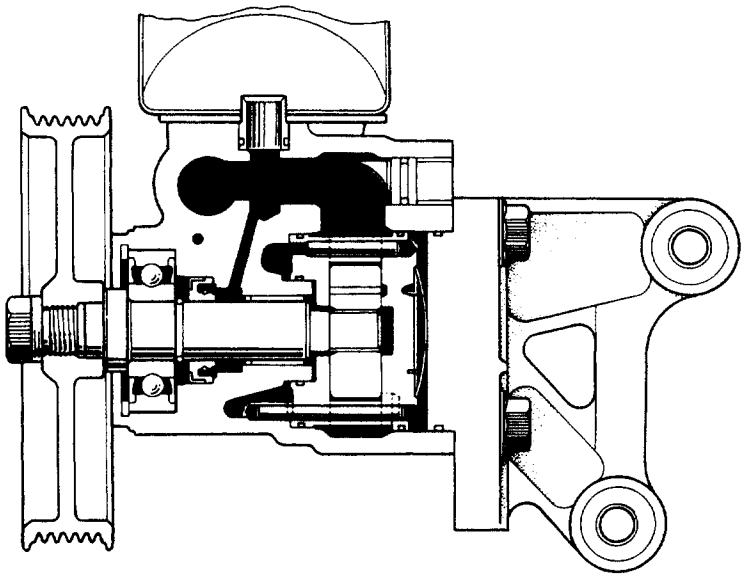
6. BLEED POWER STEERING SYSTEM

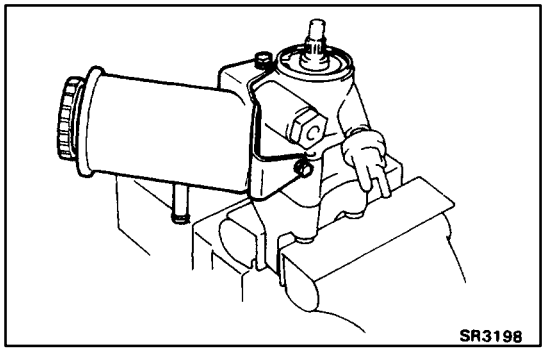
(See page SR–98)

COMPONENTS



SECTIONAL VIEW





DISASSEMBLY OF POWER STEERING PUMP

1. MOUNT POWER STEERING PUMP IN VISE

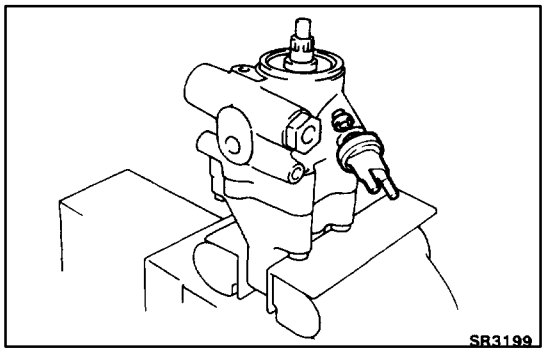
NOTICE: Do not tighten the vise too tight.

2. REMOVE RESERVOIR TANK

(a) Remove the three bolts and reservoir tank.

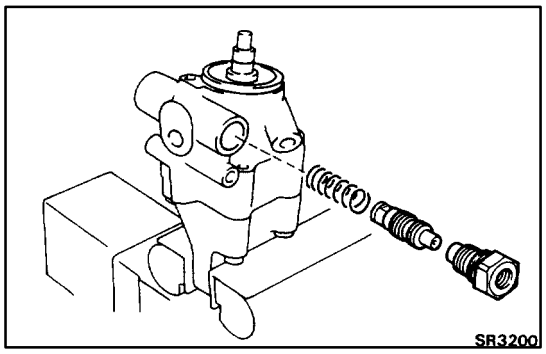
(b) Remove the O–ring from the reservoir tank.

HINT: Replace the O–ring with a new one when installing it.



3. REMOVE AIR CONTROL VALVE

HINT: Replace the union seat with a new one only when it is damaged.



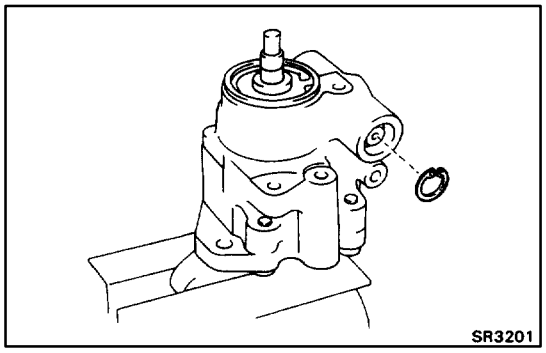
4. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

(a) Remove the pressure port union.

(b) Remove the O–ring from the union.

HINT: Replace the O–ring with a new one when installing it.

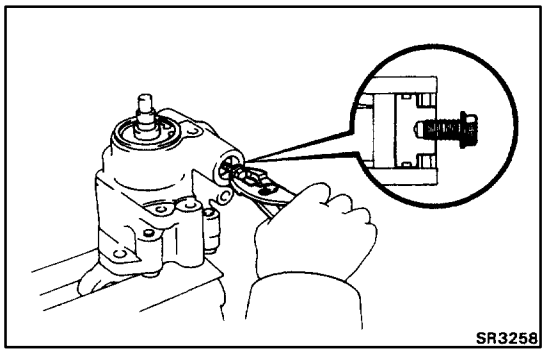
(c) Remove the flow control valve and spring.



5. REMOVE SPRING SEAT

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

HINT: The snap ring is easier to remove if the spring seat is pressed down slightly.

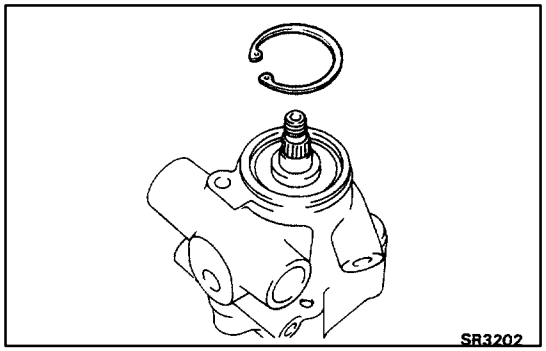


(b) Temporarily install a bolt to the seat and pull out it.

HINT: Use a bolt with diameter 6 mm (0.24 in.) and pitch 1.0 mm (0.039 in.).

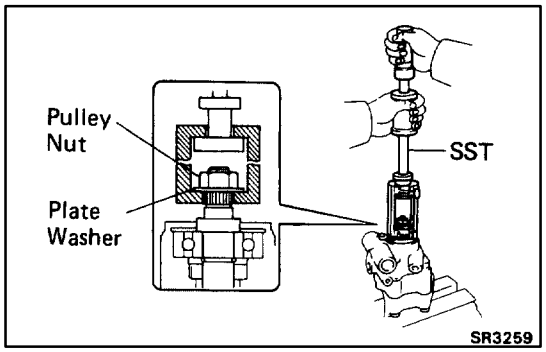
(c) Remove the O–ring from the seat.

HINT: Replace the O–ring with a new one when installing it.



6. REMOVE VANE PUMP SHAFT WITH BEARING

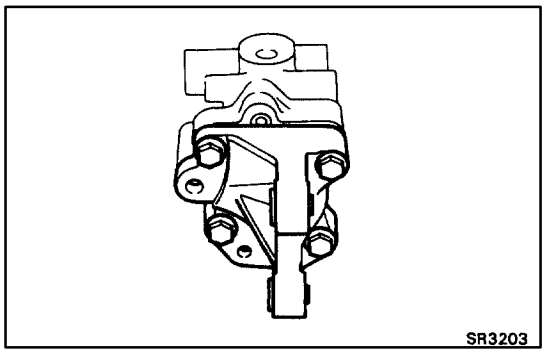
(a) Using snap ring pliers, remove the snap ring.



(b) Temporarily install the appropriate plate washer and pulley nut to the shaft.

(c) Using SST, pull out the shaft.

SST 09910–00015 (09911–00011, 09912–00010)

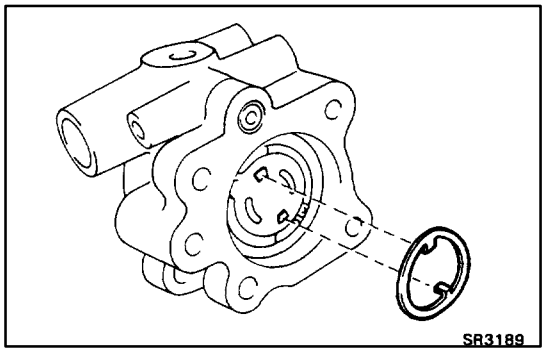


7. REMOVE REAR BRACKET

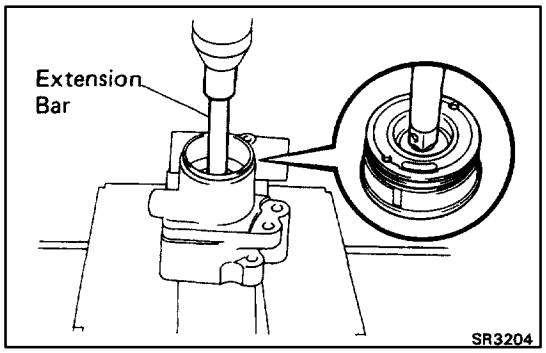
(a) Remove the four bolts and rear bracket.

(b) Remove the O–ring from the bracket.

HINT: Replace the O–ring with a new one when installing it.



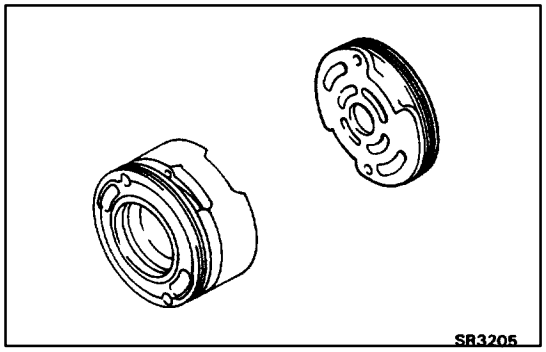
8. REMOVE WAVE WASHER



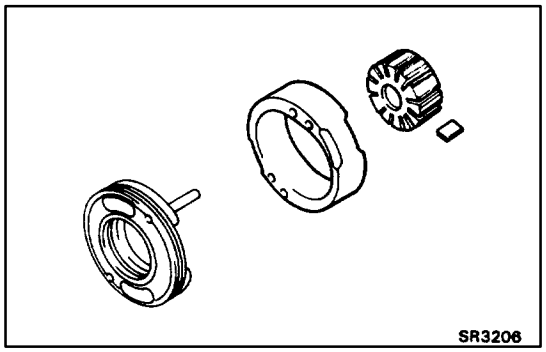
9. REMOVE FRONT SIDE PLATE, CAM RING, ROTOR, VANE PLATES AND REAR SIDE PLATE

(a) Using extension bar and press, remove the front side plate, cam ring, rotor, vane plates and rear side plate as an assembly.

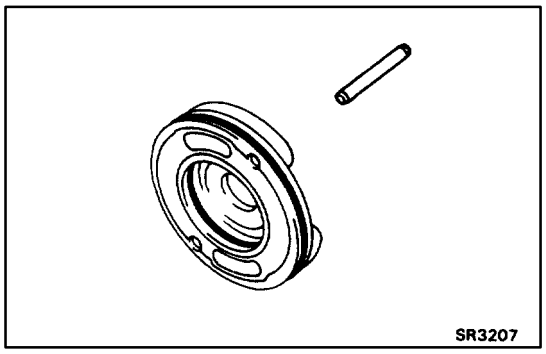
HINT: Catch the assembly in your hand to prevent it dropping.



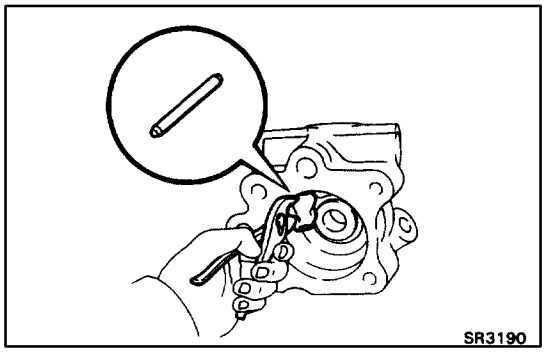
(b) Remove the rear side plate.
(c) Remove the O–ring from the rear side plate.
HINT: Replace the O–ring with a new one when installing it.



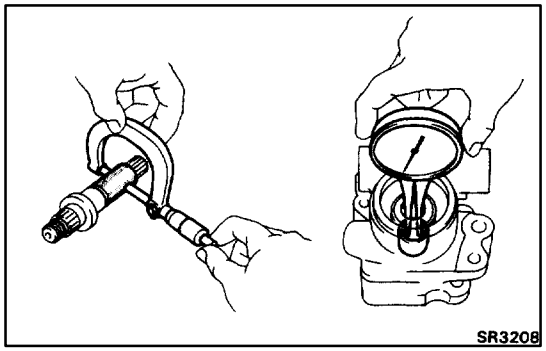
(d) Remove the cam ring, rotor and the ten vane plates.



(e) Remove the straight pin from the front side plate.
(f) Remove the two O–rings from the front side plate.
HINT: Replace the O–rings with new ones when installing them.



(g) Remove the straight pin from the front housing.
HINT: Place a workshop rag over the pin to prevent damaging it.


SR3208

INSPECTION OF POWER STEERING PUMP

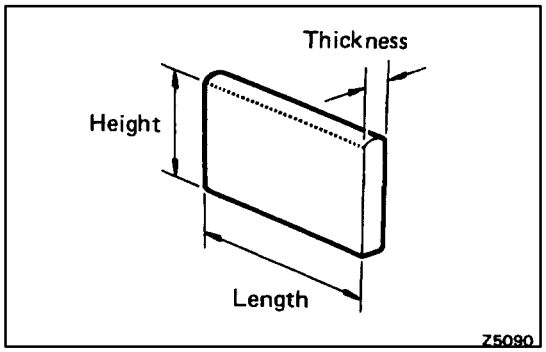
1. MEASURE OIL CLEARANCE OF SHAFT AND BUSHING

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 more than maximum, replace the entire power steering pump.



Z5090

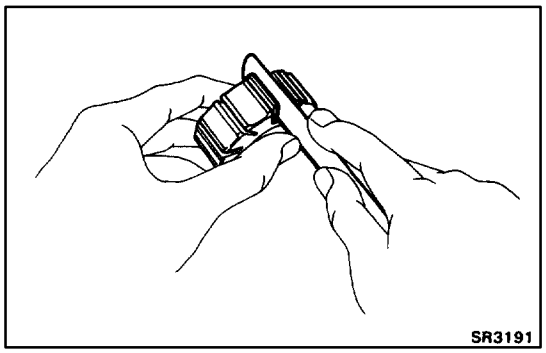
2. INSPECT ROTOR AND VANE PLATES

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

Minimum height: 8.0 mm (0.315 in.)

Minimum thickness: 1.77 mm (0.0697 in.)

Minimum length: 14.97 mm (0.5894 in.)


SR3191

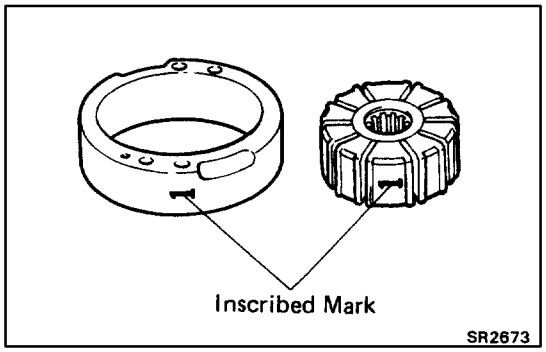
(b) Using a feeler gauge, measure the clearance between the rotor groove and vane plate.

Maximum clearance: 0.03 mm (0.0012 in.)

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

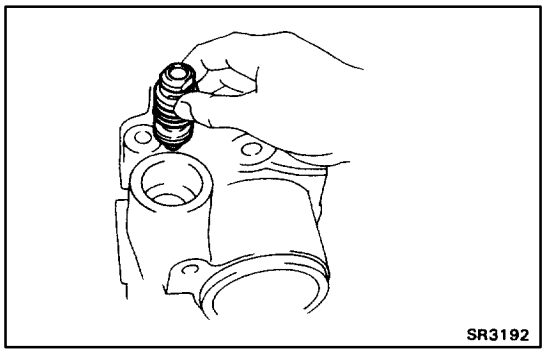
Inscribed mark: 1,2,3,4 or None

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



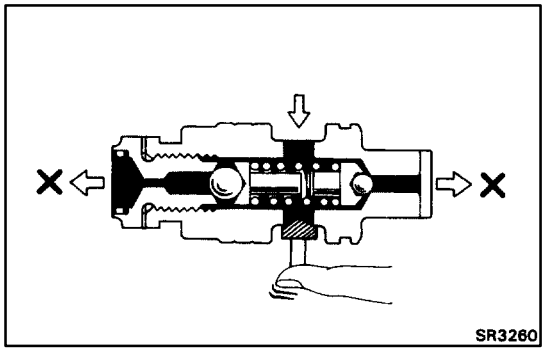
SR2673

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

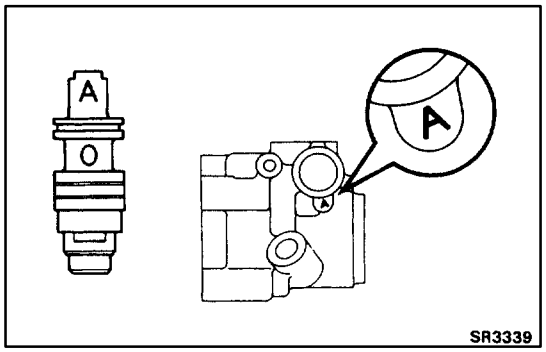

SR3192

3. INSPECT FLOW CONTROL VALVE

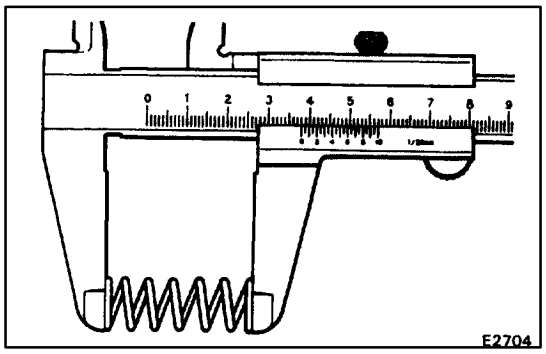
(a) Coat the valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.



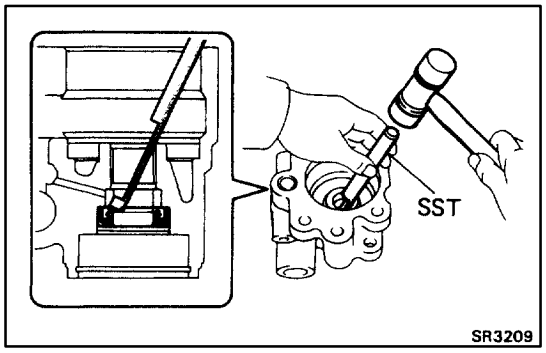
(b) Check the flow control valve for leakage.
Close one of the holes and apply compressed air [4 –5 kg/cm2 (57–71 psi, 392–490 kPa)] into the opposite side, and confirm that air does not come out from the end holes.



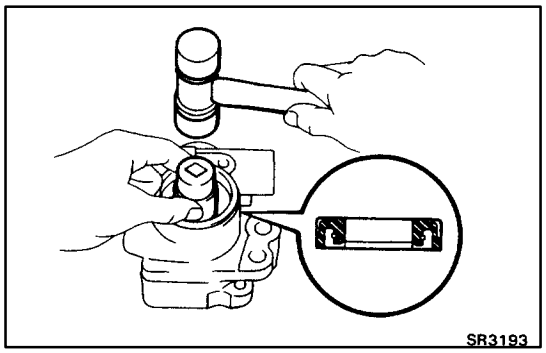
If necessary, replace the valve with one having the same letter as inscribed on the front housing.
Inscribed mark: A, B, C, D, E or F



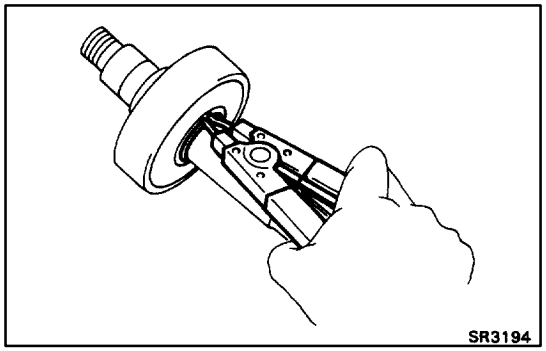
4. INSPECT FLOW CONTROL SPRING
Using a scale, measure the free length of the spring.
Minimum spring length: 36 mm (1.42 in.)
If not within specification, replace the spring.



5. IF NECESSARY, REPLACE OIL SEAL
(a) Using SST, tap out the oil seal.
SST 09631–10030

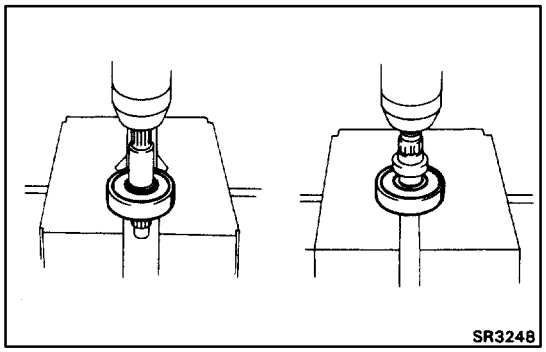


(b) Using a 22 mm socket wrench and hammer, drive in a new oil seal.
(c) Coat the oil seal lip with power steering fluid.

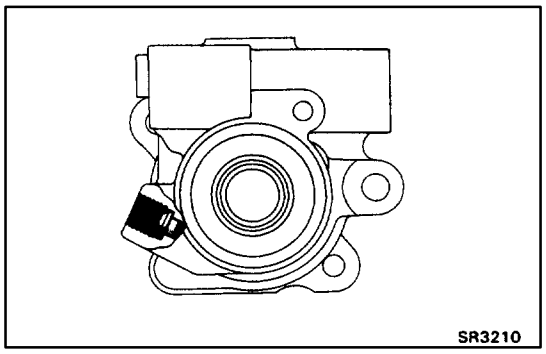


6. IF NECESSARY, REPLACE BEARING

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

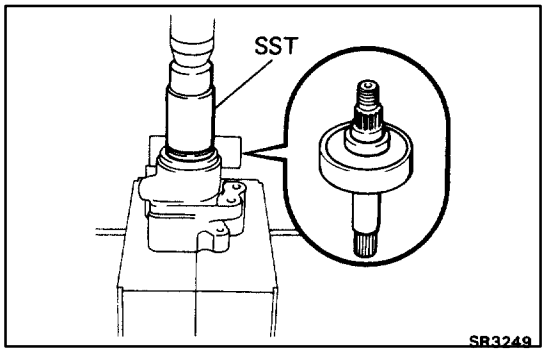


(b) Using a press, press out the bearing.
(c) Using a press, press in a new bearing.
(d) Using snap ring pliers, install the snap ring.



7. IF NECESSARY, REPLACE UNION SEAT FOR AIR CONTROL VALVE

(a) Using a plastic hammer, tap out the union seat.
If necessary, use a screw extractor to remove the union seat.
(b) Install a new union seat.



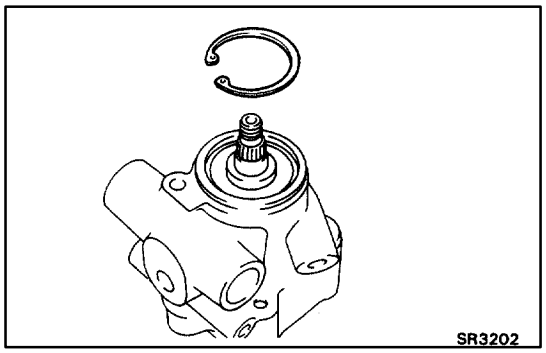
ASSEMBLY OF POWER STEERING PUMP

(See page SR–104)

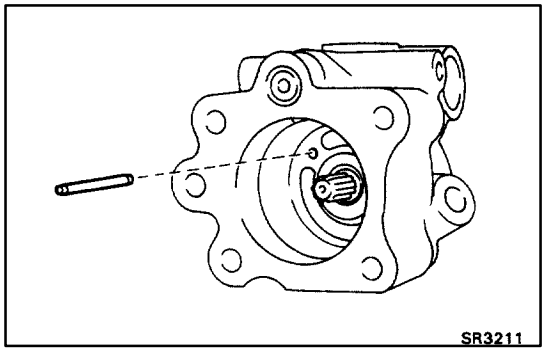
1. COAT ALL SLIDING SURFACES WITH POWER STEERING FLUID BEFORE ASSEMBLY

2. INSTALL VANE PUMP SHAFT WITH BEARING

(a) Using SST and a press, press in the shaft.
SST 09238–47012

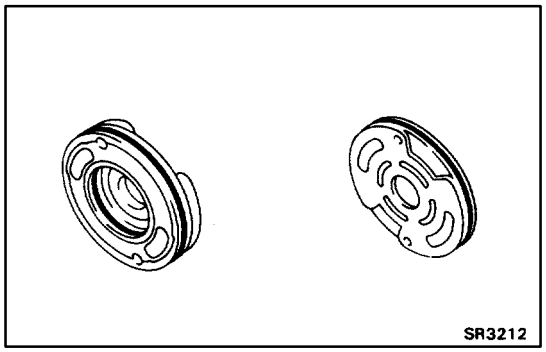


(b) Using snap ring pliers, install the snap ring.

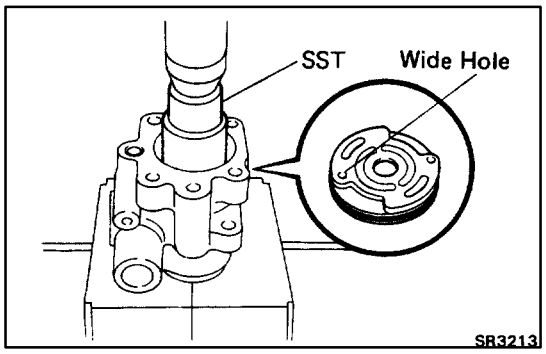

SR3211

3. INSTALL FRONT SIDE PLATE, CAM RING, ROTOR, VANE PLATES AND REAR SIDE PLATE

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


SR3212

(b) Coat new O–rings with power steering fluid and install them on the front side plate and rear side plate.



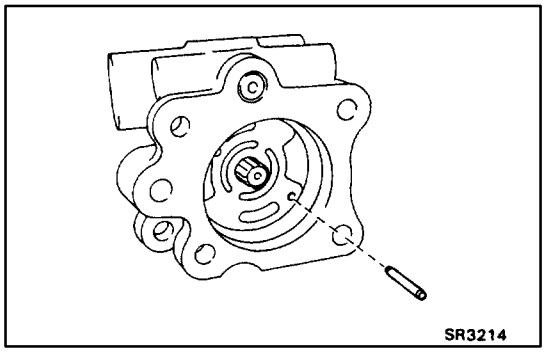
SR3213

(c) Using SST and a press, press in the front side plate.

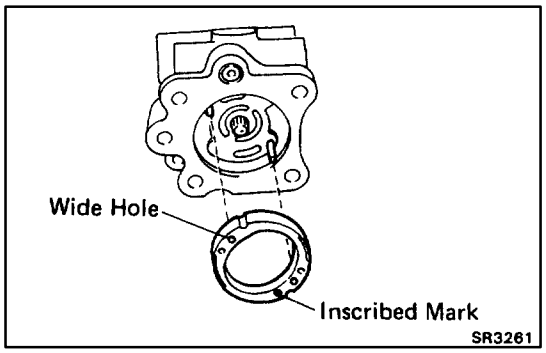
SST 09238–47012

HINT: Match the wide hole on the front side plate with the straight pin.

NOTICE: Be careful not to damage the O–rings.


SR3214

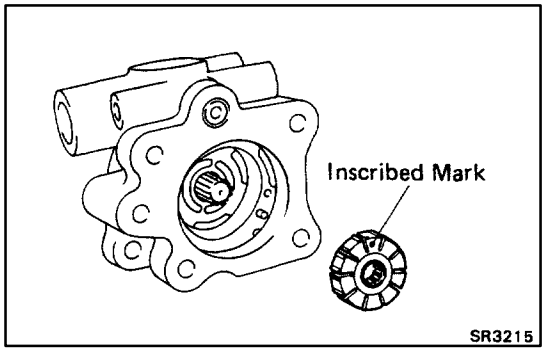
(d) Install the shorter straight pin to the front side plate.



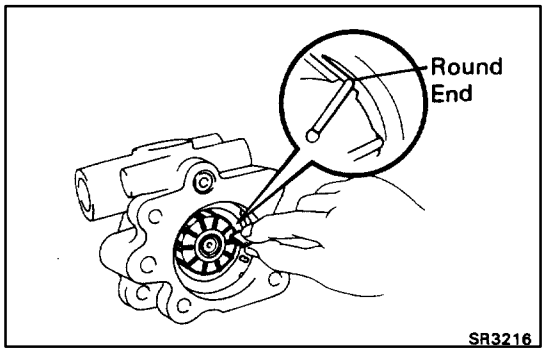
SR3261

(e) Match the wide hole of the cam ring with the longer straight pin, and install the cam ring.

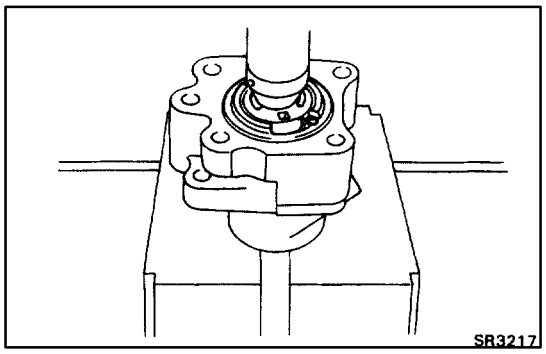
HINT: Install the cam ring with the inscribed mark facing the rear.



(f) Install the rotor to the shaft with the inscribed mark on the rotor facing toward the rear.

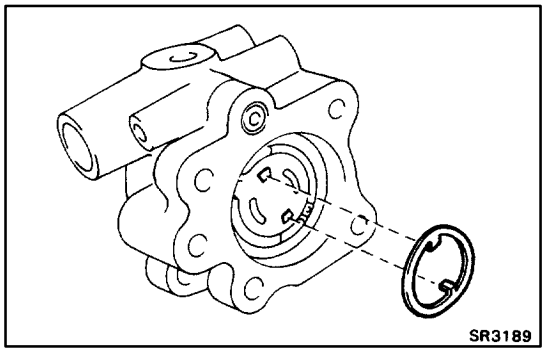


(g) Install the ten vane plates with the round end facing outward.



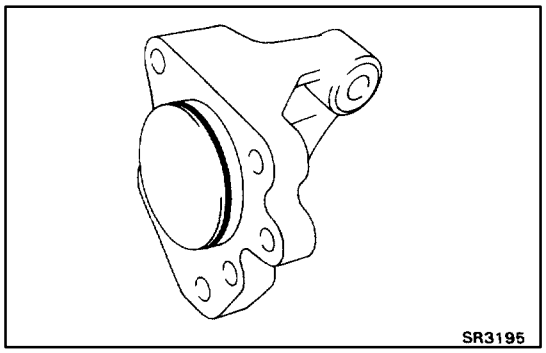
(h) Match the wide hole with the longer straight pin and press in the rear side plate with a press.

NOTICE: Be careful not to damage the O–ring.



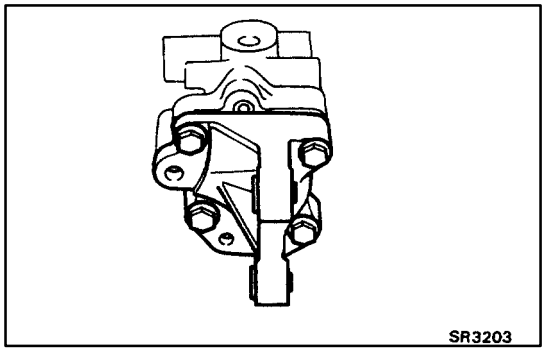
4. INSTALL WAVE WASHER

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

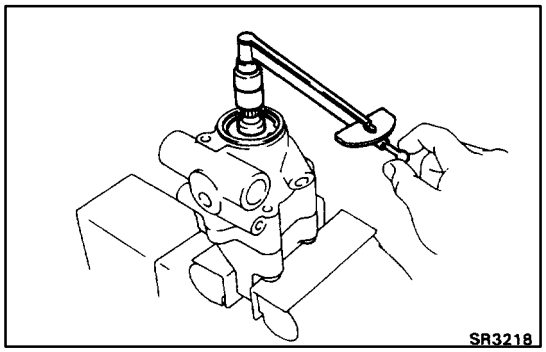


5. INSTALL REAR BRACKET

(a) Coat a new O–ring with power steering fluid and install to the rear bracket.

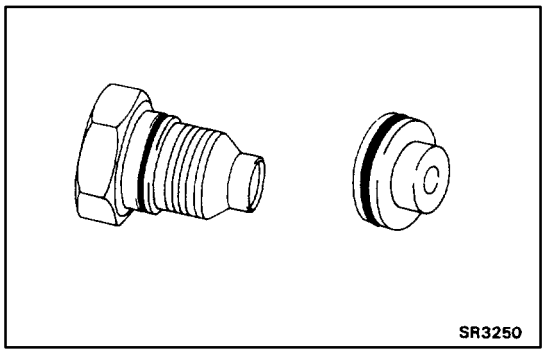


(b) Install the rear bracket and tighten the four bolts.
Torque: 400 kg–cm (29 ft–lb, 39 N·m)



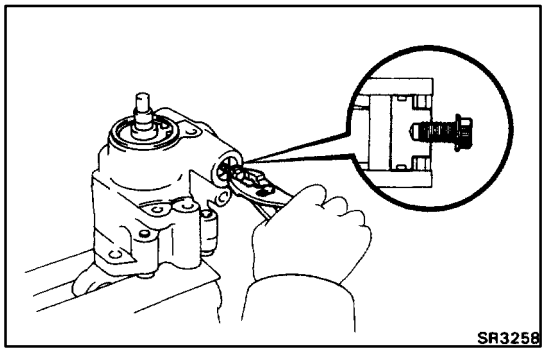
6. MEASURE PUMP SHAFT PRELOAD

(a) Check that the shaft rotates smoothly without abnormal noise.
(b) Temporarily install the pulley nut and check the rotating torque.
Rotating torque: 1.0 kg–cm (0.9 in.–lb, 0.1 N·m) or less

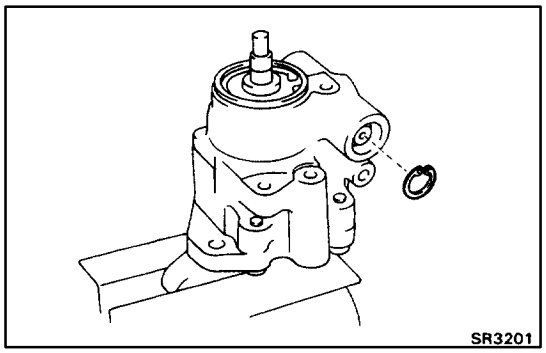


7. INSTALL FLOW CONTROL VALVE, SPRING, SPRING SEAT AND PRESSURE PORT UNION

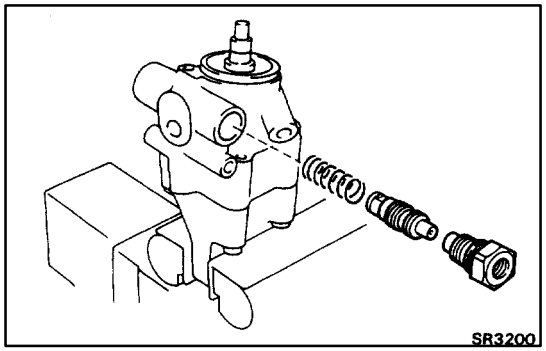
(a) Coat new O–rings with power steering fluid and install them to the spring seat and pressure port union.
HINT: Install a thick O–ring to the spring seat and a thin O–ring to the pressure port union.



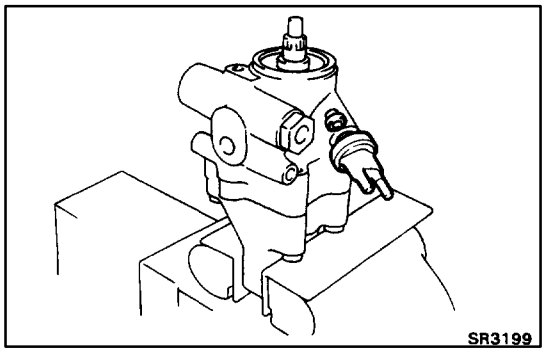
(b) Insert the spring seat with the bolt hole facing outward.



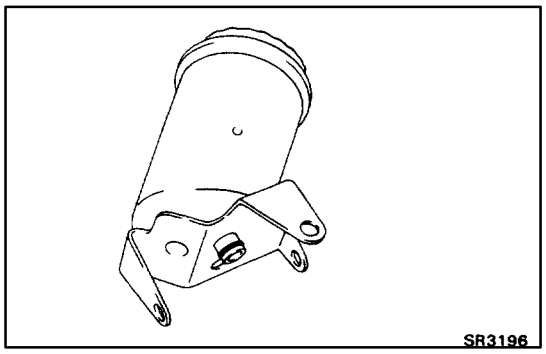
(c) Using snap ring pliers, install the snap ring.



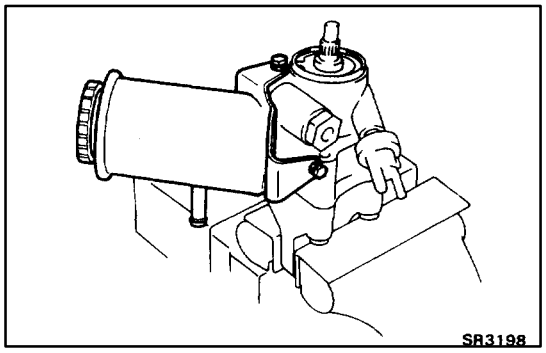
(d) Install spring and valve to the housing.
(e) Install and torque the pressure port union.
Torque: 700 kg–cm (51 ft–lb, 69 N·m)



8. INSTALL AIR CONTROL VALVE
Torque: 370 kg–cm (27 ft–lb, 36 N·m)



9. INSTALL RESERVOIR TANK
(a) Coat a new O–ring with power steering fluid and install it to the reservoir tank.



(b) Install the reservoir tank with the three bolts.
Torque: 130 kg–cm (9 ft–lb, 13 N·m)