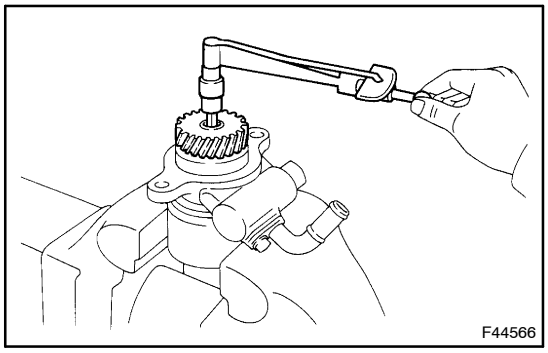
VANE PUMP ASSY (15B–FTE)

OVERHAUL

510CJ–01



1. INSPECT VANE PUMP ROTATING TORQUE

(a) Check that the smoothly vane pump rotates without abnormal noise.

(b) Using a torque wrench, check the pump rotating torque.
Rotating torque:
0.27 N·m (2.75 kgf·cm, 2.39 in.·lbf) or less

2. REMOVE POWER STEERING SUCTION PORT UNION

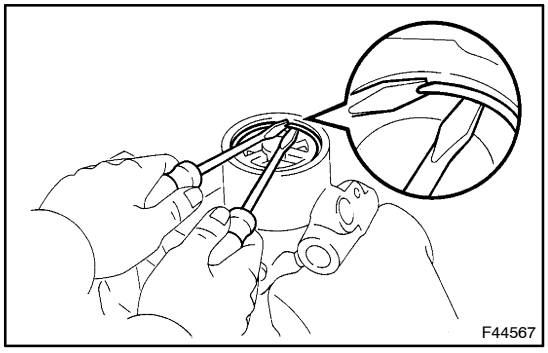
(a) Remove the bolt and disconnect the suction port union.

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

3. REMOVE FLOW CONTROL VALVE

(a) Remove the control valve orifice, flow control valve and spring.

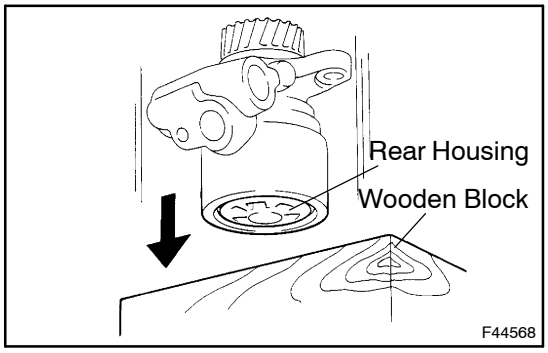
(b) Remove the O–ring from the control valve orifice.



4. REMOVE VANE PUMP HOUSING REAR

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

NOTICE:
Take care not to damage the housing.



(b) Gently tap the PS pump assy on a wood block and remove the rear housing.

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

5. REMOVE VANE PUMP CAM RING

6. REMOVE VANE PUMP ROTOR

7. REMOVE VANE PLATES

8. REMOVE STRAIGHT PIN

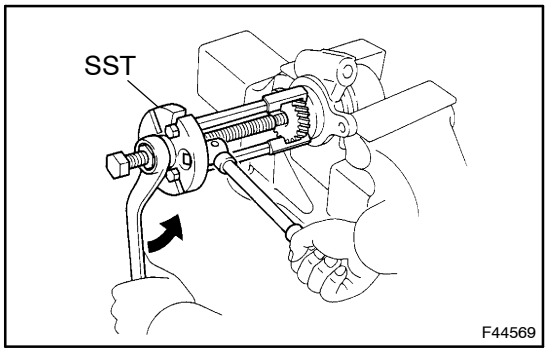
9. REMOVE SIDE PLATE AND WAVE WASHER

(a) Remove the 2 wave washers.

(b) Remove the 2 O–rings from the side plate.

NOTICE:

Be careful not to scratch the side plate.



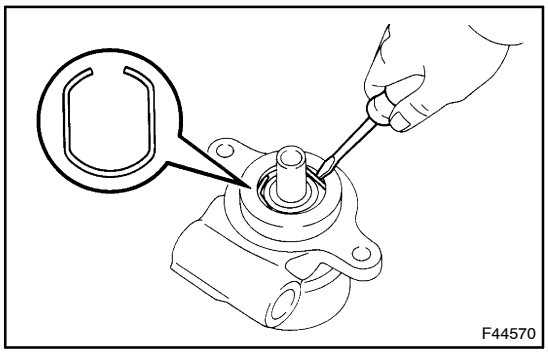
10. REMOVE VANE PUMP GEAR

(a) Using SST, pull out the gear.

SST 09950–30012 (09951–03010, 09953–03010, 09954–03010, 09955–03020)

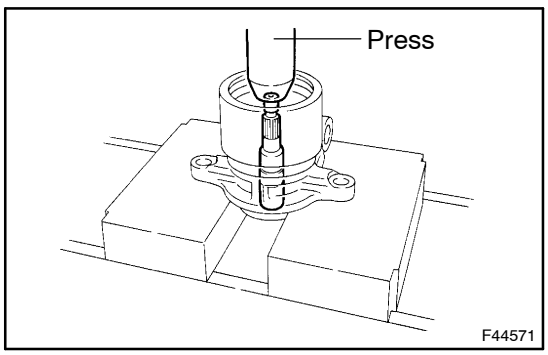
NOTICE:

Be careful not to damage the gear.

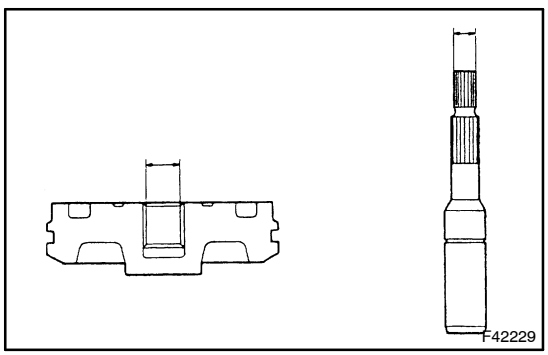


11. REMOVE VANE PUMP SHAFT WITH BEARING

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



(b) Using a press, out the shaft together with the bearing.



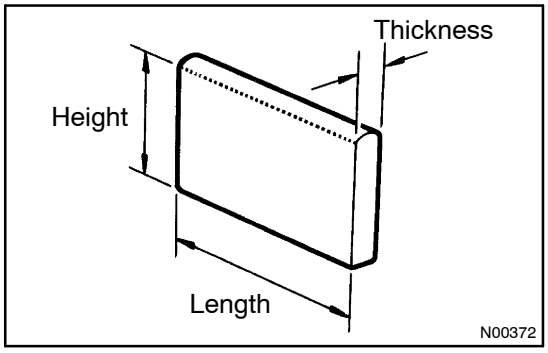
12. INSPECT OIL CLEARANCE

(a) Using a micrometer and caliper gauge, measure the oil clearance.

Oil Clearance:

Standard	0.020 – 0.087 mm (0.00079 – 0.00343 in.)
Maximum	0.087 mm (0.00343 in.)

If the result is greater than the maximum, replace the rear housing and vane pump shaft.



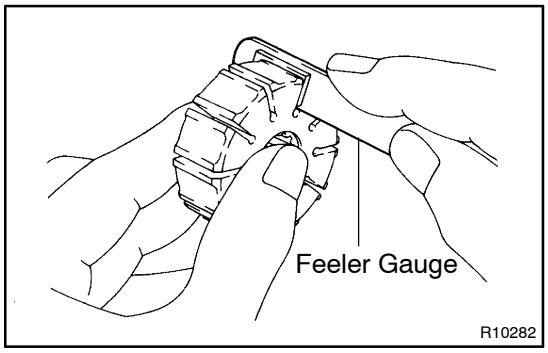
13. INSPECT VANE PUMP ROTOR AND VANE PLATES

(a) Using a micrometer, measure the dimensions of the plates.

Minimum dimension:

Height	8.6 mm (0.339 in.)
Thickness	1.397 mm (0.0550 in.)
Length	14.991 mm (0.5902 in.)

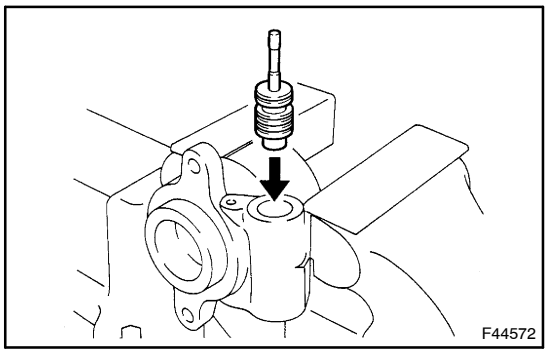
If the result is not as specified, replace the rotor and vane plates together with the cam ring.



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

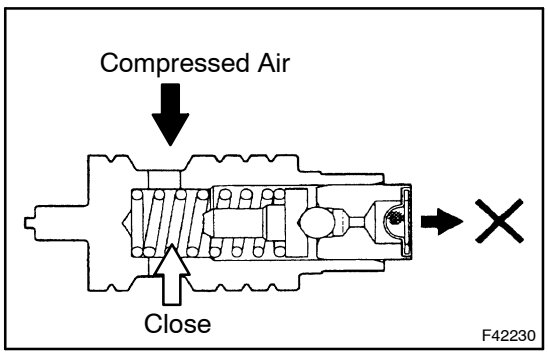
Maximum clearance: 0.03 mm (0.0012 in.)

If the result is greater than the maximum, replace the rotor and vane plates together with the cam ring.



14. INSPECT FLOW CONTROL VALVE

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

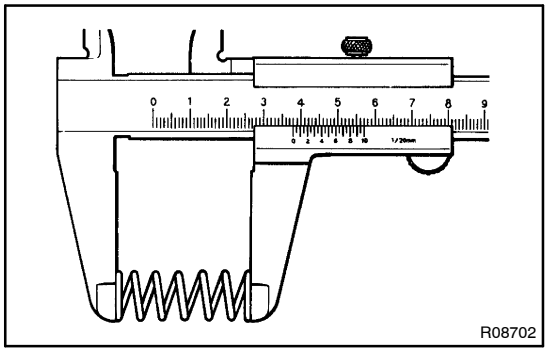


(b) Check the valve for leakage. Close one of the side holes and apply compressed air 392 – 490 kPa (4 – 5 kgf/cm^2, 57 – 71 psi) from another side hole, and confirm that no air comes out from the end hole.

15. INSPECT VANE PUMP CAM RING

(a) Check that the bearing is not rough or worn.

If necessary, replace the bearing.

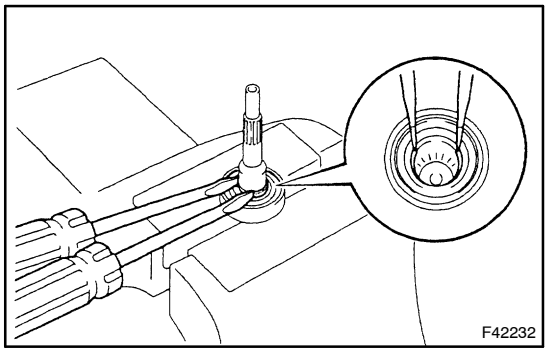


16. INSPECT FLOW CONTROL VALVE COMPRESSION SPRING

(a) Using calipers, measure the free length of the spring.

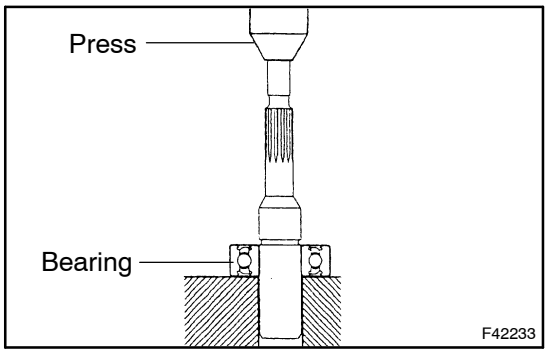
Minimum free length: 33.4 mm (1.315 in.)

If the result is less than the minimum, replace the spring.



17. REPLACE VANE PUMP SHAFT BEARING

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

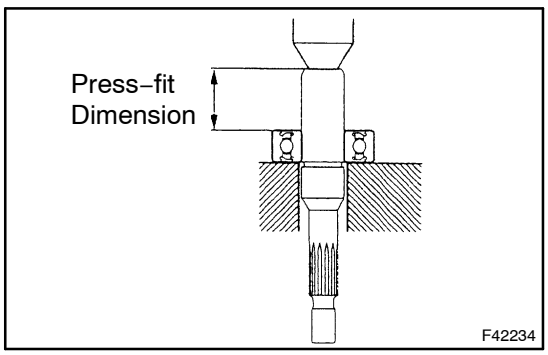


(b) Using a press, press out the bearing.

NOTICE:

Be careful not to damage the shaft.

(c) Coat a new bearing with power steering fluid.

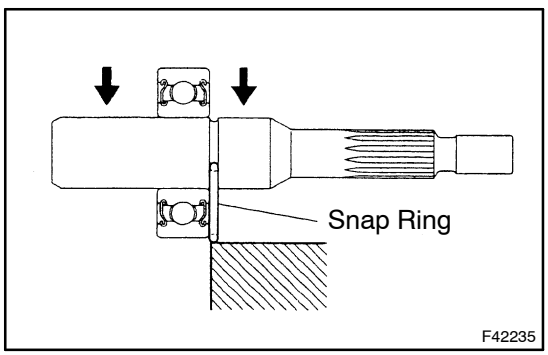


(d) Using a press, press–fit the bearing with the black side of the oil seal onto the shaft until the specified press–fit dimension is achieved.

Press–fit dimension: 21.4 – 21.7 mm (0.84. – 0.854 in.)

NOTICE:

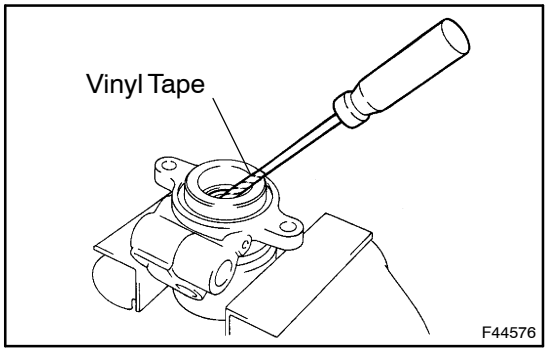
- **Be careful not to damage the shaft.**
- **Apply a work bench to the inner race of the bearing.**



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

NOTICE:

Be careful not to damage the shaft.



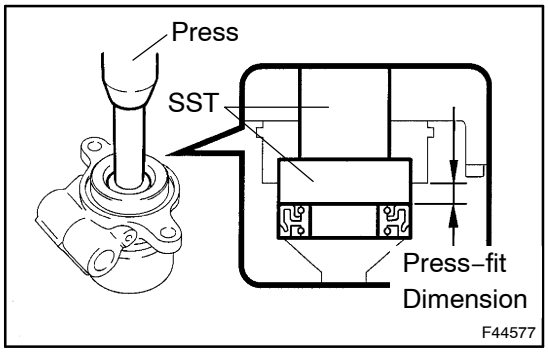
18. REPLACE VANE PUMP HOUSING OIL SEAL

(a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal from the front housing.

NOTICE:

Be careful not to damage the front housing.

(b) Coat a new oil seal lip with power steering fluid.



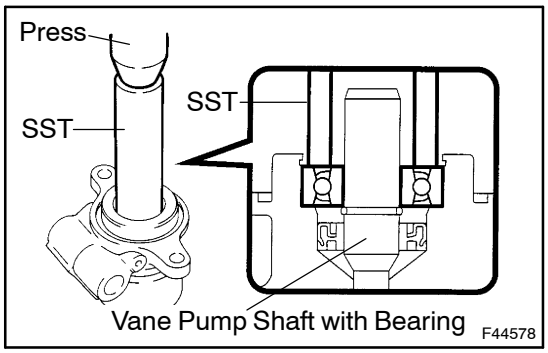
(c) Using SST, press–fit in the oil seal, as shown in the illustration.

SST 09950–60010 (09951–00300), 09950–70010 (09951–07100)

Press–fit dimension: 3.6 – 3.9 mm (0.142 – 0.154 in.)

NOTICE:

Make sure to install the oil seal so that it faces to the correct direction.



19. INSTALL VANE PUMP SHAFT WITH BEARING

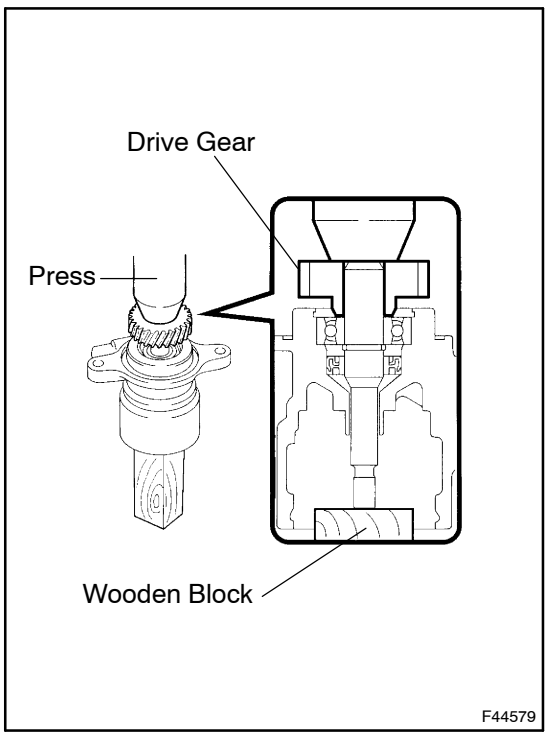
(a) Using SST and a press, press in the shaft with the bearing.

SST 09612–22011

NOTICE:

Be careful not to damage the oil seal lip.

(b) Install a new snap ring.



20. INSTALL VANE PUMP GEAR

(a) Supporting the vane pump shaft end with a wood block, press in the drive gear to the shaft, as shown in the illustration.

NOTICE:

Press in the drive gear until its top surface becomes on a level with the top of the pump shaft.

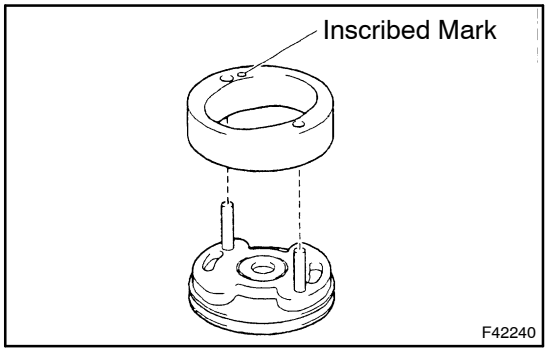
21. INSTALL SIDE PLATE AND WAVE WASHER

(a) Coat 2 new O–rings with power steering fluid and install them to the side plate.

(b) Install 2 new wave washers.

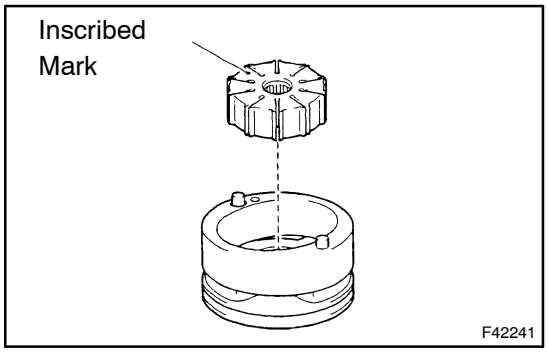
22. INSTALL STRAIGHT PIN

(a) Install 2 new straight pins to the rear housing.



23. INSTALL VANE PUMP CAM RING

(a) Install the cam ring with the inscribed marks facing upward.



24. INSTALL VANE PUMP ROTOR

(a) Install the vane pump rotor with the inscribed marks facing upward.

25. INSTALL VANE PLATES

26. INSTALL VANE PUMP HOUSING REAR

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

(b) Install a new snap ring.

27. INSTALL FLOW CONTROL VALVE

(a) Install the spring.

(b) Install the flow control valve so that it faces to the correct direction.

(c) Coat a new O–ring with power steering fluid and install it to the pressure port union.

(d) Install the flow control valve orifice.
Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

28. MEASURE PS VANE PUMP ROTATION TORQUE