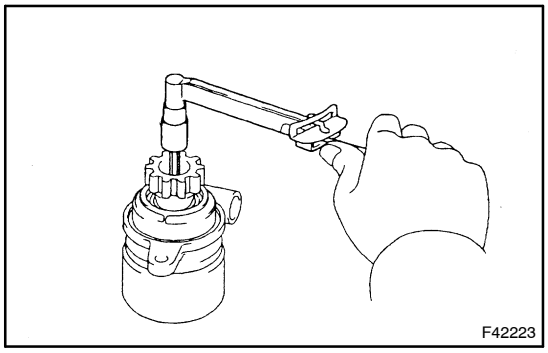
510CP–01

OVERHAUL



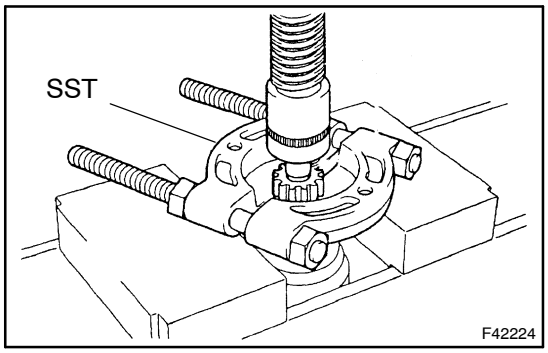
1. MEASURE PS VANE PUMP ROTATION TORQUE

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

(b) Using a torque wrench and a 8 mm hexagon wrench, check the pump rotating torque.

Rotating torque:

0.27 N·m (2.75 kgf·cm, 2.39 in.·lbf) or less



2. REMOVE VANE PUMP GEAR

(a) Using SST, a 10 mm deep socket wrench and a press, press out the vane pump gear.

SST 09950–00020

3. REMOVE FLOW CONTROL VALVE

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

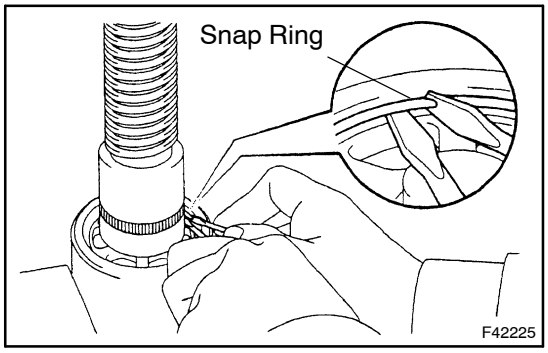
(b) Remove the O–ring from the control valve orifice.

4. REMOVE VANE PUMP HOUSING REAR

(a) Using a press, lightly push in the rear housing.

NOTICE:

The push–in amount should be washer, however it should not be more than that.

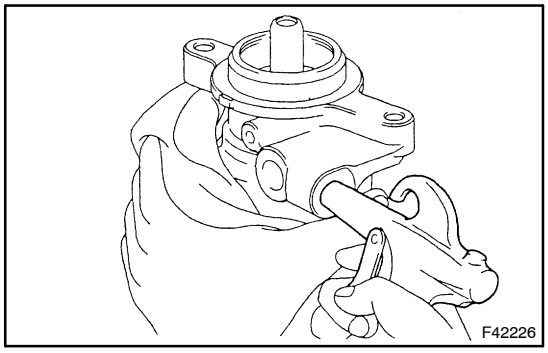


(b) Using 2 screwdrivers, pry out the snap ring.

NOTICE:

Take care not to damage the housing.

(c) Temporarily install the flow control valve orifice.



(d) Close the opening of the suction port union with your finger, use an air gun to apply air pressure from the opening of the pressure feed hose, and remove the rear housing.

NOTICE:

Cover the pump assembly with rags beforehand to prevent oil from flowing out.

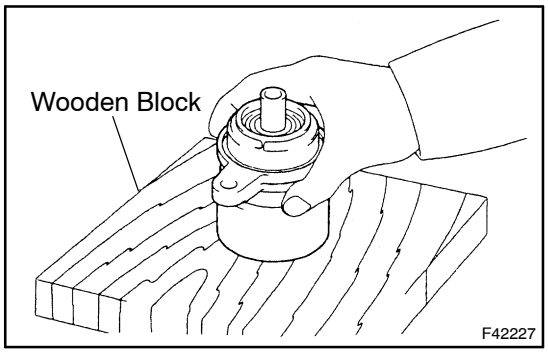
(e) Remove the O–ring from the housing.

5. REMOVE VANE PUMP CAM RING

6. REMOVE VANE PUMP ROTOR

7. REMOVE VANE PLATES

8. REMOVE STRAIGHT PIN



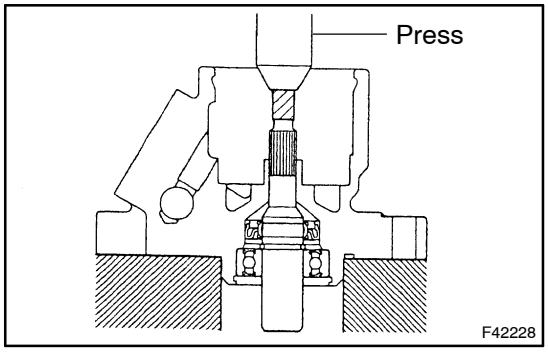
9. REMOVE SIDE PLATE AND WAVE WASHER

(a) Gently tap the vane pump assy on a wooden block and remove the side plate.

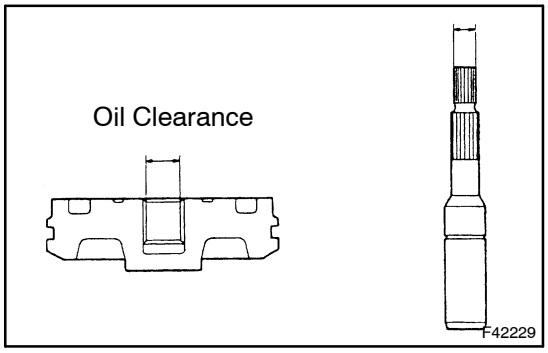
(b) Remove the 2 O–rings from the side plate.

10. REMOVE VANE PUMP SHAFT WITH BEARING

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



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



11. INSPECT OIL CLEARANCE

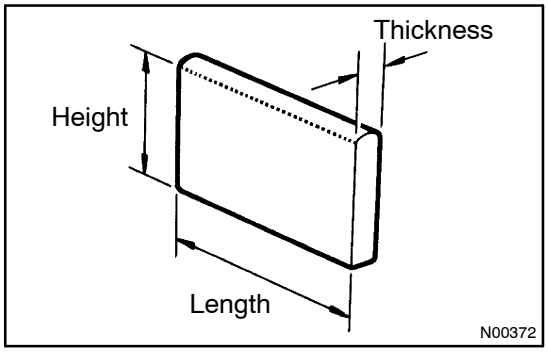
(a) Using a micrometer and caliper gauge, measure the oil clearance.

Standard clearance:

0.020 – 0.087 mm (0.00079 – 0.00343 in.)

Maximum clearance: 0.087 mm (0.00343 in.)

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



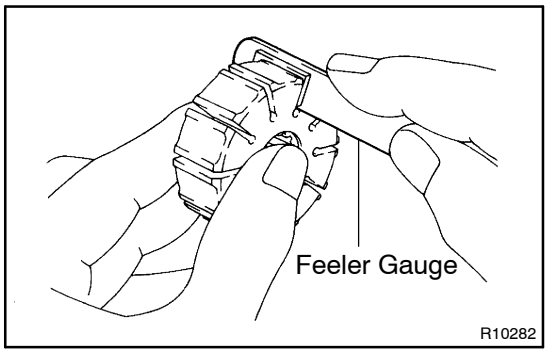
12. INSPECT VANE PUMP ROTOR AND VANE PLATES

(a) Using a micrometer, measure the dimensions.

Minimum dimension:

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

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



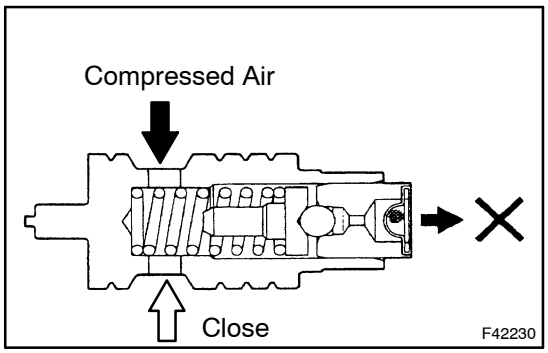
(b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

Maximum clearance: 0.03 mm (0.0012 in.)

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

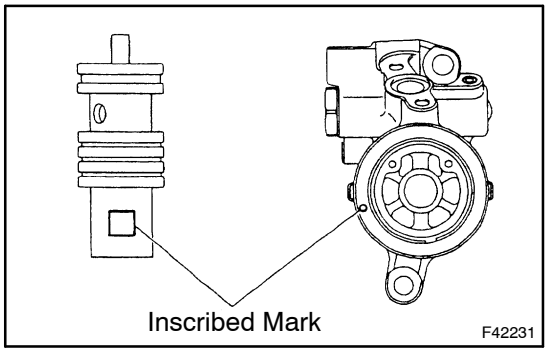
13. INSPECT FLOW CONTROL VALVE

(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.

(1) Close one of the side holes and apply compressed air of 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.



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

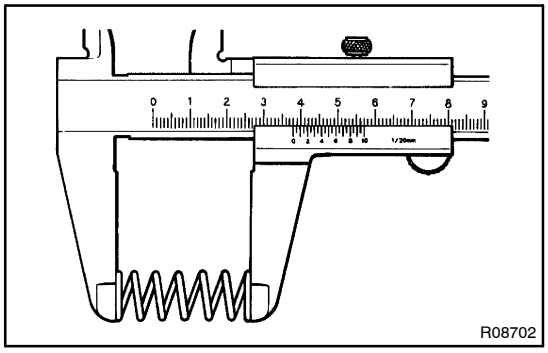
Inscribed mark:

Mark	Part No.
A	40430–37060
B	40420–37060
C	40410–37060
D	44330–37060

14. INSPECT VANE PUMP CAM RING

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

If necessary, replace the bearing.

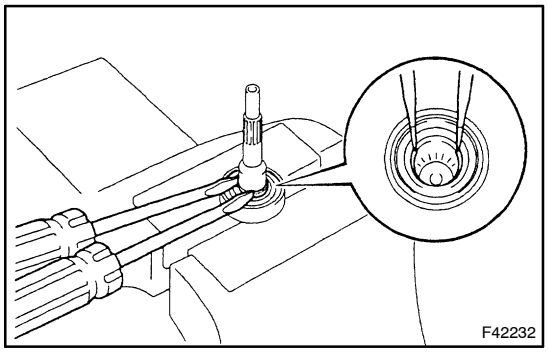


15. INSPECT FLOW CONTROL VALVE COMPRESSION SPRING

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

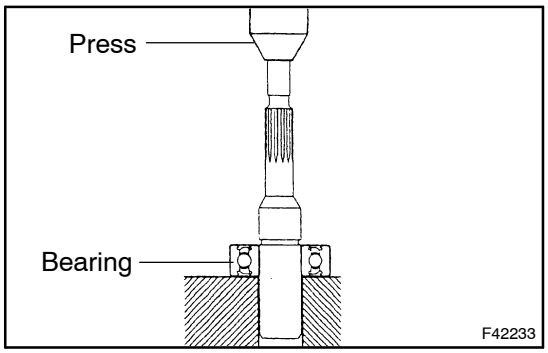
Minimum free length: 33.4 mm (1.315 in.)

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



16. REPLACE VANE PUMP SHAFT BEARING

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

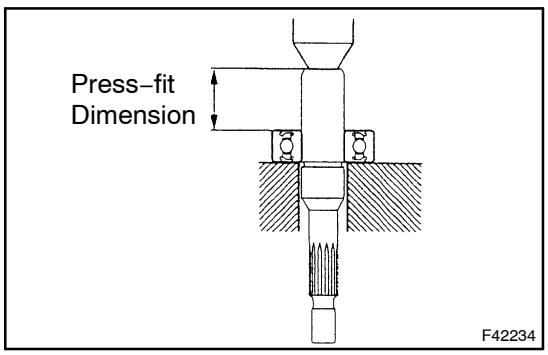


(b) Using a press, press out the bearing.

NOTICE:

Be careful not to damage the shaft.

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

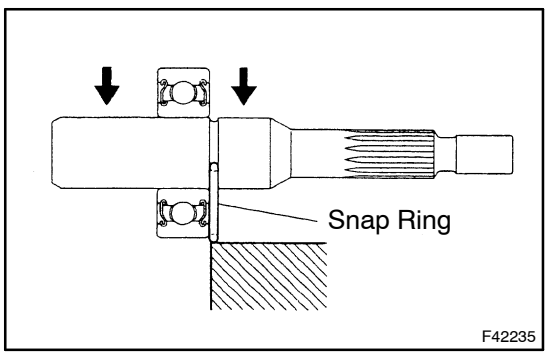


(d) Using a press, press–fit the bearing with the black side of the oil seal onto the shaft until the specified press–fit dimension is achieved.

Press–fit dimension: 21.4 – 21.7 mm (0.843 – 0.854 in.)

NOTICE:

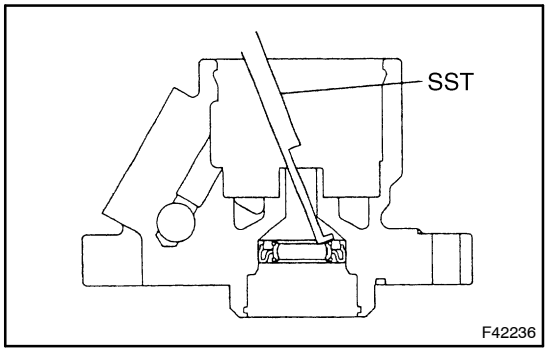
Be careful not to damage the shaft.



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

NOTICE:

Be careful not to damage the shaft.



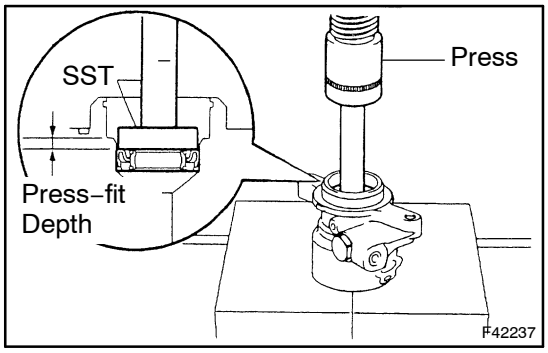
17. REPLACE VANE PUMP HOUSING OIL SEAL

(a) Using SST and a hammer, tap out the oil seal.
SST 09631–10030

NOTICE:

Be careful not to damage the vane pump housing.

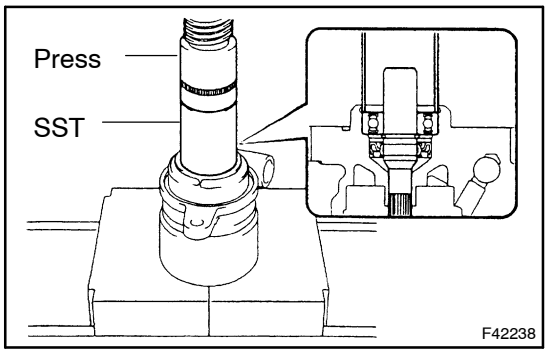
(b) Coat a new oil seal lip with power steering fluid.



(c) Using SST and a press, press in a new oil seal to the specified press–fit depth.
SST 09950–60010 (09951–00300), 09950–70010 (09951–07100, 09951–00320)
Press–fit depth: 3.6 – 3.9 mm (0.142 – 0.154 in.)

NOTICE:

Make sure that the oil seal faces to the correct direction.



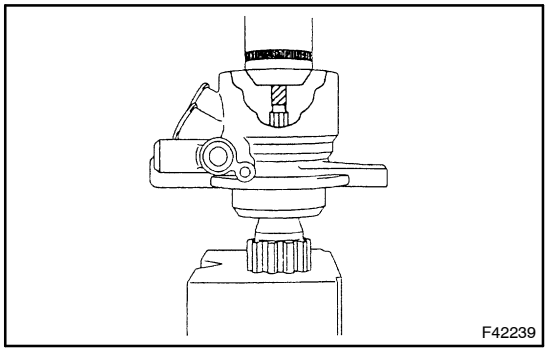
18. INSTALL VANE PUMP SHAFT WITH BEARING

(a) Using SST and a press, press in the shaft with the bearing.
SST 09632–36010

NOTICE:

Be careful not to damage the oil seal lip.

(b) Install a new snap ring.



19. INSTALL VANE PUMP GEAR

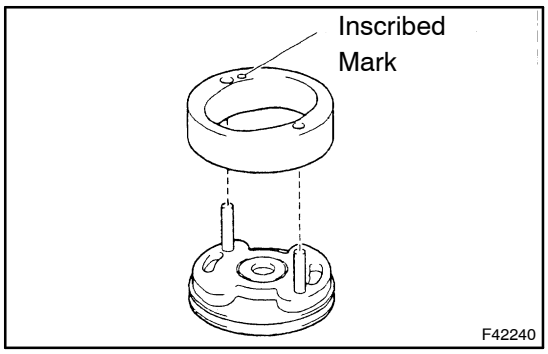
(a) Using a press, press in the vane pump gear.

NOTICE:

Take care not to incline the shaft.

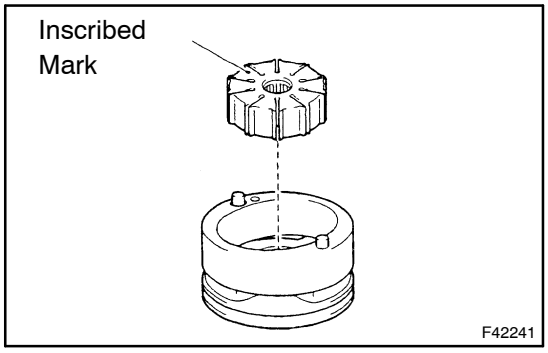
20. INSTALL STRAIGHT PIN

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



21. INSTALL VANE PUMP CAM RING

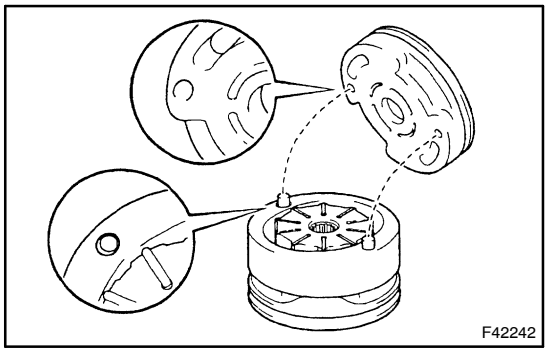
(a) Install the cam ring with the inscribed marks facing upward.



22. INSTALL VANE PUMP ROTOR

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

23. INSTALL VANE PLATES



24. INSTALL SIDE PLATE AND WAVE WASHER

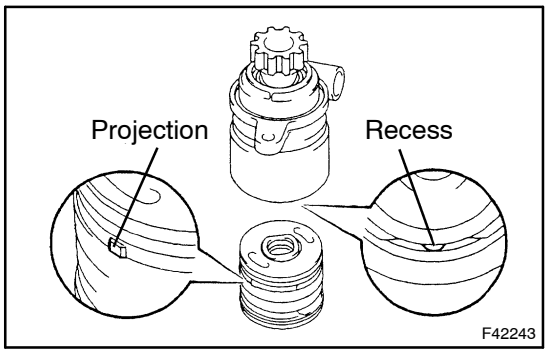
(a) Coat 2 new O–rings with power steering fluid and install them to the side plate.

(b) Align the holes of the side plate and 2 straight pins.

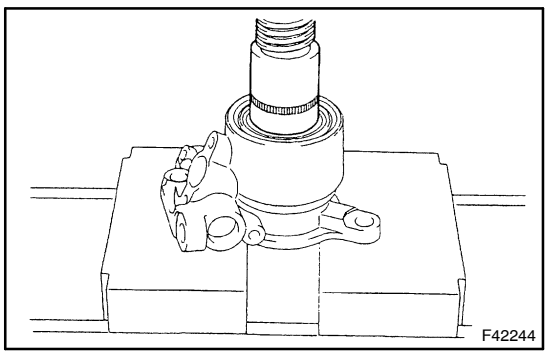
(c) Place the 2 new wave washers onto the recess of in the side plate.

25. INSTALL VANE PUMP HOUSING REAR

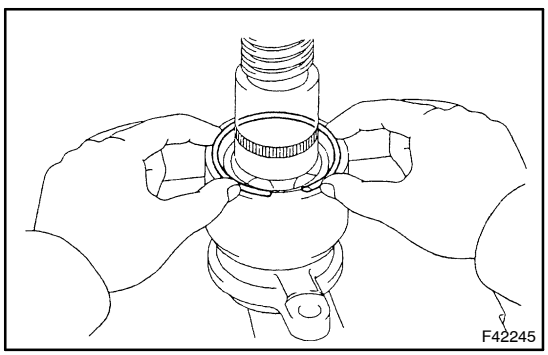
(a) Coat a new O–ring with power steering fluid and install it to the rear housing.



(b) Align the projection of the side plate with the recess of the pump housing.



(c) Using a press, press in the rear housing to the pump housing.



(d) Using a press, press in the rear housing so that a new snap ring can be installed.

NOTICE:

The push–in amount should be washer, however it should not be more than that.

(e) Install a new snap ring.

26. 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.

27. MEASURE PS VANE PUMP ROTATION TORQUE

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