510K7–01

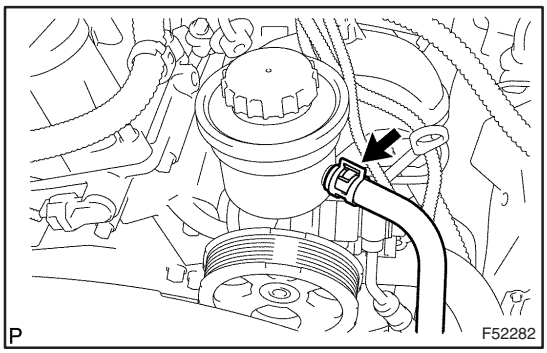
OVERHAUL

NOTICE:

- **When using a vise, do not overtighten it.**
- **When installing the parts indicated by arrows, coat them with power steering fluid (see page 51–7).**

1. DRAIN POWER STEERING FLUID

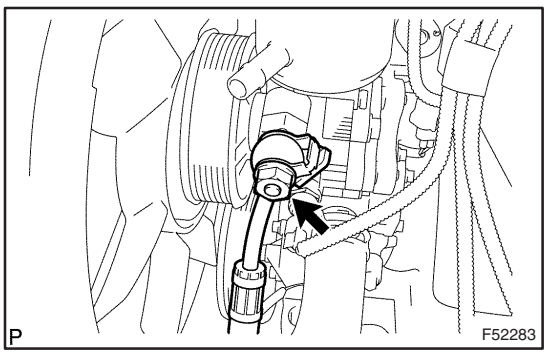
2. REMOVE FAN AND GENERATOR V BELT (SEE PAGE 14–9)



3. DISCONNECT RETURN HOSE

(a) Using pliers, grip the claws of the clip and slide the clip.

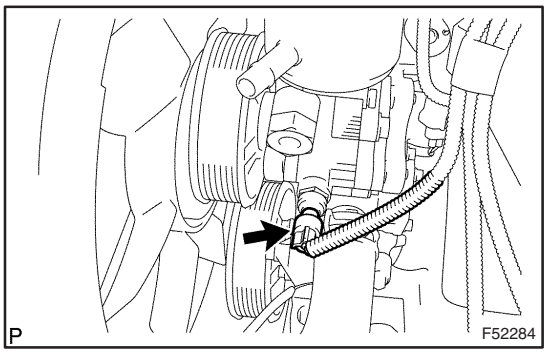
(b) Disconnect the return hose from the reservoir.



4. DISCONNECT PRESSURE FEED TUBE ASSY

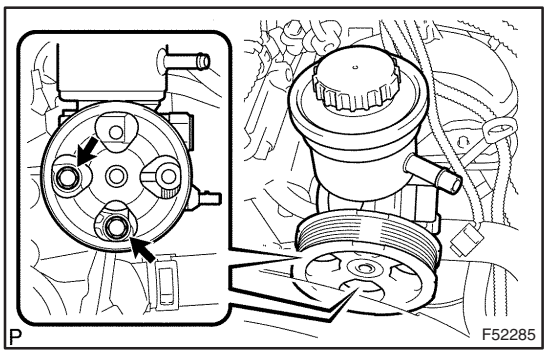
(a) Remove the union bolt and disconnect the pressure feed tube from the vane pump assy.

(b) Remove the gasket from the pressure feed tube assy.



5. REMOVE VANE PUMP ASSY

(a) Disconnect the oil pressure switch connector.



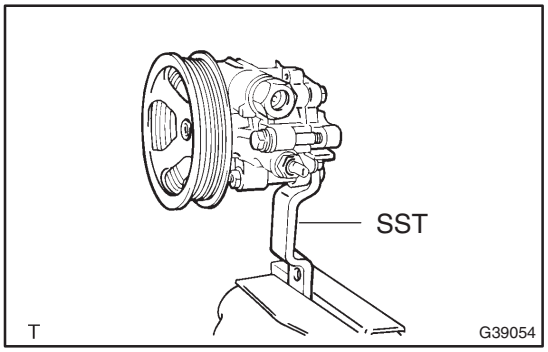
(b) Remove the 2 bolts and vane pump assy.

6. REMOVE VANE PUMP OIL RESERVOIR CAP SUB–ASSY

7. REMOVE VANE PUMP OIL RESERVOIR SUB–ASSY

(a) Remove the 3 bolts and reservoir from the vane pump housing front.

(b) Using a screwdriver, remove the O–ring from the reservoir.

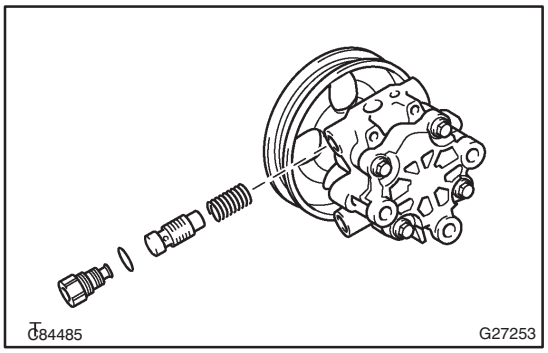


8. FIX VANE PUMP ASSY

(a) Using SST, hold the vane pump assy in a vise.
SST 09630–00014 (09631–00132)

HINT:

Detach SST depending on the situation.



9. REMOVE FLOW CONTROL VALVE

(a) Using a socket wrench (27 mm), remove the pressure port union from the vane pump housing front.

(b) Using a screwdriver, remove the O–ring from the pressure port union.

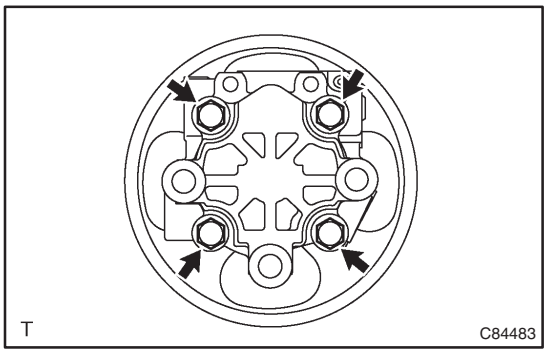
NOTICE:

Be careful not to damage the pressure port union.

(c) Remove the flow control valve and compression spring from the vane pump housing front.

10. REMOVE POWER STEERING OIL PRESSURE SWITCH

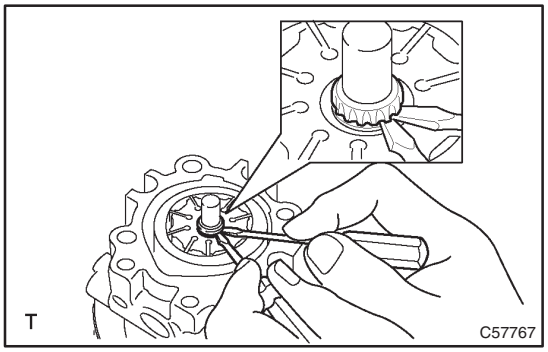
(a) Remove the pressure switch from the vane pump housing front.



11. REMOVE VANE PUMP HOUSING REAR

(a) Remove the 4 bolts and vane pump housing rear from the vane pump housing front.

(b) Remove the O–ring from the vane pump housing rear.



12. REMOVE SHAFT SUB–ASSY W/PULLEY

(a) Using 2 screwdrivers, remove the snap ring from the shaft sub–assy w/ pulley.

(b) Remove the shaft sub–assy w/ pulley from the vane pump housing front.

NOTICE:

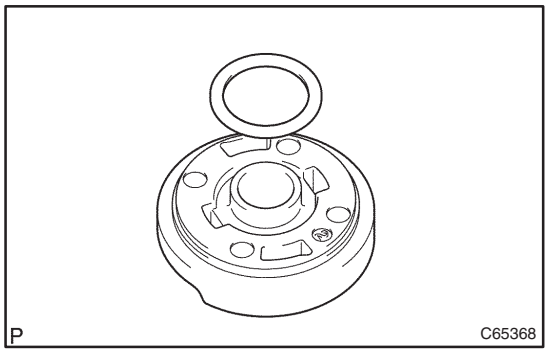
If removing the shaft sub–assy w/ pulley, replace the vane pump housing oil seal.

13. REMOVE VANE PUMP ROTOR

(a) Remove the 10 vane pump plates.

(b) Remove the vane pump rotor.

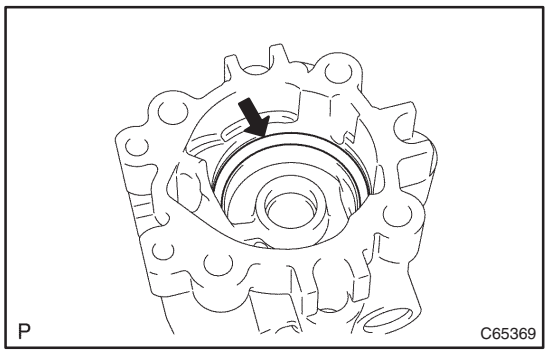
14. REMOVE VANE PUMP CAM RING



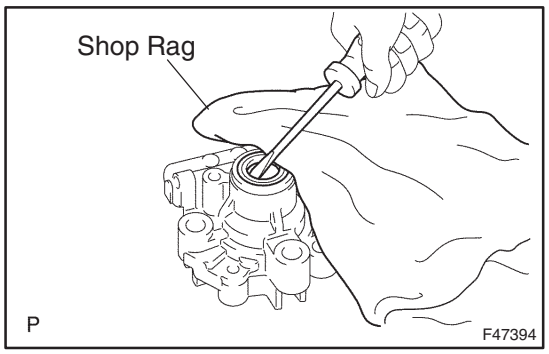
15. REMOVE VANE PUMP SIDE PLATE FRONT

(a) Remove the vane pump side plate front from the vane pump housing front.

(b) Remove the O–ring from the vane pump side plate front.



(c) Remove the O–ring from the vane pump housing front.

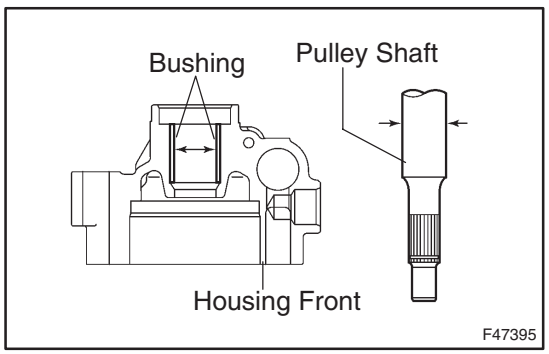


16. REMOVE VANE PUMP HOUSING OIL SEAL

(a) Using a screwdriver and shop rag, remove the vane pump housing oil seal.

NOTICE:

Be careful not to damage the vane pump housing front.



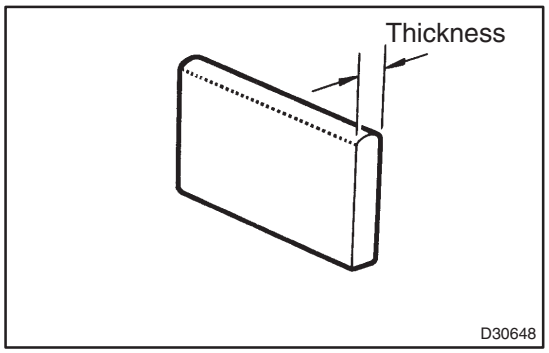
17. INSPECT VANE PUMP SHAFT AND BUSHING IN HOUSING FRONT

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

Maximum clearance: Less than 0.07 mm (0.0028 in.)

If the bushing or shaft is damaged, replace the vane pump assy.

If the fluid clearance exceeds the standard, replace the vane pump assy.



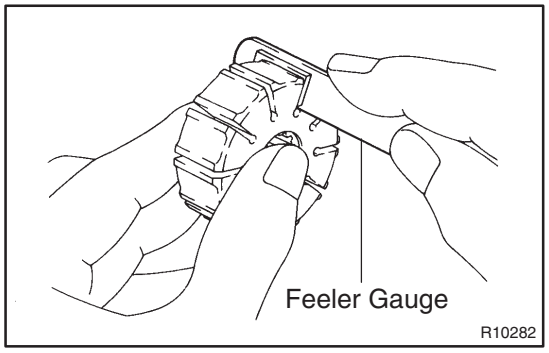
18. INSPECT VANE PUMP ROTOR AND VANE PUMP PLATE

(a) Using a micrometer, measure the thickness of the vane pump plates.

Standard thickness:

1.405 to 1.411 mm (0.05531 to 0.05555 in.)

If the thickness is less than the standard, replace the vane pump assy.



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

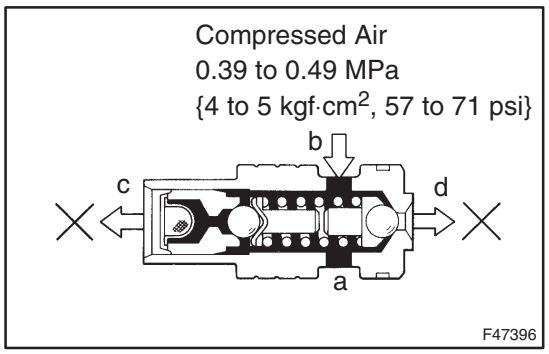
Maximum clearance: 0.03 mm (0.0012 in.)

If the clearance exceeds the maximum, replace the vane pump assy.

19. INSPECT FLOW CONTROL VALVE

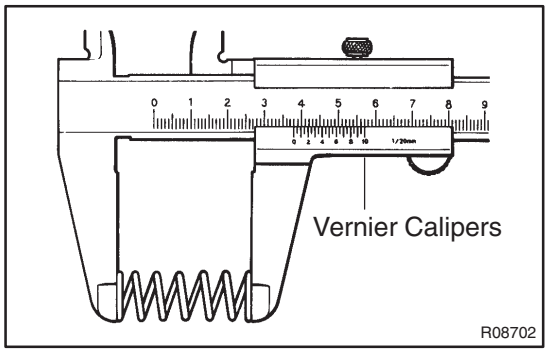
(a) Coat the flow control valve with power steering fluid and check that it falls smoothly into the flow control valve hole under its own weight.

If it lacks smoothness, replace the vane pump assy.



(b) Check the flow control valve for leakage. Close hole 'a' and apply compressed air into hole 'b'. Confirm that air does not come out from hole 'c' and/or 'd'.

If air leaks from hole 'c' and/or 'd', replace the vane pump assy.



20. INSPECT FLOW CONTROL VALVE COMPRESSION SPRING

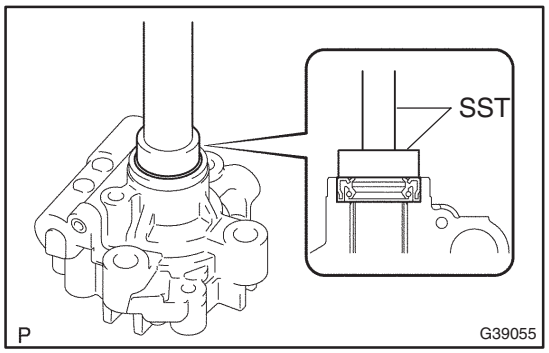
(a) Using vernier calipers, measure the free length of the compression spring.

Minimum free length: 29.2 mm (1.15 in.)

If the free length is less than the minimum, replace the vane pump assy.

21. INSPECT PRESSURE PORT UNION

If the union seat in the pressure port union is severely damaged, it may cause fluid leakage. In that case, replace the vane pump assy.



22. INSTALL VANE PUMP HOUSING OIL SEAL

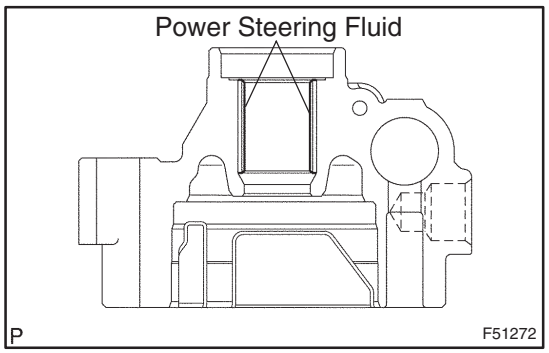
(a) Coat a new vane pump housing oil seal lip with power steering fluid.

(b) Using SST and a press, install the vane pump housing oil seal.

SST 09950–60010 (09951–00280), 09950–70010 (09951–07100)

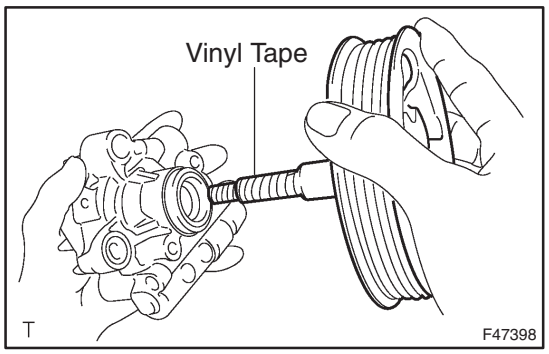
NOTICE:

Be careful not to damage the vane pump housing oil seal.
Install the vane pump housing oil seal in the correct direction.



23. INSTALL SHAFT SUB–ASSY W/PULLEY

(a) Coat the bushing surface of the vane pump housing front with power steering fluid.



(b) Gradually insert the shaft sub–assy w/ pulley.

NOTICE:

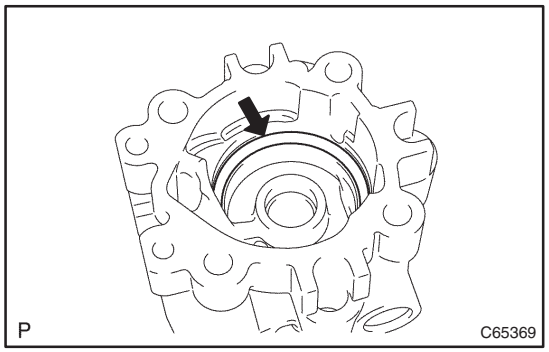
Be careful not to damage the vane pump housing oil seal lip.

HINT:

Wrap the shaft surface with vinyl tape before inserting.

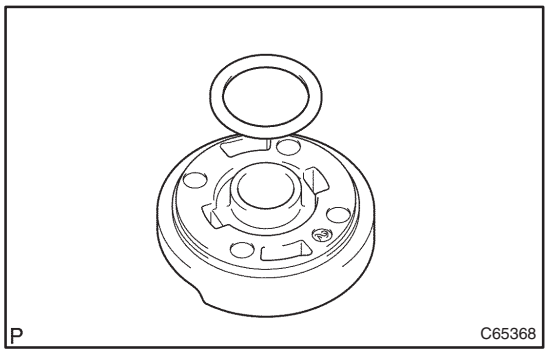
NOTICE:

After installing the shaft sub–assy w/ pulley, make sure that the vane pump housing oil seal lip is not damaged.

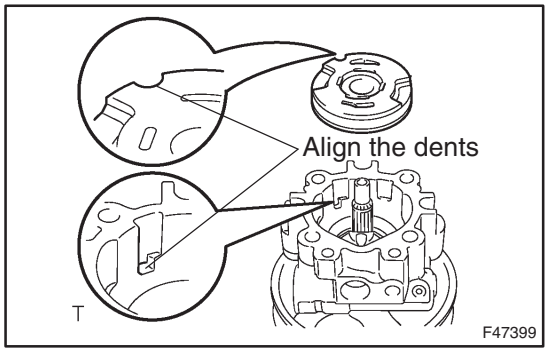


24. INSTALL VANE PUMP SIDE PLATE FRONT

(a) Coat a new O–ring (bigger one) with power steering fluid and install it to the vane pump housing front.



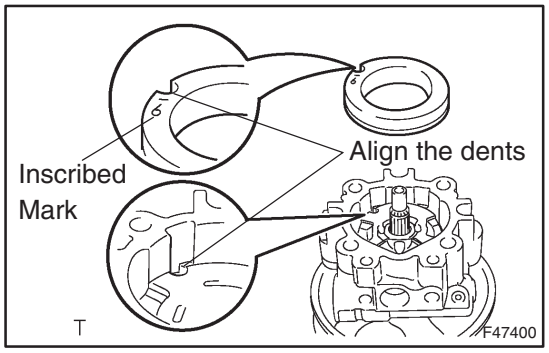
(b) Coat a new O–ring (smaller one) with power steering fluid and install it to the vane pump side plate front.



(c) Align the dent of the vane pump side plate front with that of the vane pump housing front to install.

NOTICE:

Make sure that the vane pump side plate front is installed in the correct direction.

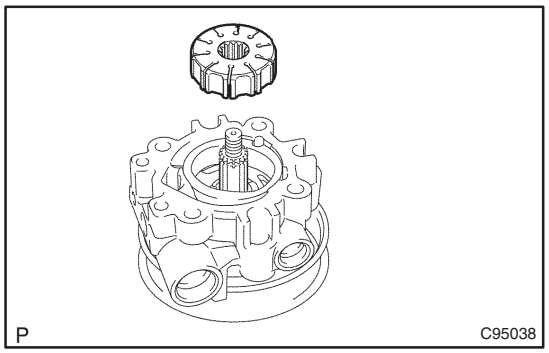


25. INSTALL VANE PUMP CAM RING

(a) Align the dent of the vane pump cam ring with that of the vane pump side plate front. Install the vane pump cam ring with the inscribed mark facing upward (the vane pump housing rear side).

NOTICE:

Make sure that the vane pump cam ring is installed in the correct direction.

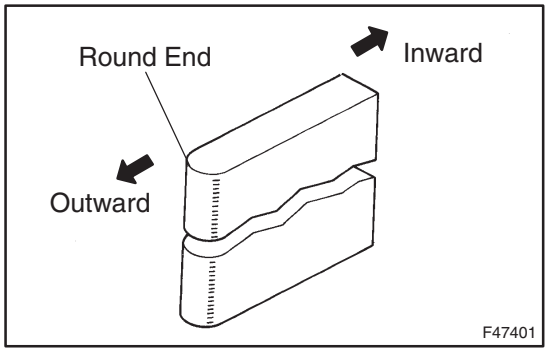


26. INSTALL VANE PUMP ROTOR

(a) Install the vane pump rotor to the vane pump housing front.

HINT:

The vane pump rotor has no specific direction.

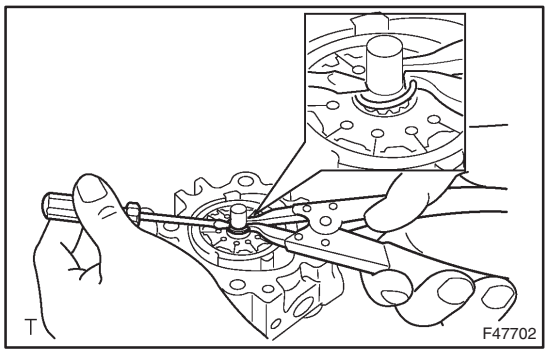


(b) Coat 10 vane pump plates with power steering fluid.

(c) Install the vane pump plates.

NOTICE:

Make sure that the round ends of the vane pump plates are facing outward.

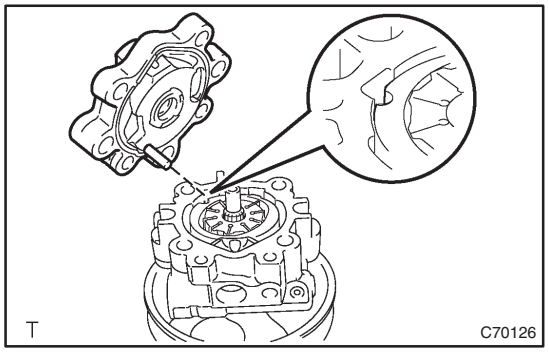


27. INSTALL VANE PUMP SHAFT SNAP RING

(a) Using a screwdriver and a snap ring expander, install a new snap ring to the shaft sub–assy w/ pulley.

NOTICE:

- **Do not overly expand the snap ring.**
- **Do not damage the vane pump rotor and shaft sub–assy w/ pulley.**
- **Make sure that the snap ring fits in the groove on the shaft sub–assy w/ pulley.**



28. INSTALL VANE PUMP HOUSING REAR

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

(b) Align the straight pin of the vane pump housing rear with the dents of the vane pump cam ring and vane pump side plate front.

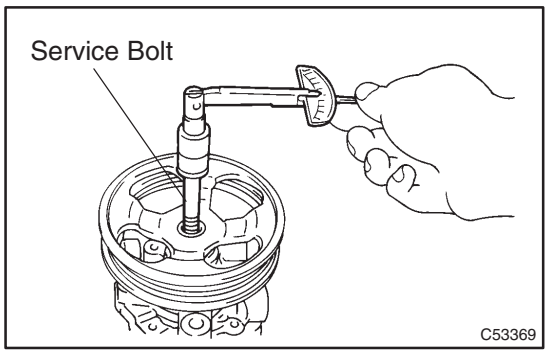
(c) Install the vane pump housing rear to the vane pump housing front.

(d) Tighten the 4 bolts.

Torque: 22 N·m (224 kgf·cm, 16 ft·lbf)

NOTICE:

Check that the O–ring is in the correct position before tightening the 4 bolts.



29. INSPECT PRELOAD

(a) Hold the vane pump assy in a vise.

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

(c) Temporarily install the service bolt.

Recommend service bolt:
Thread diameter: 10 mm (0.39 in.)
Thread pitch: 1.25 mm (0.0492 in.)
Bolt length: 50 mm (1.97 in.)

(d) Using a torque wrench, check the pump rotating torque.

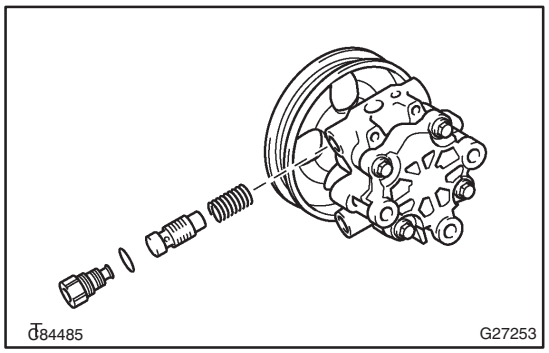
Rotating torque:
0.27 N·m (2.8 kgf·cm, 2.4 in.·lbf) or less

If the rotating torque is not as specified above, check the installation of the vane pump housing oil seal.

30. INSTALL POWER STEERING OIL PRESSURE SWITCH

(a) Install the pressure switch to the vane pump housing front.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



31. INSTALL FLOW CONTROL VALVE

(a) Install the compression spring.

(b) Coat the flow control valve with power steering fluid.

(c) Install the flow control valve.

NOTICE:

Make sure that the flow control valve is installed in the correct direction.

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

(e) Using a socket wrench (27 mm), install the pressure port union.

Torque: 69 N·m (704 kgf·cm, 51 ft·lbf)

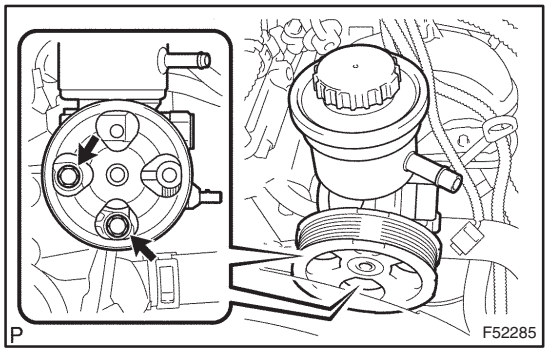
32. INSTALL VANE PUMP OIL RESERVOIR SUB–ASSY

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

(b) Install the vane pump reservoir with the 3 bolts.

Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

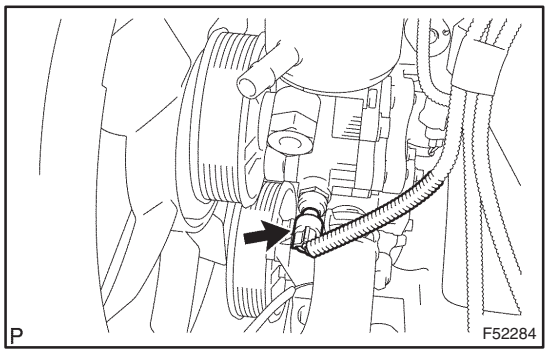
33. INSTALL VANE PUMP OIL RESERVOIR CAP SUB–ASSY



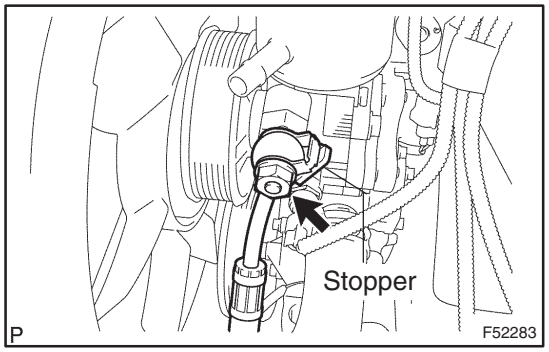
34. INSTALL VANE PUMP ASSY

(a) Install the vane pump assy with the 2 bolts.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



(b) Connect the pressure switch connector.



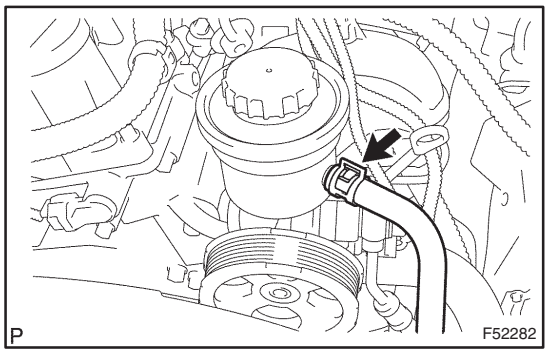
35. CONNECT PRESSURE FEED TUBE ASSY

(a) Connect the pressure feed tube assy and install a new gasket with the union bolt.

Torque: 51 N·m (520 kgf·cm, 38 ft·lbf)

NOTICE:

Make sure that the stopper of the tube is contacting the vane pump housing front as shown, then tighten the union bolt.



36. CONNECT RETURN HOSE

(a) Connect the return hose.

(b) Using pliers, grip the claws of the clip and slide the clip.

37. INSTALL FAN AND GENERATOR V BELT (SEE PAGE 14–9)

38. ADD POWER STEERING FLUID (SEE PAGE 51–3)

39. BLEED POWER STEERING FLUID (SEE PAGE 51–3)

40. CHECK POWER STEERING FLUID LEVEL IN RESERVOIR (SEE PAGE 51–3)

41. CHECK FOR FLUID LEAKS