510GK–01

OVERHAUL

NOTICE:

- **Do not overtighten when using a vice.**
- **When installing the parts indicated by arrows, coat them with power steering fluid (see page 51–9).**

1. REMOVE ENGINE UNDER COVER NO.1 (SEE PAGE 14–13)

2. DRAIN POWER STEERING FLUID

3. REMOVE AIR CLEANER INLET NO.1

(a) Remove the 2 bolts and the air cleaner inlet No.1.

4. DISCONNECT INTAKE AIR CONNECTOR PIPE

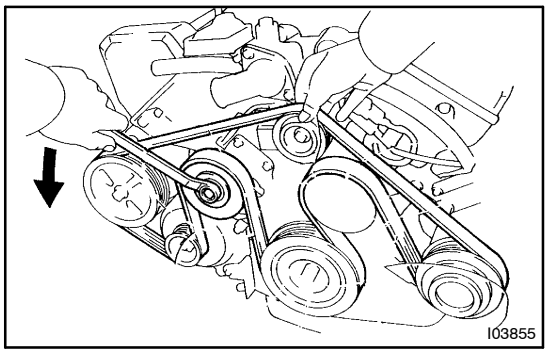
(a) Loosen the throttle body side clamp.

(b) Disconnect the intake air connector pipe from the throttle body.

5. REMOVE AIR CLEANER ASSY

(a) Disconnect the air flow meter connector from the air cleaner assy.

(b) Remove the 2 bolts and air cleaner assy with the intake air connector pipe.



6. REMOVE FAN AND GENERATOR V BELT

(a) Put a wrench on the drive belt tensioner set bolt.

(b) Turn the drive belt tensioner set bolt counterclockwise and hold it.

NOTICE:

- The drive belt tensioner set bolt is a left–hand screw.
- The drive belt tensioner set bolt comes loose when turning it clockwise.

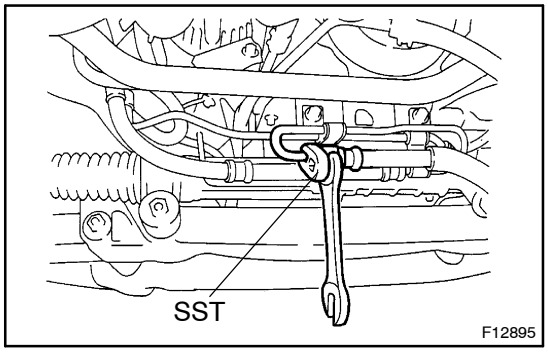
(c) Remove the fan and generator V belt.

(d) Release the drive belt tensioner.

7. DISCONNECT OIL RESERVOIR TO VANE PUMP HOSE

(a) Using pliers, disengage the vane pump side hose clip and slide it.

(b) Disconnect the oil reservoir to vane pump hose from the vane pump.



8. DISCONNECT PRESSURE FEED TUBE ASSY

(a) Remove the 3 bolts and 3 clamps.
(b) Disconnect the vacuum hoses from the vacuum switch.
(c) Using pliers, disengage the vacuum hose clips and slide them to disconnect the vacuum hoses.
(d) Put a wrench on the pressure feed tube hose side to hold it.
(e) Put SST on the flare nut as shown in the illustration on the left.
SST 09023–12700
(f) Joint a spinner handle to the SST.

HINT:
Use an extension bar or universal joint according to the situation.

(g) Loosen and disconnect the pressure feed tube.

9. REMOVE VANE PUMP ASSY

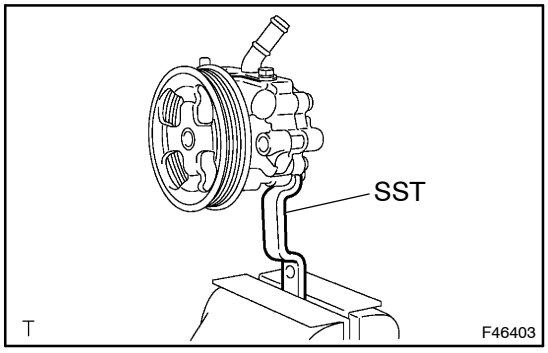
(a) Remove the nut and 2 bolts.
(b) Remove the vane pump assy with the pressure feed tube assy.

10. REMOVE PRESSURE FEED TUBE ASSY

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

11. REMOVE VANE PUMP BRACKET

(a) Remove the 3 bolts and the vane pump bracket from the vane pump assy.



12. FIX VANE PUMP ASSY

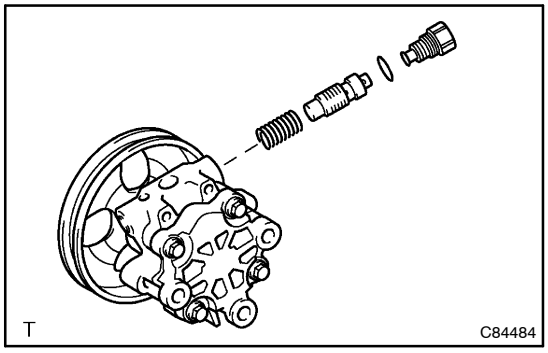
(a) Using SST, hold the vane pump assy in a vice.
SST 09630–00014 (09631–00132)

HINT:
Detach SST according to the situation.

13. REMOVE POWER STEERING SUCTION PORT UNION

(a) Remove the bolt and the suction port union from the vane pump housing front.
(b) Using a small screwdriver, remove the O–ring from the suction port union.

NOTICE:
Be careful not to damage the suction port union.



14. REMOVE FLOW CONTROL VALVE

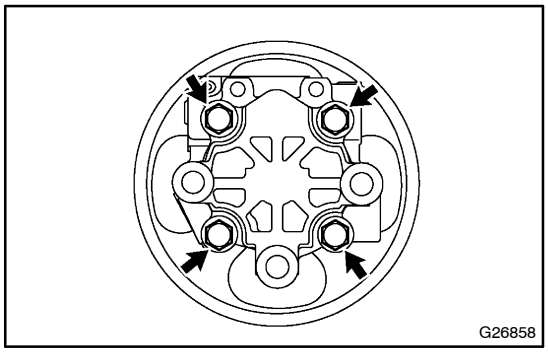
(a) Using a socket wrench (27 mm), remove the pressure port union.

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

NOTICE:

Be careful not to damage the pressure port union.

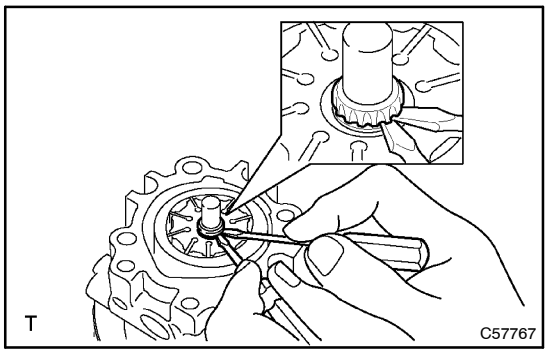
(c) Remove the flow control valve and spring.



15. REMOVE VANE PUMP HOUSING REAR

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

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



16. REMOVE W/PULLEY SHAFT SUB–ASSY

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

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

NOTICE:

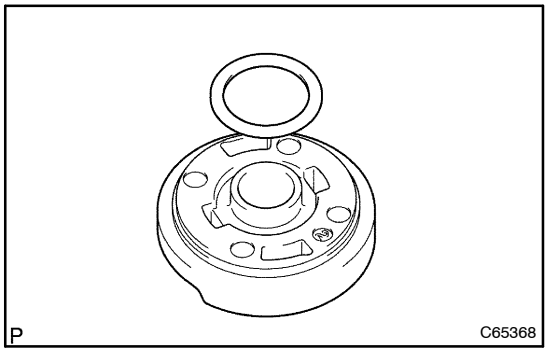
If you remove the w/pulley shaft sub–assy, replace the vane pump housing oil seal.

17. REMOVE VANE PUMP ROTOR

(a) Remove the 10 vane pump plates.

(b) Remove the vane pump rotor.

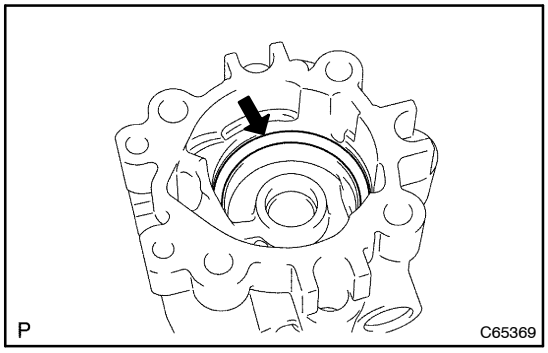
18. REMOVE VANE PUMP CAM RING



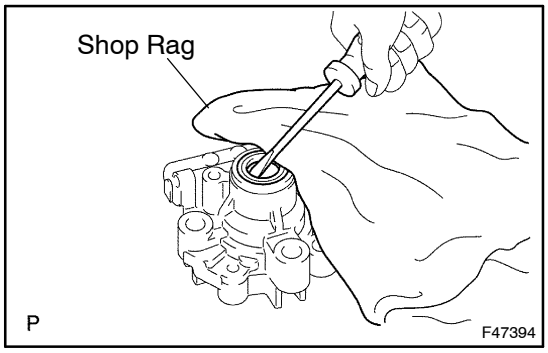
19. REMOVE VANE PUMP SIDE PLATE FRONT

(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.

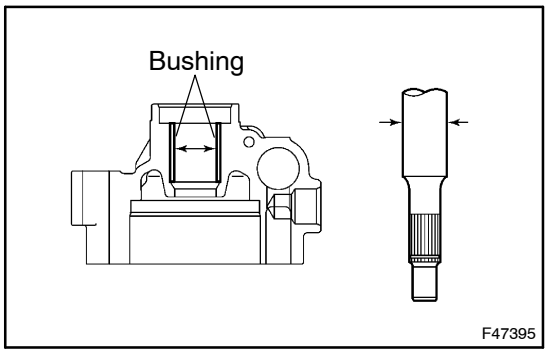


20. REMOVE VANE PUMP HOUSING OIL SEAL

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

NOTICE:

Be careful not to damage the vane pump housing front.



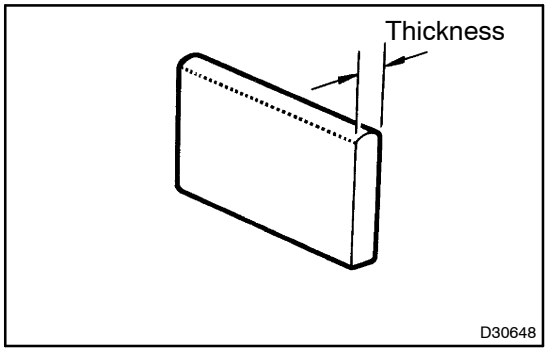
21. INSPECT VANE PUMP SHAFT AND BUSH IN HOUSING FRONT

(a) Using a micrometer and a vernier calipers, measure the oil clearance.

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

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

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



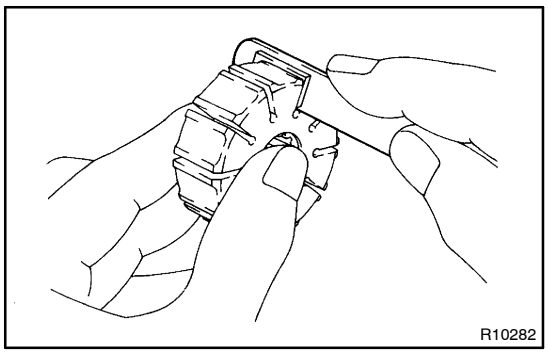
22. INSPECT VANE PUMP ROTOR AND VANE PUMP PLATES

(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.)

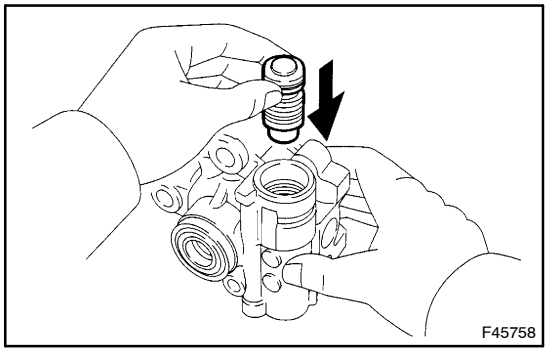
If the thickness is less than the standard, replace the vane pump assy.



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

Standard clearance: Less than 0.03 mm (0.0012 in.)

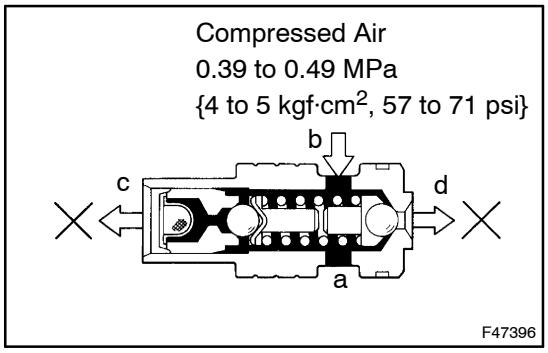
If the clearance exceeds the standard, replace the vane pump assy.



23. INSPECT FLOW CONTROL VALVE

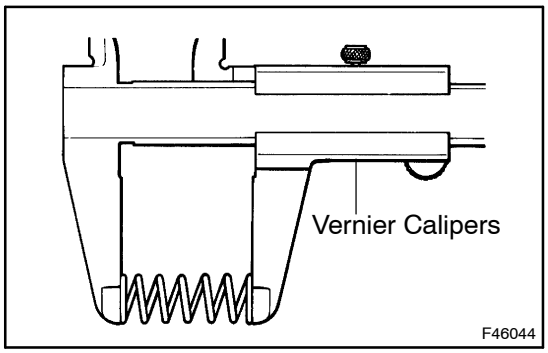
(a) Coat the flow control valve with power steering fluid and check that it falls smoothly into the flow control valve hole under its own weight.

If it is not smooth, replace the vane pump assy.



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

If air leaks from holes 'c' and 'd', replace the vane pump assy.



24. INSPECT FLOW CONTROL VALVE COMPRESSION SPRING

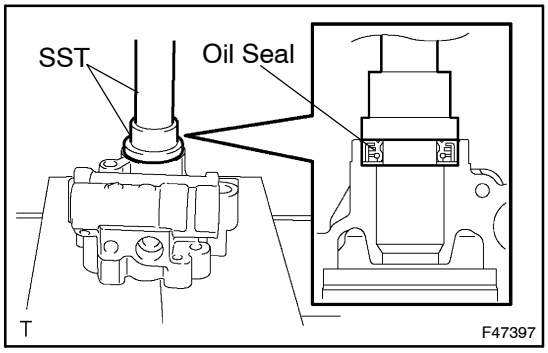
(a) Using vernier calipers, measure the free length of the compression spring.

Minimum free length: 30.3 mm (1.193 in.)

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

25. 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.



26. INSTALL VANE PUMP HOUSING OIL SEAL

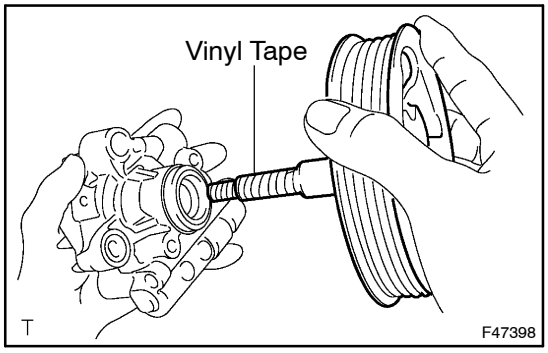
(a) Apply power steering fluid to the new vane pump housing oil seal lip.

(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. And do not install the vane pump housing oil seal in reverse.



27. INSTALL W/PULLEY SHAFT SUB–ASSY

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

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

NOTICE:

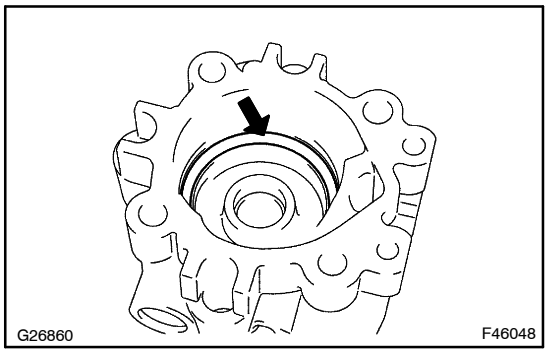
Be careful not to damage the vane pump housing oil seal lip.

HINT:

Wrap the shaft surface with vinyl tape before inserting.

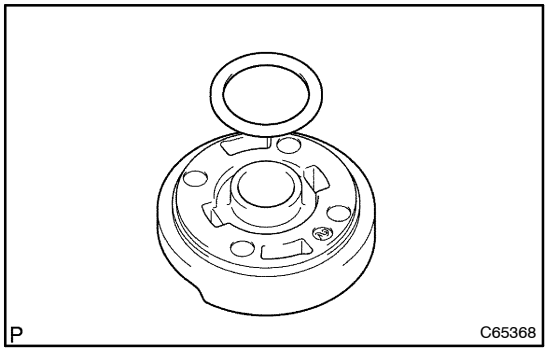
NOTICE:

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

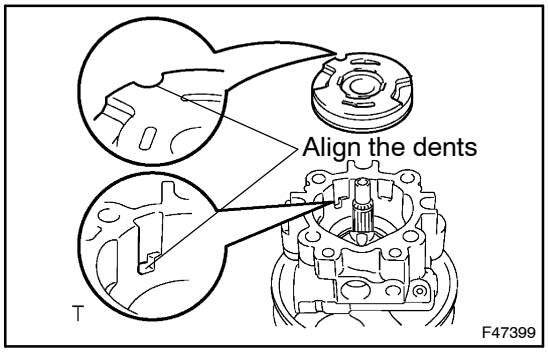


28. INSTALL VANE PUMP SIDE PLATE FRONT

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



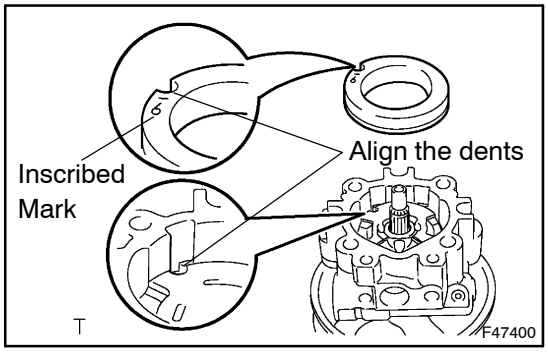
(b) Coat a new O–ring (smaller one) with power steering fluid and install it to the vane pump side plate front.



(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.

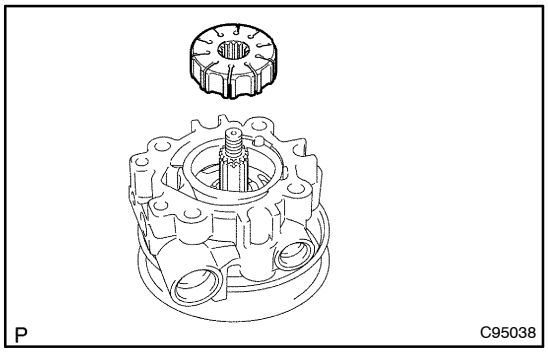


29. INSTALL VANE PUMP CAM RING

(a) Align the dent of the vane pump cam ring with that of the vane pump side plate front, and 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.

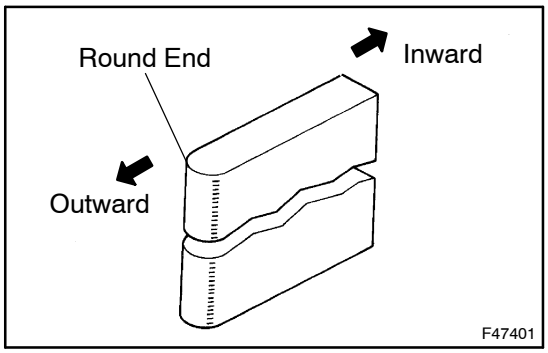


30. INSTALL VANE PUMP ROTOR

(a) Install the vane pump rotor.

HINT:

The vane pump rotor has no specific direction.

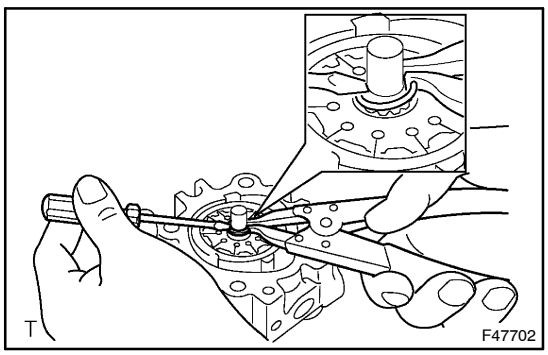


(b) Coat the 10 vane pump plates with power steering fluid.

(c) Install the vane pump plates.

NOTICE:

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

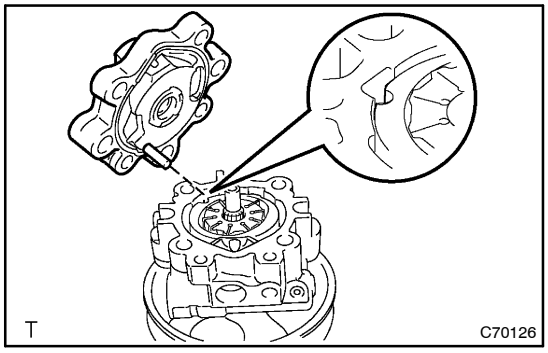


31. INSTALL VANE PUMP SHAFT SNAP RING

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

NOTICE:

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



32. 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.

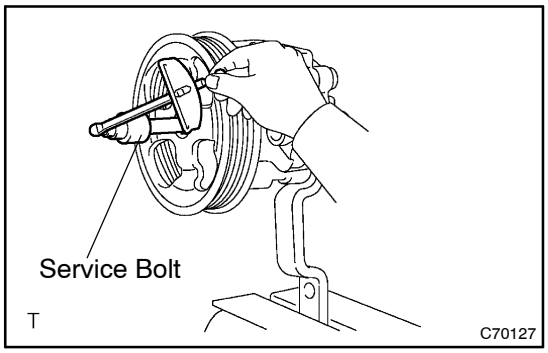
(c) Install the vane pump housing rear to the vane pump housing front.

(d) Tighten the 4 bolts.

Torque: 22 N·m (225 kgf·cm, 16 ft·lbf)

NOTICE:

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



33. INSPECT PRELOAD

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

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

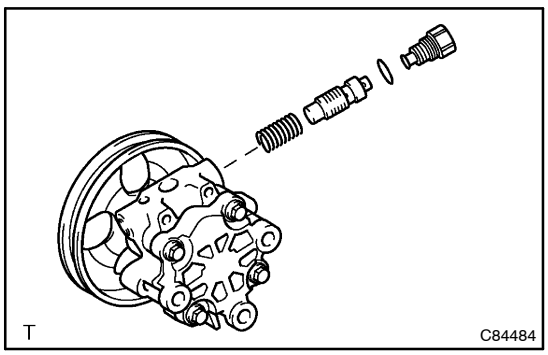
(c) Temporarily install the service bolt.

Recommend service bolt: (91111–51050)
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 installation of the vane pump housing oil seal.



34. INSTALL FLOW CONTROL VALVE

(a) Coat the spring and the flow control valve with power steering fluid.

(b) Install the spring and the flow control valve in the correct direction as shown in the illustration.

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

(d) Install the pressure port union to the vane pump housing front.

Torque: 69 N·m (705 kgf·cm, 51 ft·lbf)

35. INSTALL POWER STEERING SUCTION PORT UNION

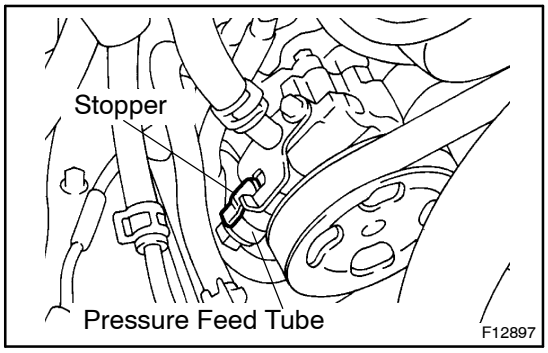
(a) Coat a new O–ring with power steering fluid and install it to the suction port union.

(b) Install the suction port union with the bolt to the vane pump housing front.

Torque: 12 N·m (125 kgf·cm, 9 ft·lbf)

36. INSTALL VANE PUMP BRACKET

(a) Install the vane pump bracket with the 3 bolts.
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)



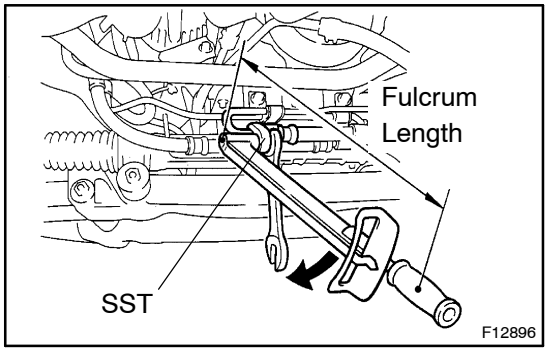
37. INSTALL PRESSURE FEED TUBE ASSY

(a) Install the pressure feed tube assy and a new gasket to the vane pump assy with the union bolt.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

HINT:
Make sure that the stopper of the pressure feed tube touches the vane pump housing front as shown in the illustration, then install the union bolt.

38. INSTALL VANE PUMP ASSY

(a) Install the vane pump assy together with the pressure feed tube assy with the nut and 2 bolts.
Torque:
Nut: 43 N·m (440 kgf·cm, 32 ft·lbf)
Bolt: 39 N·m (400 kgf·cm, 29 ft·lbf)



39. CONNECT PRESSURE FEED TUBE ASSY

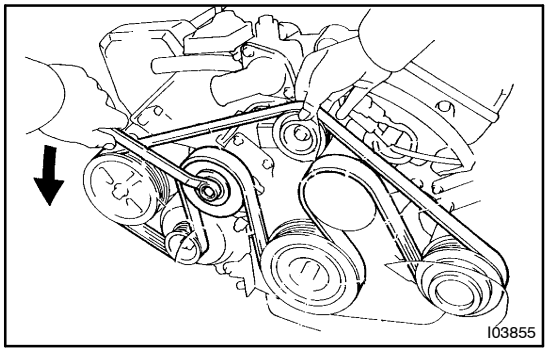
(a) Connect the pressure feed tube.
(b) Put a wrench on the pressure feed tube hose side to hold it.
(c) Put SST on the flare nut as shown in the illustration on the left.
SST 09023–12700
(d) Using a torque wrench, tighten the flare nut.
Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

HINT:
- Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
- This torque value is effective when SST is parallel to the torque wrench.

(e) Install the 3 clips and the 3 bolts.
(f) Connect the vacuum hoses to the vacuum switch.
(g) Using pliers, engage the vacuum hose clips.

40. CONNECT OIL RESERVOIR TO VANE PUMP HOSE

(a) Connect the oil reservoir to vane pump hose.
(b) Using pliers, engage the hose clip.



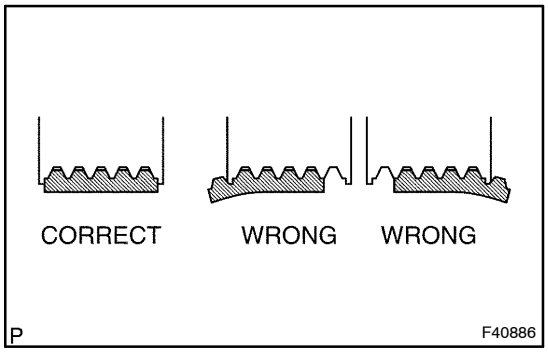
41. INSTALL FAN AND GENERATOR V BELT

(a) Put a wrench on the drive belt tensioner set bolt.

(b) Turn the drive belt tensioner set bolt counterclockwise and hold it.

NOTICE:

- **The drive belt tensioner set bolt is a left–hand screw.**
- **The drive belt tensioner set bolt comes loose when turning it clockwise.**



(c) Install the fan and generator V belt.

(d) Release the drive belt tensioner.

HINT:

The drive belt tensioner is an auto tensioner.

42. INSTALL AIR CLEANER ASSY

(a) Install the air cleaner assy together with the intake air connector pipe with the 2 bolts.

(b) Connect the air flow meter connector to the air cleaner assy.

43. CONNECT INTAKE AIR CONNECTOR PIPE

(a) Connect the intake air connector pipe to the throttle body.

(b) Tighten the clamp to hold the intake air connector pipe and the throttle body.

44. INSTALL AIR CLEANER INLET NO.1

(a) Install the air cleaner inlet No.1 with the 2 bolts.

45. BLEED AIR IN POWER STEERING SYSTEM (SEE PAGE 51–4)

46. CHECK FOR POWER STEERING FLUID LEAKAGE

If any leakage is found on the power steering system, repair or replace the related parts.

47. CHECK POWER STEERING FLUID LEVEL IN RESERVOIR (SEE PAGE 51–4)

48. INSTALL ENGINE UNDER COVER NO.1 (SEE PAGE 14–13)