TIMING BELT

141MQ–01

REPLACEMENT

1. DISCONNECT BATTERY NEGATIVE TERMINAL
2. REMOVE AIR CLEANER INLET NO.1
3. DRAIN ENGINE COOLANT (See page 16–8)
4. REMOVE V–BANK COVER
5. REMOVE INTAKE AIR CONNECTOR PIPE
6. REMOVE ENGINE UNDER COVER NO.1
7. DISCONNECT RADIATOR HOSE NO.1
8. DISCONNECT RADIATOR HOSE NO.2
9. DISCONNECT OIL COOLER INLET TUBE NO.1
10. DISCONNECT OIL COOLER OUTLET TUBE NO.1
11. REMOVE AIR CLEANER ASSY
12. REMOVE RADIATOR ASSY (See page 16–20)
13. REMOVE FAN AND GENERATOR V BELT (See page 14–6)
14. REMOVE VANE PUMP ASSY

(a) Remove the 2 bolts, nut and pump.

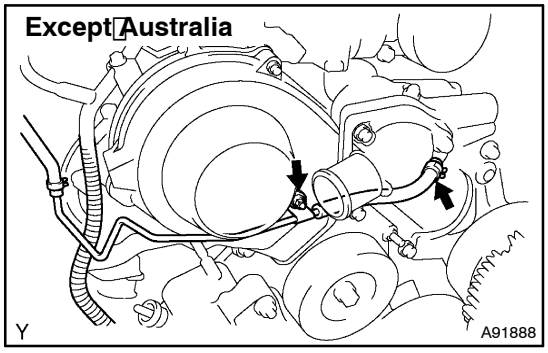
HINT:

Pump should be removed with the hoses connected and then hang with a rope or wire on the body's side.

15. REMOVE GENERATOR ASSY (See page 19–27)
16. DISCONNECT COMPRESSOR AND MAGNETIC CLUTCH

HINT:

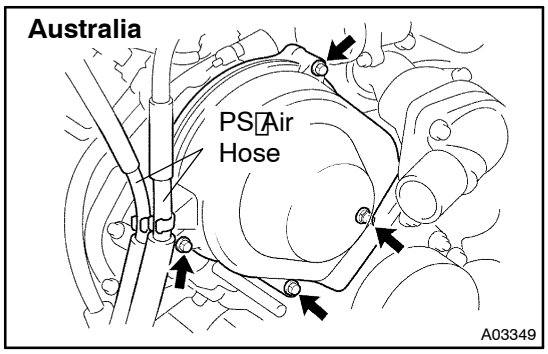
The cooler compressor together with the magnetic clutch should be removed with the low–pressure and high–pressure hoses connected and then hang with a rope or wire on the body's side.



17. REMOVE TIMING CHAIN OR BELT COVER NO.2

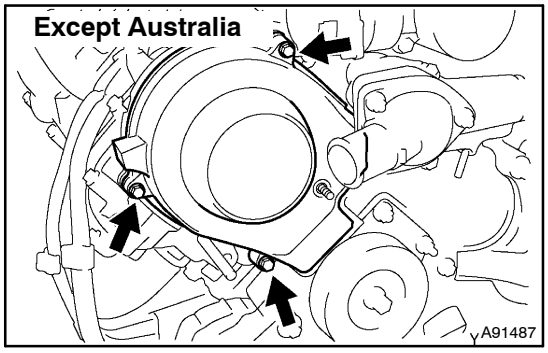
(a) Except Australia:
Remove the cap nut and bolt, and disconnect the water by–pass pipe from the cover.

(b) Except Australia:
Disconnect the 2 water by–pass hoses from the water by–pass pipe.

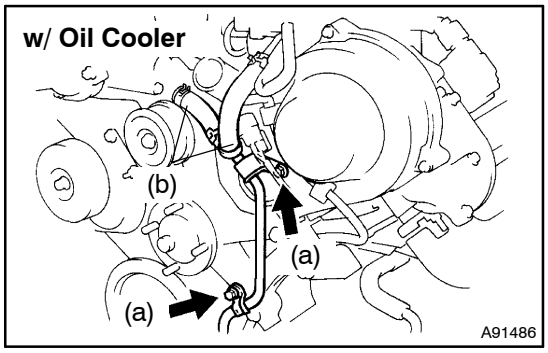


(c) Disconnect the 2 PS air hoses from the clamp on the cover.

(d) Australia:
Remove the cap nut, 3 bolts, cover and gasket.



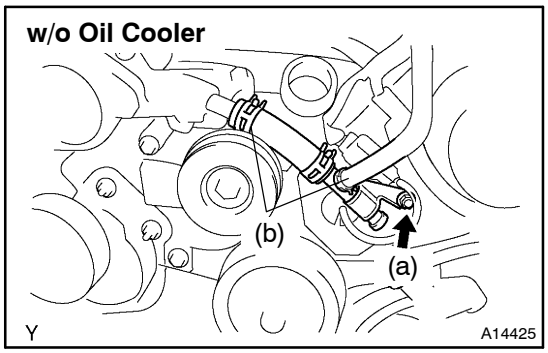
(e) Except Australia:
Remove the 3 bolts, cover and gasket.



18. REMOVE TIMING BELT COVER SUB–ASSY NO.3 LH

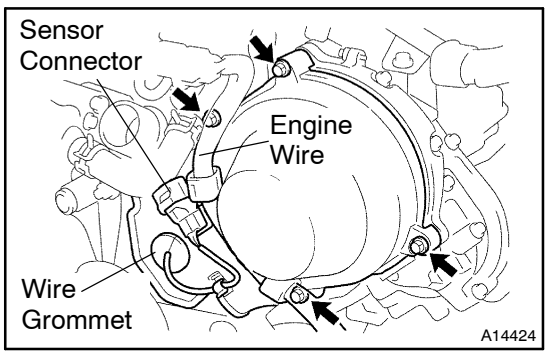
(a) w/ Oil cooler:
Remove the cap nut and bolt, and disconnect the oil cooler pipe from the cover and No. 1 drive belt idler pulley bracket.

(b) w/ Oil cooler:
Disconnect the 2 water by–pass hoses, as shown in the illustration.



(c) w/o Oil cooler:
Remove the cap nut, and disconnect the No.3 water by-pass pipe from the cover.

(d) w/o Oil cooler:
Disconnect the 2 water by–pass hoses as shown in the illustration.



(e) Disconnect the engine wire from the 2 wire clamps.
(f) Disconnect the camshaft position sensor connector.
(g) Disconnect the camshaft position sensor wire from the wire clamp on the cover.
(h) Remove the wire grommet from the cover.
(i) Remove the 4 bolts.
(j) Disconnect the cover from the timing plate and camshaft bearing cap.
(k) Disconnect the wire clamp for the sensor from the cover.
(l) Remove the connector holder from the sensor connector.
(m) Remove the cover and gasket.

19. REMOVE TIMING BELT COVER SUB–ASSY NO.2

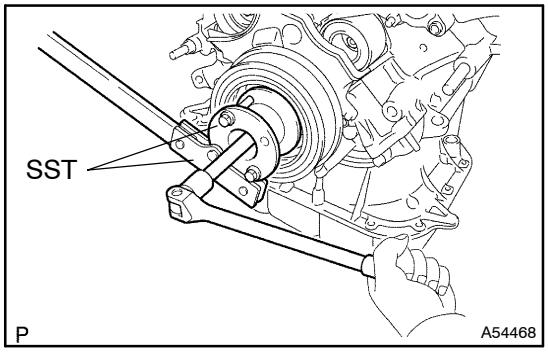
(a) Remove the 2 bolts and timing belt cover.

20. REMOVE V–RIBBED BELT TENSIONER ASSY

(a) Remove the bot, 2 nuts and belt tensioner.

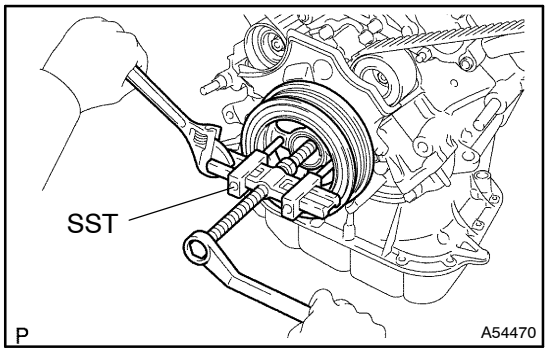
21. REMOVE IDLER PULLEY ASSY

(a) Remove the 2 bots, 2 nuts and idler pulley.



22. REMOVE CRANKSHAFT DAMPER SUB–ASSY

(a) Using SST, remove the pulley bolt.
SST 09213–70011, 09330–00021

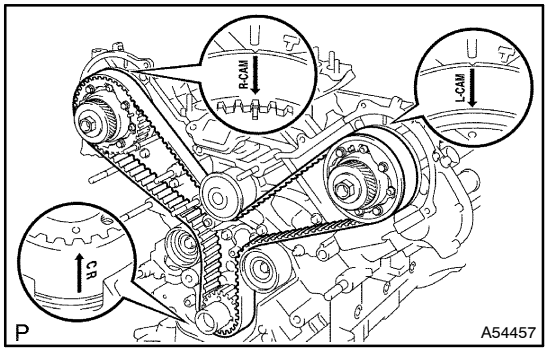


(b) Using SST, remove the damper.
SST 09950–50013 (09951–05010, 09952–05010, 09953–05010, 09953–05020, 09954–05021)

23. REMOVE TIMING BELT NO.1 COVER

(a) Remove the 4 bolts and cover.

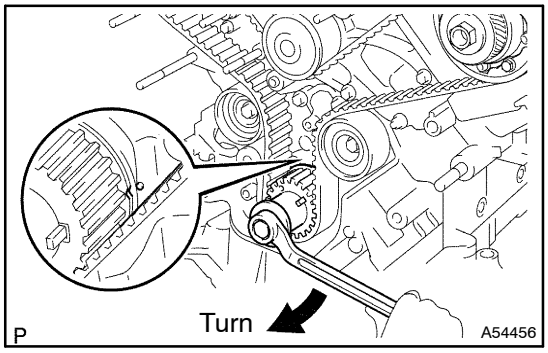
24. REMOVE CRANKSHAFT POSITION SENSOR PLATE



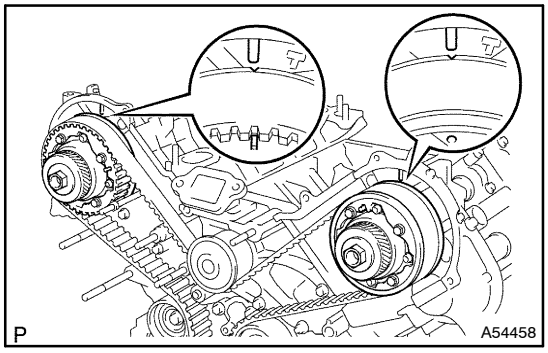
25. REMOVE TIMING BELT

(a) If planning to reuse the belt, check the installation marks on the belt.
(1) Check that there are 3 installation marks on the belt by turning the crankshaft as shown in the illustration.

If the installation marks have disappeared, place a new installation mark on the belt before removing each part.

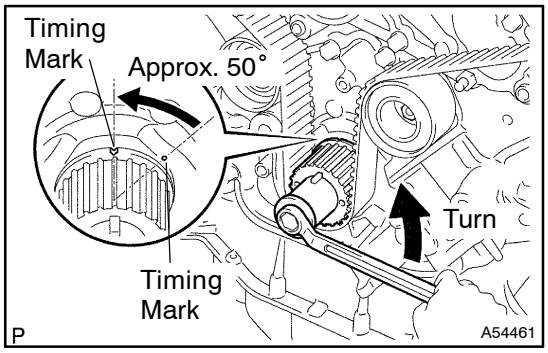


(b) Set the No. 1 cylinder to approximately 50° BTDC/compression.
(1) Using the crankshaft damper bolt, turn the crankshaft to align the timing marks of the crankshaft timing pulley and oil pump body.



(2) Check that the timing marks of the camshaft timing pulleys and timing belt plates are aligned.

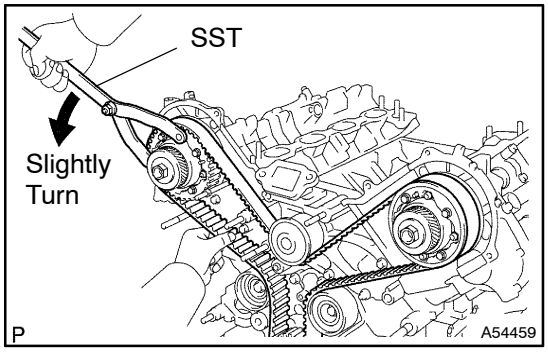
If not, turn the crankshaft 1 revolution (360˚).



(3) Using the crankshaft damper bolt, turn the crankshaft counterclockwise by approximately 50˚.

NOTICE:
With timing belt disengaged:
The crankshaft damper must be at the correct angle to avoid damage in later steps. If the crankshaft pulley is at the wrong angle and then the camshaft timing pulley and the camshaft are removed, the piston head and valve head may come in contact and be damaged.

(c) Alternately loosen the 2 bolts, and remove them, the belt tensioner and dust boot.



(d) Using SST, loosen the tension between the camshaft timing pulley (RH bank) and crankshaft timing pulley by slightly turning the camshaft timing pulley (RH bank) counterclockwise.

SST 09960–10010 (09962–01000, 09963–00350)

(e) Disconnect the belt from the timing belt idler No. 1, and remove the belt.

26. INSTALL TIMING BELT

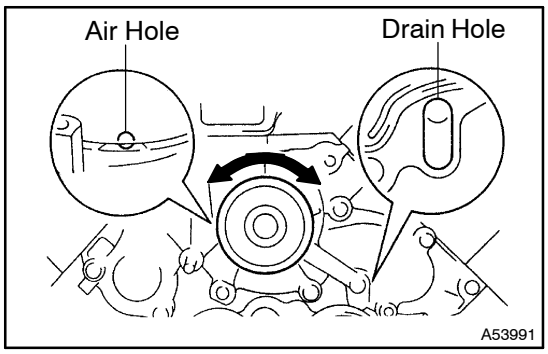
(a) Check the belt idler No. 1 and No. 2.

(1) Visually check the seal portion of the idler pulley for oil leakage.

If leakage is found, replace the idler.

(2) Check that the idler turns smoothly.

If necessary, replace the idler.



(b) Check the water pump.

(1) Visually check the air hole and water hole for coolant leakage.

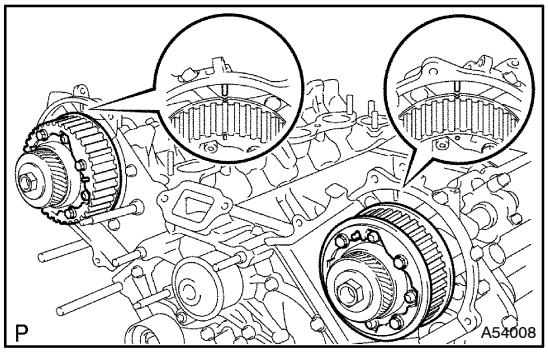
If leakage is found, replace the water pump and belt.

(2) Turn the pulley, and check that the water pump bearing moves smoothly and quietly.

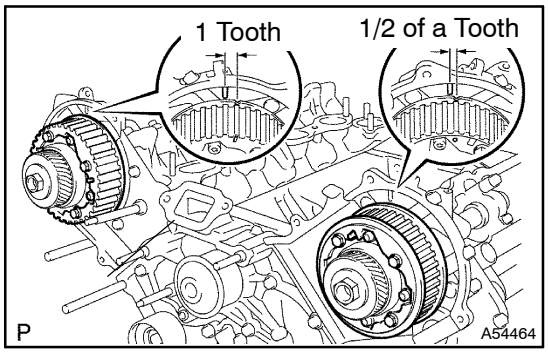
If necessary, replace the water pump.

(c) Remove any oil or water on the crankshaft damper, oil pump pulley, water pump pulley, idler No. 1 and idler No. 2. Keep them clean.

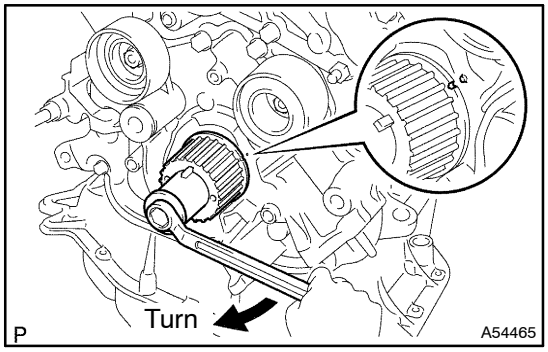
NOTICE:
Only wipe the pulleys. Do not use any cleaning agents on the pulleys.



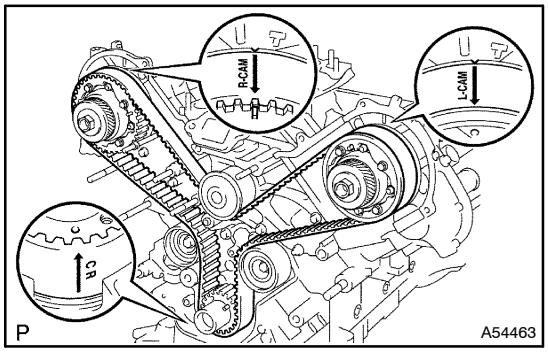
(d) Set the No. 1 cylinder to TDC/compression.
(1) Turn the hexagon wrench head portion of the camshaft to align the timing marks of the camshaft timing pulleys and timing belt plates.



HINT:
Turn the camshaft timing pulleys slightly clockwise to make installation of the timing belt easier.
Camshaft timing pulley of LH bank: 1/2 of a tooth
Camshaft timing pulley of RH bank: 1 tooth



(2) Using the crankshaft damper bolt, turn the crankshaft to align the timing marks of the crankshaft timing pulley and oil pump body.

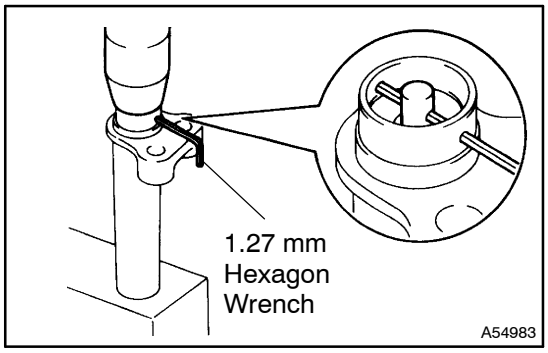


(3) Remove any oil or water on each pulley. Keep them clean.

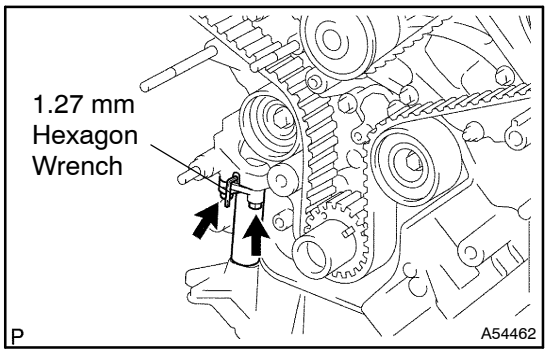
NOTICE:
Only wipe the pulleys. Do not use cleaning agents on the pulleys.

(4) Face the front mark (arrow) on the belt forward.
(5) Connect the belt to the crankshaft timing pulley.
Align the installation mark on the belt with the timing mark of the crankshaft timing pulley.
(6) Connect the belt to the idler No. 2.
(7) Connect the belt to the camshaft timing pulley (LH bank).
Align the installation mark on the belt with the timing mark of the camshaft timing pulley.
(8) Connect the belt to the water pump pulley.

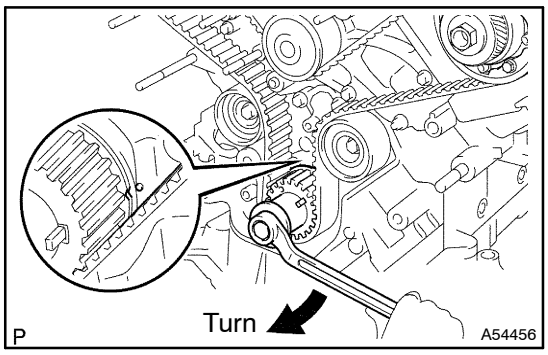
(9) Connect the belt to the camshaft timing pulley (RH bank).
Align the installation mark on the belt with the timing mark of the camshaft timing pulley.
(10) Connect the timing belt to the idler No.1.



(e) Set the belt tensioner.
(1) Using a press, slowly press in the push rod using 981 to 9,807 N (100 to 1,000 kgf, 220 to 2,205 lbf) of pressure.
(2) Align the holes of the push rod and housing. Pass a 1.27 mm hexagon wrench through the holes to keep the setting position of the push rod.
(3) Release the press.
(4) Install the dust boot to the belt tensioner.

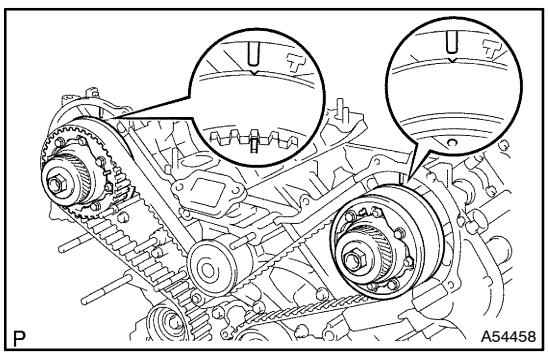


(f) Install the belt tensioner.
(1) Temporarily install the belt tensioner with the 2 bolts.
(2) Alternately tighten the 2 bolts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)
(3) Using pliers, remove the 1.27 mm hexagon wrench from the belt tensioner.



(g) Check the valve timing.
(1) Using the crankshaft damper bolt, slowly turn the crankshaft timing pulley 2 revolutions from TDC to TDC.

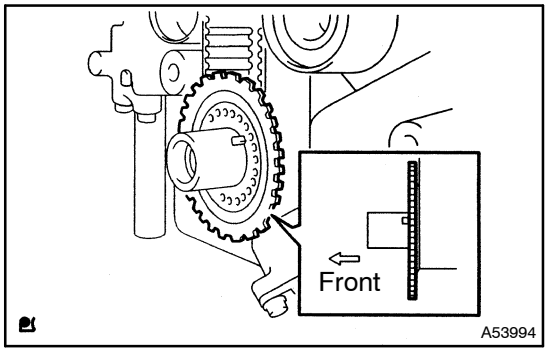
NOTICE:
Always turn the crankshaft pulley clockwise.



(2) Check that each pulley aligns with the timing marks as shown in the illustration.

If the timing marks do not align, remove the belt and reinstall it.

(3) Remove the crankshaft damper bolt.



27. INSTALL CRANKSHAFT POSITION SENSOR PLATE

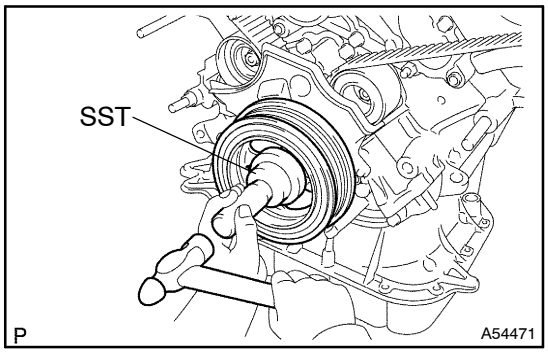
(a) Install the crankshaft position sensor plate as shown in the illustration.

NOTICE:

Be careful of the installation direction.

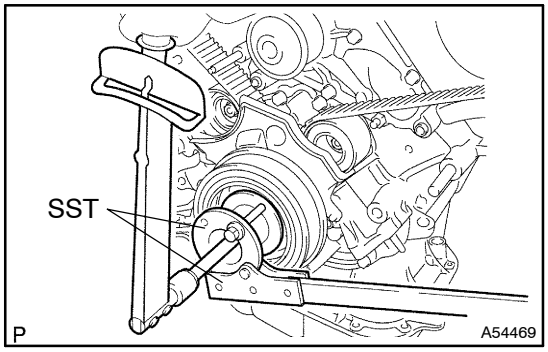
28. INSTALL TIMING BELT NO.1 COVER

(a) Install the timing belt cover with the 4 bolts.
Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)



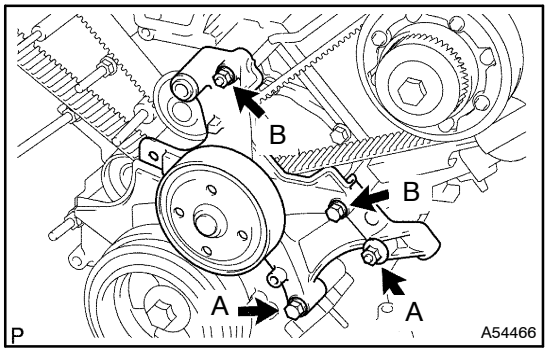
29. INSTALL CRANKSHAFT DAMPER SUB–ASSY

(a) Using SST and a hammer, tap in the damper.
SST 09223–46011



(b) Using SST, install the damper bolt.
SST 09213–70011, 09330–00021
Torque: 245 N·m (2,500 kgf·cm, 181 ft·lbf)

(c) Align the pulley set key with the key groove of the crankshaft damper.



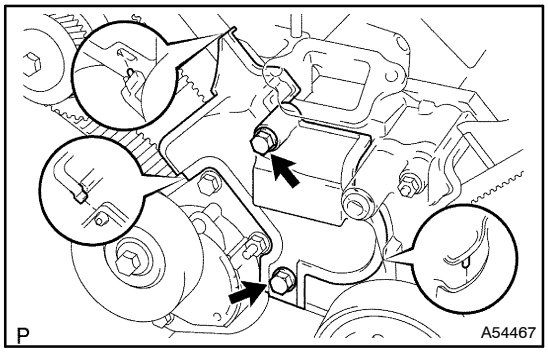
30. INSTALL IDLER PULLEY ASSY

(a) Install the idler with the 2 bolts and 2 nuts.
Torque:
16 N·m (163 kgf·cm, 12 ft·lbf) for 12 mm head bolt
32 N·m (326 kgf·cm, 24 ft·lbf) for 14 mm head bolt
Bolt length:
114 mm (4.49 in.) for 14 mm head (A)
106 mm (4.17 in.) for 12 mm head (B)

31. INSTALL V–RIBBED BELT TENSIONER ASSY

(a) Install the belt tensioner with the bolt and 2 nuts.
Torque: 16 N·m (163 kgf·cm, 12 ft·lbf)

HINT:
Use a bolt that is 106 mm (4.18 in.) in length.

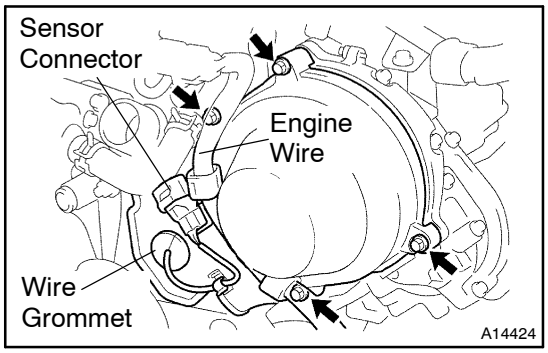


32. INSTALL TIMING BELT COVER SUB–ASSY NO.2

(a) Fit the cover No. 2, matching the claws and pin with each part.

(b) Install the timing belt cover with the 2 bolts.
Torque: 16 N·m (163 kgf·cm, 12 ft·lbf)

HINT:
Use bolts that are 106 mm (4.17 in.) in length.



33. INSTALL TIMING BELT COVER SUB–ASSY NO.3 LH

(a) Install the gasket to the cover.

(b) Run the camshaft position sensor wire through the cover hole.

(c) Install the cover with the 4 bolts.
Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)

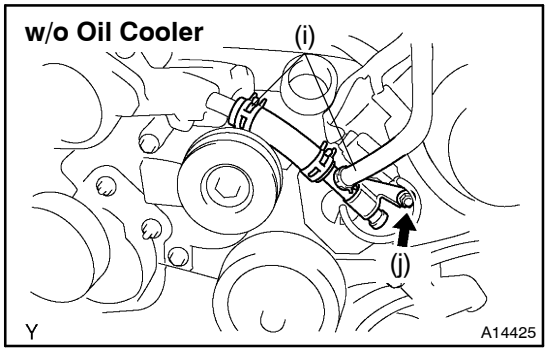
(d) Install the wire grommet to the cover.

(e) Install the sensor connector to the sensor holder.

(f) Connect the sensor connector.

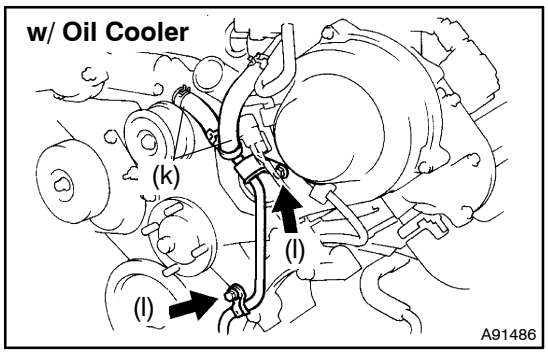
(g) Install the sensor wire to the wire clamp on the cover.

(h) Install the engine wire to the 2 wire clamps on the cover.



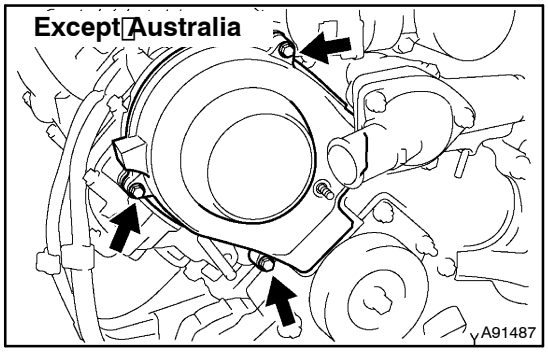
(i) w/o Oil cooler:
Connect the 2 water by–pass hoses, as shown in the illustration.

(j) w/o Oil cooler:
Install the No. 3 water by–pass pipe to the cover with the cap nut.
Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)



(k) w/ Oil cooler:
Connect the 2 water by–pass hoses, as shown in the illustration.

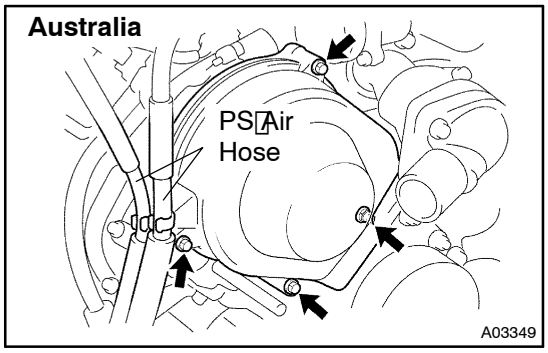
(l) w/ Oil cooler:
Install the oil cooler pipe to the cover and No. 1 drive belt idler pulley bracket with the cap nut and bolt.
Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)



34. INSTALL TIMING CHAIN OR BELT COVER NO.2

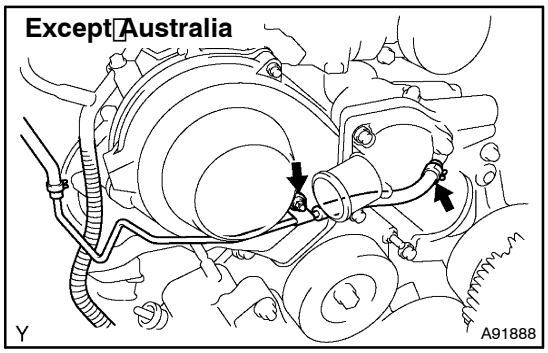
(a) Install the gasket to the cover.

(b) Except Australia:
Install the cover with the 3 bolts.
Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)



(c) Australia:
Install the cover with the cap nut and 3 bolts.
Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)

(d) Install the 2 PS air hoses to the clamp on the cover.



(e) Except Australia:
Connect the 2 water by-pass hoses to the water by-pass pipe.

(f) Except Australia:
Install the water by-pass pipe to the cover with the cap nut and bolt.
Torque: 7.5 N·m (77 kgf·cm, 66 in.·lbf)

35. INSTALL COMPRESSOR AND MAGNETIC CLUTCH

(a) Install the cooler compressor, stay and wire bracket with the 3 bolts and nut.
Torque:
49 N·m (500 kgf·cm, 36ft·lbf) for bolt
29 N·m (296 kgf·cm, 21 ft·lbf) for nut

36. INSTALL GENERATOR ASSY (See page 19–27)

37. INSTALL VANE PUMP ASSY

(a) Install the pump with the 2 bolts and nut. Alternately tighten the bolts and nut.
Torque:
39.2 N·m (400 kgf·cm, 29 ft·lbf) for bolt
43.1 N·m (440 kgf·cm, 32 ft·lbf) for nut

38. INSTALL FAN AND GENERATOR V BELT (See page 14–6)

39. INSTALL RADIATOR ASSY (See page 16–20)

40. INSTALL AIR CLEANER ASSY
Torque: 5.0 N·m (51 kgf·cm, 41 in.·lbf)

41. INSTALL OIL COOLER OUTLET TUBE NO.1

42. INSTALL OIL COOLER INLET TUBE NO.1

43. INSTALL AIR CLEANER INLET NO.1
Torque: 5.0 N·m (51 kgf·cm, 41 in.·lbf)

44. INSTALL INTAKE AIR CONNECTOR PIPE

Torque: 5.0 N·m (51 kgf·cm, 41 in.·lbf)

45. INSTALL V–BANK COVER

Torque: 5.0 N·m (51 kgf·cm, 41 in.·lbf)

46. REFILL ENGINE COOLANT (See page 16–8)

47. CHECK FOR ENGINE COOLANT LEAKS (See page 16–1)

48. INSTALL ENGINE UNDER COVER NO.1

49. CONNECT BATTERY NEGATIVE TERMINAL

50. POWER WINDOW CONTROL SYSTEM INITIALIZE (See page 05–1984)

51. FRONT POWER SEAT CONTROL SYSTEM INITIALIZE (See page 05–2280)

52. BACK GUIDE MONITOR SYSTEM INITIALIZE (See page 05–1913)