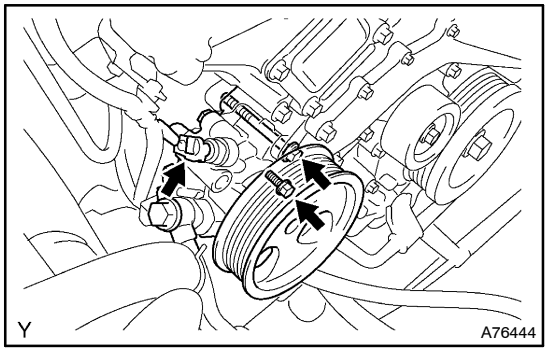
1415W–02

REPLACEMENT

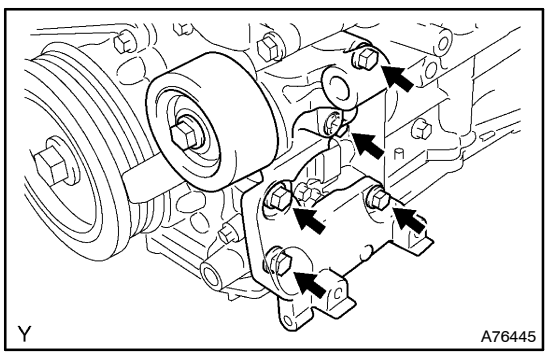
HINT:
Refer to CAMSHAFT (RH BANK) or CAMSHAFT (LH BANK) for the replacement procedure of the No. 2 chain.

1. REMOVE POWER STEERING LINK ASSY (See Pub. No. RM990E on page 51–42)
2. REMOVE DIFFERENTIAL CARRIER ASSY FRONT (See Pub. No. RM990E on page 29–13)
3. DRAIN ENGINE COOLANT (See page 16–5)
4. DRAIN ENGINE OIL (See page 17–14)
5. REMOVE BATTERY
6. REMOVE V–BANK COVER (See page 10–7)
7. REMOVE RADIATOR SUPPORT SEAL UPPER
(a) Remove the 11 clips and radiator support seal upper.
8. LOOSEN FAN W/ FLUID COUPLING (See page 16–6)
9. REMOVE FAN AND GENERATOR V BELT (See page 14–5)
10. REMOVE FAN W/ FLUID COUPLING (See page 16–6)
11. DISCONNECT VENTILATION HOSE NO.2 (See page 10–7)
12. REMOVE AIR CLEANER ASSY (See page 10–7)
13. REMOVE OIL LEVEL GAUGE GUIDE
(a) Remove the oil level gauge.
(b) Remove the bolt and pull out the oil level gauge guide.
(c) Remove the O–ring from the oil level gauge guide.
14. REMOVE WATER INLET (See page 16–6)



15. SEPARATE VANE PUMP ASSY
(a) Disconnect the P/S oil pressure switch connector.
(b) Remove the 2 bolts, and separate the vane pump.
NOTICE:
Do not hit the pulley to other parts when separating the vane pump.
HINT:
The vane pump is suspended securely.

16. REMOVE GENERATOR ASSY (See page 19–10)
17. SEPARATE COOLER COMPRESSOR ASSY (W/ AIR CONDITIONING) (See page 18–7)
18. REMOVE IDLER PULLEY ASSY (W/O AIR CONDITIONING)
(a) Remove the 3 bolts and idler pulley assy.



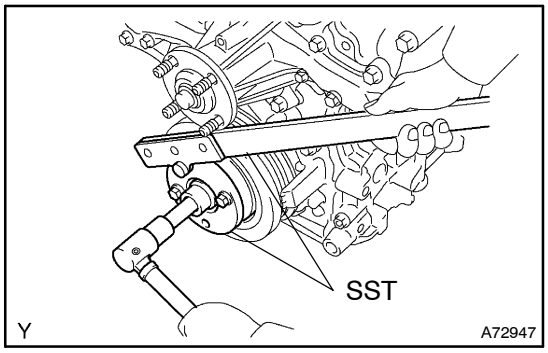
19. REMOVE V–RIBBED BELT TENSIONER ASSY
(a) Remove the 5 bolts and V–ribbed belt tensioner.

20. REMOVE IDLER PULLEY SUB–ASSY NO.2

(a) Remove the 2 bolts and 2 idler pulleys.

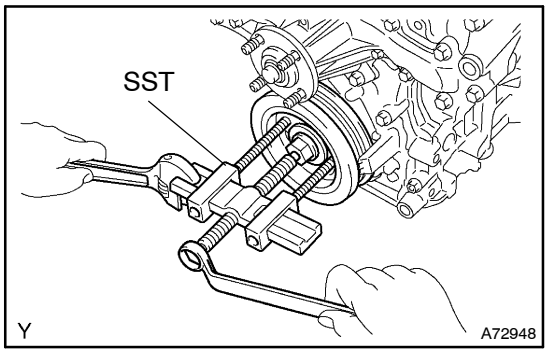
21. REMOVE IDLER PULLEY SUB–ASSY NO.1

(a) Remove the bolt and idler pulley.

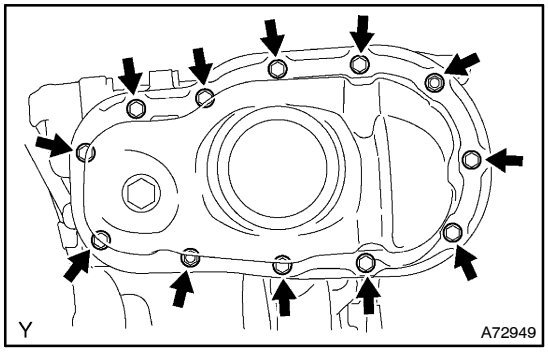


22. REMOVE CRANKSHAFT PULLEY

(a) Using SST, hold the crankshaft pulley and loosen the pulley set bolt.
SST 09213–54015 (91651–60855), 09330–00021

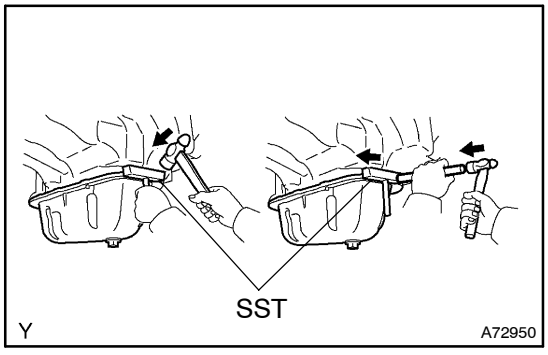


(b) Using the pulley set bolt and SST, remove the crankshaft pulley.
SST 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05030)



23. REMOVE OIL PAN SUB–ASSY NO.2

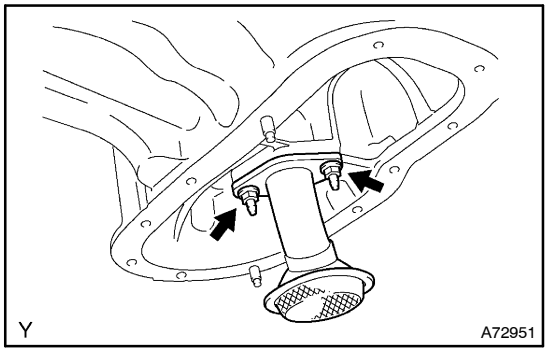
(a) Remove the 10 bolts and 2 nuts.



(b) Insert the blade of SST between the oil pan and oil pan No. 2, cut off applied sealer from and remove the oil pan No. 2.
SST 09032–00100

NOTICE:

- **Be careful not to damage the contact surface of the oil pan and oil pan No. 2.**
- **Be careful not to damage the oil pan No. 2 flange.**

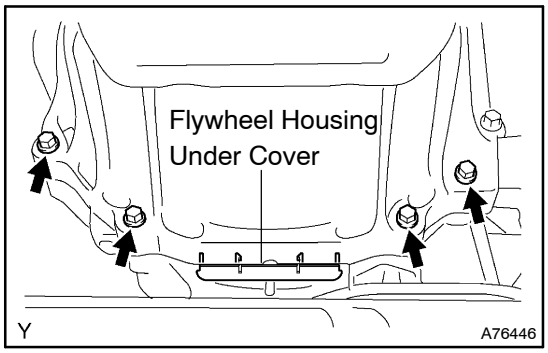


24. REMOVE OIL STRAINER SUB–ASSY

(a) Remove the 2 nuts, oil strainer and gasket.

25. REMOVE ENGINE OIL LEVEL SENSOR (FOR EUROPE)

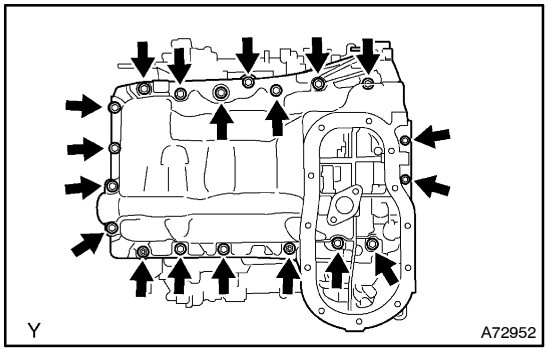
(a) Remove the 4 bolts, engine oil level sensor and gasket.



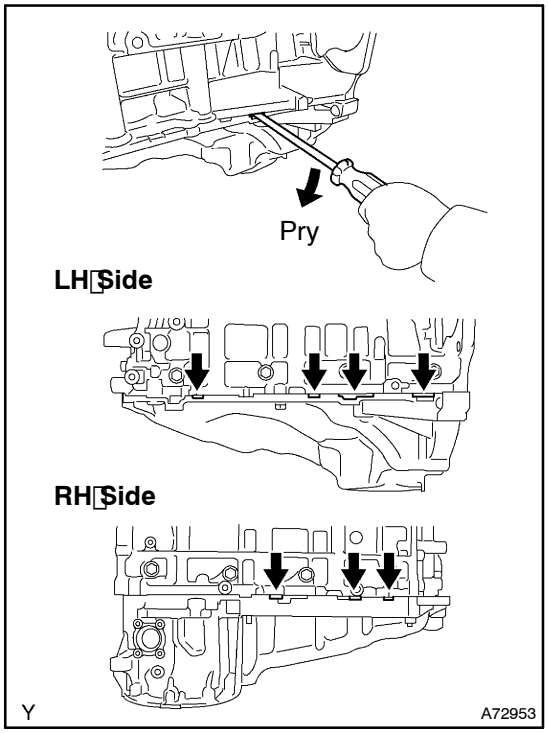
26. REMOVE OIL PAN SUB–ASSY

(a) Remove the 4 housing bolts.

(b) Remove the flywheel housing under cover.



(c) Remove 17 bolts and 2 nuts.



(d) Using a screwdriver, remove the oil pan by prying between the oil pan and cylinder block in the sequence shown.

NOTICE:

Be careful not to damage the contact surfaces of the cylinder block and oil pan.

(e) Remove the O-ring from the oil pump.

27. REMOVE INTAKE AIR SURGE TANK (See page 14–58)

28. REMOVE IGNITION COIL ASSY

29. REMOVE CYLINDER HEAD COVER SUB-ASSY RH (See page 14–58)

30. REMOVE CYLINDER HEAD COVER SUB-ASSY LH (See page 14–58)

31. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE ASSY

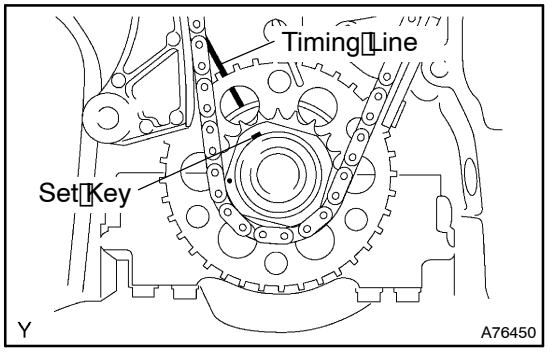
(a) Disconnect the 2 oil control valve connectors.

(b) Remove the 2 bolts and 2 camshaft timing oil control valves.

32. REMOVE VVT SENSOR (See page 18–5)

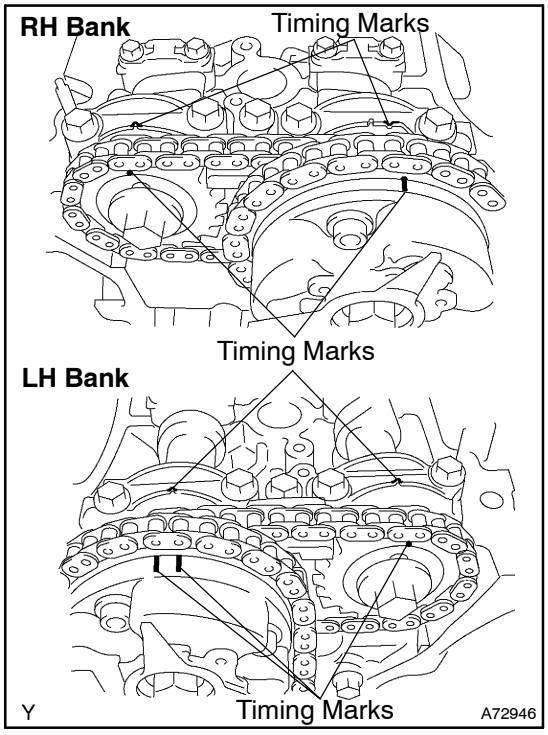
33. REMOVE TIMING CHAIN COVER SUB-ASSY (See page 17–9)

34. REMOVE TIMING CHAIN COVER OIL SEAL (See page 17–9)



35. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Using the crankshaft pulley set bolt, turn the crankshaft to align the crankshaft set key with the timing line of the cylinder block.



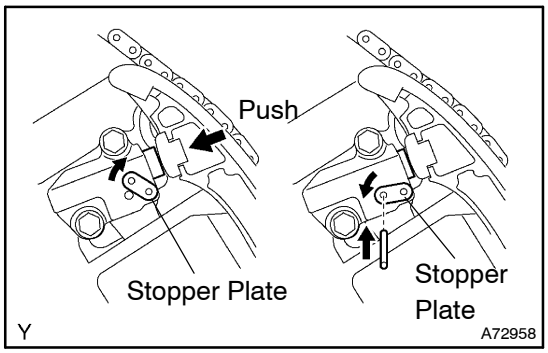
(b) Check that the timing marks of the camshaft timing gears are aligned with the timing marks of the bearing cap as shown in the illustration.

If not, turn the crankshaft 1 complete revolution (360°) and align the timing marks as above.

36. REMOVE CHAIN TENSIONER ASSY NO.1

NOTICE:

- **Never rotate the crankshaft with the chain tensioner removed.**
- **When rotating the camshaft with the timing chain removed, rotate the crankshaft counterclockwise 40° from the TDC first.**

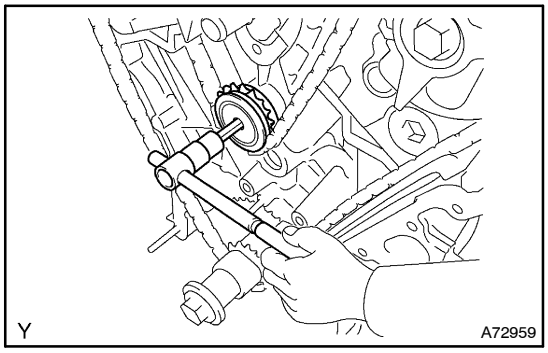


(a) While turning the stopper plate of the tensioner upward, push in the plunger of the chain tensioner as shown in the illustration.

(b) While turning the stopper plate of the tensioner downward, insert a bar of ϕ 3.5 mm (0.138 in.) into the holes in the stopper plate and tensioner to fix the stopper plate.

(c) Remove the 2 bolts and chain tensioner.

37. REMOVE CHAIN TENSIONER SLIPPER



38. REMOVE IDLE GEAR NO.1

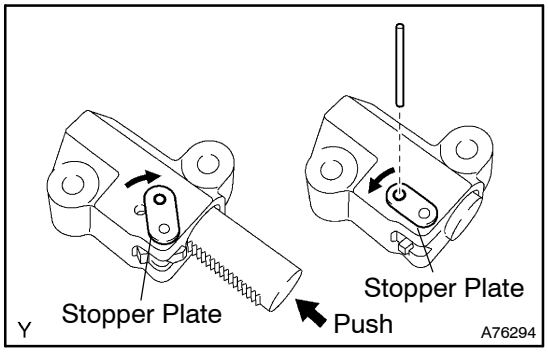
(a) Using a 10 mm hexagon wrench, remove the idle gear shaft No. 2, idle gear No. 1 and idle gear shaft No. 1.

39. REMOVE CHAIN VIBRATION DAMPER NO.2

(a) Remove the 2 chain vibration damper No. 2.

40. REMOVE CHAIN SUB–ASSY

41. INSTALL CHAIN TENSIONER SLIPPER



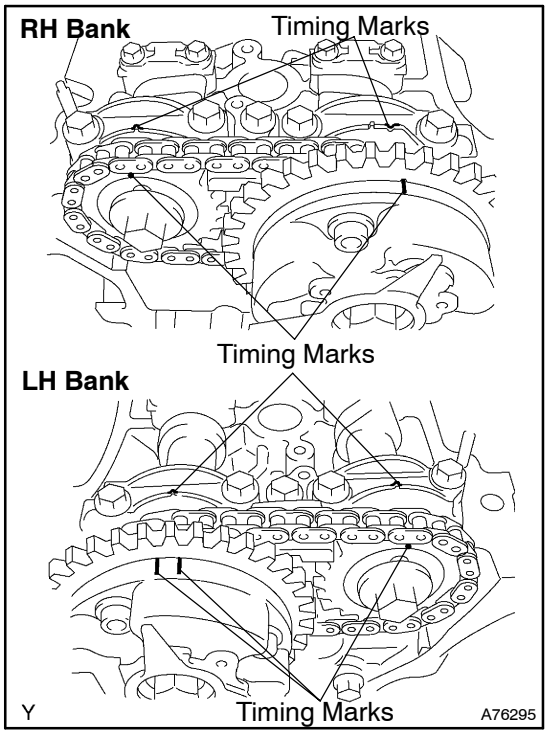
42. INSTALL CHAIN TENSIONER ASSY NO.1

(a) While turning the stopper plate of the tensioner clockwise, push in the plunger of the tensioner as shown in the illustration.

(b) While turning the stopper plate of the tensioner counterclockwise, insert a bar of ϕ 3.5 mm (0.138 in.) into the holes in the stopper plate and tensioner to fix the stopper plate.

(c) Install the chain tensioner with the 2 bolts.

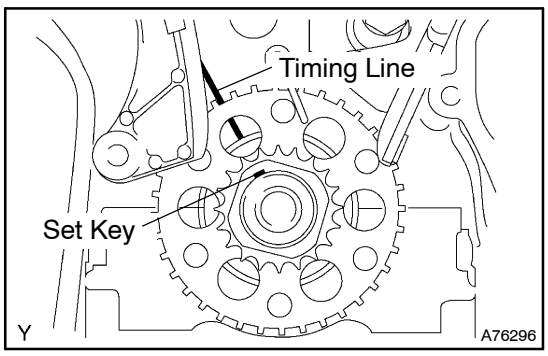
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



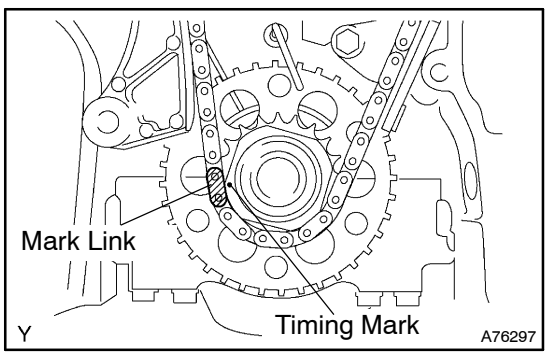
43. INSTALL CHAIN SUB–ASSY

(a) Set the No. 1 cylinder to TDC/ compression.

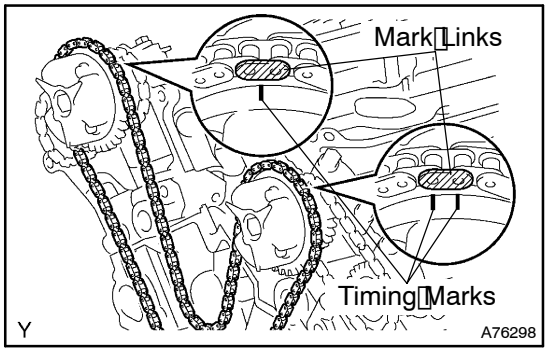
(1) Align the timing marks of the camshaft timing gears and bearing caps.



(2) Using the crankshaft pulley set bolt, turn the crankshaft to align the crankshaft set key with the timing line of the cylinder block.



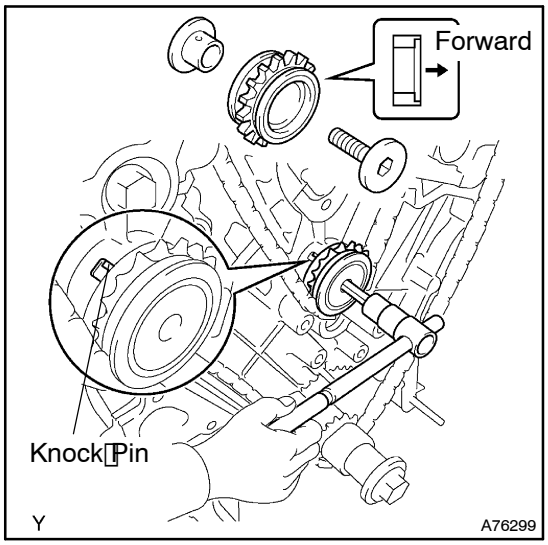
(b) Align the mark link (yellow) with the timing mark of the crankshaft timing gear.



(c) Align the mark links (orange) with the timing marks of the camshaft timing gears, and install the chain.

44. INSTALL CHAIN VIBRATION DAMPER NO.2

(a) Install the 2 chain vibration damper No.2.



45. INSTALL IDLE GEAR NO.1

(a) Apply a light coat of engine oil to rotating surface of the idle gear shaft No.1.

(b) Temporarily install the idle gear shaft No.1 and idle gear No.1 with the idle gear shaft No.2 while aligning the knock pin of the idle gear shaft No.1 with the knock pin groove of the cylinder block.

NOTICE:

Be careful of the idle gear direction.

(c) Using a 10 mm hexagon wrench, tighten the idle gear shaft No.2.

Torque: 60 N·m (612 kgf·cm, 44 ft·lbf)

(d) Remove the bar from the chain tensioner.

46. INSTALL TIMING CHAIN COVER OIL SEAL (See page 17–9)

SST 09226–10010

47. INSTALL TIMING CHAIN COVER SUB–ASSY (See page 17–9)

48. INSTALL VVT SENSOR (See page 18–5)

49. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSY

(a) Insert the camshaft timing oil control valves to each cylinder head, and tighten the 2 bolts.

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

50. INSTALL CYLINDER HEAD COVER SUB–ASSY LH (See page 14–58)

51. INSTALL CYLINDER HEAD COVER SUB–ASSY RH (See page 14–58)

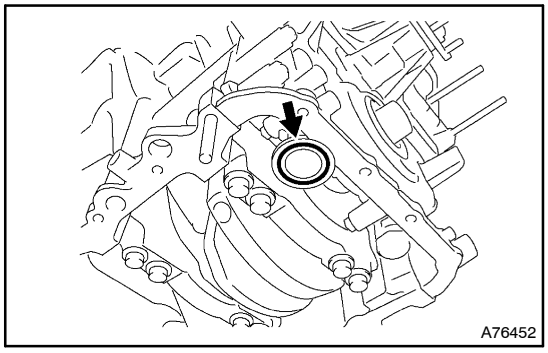
52. INSTALL IGNITION COIL ASSY

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

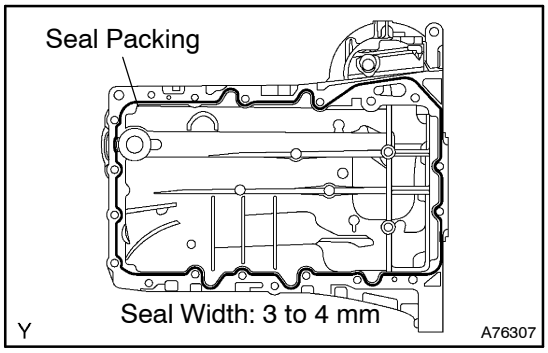
53. INSTALL INTAKE AIR SURGE TANK (See page 14–58)

54. INSTALL OIL PAN SUB–ASSY

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the cylinder block, rear oil seal retainer and oil pan.



(b) Install a new O–ring to the oil pump.

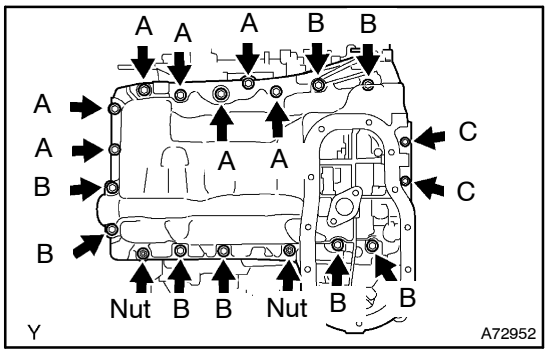


(c) Apply a continuous bead of the seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) to the oil pan as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

NOTICE:

Install the oil pan within 3 minutes after applying seal packing. After installing it, oil pan bolts and nuts must be tightened within 15 minutes. Otherwise the seal packing must be removed and reapplied.



(d) Install the oil pan with the 17 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.

Torque:

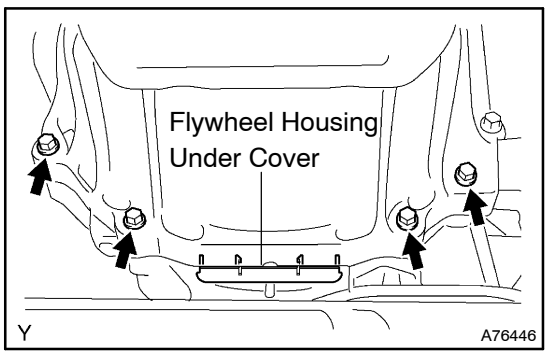
9.0 N·m (92 kgf·cm, 80 in.·lbf) for 10 mm (0.39 in.) head

19 N·m (194 kgf·cm, 14 ft·lbf) for 12 mm (0.47 in.) head

HINT:

Each bolt length as follows:

A 25 mm (0.98 in.)
B 40 mm (1.57 in.)
C 14 mm (0.55 in.)



(e) Install the 4 housing bolts.

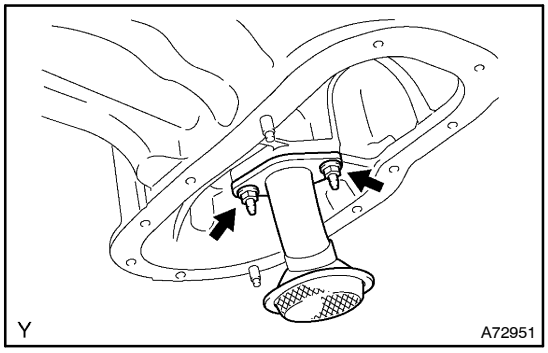
Torque: 37 N·m (377 kgf·cm, 27 ft·lbf)

(f) Install the flywheel housing under cover.

55. INSTALL ENGINE OIL LEVEL SENSOR (FOR EUROPE)

(a) Install a new gasket and engine oil level sensor with the 4 bolts.

Torque: 7.0 N·m (71 kgf·cm, 62 in.·lbf)

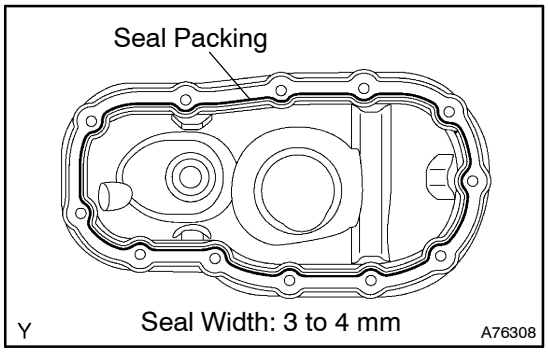


56. INSTALL OIL STRAINER SUB–ASSY

(a) Install a new gasket and the oil strainer with the 2 nuts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

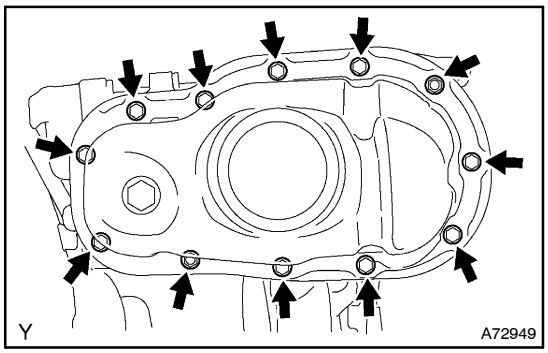
57. INSTALL OIL PAN SUB–ASSY NO.2

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the oil pan and oil pan No. 2.

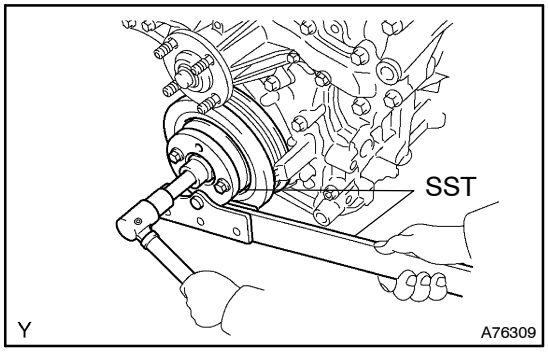


(b) Apply a continuous bead of the seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) as shown in the illustration.
Seal packing: Part No. 08826–00080 or equivalent

NOTICE:
Install the oil pan No. 2 within 3 minutes after applying seal packing. After installing it, oil pan No. 2 bolts and nuts must be tightened within 15 minutes. Otherwise the seal packing must be removed and reapplied.

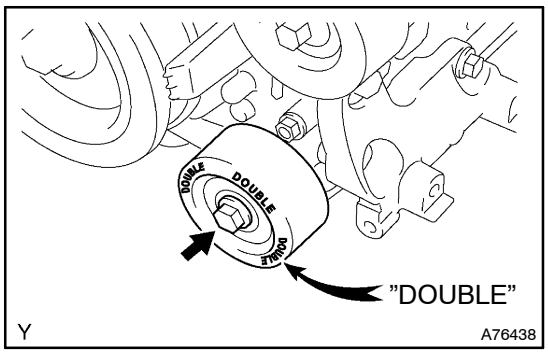


(c) Install the oil pan No. 2 with the 10 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)



58. INSTALL CRANKSHAFT PULLEY

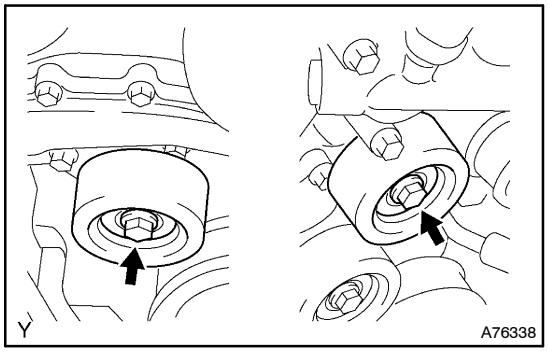
(a) Using SST, install the pulley set bolt.
SST 09213–54015 (91651–60855), 09330–00021
Torque: 250 N·m (2,549 kgf·cm, 184 ft·lbf)



59. INSTALL IDLER PULLEY SUB–ASSY NO.1

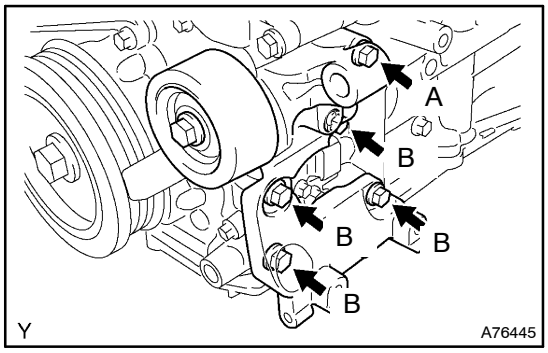
(a) Install the idler pulley with the bolt.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

HINT:
"DOUBLE" is marked on the idler pulley No. 1 to distinguish it from the idler pulley No. 2.



60. INSTALL IDLER PULLEY SUB-ASSY NO.2

(a) Install the 2 idler pulleys with the 2 bolts.
Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)



61. INSTALL V-RIBBED BELT TENSIONER ASSY

(a) Install the V-ribbed belt tensioner with the 5 bolts.
Torque: 36 N·m (367 kgf·cm, 27 ft·lbf)

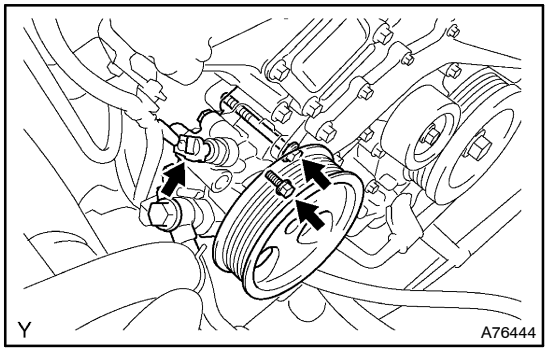
HINT:
Each bolt length as follows:
A 70 mm (2.76 in.)
B 33 mm (1.30 in.)

62. INSTALL IDLER PULLEY ASSY (W/O AIR CONDITIONING)

(a) Install the idler pulley with the 3 bolts.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

63. INSTALL COOLER COMPRESSOR ASSY (W/ AIR CONDITIONING) (See page 18-7)

64. INSTALL GENERATOR ASSY (See page 19-10)



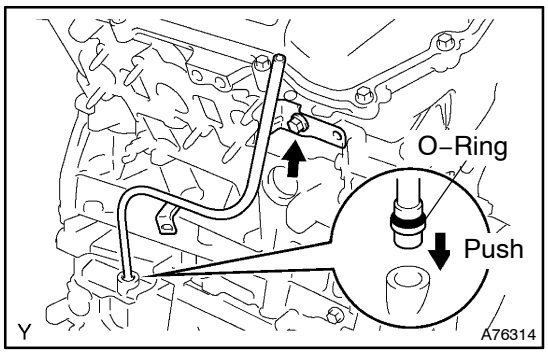
65. INSTALL VANE PUMP ASSY

(a) Install the vane pump with the 2 bolts.
Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

NOTICE:
Do not hit the pulley to other parts when installing the vane pump.

(b) Connect the P/S oil pressure switch connector.

66. INSTALL WATER INLET (See page 16-6)



67. INSTALL OIL LEVEL GAUGE GUIDE

(a) Install a new O-ring to the oil level gauge guide.
(b) Apply a light coat of engine oil to the O-ring.
(c) Push in the oil level gauge guide end into the guide hole of the oil pan.
(d) Install the oil level gauge guide with the bolt.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)
(e) Install the oil level gauge.

68. INSTALL AIR CLEANER ASSY (See page 10–7)
69. CONNECT VENTILATION HOSE NO.2
70. INSTALL FAN W/ FLUID COUPLING (See page 16–6)
71. INSTALL FAN AND GENERATOR V BELT (See page 14–5)
72. FULLY TIGHTEN FAN W/ FLUID COUPLING (See page 16–6)
73. INSTALL RADIATOR SUPPORT SEAL UPPER
74. INSTALL BATTERY
75. INSTALL DIFFERENTIAL CARRIER ASSY FRONT (See Pub. No. RM990E on page 29–13)
76. INSTALL POWER STEERING LINK ASSY (See Pub. No. RM990E on page 51–42)
77. ADD ENGINE OIL (See page 17–14)
78. ADD ENGINE COOLANT (See page 16–5)
79. CHECK FOR ENGINE OIL LEAKS
80. CHECK FOR ENGINE COOLANT LEAKS (See page 16–1)
81. INSTALL V–BANK COVER
(a) Install the V–bank cover with the 2 nuts.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)
82. INSPECT IGNITION TIMING (See page 14–1)
SST 09843–18040