

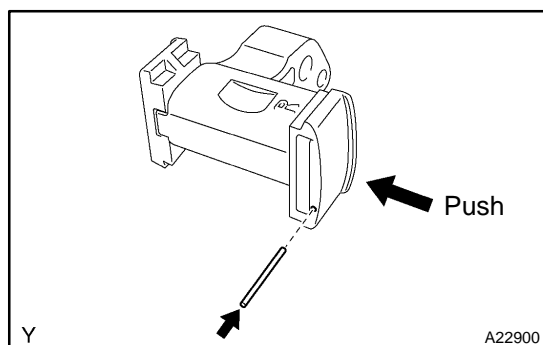
INSTALLATION

1. SET CRANKSHAFT POSITION

Using the crankshaft pulley set bolt, turn the crankshaft, and set the crankshaft set key into the left horizontal position.

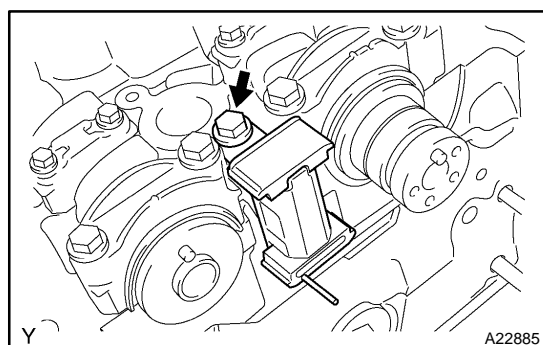
NOTICE:

Having the crankshaft at the wrong angle can cause the piston head and valve head to come into contact with each other when you install the camshaft, causing damage. So always set the crankshaft at the correct angle.

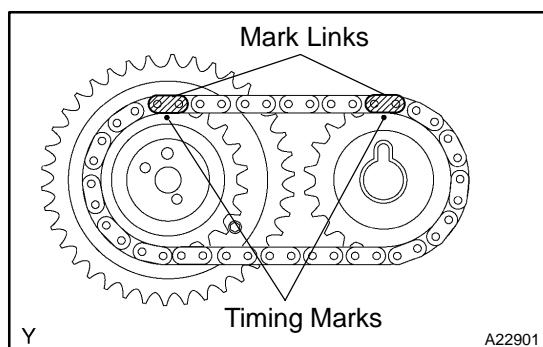


2. INSTALL CHAIN TENSIONER NO.2

- (a) While pushing in the tensioner, insert a pin of ϕ 1.0 mm (0.039 in.) into the hole to fix it.

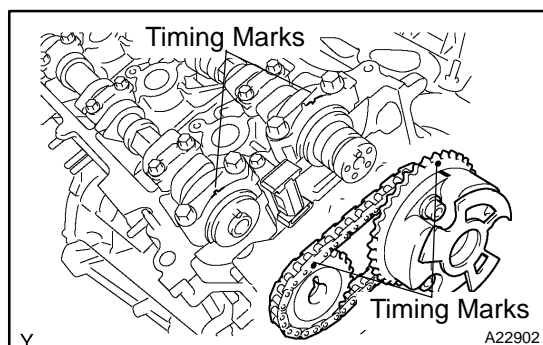


- (b) Install the chain tensioner No. 2 with the bolt.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



3. INSTALL NO.2 TIMING CHAIN

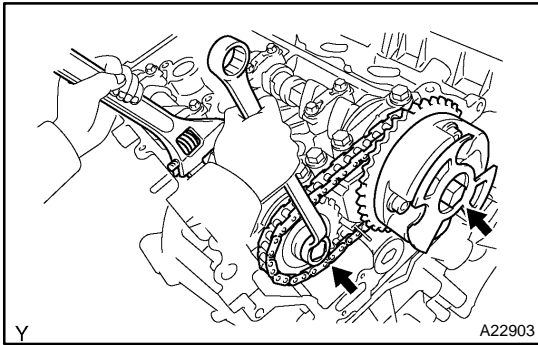
- (a) Align the mark links (yellow) with the timing marks (1-dot mark) of the camshaft timing gear assembly and camshaft timing sprocket as shown in the illustration.



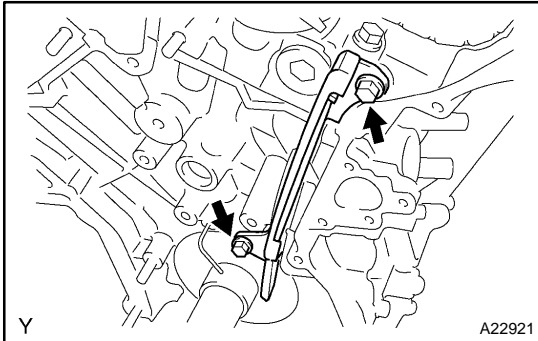
- (b) Align the timing marks on the camshaft timing gear assembly and camshaft timing sprocket with the timing marks on the bearing caps, and install the camshaft timing gears with the chain to the RH camshafts.
- (c) Temporarily install the 2 camshaft timing gear bolts.

NOTICE:

Do not push camshaft timing gear assembly to the camshaft forcibly when installing it.

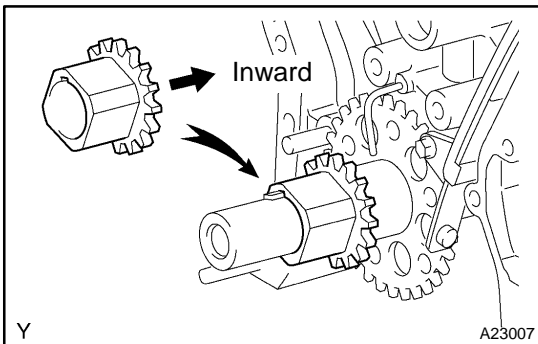


- (d) Hold the hexagonal portion of the camshaft with a wrench, and tighten the 2 bolts.
Torque: 100 N·m (1,020 kgf·cm, 74 ft·lbf)
- (e) Remove the pin from the chain tensioner No. 2.



4. INSTALL CHAIN VIBRATION DAMPER NO.1

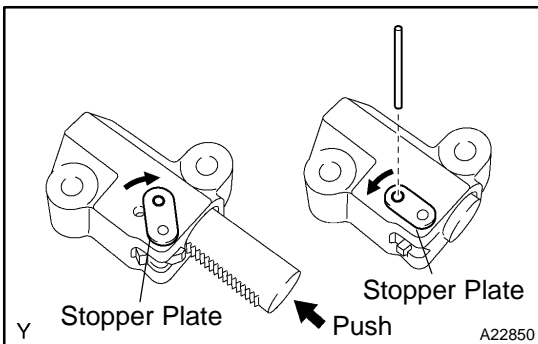
- (a) Install the chain vibration damper No. 1 with the 2 bolts.
Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)



5. INSTALL CRANKSHAFT TIMING SPROCKET

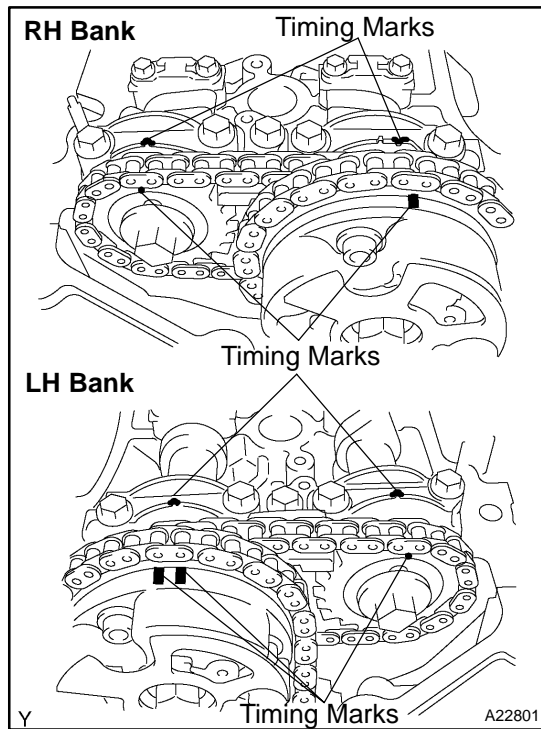
- (a) Align the timing gear set key with the key groove of the timing sprocket.
- (b) Install the timing gear onto the crankshaft with the sprocket side facing inward.

6. INSTALL CHAIN TENSIONER SLIPPER



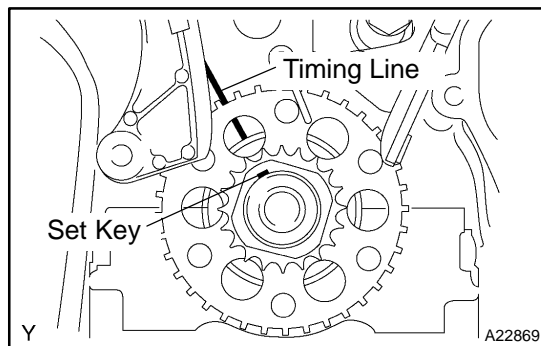
7. INSTALL CHAIN TENSIONER NO.1

- (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 counter-clockwise, 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: 10 N·m (102 kgf·cm, 7 ft·lbf)

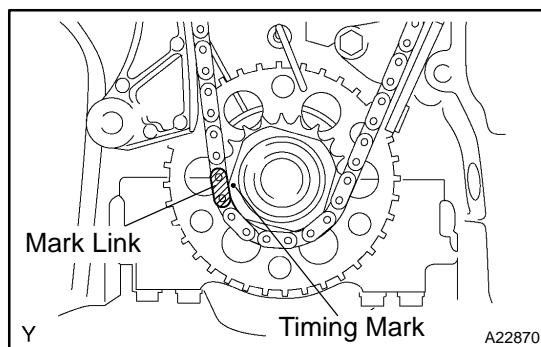


8. SET NO.1 CYLINDER TO TDC/COMPRESSION

- (a) Align the timing marks of the camshaft timing gear assembly, camshaft timing sprocket and bearing caps.

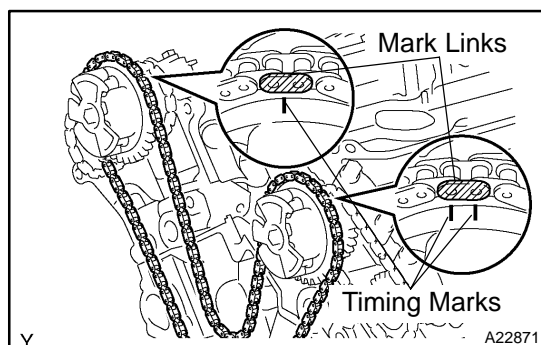


- (b) Using the crankshaft pulley set bolt, turn the crankshaft to align the crankshaft set key with the timing line of the cylinder block.



9. INSTALL TIMING CHAIN NO.1

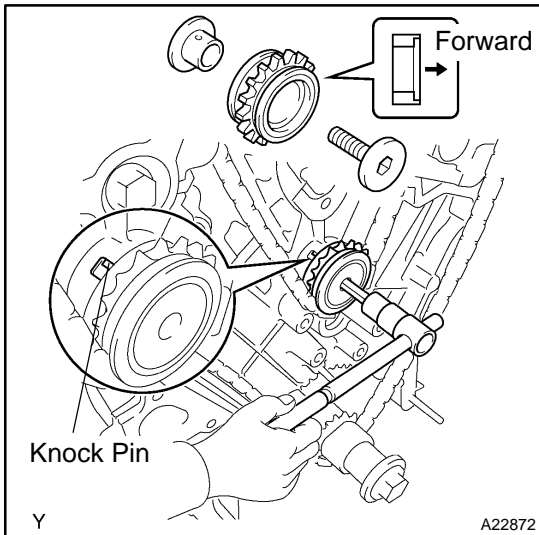
- (a) Align the mark link (yellow) with the timing mark of the crankshaft timing sprocket.



- (b) Align the mark links (orange) with the timing marks of the camshaft timing gear assembly and camshaft timing sprocket, and install the chain.

10. INSTALL CHAIN VIBRATION DAMPER NO.2

Install the 2 chain vibration damper No.2.



11. INSTALL IDLE GEAR NO.1

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

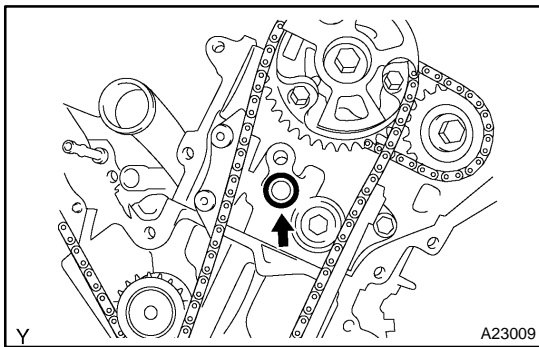
- Using a 10 mm hexagon wrench, tighten the idle gear shaft No. 2.

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

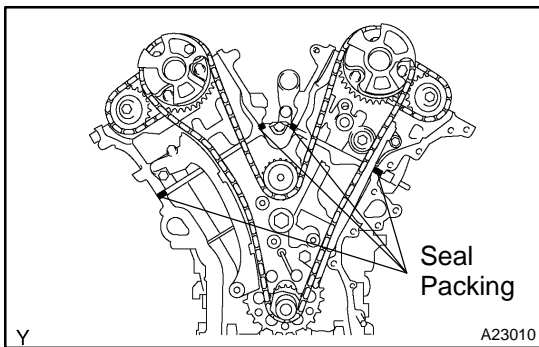
- Remove the bar from the chain tensioner.

12. INSTALL TIMING CHAIN COVER

- Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the timing chain cover, cylinder head and cylinder block.

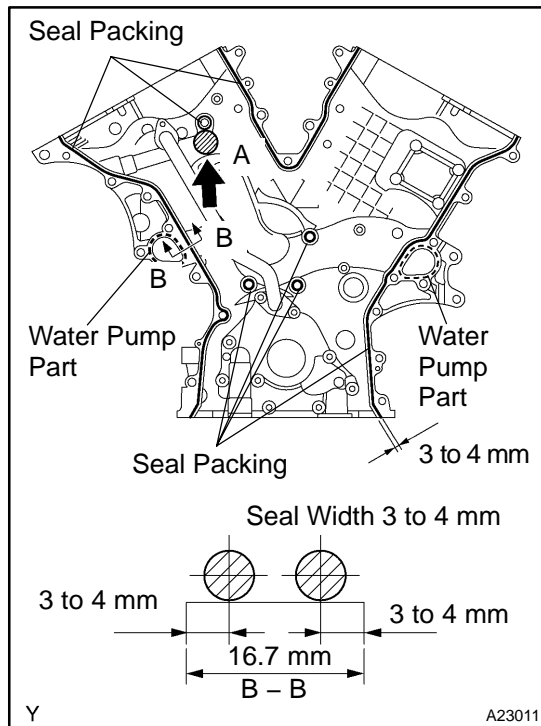


- Install a new O-ring to the LH cylinder head as shown in the illustration.



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

Seal packing: Part No. 08826-00080 or equivalent



- (d) Apply a continuous bead of seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) to the timing chain cover as shown in the illustration.

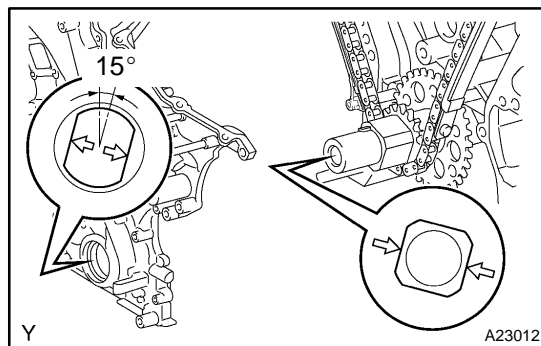
Seal packing:

Water pump part: Part No. 08826-00100 or equivalent

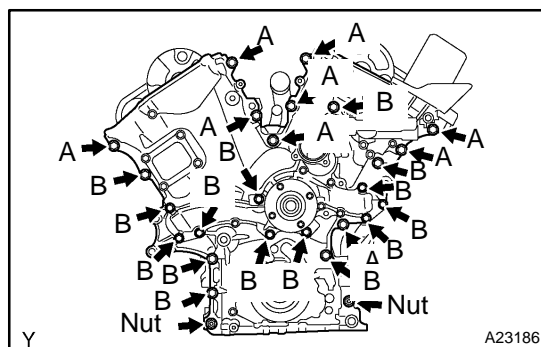
Other part: Part No. 08826-00080 or equivalent

NOTICE:

- Install the timing chain cover within 3 minutes after applying seal packing. After installing it, the timing chain cover bolts and nuts must be tightened within 15 minutes. Otherwise the seal packing must be removed and reapplied.
- Do not apply seal packing to the "A" as shown in the illustration.



- (e) Align the key way of the oil pump drive rotor with the rectangular portion of the crankshaft timing gear, and slide the timing chain cover into place.



- (f) Install the timing chain cover with the 24 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.

Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

NOTICE:

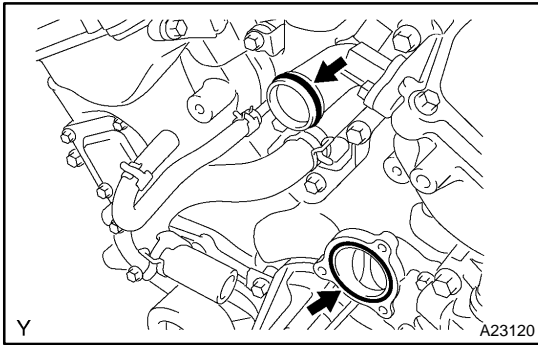
- Pay attention not to wrap the chain and slipper over the timing chain cover seal line.
- Install the water pump within 15 minutes after installing the timing chain cover.

HINT:

Each bolt length is as follows:

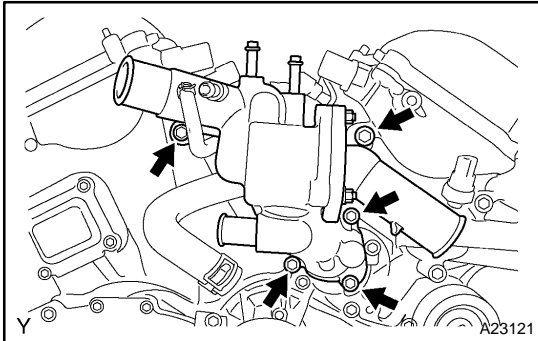
A: 25 mm (0.98 in.)

B: 55 mm (2.17 in.)

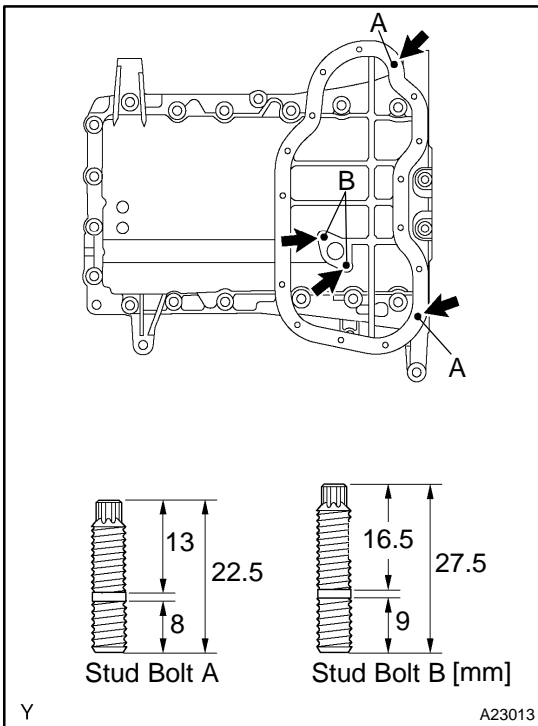


13. INSTALL WATER INLET

- (a) Install a new O-ring to the water outlet pipe.
- (b) Install a new gasket to the water pump.
- (c) Apply soapy water to the O-ring.

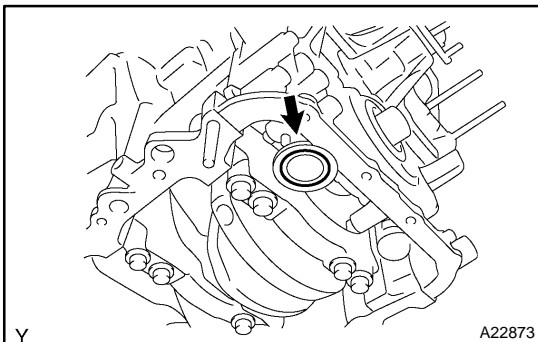


- (d) Install the water inlet with the 5 bolts.
Torque: 9.0 N·m (92 kgf·cm, 80 in·lbf)
- (e) Connect the 5 water by-pass hoses.
- (f) Connect the 2 radiator hoses.
- (g) Connect the 2 oil cooler hoses (w/ oil cooler).

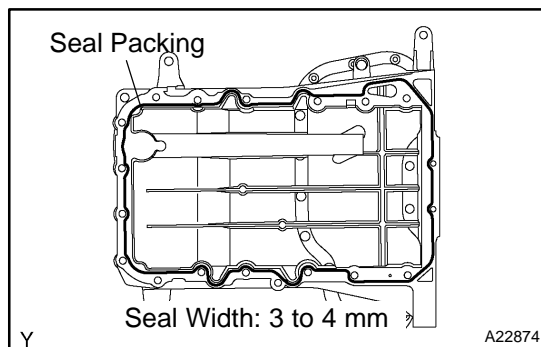


14. INSTALL OIL PAN

- (a) Install the 4 stud bolts.
Torque: 4.0 N·m (41 kgf·cm, 35 in·lbf)
- (b) Remove any old packing material (FIPG) and be careful not to drop any oil on the contact surfaces of the cylinder block, rear oil seal retainer and oil pan.



- (c) Install a new O-ring to the oil pump.

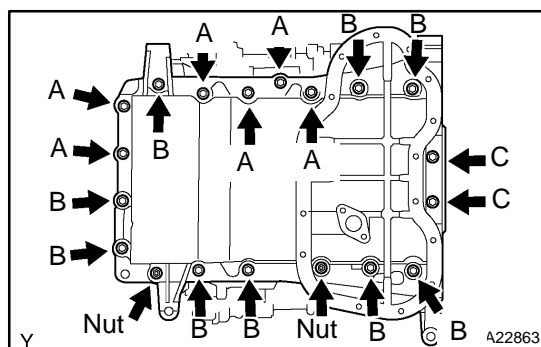


- (d) Apply a continuous bead of seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) to the oil pan as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

NOTICE:

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



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

Torque:

Bolt A, B, Nut: 21 N·m (214 kgf·cm, 15 ft·lbf)

Bolt C: 10 N·m (102 kgf·cm, 7 ft·lbf)

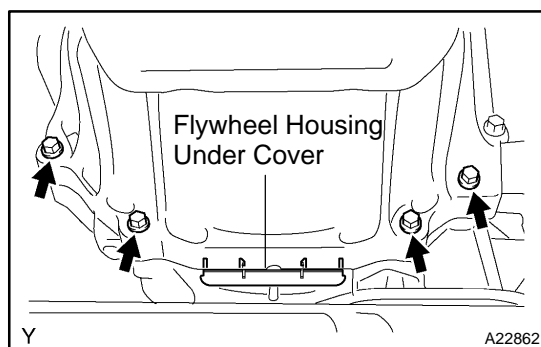
HINT:

Each bolt length is as follows:

A: 25 mm (0.98 in.)

B: 45 mm (1.77 in.)

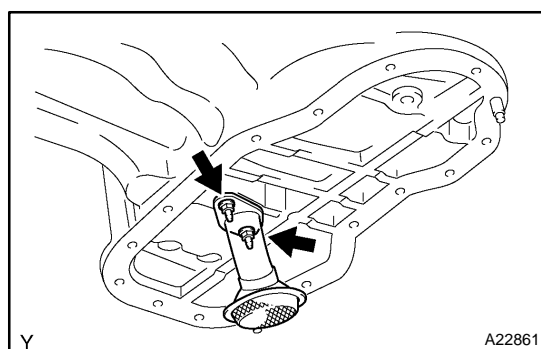
C: 14 mm (0.55 in.)



- (f) Install the 4 housing bolts.

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

- (g) Install the flywheel housing under cover.



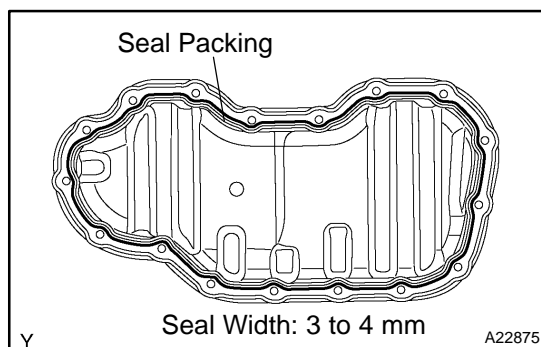
15. INSTALL OIL STRAINER

- (a) Install a new gasket and the oil strainer with the 2 nuts.

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

16. INSTALL OIL PAN NO.2

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

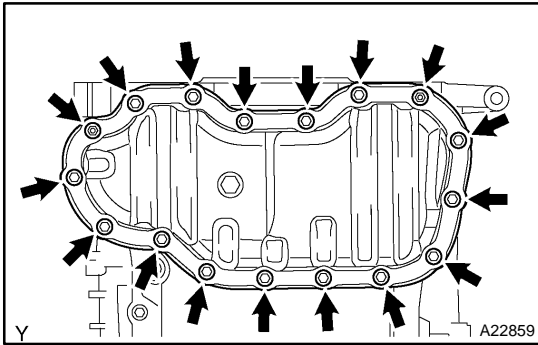


- (b) Apply a continuous bead of the seal packing (diameter 3 to 4 mm (0.12 to 0.16 in.)) as shown in the illustration.

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, the oil pan No. 2 bolts and nuts must be tightened within 15 minutes. Otherwise the seal packing must be removed and reapplied.

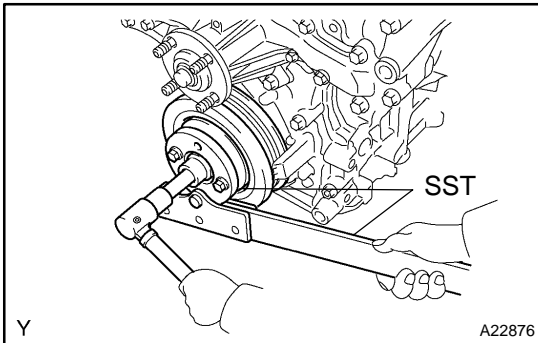


- (c) Install the oil pan No. 2 with the 15 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.

Torque:

Bolt: 9.0 N·m (92 kgf·cm, 80 in.-lbf)

Nut: 10 N·m (102 kgf·cm, 7 ft·lbf)

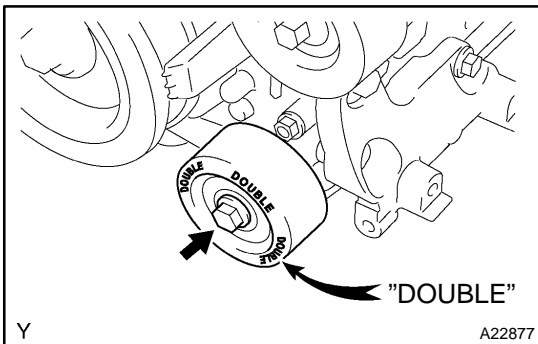


17. INSTALL CRANKSHAFT PULLEY

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)



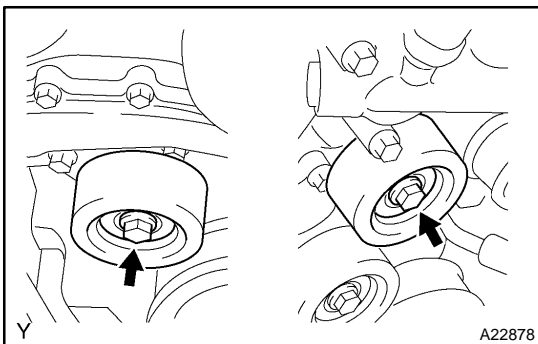
18. INSTALL IDLER PULLEY NO.1

Install the idler pulley with the bolt.

Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

HINT:

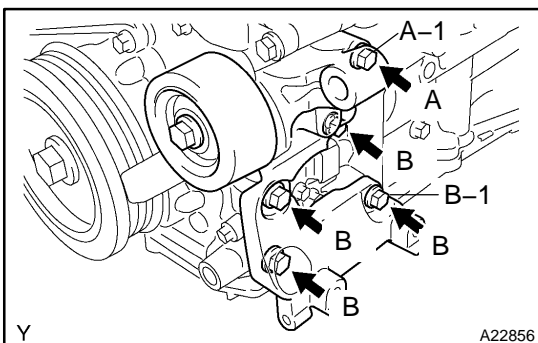
"DOUBLE" is marked on the idler pulley No. 1 to distinguish it from the idler pulley No. 2.



19. INSTALL IDLER PULLEY NO.2

Install the 2 idler pulleys with the 2 bolts.

Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)



20. INSTALL V-RIBBED BELT TENSIONER ASSY

Tighten bolts A-1 and B-1 in order first, then tighten the remaining bolts.

Torque: 36 N·m (367 kgf·cm, 27 ft·lbf)

HINT:

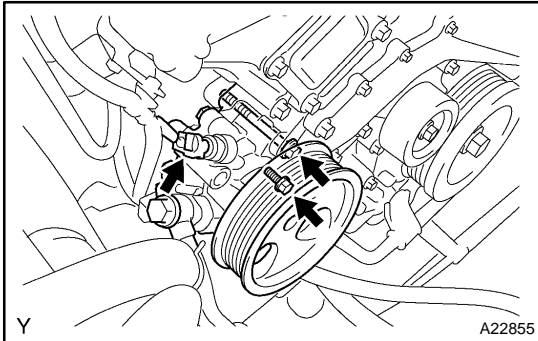
Each bolt length is as follows:

A: 70 mm (2.76 in.)

B: 33 mm (1.30 in.)

21. INSTALL COOLER COMPRESSOR

(See page [AC-58](#))

22. INSTALL GENERATOR (See page [CH-15](#))**23. INSTALL VANE PUMP**

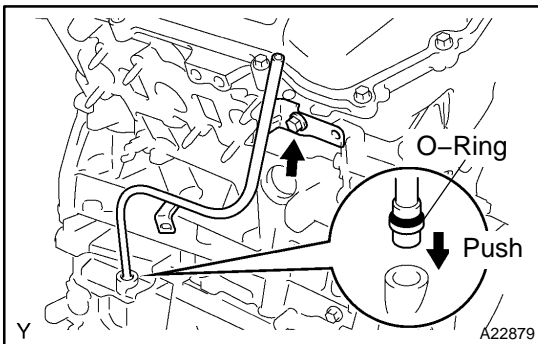
- (a) Install the vane pump with the 2 bolts.

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.

24. INSTALL WATER INLET (See page [EM-89](#))**25. 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.

**26. INSTALL CYLINDER HEAD COVER
(See page [EM-89](#))****27. INSTALL INTAKE AIR SURGE TANK
(See page [EM-89](#))****28. INSTALL AIR CLEANER (See page [EM-89](#))****29. INSTALL FAN W/FLUID COUPLING
(See page [EM-89](#))****30. INSTALL DRIVE BELT (See page [EM-89](#))****31. FULLY TIGHTEN FAN W/FLUID COUPLING****32. INSTALL RADIATOR (See page [CO-18](#))****33. INSTALL V-BANK COVER****34. INSTALL BATTERY****35. ADD ENGINE OIL (See page [LU-3](#))****36. ADD ENGINE COOLANT (See page [CO-2](#))****37. CHECK FOR LEAKS****38. CHECK IGNITION TIMING (See page [EM-23](#))****39. CHECK IDLE SPEED (See page [EM-25](#))**