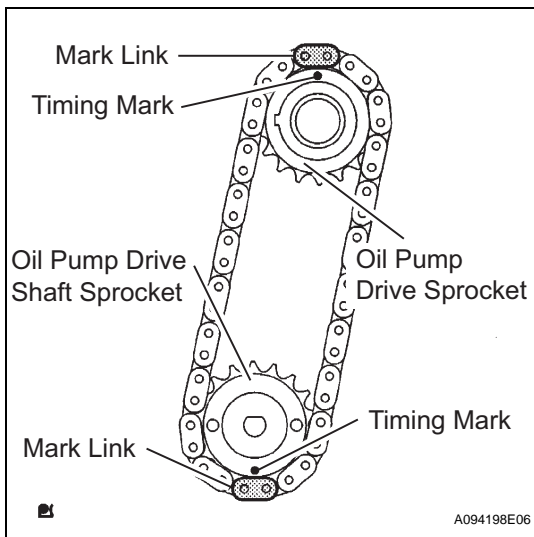
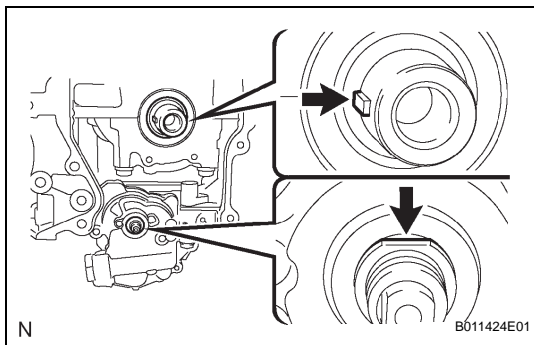


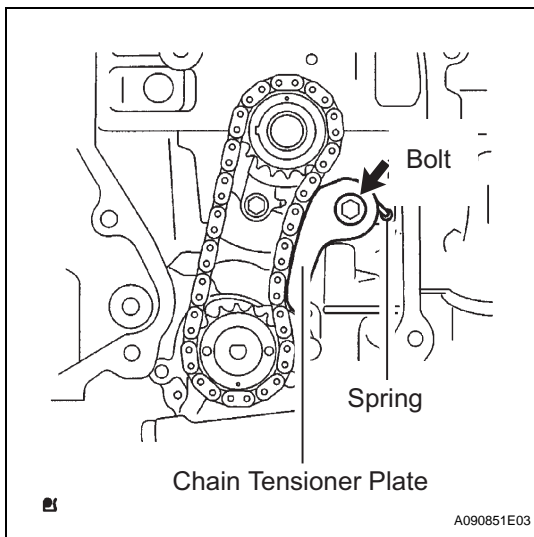
INSTALLATION

1. INSTALL NO. 2 CHAIN SUB-ASSEMBLY

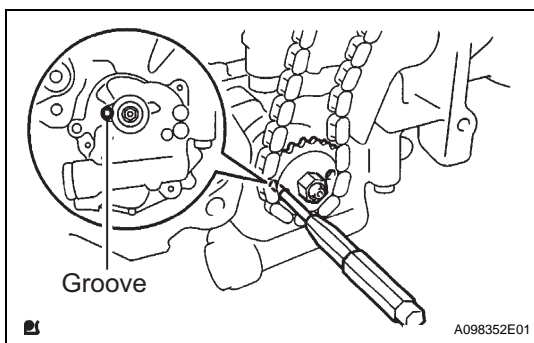
- (a) Set the crankshaft key in the left horizontal position.
- (b) Turn the cutout of the drive shaft so that it faces upward.



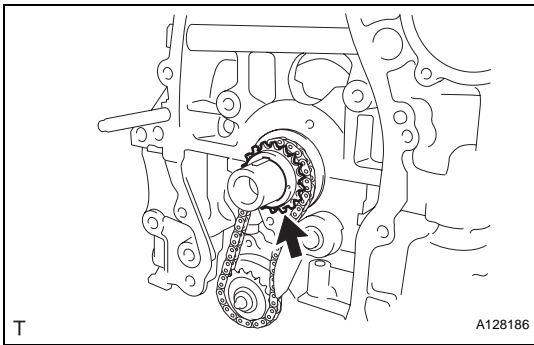
- (c) Align the yellow mark links with the timing marks of each gear as shown in the illustration.
- (d) Install the sprockets onto the crankshaft and oil pump shaft with the chain wrapped on the gears.
- (e) Temporarily tighten the oil pump drive shaft sprocket with the nut.



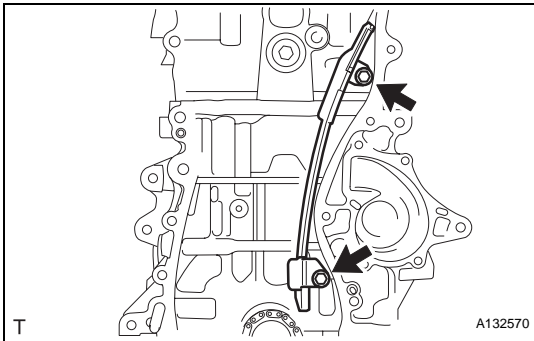
- (f) Insert the damper spring into the adjusting hole, and then install the chain tensioner plate with the bolt.
Torque: 12 N*m (122 kgf*cm, 9 ft.*lbf)



- (g) Align the adjusting hole of the oil pump drive shaft sprocket with the groove of the oil pump.
- (h) Insert a 4 mm diameter bar into the adjusting hole of the oil pump drive shaft gear to lock the gear in position, and then tighten the nut.
Torque: 29.5 N*m (301 kgf*cm, 22 ft.*lbf)

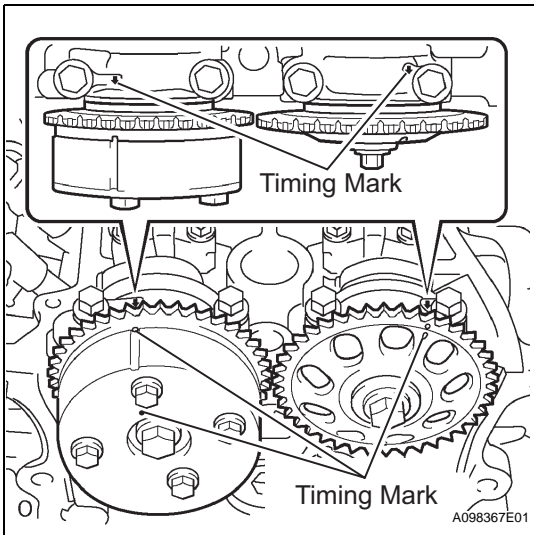


2. INSTALL CRANKSHAFT TIMING SPROCKET



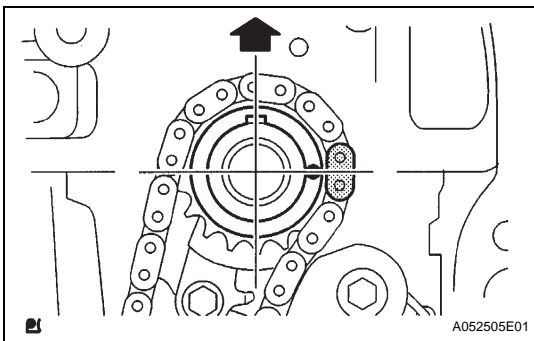
3. INSTALL NO. 1 CHAIN VIBRATION DAMPER

- (a) Install the chain vibration damper with the 2 bolts.
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

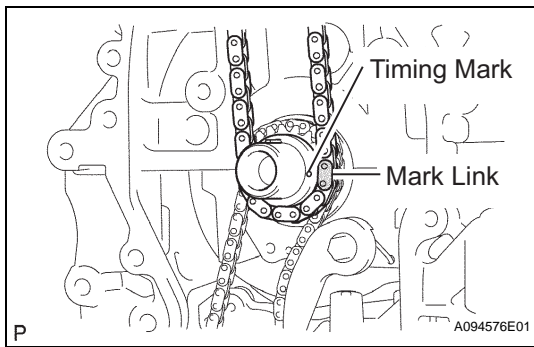


4. INSTALL CHAIN SUB-ASSEMBLY

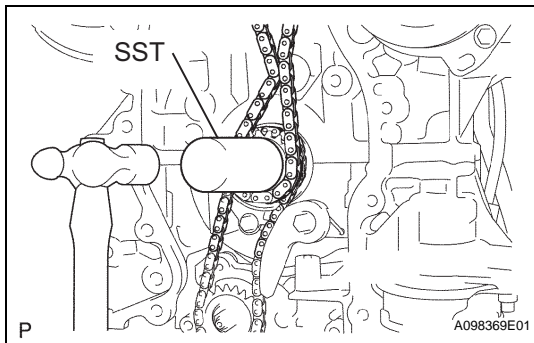
- (a) Set the No. 1 cylinder to TDC/compression.
- (1) Turn the camshafts with a wrench (using the hexagonal lobe) to align the timing marks of the camshaft timing gear with each timing mark located on the No. 1 and No. 2 bearing caps as shown in the illustration.



- (2) Using the crankshaft pulley bolt, turn the crankshaft to position the key on the crankshaft upward.

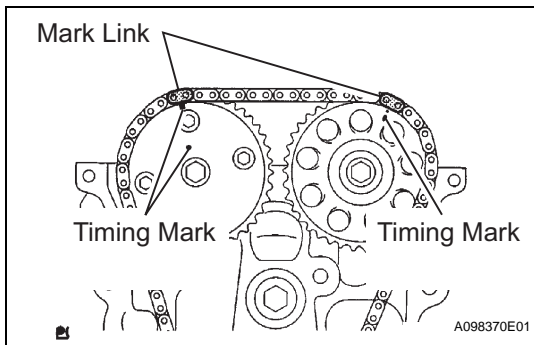


- (b) Install the chain onto the crankshaft timing sprocket with the gold or orange mark link aligned with the timing mark on the crankshaft.

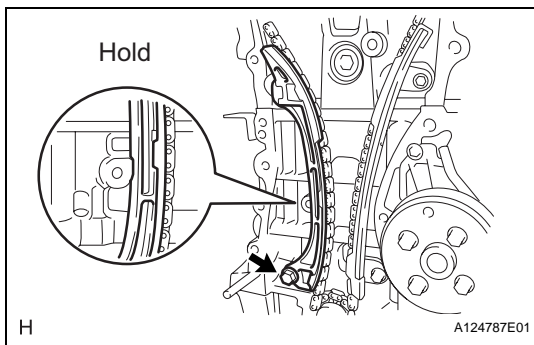


- (c) Using SST and a hammer, tap in the crankshaft timing sprocket.

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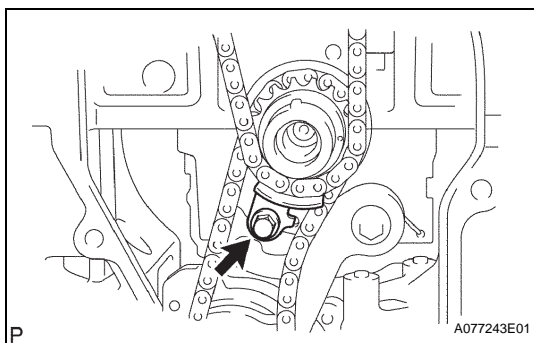


- (d) Align the gold or yellow links with each timing mark located on the camshaft timing gear and sprocket, then install the chain.



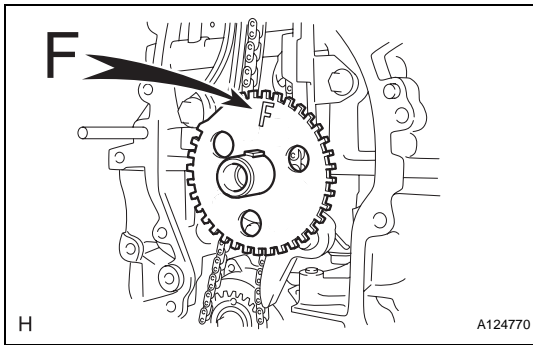
5. INSTALL CHAIN TENSIONER SLIPPER

- (a) Install the chain tensioner slipper with the bolt.
Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)



6. INSTALL TIMING CHAIN GUIDE

- (a) Install the timing chain guide with the bolt.
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

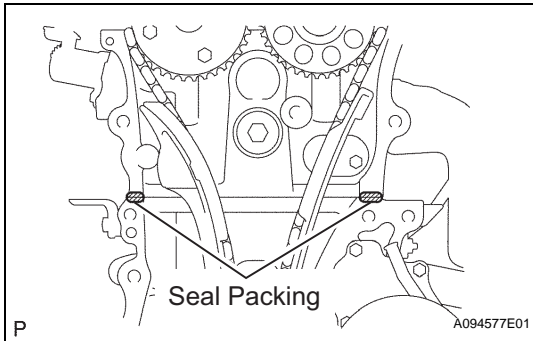


7. INSTALL NO. 1 CRANKSHAFT POSITION SENSOR PLATE

- (a) Install the sensor plate with the "F" mark facing forward.

8. INSTALL TIMING CHAIN COVER SUB-ASSEMBLY

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



- (b) Apply seal packing (Diameter 4.0 to 4.5 mm (0.157 to 0.177 in.)) as shown in the illustration.

Seal packing:

Toyota Genuine Seal Packing Block, Three Bond 1207B or Equivalent

NOTICE:

- Remove any oil from the contact surface.
- Install the chain cover within 3 minutes of applying seal packing.
- Do not add engine oil for at least 2 hours after installing the chain cover.

- (c) Apply a continuous bead of seal packing as shown in the illustration.

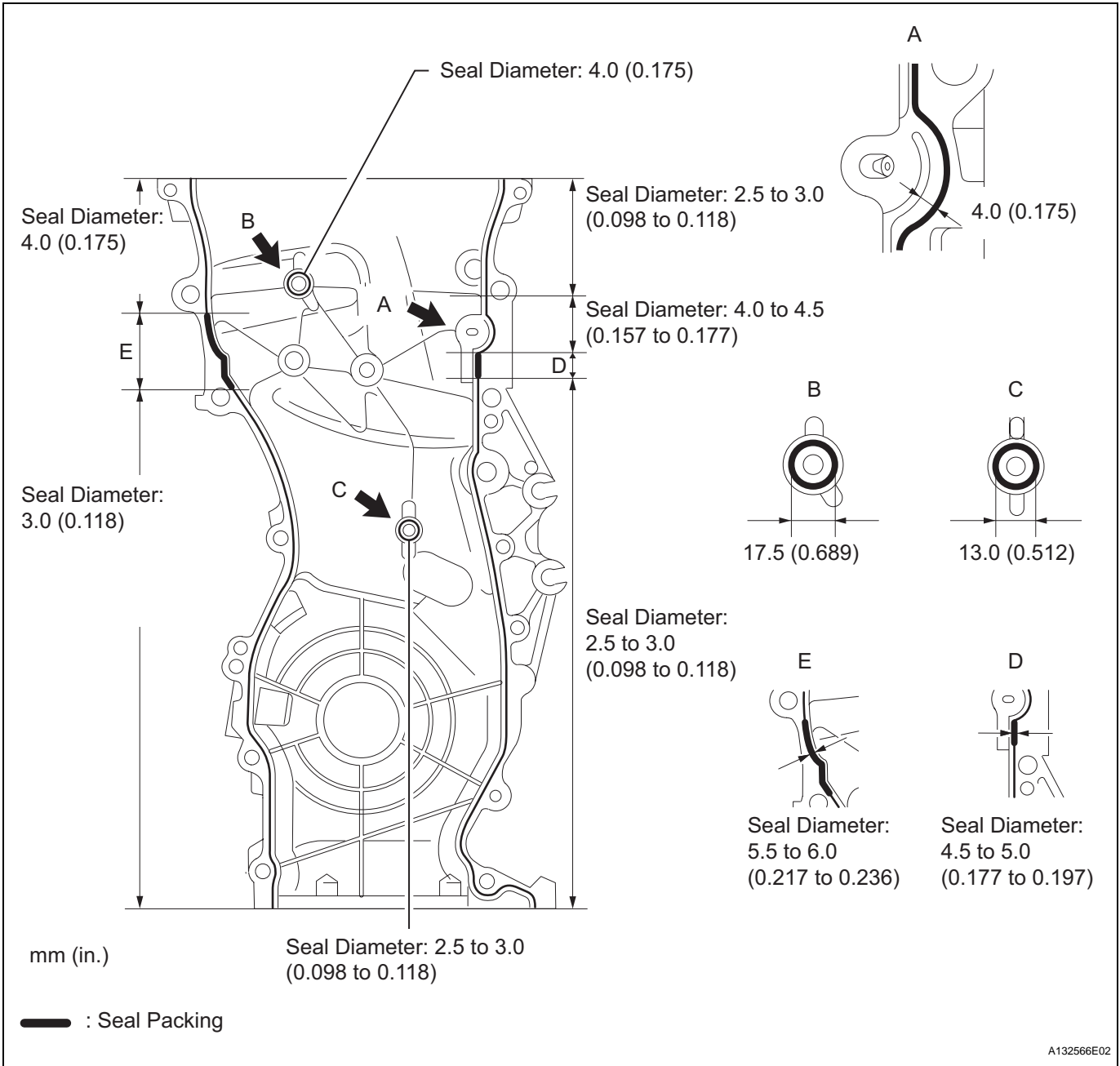
Seal packing:

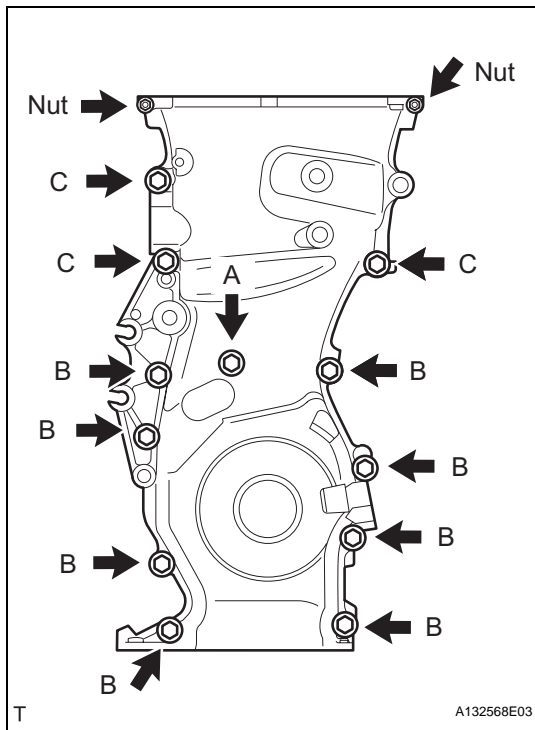
Toyota Genuine Seal Packing Block, Three Bond 1207B or Equivalent

NOTICE:

- Remove any oil from the contact surface.
- Install the chain cover within 3 minutes of applying seal packing.

- Do not add engine oil for at least 2 hours after installing the chain cover.





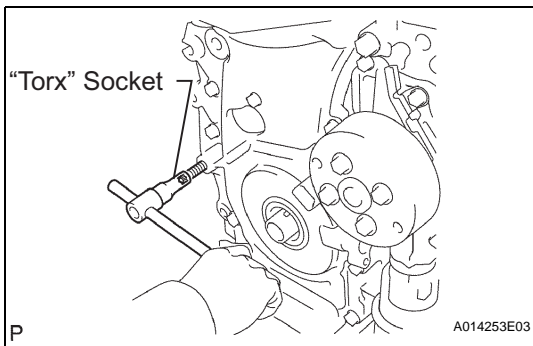
- (d) Install the timing chain cover with the 12 bolts and 2 nuts.

Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf) for bolt A
25 N*m (255 kgf*cm, 18 ft.*lbf) for bolt B
55 N*m (561 kgf*cm, 41 ft.*lbf) for bolt C
11 N*m (112 kgf*cm, 8 ft.*lbf) for nut

HINT:

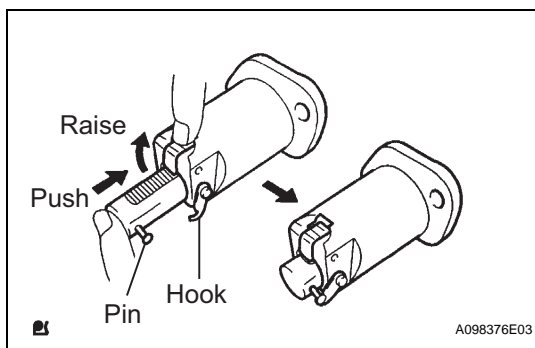
Bolt length:

| | |
|--------|--|
| Bolt A | 30 mm (1.18 in.) length for 10 mm head |
| Bolt B | 30 mm (1.18 in.) length for 12 mm head |
| Bolt C | 40 mm (1.57 in.) length for 14 mm head |



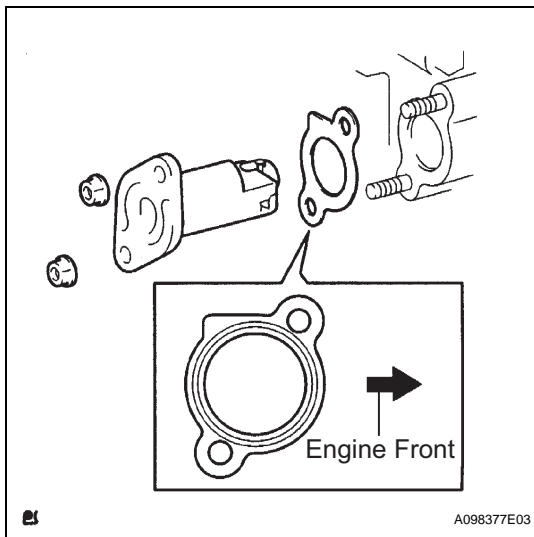
- (e) Using an E10 "torx" socket, install the stud bolt for the V-ribbed belt tensioner.

Torque: 21.5 N*m (219 kgf*cm, 16 ft.*lbf)



9. INSTALL NO. 1 CHAIN TENSIONER ASSEMBLY

- (a) Release the ratchet pawl, then fully push in the plunger and hook the hook to the pin so that the plunger is in the position shown in the illustration.



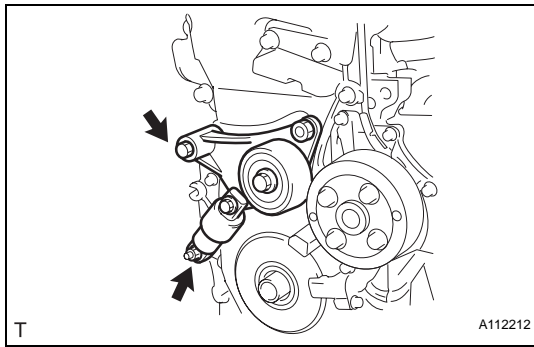
- (b) Install a new gasket and the chain tensioner with the 2 nuts.

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

NOTICE:

When installing the chain tensioner, set the hook again if the hook releases the plunger.

EM



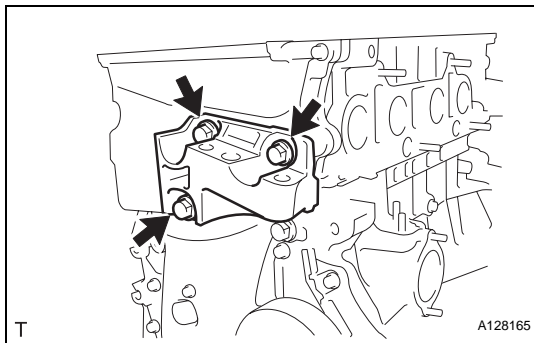
10. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY

- (a) Install the V-ribbed belt tensioner with the bolt and nut.

Torque: 59.5 N*m (607 kgf*cm, 44 ft.*lbf)

NOTICE:

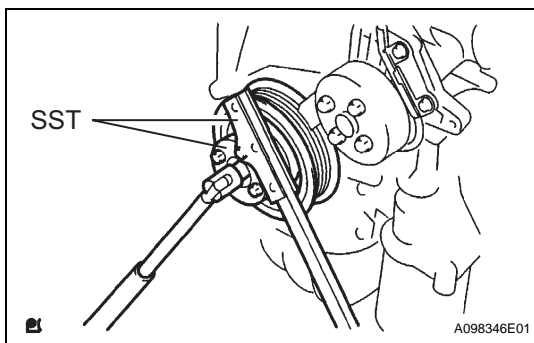
Do not lift the engine more than necessary.



11. INSTALL ENGINE MOUNTING BRACKET RH

- (a) Install the engine mounting bracket RH with the 3 bolts.

Torque: 55 N*m (561 kgf*cm, 41 ft.*lbf)

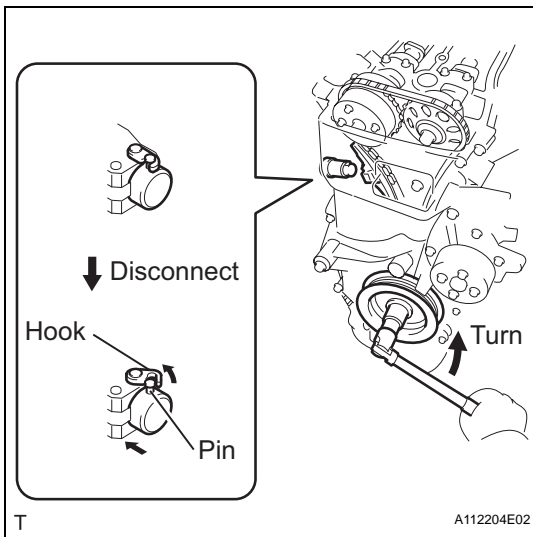


12. INSTALL CRANKSHAFT PULLEY

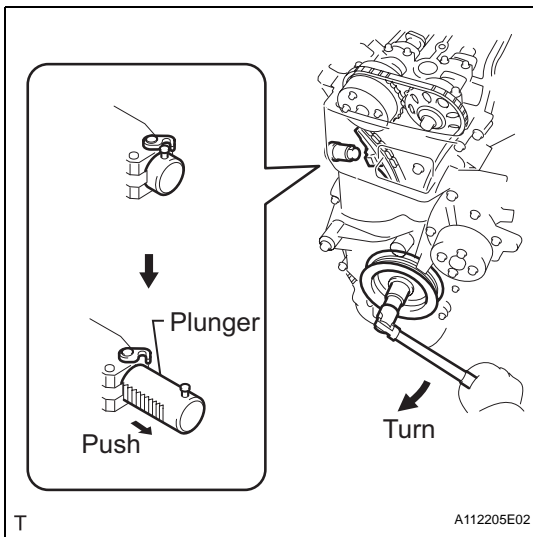
- (a) Using SST, fix the pulley in place and tighten the bolt.

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Torque: 180 N*m (1,835 kgf*cm, 133 ft.*lbf)



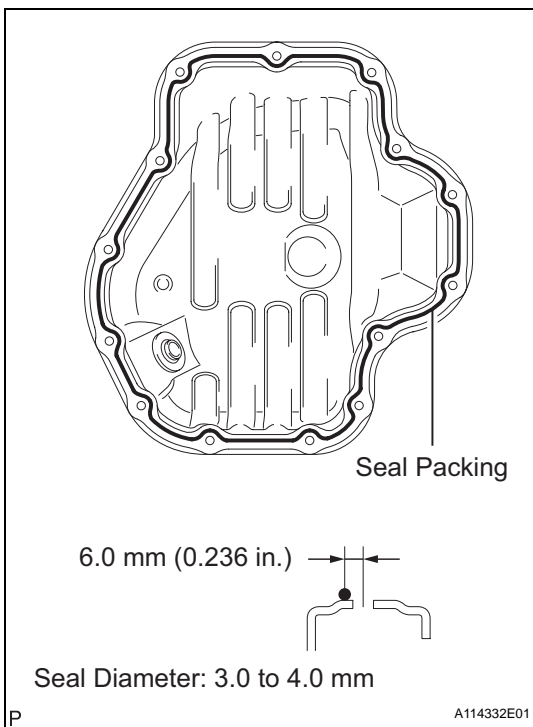
- (b) Turn the crankshaft counterclockwise, then disconnect the plunger knock pin from the hook.



- (c) Turn the crankshaft clockwise, then check that the plunger is extended.

13. INSTALL OIL PAN SUB-ASSEMBLY

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



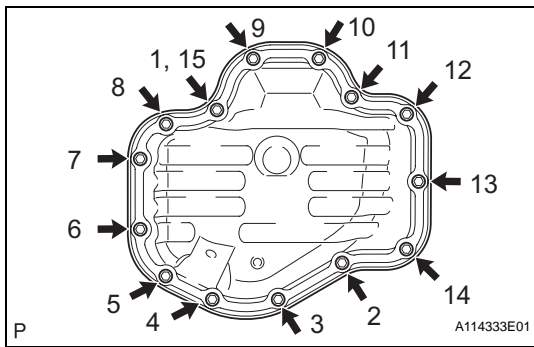
- (b) Apply a continuous bead of seal packing (Diameter 3.0 to 4.0 mm (0.118 to 0.157 in.)) as shown in the illustration.

Seal packing:

Toyota Genuine Seal Packing Block, Three Bond 1207B or Equivalent

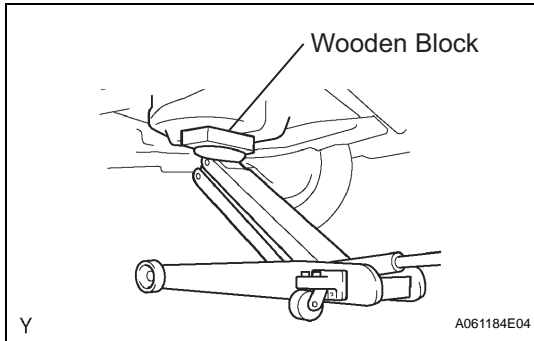
NOTICE:

- Remove any oil from the contact surface.
 - Install the oil pan within 3 minutes of applying seal packing.
 - Do not add engine oil for at least 2 hours after installing the oil pan.
- (c) Install the oil pan to the cylinder block.



- (d) Uniformly tighten the 12 bolts and 2 nuts in the sequence shown in the illustration.

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



- (e) Place a transmission jack underneath the engine, then put a wooden block on the jack.

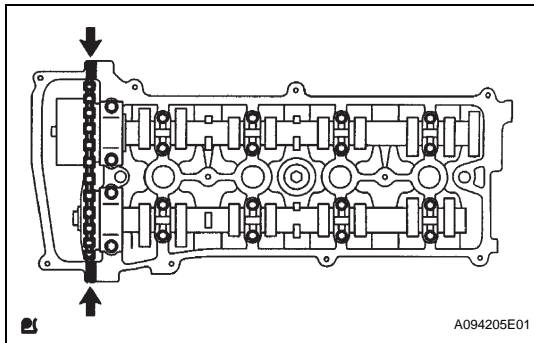
- (f) Remove the chain block and sling device.

- (g) Remove the No. 1 and No. 2 engine hangers.

14. INSTALL CRANKSHAFT POSITION SENSOR (See page ES-402)

15. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY

- (a) Remove any old packing material from the contact surface.



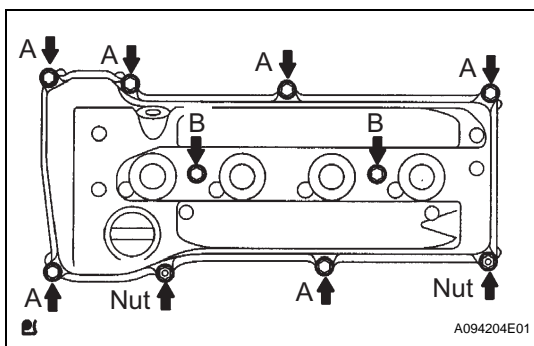
- (b) Apply seal packing to the 2 locations shown in the illustration.

Seal packing:

Toyota Genuine Seal Packing Block, Three Bond 1207B or Equivalent

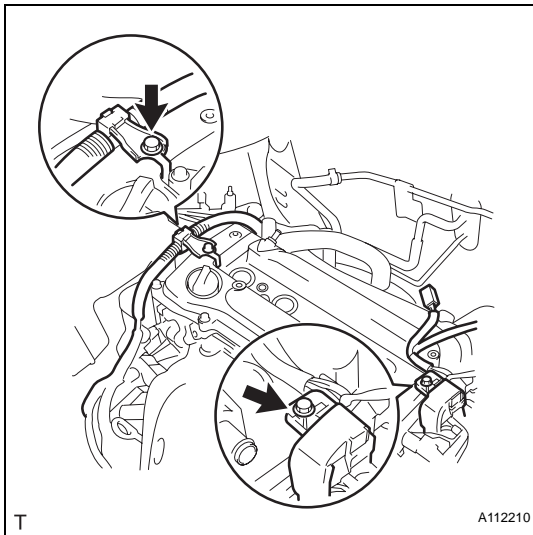
NOTICE:

- Remove any oil from the contact surface.
- Install the oil pan within 3 minutes of applying seal packing.
- Do not add engine oil for at least 2 hours after installing the oil pan.

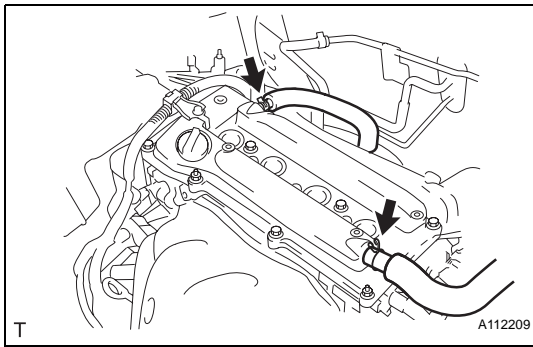


- (c) Install the cylinder head cover with the 8 bolts and 2 nuts.

Torque: 11 N*m (112 kgf*cm, 8 ft.*lbf) for bolt A
14 N*m (143 kgf*cm, 10 ft.*lbf) for bolt B
11 N*m (112 kgf*cm, 8 ft.*lbf) for nut



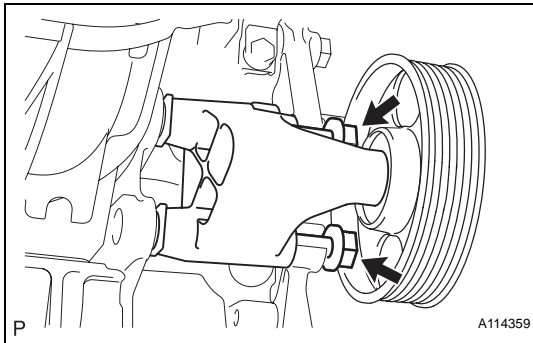
- (d) Install the 2 engine wires with the 2 bolts.
Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)



- (e) Connect the 2 ventilation hoses to the cylinder head cover.

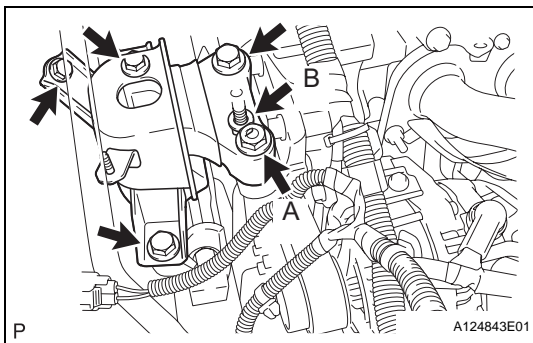
16. INSTALL SPARK PLUG (See page EM-16)

17. INSTALL IGNITION COIL ASSEMBLY (See page IG-9)



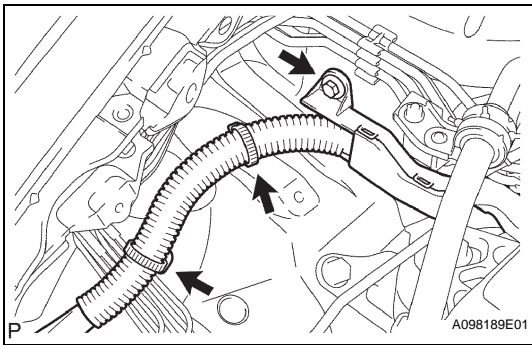
18. INSTALL IDLER PULLEY

- (a) Install the idler pulley with the 2 bolts.
Torque: 60 N*m (612 kgf*cm, 44 ft.*lbf)

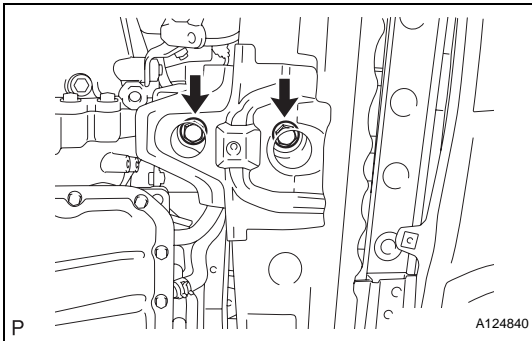


19. INSTALL ENGINE MOUNTING INSULATOR RH

- (a) Install the engine mounting insulator RH with the 4 bolts and 2 nuts.
Torque: 95 N*m (969 kgf*cm, 70 ft.*lbf) for bolt
95 N*m (969 kgf*cm, 70 ft.*lbf) for nut A
52 N*m (530 kgf*cm, 38 ft.*lbf) for nut B



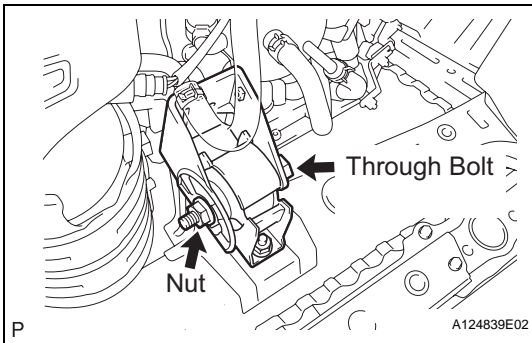
- (b) Connect the 2 clamps of the engine wire.
- (c) Install the wire harness protector with the bolt.



20. INSTALL ENGINE MOUNTING INSULATOR FR

- (a) Install the engine mounting insulator FR with the 2 bolts.

Torque: 95 N*m (969 kgf*cm, 70 ft.*lbf)

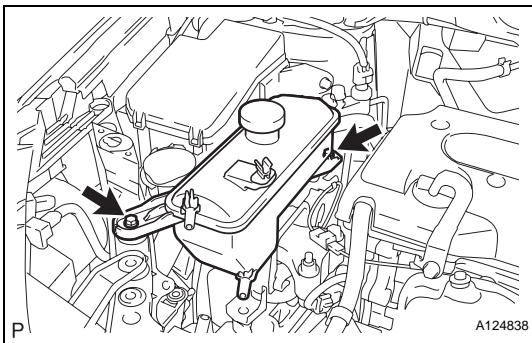


- (b) Install the through bolt and nut.

Torque: 145 N*m (1,479 kgf*cm, 107 ft.*lbf)

HINT:

Install the bolt which is used to secure the front engine mounting bracket FR.



21. INSTALL RADIATOR RESERVOIR

- (a) Install the radiator reservoir with the 2 bolts.

Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

22. INSTALL GENERATOR ASSEMBLY (See page [CH-15](#))

23. INSTALL FAN AND GENERATOR V BELT (See page [EM-7](#))

24. INSTALL FRONT SUSPENSION MEMBER REINFORCEMENT RH (See page [EM-7](#))

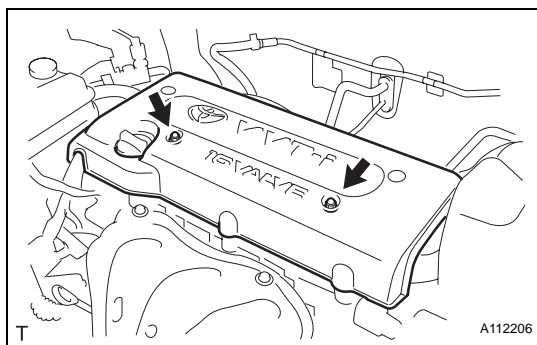
25. INSTALL FRONT EXHAUST PIPE (See page [EX-4](#))

26. ADD ENGINE OIL (See page [LU-4](#))

27. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

28. CHECK FOR ENGINE OIL LEAKS

29. CHECK FOR EXHAUST GAS LEAKS

**30. INSTALL NO. 1 ENGINE COVER**

- (a) Install the engine cover with the 2 nuts.
Torque: 7.0 N*m (71 kgf*cm, 62 in.*lbf)

31. INSTALL FRONT FENDER APRON RH**32. INSTALL NO. 1 ENGINE UNDER COVER****33. INSTALL FRONT WHEEL RH****34. INSTALL RADIATOR SUPPORT OPENING COVER**