

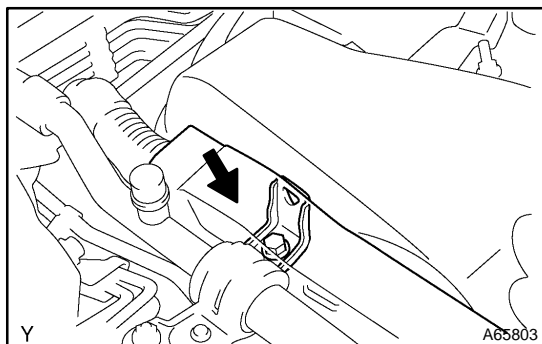
## REPLACEMENT

### 1. REMOVE ENGINE UNDER COVER RH

### 2. DRAIN COOLANT (See page 16-6)

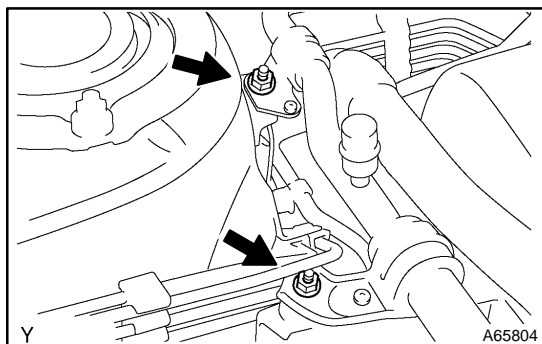
### 3. REMOVE CYLINDER HEAD COVER NO.2

- (a) Remove the 3 bolts, the nut and the cylinder head cover No. 2.



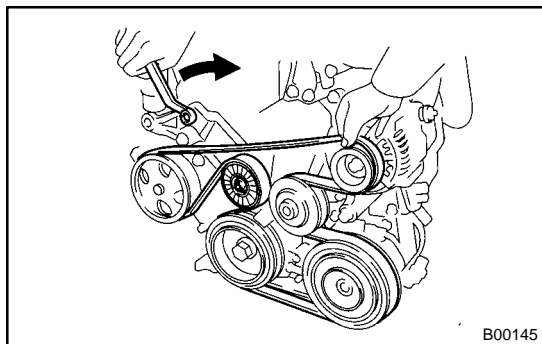
### 4. REMOVE WIRE HARNESS CLAMP

- (a) Disconnect engine wire harness.  
(b) Remove the bolt and wiring harness clamp bracket.



### 5. DISCONNECT SUCTION HOSE SUB-ASSY

- (a) Remove the 2 nuts installing the suction hose sub-assy.  
(b) Disconnect the suction hose sub-assy.



### 6. REMOVE FAN AND GENERATOR V BELT

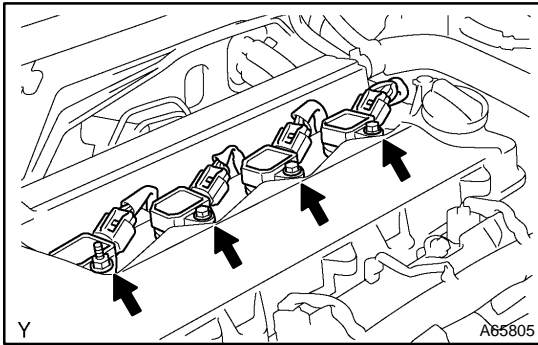
- (a) Turn the drive belt tensioner slowly clockwise and loosen it. Then, remove the drive belt and put back the drive belt tensioner little by little and fix it quietly.

### 7. REMOVE GENERATOR BRACKET NO.1 (See page 19-15)

### 8. REMOVE GENERATOR ASSY (See page 19-15)

### 9. DISCONNECT ENGINE WIRE

- (a) Disconnect the ignition coil connectors, oil control valve and crankshaft position sensor connector.  
(b) Remove the bolt and nut for the earth and put the engine wiring side.

**10. REMOVE IGNITION COIL ASSY**

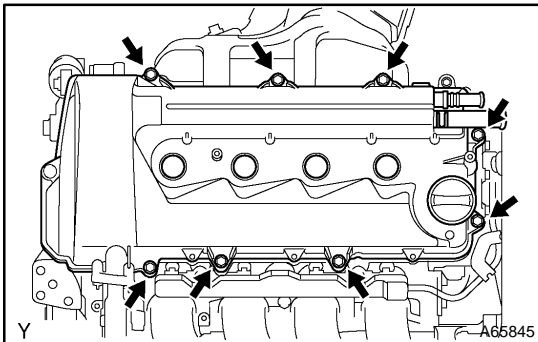
- (a) Remove the 4 bolts and the 4 ignition coils.

**11. REMOVE CYLINDER HEAD COVER SUB-ASSY**

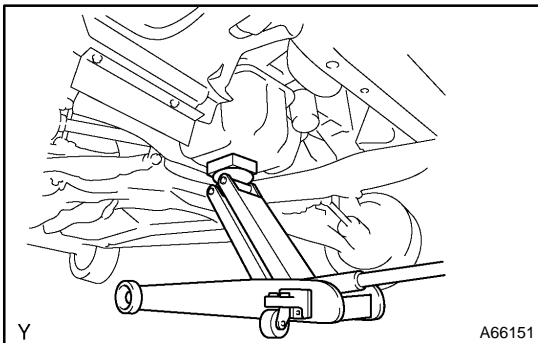
- (a) Disconnect the fuel hose clamp and 2 PCV hoses from the cylinder head cover.



- (b) Remove the 2 nuts, bolt and disconnect the No. 3 ventilation hose from the No. 1 ventilation pipe.  
(c) Disconnect the ventilation No. 1 tube and gasket.



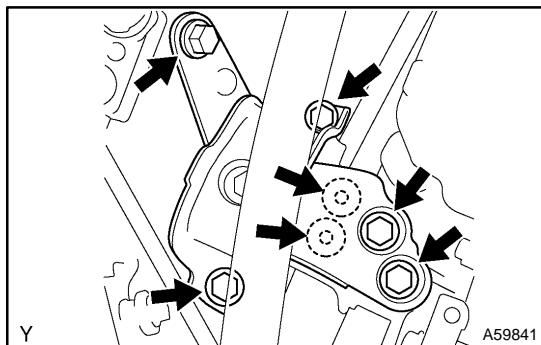
- (d) Remove the 8 bolts, wire harness protector, cylinder head cover and gasket.  
(e) Remove the O-ring from the cylinder head cover.

**12. REMOVE ENGINE MOUNTING INSULATOR SUB-ASSY RH**

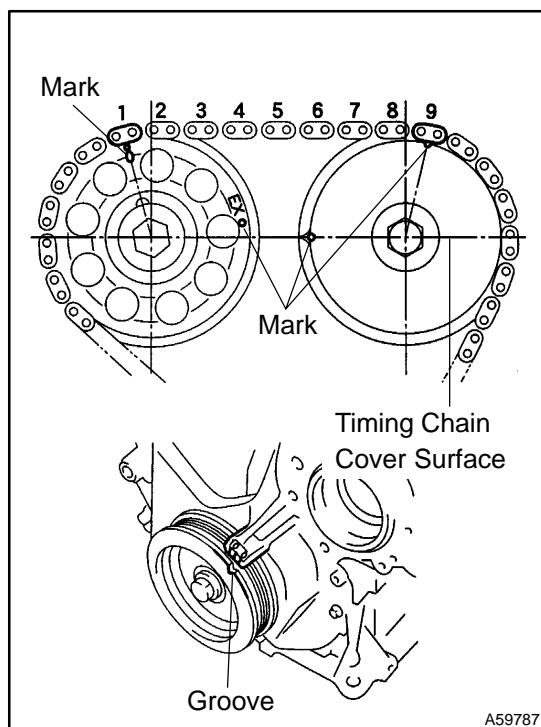
- (a) Set the jack to the engine.

HINT:

Place a wooden block between the jack and engine.



- (b) Remove the 5 bolts, 2 nuts and engine mounting insulator sub-assy RH.



### 13. SET NO. 1 CYLINDER TO TDC/COMPRESSION

- (a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the timing chain cover.
- (b) Check that the point marks of the camshaft timing sprocket and VVT timing sprocket are in straight line on the timing chain cover surface as shown in the illustration.

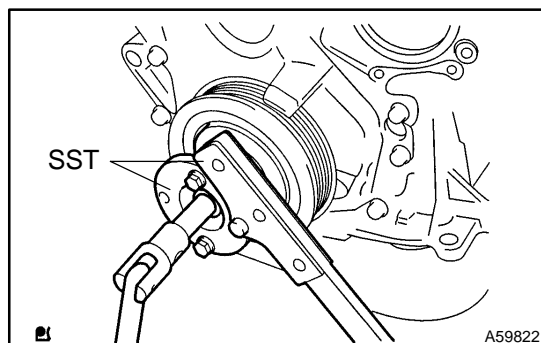
#### HINT:

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

### 14. REMOVE V-RIBBED BELT TENSIONER ASSY

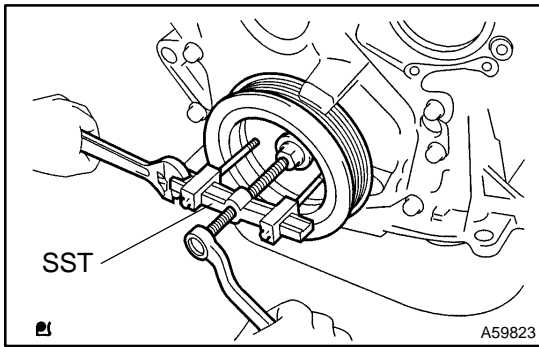
#### HINT:

Handle a jack up and down to remove the bolt.

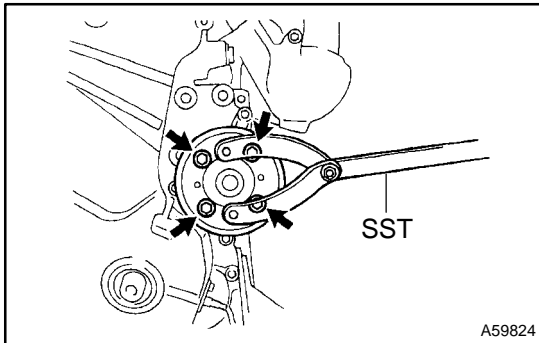


### 15. REMOVE CRANKSHAFT PULLEY

- (a) Using SST, remove the pulley bolt.  
SST 09213-70011 (09213-70020), 09330-00021

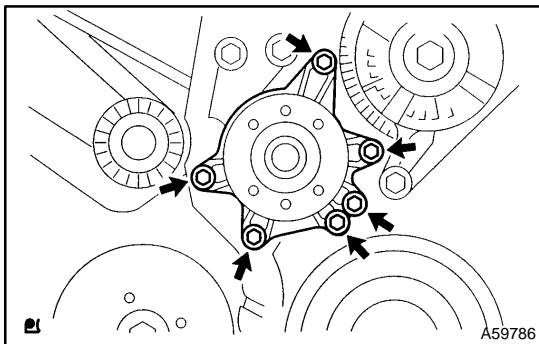


- (b) Using SST, remove the crankshaft pulley.  
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021, 09957-04010)



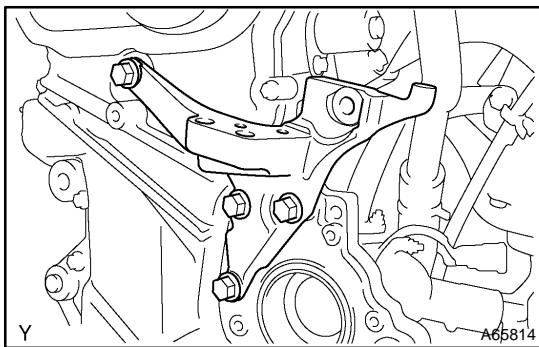
#### 16. REMOVE WATER PUMP PULLEY

- (a) Using SST, remove the water pump pulley.  
SST 09960-10010



#### 17. REMOVE WATER PUMP ASSY

- (a) Remove the 6 bolts and water pump.



#### 18. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

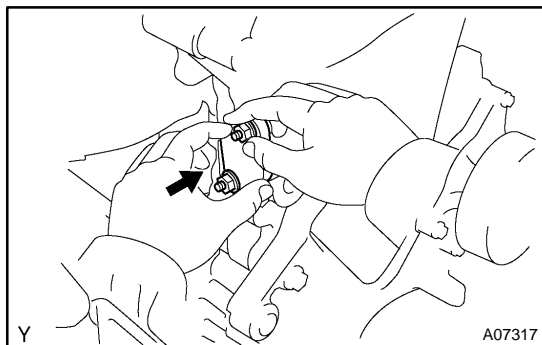
- (a) Remove the 4 bolts and the engine mounting bracket.

#### 19. REMOVE COMPRESSOR AND MAGNETIC CLUTCH (W/ AIR CONDITIONER) (See page 55-34)

HINT:

Hung up the hoses instead of detaching.

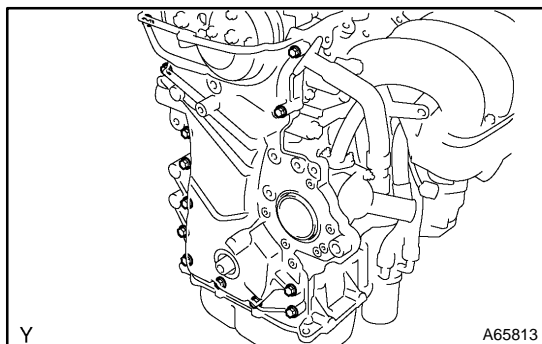
#### 20. REMOVE CRANK POSITION SENSOR

**21. REMOVE CHAIN TENSIONER ASSY NO.1**

- (a) Remove the 2 nuts and chain tensioner assy No. 1.

**NOTICE:**

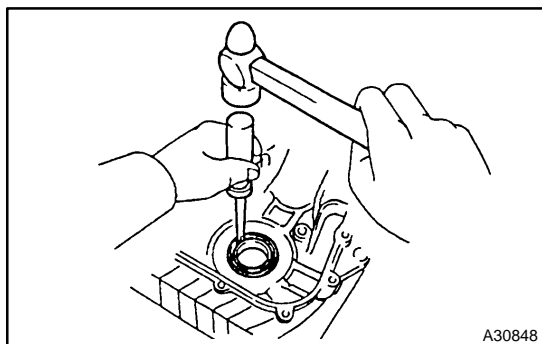
Be sure not to revolve the crankshaft without the chain tensioner.

**22. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY**

- (a) Remove the 12 bolts.  
 (b) Using a torx wrench socket (E8), remove the stud bolt.  
 (c) Remove the timing chain cover and 2 gaskets.

**NOTICE:**

Be careful not to damage the contact surfaces of the timing chain cover, cylinder head and cylinder block.

**23. REMOVE TIMING GEAR COVER OIL SEAL**

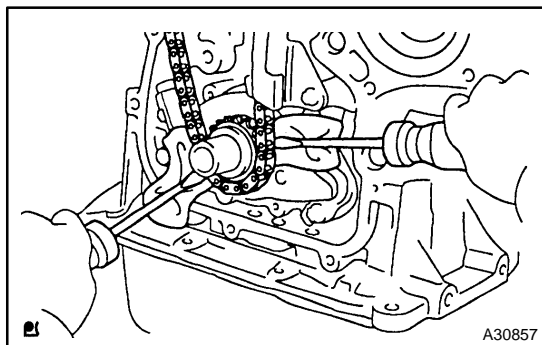
- (a) Using a screwdriver, remove the oil seal.

**24. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1****25. REMOVE CHAIN TENSIONER SLIPPER**

- (a) Remove the bolt and the chain tensioner slipper.

**26. REMOVE CHAIN VIBRATION DAMPER NO.1**

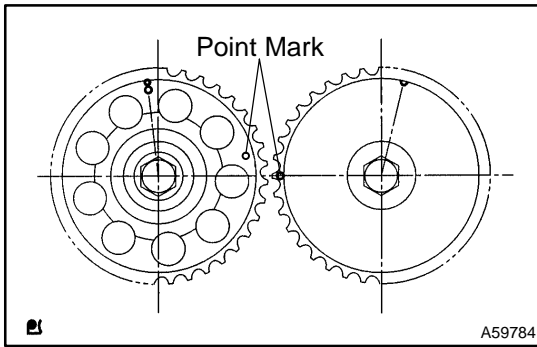
- (a) Remove the 2 bolts and chain vibration damper No. 1.

**27. REMOVE CHAIN SUB-ASSY**

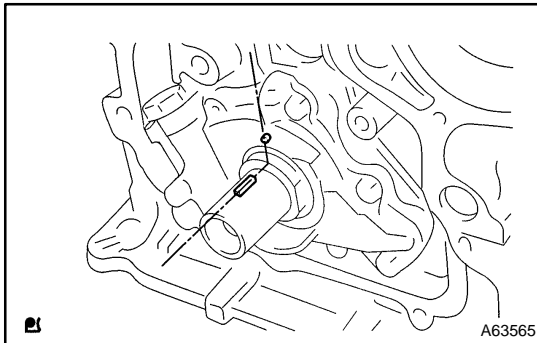
- (a) Remove the timing chain with the crankshaft timing gear using screwdrivers as shown in the illustration.

**NOTICE:**

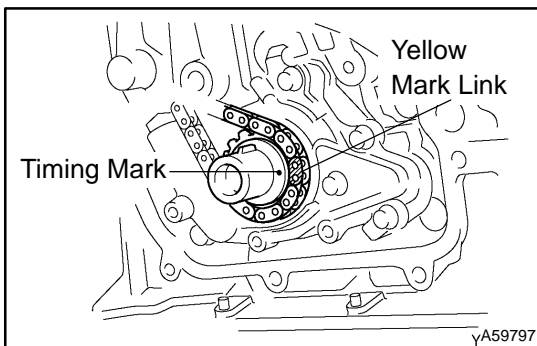
- Put shop rag to protect the engine.
- In case of revolving the camshafts with the chain off the sprockets, turn the crankshaft 1/4 revolution for valves not to touch the pistons.

**28. INSTALL CHAIN SUB-ASSY**

- (a) Set No. 1 cylinder to TDC/compression.
- (1) Turn the hexagonal wrench head portion of the camshafts, and align the point marks of the camshaft timing sprockets.



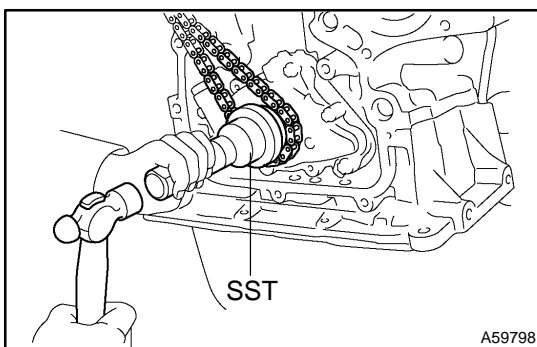
- (2) Turn the crankshaft and set the set key on the crankshaft upward.



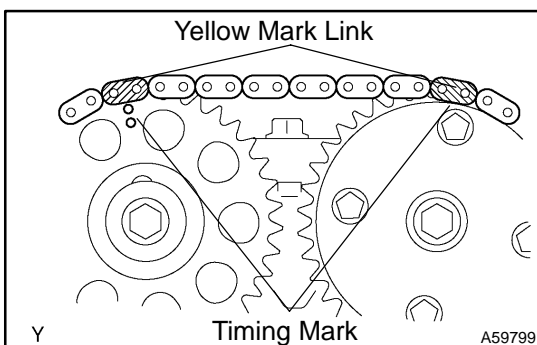
- (b) Install the timing chain on the crankshaft timing sprocket with the yellow mark link aligned with the timing mark on the crankshaft timing sprocket.

**HINT:**

Three yellow color links are on the chain.



- (c) Using a SST, install the sprocket.  
SST 09223-22010

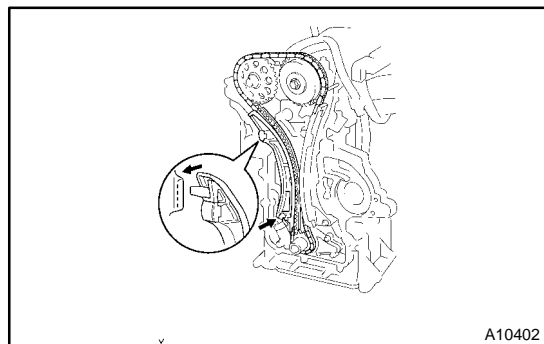


- (d) Install the timing chain on the camshaft timing sprockets with the yellow mark links aligned with the timing marks on the camshaft timing sprockets.

**29. INSTALL CHAIN VIBRATION DAMPER NO.1**

- (a) Install the chain vibration damper No. 1 with the 2 bolts.

**Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)**

**30. INSTALL CHAIN TENSIONER SLIPPER**

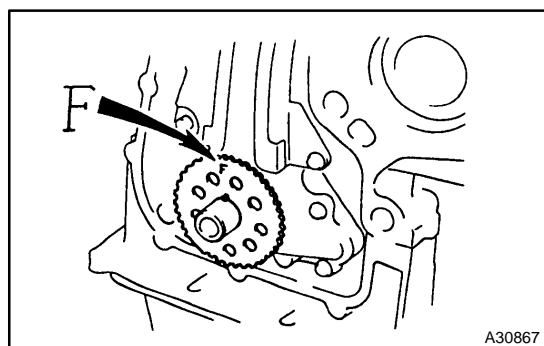
- (a) Install the chain tensioner slipper with the bolt.

**Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)**

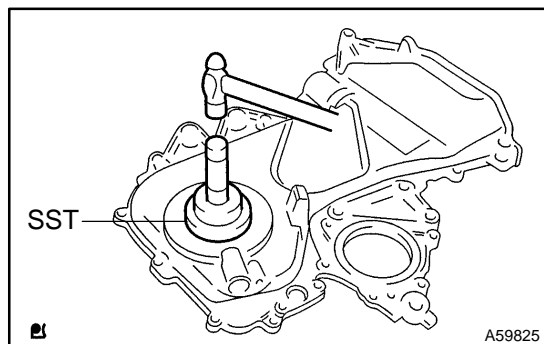
- (b) Check that the chain tensioner slipper moves is caught on the cylinder head stopper.

**NOTICE:**

**Do not turn the crankshaft.**

**31. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1**

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

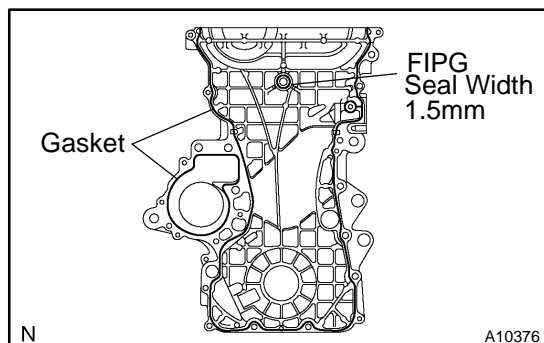
**32. INSTALL TIMING GEAR COVER OIL SEAL**

- (a) Apply MP grease to the oil seal lip.  
(b) Using SST and a hammer, tap in a new oil seal until its surface is flush with the timing chain cover edge.

SST 09223-22010

**NOTICE:**

**Keep the lip off foreign materials.**

**33. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSY**

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

- Using a razor blade and a gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing grooves.
- Thoroughly clean all components to remove all the loose material.
- Using a non-residue solvent, clean both sealing surfaces.

- (b) Apply seal packing to the timing chain cover as shown in the illustration.

**Seal packing:****Part No. 08826-00100 or equivalent**

- Install a nozzle that has been cut to a 1.5 mm opening.

**HINT:**

Avoid applying an excessive amount to the surface.

- Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

- (c) Install the 2 gaskets to the timing chain cover as shown in the illustration.

- (d) Apply seal packing to 4 locations as shown in the illustration.

**Seal packing:****Part No. 08826-00080 or equivalent**

- Install a nozzle that has been cut to a 4 – 5 mm (0.16 – 0.20 in.) opening.

**HINT:**

Avoid applying an excessive amount to the surface.

- Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

**NOTICE:**

**Do not put into engine oil within 2 hours after installing.**

- (e) Install the timing chain cover, with the 12 bolts and nut.

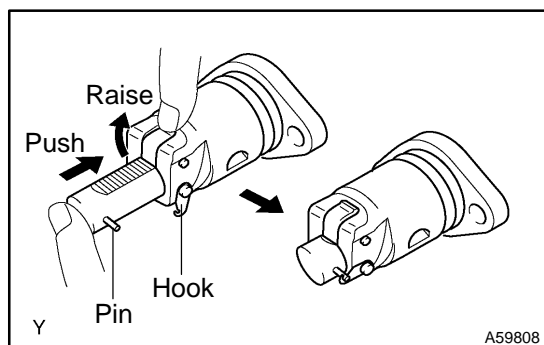
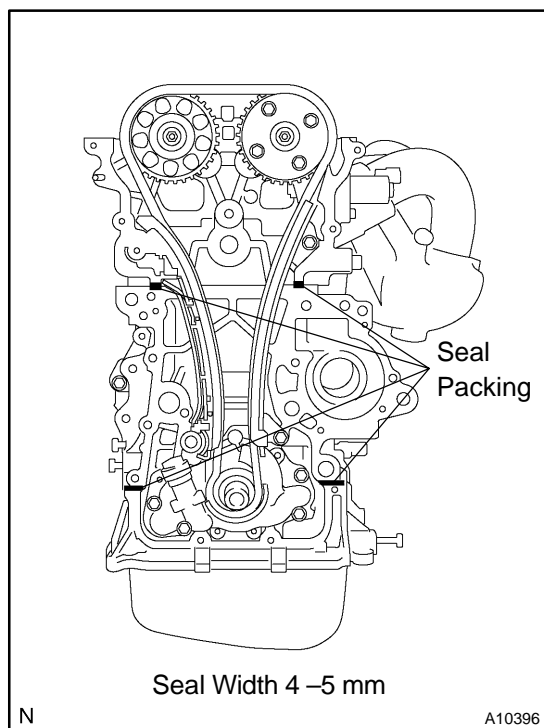
**Torque:**

**21 N·m (214 kgf·cm, 15 ft·lbf) (M8)**

**11 N·m (112 kgf·cm, 8 ft·lbf) (M6)**

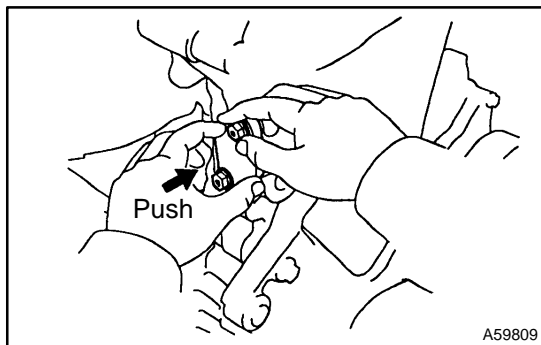
- (f) Install the stud bolt.

**Torque: 9.5 N·m (97 kgf·cm, 84 in·lbf)**

**34. INSTALL CHAIN TENSIONER ASSY NO.1**

- (a) Check the O-ring is clean, and set the hook as shown in the illustration.

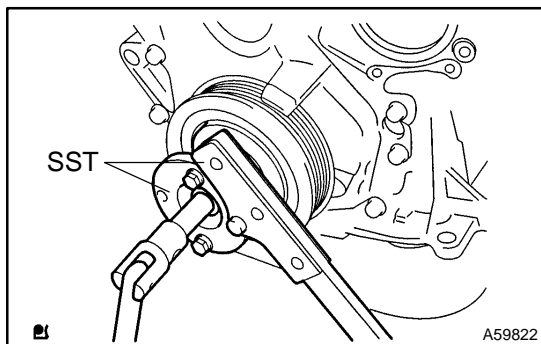




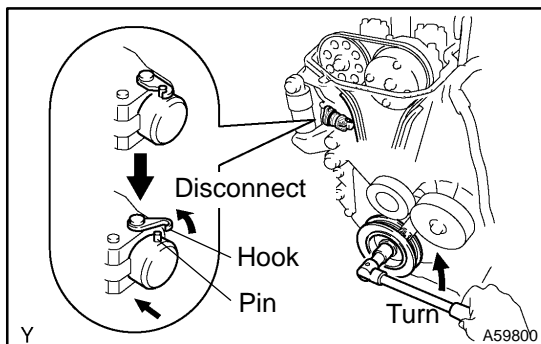
- (b) Apply engine oil to the chain tensioner and install it.  
Torque: 9.0 N·m (92 kgf·cm, 80 in.-lbf)

**NOTICE:**

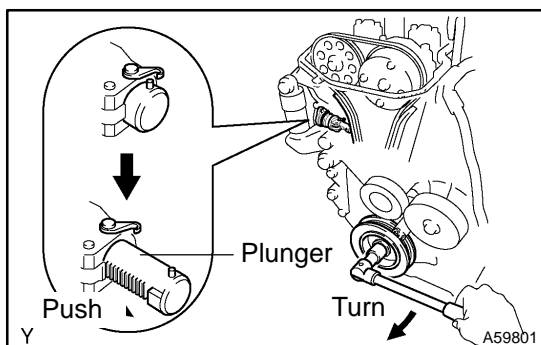
When installing the tensioner, set the hook again if the hook release the plunger.

**35. INSTALL CRANKSHAFT PULLEY**

- (a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.  
(b) Using SST, install the pulley bolt.  
SST 09213-70011 (09213-70020), 09330-00021  
Torque: 118 N·m (1,203 kgf·cm, 87 ft.-lbf)



- (c) Turn the crankshaft counterclockwise, and disconnect the plunger knock pin from the hook.

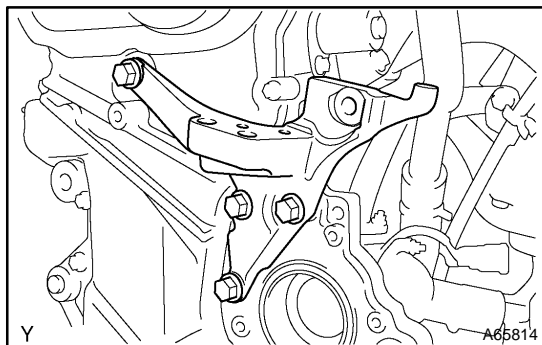


- (d) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.

**36. INSTALL CRANK POSITION SENSOR**

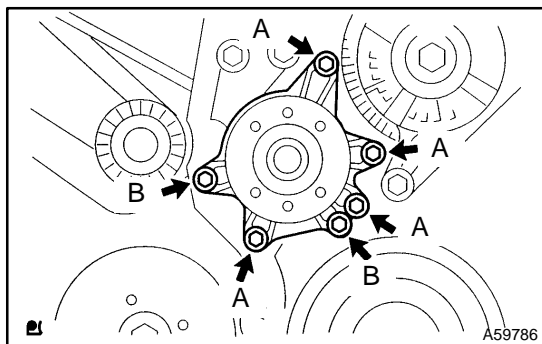
Torque: 9.0 N·m (92 kgf·cm, 80 in.-lbf)

**37. INSTALL COMPRESSOR AND MAGNETIC CLUTCH (W/ AIR CONDITIONER) (See page 55-34)**



### 38. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

- (a) Install the engine mounting bracket with the 4 bolts.  
**Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)**



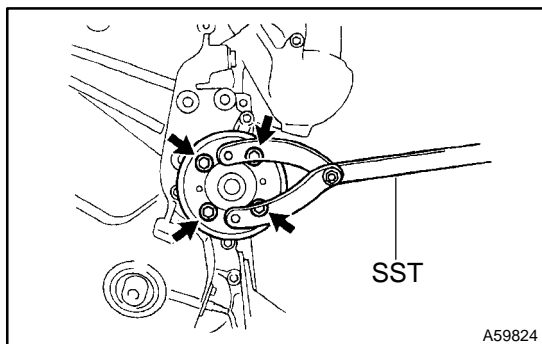
### 39. INSTALL WATER PUMP ASSY

- (a) Place a new O-ring on the timing chain cover.  
 (b) Install the water pump with the 6 bolts.  
**Torque: 9.0 N·m (92 kgf·cm, 80 in·lbf)**

#### HINT:

Each bolt length is indicated in the illustration.

Bolt A	35 mm (1.38 in.)
Bolt B	28 mm (1.10 in.)



### 40. INSTALL WATER PUMP PULLEY

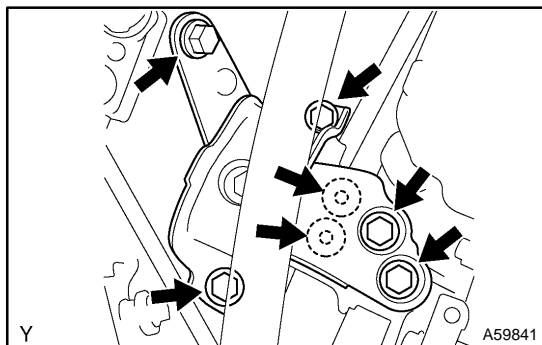
- (a) Using SST, install the water pump pulley.  
 SST 09960-10010 (09962-01000, 09963-00600)  
**Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)**

### 41. INSTALL V-RIBBED BELT TENSIONER ASSY

#### Torque:

**Nut: 29 N·m (296 kgf·cm, 21 ft·lbf)**

**Bolt: 100 N·m (1,020 kgf·cm, 74 ft·lbf)**



### 42. INSTALL ENGINE MOUNTING INSULATOR SUB-ASSY RH

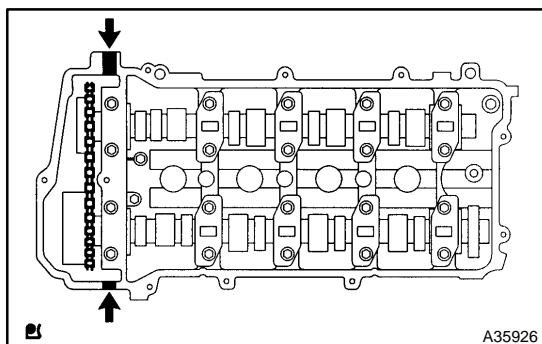
- (a) Install the engine mounting insulator sub-assy RH with the 5 bolts and the 2 nuts.  
**Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)**

### 43. INSTALL CYLINDER HEAD COVER SUB-ASSY

- (a) Remove any old packing (FIPG) material.

#### HINT:

When FIPG on the head cover gasket side cannot be eliminated completely, replace the gasket.



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

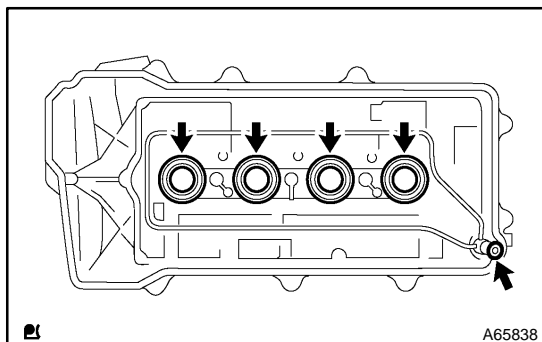
**Seal packing:**

**Part No. 08826-00080 or equivalent**

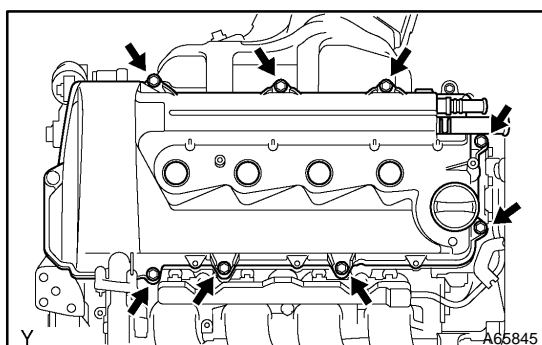
- (c) Install the cylinder head cover gasket to the cylinder head cover.

**HINT:**

Part must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.



- (d) Install the new spark plug tube gasket and a new O-ring to the cylinder head cover.



- (e) Install the cylinder head cover and wire harness protector with the 9 bolts. Uniformly tighten the bolts, in the several passes, in the sequence shown.

**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

- (f) Connect the 2 PCV hoses to the cylinder head cover.



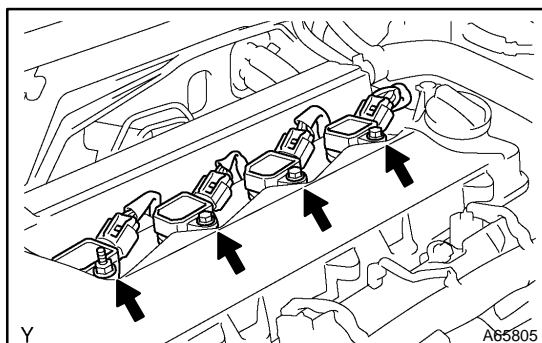
- (g) Install a new gasket and No. 1 ventilation pipe with 2 nuts and bolt.

**Torque:**

**Nut 10 N·m (102 kgf·cm, 7 ft·lbf)**

**Bolt 24 N·m (245 kgf·cm, 18 ft·lbf)**

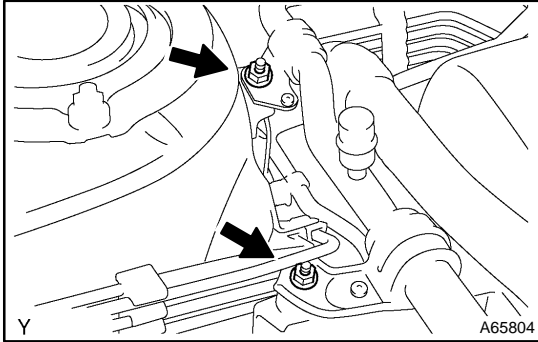
- (h) Connect the No. 3 ventilation hose to the No. 1 ventilation pipe.



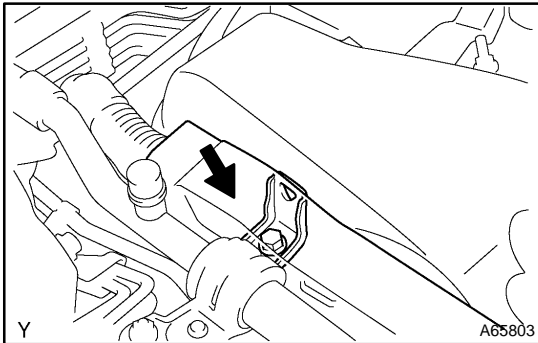
**44. INSTALL IGNITION COIL ASSY**

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

- 45. INSTALL GENERATOR ASSY (See page 19-15)
- 46. INSTALL GENERATOR BRACKET NO.1(See page 19-15)



- 47. INSTALL SUCTION HOSE SUB-ASSY  
Torque: 9.8 N·m (100 kgf·cm, 87 in·lbf)



- 48. INSTALL WIRE HARNESS CLAMP  
Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)

- 49. INSTALL CYLINDER HEAD COVER NO.2  
Torque: 7.0 N·m (71 kgf·cm, 62 in·lbf)
- 50. ADD COOLANT (See page 16-6)
- 51. CHECK ENGINE COOLANT LEAK (See page 16-1)
- 52. INSPECT OIL LEAK