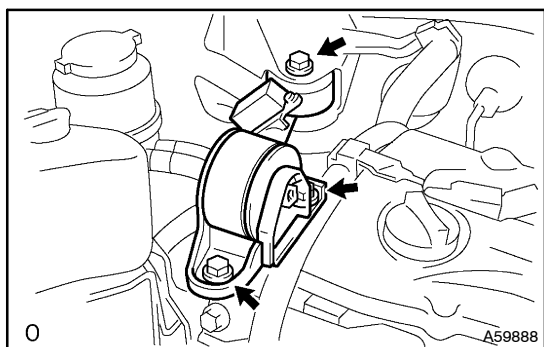


# CHAIN[1AZ-FE]

## REPLACEMENT

140IU-01

1. REMOVE[HOOD]SUB-ASSY
2. REMOVE[FRONT]WHEEL[RH]
3. REMOVE[ENGINE]UNDER[COVER]LH
4. REMOVE[ENGINE]UNDER[COVER]RH
5. REMOVE[FRONT]FENDER[APRON]SEAL[RH]
6. DRAIN[ENGINE]OIL
  - (a) Install a new gasket and the drain plug after draining engine oil.  
Torque: 25 N·m (255 kgf·cm, 18 ft·lb)
7. REMOVE[EXHAUST]PIPE ASSY[FRONT]

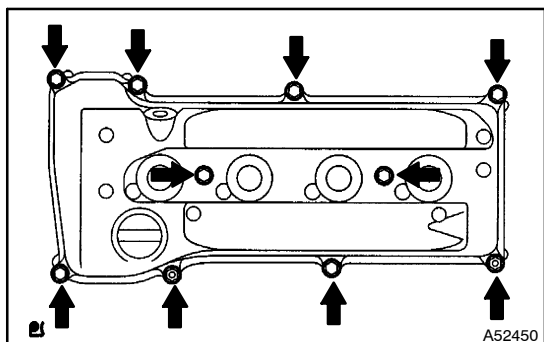


8. REMOVE ENGINE MOVING CONTROL ROD W/BACKET
  - (a) Remove the 3 bolts and engine moving control rod w/ bracket.

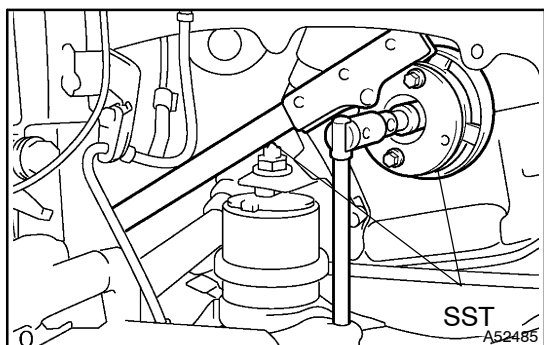
9. REMOVE[ENGINE]MOUNTING STAY[NO.2]RH
10. REMOVE[ENGINE]MOUNTING BRACKET[NO.2]RH
11. REMOVE[FAN]AND[GENERATOR]V[BELT]
 

(See page 14-5)
12. REMOVE[ENGINE]COVER SUB-ASSY[NO.1]
13. DISCONNECT[ENGINE]WIRE
14. REMOVE GENERATOR ASSY
15. REMOVE VANE PUMP ASSY
 

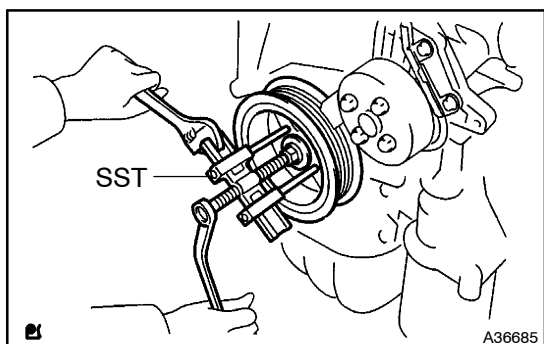
(See page 15-8)
- NOTICE:  
Do not disconnect the hose.
16. REMOVE IGNITION COIL ASSY
17. DISCONNECT VENTILATION HOSE

**18. DISCONNECT VENTILATION HOSE NO.2****19. REMOVE CYLINDER HEAD COVER SUB-ASSY**

- (a) Remove the bolt and disconnect the engine wire harness clamp.
- (b) Remove the 8 bolts and 2 nuts, and disconnect the cylinder head cover.

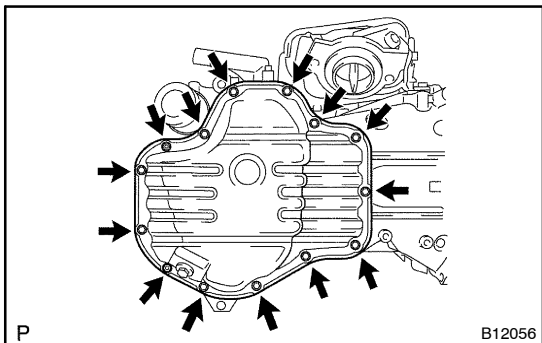
**20. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 4-7)****21. REMOVE CRANKSHAFT PULLEY**

- (a) Using SST, loosen the pulley bolt.  
SST 09213-54015 (91651-60855), 09330-00021

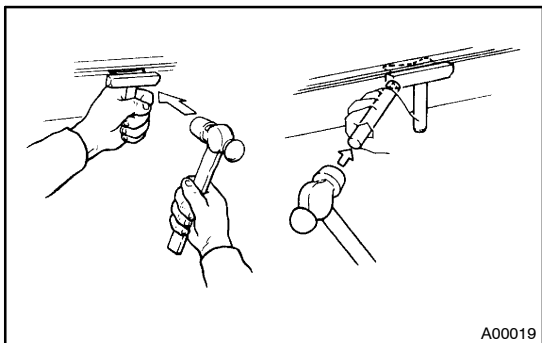


- (b) Using SST, remove the crankshaft pulley.  
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

**22. REMOVE CRANK POSITION SENSOR**

**23. REMOVE OIL PAN SUB-ASSY**

- (a) Remove the 12 bolts and 2 nuts.

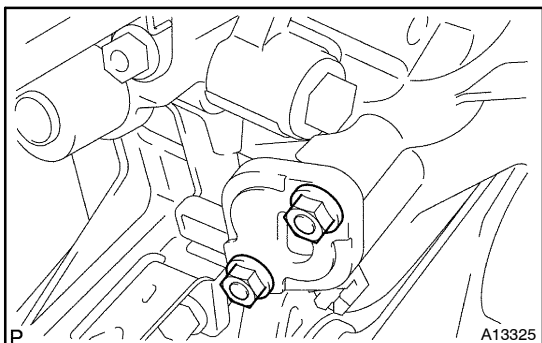


- (b) Insert the blade of SST between the crank case and oil pan, cut off applied sealer and remove the oil pan.

SST 09032-00100

**NOTICE:**

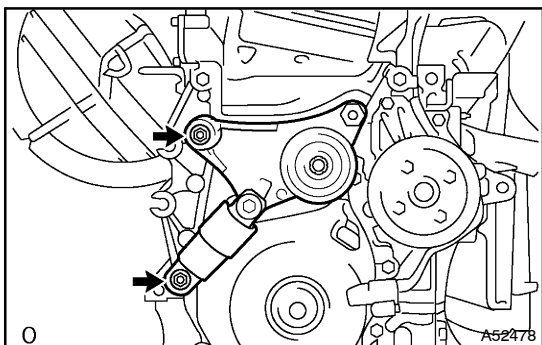
**Be careful not to damage the contact surface of the cylinder block and oil pan.**

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

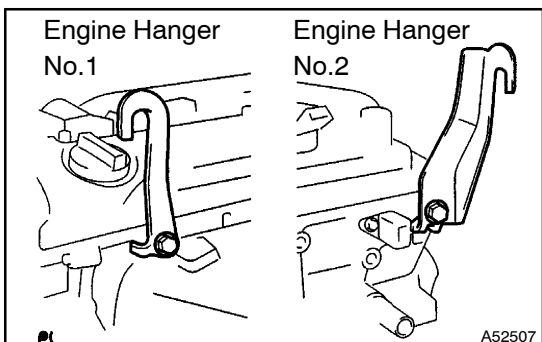
- (a) Remove the 2 nuts, timing chain tensioner and gasket.

**NOTICE:**

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

**25. REMOVE V-RIBBED BELT TENSIONER ASSY**

- (a) Remove the bolt, the bolt and drive belt tensioner.

**26. INSTALL ENGINE HANGER NO.1**

- (a) Install the engine hanger No.1, No.2 and bolt as shown in the illustration.

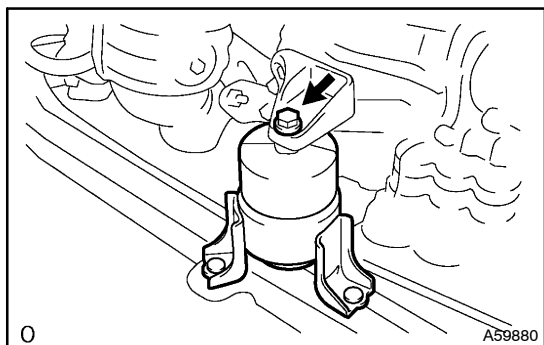
**Torque: 38 N·m (387 kgf·cm, 30 ft·lbf)**

**Parts No.:**

**Engine hanger No. 1 12281-28010**

**Engine hanger No. 2 12282-28010**

**Bolt 91512-61020**



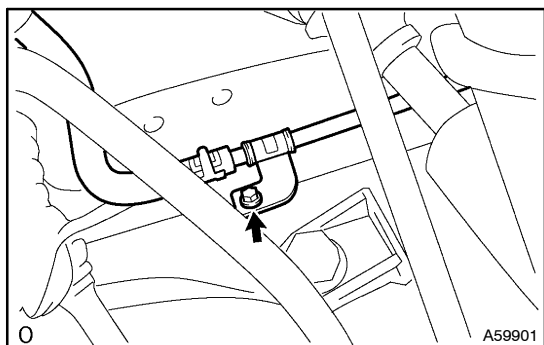
## 27. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

- (a) Attach the engine chain hoist to the engine hangers.

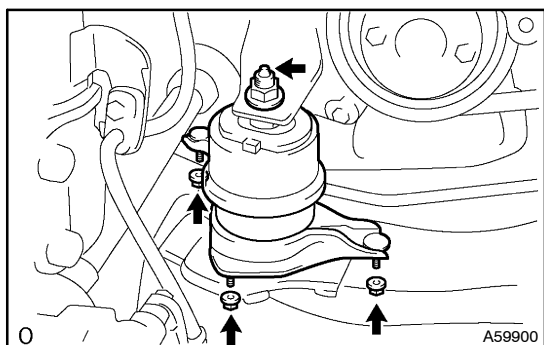
### CAUTION:

**Do not attempt to hang the engine by hooking the chain to any other part.**

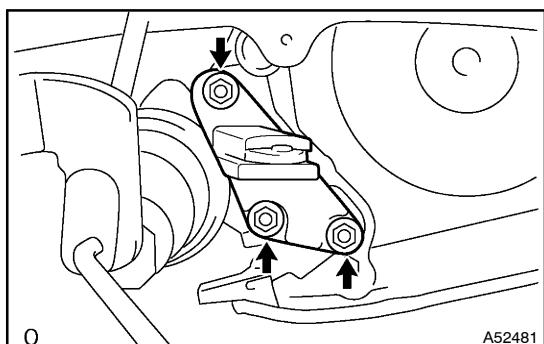
- (b) Remove the bolt, and disconnect the engine mounting insulator.



- (c) Remove the bolt and disconnect the steering gear return hose clamp from the frame.

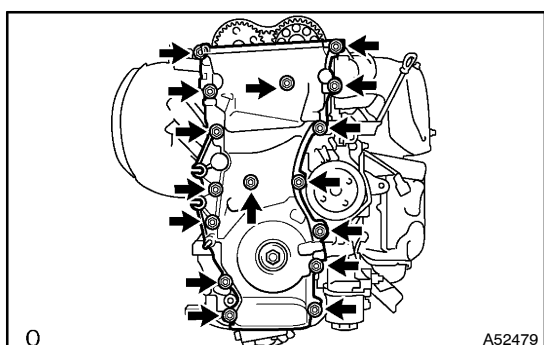


- (d) Remove the 4 nuts from the engine mounting insulator RH.  
(e) Raise the engine and remove the engine mounting insulator RH.



## 28. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

- (a) Remove the 3 bolts and the engine mounting bracket RH.

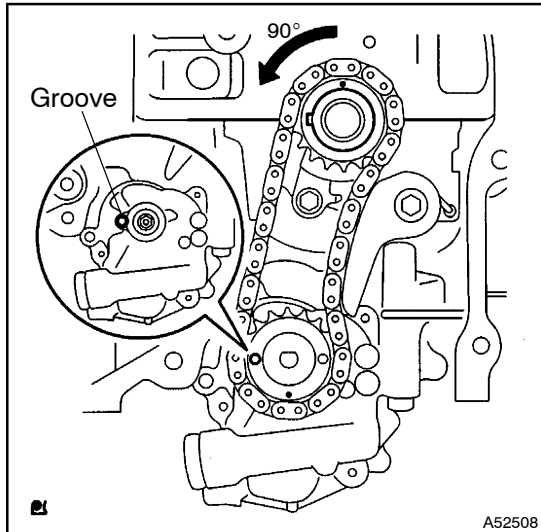


## 29. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY

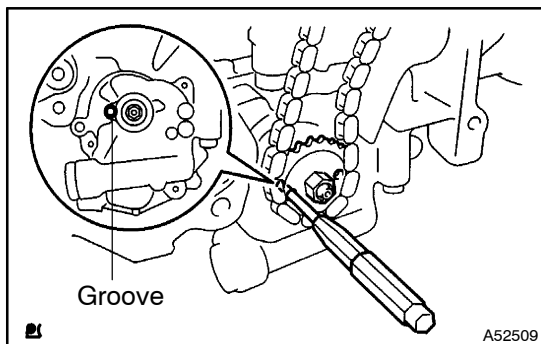
- (a) Remove the stud bolt for drive belt tensioner from the cylinder block.  
(b) Remove the 14 bolts and 2 nuts.  
(c) Remove the timing chain cover with a screwdriver.

### NOTICE:

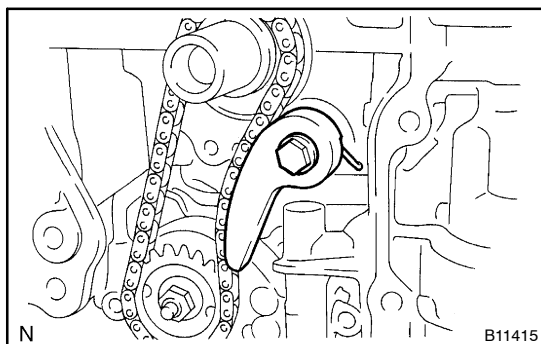
**Be careful not to damage the contact surfaces of timing chain cover, cylinder block and cylinder head.**

**30. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1****31. REMOVE CHAIN TENSIONER SLIPPER****32. REMOVE CHAIN VIBRATION DAMPER NO.1****33. REMOVE CHAIN SUB-ASSY****34. REMOVE CRANKSHAFT TIMING GEAR OR SPROCKET****35. REMOVE NO.2 CHAIN SUB-ASSY**

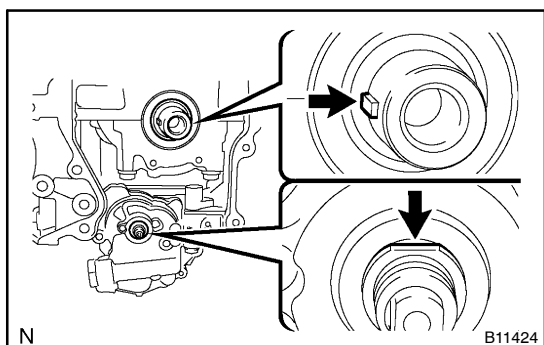
- (a) Turn the crankshaft counterclockwise 90°, and align an adjusting hole of the oil pump drive shaft gear with the groove of the oil pump.



- (b) Put a bar (φ4mm) in the adjusting hole of the oil pump drive shaft gear to lock in position, and remove a nut.

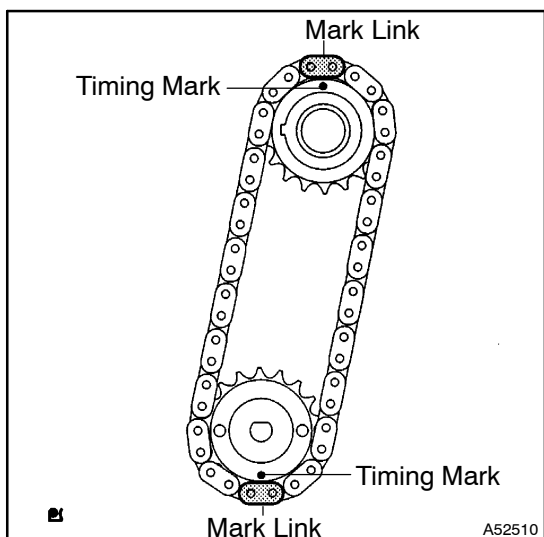


- (c) Remove the bolt, chain tensioner plate and spring.  
(d) Remove the chain tensioner, oil pump drive shaft gear and No.2 chain.

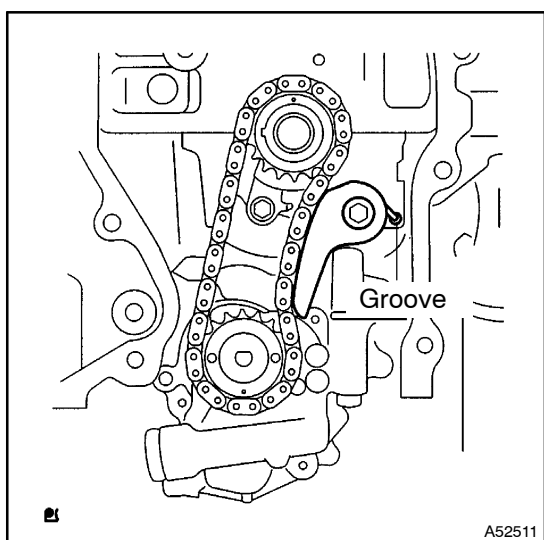


### 36. INSTALL NO.2 CHAIN SUB-ASSY

- (a) Set the crankshaft key into the left horizontal position.
- (b) Turn the cutout of the drive shaft to the top.

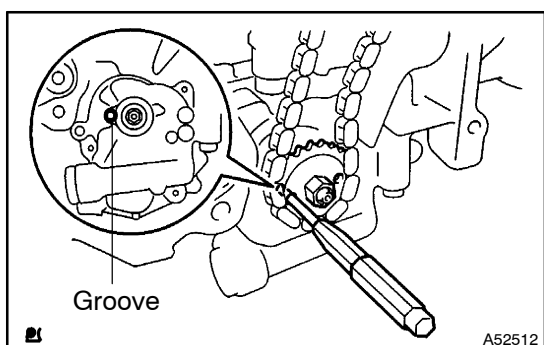


- (c) Align the mark links (yellow colored links) with the timing marks of the gear as shown in the illustration.
- (d) Insert the gears with chain to the crankshaft and oil pump shaft.
- (e) Temporarily tighten the oil pump drive shaft gear by a nut.



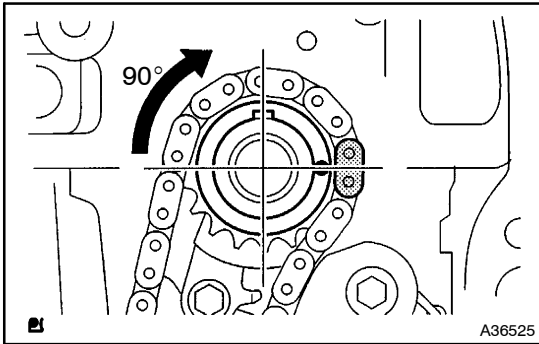
- (f) Inset the damper spring into the adjusting hole, and install the chain tensioner plate by a nut.

**Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)**



- (g) Align an adjusting hole of the oil pump drive shaft gear with the groove of the oil pump.
- (h) Put a bar ( $\phi 4\text{mm}$ ) in the adjusting hole of the oil pump drive shaft gear to lock in position, and assemble a nut.

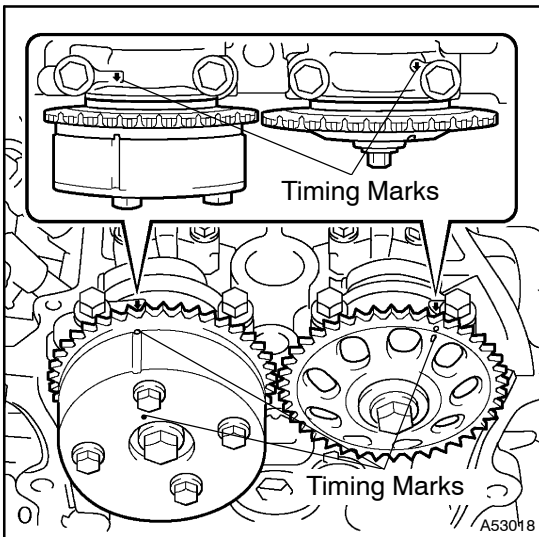
**Torque: 30 N·m (301 kgf·cm, 22 ft·lbf)**



- (i) Rotate the crankshaft counterclockwise 90°, and align the crankshaft key to the top.

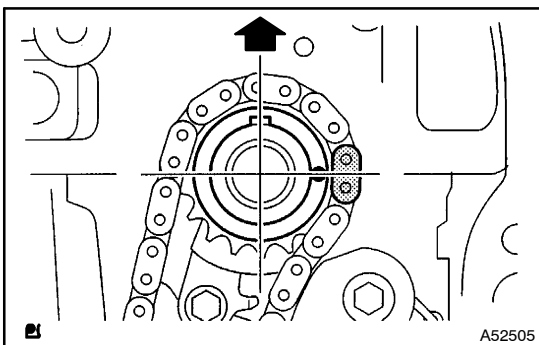
### 37. INSTALL CHAIN VIBRATION DAMPER NO.1

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

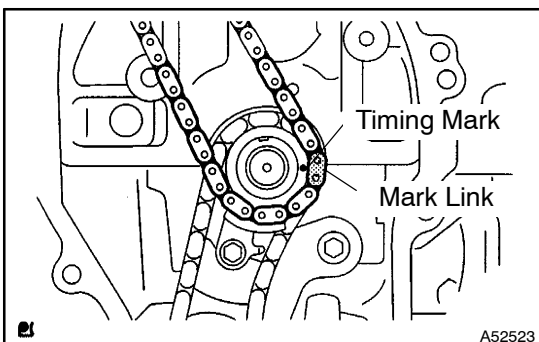


### 38. INSTALL CHAIN SUB-ASSY

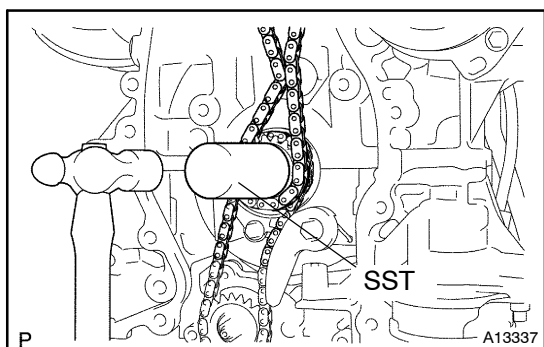
- (a) Set No.1 cylinder to TDC/compression.  
 (1) Align the timing marks of the camshaft timing sprockets with No.1 bearing caps.



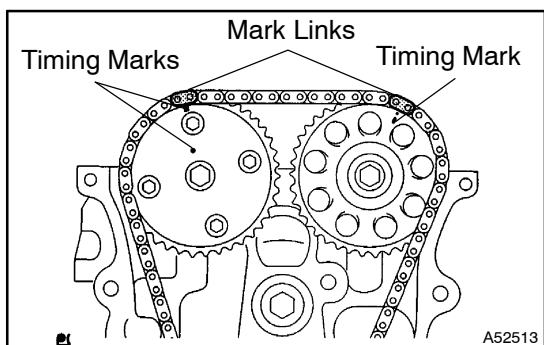
- (2) Using the crankshaft pulley bolt, turn the crankshaft and set the set key on the crankshaft upward.



- (b) Align the mark link (gold or orange colored link) with the timing mark of the crankshaft timing gear.



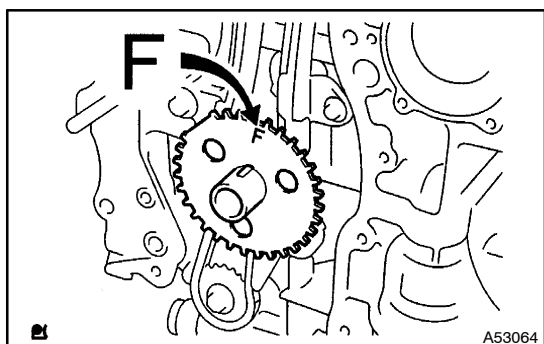
- (c) Using a SST, install the sprocket.  
SST 09309-37010



- (d) Align the mark links (gold or yellow colored links) with the timing marks of the camshaft timing gear, and install the chain.

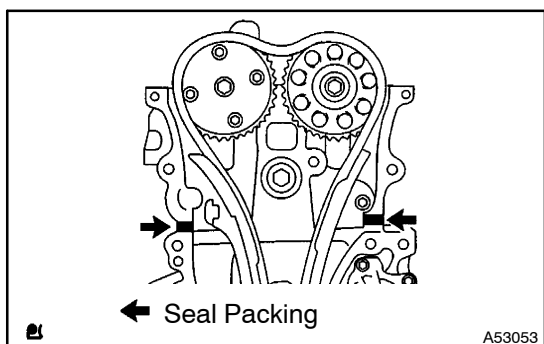
### 39. INSTALL CHAIN TENSIONER SLIPPER

**Torque: 19 N·m (194 kgf·cm, 14 ft·lbf)**



### 40. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1

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

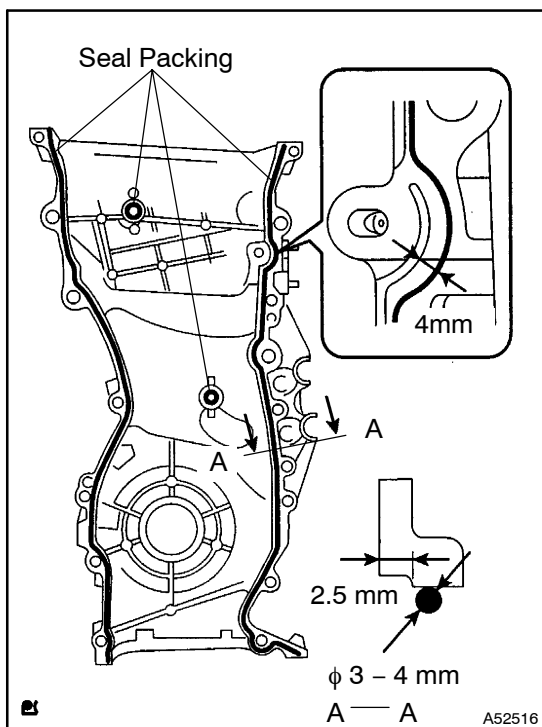


### 41. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSY

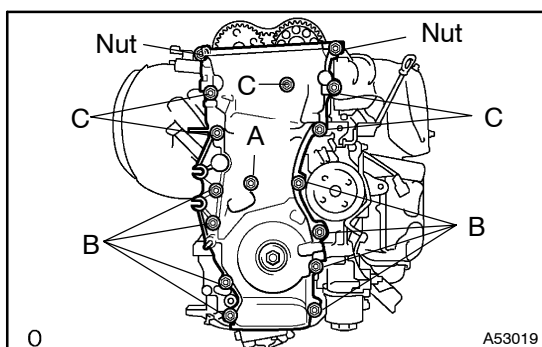
#### NOTICE:

- Remove any oil from the contact surface.
  - Install the chain cover within 3 minutes after applying seal packing.
  - Do not start the engine 2 hours after installing.
- (a) 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.
- (b) Apply seal packing in the shape of bead (Diameter 2 mm (0.099 in.)) as shown in the illustration.
- Seal packing: Part No. 08826-00080 or equivalent**

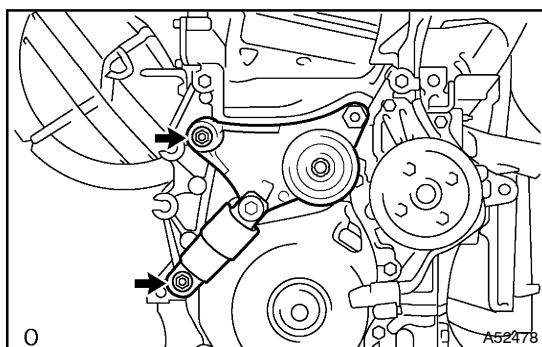




- (c) Apply seal packing in the shape of bead (Diameter 3 – 4 mm (0.118–0.157 in.)) as shown in the illustration .  
**Seal packing: Part No. 08826-00080 or equivalent**

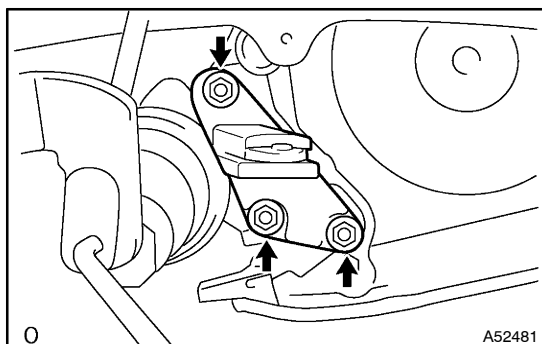


- (d) Install the timing chain cover with the 14 bolts and 2 nuts.  
**Torque:**  
**Bolt A 9.0 N·m (92 kgf·cm, 80 in·lbf)**  
**Bolt B 21 N·m (214 kgf·cm, 15 ft·lbf)**  
**Bolt C 43 N·m (438 kgf·cm, 32 ft·lbf)**  
**Nut 9.0 N·m (92 kgf·cm, 80 in·lbf)**  
 (e) Install the stud bolt to the drive belt tensioner.  
**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**



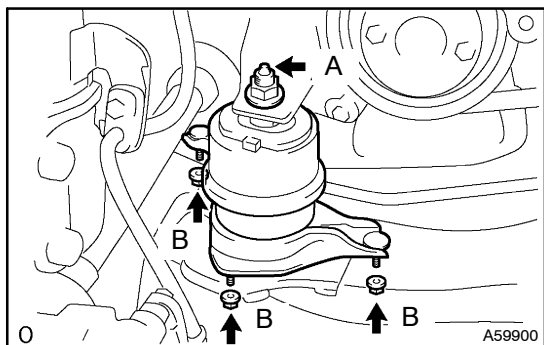
#### 42. INSTALL V-RIBBED BELT TENSIONER ASSY

- (a) Install the drive belt tensioner with the bolt and nut.  
**Torque: 59.5 N·m (607 kgf·cm, 44 ft·lbf)**



#### 43. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET

- (a) Install the engine mounting bracket RH with the 3 bolts.  
**Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)**



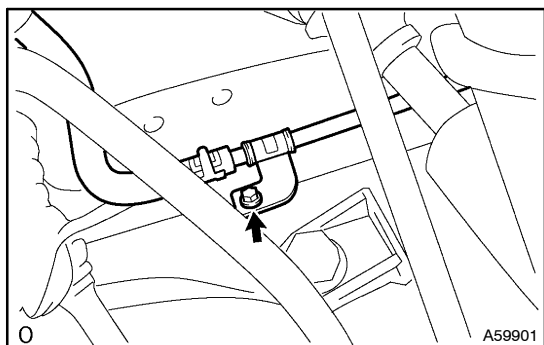
#### 44. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

- (a) Raise the engine and install the engine mounting insulator RH.
- (b) Install the engine mounting insulator RH with the 4 nuts.

**Torque:**

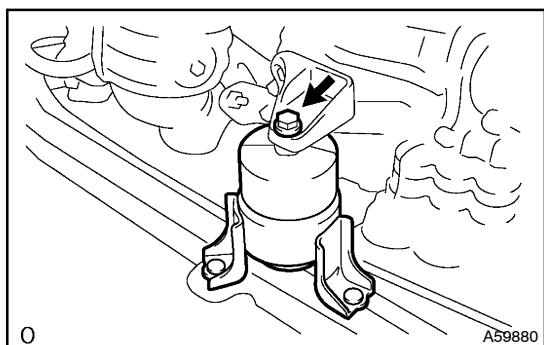
**Bolt A 95 N·m (969 kgf·cm, 70 ft·lbf)**

**Bolt B 87 N·m (888 kgf·cm, 64 ft·lbf)**



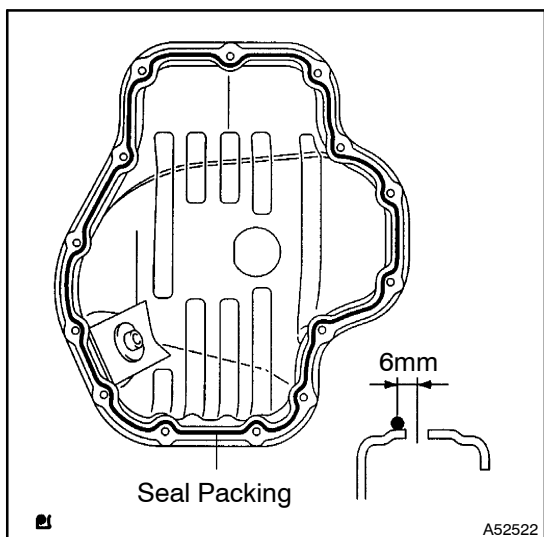
- (c) Install the bolt and disconnect the steering gear return hose clamp from the frame.

**Torque: 8.0 N·m (80 kgf·cm, 69 in·lbf)**



- (d) Install the engine mounting insulator FR with the bolt.

**Torque: 87 N·m (888 kgf·cm, 64 in·lbf)**



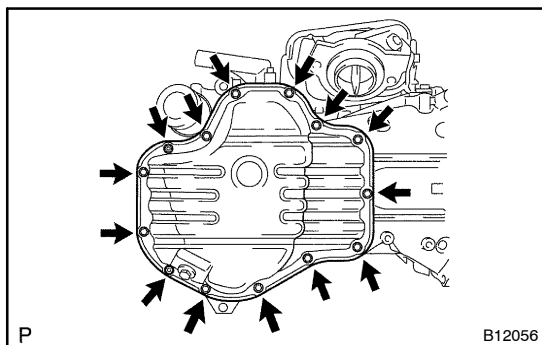
#### 45. INSTALL OIL PAN SUB-ASSY

##### NOTICE:

- Remove any oil from the contact surface.
  - Install the oil pan within 3 minutes after applying seal packing.
  - Do not start the engine 2 hours after installing.
- (a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surface of the cylinder block and oil pan.
  - (b) Apply seal packing in the shape of bead (Diameter 3 – 4 mm (0.157 in.)) as shown in the illustration, and install the oil pan.

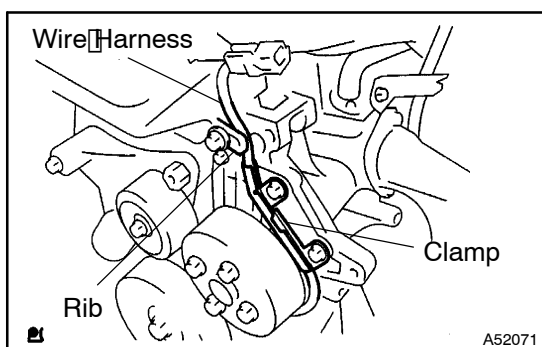
**Seal packing:**

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



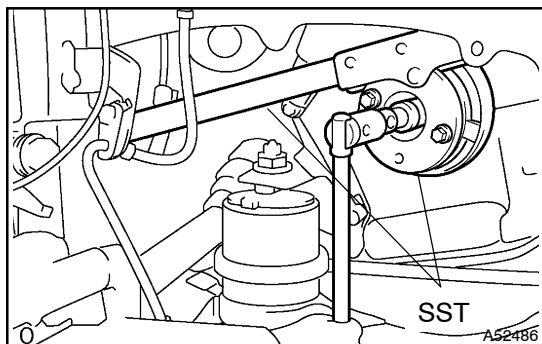
- (c) Install the oil pan with the 12 bolts and 2 nuts.  
**Torque: 9.0 N·m (92 kgf·cm, 80 in. lbf)**

#### 46. INSTALL CHAIN TENSIONER ASSY NO.1 (See page 14-48)



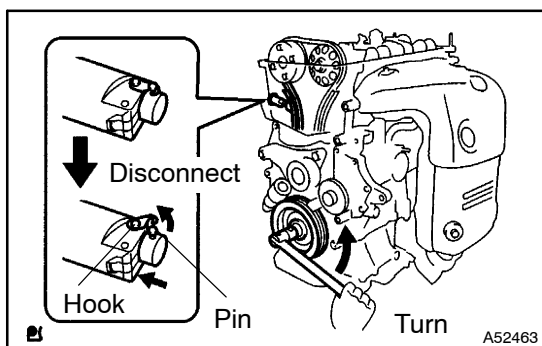
#### 47. INSTALL CRANK POSITION SENSOR

- (a) Install the bolt and crankshaft position sensor.  
**Torque: 9.0 N·m (92 kgf·cm, 80 in. lbf)**
- (b) Confirm the wire harness of the crank position sensor is placed as shown in the illustration.

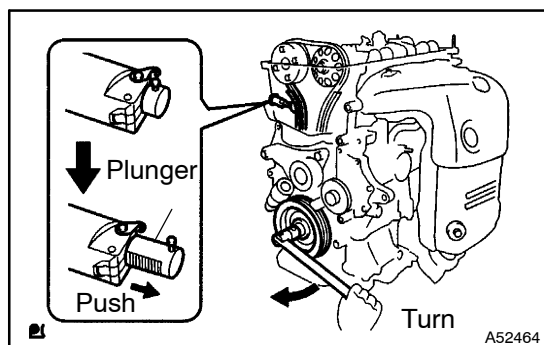


#### 48. INSTALL CRANKSHAFT PULLEY

- (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 09213-54015 (91651-60855), 09330-00021  
**Torque: 170 N·m (1,733 kgf·cm, 125 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.

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

(See page 14-48)

#### 50. INSTALL IGNITION COIL ASSY

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

#### 51. INSTALL VANE PUMP ASSY

(See page 51-8)

#### 52. INSTALL GENERATOR ASSY

(See page 9-7)

#### 53. INSTALL ENGINE WIRE

#### 54. INSTALL FAN AND GENERATOR V-BELT

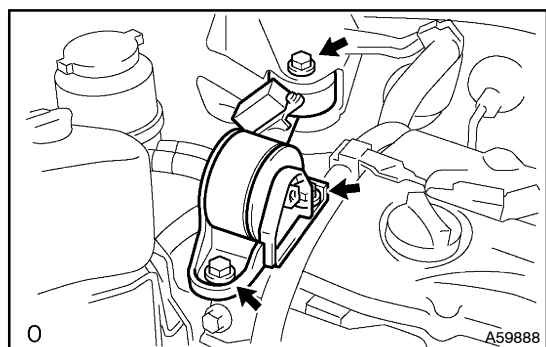
(See page 14-5)

#### 55. INSTALL ENGINE MOUNTING BRACKET NO.2 RH

Torque: 52 N·m (531 kgf·cm, 38 ft·lbf)

#### 56. INSTALL ENGINE MOUNTING STAY NO.2 RH

Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)



#### 57. INSTALL ENGINE MOVING CONTROL ROD W/BACKET

- (a) Install the engine mounting control rod w/bracket with 3 bolts.

Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)

#### 58. INSTALL EXHAUST PIPE ASSY FRONT

(See page 5-2)

#### 59. INSTALL FRONT WHEEL RH

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

#### 60. INSTALL HOOD SUB-ASSY

Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

#### 61. ADD ENGINE OIL

#### 62. INSPECT OIL LEAK