CHAIN (1AZ–FE)

REPLACEMENT

140IU–01

1. REMOVE HOOD SUB–ASSY

2. REMOVE FRONT WHEEL RH
3. REMOVE ENGINE UNDER COVER LH

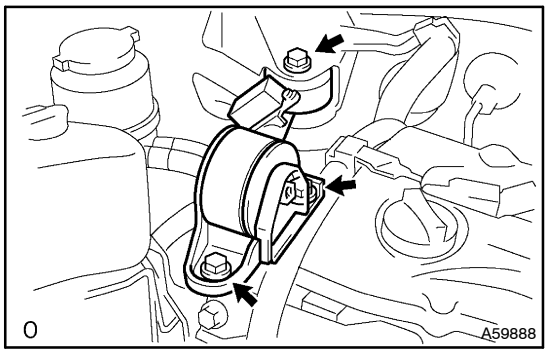
4. REMOVE ENGINE UNDER COVER RH

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·lbf)

7. REMOVE EXHAUST PIPE ASSY FRONT



8. REMOVE ENGINE MOVING CONTROL ROD W/BRACKET

(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

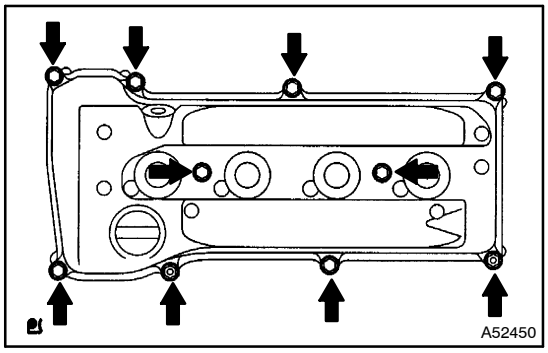
15. REMOVE VANE PUMP ASSY
(See page 51–8)

NOTICE:
Do not disconnect the hose.

16. REMOVE IGNITION COIL ASSY

17. DISCONNECT VENTILATION HOSE

18. DISCONNECT VENTILATION HOSE NO.2

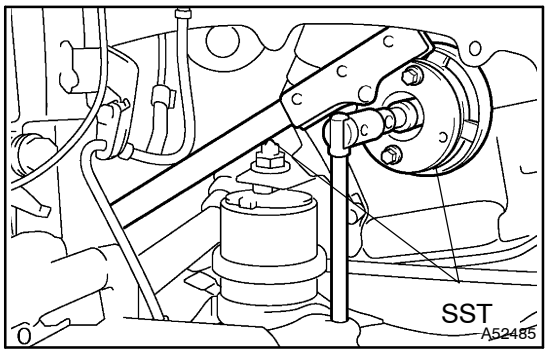


19. REMOVE CYLINDER HEAD COVER SUB–ASSY

(a) Remove the bolt and disconnect the engine wire harness clamp.

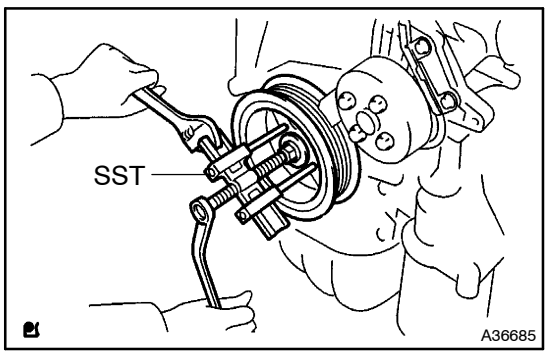
(b) Remove the 8 bolts and 2 nuts, and disconnect the cylinder head cover.

20. SET NO.1 CYLINDER TO TDC/COMPRESSION (See page 14–7)



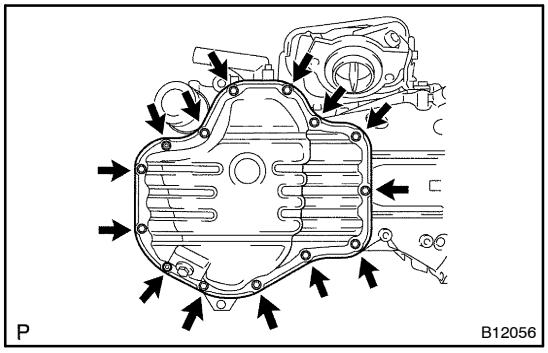
21. REMOVE CRANKSHAFT PULLEY

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



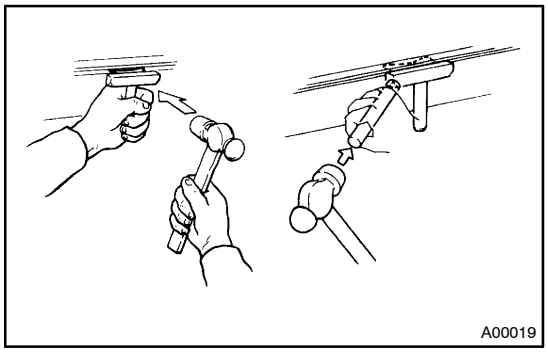
(b) Using SST, remove the crankshaft pulley.
SST 09950–50013 (09951–05010, 09952–05010, 09953–05020, 09954–05021)

22. REMOVE CRANK POSITION SENSOR



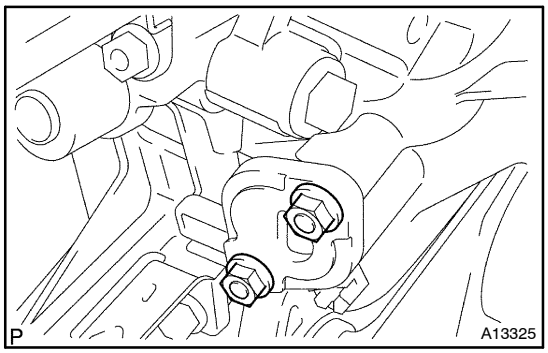
23. REMOVE OIL PAN SUB–ASSY

(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

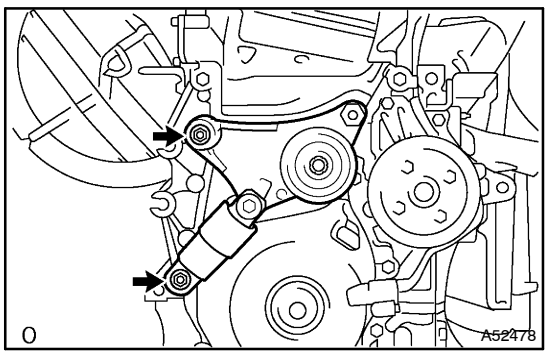
NOTICE:
Be careful not to damage the contact surface of the cylinder block and oil pan.



24. REMOVE CHAIN TENSIONER ASSY NO.1

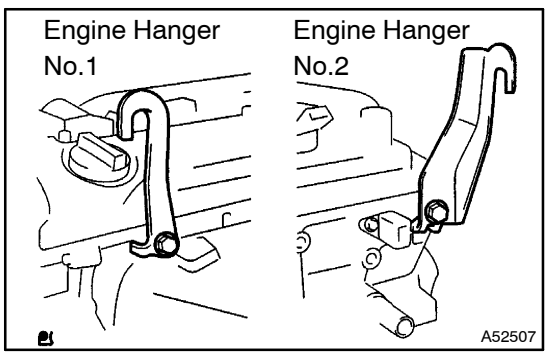
(a) Remove the 2 nuts, timing chain tensioner and gasket.

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



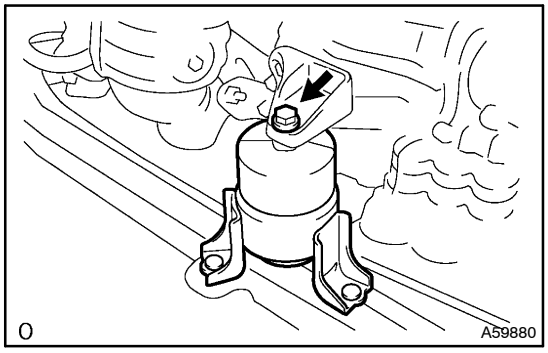
25. REMOVE V–RIBBED BELT TENSIONER ASSY

(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



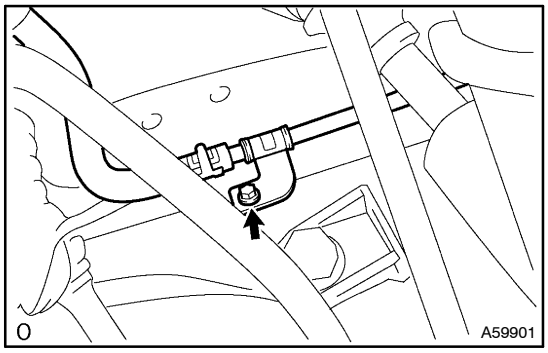
27. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

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

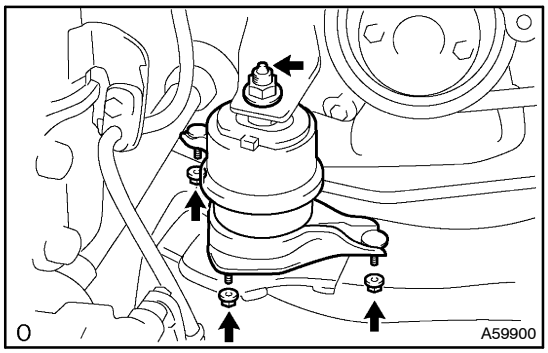
CAUTION:

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.

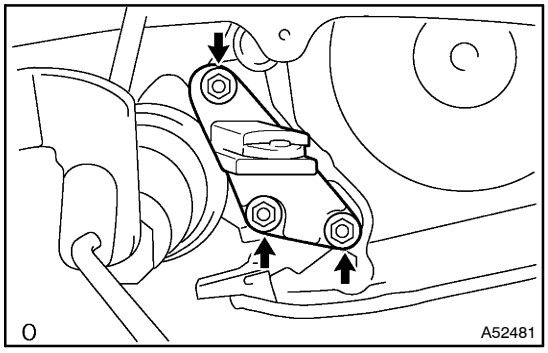


(c) Remove the bolt and disconnect the steering gear return hose cramp from the frame.



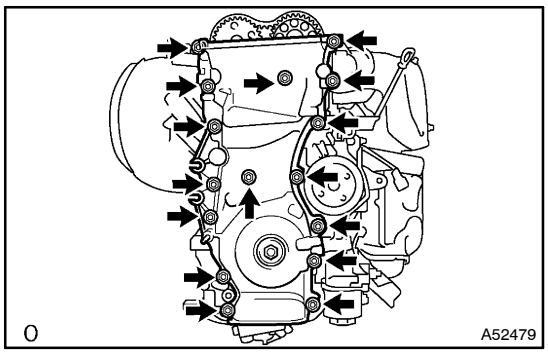
(d) Remove the 4 nuts from the engine mounting insulator RH.

(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.

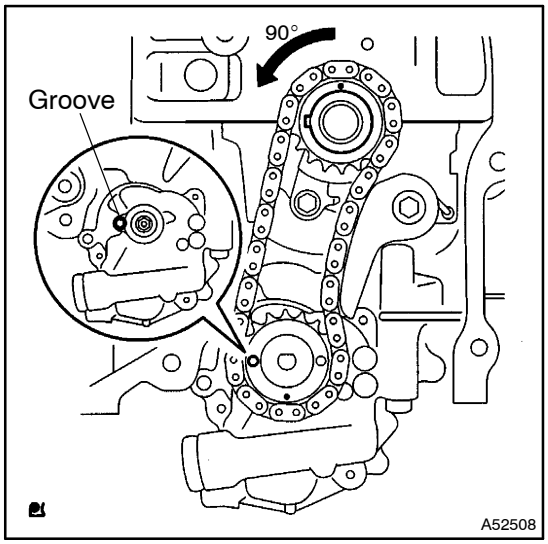
30. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1

31. REMOVE CHAIN TENSIONER SLIPPER

32. REMOVE CHAIN VIBRATION DAMPER NO.1

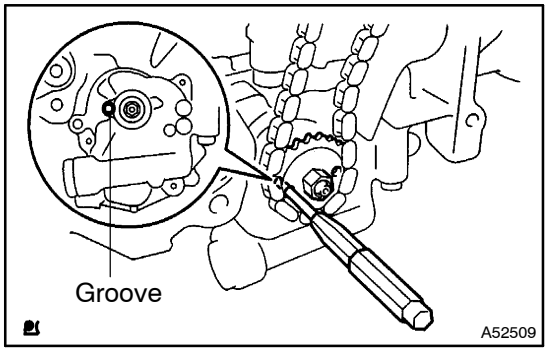
33. REMOVE CHAIN SUB–ASSY

34. REMOVE CRANKSHAFT TIMING GEAR OR SPROCKET

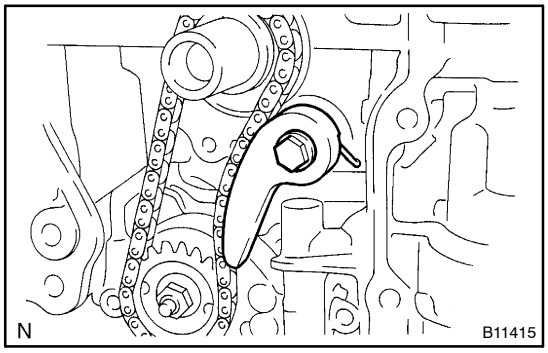


35. REMOVE NO.2 CHAIN SUB–ASSY

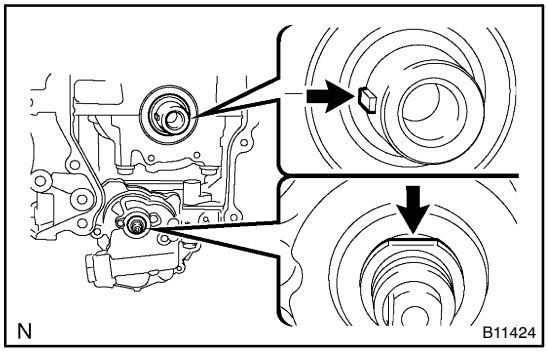
(a) Turn the crankshaft counterclockwise 90°, and align an adjusting hole of the oil pump drive shaft gear with the groove of the oil pump.



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

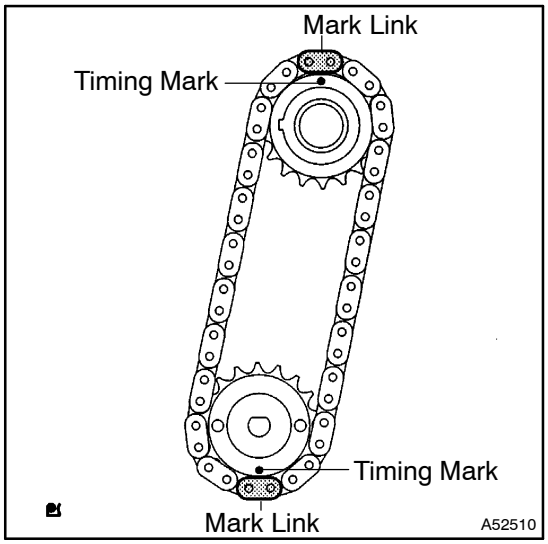


(c) Remove the bolt, chain tensioner plate and spring.
(d) Remove the chain tensioner, oil pump drive shaft gear and No.2 chain.

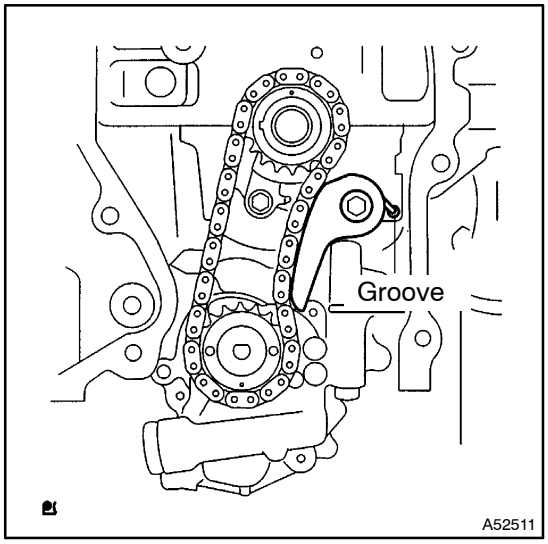


36. INSTALL NO.2 CHAIN SUB–ASSY

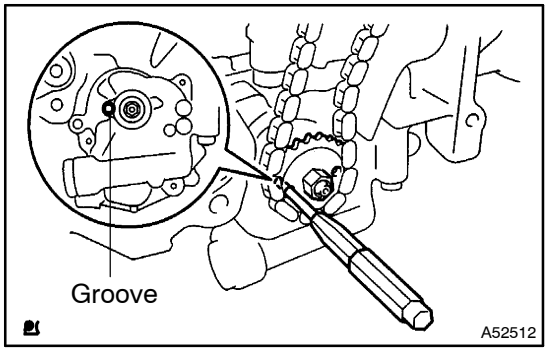
(a) Set the crankshaft key into the left horizontal position.
(b) Turn the cutout of the drive shaft to the top.



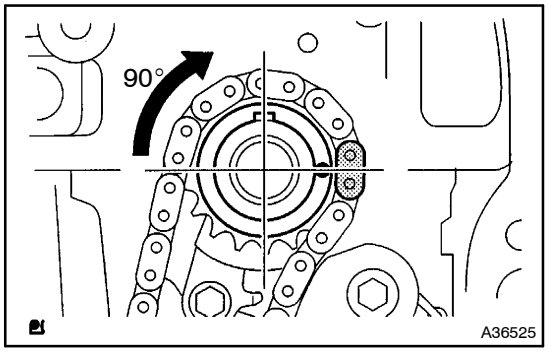
(c) Align the mark links (yellow colored links) with the timing marks of the gear as shown in the illustration.
(d) Insert the gears with chain to the crankshaft and oil pump shaft.
(e) Temporarily tighten the oil pump drive shaft gear by a nut.



(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)



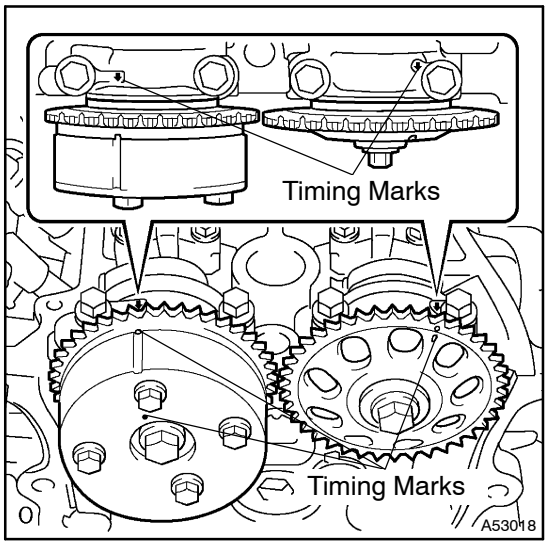
(g) Align an adjusting hole of the oil pump drive shaft gear with the groove of the oil pump.
(h) Put a bar (ϕ4mm) in the adjusting hole of the oil pump drive shaft gear to lock in position, and assemble a nut.
Torque: 30 N·m (301 kgf·cm, 22 ft·lbf)



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

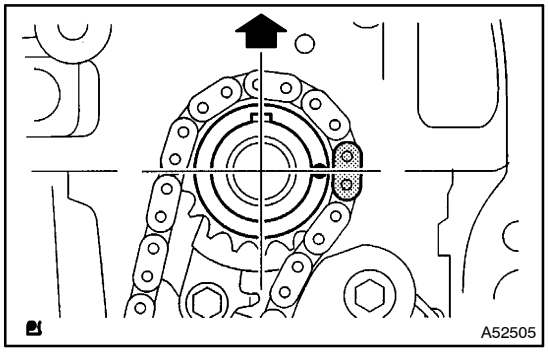
37. INSTALL CHAIN VIBRATION DAMPER NO.1

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

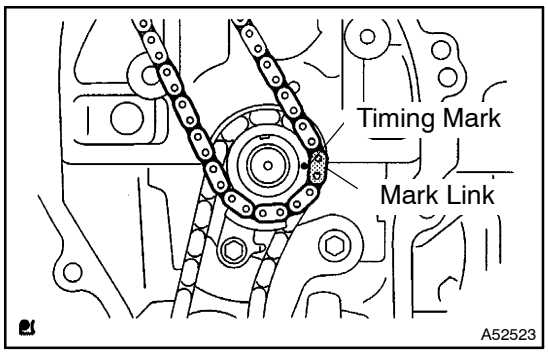


38. INSTALL CHAIN SUB–ASSY

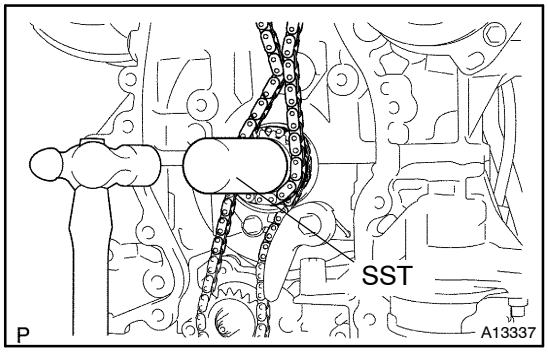
(a) Set No.1 cylinder to TDC/compression.
(1) Align the timing marks of the camshaft timing sprockets with No.1 bearing caps.



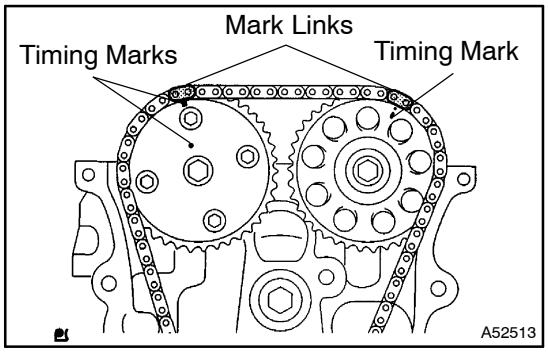
(2) Using the crankshaft pulley bolt, turn the crankshaft and set the set key on the crankshaft upward.



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



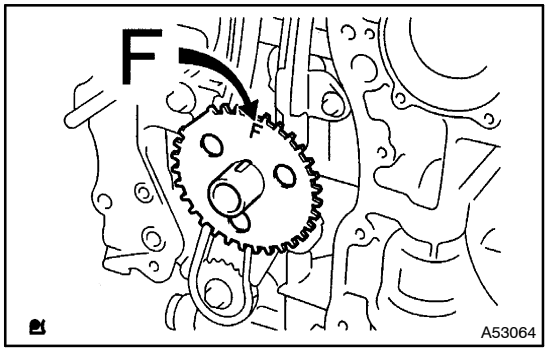
(c) Using a SST, install the sprocket.
SST 09309–37010



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

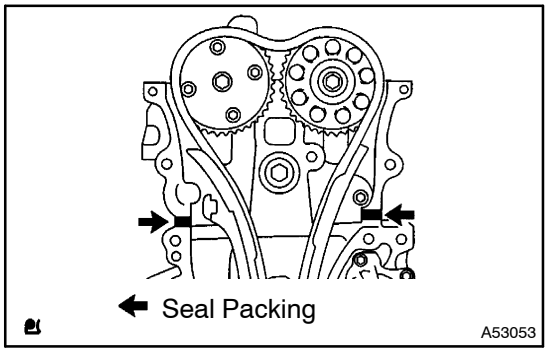
39. INSTALL CHAIN TENSIONER SLIPPER

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.

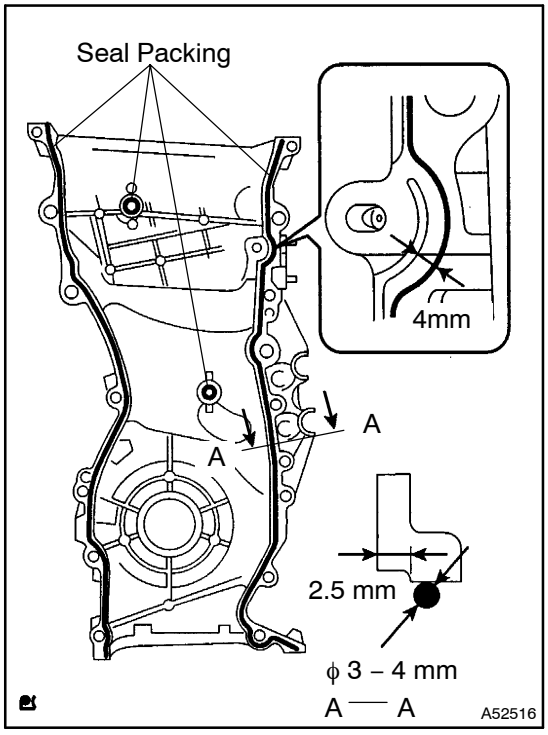


41. INSTALL TIMING CHAIN OR BELT COVER SUB–ASSY

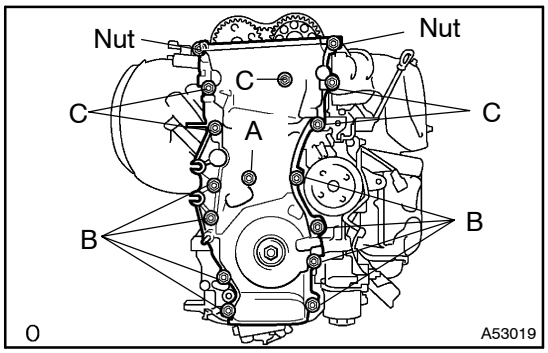
NOTICE:
- **Remove any oil from the contact surface.**
- **Install the chain cover within 3 minutes after applying seal packing.**
- **Do not start the engine 2 hours after installing.**

(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

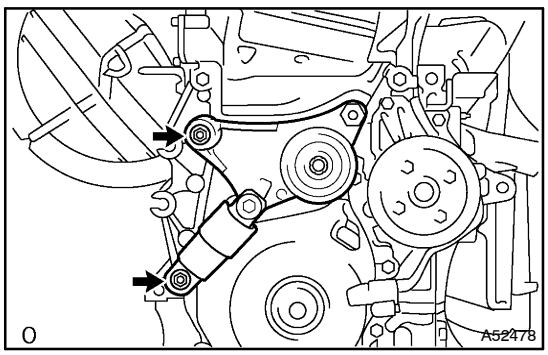


(c) Apply seal packing in the shape of bead (Diameter 3 – 4 mm (0.118–0.157 in.)) as shown in the illustration .
Seal packing: Part No. 08826–00080 or equivalent



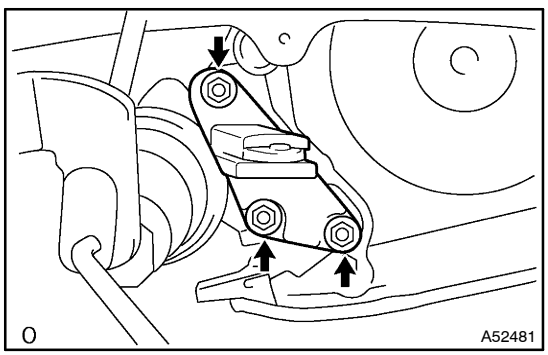
(d) Install the timing chain cover with the 14 bolts and 2 nuts.
Torque:
Bolt A 9.0 N·m (92 kgf·cm, 80 in.·lbf)
Bolt B 21 N·m (214 kgf·cm, 15 ft·lbf)
Bolt C 43 N·m (438 kgf·cm, 32 ft·lbf)
Nut 9.0 N·m (92 kgf·cm, 80 in.·lbf)

(e) Install the stud bolt to the drive belt tensioner.
Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)



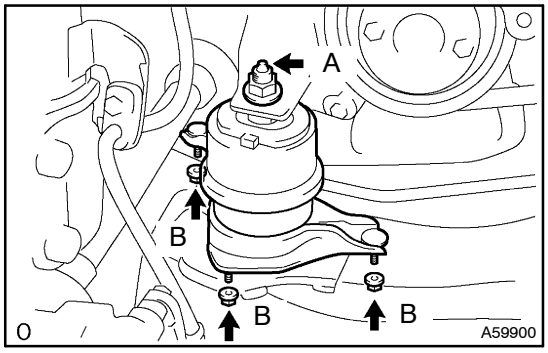
42. INSTALL V–RIBBED BELT TENSIONER ASSY

(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

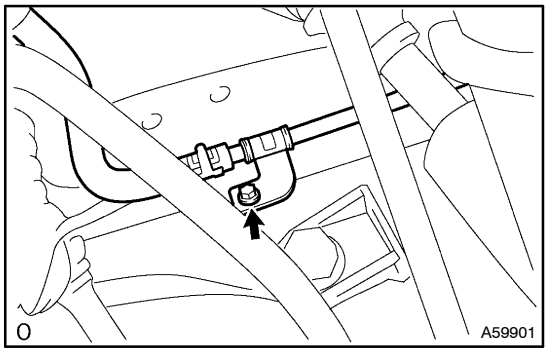
(a) Install the engine mounting bracket RH with the 3 bolts.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)



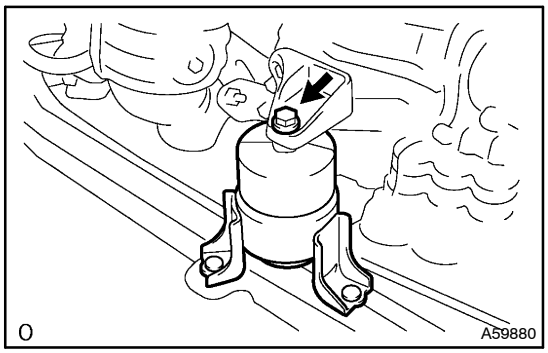
44. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR

(a) Raise the engine and install the engine mounting insulator RH.

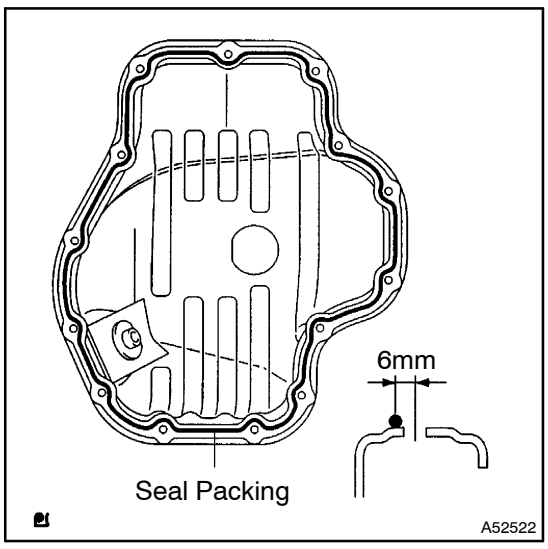
(b) Install the engine mounting insulator RH with the 4 nuts.
Torque:
Bolt A 95 N·m (969 kgf·cm, 70 ft·lbf)
Bolt B 87 N·m (888 kgf·cm, 64 ft·lbf)



(c) Install the bolt and disconnect the steering gear return hose cramp 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)

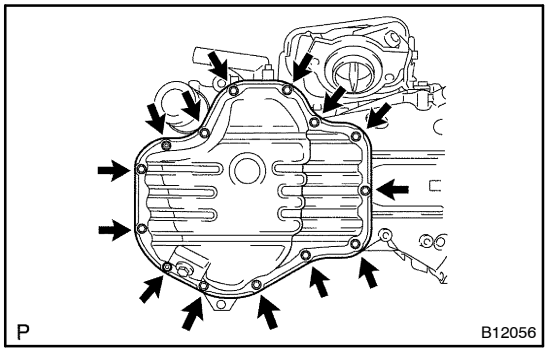


45. INSTALL OIL PAN SUB–ASSY

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.**

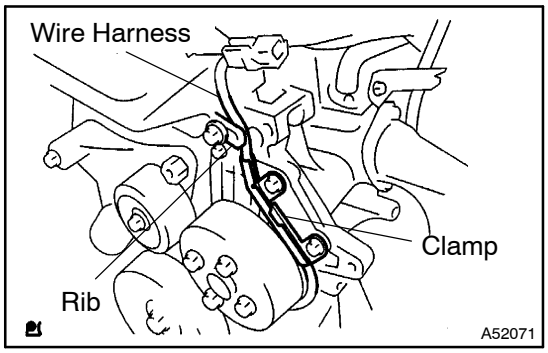
(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surface of the cylinder block and oil pan.

(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



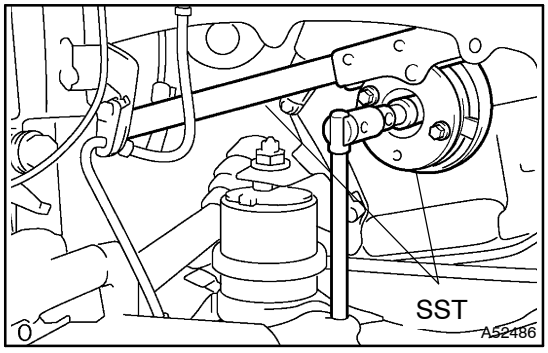
(c) Install the oil pan with the 12 bolts and 2 nuts.
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

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



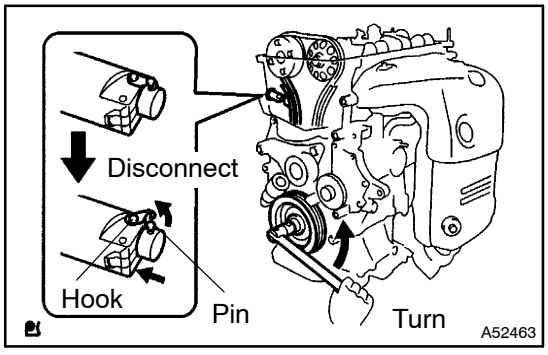
47. INSTALL CRANK POSITION SENSOR

(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.

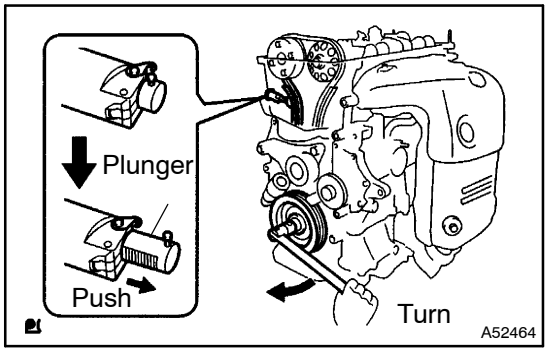


48. INSTALL CRANKSHAFT PULLEY

(a) Align the pulley set key with the key groove of the pulley, and side 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.

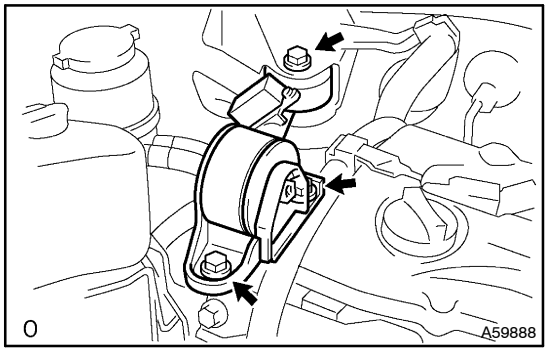
49. INSTALL CYLINDER HEAD COVER SUB–ASSY
(See page 14–48)
50. INSTALL IGNITION COIL ASSY

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 19–7)
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/BRACKET
(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 15–2)
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