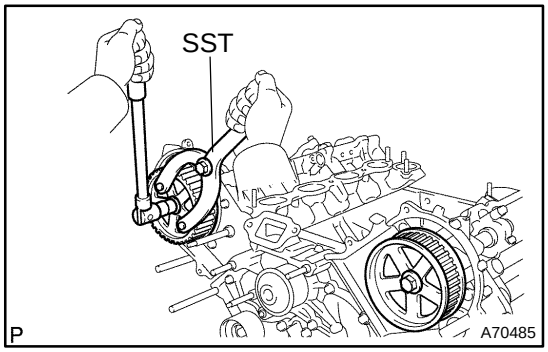
140ZV-01

REPLACEMENT

1. REMOVE TIMING BELT (See page 14-107)



2. REMOVE CAMSHAFT TIMING PULLEY

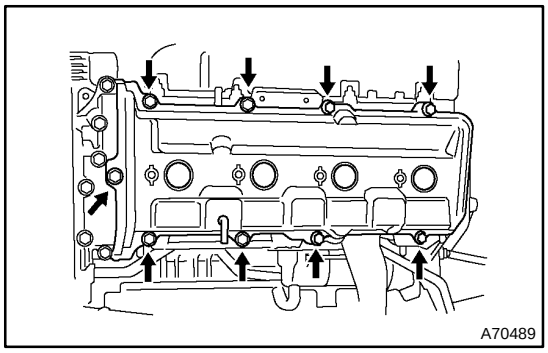
(a) Using SST, remove the bolt and timing pulley. Remove the timing pulley.
SST 09960-10010 (09962-01000, 09963-01000)

3. REMOVE TIMING BELT PLATE RR RH

(a) Remove the 3 bolts, stud bolt and timing belt plate RR RH.

4. REMOVE IGNITION COIL ASSY

(a) Disconnect the 4 ignition coil assy connectors.
(b) Remove the 4 bolts and 4 ignition coil assy.



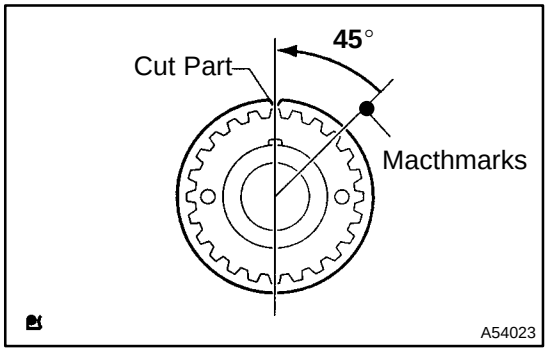
5. REMOVE CYLINDER HEAD COVER

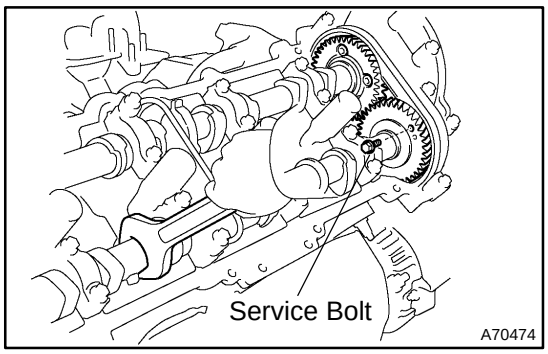
(a) Remove the 9 bolts, 9 seal washers, cylinder head cover and gasket. Remove the cylinder head cover.

6. REMOVE CAMSHAFT

NOTICE:

- **As the thrust clearance of the camshaft is small, the camshaft must be levelled while it is being removed. If the camshaft is not being levelled, the portion of the cylinder head receiving the shaft thrust may crack or be damaged. To avoid this, the following steps should be carried out.**
- **Having the crankshaft pulley at the wrong angle can cause damages due to the piston head and valve head come into contact with each other while you remove the camshaft. Always be sure to set the crankshaft pulley at the correct angle as shown in the illustration.**





(a) Boring the service bolt hole of the sub-gear upward by turning the hexagon wrench head portion of the exhaust camshaft with a wrench.

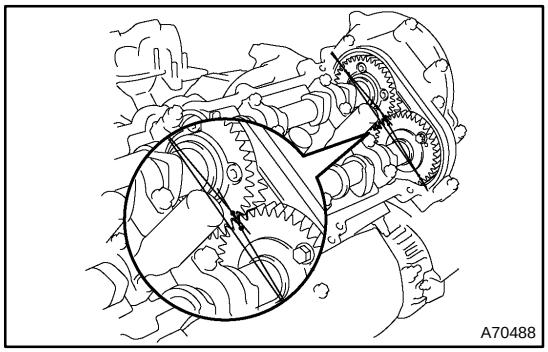
(b) Secure the sub-gear to the main gear with a service bolt.

Recommended service bolt:

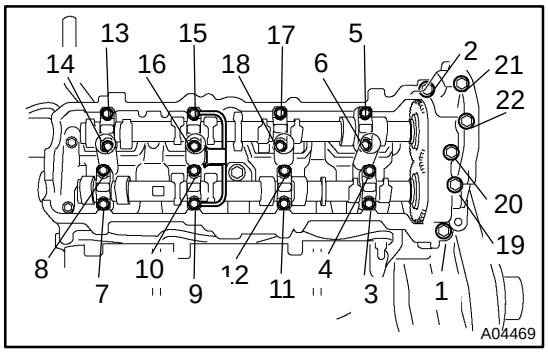
Thread diameter	6 mm
Thread pitch	1.0 mm
Bolt length	16 - 20 mm

HINT:

When removing the camshafts, make sure that the torsional spring force of the sub-gear has been eliminated by the above operation.



(c) Set the timing mark (1 dot mark) of the camshaft main gear at approx. 10˚ angle by turning the hexagon wrench head portion of the exhaust camshaft with a wrench.

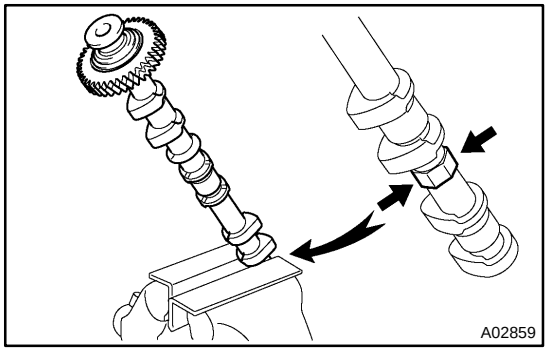


(d) Uniformly loosen and remove the 22 bearing cap bolts in several passes, in the sequence shown.

(e) Remove the oil feed pipe, 9 bearing caps, cam shaft timing oil control valve and camshafts.

HINT:

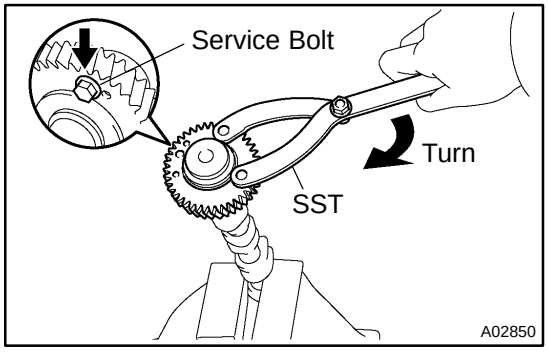
Arrange the bearing caps in correct order.



(f) Mount the hexagon wrench head portion of the camshaft in a vise.

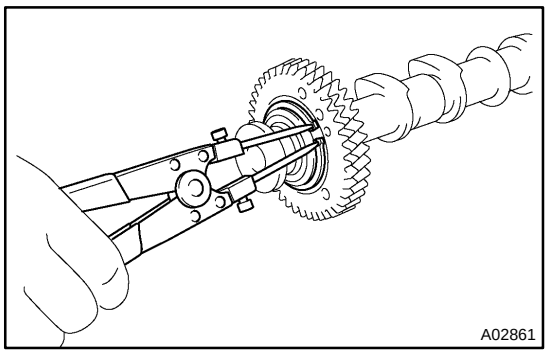
NOTICE:

Be careful not to damage the camshaft.



(g) Using SST, turn the sub-gear clockwise, and remove the service bolt.

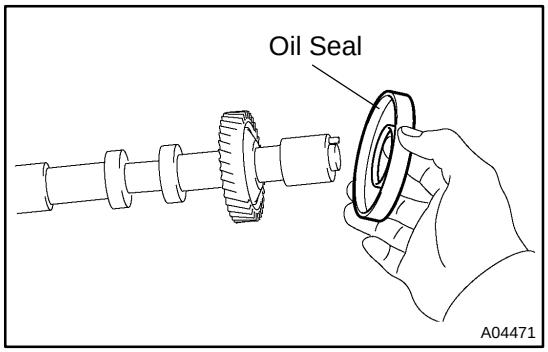
SST 09960-10010 (09962-01000, 09963-00500)



(h) Using snap ring pliers, remove the snap ring.
(i) Remove these parts:
- Wave washer
- Camshaft sub-gear
- Camshaft gear spring

HINT:
Arrange the camshaft sub-gears and gear spring (RH and LH sides).

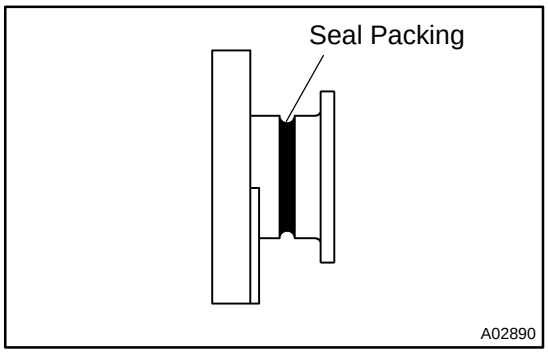
NOTICE:
Be careful not to damage the camshaft timing tube.



(j) Remove the oil seal from the intake camshaft.

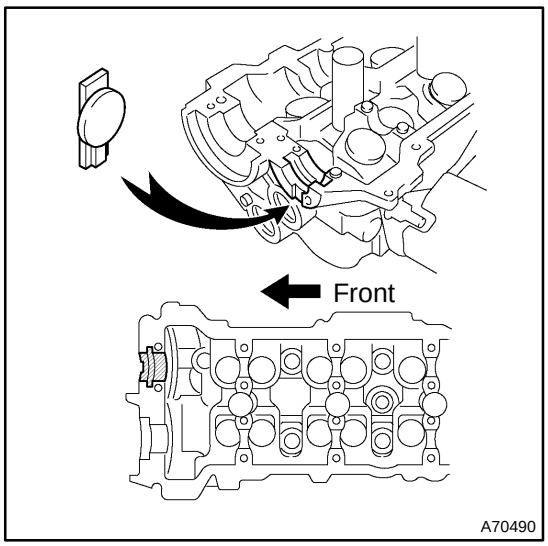
7. REMOVE CAMSHAFT HOUSING PLUG

8. REMOVE SEMICIRCULAR PLUG

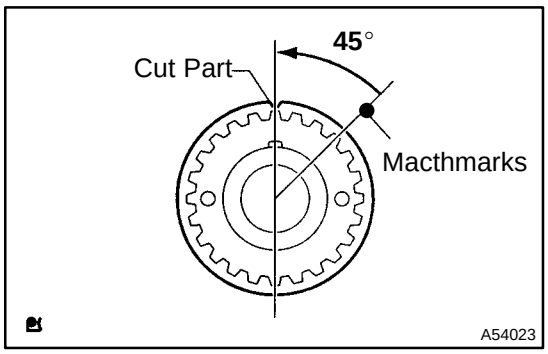


9. INSTALL CAMSHAFT HOUSING PLUG

(a) Remove any old packing (FIPG) material.
(b) Apply seal packing to the camshaft housing plug grooves.
Seal packing:
Part No. 08826-00080 or equivalent



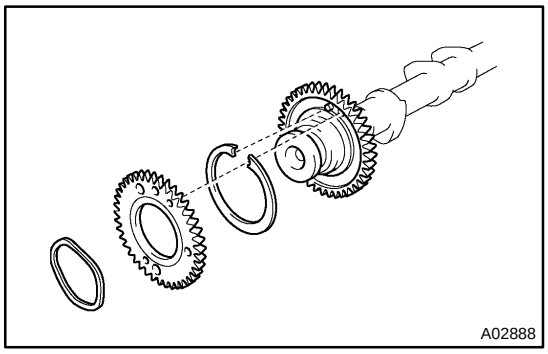
(c) Install the camshaft housing plug to the cylinder heads.



10. INSTALL CAMSHAFT

NOTICE:

- **As the thrust clearance of the camshaft is small, the camshaft must be levelled while it is being installed. If the camshaft is not being levelled, the portion of the cylinder head receiving the shaft thrust may crack or be damaged. To avoid this, the following steps should be carried out.**
- **Having the crankshaft pulley at the wrong angle can cause damage due to the piston head and valve head come into contact with each other when you install the camshaft. Always, be sure to set the crankshaft pulley at the correct angle as shown in the illustration.**

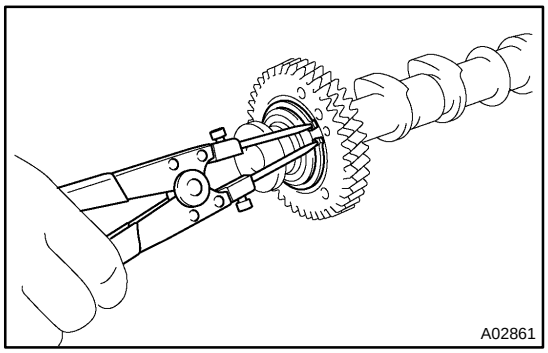


(a) Install these parts:
  (1) Camshaft gear spring
  (2) Camshaft sub-gear

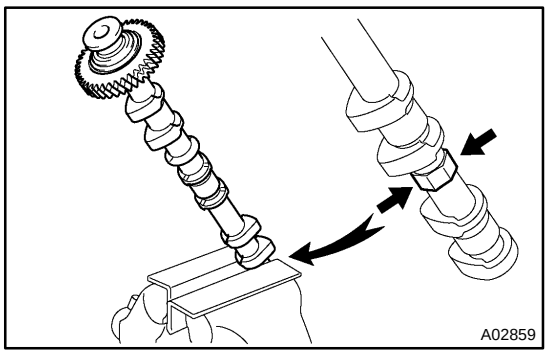
HINT:

Attach the pins on the gears to the gear spring ends.

  (3) Wave washer



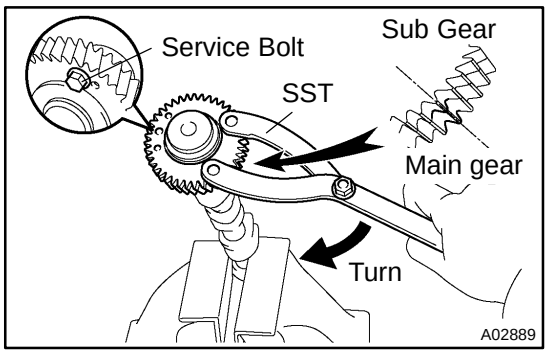
(b) Using snap ring pliers, install the snap ring.



(c) Mount the hexagon wrench head portion of the camshaft in a vise.

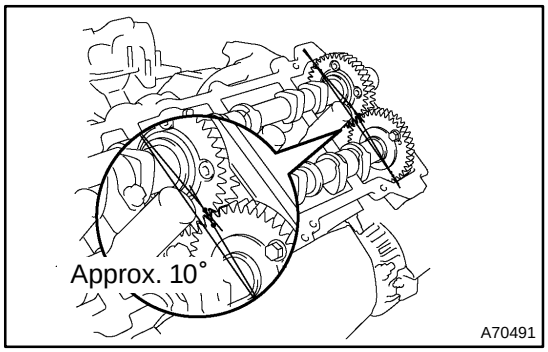
NOTICE:

Be careful not to damage the camshaft.



(d) Using SST, align the holes of the camshaft main gear and sub-gear by turning camshaft sub-gear counterclockwise, and temporarily install a service bolt.
SST 09960-10010 (09962-01000, 09963-00500)

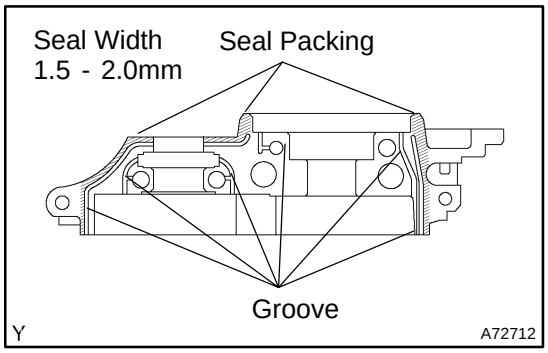
(e) Align the gear teeth of the main gear and sub-gear, and tighten the service bolt.



(f) Apply MP grease to the thrust portion of the intake and exhaust camshafts.

(g) Place the intake and exhaust camshafts.

(h) Set the timing mark (1 dot mark) of the camshaft main gear at approx. 10° angle.



(i) Remove any old packing (FIPG) material from front bearing cap.

(j) Apply seal packing to the front bearing cap as shown in the illustration.

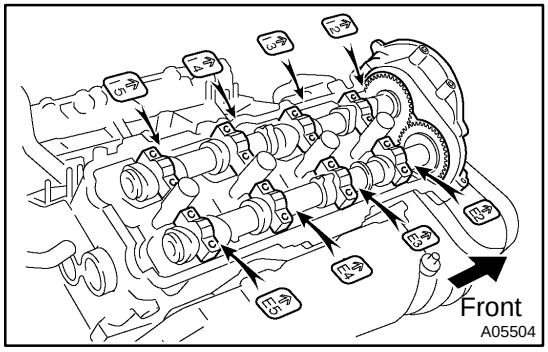
Seal packing:

Part No. 08826-00080 or equivalent

- Install a nozzle that has been cut to a 1.5 - 2.0 mm (0.059 - 0.0079 in.) opening.0
- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

NOTICE:

Do not apply seal packing to the front bearing cap grooves.



(k) Install the front bearing cap.

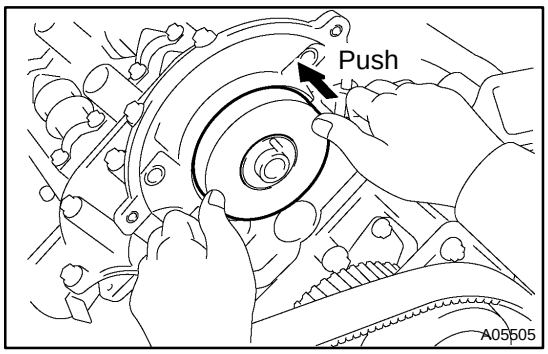
HINT:

Installing the front bearing cap will determine the thrust portion of the camshaft.

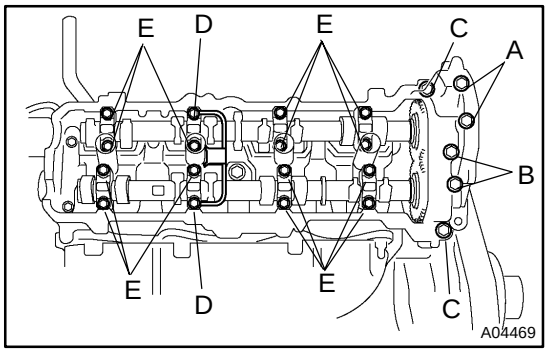
(l) Install the other bearing cap in the sequence shown with the arrow mark facing forward.

HINT:

Align the arrow marks at the front and rear of the cylinder head with the mark on the bearing cap.



(m) Push in the new camshaft oil seal.



(n) Apply a light coat of engine oil on the threads and under the heads (D and E) of the bearing cap bolts.

HINT:

Do not apply engine oil under the heads of the bearing cap bolt (A), (B) and (C).

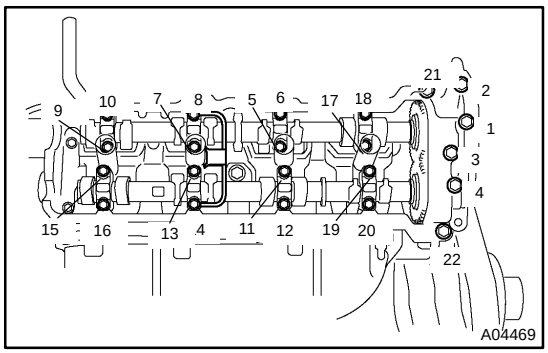
(o) Install the oil feed pipe and the 22 bearing cap bolts as shown.

HINT:

Each bolt length is indicated in the illustration.

Bolt length:

94 mm (3.70 in.) for A
72 mm (2.83 in.) for B
25 mm (0.98 in.) for C
52 mm (2.05 in.) for D
38 mm (1.50 in.) for E

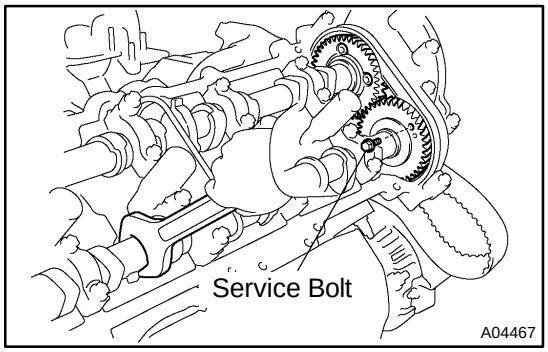


(p) Uniformly tighten the 22 bearing cap bolts in several passes, in the sequence shown.

Torque:

Bolt C 7.5 N·m (80 kgf·cm, 66 in.·lbf)

Others 16 N·m (160 kgf·cm, 12 ft·lbf)

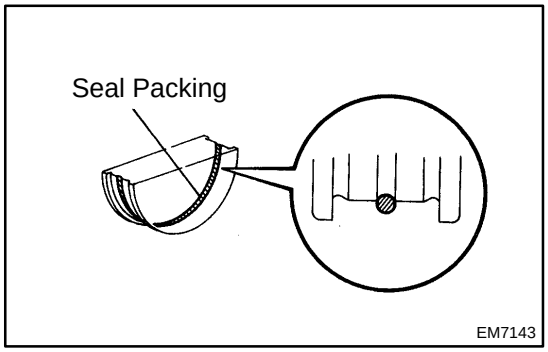


(q) Boring the service bolt installed in the driven sub-gear upward by turning the hexagon wrench head portion of the camshaft with a wrench.

(r) Remove the service bolt.

11. INSPECT VALVE CLEARANCE (See page 14-6)

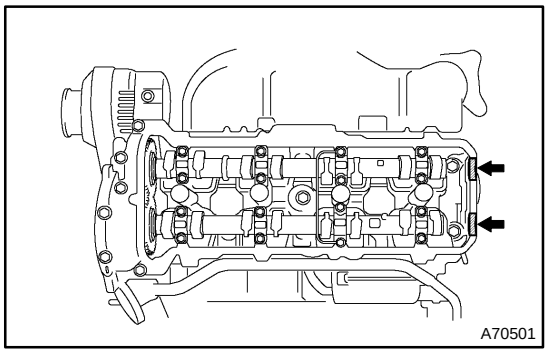
(a) Turn the camshaft and position the cam lobe upward, and check and adjust the valve clearance.



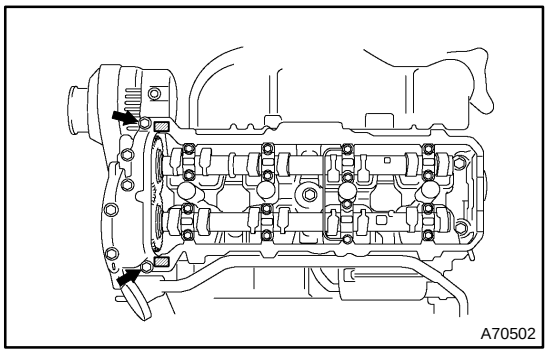
12. INSTALL SEMICIRCULAR PLUG

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

(b) Apply seal packing to the semi-circular plug grooves.
Seal packing:
Part No. 08826-00080 or equivalent



(c) Install the 2 semi-circular plugs to the cylinder heads.



13. INSTALL CYLINDER HEAD COVER

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

(b) Apply seal packing to the cylinder heads as shown in the illustration.
Seal packing:
Part No. 08826-00080 or equivalent

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

(d) Install the seal washer to the bolt.

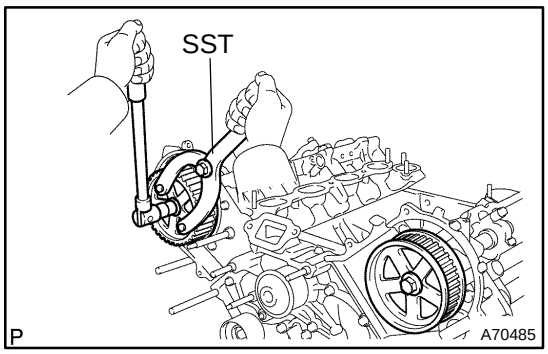
(e) Install the cylinder head cover with the 18 bolts. Uniformly tighten the bolts in several passes. Install the 2 cylinder head covers.
Torque: 6.0 N·m (60 kgf·cm, 53 in.·lbf)

14. INSTALL IGNITION COIL ASSY

(a) Install 4 bolts and ignition coil assys.
Torque: 7.5 N·m (80 kgf·cm, 66 in.·lbf)

15. INSTALL TIMING BELT PLATE RR RH

(a) Install the timing belt plate with 3 the bolts and stud bolt.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)



16. INSTALL CAMSHAFT TIMING PULLEY

(a) Using SST, install the timing pulley with the bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 108 N·m (1100 kgf·cm, 80 ft·lbf)

17. INSTALL TIMING BELT (See page 14-107)