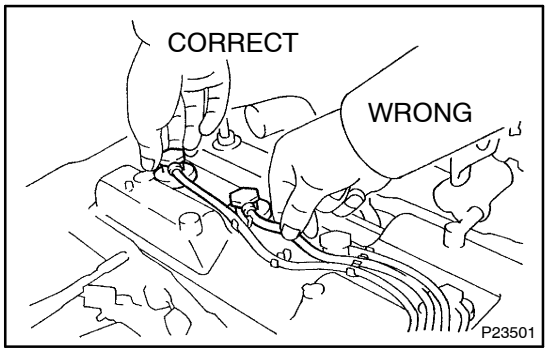
14124–01

REPLACEMENT

1. **REMOVE ENGINE UNDER COVER SUB–ASSY NO.1**

(a) Remove the 4 bolts and engine under cover.

2. **DISCONNECT ACCELERATOR CONTROL CABLE ASSY**
3. **DISCONNECT THROTTLE CABLE ASSY (A/T TRANSAXLE)**
4. **REMOVE AIR CLEANER CAP SUB–ASSY (See page 10–10)**
5. **REMOVE INTAKE AIR CONNECTOR SUB–ASSY (See page 10–10)**
6. **DISCONNECT VENTILATION HOSE**
7. **DISCONNECT VENTILATION HOSE NO.2**



8. **REMOVE IGNITION COIL BRACKET (LEADED GASOLINE)**

(a) Remove the resistive cord from the clamps.

(b) Disconnect the resistive cord from the spark plugs.

NOTICE:

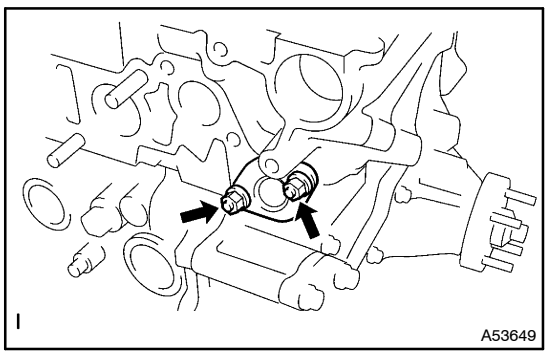
Pulling on or bending the resistive cord may damage the conductor inside.

(c) Disconnect the 2 ignition coil connectors.

(d) Remove the bolt and ground terminal of the engine wire.

(e) Remove the bolt, nut and ignition coil bracket together with the coil and spark cord set.

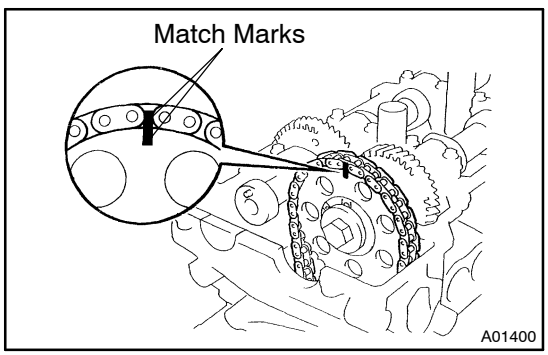
9. **REMOVE IGNITION COIL NO.1 (UNLEADED GASOLINE) (See page 14–9)**
10. **REMOVE CYLINDER HEAD COVER SUB–ASSY (See page 14–9)**
11. **SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14–9)**



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

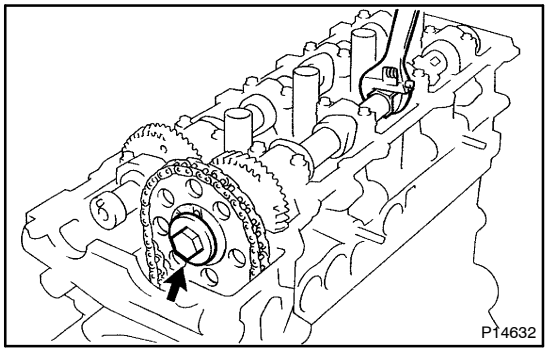
(a) Remove the 2 nuts, chain tensioner and gasket.

13. **REMOVE SEMICIRCULAR PLUG**

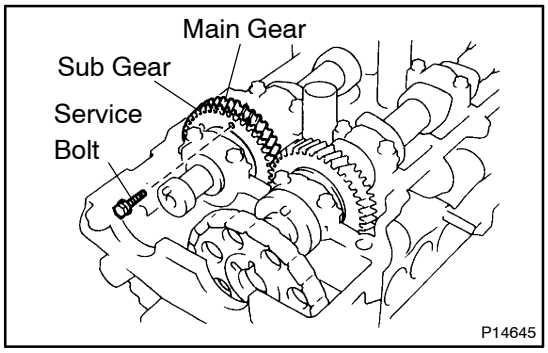


14. **REMOVE CAMSHAFT TIMING GEAR OR SPROCKET**

(a) Place the match marks on the camshaft timing gear and chain.



(b) Hold the camshaft with a wrench and remove the bolt.
(c) Remove the camshaft timing gear and chain from the camshaft and leave on the chain tensioner slipper and chain vibration damper.



15. REMOVE CAMSHAFT

NOTICE:

Since the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being removed. If there camshaft is not kept level, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, these steps should be carried out.

(a) Bring the service bolt hole of the driven sub gear upward by turning the hexagon wrench head portion of the camshaft No. 2 with a wrench.
(b) Secure the camshaft No.2 sub gear to the main gear with a service bolt.

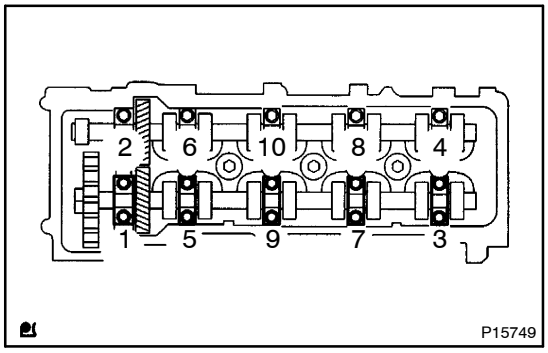
Torque: 5.0 N·m (51 kgf·cm, 44 ft·lbf)

Recommended service bolt:

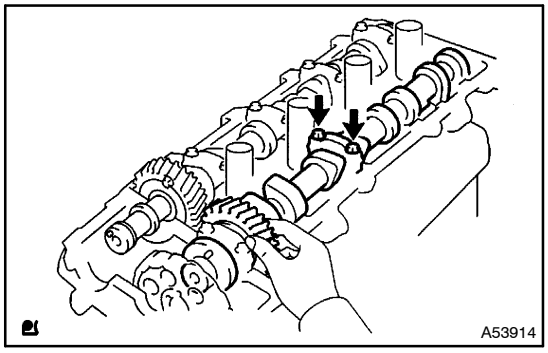
Thread diameter	6 mm
Thread pitch	1.0 mm
Bolt length	16 – 20 mm (0.63 – 0.79 in.)

HINT:

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



(c) Uniformly loosen and remove the 10 camshaft bearing cap bolts in several passes, in the sequence shown.



(d) Remove the 5 camshaft bearing caps and camshaft.

NOTICE:

Do not pry or attempt to force the camshaft with a tool or other object.

HINT:

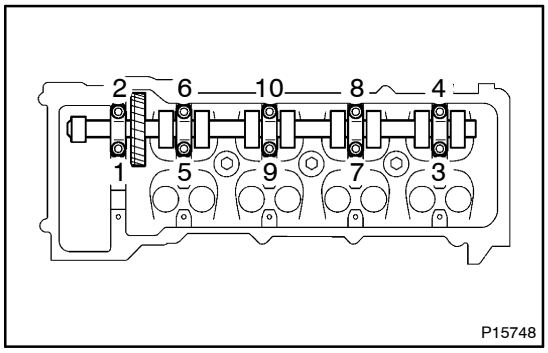
If the camshaft is not being lifted out straight and level, reinstall the No. 3 camshaft bearing cap with the 2 bolts. Then alternately loosen and remove the camshaft bearing cap bolts with the camshaft gear pulled up.

(e) Remove the camshaft.

16. REMOVE NO.2 CAMSHAFT

NOTICE:

Since the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being removed. If there camshaft is not kept level, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, these steps should be carried out.



(a) Uniformly loosen and remove the 10 camshaft bearing cap bolts in several passes, in the sequence shown.

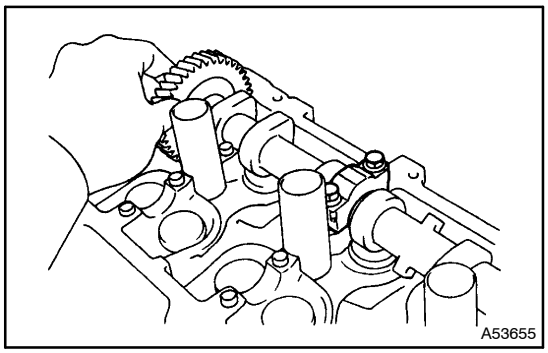
(b) Remove the 5 camshaft bearing caps and camshaft.

NOTICE:

Do not pry or attempt to force the camshaft with a tool or other object.

HINT:

If the camshaft is not being lifted out straight and level, reinstall the No. 3 camshaft bearing cap with the 2 bolts. Then alternately loosen and remove the camshaft bearing cap bolts with the camshaft gear pulled up.



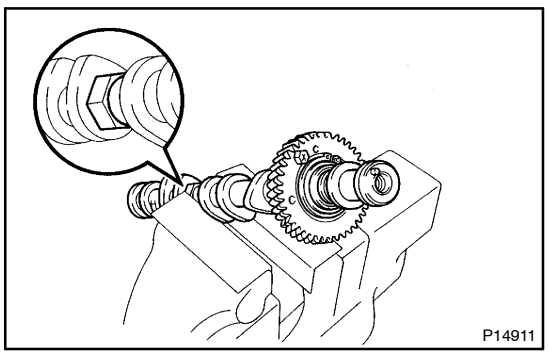
(c) Remove the No. 2 camshaft.

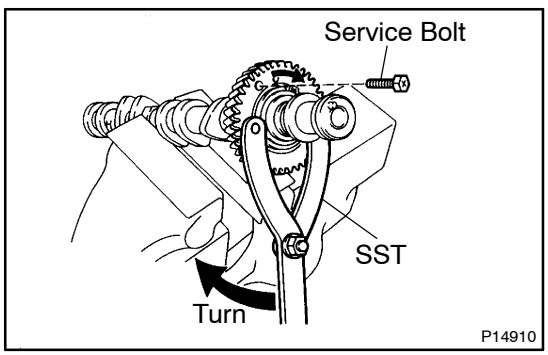
17. REMOVE CAMSHAFT SUB GEAR

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

NOTICE:

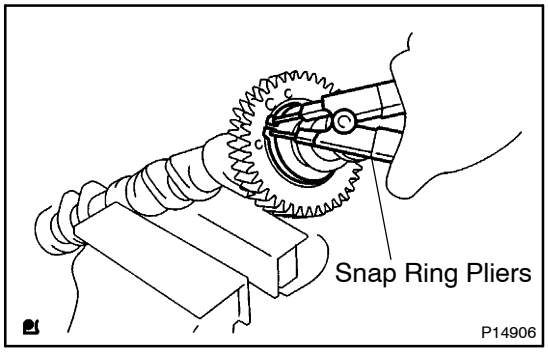
Be careful not to damage the camshaft.



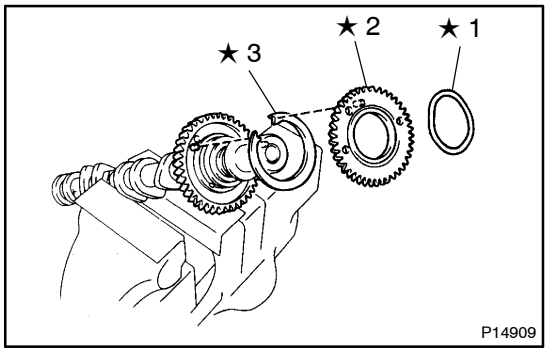


(b) Using SST, turn the camshaft sub gear clockwise, and remove the service bolt.

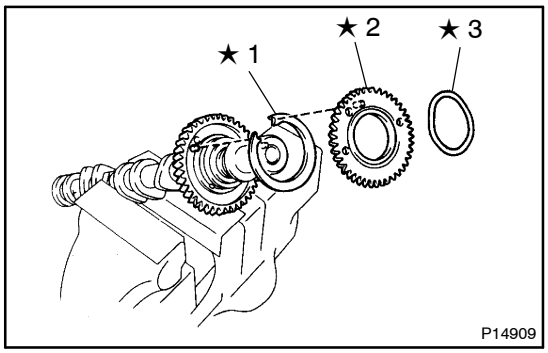
SST 09960–10010 (09962–01000, 09963–00500)



(c) Using snap ring pliers, remove the camshaft sub gear shaft snap ring.



(d) Remove these parts the camshaft sub gear wave washer (★ 1), camshaft sub gear (★ 2) and camshaft timing gear bolt washer (★ 3).



18. INSTALL CAMSHAFT SUB GEAR

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

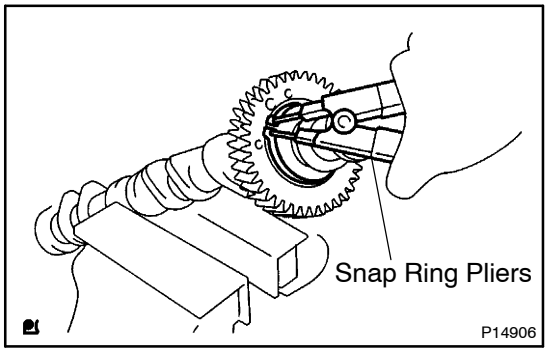
NOTICE:

Be careful not to damage the camshaft.

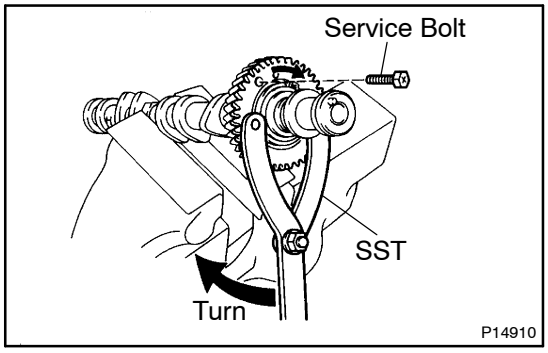
(b) Install these parts the camshaft timing gear bolt washer (★ 1), camshaft sub gear (★ 2) and camshaft sub gear wave washer (★ 3).

HINT:

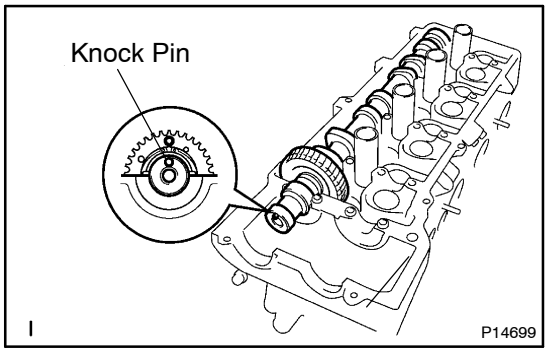
Align the pins on the gears with the camshaft timing gear bolt washer.



(c) Using snap ring pliers, install the camshaft sub gear shaft snap ring.



(d) Using SST, align the holes of the camshaft main gear and sub gear by turning camshaft sub gear clockwise, and install a service bolt.
SST 09960–10010 (09962–01000, 09963–00500)
Torque: 5.0 N·m (51 kgf·cm, 44 ft·lbf)



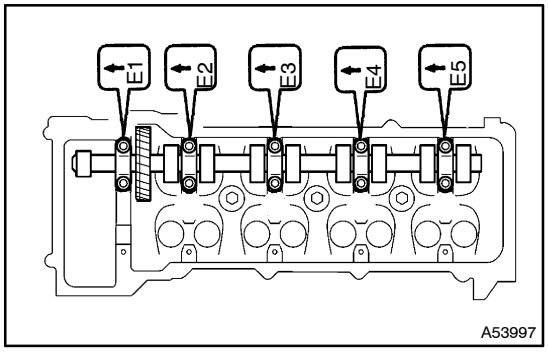
19. INSTALL NO.2 CAMSHAFT

NOTICE:

Since the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being installed. If there camshaft is not kept level, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, these steps should be carried out.

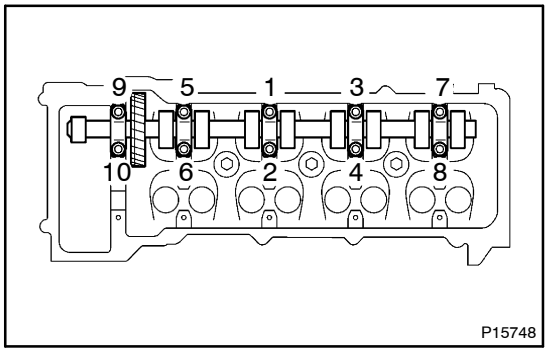
(a) Apply MP grease to the thrust portion of the No. 2 camshaft.

(b) Place the No. 2 camshaft with knock pin facing upward of camshaft angle on the cylinder head.

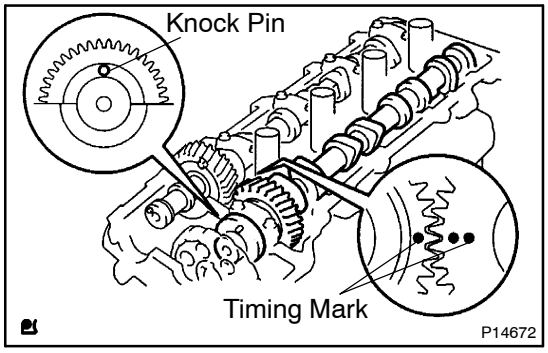


(c) Install the 5 camshaft bearing caps in their proper location.

(d) Apply a light coat of engine oil on the threads and under the heads of the camshaft bearing cap bolts.



(e) Install and uniformly tighten the 10 camshaft bearing cap bolts in several, in the sequence shown.
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)



20. INSTALL CAMSHAFT

NOTICE:

Since the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being installed. If there camshaft is not kept level, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, these steps should be carried out.

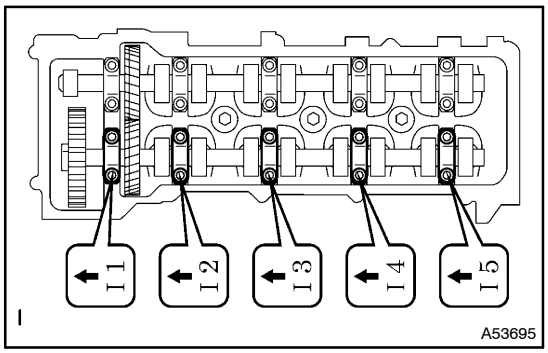
(a) Apply MP grease to the thrust portion of the camshaft.

(b) Engage the camshaft gear to the camshaft No.2 gear by matching the timing marks (1 and 2 dots) on each gear.

NOTICE:

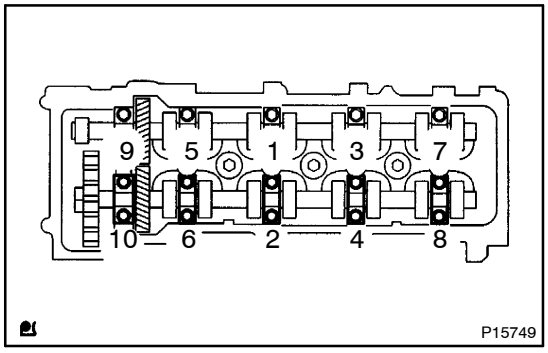
There are also timing marks (for TDC) on each gear as shown in the illustration. Do not use these marks.

(c) Roll down the camshaft onto the bearing journal while engaging gears with each other.

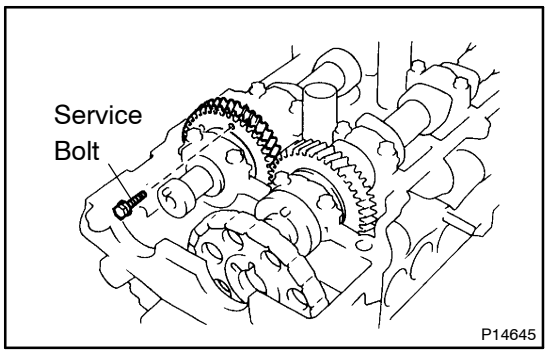


(d) Install the 5 camshaft bearing caps in their proper location.

(e) Apply a light coat of engine oil on the threads and under the heads of the camshaft bearing cap bolts.

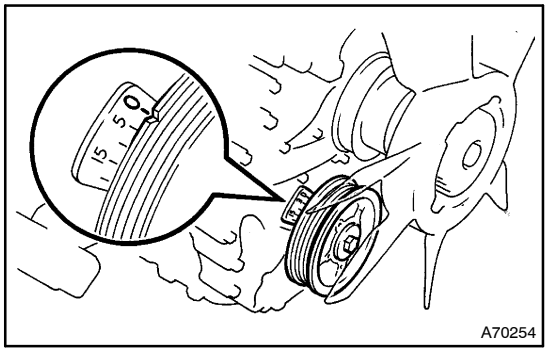


(f) Install and uniformly tighten the 10 camshaft bearing cap bolts in several, in the sequence shown.
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)



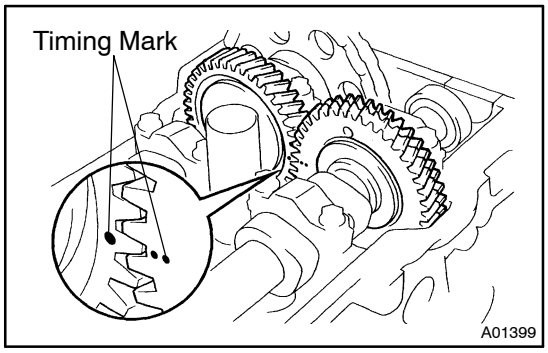
(g) Remove the service bolt.

(h) Check that the camshafts turn smoothly.

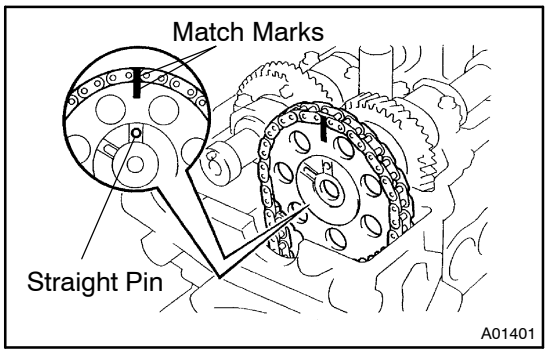


21. SET NO. 1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley clockwise, and align its groove with timing mark ”0” of the oil pump cover.



(b) Turn the camshafts so that the timing marks with 1 and 2 dots will be in straight line on the cylinder head surface as shown in the illustration.

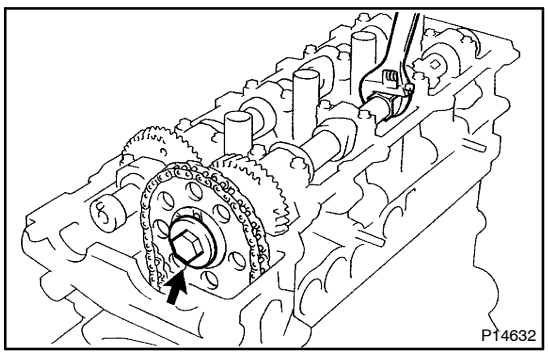


22. INSTALL CAMSHAFT TIMING GEAR OR SPROCKET

HINT:

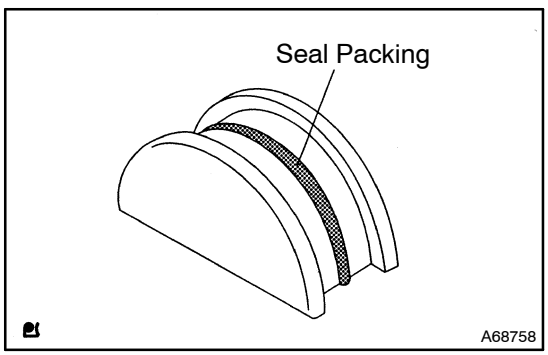
Check that the match marks on the camshaft timing gear and chain aligned.

(a) Place the gear over the straight pin of the camshaft.



(b) Hold the camshaft with a wrench, install and torque the bolt.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



23. INSTALL SEMICIRCULAR PLUG

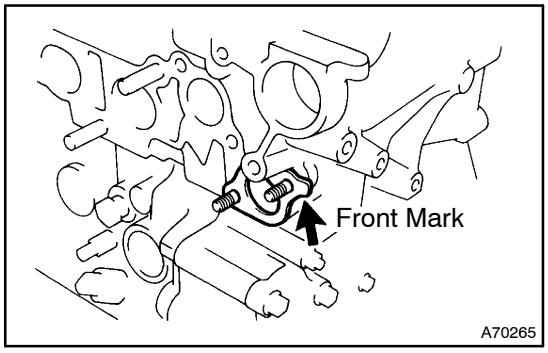
(a) Apply seal packing to the cylinder head installation surface of the semicircular plug.

Seal packing: Part No. 08826–00080 or equivalent

NOTICE:

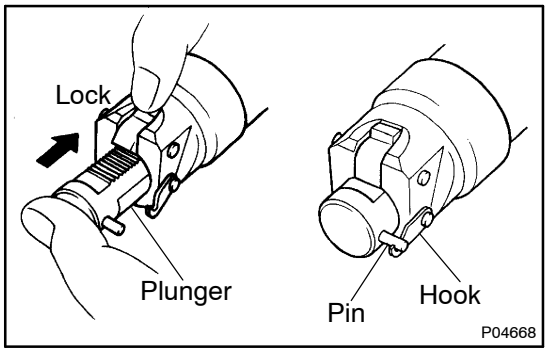
- **Remove any oil from the contact surface**
- **Install the cylinder head cover within 3 minutes after applying seal packing.**
- **Do not start the engine within 2 hours after installing.**

(b) Install the semicircular plug to the cylinder head.



24. INSTALL CHAIN TENSIONER ASSY NO.1

(a) Place a new gasket so that the front mark is toward the front side.

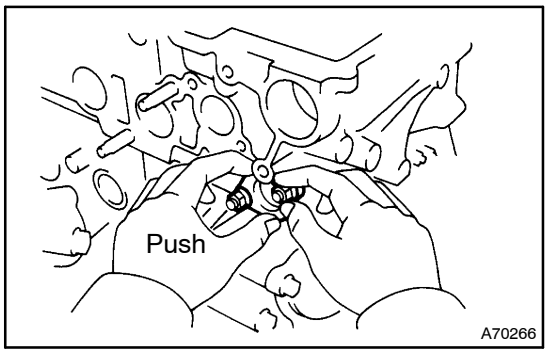


(b) Release the ratchet pawl, fully push in the plunger and apply the hook to the pin so that the plunger cannot spring out.

(c) Turn the crankshaft pulley clockwise to provide some slack for the chain on the chain tensioner side.

NOTICE:

Do not turn the crankshaft pulley counterclockwise.



(d) Push the chain tensioner by hand until it touches the cylinder head installation surface, then install the 2 nuts.

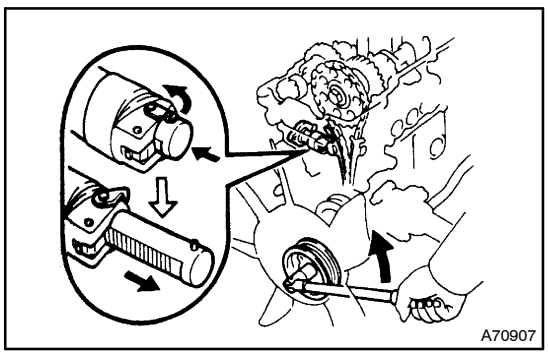
(e) Tighten the 2 nuts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(f) Check that the hook of the chain tensioner is not released.

NOTICE:

If the plunger springs out during installation of the chain tensioner, repeat the operation in step (b) before installing the chain tensioner.

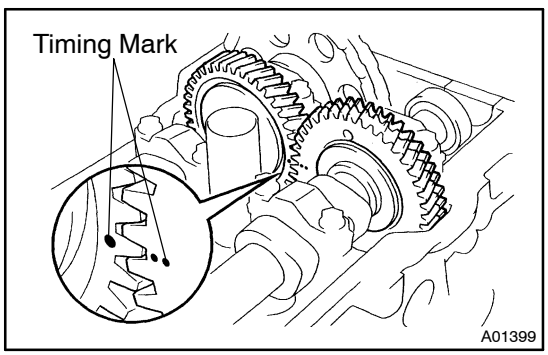


(g) Set chain tensioner.

(1) Turn the crankshaft to the left so that the hook of the chain tensioner is released from the pin of plunger, causing the plunger to spring out and the chain tensioner slipper to be pushed in to the chain.

HINT:

If the plunger does not spring out, press the chain tensioner slipper into the chain tensioner with a screwdriver so that the hook is released and the plunger springs out.



(h) Check valve timing

(1) Turn the crankshaft pulley clockwise and align its groove with the ”0” mark on the oil pump cover.

(2) Check that the timing marks (1 and 2 bolts) of the camshaft drive and driven gears are in straight line on the cylinder head surface as shown in the illustration. If not, turn the crankshaft 1 revolution (360°) and align the marks as above.

25. INSPECT VALVE CLEARANCE (See page 14–9)

26. ADJUST VALVE CLEARANCE (See page 14–9)

SST 09248–55040 (09248–05410, 09248–05420)

27. INSTALL CYLINDER HEAD COVER SUB–ASSY (See page 14–9)

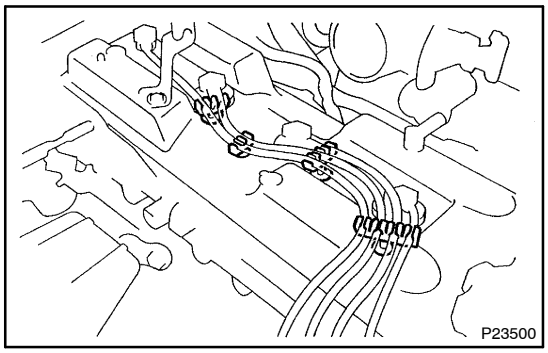
28. INSTALL IGNITION COIL BRACKET (LEADED GASOLINE)

(a) Install the ignition coil bracket together with the coil and spark cord set with the bolt and nut.
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

(b) Install ground terminal of the engine wire with the bolt.
Torque: 8.2 N·m (84 kgf·cm, 73 in.·lbf)

(c) Connect the 2 ignition coil connectors.

(d) Connect the resistive cord to the spark plugs.



(e) Secure the resistive cord with the clamps as shown in the illustration.

29. INSTALL IGNITION COIL NO.1 (UNLEADED GASOLINE) (See page 14–9)

30. CONNECT VENTILATION HOSE NO.2

31. CONNECT VENTILATION HOSE

32. INSTALL INTAKE AIR CONNECTOR SUB–ASSY (See page 10–10)

33. INSTALL AIR CLEANER CAP SUB–ASSY

34. INSTALL THROTTLE CABLE ASSY (A/T TRANSAXLE)

35. INSTALL ACCELERATOR CONTROL CABLE ASSY

36. INSTALL ENGINE UNDER COVER SUB–ASSY NO.1

(a) Install the engine under cover with the 4 bolts.
Torque: 29 N·m (296 kgf·cm, 21 ft·lbf)