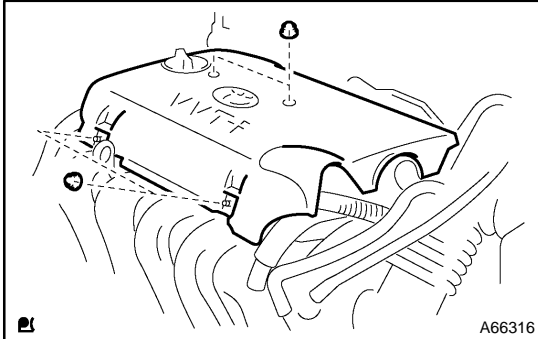
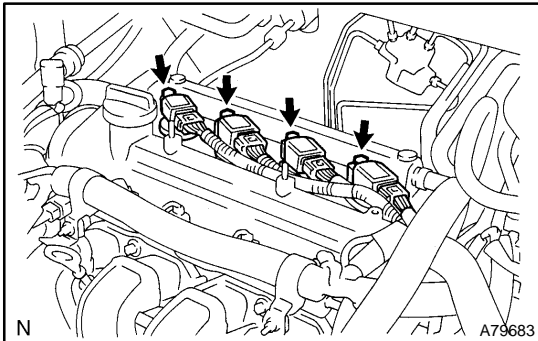


# REPLACEMENT



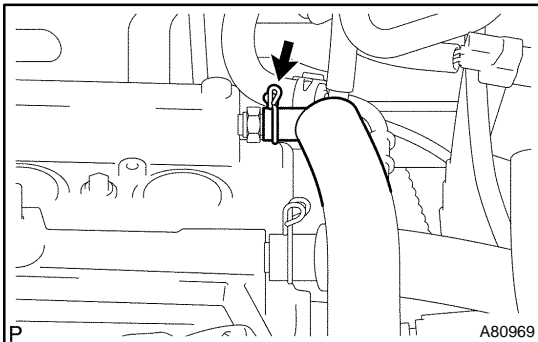
## 1. REMOVE CYLINDER HEAD COVER NO.2

- (a) Remove the 4 nuts and cylinder head cover No. 2.



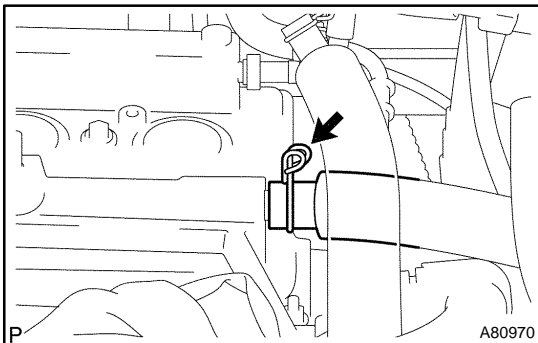
## 2. REMOVE IGNITION COIL NO.1

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



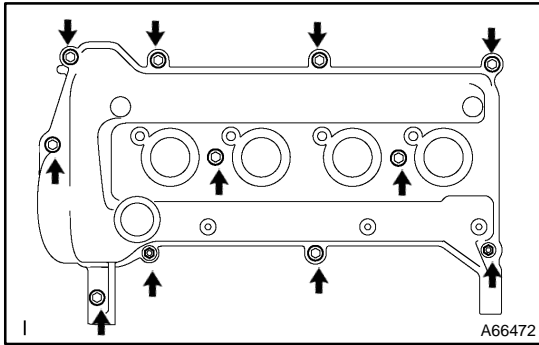
## 3. DISCONNECT VENTILATION HOSE

- (a) Disconnect the ventilation hose from the cylinder head cover.



## 4. DISCONNECT VENTILATION HOSE NO.2

- (a) Disconnect the ventilation hose No. 2 from the cylinder head cover.

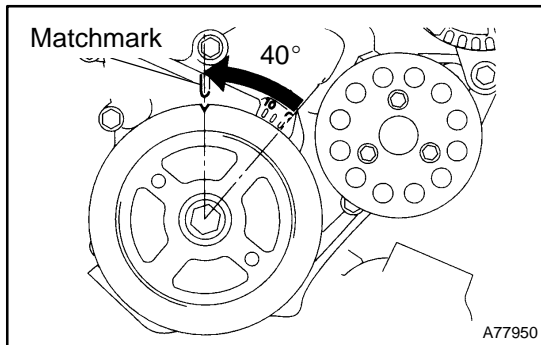


### 5. REMOVE CYLINDER HEAD COVER SUB-ASSY

- (a) Remove the 9 bolts and 2 nuts, and then remove the cylinder head cover.

### 6. REMOVE ENGINE UNDER COVER RH

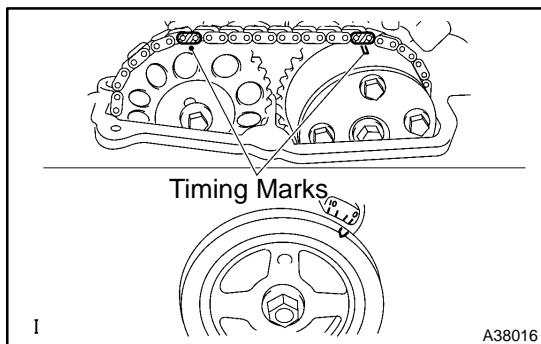
(See page 19-3)



### 7. REMOVE NO.2 CAMSHAFT

#### NOTICE:

When rotating the camshaft with the timing chain removed, rotate the crankshaft damper counterclockwise 40° from the TDC and align its timing notch with the matchmark of the chain cover to prevent contact of the pistons with the valves.

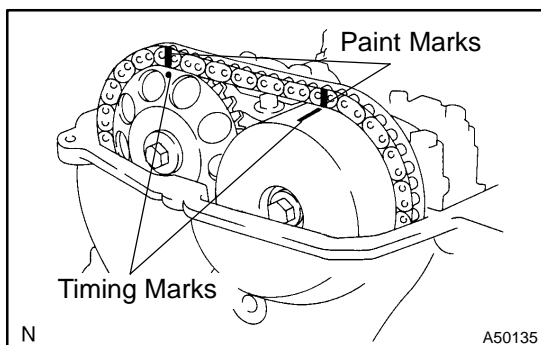


- (a) Set the No. 1 cylinder to the TDC/compression.

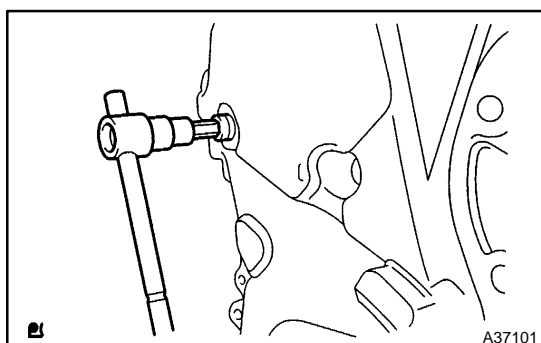
- (1) Turn the crankshaft damper, and align its timing notch with the timing mark "0" of the chain cover.
- (2) Check that both timing marks on the camshaft timing sprocket and camshaft timing gear are facing upward as shown in the illustration.

#### HINT:

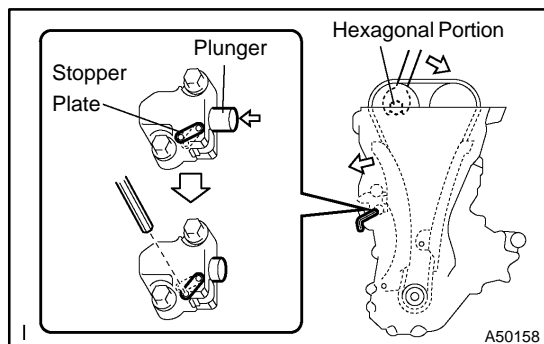
If not, turn the crankshaft 1 complete revolution (360°) and align the marks as above.



- (b) Put paint marks on the timing chain in place where the timing marks of the camshaft timing sprocket and camshaft timing gear are located.



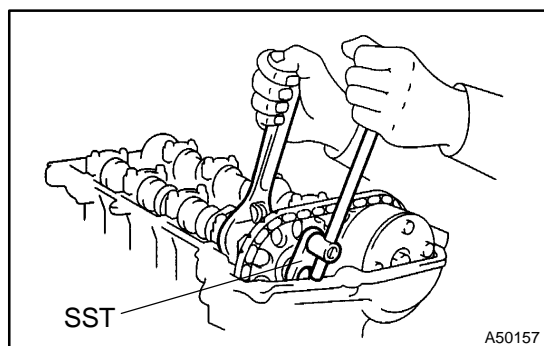
- (c) Using an 8 mm hexagon wrench, remove the screw plug.



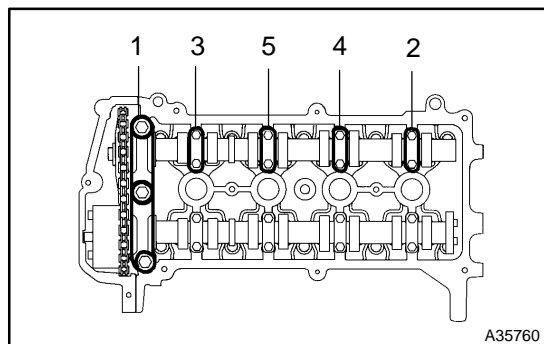
- (d) Insert a screwdriver into the service hole of the chain tensioner to hold the stopper plate of the chain tensioner at upward position.
- (e) Using a wrench, rotate the camshaft No. 2 clockwise to push in the plunger of the chain tensioner.
- (f) Remove the screwdriver from the service hole, then align the hole of the stopper plate with the service hole and insert a 2 to 3 mm (0.08 to 0.12 in.) diameter bar into the holes to hold the stopper plate.

**HINT:**

- Fix the stopper plate using the bar while rotating the camshaft right and left slightly.
- Hold the bar with tape so that the bar does not come off.



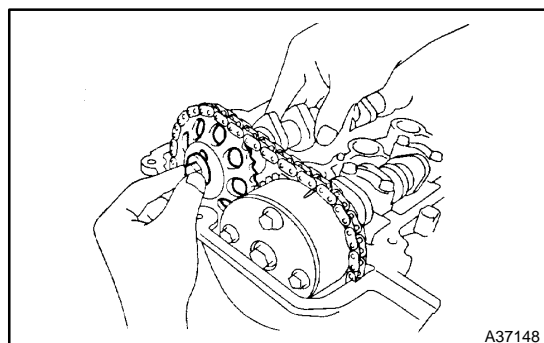
- (g) Hold the camshaft with a wrench on the hexagonal lobe, and remove the bolt.



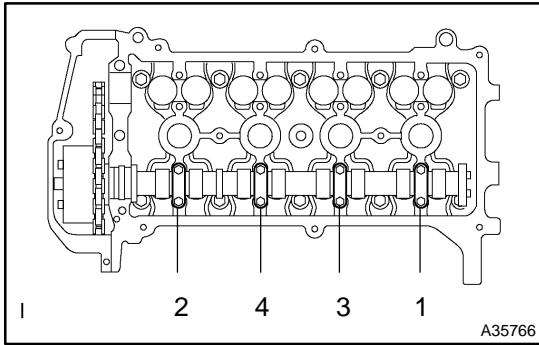
- (h) Using several steps, loosen and remove the 11 bearing cap bolts uniformly in the sequence shown in the illustration, then remove the 5 bearing caps.

**NOTICE:**

**Loosen each bolt uniformly keeping the camshaft level.**



- (i) Remove the fringe bolt with the No.2 camshaft lifted up, then detach the No. 2 camshaft and camshaft timing sprocket.

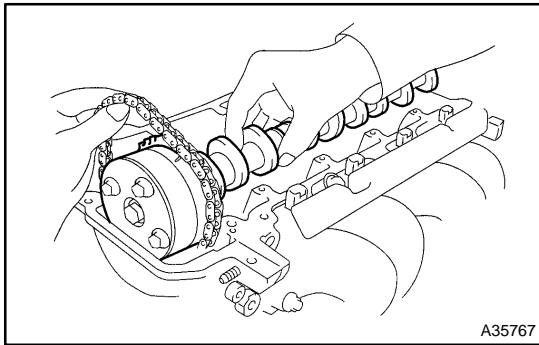


**8. REMOVE CAMSHAFT**

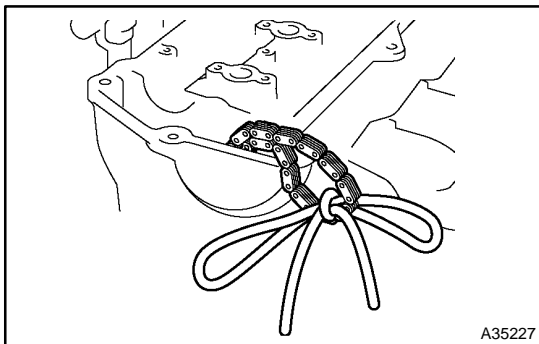
- (a) Using several steps, loosen and remove the 8 bearing cap bolts uniformly in the sequence shown in the illustration, then remove the 4 bearing caps.

**NOTICE:**

**Loosen each bolt uniformly keeping the camshaft level.**



- (b) Hold the timing chain by hand, and remove the camshaft and camshaft timing gear assembly.



- (c) Tie the timing chain with a string as shown in the illustration.

**NOTICE:**

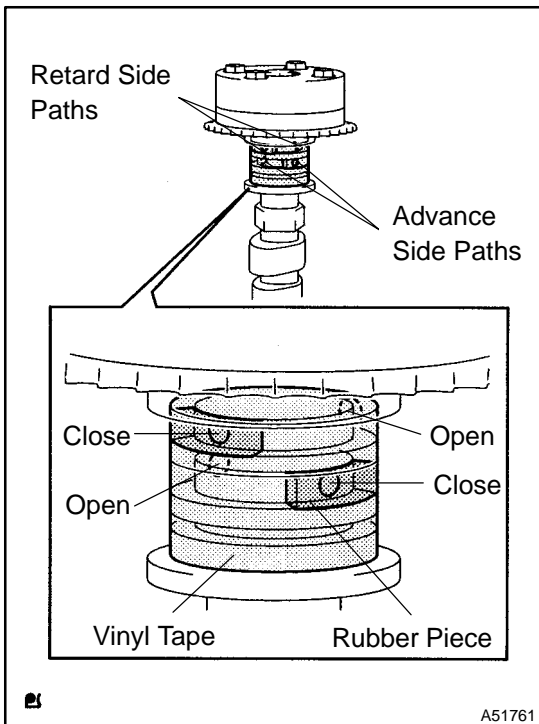
**Be careful not to drop anything inside the chain cover.**

**9. REMOVE CAMSHAFT TIMING GEAR ASSY**

- (a) Clamp the camshaft in a vise, and confirm that it is locked.

**NOTICE:**

**Be careful not to damage the camshaft.**

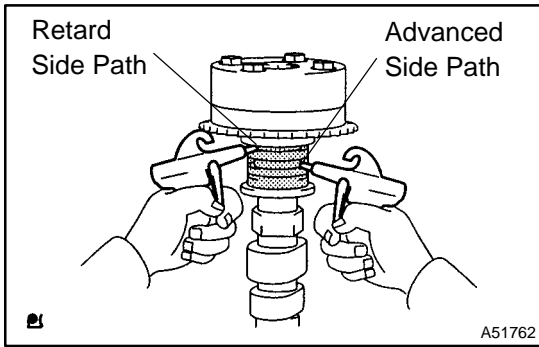


- (b) Cover the 4 oil paths of the cam journal with tape as shown in the illustration.

**HINT:**

One of the 2 grooves located on the cam journal is for retarding cam timing (upper) and the other is for advancing cam timing (lower). Each groove has 2 oil paths. Plug one of the oil paths for each groove with rubber pieces before wrapping the cam journal with the tape.

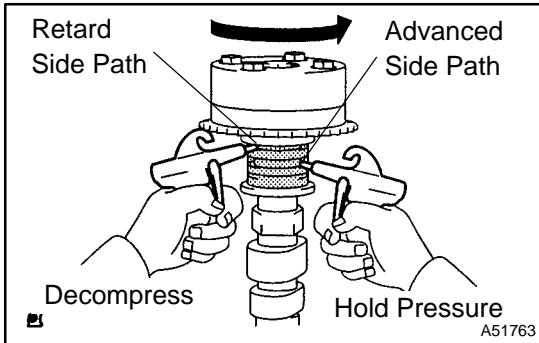
- (c) Punctuate the tape for the advance oil path and for the retard oil path on the opposite side from the advance oil path.



(d) Put air pressure into two broken paths (the advance side path and the retard side path) with about 150 kPa (1.5 kgf/cm<sup>2</sup>).

**NOTICE:**

**Cover the paths with shop rag to prevent oil splashing.**



(e) Confirm if the camshaft timing gear assembly revolves in the timing advance direction when reducing the air pressure of the timing retard path.

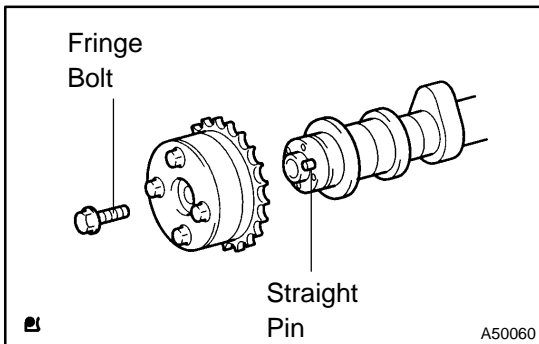
**HINT:**

The lock pin is released, and the camshaft timing gear revolves in the timing advance direction.

(f) When the camshaft timing gear reaches the most advanced position, remove the air pressure of the timing retard side path, and then release the air pressure of the timing advance side path.

**NOTICE:**

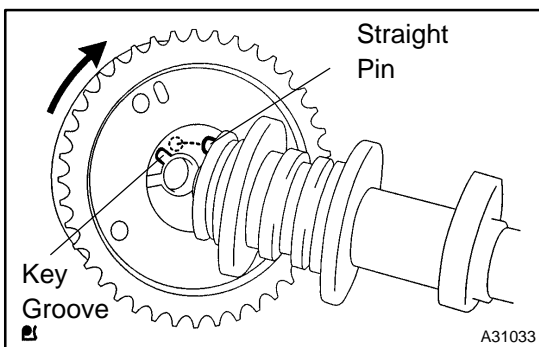
**Camshaft timing gear assembly occasionally shifts to the retard side abruptly, if the air compression of the advanced side path is released first. It often results in the breakage of the lock pin.**



(g) Remove the fringe bolt of the camshaft timing gear assembly.

**NOTICE:**

- **Be careful not to remove the other 4 bolts.**
- **In case of reusing the camshaft timing gear, unlock the lock pin inside the camshaft timing gear first.**



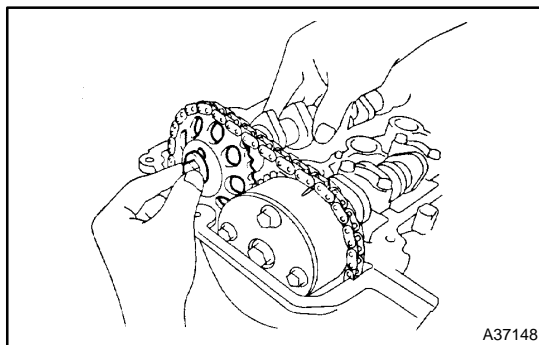
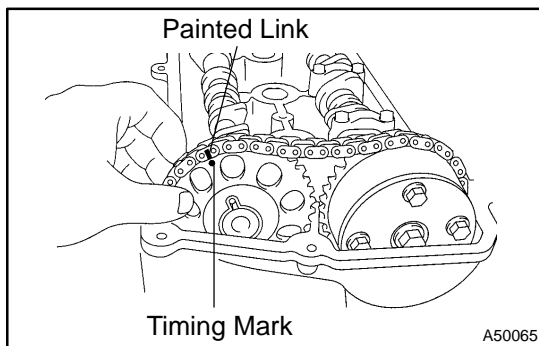
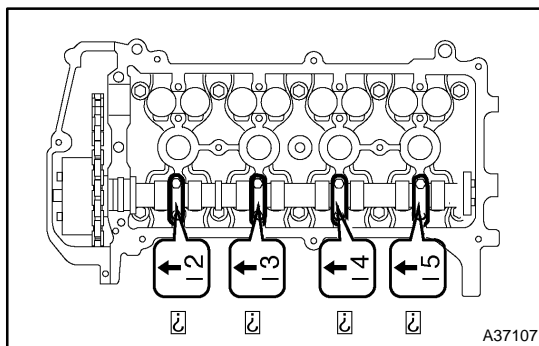
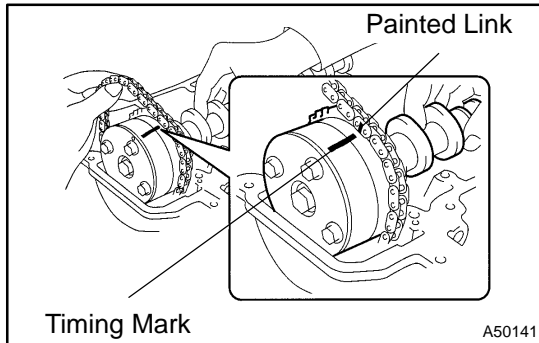
**10. INSTALL CAMSHAFT TIMING GEAR ASSY**

- (a) Put the camshaft timing gear assembly and camshaft together with the straight pin off the groove.
- (b) Turn the camshaft timing gear assembly clockwise while pushing it lightly forwards the camshaft. Push further at the position where the pin fits into the groove.

**NOTICE:**

**Be careful not to turn the camshaft timing gear to the retarded angle (to the right).**

- (c) Check that there is no clearance between the gear fringe and camshaft.
- (d) Tighten the fringe bolt with the camshaft timing gear fixed.  
**Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)**



- (e) Check that the camshaft timing gear assembly can move to the retarded angle (to the right) and is locked at the most retarded position.

#### 11. INSTALL CAMSHAFT

- (a) Apply a light coat of engine oil on the camshaft journals.  
 (b) Install the timing chain on the camshaft timing gear with the painted link aligned with the timing mark on the camshaft timing gear as shown in the illustration.

- (c) Examine the front marks and numbers and tighten the bolts in the sequence shown in the illustration.

**Torque: 13 N·m (129 kgf·cm, 9.4 ft·lbf)**

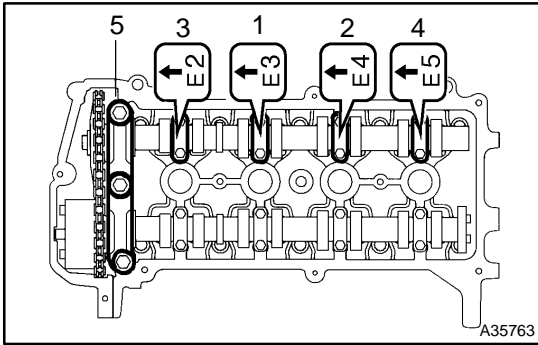
#### NOTICE:

**Tighten each bolt uniformly keeping the camshaft level.**

#### 12. INSTALL NO.2 CAMSHAFT

- (a) Hold the timing chain, and align the painted link on the timing chain with the timing mark on the camshaft timing sprocket.

- (b) Align the alignment pin hole of the camshaft timing sprocket with the alignment pin of the camshaft, and install the sprocket to the camshaft.  
 (c) Temporarily install the timing sprocket bolt.

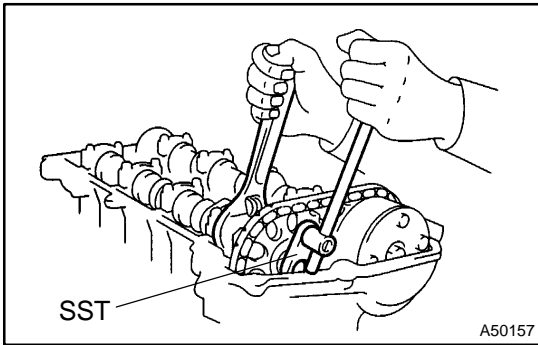


- (d) Examine the front marks and numbers and tighten the bolts in the sequence shown in the illustration.  
**Torque: 13 N·m (129 kgf·cm, 9.4 ft·lbf)**

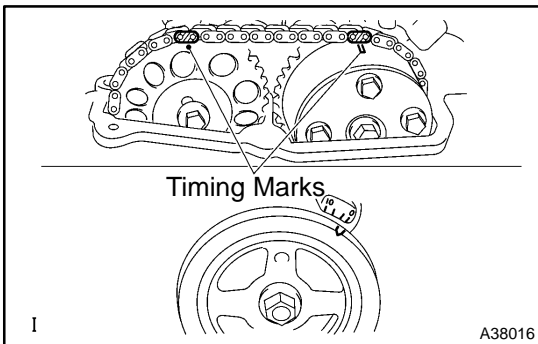
**NOTICE:**

**Tighten each bolt uniformly keeping the camshaft level.**

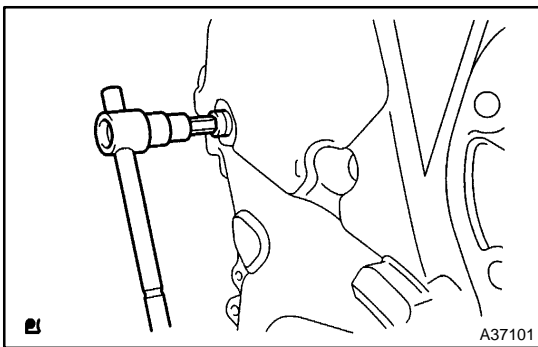
- (e) Install the bearing cap No. 1.  
**Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)**



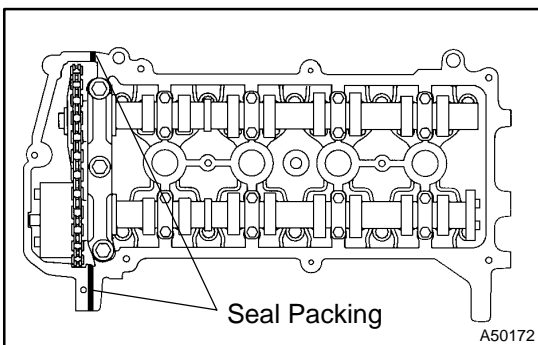
- (f) Hold the camshaft with a wrench on the hexagonal lobe, and install the bolt.  
SST 09023-38400  
**Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)**
- (g) Remove the bar from the timing chain tensioner.



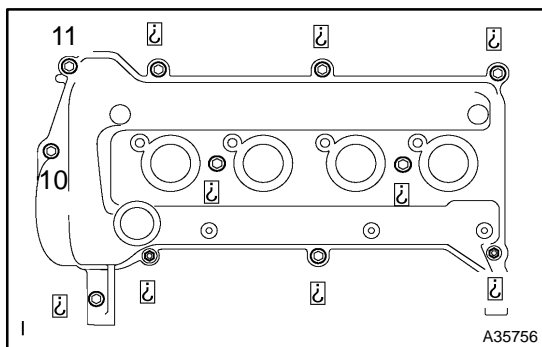
- (h) Turn the crankshaft damper, and align its timing notch with the timing mark "0" of the chain cover.
- (i) Check that all the pairs of the timing marks are aligned.
- (j) Apply the seal packing to 2 or 3 threads of the screw plug end.  
**Seal packing:**  
**Part No. 08833 - 00070 or equivalent**



- (k) Using an 8 mm hexagon wrench, install the screw plug.  
**Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)**
- 13. INSPECT VALVE CLEARANCE (See page 14-7)**  
**14. ADJUST VALVE CLEARANCE (See page 14-7)**  
SST 09023-38400



- 15. INSTALL CYLINDER HEAD COVER SUB-ASSY**
- (a) Apply the seal packing to the 2 locations shown in the illustration.  
**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 the seal packing.
  - Do not start the engine within 2 hours of installation.

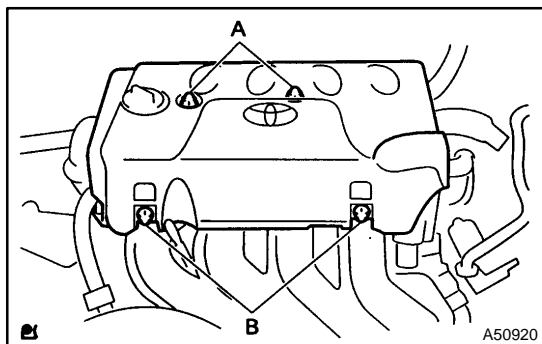


- (b) Install the cylinder head cover with the 9 bolts, 2 seal washers and 2 nuts.
- (c) Using several steps, tighten the bolts and nuts uniformly in the sequence shown in the illustration.

**Torque: 10 N·m (102 kgf·cm, 7.4 ft·lbf)**

**16. INSTALL IGNITION COIL NO.1**

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



**17. INSTALL CYLINDER HEAD COVER NO.2**

- (a) First tighten nut A, then tighten bolt B.

**Torque: 7.0 N·m (71 kgf·cm, 62 in·lbf)**

**18. INSTALL ENGINE UNDER COVER RH**

**Torque:**

**5.0 N·m (51 kgf·cm, 44 in·lbf) for Bolt**

**5.0 N·m (51 kgf·cm, 44 in·lbf) for Nut**

**19. CHECK FOR ENGINE OIL LEAKS**