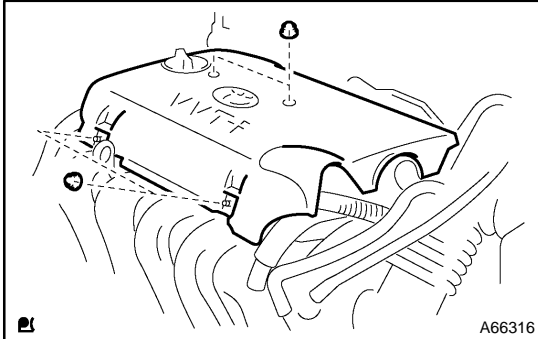
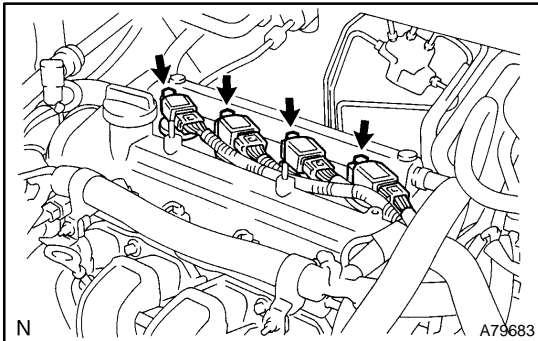


VALVE CLEARANCE ADJUSTMENT

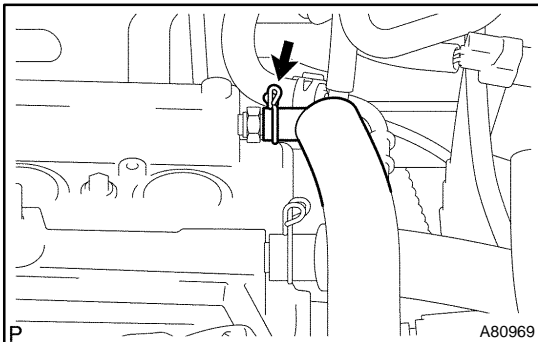
141FO-01



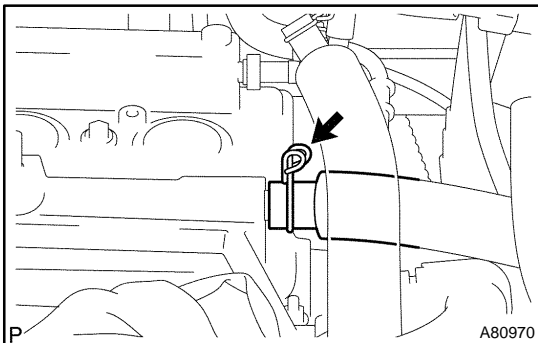
- 1. REMOVE CYLINDER HEAD COVER NO.2**
- (a) Remove the 4 nuts and cylinder head cover No. 2.



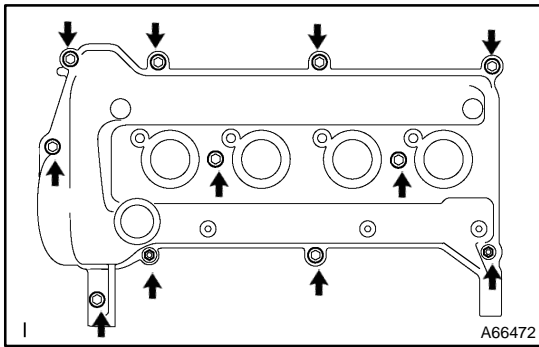
- 2. REMOVE IGNITION COIL NO.1**
- (a) Remove the 4 bolts and pull out the 4 ignition coils.



- 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.

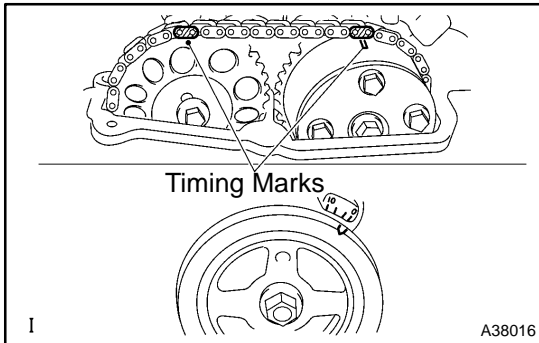


5. REMOVE CYLINDER HEAD COVER SUB-ASSY

- (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. INSPECT VALVE CLEARANCE

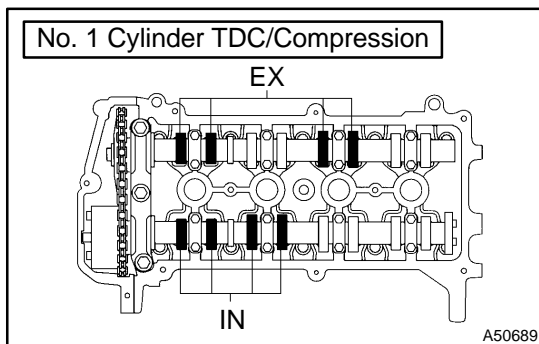
HINT:

Inspect and adjust the valve clearance when the engine is cold.

- (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 the 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.



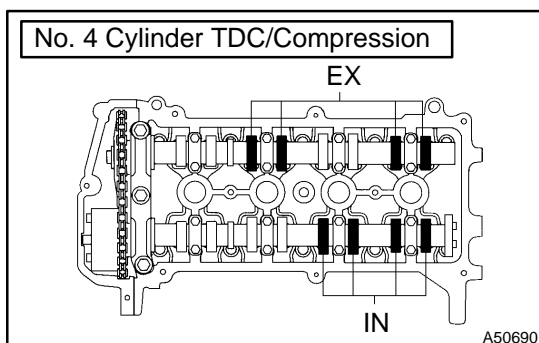
- (b) Check the valves indicated in the illustration.
- (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

Valve clearance (Cold) :

Intake 0.15 to 0.25 mm (0.006 to 0.010 in.)

Exhaust 0.25 to 0.35 mm (0.010 to 0.014 in.)

- (2) Record the out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.
- (c) Turn the crankshaft 1 complete revolution (360°) and align its timing notch with the timing mark "0" of the chain cover.



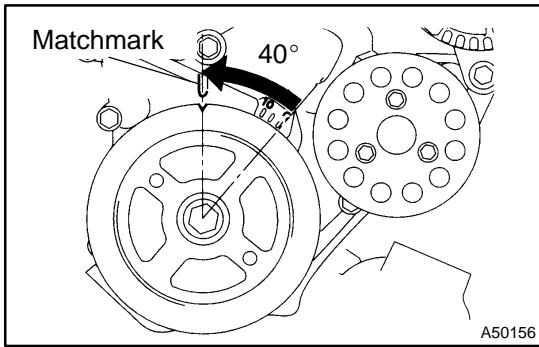
- (d) Check the valves indicated in the illustration.
- (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.

Valve clearance (Cold) :

Intake 0.15 to 0.25 mm (0.006 to 0.010 in.)

Exhaust 0.25 to 0.35 mm (0.010 to 0.014 in.)

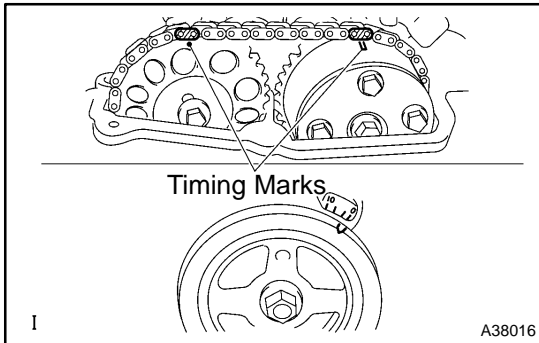
- (2) Record the out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.



8. ADJUST VALVE CLEARANCE

NOTICE:

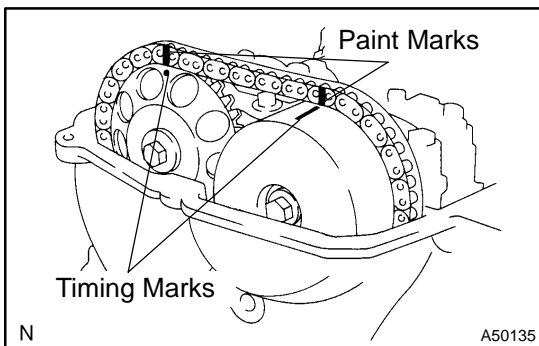
When rotating the camshaft with the timing chain removed, rotate the crankshaft damper counterclockwise 40° from the TDC and align its timing notch with the matchmark of the timing chain cover to prevent contact of the pistons with the valves.



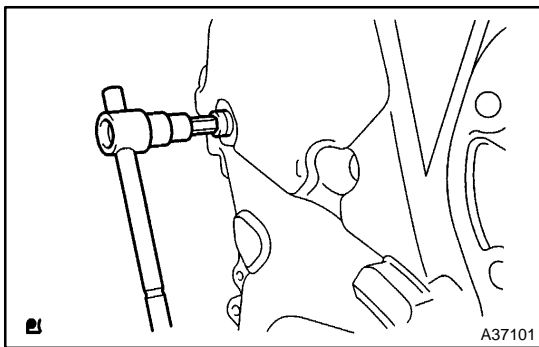
- (a) Set the No. 1 cylinder to the TDC/compression.
 - (1) Turn the crankshaft damper, and align its timing notch with timing mark "0" of the chain cover.
 - (2) Check that both timing marks on the camshaft timing sprocket and valve timing controller assembly are facing upward as shown in the illustration.

HINT:

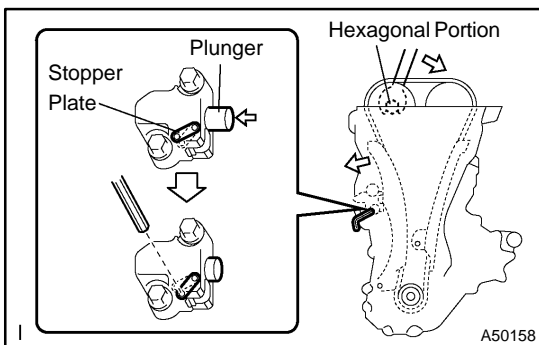
If not, turn the crankshaft 1 complete revolution (360°) and align the marks as above.



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



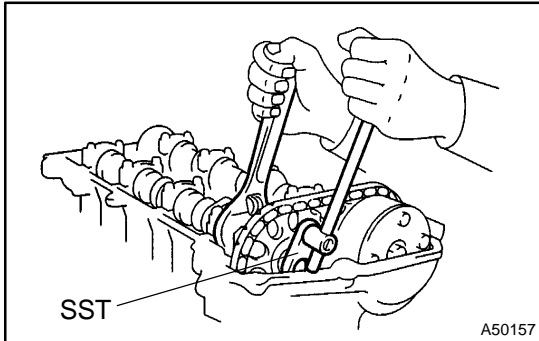
- (c) Using an 8 mm hexagon wrench, remove the screw plug.



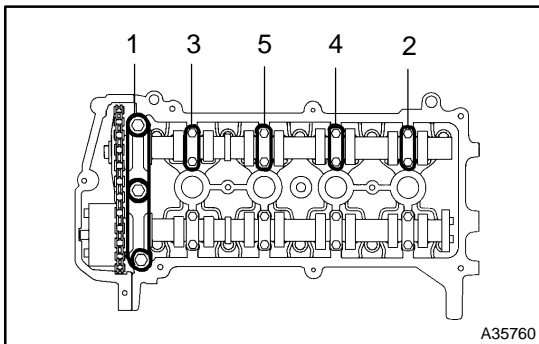
- (d) Insert a screwdriver into the service hole of the chain tensioner to the hole stopper plate of the chain tensioner at upward position.
- (e) Using a wrench, rotate the camshaft No. 2 clockwise to push in the plunger of the chain tensioner.
- (f) Remove the screwdriver from the service hole, then 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.



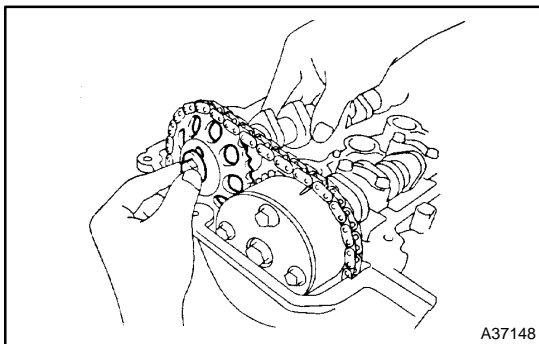
- (g) Hold the camshaft with a wrench on the hexagonal lobe, and remove the bolt.
SST 09023-38400



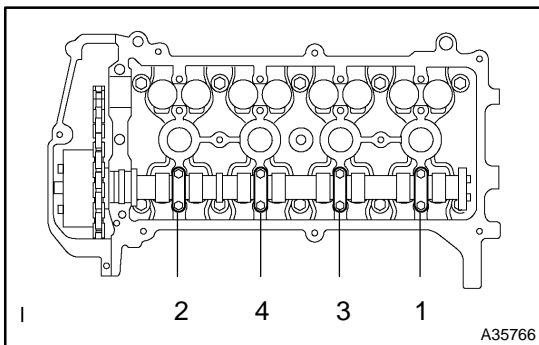
- (h) Using several steps, loosen and remove the 11 bearing cap bolts uniformly in the sequence shown in the illustration, then remove the 5 bearing caps.

NOTICE:

Loosen each bolt uniformly keeping the camshaft level.



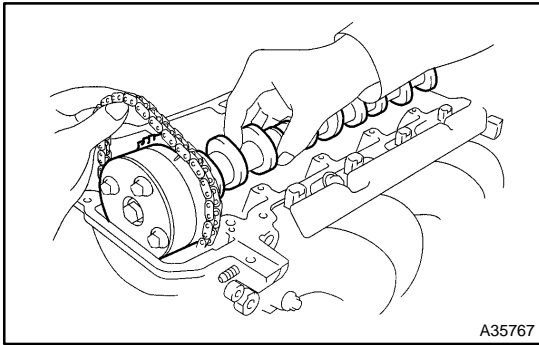
- (i) Remove the fringe bolt with the No. 2 camshaft lifting up, then detach the No. 2 camshaft and camshaft timing sprocket.



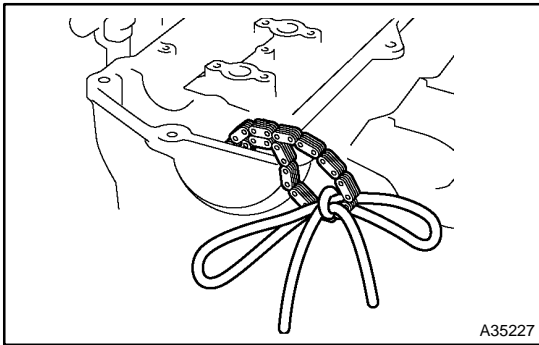
- (j) Using several steps, loosen and remove the 8 bearing cap bolts uniformly in the sequence shown in the illustration, then remove the 4 bearing caps.

NOTICE:

Loosen each bolt uniformly keeping the camshaft level.



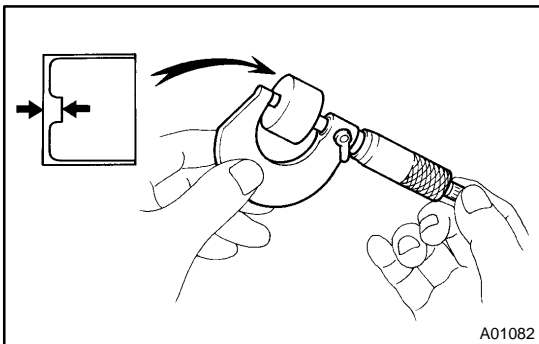
- (k) Hold the timing chain by hand, and remove the camshaft and camshaft timing gear assembly.



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

NOTICE:

Be careful not to drop anything inside the chain cover.



- (m) Remove the valve lifters.
- (n) Using a micrometer, measure the thickness of the removed lifter.
- (o) Calculate the thickness of a new lifter so that the valve clearance comes within the specified value.

A	Thickness of new lifter
B	Thickness of used lifter
C	Measured valve clearance

Specified value (Cold):

Intake $A = B + (C - 0.20 \text{ mm (0.008 in.)})$

Exhaust $A = B + (C - 0.30 \text{ mm (0.012 in.)})$

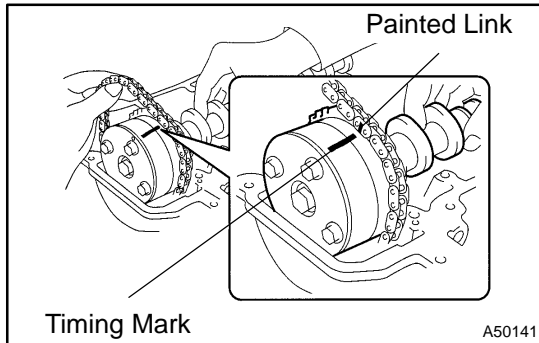
- (p) Select a new lifter with a thickness as close as possible to the calculated values.

EXAMPLE (Intake):
 Measured valve clearance = 0.40 mm (0.0158 in.)
 $0.40 \text{ mm (0.0158 in.)} - 0.20 \text{ mm (0.0079 in.)} = 0.20 \text{ mm (0.0079 in.)}$
 (Measured – Specification = Excess clearance)
 Used lifter measurement = 5.25 mm (0.2067 in.)
 $0.20 \text{ mm (0.0079 in.)} + 5.25 \text{ mm (0.2067 in.)} = 5.45 \text{ mm (0.2146 in.)}$
 (Excess clearance + Used lifter = Ideal new lifter)
 Closest new lifter = 5.45 mm (0.2146 in.)
 Select No. "46" lifter (5.46 mm (0.2150 in.))

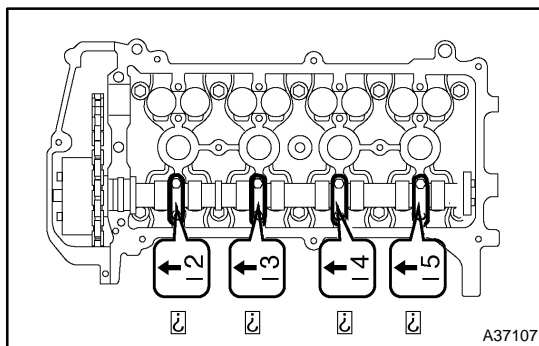
HINT:

- Lifters are available in 35 sizes in increments of 0.020 mm (0.0008 in.), from 5.060 mm (0.1992 in.) to 5.740 mm (0.2260 in.).
- Refer to the New Lifter Thickness table on the next 2 pages.

- (q) Reinstall the valve lifters.
- (r) Apply a light coat of engine oil on the camshaft journals.



- (s) Install the timing chain to the camshaft timing gear with the painted link and timing marks aligned as shown in the illustration.

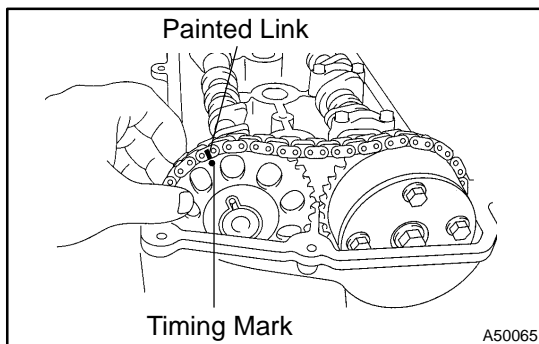


- (t) Examine the front marks and numbers and tighten the bolts in the sequence shown in the illustration.

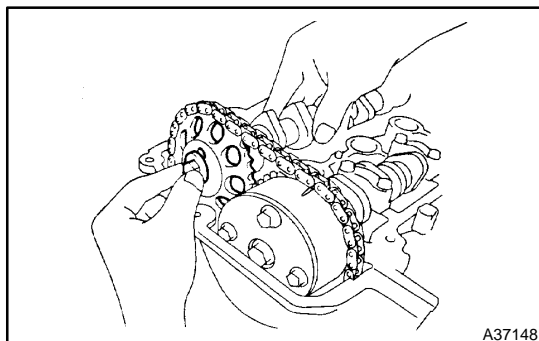
Torque: 13 N·m (129 kgf·cm, 9.4 ft·lbf)

NOTICE:

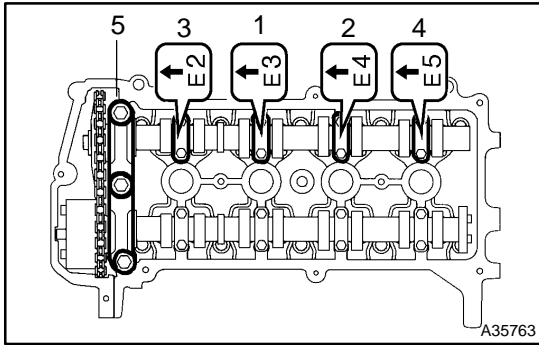
Tighten each bolt uniformly keeping the camshaft level.



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



- (v) Align the alignment pin hole located on the camshaft timing sprocket with the alignment pin of the camshaft, and install the sprocket to the camshaft.
- (w) Temporarily install the timing sprocket bolt.

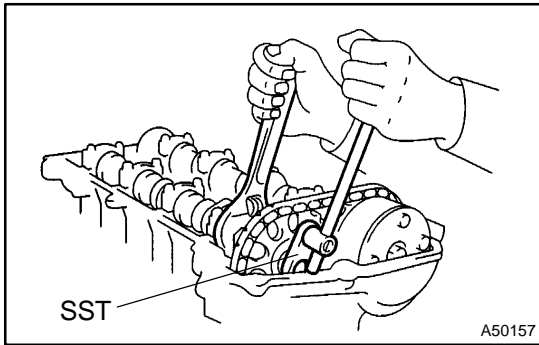


- (x) Examine the front marks and numbers and tighten the bolts in the sequence shown in the illustration.
Torque: 13 N·m (129 kgf·cm, 9.4 ft·lbf)

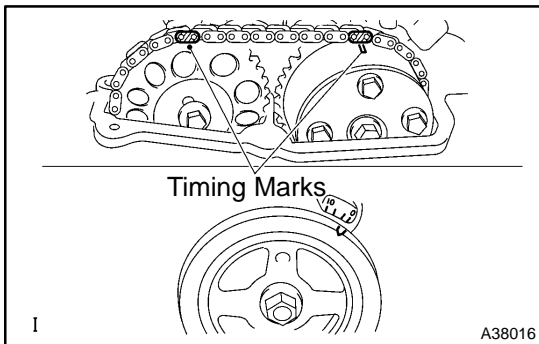
NOTICE:

Tighten each bolt uniformly keeping the camshaft level.

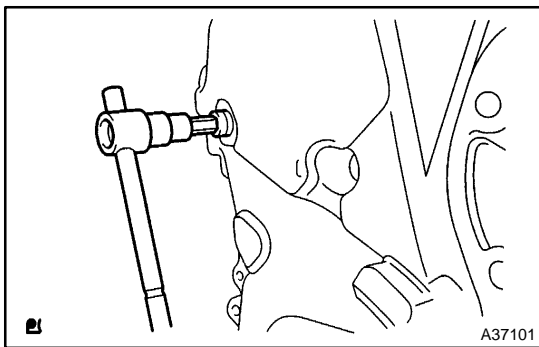
- (y) Install the bearing cap No. 1.
Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)



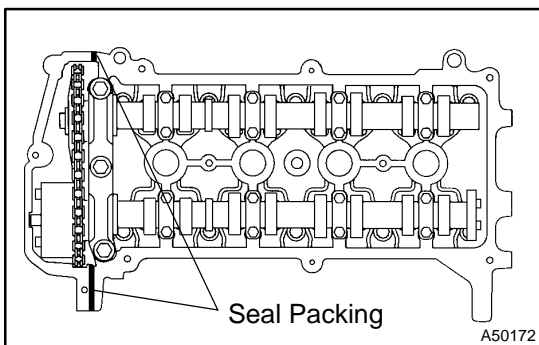
- (z) Hold the camshaft with a wrench on the hexagon lobe, and install the bolt.
Torque: 64 N·m (653 kgf·cm, 47 ft·lbf)
- (aa) Remove the bar from the timing chain tensioner.



- (ab) Turn the crankshaft damper, and align its timing notch with the timing mark "0" of the chain cover.
- (ac) Check that all the pairs of the timing marks are aligned.



- (ad) Apply seal packing to 2 or 3 threads of the screw plug end.
Seal packing:
Part No. 08833 - 00070 or equivalent
- (ae) Using an 8 mm hexagon wrench, install the screw plug.
Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)



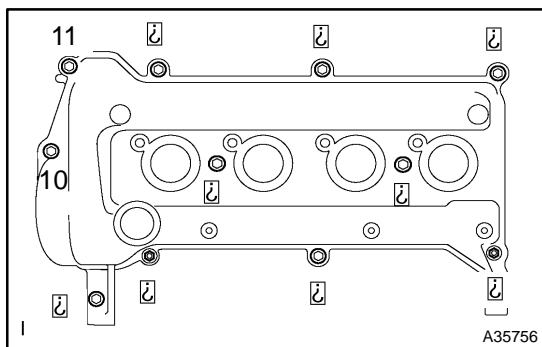
9. INSTALL CYLINDER HEAD COVER SUB-ASSY

- (a) Apply 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 seal packing.
- Do not start the engine within 2 hours of installation.

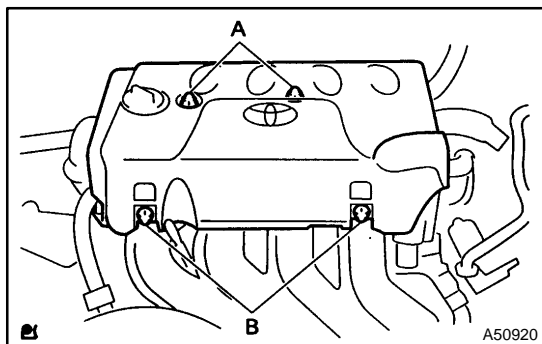


- (b) Install the cylinder head cover with the 9 bolts, 2 seal washers and 2 nuts.
- (c) Using several steps, tighten the bolts and nuts uniformly in the sequence shown in the illustration.

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

10. INSTALL IGNITION COIL NO.1

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



11. 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)

12. 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

13. CHECK FOR ENGINE OIL LEAKS