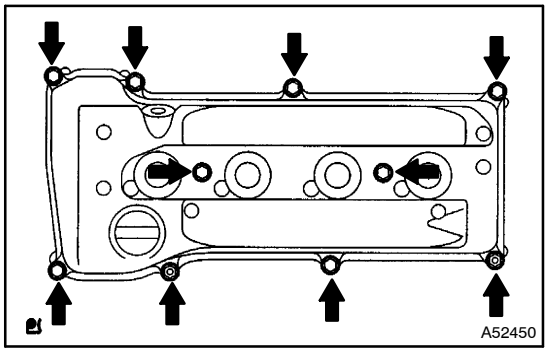
VALVE CLEARANCE (1AZ–FE)

140IQ–01

ADJUSTMENT

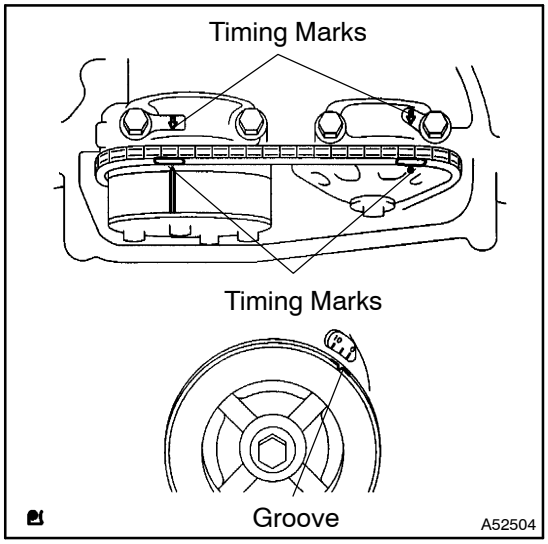
1. **REMOVE FRONT WHEEL RH**
2. **REMOVE FRONT FENDER APRON SEAL RH**
3. **REMOVE ENGINE COVER SUB–ASSY NO.1**
4. **REMOVE IGNITION COIL ASSY**
5. **DISCONNECT VENTILATION HOSE**
6. **DISCONNECT VENTILATION HOSE NO.2**
7. **DISCONNECT ENGINE WIRE**



8. REMOVE CYLINDER HEAD COVER SUB–ASSY

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

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



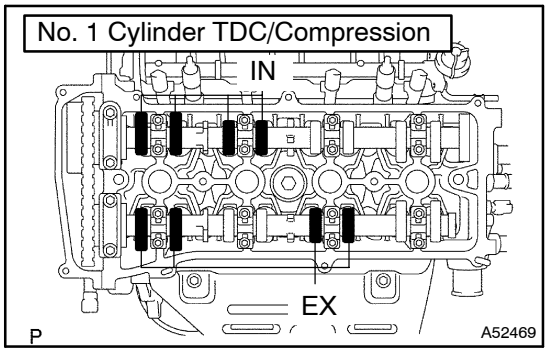
9. SET NO.1 CYLINDER TO TDC/COMPRESSION

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

(b) Check that the timing marks of the camshaft timing sprockets are aligned with the timing marks of the No.1 bearing cap as shown in the illustration.

10. INSPECT VALVE CLEARANCE

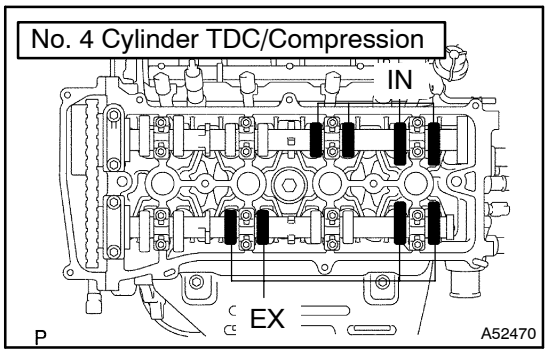
HINT:
Inspect and adjust the valve clearance when the engine is cold.



(a) Check only the valve indicated.
  (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
  (2) Record the out–of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

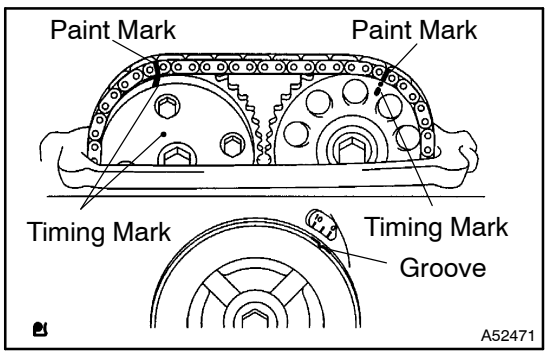
Valve clearance (Cold):
Intake 0.19 – 0.29 mm (0.0075 – 0.0114 in.)
Exhaust 0.30 – 0.40 mm (0.0118 – 0.0157 in.)

(b) Turn the crankshaft clockwise 1 revolution (360°) and set No.4 cylinder to TDC/compression.



(c) Check only the valve indicated.
  (1) Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
  (2) Record the out–of specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

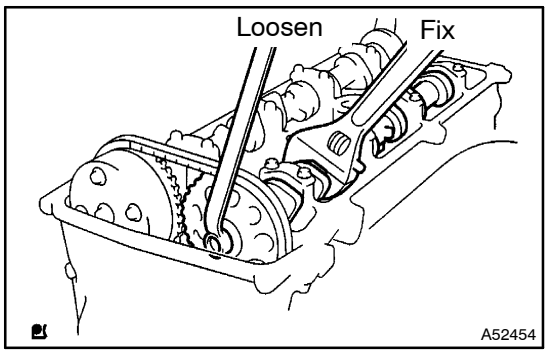
Valve clearance (Cold):
Intake 0.19 – 0.29 mm (0.0075 – 0.0114 in.)
Exhaust 0.30 – 0.40 mm (0.0118 – 0.0157 in.)



11. ADJUST VALVE CLEARANCE

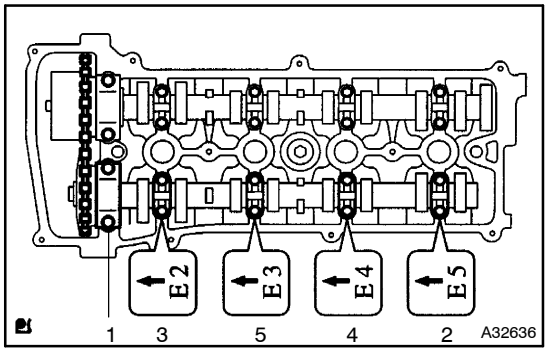
NOTICE:
Be sure not to turn the crankshaft without the chain tensioner.

(a) Turn the crankshaft clockwise 1 revolution (360°) and set the No.1 cylinder to the TDC/compression.
(b) Place matchmarks on the timing chain and camshaft timing gear.
(c) Remove the 2 bolts and chain tensioner.

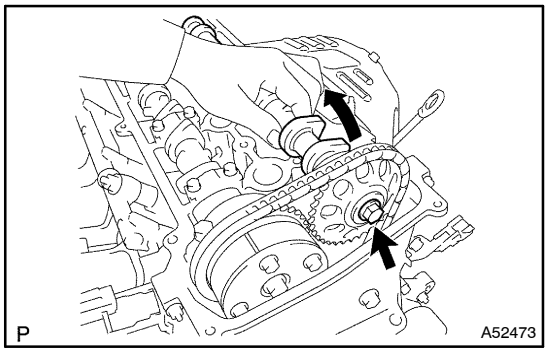


(d) Fix the camshaft with a spanner and so on, then loosen the camshaft timing gear set bolt.

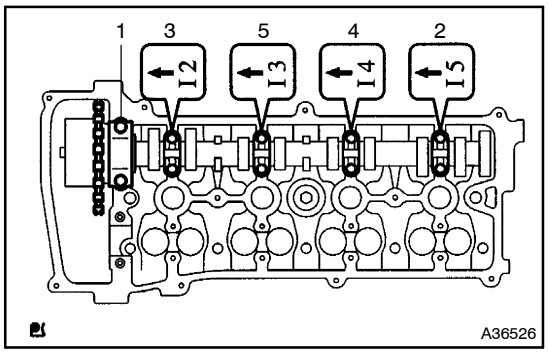
NOTICE:
Be careful not to damage the valve lifter.



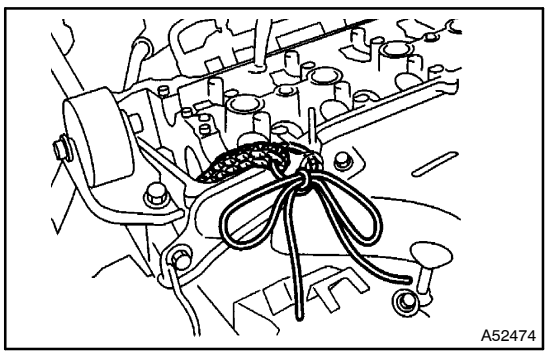
(e) Loosen the camshaft bearing cap bolts on No.2 camshaft in the sequence shown in the illustration in several passes, and remove the caps.



(f) Raising the camshaft, remove the set bolt.
(g) Remove the timing chain sprocket from the camshaft with timing chain.
(h) Remove the timing chain sprocket from the timing chain.



(i) Loosen the camshaft bearing cap bolts on camshaft in the sequence shown in the illustration in several passes, and remove the caps.
(j) Remove the intake camshaft.

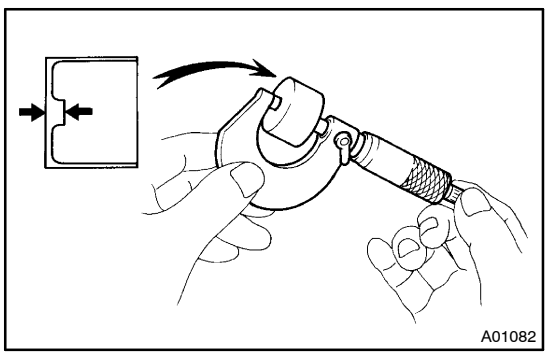


(k) Tie the timing chain with a string.

NOTICE:

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

(l) Remove the valve lifers.



(m) Using a micrometer, measure the thickness of the removed lifter.

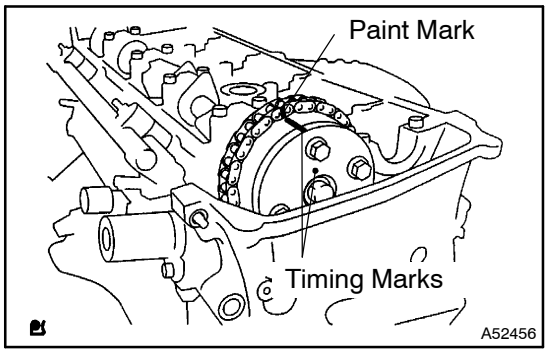
(n) Calculate the thickness of a new lifter so that the valve clearance comes within the specified value.

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

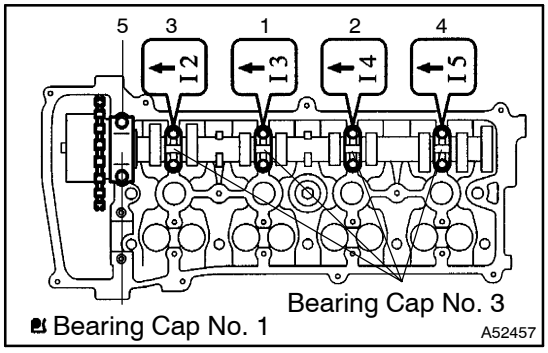
Valve clearance:
Intake A = B + (C – 0.24 mm (0.0094 in.))
Exhaust: A = B + (C – 0.35 mm (0.0138 in.))

HINT:

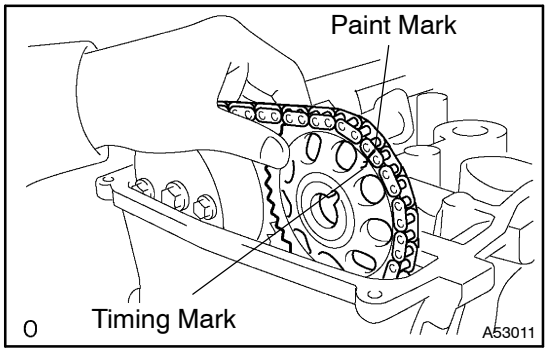
- Select a new lifter with a thickness as close as possible to the calculated values.
- Lifter are available in 35 sizes in increments of 0.020 mm (0.0008 in.), from 5.060 mm (0.1992 in.) to 5.740 mm (0.2260 in.).



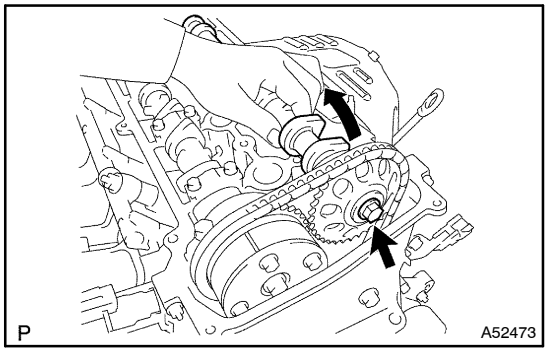
(o) Install the timing chain on the camshaft timing gear, with the painted links aligned with the timing marks on the camshaft timing sprockets.



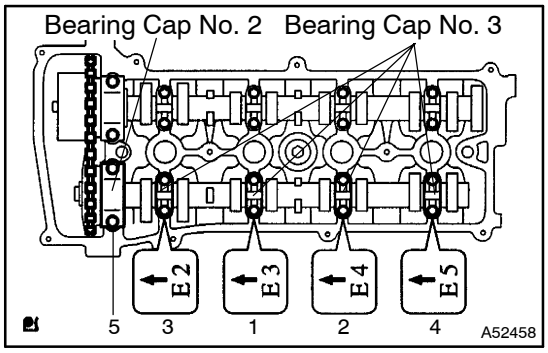
(p) Examine the front marks and numbers and tighten the bolts in the order shown in the illustration.
Torque:
Bearing cap No. 1 30 N·m (301 kgf·cm, 22 ft·lbf)
Bearing cap No. 3 9.0 N·m (92 kgf·cm, 80 in.·lbf)



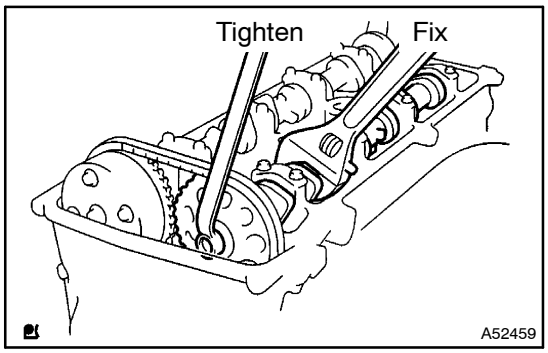
(q) Put the camshaft No.2 on the cylinder head with the painted links of chain aligned with the timing mark on the camshaft timing sprockets.



(r) Raising the camshaft, tighten the set bolt temporarily.

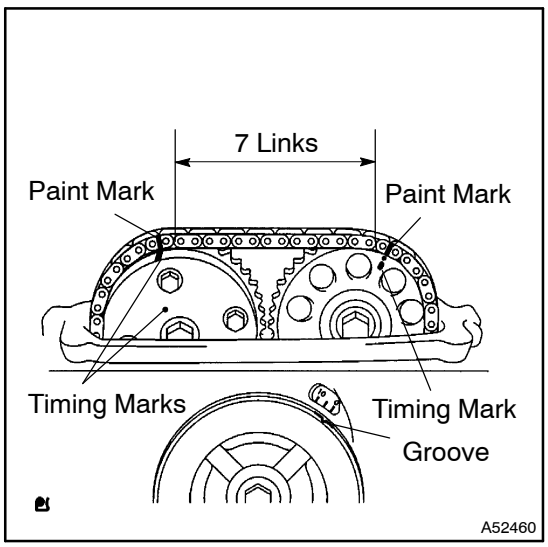


(s) Examine the from marks and numbers and tighten the bolts in the sequence shown in the illustration.
Torque:
Bearing cap No. 2 30 N·m (301 kgf·cm, 22 ft·lbf)
Bearing cap No. 3 9.0 N·m (92 kgf·cm, 80 in.·lbf)

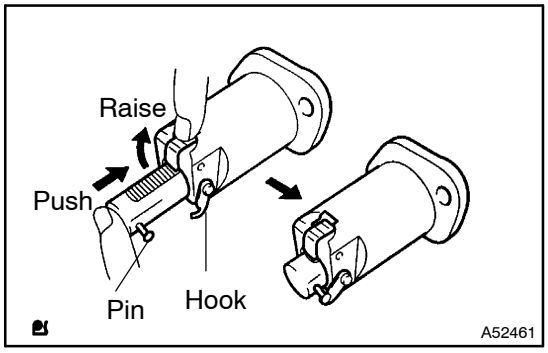


(t) Fix the camshaft with a spanner and so on, then tighten the camshaft timing gear set bolt.
Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)

NOTICE:
Be careful not to damage the valve lifter.

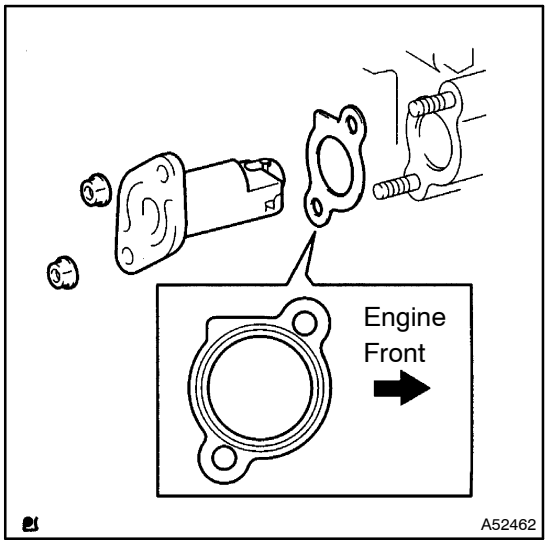


(u) As shown in the illustration, check the matchmarks on the timing chain and camshaft timing sprockets and the alignment of the pulley groove with timing mark of the chain cover.



(v) Install chain tensioner.

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

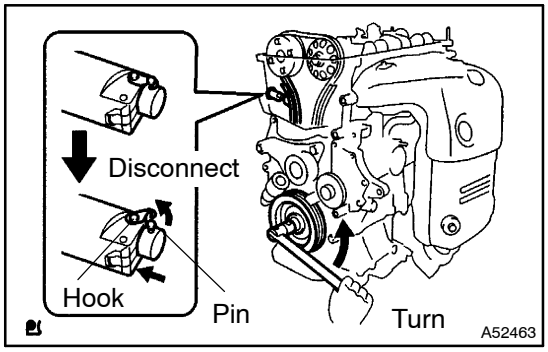


(2) Install a new gasket and chain tensioner with the 2 nuts.

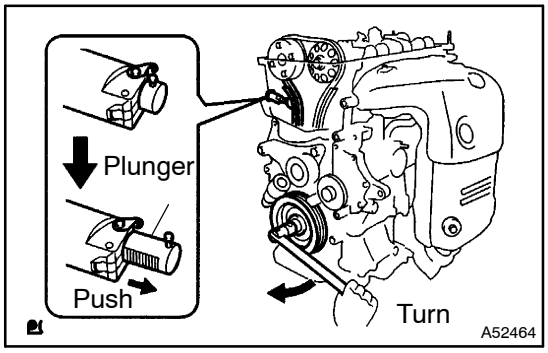
Torque: 9.0 N·m (92 kgf·cm, 80 in.·lbf)

NOTICE:

When installing the tensioner, set the hook again if the hook releases the plunger.



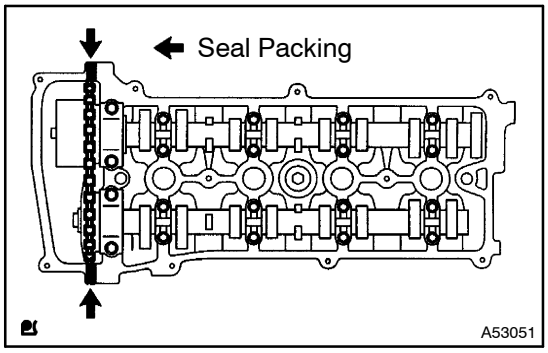
(3) Turn the crankshaft counterclockwise, and disconnect the plunger knock pin from the hook.



(4) Turn the crankshaft clockwise, and check that the slipper is pushed by the plunger.

12. INSTALL CYLINDER HEAD COVER SUB–ASSY

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

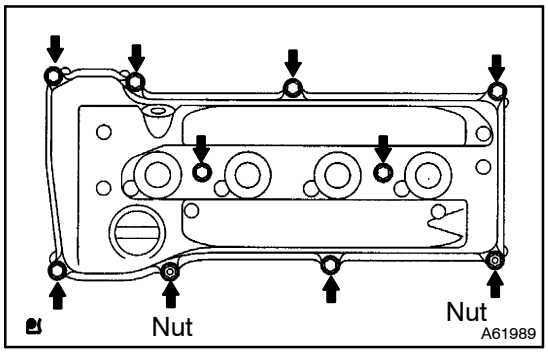


(b) Apply seal packing to 2 locations as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

NOTICE:

- **Remove any oil the contact surface.**
- **Install the cylinder head cover within 5 minutes after applying seal packing.**
- **Do not put into engine oil 2 hours after installing.**



(c) Install the cylinder head cover with the 8 bolts and 2 nuts.

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

13. INSTALL IGNITION COIL ASSY

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

14. INSTALL FRONT WHEEL RH

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

15. INSPECT OIL LEAK